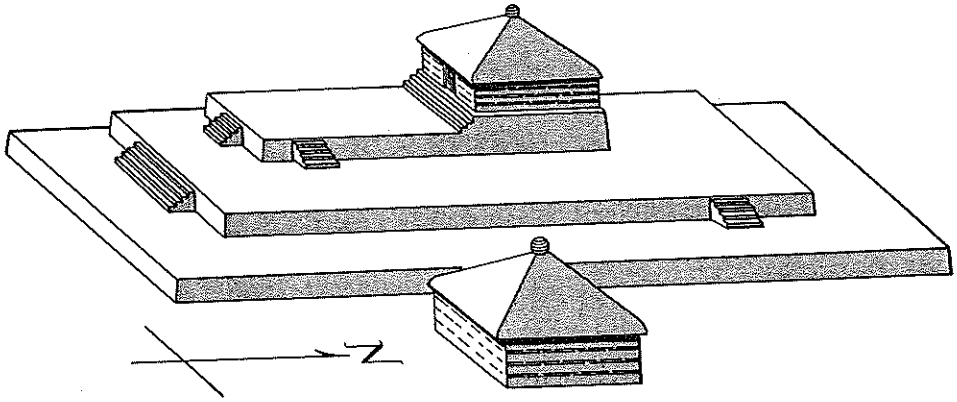
THE PENNSYLVANIA STATE UNIVERSITY

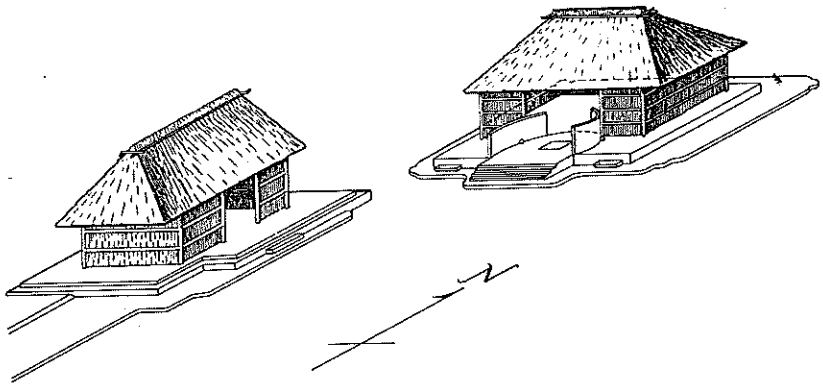
KAMINALJUYU PROJECT – 1969, 1970 SEASONS

PART I – MOUND EXCAVATIONS



Editors

Joseph W. Michels and William T. Sanders



NUMBER 9

DECEMBER 1973

Occasional Papers in Anthropology

Department of Anthropology

THE PENNSYLVANIA STATE UNIVERSITY

University Park, Pennsylvania

THE PENNSYLVANIA STATE UNIVERSITY

KAMINALJUYU PROJECT - 1969, 1970 SEASONS

PART I - MOUND EXCAVATIONS

EDITORS

JOSEPH W. MICHELS AND WILLIAM T. SANDERS

NUMBER 9 DECEMBER 1973

OCCASIONAL PAPERS IN ANTHROPOLOGY
DEPARTMENT OF ANTHROPOLOGY
THE PENNSYLVANIA STATE UNIVERSITY
UNIVERSITY PARK, PENNSYLVANIA

STAFF OF THE KAMINALJUYU PROJECT - 1969 SEASON

Senior Staff

Co-Directors - William T. Sanders and Joseph W. Michels

Ceramicist - Ronald K. Wetherington Consultant - Gustavo Espinoza

Test Trenching - Richard Diehl Ethnographic Survey - Gabriele Escobar

Junior Staff

Donald Austin
Joseph Ball
Carl Bebrich
William Bedoian
Sean Cardenas
Terry Cardenas
Michael Davis
Dennis Dickinson
Boyd Dixon
Lynn Dixon
James Dutt
Katherine Dutt
Lawrence Feldman
Dora Gonzalez
Donna Gursky
Martin Gursky
Brian Hayden
Robert Hirning
Joseph Lischka
Leslie Lischka
Gordon Lothson
Martin McAllister
Gabriele Michels
Tim Nowak
Barbara Price
Douglas Price
Reinard Rudnicky
Michael Steffy
Robert Tiling
John Warner
David Webster
Ned Woodall
Jack Wynn
Mary-Frank Wynn

STAFF OF THE KAMINALJUYU PROJECT - 1970 SEASON

Senior Staff

Co-Directors - William T. Sanders and Joseph W. Michels

Ceramicist - Ronald K. Wetherington Consultant - Gustavo Espinoza

Test Trenching - James Fitting Ethnographic Survey - Dean Arnold

Junior Staff

Georgia Antezberger
Carl Bebrich
William Bedoian
Kathleen Bliss
Marla Brenner
Kenneth Brown
Annetta Cheek
Charles Cheek
Michael Davis
William Doelle
Molly Fitting
Tom Forhan
Leslie Gilsen
Dora Gonzalez
Vicki Gordon
Tom Gray
Brian Hayden
David Hull
Jonathan Kent
Richard Kirsch
Joseph Lischka
Michael Logan
Martin McAllister
Shirley McAllister
Gabriele Michels
Mark Milne
Kathy Morrow
Eileen Reinhardt
Cindy Reynolds
John Reynolds
Robert Riley
Carol Rostvedt
Nancy Stenholm
Sarah Starrett
Beth Voorhies

ACKNOWLEDGMENTS

We wish to express our thanks to Luis Lujan, Director of the Instituto Nacional de Antropologia e Historia for his official support of the project, to Edwin M. Shook for the generous assistance he gave the many students who sought him out, to Richard Adams for his interest and support of the project, and to the Ford Foundation and the National Science Foundation for providing the funds to finance the project. Finally, we want to thank Richard W. Kirsch for the invaluable editorial assistance he provided in all phases of the preparation of this volume.

TABLE OF CONTENTS

	Page
FOREWORD - Joseph W. Michels and William T. Sanders	1
RADIOCARBON AND OBSIDIAN DATING: A CHRONOMETRIC FRAMEWORK FOR KAMINALJUYU - Joseph W. Michels	21
MOUND B-V-6: A LATE FORMATIVE CEREMONIAL STRUCTURE - Carl A. Bebrich and Jack T. Wynn	67
THE B-V-8 MOUND GROUP: A LATE FORMATIVE AND MIDDLE CLASSIC ELITE RESIDENCE COMPLEX - Joseph W. Ball	159
MOUND B-V-4: A LATE FORMATIVE CEREMONIAL STRUCTURE AND MIDDLE CLASSIC RESIDENCE COMPLEX - John Reynolds and D. Sean Cardenas	215
THE B-V-11 MOUND GROUP: A MIDDLE CLASSIC ELITE RESIDENCE COMPOUND - David Webster	253
MOUND A-VI-6: A TERMINAL FORMATIVE BURIAL SITE AND EARLY POSTCLASSIC HOUSE PLATFORM - Richard Kirsch	297
THE B-III-5 MOUND GROUP: EARLY AND MIDDLE CLASSIC CIVIC ARCHITECTURE - Kenneth L. Brown	391
ARTIFACT SUMMARIES FOR KAMINALJUYU MOUND EXCAVATIONS - Joseph W. Michels	465
AN ANNOTATED BIBLIOGRAPHY OF THE ARCHAEOLOGY OF KAMINALJUYU - Richard W. Kirsch	483
REFERENCES CITED	525

FOREWORD

by

Joseph W. Michels and William T. Sanders

INTRODUCTION

This volume represents the second in a series of monographs on the Kaminaljuyu Project that are being published in the Occasional Papers in Anthropology series under the auspices of the Department of Anthropology at The Pennsylvania State University. The first volume, Occasional Paper No. 2, published in May of 1969 describes the excavations conducted at Kaminaljuyu during the 1968 field season. This volume performs a similar service but with a focus upon principally the mound excavations, conducted in the 1969 and 1970 field seasons. The sheer size and productivity of the excavations during these latter two seasons preclude description of all excavation activities in a single volume. Thus, the report on the settlement pattern test trench excavations will come out as a separate volume, as will the report on the excavation of the Monument Plaza and its related mounds (C-II-12 and C-II-14).

The valley survey which sought to discover and to document as many archaeological sites as possible during the life of the project will also require a separate volume to present the extensive results of that program. Finally, the analysis of the artifact data collected during the three principal field seasons, 1968, 1969, 1970, have already generated a number of manuscripts and will be the subject of several monograph volumes. In this regard, we may anticipate volumes that are devoted to ceramic analysis, other artifact analysis, settlement pattern analysis at Kaminaljuyu and others.

The editors of this volume plan to offer a variety of commentary in the body of this foreword, a commentary that will bring the reader up to date with the developments of the project and prospects for the future.

PROJECT SYNOPSIS (1969-1973)

In the introduction to the first volume we provided a discussion of the background of the Kaminaljuyu Project and a summary of the activities that took place during the 1968 field season. Continuing along those lines we report that on the basis of the results of the 1968 field season the National Science Foundation awarded the project a two-year research grant for approximately $180,000 and, supplementing this, the Ford Foundation made available under the auspices of the Department of Anthropology at the University of Minnesota several graduate traineeships in archaeology. With these new resources a full program of field and laboratory work was planned for 1969. Early in the spring of 1969, we secured a new field laboratory facility in Guatemala City that gave us considerably more room to set up operation. By March a small team of students and staff were in the field initiating a second season of settlement pattern test trenching, mound excavations and valley survey. By June a full complement of staff and students had arrived and all of the above mentioned programs were expanded.

The field laboratory began to process very large quantities of artifacts and made use of the IBM computer facility in Guatemala City to punch the data onto IBM cards immediately after their processing in the laboratory. At the peak of the summer field season, the project employed over 100 local laborers and had a mixed, volunteer and salaried staff of over 35 persons.

An ethnographic survey was initiated during the summer under the direction of Gabriel Escobar. The object of the survey was to secure information on those parameters of peasant culture and behavior that might be relevant to the construction of models with which to interpret the archaeological record. The survey was conducted in the general vicinity of the Valley of Guatemala.

The excavation program during this season was focused on two Areas of the site--Area 23 and Area 32. In Area 23, large scale excavation of the Monument Plaza was continued, as well as intensive settlement pattern test trenching of available Sectors surrounding the Monument Plaza. In Area 32 eight mounds were excavated as well as numerous test trenches within Sectors in proximity to the mounds.

In the Valley survey program, the attempt was to secure highly systematic sampling of relatively small areas so that we could evaluate settlement density and configuration. Thus, two 25 square kilometer Zones received very heavy emphasis on the part of the survey team. We also assigned a team under the supervision of Lawrence Feldman to perform a systematic investigation of Chinautla viejo, a Late Postclassic site at the northern end of the valley.

In September of 1969, the principal field season came to an end and a small team of students and workers were left behind to continue the valley survey, the settlement pattern test trenching, and excavation of the Monument Plaza. In June of 1970, a third major field season was initiated. Again the project, at its peak, employed over 100 laborers and had approximately 35 junior and senior staff. During this final season of field work, the project shifted its focus away from mound excavation and concentrated most of its resources into completing the settlement pattern test trench program.

A similar strategy was undertaken by the valley survey teams--they attempted to investigate areas of the valley which had not yet been adequately covered so that, again, by the end of this final field season the survey records would contain information on most of the major sites throughout the valley, as well as more intensive sampling of rural settlements in selected Zones.

Laboratory work was also heavily emphasized. A backlog of materials remained to be catalogued from the 1969 field season and a large volume of material was coming in steadily during the summer. An effort was made to complete the cataloging of all materials from all seasons by the end of the summer.

A number of special projects were initiated during the final season. One, under the direction of James Fitting, was a program to reconstruct the paleohydrology and paleotopography of the Kaminaljuyu site. A second one,

under the supervision of Joseph W. Michels, was the functional and typological analysis of artifacts excluding pottery. A third, under the supervision of Ronald K. Wetherington, was the revision of the ceramic typology. A fourth, under the supervision of William Bedoian, was the compilation of a listing and summary description of all stone sculpture from Kaminaljuyu. Another one, under the supervision of Dean Arnold, was an ethnographic study of pottery making among the communities in the vicinity of Chinautla. Others included special studies in ethnobotany, ethnohistory, paleobotany, and cultural ecology; the latter under the supervision of William T. Sanders.

At the end of the summer field season, the main operations were closed down but a small team was left behind to continue with the artifact cataloging operation which had not been entirely completed.

As early as spring 1970, it became clear to us that additional funds would be necessary to complete the analysis of artifacts. Specifically funds were needed to complete the final analysis and coding of artifacts which were continuing to be catalogued through the fall of 1970 and the winter of 1971. Funds were also needed to continue the obsidian hydration dating program which had begun in 1968, and to initiate a radiocarbon dating program. Furthermore, the final data processing of all the materials and the statistical analysis of these specimens had to be initiated. These involved heavy use of computer time, and the services of a professional computer programmer. Finally, funds were needed to facilitate the preparation of subsequent volumes of the Kaminaljuyu Project report. In the fall of 1970 the National Science Foundation graciously agreed to provide the Kaminaljuyu Project with an additional $77,000 to cover these expenses.

The final season at Kaminaljuyu, consisting of the winter and spring of 1971, was devoted exclusively to laboratory analysis. Joseph W. Michels completed the study of the artifacts and Ronald K. Wetherington completed the classification and preliminary analysis of the rim sherds, figurines, and incensario fragments. By the summer of 1971, it became apparent that, with the exception of ceramic analysis, all of the objectives could be reached with the additional funding. Ronald K. Wetherington, our chief ceramicist, was therefore obliged to request additional NSF support to enable him to complete this work. The National Science Foundation again agreed to additional funding and as of the fall of 1973 the ceramic analysis has been completed and a final report is in preparation.

KAMINALJUYU PROJECT RESULTS: SOME STATISTICS

The Kaminaljuyu Project received financial support from the National Science Foundation and the Ford Foundation over a period of four years (1968-1972) of an amount in excess of $300,000. With these resources the project was able to discover and document approximately 600 archaeological sites from throughout the Valley of Guatemala; ranging from substantial civic centers to small farming hamlets. The sites discovered during the valley survey will enable us to evaluate the role of Kaminaljuyu within its general region. It is already clear, for example, that the role of Kaminaljuyu as a civic, economic and religious center for the valley was not straightforward but that a variety of complex relationships obtained between Kaminaljuyu and other political entities located in various parts of the valley during the past.

It also conducted approximately 550 settlement pattern test trench excavations within Kaminaljuyu and distributed the trenches in such a way as to assure adequate representation of all areas within the site, thereby providing a reliable framework for the reconstruction and analysis of settlement pattern at Kaminaljuyu through time.

Of course, one of the key objectives of the Kaminaljuyu Project was to salvage as much as possible of the information contained in the remarkable aggregate of earthen mounds located there. Towards this end the project was able to conduct systematic excavations of 19 earthen mounds and to conduct test excavations of another 48 mounds. In the course of all of these programs (mound excavation, mound testing, settlement pattern test trench excavation, and valley survey) approximately 2 million artifacts were collected. These were washed, numbered, catalogued, carefully bagged, and stored on a permanent basis in the Museum of Anthropology in Guatemala City in such a way as to make them conveniently accessible to future researchers. The artifact catalog itself was converted to a computerized format and the information on all of the artifacts is currently on magnetic computer tape. Duplicates of these tapes can be made available as a data bank for other interested scholars.

In the course of analysis, the project has accumulated 3000 obsidian dates which have a chronometric capability due to the successful calculation of a rate of hydration for El Chayal obsidian. In addition, 19 radiocarbon dates have been run and 32 archeomagnetic samples have been taken and processed, and are soon to be published. Finally, a data processing system has been developed that permits effective storage and retrieval of all artifact information through the use of 20 specially written computer programs. In addition, the system facilitates hook-up with the computer center library statistical package program, so that statistical manipulation of the data can be achieved with a maximum of convenience and flexibility.

We feel confident that the Kaminaljuyu Project has achieved its primary goal of salvaging an adequate scientific record of the site so that its imminent destruction will not be as great a calamity as it otherwise would have been. Furthermore, we believe that we have been particularly fortunate in developing a methodology, involving the use of computer data processing

and multi-tactic field work, which appears to be successful in the investigation of complex cultural systems.

PARTICIPATING AND TRAINING

One of the most stimulating parts of a project such as this is the opportunity it provides for the cooperative effort on the part of a large number of individuals and academic institutions. During the four years of the Kaminaljuyu Project the staff was able to work with and provide training for 46 graduate students and 19 undergraduate students.

These students came from 12 different institutions: The Pennsylvania State University, University of Missouri, University of Chicago, University of California at San Diego, Case Western Reserve University, University of Arizona, Southern Methodist University, University of Washington, University of Minnesota, University of San Carlos, University of Michigan, and Columbia University.

The interaction among the students and between the students and the staff played an important role in the formulation of research design and the innovation of specific tactics in the field and in the laboratory.

The wide variety of simultaneous activities in the field necessitated delegating considerable responsibility to individual students. This, we believe, enabled them to gain a maximum amount from their experience and also stimulated a number of them to continue with their interest in highland Guatemala as professional scholars. As of this writing, eight of those students have either completed or are in the process of completing doctoral dissertations utilizing the data from the Kaminaljuyu Project. Similarly, there are, currently, five master's theses based on data from the Kaminaljuyu Project. We conclude, therefore, that one of the important by-products of the salvage effort at Kaminaljuyu was the opportunity it provided for the training (at both beginner and advanced levels) of archaeology students, a number of whom plan to commit themselves professionally to carry on the work begun by the project.

CONTENTS OF THIS VOLUME

The first report is by Joseph W. Michels entitled "Radiocarbon and Obsidian Dating: A Chronometric Framework for Kaminaljuyu," with an appendix by Luis Hurtado de Mendoza. In this report Michels discusses the effort made to establish a rate of hydration for El Chayal obsidian which was in heavy use at Kaminaljuyu and throughout the Valley of Guatemala during its entire occupational history. The attempt was successful and the 3000 obsidian hydration measurements currently available can now be used as chronometric dates. In order to establish the hydration rate Michels selected 19 charcoal samples for radiocarbon dating and these are discussed

as well. An added feature of the report is an appendix by Luis Hurtado de Mendoza who applies neutron activation analysis to measure the compositional variation of the obsidian being recovered from Kaminaljuyu. On the basis of his study it becomes clear that there is a single predominant geological source from which obsidian is being exploited so that a hydration rate established for Kaminaljuyu can be applied with a high level of confidence to any obsidian specimens.

The report by Carl Bebrich and Jack Wynn entitled "Mound B-V-6: A Late Formative Ceremonial Structure" is the first of a series in this volume that covers the Late Formative period. The combined set of reports give us, for the first time, a rather complete look at a Late Formative ceremonial complex in the highlands of Guatemala. This particular report provides the reader with a superlative discussion of mound construction techniques and materials.

The next report by Joseph W. Ball is entitled "The B-V-8 Mound Group: A Late Formative and Middle Classic Elite Residence Complex." This is a noteworthy analysis from several standpoints: (1) it provides us with our first glimpse of a Late Formative elite residence (Structure C1); (2) it also describes an interesting combination of residential architecture during the Middle Classic period that seems to suggest variation in social rank.

"Mound B-V-4: A Late Formative Ceremonial Structure and Middle Classic Residence Complex" by John Reynolds and D. Sean Cardenas continues the discussion of Late Formative ceremonial architecture and provides comparisons with Mound B-V-2 which was reported in the first volume of the Kaminaljuyu report (Cardenas 1969). Again, as in the case of the B-V-8 mound group, Mound B-V-4 offers further information about variability in residential architecture during the Middle Classic period.

"The B-V-11 Mound Group: A Middle Classic Elite Residence Compound" written by David Webster, provides a rather detailed description of a well-preserved elite residential compound dating to the Middle Classic period. A unique feature of the complex was the well-preserved floor of a superstructure for Mound B-V-11. Preservation was due to a fire which covered the floor of the superstructure with the burnt clay rubble from the walls. The rubble served as an effective seal and appears to have discouraged efforts on the part of looters to penetrate it.

The report by Richard Kirsch entitled "Mound A-VI-6: A Terminal Formative Burial Site and Early Postclassic House Platform" is especially interesting for two reasons: (1) it provides us with a framework within which Kirsch offers a comparative discussion of Terminal Formative burials and (2) it offers us our first glimpse of an Early Postclassic residential complex.

The next report entitled "The B-III-5 Mound Group: Early and Middle Classic Civic Architecture" written by Kenneth L. Brown traces the remarkable continuity of an Early Classic elite residential and civic complex into the Middle Classic. In the context of his discussion of the ball court which is an integral part of this complex Brown offers us an extensive discussion of the Early Classic origins of the ball court and of the changes in the

compass orientation of ball courts from Early and Middle Classic to Late Classic.

The reader will note that all of the chapters in this volume provide firm chronological determinations for the architecture and features they report upon. Furthermore, they all are able to make use of preliminary analyses of the artifact assemblages recovered during the excavations that they are writing about. Both of these are new features not to be found in the first volume. They reflect the fact that the data processing system and the program of obsidian and radiocarbon dating has made significant progress since the initial report. In order to supplement the reports in the first volume, Joseph W. Michels offers artifact summaries for mounds excavated by the project and reported previously, as well as artifact summaries for mounds which were excavated by other groups but where the artifacts were catalogued through the Kaminaljuyu Project field laboratory, at the request of the Instituto de Antropologia e Historia in Guatemala. The summaries are based on the general computer code of artifact types that serves as the principal identification for artifacts in the data processing system. More specific breakdowns of the artifact specimens, with respect to type and function, must await the volume on artifact analysis that is still in preparation. This chapter however will give the reader some comparative insights into the richness and volume of the mound assemblages.

The final report in the volume is "An Annotated Bibliography of the Archaeology of Kaminaljuyu" compiled by Richard Kirsch. It will, we believe, prove to be a useful research tool, not only to those of us currently involved in analyzing results of the project, but also to future scholars and others who wish to pursue the investigation of one or another topic that bear upon the literature of Kaminaljuyu.

HORIZONTAL PROVENIENCE CONTROL SYSTEM

In order to facilitate the study of settlement pattern and in order to have available a system of horizontal provenience that could integrate both valley wide survey data as well as specific excavational localities within the site of Kaminaljuyu, a grid system with three levels of horizontal control was superimposed upon the Valley of Guatemala (initial discussion of this system can be found in the Introduction to the first volume). Grid units and compass orientation have been selected which are fully compatible with the 1:50,000 series topographic maps published in 1964 by the Guatemalan Cartographic Institute. Since these maps were produced with the currently available aerial photographic series for the region, it is convenient to move between aerial photographs, topographic maps and our own horizontal grid units.

The three levels of horizontal control are referred to as Zone, Area and Sector. The Zone is the largest control unit and it encloses an area of 5 kilometers by 5 kilometers. The Area is a subordinate unit 1 kilometer square. There are 25 Areas in a single Zone. The Sector is a unit of 50 meters by 50 meters and is the principal operation unit of the project.

There are 400 Sectors in a single Area. Zone 46 is the grid position of Kaminaljuyu and it occupies all of Areas 12, 13, 22, 23, 32 and 33 within that Zone. This means that Kaminaljuyu is operationally divided into 2400 50 meter by 50 meter sectors. These are our sampling units in the study of settlement pattern at the site and also are the locational units which are used to define the location of all Kaminaljuyu mounds.

As a result, the original grid system applied to Kaminaljuyu by the Carnegie Institution of Washington is no longer being used. However, since that grid system was the basis for mound designations at Kaminaljuyu, the Carnegie grid has been retained for naming purposes. Thus, new mounds that have been reported have been assigned a mound designation based on the Carnegie grid system. An example would be Mound B-V-15; it was not listed on the original Carnegie map prepared by T. R. Johnson and E. M. Shook but was selected for excavation by the Kaminaljuyu Project and needed to be appropriately named. In some occasions, furthermore, where the Carnegie map provided a single designation to an entire mound aggregate the Kaminaljuyu Project has seen fit to supply individual designations to mound elements within the complex. For these purposes, the Carnegie grid system continued to be used as the basis for mound designation and we recommend that this convention continue. Thus, all mounds at Kaminaljuyu have two designations. A naming designation based on the Carnegie grid system and a locational designation based on the Area and Sector of Zone 46 within which they are located. Figure 1 is the latest version of the map of Kaminaljuyu. It is based on a survey by T. R. Johnson and E. M. Shook for the Carnegie Institution of Washington and upon plans prepared by Gustavo Espinoza of the Instituto de Antropologia e Historia in Guatemala. Further modification and additions have been incorporated based upon the work of the Kaminaljuyu Project.

One of the ultimate advantages of the Kaminaljuyu Project grid system is that it will facilitate computer mapping not only of the site of Kaminaljuyu but also of the sustaining area of the Valley of Guatemala. Furthermore it has also permitted convenient assessment of distances between separated archaeological sites.

Although the Kaminaljuyu Project grid is the principal locational system for proveniencing archaeological finds, occasions arise--especially in connection with the excavation of complex architectural features--where a more specific system of horizontal provenience control is demanded. This, of course, would include the excavation of mounds where the excavation takes place in some sub-Sector unit of control, such as a trench. One instance occurred in 1969, in which eight mounds in immediate proximity to one another were being simultaneously excavated. This occurred in the Finca el Mirador section of the Kaminaljuyu site. In order to provide each mound excavation with a sub-Sector horizontal provenience control system and also to coordinate systems among the eight mounds being excavated a special east-west, north-south coordinate grid was overlaid and a single primary data point was established. Figure 2 illustrates this special case. Most mound excavation reports in this volume are tied into the Finca el Mirador coordinate grid system.

THE ARTIFACT CODE

As mentioned earlier, a project laboratory was set up in Guatemala City. All artifacts were brought to the laboratory where they were washed, allowed to dry and a catalog number assigned to each specimen lot. The specimen lots were then sorted and catalogued. A predominantly functional artifact classification scheme was designed with direct reference to the kind of artifacts being recovered from Kaminaljuyu. Each specimen lot was examined by a student laboratory assistant who assigned it to one of the 160 taxonomic categories recognized for the purposes of preliminary analysis. These include some 34 different ceramic categories, six obsidian categories, some 90 "other stone" categories, 15 different bone categories and approximately 15 miscellaneous categories. Table 1 illustrates the typological coding scheme used for this purpose. Counts were then made of each category represented in a specimen lot. The student laboratory assistant would transcribe all provenience information and all typological information on computer code sheets. Thus, for example, an artifact bag might come from Zone 46, Area 23, Sector 190, square one, level two, 20 to 40 centimeters below the surface. The bag containing this specimen lot might contain 150 body sherds, 25 rim sherds, 1 figurine fragment, 4 incensario fragments, 4 obsidian blades, 13 obsidian flake tools, 1 small, spherical hammerstone and 1 ridged metate. The catalog number assigned to this bag might be KJ69-1345. All of this information was placed on computer code sheets and later were transferred to IBM punch cards, which in turn were used to store the catalog information on computer magnetic tapes.

Since the taxonomic scheme is considerably more complex than what is usually used for cataloging purposes and because we rotated through the cataloging operation different student assistants, all classification decisions were reviewed by two people other than the cataloger: the student lab supervisor and a senior staff member.

Since the completion of the cataloging operation, a number of the typological distinctions made in the original coding format (Table 1) have been called into question through the detailed analysis of the artifacts conducted by Joseph W. Michels in the winter of 1971. Thus, the artifact identification code in Table 1 should be treated as illustrative of the variability inherent in the artifact collection at Kaminaljuyu, and in the Valley of Guatemala, as a whole, but the implied functional identity of the specimen should be treated as only provisional at this point.

Table 1

Artifact Identification Code - Kaminaljuyu Catalogue

Material Code (Col 49, 50)	Item Field (Col 53, 54)	Sub-Item Field (Col 55, 56)
1 - Ceramics	1 - rim sherd	
	2 - body sherd	
	3 - unclassified artifact	
	4 - burnt clay lumps	1 - without surfacing
		2 - with painted surface
		3 - with unpainted surface
	5 - figurine	4 - with impressions
	6 - effigy sherd	5 - surface and impressions
	7 - adorno	
	8 - effigy whistle	
	9 - bead	1 - cylindrical
		2 - disc
		3 - spool-shaped
		4 - spherical
	10 - stamp	1 - flat
		2 - rocker
		3 - cylindrical
	11 - rattle ball	
	12 - disc	1 - perforated
		2 - unperforated
	13 - pendant	1 - simple
		2 - figurine
	14 - incensario	1 - fragment
		2 - whole or restorable
	15 - miniature vessel	
	16 - pottery vessel (whole or restorable)	
	17 - sherd abrader	
	18 - spindle whorl	

Table 1 (continued)

Material Code (Col 49, 50)	Item Field (Col 53, 54)	Sub-Item Field (Col 55, 56)
1 - Ceramics (cont)	19 - candelero	0 - indeterminate 1 - conical 2 - handled cup 3 - small
	20 - adobe or clay sculpture	1 - fired 2 - unfired
	21 - ear plug	
	22 - finger ring	
	23 - gourd-shaped vessel (Botijo)	
	24 - rim head vessel sherds	
	25 - clay cones (30 cm high)	
	26 - mold	
2 - Obsidian	1 - blade artifact	
	2 - flake artifact	
	3 - core	
	4 - shaped artifact	
	5 - water-worn pebble (small)	
	6 - quarry nodules	
3 - Other Stone	1 - building material	
	2 - unclassified shaped artifact - chipped	
	3 - unclassified shaped artifact - ground	
	4 - mica	
	5 - grooved stone weight	
	6 - mineral pigment	
	7 - quartz crystal	
	8 - green matrix material	
	9 - soapstone	
	10 - stone sculpture	

Table 1 (continued)

Material Code (Col 49, 50)	Item Field (Col 53, 54)	Sub-Item Field (Col 55, 56)
3 - Other Stone (cont)	11 - unclassified utilized cobble	
	12 - pumice	
	13 - pyrite	
	14 - tabular mano (vesicular basalt)----------	0 - unclassifiable
		1 - bi-plano in longitudinal cross-section (thin)
		2 - bi-convex in longitudinal cross-section
		3 - triangular in transverse cross-section
		4 - bi-plano in longitudinal cross-section (thick)
	15 - cylindrical mano (vesicular basalt)-------	1 - plain
		2 - with nubbin handle
	16 - pebble mano (vesicular basalt)	
	17 - fine-grained mano (shaped: plano-convex or circular)	
	18 -	
	19 - miscellaneous non-artifact detritus	
	20 - hammer stone----------	0 - unclassifiable
		1 - multiple facet (small)
		2 - bi-terminal cobble (small to medium)
		3 - spherical (small)
		4 - tablet-shaped (sometimes with finger indentations in center) (large)
		5 - angular chunk (large)
	21 - abrading pebble----------	1 - power-fine abrasive pebble
		2 - granular abrasive pebble
		3 - non-granular abrading pebble
		4 - pumice abrader
	22 - polishing pebble----------	1 - angular pebble with multiple/narrow polishing surfaces

Table 1 (continued)

Material Code (Col 49, 50)	Item Field (Col 53, 54)	Sub-Item Field (Col 55, 56)
3 - Other Stone (cont)	23 - metate	0 - unclassifiable
		1 - simple slab, open-ended shallow trough
		2 - simple slab, ridged shallow trough
		3 - small slab metate
		4 - simple slab, open-ended deep trough
		5 - simple plate-thin shallow trough
		6 - simple shallow-dish slab metate
		7 - large bipedal metate
		8 - bar-support metate
		9 - pedestled metate
		10 - modern metate (squared supports)
		11 - effigy metate
	24 - rubbing platform	1 - large coarse-grained tuff or vesicular basalt cobble or slab with exploitation of naturally-occurring flat surface
		2 - small fine-grained stone fragment with very flat naturally-occurring surface
		3 - fine grained stone with triangular cross-section (used area on longitudinal ridge)
	25 - mortar	2 - miniature vesicular basalt mortar
		3 - incipient mortar cavity in portable stone slab or cobble
		4 - well-shaped portable mortar
	26 - pestle	1 - circular tablet with nubbin palm-grip
		2 - conical
	27 - digging stick weight	
	28 - hoe	1 - spatulate with hafting tang

Table 1 (continued)

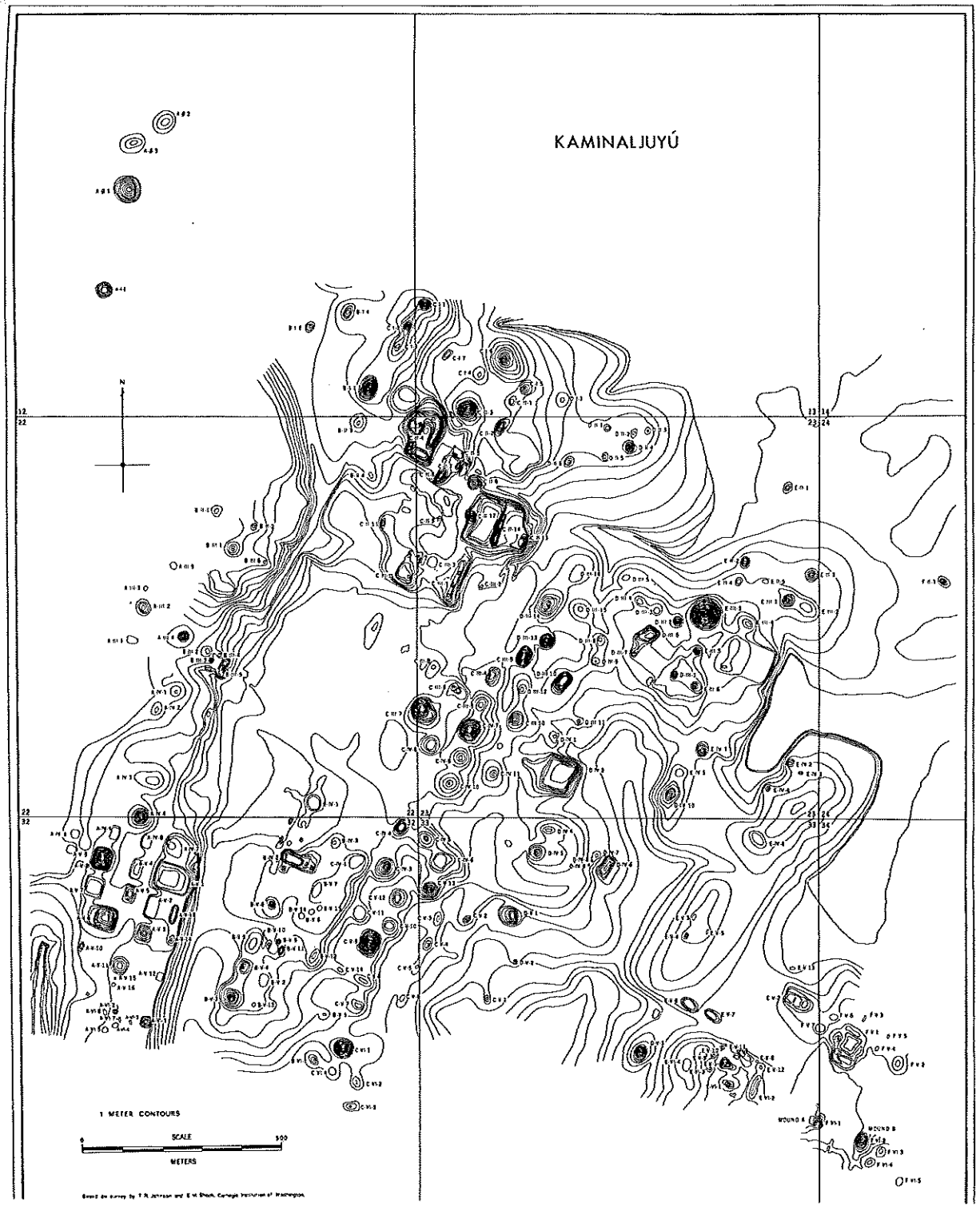
Material Code (Col 49, 50)	Item Field (Col 53, 54)	Sub-Item Field (Col 55, 56)
3 - Other Stone (cont)	29 - stone club	1 - spherical with medial groove haft
		2 - ovate with medial groove haft
		3 - mace head (perforated basalt cobble with side indentations)
	30 - bark beater	
	31 - conical perforator/abrader	
	32 - lime stone	
	33 - ground and pecked stone vessel	
	34 - anvil	1 - large cobble
		2 - small-concave
		3 - small-convex
	35 - large thin slab plate (building material or platform)	
	36 - celt (any material)	
	37 - bead	1 - cylindrical
		2 - spherical
		3 - spool-shaped
		4 - disc
		5 - tab
	38 - plug (ear or nose)	
	39 - pendant	1 - figurine
		2 - simple
	40 - carved stone vessel	
	41 - basalt flake artifact	
	42 - chalcedony flake artifact	
	43 - shaft smoother	
	44 - steatite (soapstone) tab	
	45 - large talpetate chunk or block	
	46 - dressed stone block	
	47 - dressed pumice (block or otherwise)	
	48 - stone pounder	
	49 - spindle whorl	

Table 1 (continued)

Material Code (Col 49, 50)	Item Field (Col 53, 54)	Sub-Item Field (Col 55, 56)	Taxon (Col 57, 58)
3 - Other Stone (cont)	50 - figurine		
	51 - mushroom stone		
	52 - hemispherical mano		
	53 - large disc plaque		
	54 - stone basin		
	55 -		
	56 - column		
	57 - yoke		
4 - Radiocarbon Sample	1 - of unknown composition		
	2 - charcoal		
	3 - organic substance		
5 - Bone	0 - unclassified		
	1 - animal (unmodified)	1 - bird	Taxon (e.g. species)
		2 - mammal	Taxon (e.g. species)
		3 - fish	Taxon (e.g. species)
		4 - insect	Taxon (e.g. species)
	2 - animal (artifact)	1 - bead	
		2 - pendent	
		3 - tool	
	3 - human (unmodified)	0 - not sexable	0 - age indeterminate
		1 - male	1 - infant
		2 - female	2 - immature
			3 - adult
	4 - human (artifact)		
	5 - burial (human)	0 - not sexable	0 - age indeterminate
		1 - male	1 - infant
		2 - female	2 - immature
			3 - adult
	6 - burial (animal)	1 - bird	Taxon (e.g. species)
		2 - mammal	Taxon (e.g. species)
	7 - cremation (human)		

Table 1 (continued)

Material Code (Col 49, 50)	Item Field (Col 53, 54)	Sub-Item Field (Col 55, 56)
6 - Shell	1 - unmodified 2 - artifact	
7 - Soil	1 - soil sample	1 - strata sample 2 - interior of vessel sample 3 - flotation sample 4 - concretion (natural) 5 - raw clay sample
8 - Ash	1 - consolidated ash	
9 - Ecological Specimen (plant)	1 - seed 2 - wood 3 - nut 4 - rubber 5 - maize cob	
10 - Textile	1 - fiber	
11 - Unidentified Object		
12 - Adobe Floor	1 - house floor 2 - plaza floor	
13 - Stucco		
14 - Metal	1 - unidentified 2 - ear plug 3 - knife blade	


KAMINALJUYÚ
N
1 METER CONTOURS
SCALE
0
500
METERS
MOUND A
MOUND B

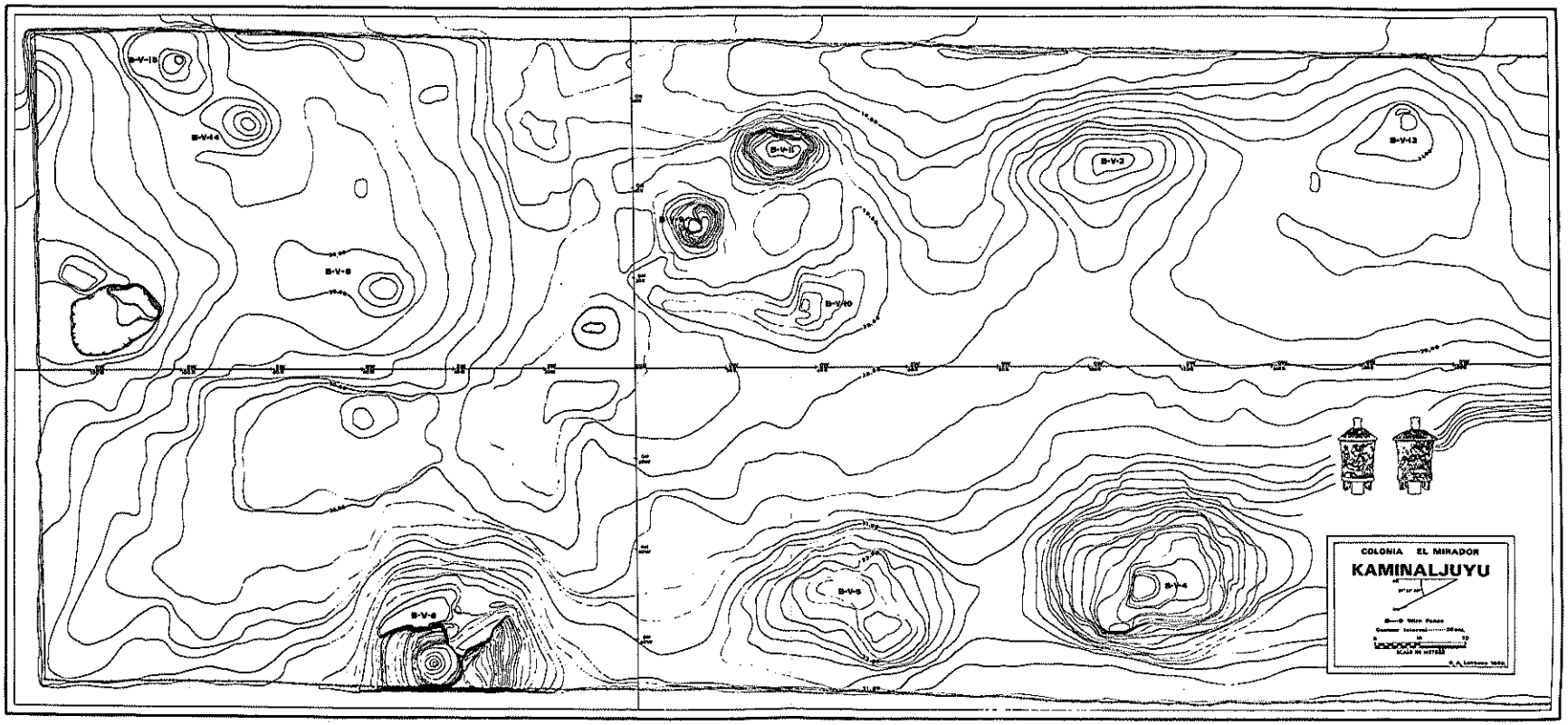


FIGURE 2: MAP OF COLONIA EL MIRADOR, KAMINALJUYU

RADIOCARBON AND OBSIDIAN DATING:

A CHRONOMETRIC FRAMEWORK FOR KAMINALJUYU

by

Joseph W. Michels

TABLE OF CONTENTS

	Page
INTRODUCTION	25
RADIOCARBON DATING	27
OBSIDIAN HYDRATION MEASUREMENTS	29
CALCULATING THE RATE OF HYDRATION BY AVERAGING	36
HYDRATION RATE DISCUSSION	38
THE CLIMATIC SETTING	40
CALENDAR CONVERSION AND CULTURE PERIODS	41
CONCLUSION	42
APPENDIX 1: Neutron Activation Analysis of Kaminaljuyu Obsidian, by Luis Hurtado de Mendoza	43
APPENDIX 2: Calendar Conversion Tables for Hydration Measurements: Rate = 7.03 μ^2/1000 Yrs.	55

LIST OF TABLES

Table		Page
1	Archeomagnetic Samples Collected at Kaminaljuyu	26
2	Kaminaljuyu Project Radiocarbon Dates	28
3	Previous Radiocarbon Dates from Kaminaljuyu	30
4	Kaminaljuyu Project Obsidian Hydration Measurements	32
5	Data Set for Hydration Rate Averaging	37
6	Rate Evaluation: Radiocarbon Dates	38
7	Rate Evaluation: Obsidian Measurements	39
8	The Kaminaljuyu Project Culture Period Sequence	42
9	"Rabbits" Irradiation Data and Distribution of Standards and Specimens	45
10	Distribution of Obsidian Specimens Categorized by their Na:Mn Ratios	47
11	A Detailed List of Obsidian Specimens from Kaminaljuyu Analyzed through Neutron Activation of Sodium and Manganese-Results	49

LIST OF FIGURES

Figure		Page
1	Graphic Representation of the Frequency Distribution of Na:Mn Ratios in Obsidian	53
2	Obsidian Specimens Plotted on the Basis of Sodium and Manganese Percentages	54

INTRODUCTION

The Kaminaljuyu Project, not unlike many other large-scale archaeological research programs, faced formidable problems establishing a time framework for its many hundreds of discrete data-producing locations. Specifically, the project was confronted with a need to date over 600 surface survey sites scattered throughout the Valley of Guatemala, as well as over 550 settlement pattern test trenches within the Kaminaljuyu proper. Many of the latter were over one meter deep and contained more than one archaeological component. Finally, a systematic survey of the remaining Kaminaljuyu mounds involved an effort to assign dates to as many as possible.

To accomplish this goal the staff decided early on to capitalize upon the widest possible variety of chronometric and relative dating opportunities available at the site. Pottery, always an effective relative dating resource, was available in virtually every Sector location sampled. Close to two million sherds were catalogued. These have received the attention of a well-trained ceramics team lead by Ronald K. Wetherington, of the Southern Methodist University, who should in the very near future be prepared to release his final report. The report will apply a fully revised version of the typological scheme developed by earlier researchers to the cross-dating needs of the project's valley survey program, settlement pattern test trench program, and Kaminaljuyu mound survey program.

Exciting prospects also lie ahead in the area of archeomagnetic dating at Kaminaljuyu. Robert DuBois, Paul Baumgartner, and Daniel Wolfman collected 32 archeomagnetic samples from Kaminaljuyu between 1968 to 1972 (see Table 1). Four samples were removed from settlement pattern test trenches, 15 samples were taken from constructional episodes within the Monument Plaza, 6 samples were taken from architectural remains of the C-II-4 complex excavated by Gustavo Espinosa, and the remainder derive from various other Kaminaljuyu mounds. As is clear from the number of samples, the chronometric dates resulting from archeomagnetic analysis should prove especially important in dating the architectural sequence within the Monument Plaza.

Both of these sources of chronological information--ceramic cross-dating and archeomagnetic dating--have yet to be made available in final form and will not be touched upon any further in this report. Another avenue of chronological analysis that we plan to pursue involves computer-assisted distributional analysis of other time-sensitive artifact types. The results of this study will be reported in conjunction with the Kaminaljuyu Project report on artifacts, which is still in preparation.

Early in the project it was decided that first priority in chronological analysis should be given to the establishment of an obsidian hydration rate for the site since obsidian was distributed in large quantities in virtually every data collecting locality, and it was known to be an inexpensive and fairly rapid technique of chronometric dating. Furthermore, it was understood that the resulting dates would be accurate and reliable provided that a satisfactory level of calibration control could be obtained by means of an independent chronometric dating technique, and provided that the chemical composition of obsidian specimens could be determined to be largely

Table 1

Archeomagnetic Samples Collected at Kaminaljuyu*

Field Designation of Sample	Kaminaljuyu Sector Location	Mound Association
8-18-68 KJ	46-22-110	(Test pit)
8-19-68 KJ	46-22-131	B-III-1
8-20-68 KJ	46-22-079	(Test pit)
8-21-68 KJ	46-23-000	C-II-4 complex
7-30-70 KJ	46-12-189	(Test pit)
6-30-70 KJ	46-32-133	B-V-11
7- 1-70 KJ	46-23-103	Monument plaza (E3-a)
7- 2-70 KJ	46-23-103	Monument plaza (Da-b or c)
7- 3-70 KJ	46-23-103	Monument plaza (D3)
7- 4-70 KJ	46-23-103	Monument plaza (D3)
7- 5-70 KJ	46-23-103	Monument plaza (E3-b)
7- 7-70 KJ	46-23-103	Monument plaza (D2-b)
7- 8-70 KJ	46-23-103	Monument plaza (E3-a)
7- 9-70 KJ	46-23-103	Monument plaza (D1-b)
7-10-70 KJ	46-23-103	Monument plaza (E4)
7-11-70 KJ	46-23-103	Monument plaza (D1-b)
7-12-70 KJ	46-23-103	Monument plaza (D2-c)
7-13-70 KJ	46-23-103	Monument plaza (D1-a)
7-14-70 KJ	46-23-103	Monument plaza (U1)
7- 6-70 KJ	46-32-204	A-VI-5
7-12-71 KJ	46-23-103	Monument plaza (D2-b)
7-16-71 KJ	46-23-103	C-II-12 (C1/2)
7-17-71 KJ	46-23-000	C-II-4 complex
7-18-71 KJ	46-23-000	C-II-4 complex
7-19-71 KJ	46-23-000	C-II-4 complex
7-20-71 KJ	46-33-358	(Test pit)
7-12-72 KJ	46-23-000	C-II-4 complex
7-13-72 KJ	46-23-103	Monument plaza
7-14-72 KJ	46-23-103	Monument plaza
7-15-72 KJ	46-23-000	C-II-4 complex
7-24-72 KJ	46-23-211	D-III-6
7-25-72 KJ	46-23-211	D-III-6

* 1968 samples collected by Paul Baumgartner.
1970 samples collected by Robert DuBois.
1971 and 1972 samples collected by Daniel Wolfman.

homogeneous. This paper, then, reports on the effort that has been made in establishing a hydration rate based on calibration with a number of radiocarbon dates. It also reports on efforts to control for obsidian composition by means of neutron activation analysis.

RADIOCARBON DATING

During the course of excavations, the Kaminaljuyu Project collected hundreds of charcoal specimens suitable for radiocarbon dating. Only a small fraction could be dated since the expense is considerable. The first step in the selection procedure was to identify the very best samples among the total number recovered with respect to the requirements of the dating technique. Samples were determined to be of high quality on the basis of the lack of obvious depositional or recovery contamination, on the intactness or chunkiness of the carbonized remains, and on the weight (or size) of the sample. Thus, a desirable sample would be large (ie., greater than 10 grams in weight), chunky rather than powdery, and one which was not badly contaminated by rootlets or other extraneous carbon-bearing materials.

For the calculation of an obsidian hydration rate, it is desirable to generate a data-set with as wide a chronological range as possible and with appropriate intermediate points as well. This, then, became the criteria for the second round of sample selection. Beginning in 1968, The Pennsylvania State University Obsidian Dating Laboratory had carried on a continuous program of hydration measurement on Kaminaljuyu obsidian so that by the time it became necessary to select charcoal samples for radiocarbon dating we had available most of the approximately 3000 obsidian measurements ultimately processed. The first task was to identify Sector locations that contained a cluster of obsidian hydration measurements of either very low value or very high value. These would then constitute the maximum range of hydration which could theoretically be correlated with radiocarbon dates. Although the hydration measurement range provided by the obsidian specimen clusters was of a smaller magnitude than the range of individual hydration measurements themselves, it did constitute sufficient range for a reliable computation of the hydration rate. A search was then undertaken to locate charcoal samples in direct association with such obsidian specimen clusters. Intermediate points along the hydration range were then filled in by a search for either suitable clusters of hydration measurements or for suitable radiocarbon samples for which obsidian specimens were in direct association.

Nineteen charcoal samples were ultimately selected for radiocarbon dating. One sample was submitted to the University of Michigan Lab, the rest to Isotopes Inc. Although the principal criterion for selection of a sample for radiocarbon dating was its relevance for the calculation of a hydration rate, it did turn out that several of the samples were found in contexts which were susceptible to archeomagnetic dating. In such cases, the radiocarbon dates have not only aided in computing a rate of hydration but have also aided in determining an archeomagnetic secular variation curve for Mesoamerica (Wolfman 1972, personal communication). The results of dating and various provenience information are given in Table 2.

Table 2

Kaminaljuyu Project Radiocarbon Dates

Sample Number	Laboratory Date (BP)*	Corrected Date (BP)**	Catalog Number(s)	Kaminaljuyu Sector Location	Mound Association	Feature Association	Excavation Unit	Vertical Provenience (cm)
I-6611	1175 ± 90	1159 ± 90	KJ69-7049,7057 7058,7064, 7097,7103, 7104	46-23-103	C-II-14	5	28E/4N 27E/4N 28E/2N	Lvls 8,9;1750-1739
I-6743	1220 ± 115	1206 ± 115	KJ70-10109, 10403	46-32-184	A-VI-6	-	101E/100N 98E/98N	Lvls 2,3;1898-1839
I-6270	1225 ± 90	1211 ± 90	KJ69-7066	46-32-141	B-V-4	4	40	Lvl 1; 2331
I-6246	1250 ± 90	1237 ± 90	KJ70-9459	46-22-229	B-III-3	11	24E/9N	Lvl 4; 1710-1690
I-6251	1430 ± 90	1472 ± 90	KJ69-6434	46-32-133	B-V-11	14	26	Lvl 1; 1917
I-6608	1505 ± 90	1493 ± 90	KJ70-2926	46-23-103	C-II-14	221	11E/18N	Lvl 24; 1454-1432
M-2442	1730 ± 130	1731 ± 130	KJ68-1786	46-22-090	B-II-1	36	NL	Lvl 13; 987
I-6308	1750 ± 90	1752 ± 90	KJ69-6724,6728	46-23-072	-	22	Ext. 104	Lvl 5; 96-90
I-6332	1830 ± 90	1834 ± 90	KJ69-352	46-23-023	-	1	Orig. Pit	Lvl 10; 199
I-6247	1865 ± 150	1870 ± 150	KJ69-4516	46-23-184	-	-	Orig. Pit	Lvl 14; 280
I-6269	1915 ± 90	1970 ± 90	KJ69-6988,7050	46-32-094	B-V-7	-	Ext. 1	Lvl 10; 200-180
I-6306	1955 ± 90	2013 ± 90	KJ69-5842	46-32-094	B-V-15	6	309	Lvl 5; 1985
I-6248	1965 ± 90	2023 ± 90	KJ70-10165, 10163	46-12-189	-	1	Orig. Pit	Lvl 6; 127-121
I-6305	2060 ± 90	2121 ± 90	KJ69-8245	46-23-072	-	2	Ext. 1	Lvl 17, 330
I-6249	2090 ± 90	2152 ± 90	KJ69-4484	46-23-185	-	-	Orig. Pit	Lvl 12, 236-230
I-6609	2150 ± 160	2264 ± 160	KJ70-9453	46-23-103	C-II-12	275	18W/6N	Lvl 16,17;1640-1630
I-6384	2205 ± 180	2321 ± 180	KJ68-1721	46-12-396	-	2	Orig. Pit	Lvl 10; 198
I-6610	2215 ± 90	2331 ± 90	KJ70-785	46-33-056	E-IV-6(?)	2	Ext. 2	Lvl 6; 105-100
I-6250	2355 ± 90	2475 ± 90	KJ70-973	46-23-268	-	7	Orig. Pit	Lvl 15; 290

*Half-life of 5568 years; no correction for fluctuations in the atmospheric inventory of $C^{14}O_2$.
**Corrected half-life (5730 years); correction for fluctuation in atmospheric inventory of $C^{14}O_2$ by means of MASCA Correction Factors (Ralph 1971: Table 1.5).

The reader will note in Table 2 that the radiocarbon dates range from 2475 BP to 1260 BP (corrected dates); indicating a chronometric range of approximately 1300 years. This range begins with a date of 503 B.C. $\pm$ 98 and ends with a date of 766 A.D. $\pm$ 115. Using the Kaminaljuyu Project culture period scheme, which is discussed later in this paper, the dates range between the beginning of the Late Formative period to the first half of the Late Classic period. The entire Middle Formative period, which we have beginning at approximately 1000 B.C., the balance of the Late Classic period, and the Early and Late Postclassic periods all failed to be represented. The actual chronological range of occupation at Kaminaljuyu is 2500 years, twice the magnitude of the range which is covered by the radiocarbon date series. This is, however, not regarded as a critical problem since we are not seeking to evaluate the diffusion equation which governs the hydration rate. We have instead adopted the diffusion equation first proposed by Friedman and Smith (1960). This equation, $M^2 = Kt$, has received support from both controlled laboratory experiments conducted by Friedman and his associates (1966) and by field tests conducted by Johnson (1969). Furthermore, since most of the 3000 obsidian hydration measurements available for Kaminaljuyu fall within the time-range covered by the radiocarbon date series, the possibility for error based on the data-set range is low.

The radiocarbon date series also provides chronometric information on 11 Kaminaljuyu mounds. This augments the radiocarbon date series previously published by earlier researchers relating to 7 other Kaminaljuyu mounds (Table 3). Although Table 2 summarizes provenience information, readers desiring more specific information on the behavioral context of each of the radiocarbon samples should look in the published report of the excavation unit in question. Thus, in this volume the reader will find additional discussion of some of the dates in those chapters covering mound excavations which have yielded radiocarbon dated samples. Those samples that were obtained from settlement pattern test trenches, as well as those from the Monument Plaza complex (C-II-14 and C-II-12), will be discussed in more detail in the reports on those excavations, which are scheduled for publication in the very near future.

OBSIDIAN HYDRATION MEASUREMENTS

The obsidian specimens selected for inclusion in the data-set to be used for the computation of the hydration rate were selected because of their association with the radiocarbon dated samples discussed above. Information on these obsidian specimens is summarized in Table 4.

There are several aspects of the data-set that deserve comment. First of all, the number of radiocarbon dated samples listed is 18 rather than 19. The reason for this is that the obsidian specimens associated with one of the radiocarbon dated samples could not be located; having been apparently misplaced. We learned of this only after the radiocarbon sample had been processed. Thus, we have obsidian in association with only 18 of the 19 radiocarbon dates. Another feature of the data is its distributional irregularity. The number of specimens associated with each of the

Table 3

Previous Radiocarbon Dates from Kaminaljuyu

Laboratory Sample Number	Laboratory Date (BP)*	Corrected Date (BC/AD)**	Sector Location	Mound Association	Depositional Context	Collected By
Y-629	1560 ± 70	402 A.D. ± 70	46-23-226	D-III-13	Below burial, above stones	M. Coe
Y-405	1660 ± 60	299 A.D. ± 60	46-23-226	D-III-13	Upright post in fill of structure below Structure K	H. Berlin
Y-378	1785 ± 60	171 A.D. ± 60	46-23-226	D-III-13	Grave 1	E.M. Shook
Y-406	1800 ± 60	155 A.D. ± 60	46-23-253	D-III-1	Midden sealed by terrace fill	E.M. Shook
Y-370	1850 ± 60	104 A.D. ± 60	46-23-267	D-III-10	Wood post from early construction phase	E.M. Shook
Y-396	1860 ± 60	93 A.D. ± 60	46-23-226	D-III-13	Bottom of posthole in fill of structure assoc. with Floor 2 and 3, earlier than stone stairway Structure N; later than painted adobe Structure M	H. Berlin
Y-382	1920 ± 60	32 A.D. ± 60	46-23-194	E-III-3	Fill of structure 3b, 3c, 3d, 4	E.M. Shook
Y-377	1940 ± 60	39 B.C. ± 60	46-23-194	E-III-3	Tomb 1	E.M. Shook
Y-391	2025 ± 60	126 B.C. ± 60	46-23-199	E-III-2	Fill of structure 5	E.M. Shook
Y-402	2070 ± 50	173 B.C. ± 50	46-23-324	C-III-10	Top of sandy layer directly overlying sterile soil, outside base of primary structure and sealed by second structure	A.V. Kidder
Y-401	2240 ± 60	398 B.C. ± 60	46-23-325	C-III-10	Second structure	E.M. Shook
M-1257	2280 ± 130	434 B.C. ± 130	59-12-084	Pit No. 2b	From within ceramic vessel imbedded in hard caliche-like clay at bottom of 2 m deep pit	S.F. de Borhegyi

Table 3 (continued)

Laboratory Sample Number	Laboratory Date (BP)*	Corrected Date (BC/AD)**	Sector Location	Mound Association	Depositional Context	Collected By
Y-390	2335 ± 50	496 B.C. ± 50	46-23-261	C-III-6	Intrusive cache	E.M. Shook
Y-384	2340 ± 50	501 B.C. ± 50	59-12-084	Pit No. 1	Finca Las Charcas	E.M. Shook
C-887	2490 ± 300	661 B.C. ± 300	46-23-194	E-III-3	Structure 5	E.M. Shook

*Half-life of 5568 years; no correction for fluctuations in the atmospheric inventory of $C^{14}O_2$.
**Corrected half-life (5730 years); correction for fluctuation in atmospheric inventory of $C^{14}O_2$ by means of MASCA Correction Factors (Ralph 1971: Table 1.5).

Table 4

Kaminaljuyu Project Obsidian Hydration Measurements

Radiocarbon Sample Number	Associated Obsidian Specimens		NAA Exclusions		Net Number of Obsidian Specimens	Mean-Micron Value for Cluster	Cluster Standard Deviation
	Lab Number*	Micron Value	Lab Number	Micron Value			
I-6611	PODL 209	2.66			4	2.86	0.18
	PODL 216	2.77					
	PODL 214	2.90					
	PODL 215	3.09					
I-6743	PSU 7450	2.55	PSU 7376	3.02	5	2.70	0.46
	PSU 7452	2.38					
	PSU 7375	2.37					
	PSU 7377	2.72					
	PSU 7376	3.02					
	PSU 7451	3.49					
I-6270	PSU 8927	3.07			4	2.86	0.43
	PSU 8928	3.20					
	PSU 8929	2.92					
	PSU 8930	2.23					
I-6246	PSU 7829	2.42			4	2.65	0.38
	PSU 7830	2.63					
	PSU 7831	2.34					
	PSU 7832	3.19					
I-6251	PSU 5173	3.23	PSU 5200	3.26	1	3.23	0.00
	PSU 5200	3.26					
M-2442	PSU 6561	3.71	PSU 6561	3.71	2	3.65	0.03
	PSU 6572	3.62					
	PSU 6573	3.67					
I-6308	PSU 8900	3.96			4	3.65	0.38
	PSU 8901	3.29					
	PSU 8902	4.01					
	PSU 8903	3.36					

Table 4 (continued)

Radiocarbon Sample Number	Associated Obsidian Specimens		NAA Exclusions		Net Number of Obsidian Specimens	Mean-Micron Value for Cluster	Cluster Standard Deviation
	Lab Number*	Micron Value	Lab Number	Micron Value			
I-6332	PSU 8897	3.73			2	3.70	0.04
	PSU 8899	3.68					
I-6247	PSU 8908	4.06			4	3.93	0.24
	PSU 8909	3.57					
	PSU 8910	3.99					
	PSU 8911	4.10					
I-6269	PSU 8923	3.28			4	3.69	0.38
	PSU 8924	3.63					
	PSU 8925	3.63					
	PSU 8926	4.20					
I-6306	PSU 8918	3.22			4	3.91	0.46
	PSU 8920	4.17					
	PSU 8921	4.19					
	PSU 8922	4.06					
I-6248	PSU 7136	3.66	PSU 7137	3.48	5	3.80	0.29
	PSU 7137	3.48					
	PSU 8893	3.96					
	PSU 8894	3.51					
	PSU 8892	4.23					
	PSU 8895	3.65					
I-6305	PSU 7098	4.10			6	3.90	0.21
	PSU 7099	3.56					
	PSU 8904	4.10					
	PSU 8905	3.76					
	PSU 8906	3.97					
	PSU 8908	3.89					

Table 4 (continued)

Radiocarbon Sample Number	Associated Obsidian Specimens		NAA Exclusions		Net Number of Obsidian Specimens	Mean-Micron Value for Cluster	Cluster Standard Deviation
	Lab Number*	Micron Value	Lab Number	Micron Value			
I-6249	PSU 6375	3.80			8	3.92	0.29
	PSU 6374	3.69					
	PSU 6371	3.93					
	PSU 6372	4.13					
	PSU 6373	4.03					
	PSU 8912	3.46					
	PSU 8913	4.43					
	PSU 8914	3.90					
I-6609	PSU 8565	3.51	PSU 8566	3.62	2	3.75	0.33
	PSU 8566	3.62					
	PSU 8567	3.98					
I-6384	PSU 5248	3.89	PSU 5248	3.89	6	4.20	0.21
	PSU 5249	4.40					
	PSU 5250	4.38					
	PSU 5246	4.22					
	PSU 5247	4.30					
	PSU 5251	4.00					
	PSU 5263	3.89					
I-6610	PSU 8165	4.63			4	4.09	0.47
	PSU 8164	3.48					
	PSU 8167	4.19					
	PSU 8168	4.08					
I-6250	PSU 7467	4.12			6	3.90	0.16
	PSU 7468	4.08					
	PSU 8915	3.77					
	PSU 8916	3.79					
	PSU 8917	3.77					
	PSU 8918	3.85					

Table 4 (continued)

Radiocarbon Sample Number	Associated Obsidian Specimens: Lab Number*	Associated Obsidian Specimens: Micron Value	NAA Exclusions: Lab Number	NAA Exclusions: Micron Value	Net Number of Obsidian Specimens	Mean-Micron Value for Cluster	Cluster Standard Deviation
			Total NAA Exclusions = 6		Net Total Obsidian Specimens = 75	Micron Range of Cluster Means = 1.55 (4.20-2.65)	Micron Range of Individual Measurements (This Sample) = 2.40 (4.63-2.23)

*PODL = Pennsylvania Obsidian Dating Laboratory
PSU = Pennsylvania State University Obsidian Dating Laboratory

radiocarbon dates varies from 2 to 8. This is a consequence of the fact that we were not always able to locate as many obsidian specimens in association with the radiocarbon samples as we would have liked. The target number was four hydration measurements per radiocarbon sample. As the reader can see, this goal was reached in most instances. In some cases the number of specimens measured exceeded four. This was primarily a result of the fact that additional specimens were measured for purposes other than the calculation of a rate; and since they were available they were incorporated into the data-set. The within lot variance is given in the last column of Table 4. Inspection of the variance indicates that the amount of deviation (at the one sigma magnitude of standard deviation) is not a direct function of the number of specimens within the cluster.

It was only after all of the hydration measurements had been obtained and the radiocarbon samples processed that an evaluation of the compositional homogeneity of the obsidian was undertaken. The evaluation was conducted by Luis Hurtado de Mendoza using The Pennsylvania State University nuclear reactor and a procedure of neutron activation analysis which is summarized later in this paper (Appendix 1). On the basis of the neutron activation analysis, Hurtado was able to identify six specimens which were originally members of the data-set that should be excluded because they were not El Chayal obsidian. The excluded specimens are listed in the column of Table 4 entitled "NAA Exclusions." The remaining balance of each cluster of obsidian specimens associated with a radiocarbon sample were then averaged; yielding a mean hydration value for each of the radiocarbon dates. These are listed in the column entitled "Mean Micron Value for Cluster" in Table 4. The reader will note that the micron range of the clustered means extends from 4.20 microns to 2.65 microns--a spread of 1.55 microns. This range will be correlated with the 1300 year spread in the radiocarbon date series.

CALCULATING THE RATE OF HYDRATION BY AVERAGING

The diffusion of water into obsidian follows the diffusion law

$$M^2 = Kt,$$

where

M = microns
K = the diffusion coefficient
t = the time in years

for the calculation, we start with the general equation

$$y = a \cdot x^{1/2},$$

where

x = hydration measurement
y = radiocarbon date (BP)

solving for a, we have

$$a = \frac{y}{x^{1/2}}$$

We now construct a table of values (x and y are given) (Table 5).

Table 5

Data Set for Hydration Rate Averaging

Radiocarbon Sample Number	y (Mean Micron Value for Cluster)	x (Corrected C^{14} Date)	$a = \frac{y}{x^{1/2}}$
I-6611	2.86	1159	0.0840
I-6743	2.70	1206	0.0777
I-6270	2.86	1211	0.0822
I-6246	2.65	1237	0.0753
I-6251	3.23	1472	0.0842
M-2442	3.65	1731	0.0877
I-6308	3.65	1752	0.0872
I-6332	3.70	1834	0.0864
I-6247	3.93	1870	0.0909
I-6269	3.69	1970	0.0831
I-6306	3.91	2013	0.0871
I-6248	3.80	2023	0.0845
I-6305	3.90	2121	0.0847
I-6249	3.92	2152	0.0845
I-6609	3.75	2264	0.0788
I-6384	4.20	2321	0.0872
I-6610	4.09	2331	0.0847
I-6250	3.90	2475	0.0784

The average value of a can now be found.

$$A = \frac{\varepsilon a}{n} = 0.0838$$

The hydration rate = $A^2 \cdot 1000$,

Thus the hydration rate for El Chayal obsidian at Kaminaljuyu is

7.03 microns^2/1000 years.

HYDRATION RATE DISCUSSION

Table 6 provides an evaluation of the computed rate (7.03 microns squared per thousand years) on the radiocarbon date series. It gives the original BP value and then what the BP value would be if computed from the mean micron value for the cluster with which it is associated (PREDBP). It then expresses (DIFBP) the difference between the laboratory BP date and the predicted BP date.

The reader will note that use of the computed rate of 7.03 microns squared per thousand years allows for approximately one-half of the predicted radiocarbon dates (PREDBP) to fall within the one sigma standard deviation of calculated dates reported by the radiocarbon dating laboratories (DIFBP > S.D.). Secondly, we see that there is a clear tendency for radiocarbon dates with large standard deviations of error to also show a marked difference between the predicted date and the calculated date. Thus, a portion of the discrepancy between predicted and calculated dates can be explained as a product of poor C^{14} samples.

Table 6

Rate Evaluation: Radiocarbon Dates

Radiocarbon Sample Number	BP	PREDBP	DIFBP	Laboratory Standard Deviation	DIFBP > S.D.
I-6611	1159.00	1164.26	- 5.26	± 90	NO
I-6743	1206.00	1037.64	168.36	± 115	53.36
I-6270	1211.00	1164.26	46.74	± 90	NO
I-6246	1237.00	999.56	237.44	± 90	147.44
I-6251	1472.00	1484.99	- 12.99	± 90	NO
M-2442	1731.00	1896.28	-165.28	± 130	35.28
I-6308	1752.00	1896.28	-144.28	± 90	54.28
I-6332	1834.00	1848.59	-114.59	± 90	24.59
I-6247	1870.00	2198.38	-328.38	± 150	178.38
I-6269	1970.00	1938.07	31.93	± 90	NO
I-6306	2013.00	2176.06	-163.06	± 90	73.06
I-6248	2023.00	2055.35	- 32.35	± 90	NO
I-6305	2121.00	2164.94	- 43.94	± 90	NO
I-6249	2152.00	2187.21	- 35.21	± 90	NO
I-6609	2264.00	2001.61	262.39	± 160	102.39
I-6384	2321.00	2510.82	-189.82	± 180	9.82
I-6610	2331.00	2381.03	- 50.03	± 90	NO
I-6250	2475.00	2164.94	310.06	± 90	220.06

Table 7 provides the original mean micron value for the obsidian cluster together with the predicted micron value if computed with the established rate from the original radiocarbon date. We can observe that a full 75% of the predicted micron values fall within the standard deviation of the cluster mean, and although it is true that the standard deviation values are large it should be pointed out that the difference between the cluster means and the predicted micron value tends to be quite small. In fact, almost 50% reveal differences less than the ± 0.1 micron standard deviation associated with all hydration measurements processed by the PSU Obsidian Dating Laboratory.

Table 7

Rate Evaluation: Obsidian Measurements

Radiocarbon Sample Number	MU	PREDMU	DIFMU	Cluster Standard Deviation	DIFMU > S.D.
I-6611	2.8600	2.8535	0.0065	± 0.18	NO
I-6743	2.7000	2.9108	-0.2108	± 0.46	NO
I-6270	2.8600	2.9168	-0.0568	± 0.43	NO
I-6246	2.6500	2.9480	-0.2980	± 0.38	NO
I-6251	3.2300	3.2158	0.0142	± 0.00	0.0142
M-2442	3.6500	3.4873	0.1627	± 0.03	0.1327
I-6308	3.6500	3.5084	0.1416	± 0.38	NO
I-6332	3.7000	3.5896	0.1104	± 0.04	0.0704
I-6247	3.9300	3.6246	0.3054	± 0.24	0.0754
I-6269	3.6900	3.7203	-0.0303	± 0.38	NO
I-6306	3.9100	3.7607	0.1493	± 0.46	NO
I-6248	3.8000	3.7700	0.0300	± 0.29	NO
I-6305	3.9000	3.8602	0.0398	± 0.21	NO
I-6249	3.9200	3.8883	0.0317	± 0.29	NO
I-6609	3.7500	3.9882	-0.2382	± 0.33	NO
I-6384	4.2000	4.0381	0.1619	± 0.21	NO
I-6610	4.0900	4.0468	0.0432	± 0.47	NO
I-6250	3.9000	4.1699	-0.2699	± 0.16	0.1099

In conclusion, it appears warranted to assert that, by and large, the data-set is quite consistent. The few discrepancies that are revealed in the data-set when we apply the calculated rate of 7.03 microns squared per thousand years are partly a product of poor C^{14} samples and partly a product of poor hydration measurement clusters.

Application of the 7.03 hydration rate to the 3000 obsidian hydration measurements currently available from Kaminaljuyu and its sustaining area

show excellent correlation with other lines of chronological evidence. We have therefore adopted this rate as being a rigorously calibrated rate for Kaminaljuyu and the Valley of Guatemala as a whole providing that the obsidian specimens to which it is applied can safely be assumed to have derived from the El Chayal magma.

Based on the neutron activation analysis of 131 obsidian specimens from Kaminaljuyu, where 94.65% were shown to be fully homogeneous and identifiable with the El Chayal magma, the probability is extremely high that this is a safe assumption (Appendix 1). Hurtado's analysis (Hurtado 1973) does warrant taking precautions when dating bifacially-worked specimens since there is some evidence that Ixtepeque obsidian was favored for the production of such artifacts. In such cases it would be appropriate to do a source identification analysis of the individual specimen before applying this rate to it. A second precaution stems from the possibility that there is a still unidentified obsidian source not far from the northwestern periphery of the Valley of Guatemala (the Chimaltenango source). This is based on the fact that some of the surface collections from settlements up on the northwest piedmont and in the Chimaltenango area exhibit a predominance of obsidian specimens that upon "in the hand" inspection appear different from El Chayal material. Added to this is the fact that two of the 131 specimens submitted to neutron activation analysis turned out to have come from an unidentifiable source; that is, they were neither El Chayal nor Ixtepeque. Thus, valley survey obsidians from the northwest piedmont and from the Chimaltenango area should receive further source identification before this rate is applied to them (see Appendix 1).

THE CLIMATIC SETTING

The climate of the valley has been classified as tropical upland savanna. Mean annual precipitation is 52 inches, distributed unevenly with a long wet season during the period May through November, with June being the wettest month during which an average of 11 inches of rainfall occur. Mean annual temperature is 72°F and the warmest month is May, when the maximum daily temperature is about 84°F. January is the coldest month, with a minimum daily temperature of 53°F. The general climatic picture is one of a generally cool, but frost-free, wet regime with a pronounced dry season lasting four months--from January through April. Pine-oak woodland appears to have been the prevailing vegetation cover at all elevations within the valley during prehistoric times.

The Valley of Guatemala is a broad plateau with an elevation of 1500 meters above sea level. Its surfaces are traversed by deeply cut and relatively narrow stream valleys, or barrancas, which give it a high degree of relief. The barrancas are widely spaced so that only a small part of the plateau surface is dissected into deep slopes. The land areas between the barrancas tend to be broad and flat. The plateau is bordered on the east and west by geologically young hill lands. The slopes of these hill lands tend to vary considerably in steepness, but a considerable area of gentle to moderate slope is available throughout.

The hill lands are more minutely dissected by stream erosion than the plateau surfaces. These streams are finger-like barranca systems that tend to carve up the terrain into a mosaic of peninsular land structures of gentle to moderate slope. The uplands of this hill country are often fairly level. The Canchon Plateau, at the summit of the eastern hill country, is a good example. At the northern end, the plateau surface of the Valley of Guatemala becomes highly dissected by an elaborate drainage system directing water down into the Montagua Valley. The terrain is a series of closely spaced and deeply cut gorges. Slopes are very steep, and flat surfaces tend to be narrow linear strips either on the banks of the rivers or on Mesa-like summits between. The plateau surface also slopes down at the southern end, terminating with Lake Amatitlan at an elevation of 1200 meters. The Rio Villa Lobos has built a large delta into the northern part of the west basin. The lake waters are entrapped by a segment of the volcanic range that separates the coastal plain and the highlands. All points within what is here referred to as the Valley of Guatemala fall between 1200 and 1800 meters above sea level, with the greatest percentage of land area falling between 1400 and 1600 meters.

What I wish to suggest is that variation in temperature regimes among the recognizable microclimatic zones of the Valley of Guatemala does not amount to significant magnitudes from the standpoint of the hydration process. It is therefore appropriate to view the valley as a single hydration-rate region--per compositional variant of obsidian. That is, for El Chayal obsidian the rate of 7.03 μ^2/1000 years would apply anywhere in the valley. It would not apply, however, to Ixtepeque obsidian even if found within the valley.

CALENDAR CONVERSION AND CULTURE PERIODS

For ease in converting micron measurements to calendar dates a Conversion Table has been generated by computer and included in this chapter as Appendix 2. It provides conversion information for micron values ranging from 0.01 micron to 5.88 microns. This table is adequate for virtually all obsidian so far measured from the Valley of Guatemala.

For the purpose of facilitating archaeological analysis in a situation where dozens of scholars are working on various Kaminaljuyu data more or less independently, we have adopted a conventional culture period chronological and terminological scheme (Table 8). It is in broad agreement with other such schemes currently in use in the Guatemalan Highlands and Pacific Coastal area.

Table 8

The Kaminaljuyu Project Culture Period Sequence

Modern Period	1800-1971 A.D.
Colonial Period	1500-1800 A.D.
Late Postclassic Period	1200-1500 A.D.
Early Postclassic Period	1000-1200 A.D.
Late Classic Period	700-1000 A.D.
Middle Classic Period	400- 700 A.D.
Early Classic Period	200- 400 A.D.
Late Terminal Formative Period	1- 200 A.D.
Early Terminal Formative Period	200- 1 B.C.
Late Formative Period	500- 200 B.C.
Middle Formative Period	1000- 500 B.C.
Early Formative Period	2500-1000 B.C.
Archaic Period	8000-2500 B.C.

CONCLUSION

The Kaminaljuyu hydration rate for El Chayal obsidian offers researchers virtually unlimited possibilities for chronometric assessment of archaeological remains throughout the Valley of Guatemala. A skilled technician in a properly equipped laboratory can process as many as four specimens per hour with a standard error of only $\pm$ 0.1 micron. Furthermore, the measurements can be made at a field laboratory, since all the equipment is portable. Thus, we have the prospect of an excavation team receiving reliable chronometric dates on features even before they are fully exposed.

At the present time the Kaminaljuyu Project has dated 3000 obsidian specimens at its Penn State Obsidian Dating Laboratory. The series includes specimens from all but a few of the 550 settlement pattern test trenches, from numerous valley sites which the project has surface collected, and from all Kaminaljuyu mounds that the project has excavated. Additional dates will be run as analysis continues. For this purpose, among others, the entire collection of obsidian artifacts recovered by the project were shipped to The Pennsylvania State University, with the kind permission of the Instituto de Antropologia e Historia.

We anticipate using obsidian dates to calibrate ceramic types, so that the time-sensitivity of individual pottery types as well as ceramic phases can be established. This will serve to extend our chronometric controls even into areas of typological cross-dating.

Appendix 1

NEUTRON ACTIVATION ANALYSIS OF KAMINALJUYU OBSIDIAN

by

Luis Hurtado de Mendoza

INTRODUCTION

One hundred and thirty-one obsidian artifacts from Kaminaljuyu, Guatemala, were subjected to neutron activation analysis in order to ascertain their content of sodium and manganese and the ratio between the mass of these two elements. Through this procedure three different goals were pursued: (1) to determine the degree of homogeneity or heterogeneity in obsidian composition among obsidian specimens acquired by the occupants of Kaminaljuyu over time; (2) to identify the geologic source of the obsidian used at Kaminaljuyu; and (3) to evaluate the selection of obsidian for the production of various kinds of artifacts. For the purposes of this report only the first and second objectives will be discussed.

THE SAMPLE

A preliminary analysis was undertaken with 50 obsidian specimens selected on the basis of variability in texture, color and composition as detected with "in the hand" examination. The object was to explore as fully as possible the range of visually observable variation in the obsidian assemblage at Kaminaljuyu. Three of the 50 samples had to be discarded. Two specimens because they showed major inconsistencies in their data as a result of technical errors during the neutron activation process. And a third because it was a duplicate specimen deliberately "contaminated" by careless manipulation and direct contact with the fingers in order to measure the error which such careless handling could introduce.

A second batch of 84 specimens were then selected, including the 81 specimens described earlier by Michels as the data-set for calculation of the hydration rate. This test was designed to evaluate the compositional homogeneity of those specimens which were to be used by Michels in the calculation of the hydration rate.

All 131 specimens were hydration dated and all were artifacts that had been recovered during excavation at Kaminaljuyu. The specimens represent 22 different Sector locations within the site and, based on the 7.03 $\mu^2/1000$ hydration rate, represent obsidian consumption at Kaminaljuyu between 531 B.C. and 805 A.D.: a time span of over 1300 years.

LABORATORY PROCEDURES

In general, the procedures designed by Gordus and his associates in the Department of Chemistry at the University of Michigan (Gordus et al. 1967) were adopted. Slight modifications in this strategy were effected in order to make them suitable to the Penn State nuclear reactor facilities.

Wedges of 30.0 ± 1.5 mg were cut from each obsidian specimen and then cleaned with acetone and distilled water in order to decontaminate them. Each wedge was then sealed in a tiny polyethylene envelope and grouped in six "rabbits," to be irradiated at six different times. Each "rabbit" was irradiated together with known amounts of sodium and manganese for purposes of calibration. Table 9 gives the specifications for each of the six "rabbits." The "rabbits" were submitted to irradiation in the Breazeale Nuclear Reactor at The Pennsylvania State University.

Table 9

"Rabbits" Irradiation Data and Distribution of Standards and Specimens

"Rabbit" Designation	A	B	C	D	E	F
Date of Irradiation	8.10.72	8.15.72	11.6.72	11.8.72	11.10.72	4.9.73
Time of Irradiation	2 min	2 min	2 min	4 min	1 min	2 min
Power Level	1 MW	1 MW	1 MW	250 KW	1 MW	500 KW
Activity Counting Time						
a. Start:	1:57:00	1:55:03	1:45:00	2:24:00	2:06:00	2:21:00
b. End:	6:56:00	6:02:33	4:34:00	5:36:00	4:42:00	4:27:00
Standards	3	3	3	4	4	4
Specimens	25	25	22	24	24	14

The standards used in the "rabbit" contained 0.05 cc of a water-sodium-manganese solution with 1.5344 mg of sodium and 0.02425 mg of manganese; representing 3.0688% and 0.0485% respectively the percentages of these two elements respectively. These percentages are very close to the expected chemical composition of the obsidian specimens under study.

After irradiation the standards and obsidian specimens were transferred to individual polyethylene vials for analysis and resolution of the activity levels of each isotope treated by means of the neutronic flux at the bay of the nuclear reactor (24 Na:56 Mn). A pulse height detector of the Germanium-Lithium kind was utilized, and the data acquired in the form of a spectrum for each specimen. The data was stored on punched paper and then subsequently transferred to magnetic tape for computer analysis.

The counting process was normally performed during the second and seventh hours after irradiation; times that had been observed to be appropriate to the short half-life time of the 56 Mn isotope and also because at such times there was very little interference with the counting operation by the activity of other isotopes.

Computer analysis yielded lists of the activity values for each of the 1024 channels into which the spectra are divided, and also resolve the characteristics and calculated values for each peak in the spectrum. Four of these peaks were relevant to this analysis. Sodium 24 produces two peaks, one at an energy level of 1368.4 KeV, and another at 2753.6 KeV. The intensity level of the second peak is higher than that of the first but either one can be used for the purpose of measuring the content of sodium. Manganese 56 also has two peaks in the spectrum but only one, at an energy level of 846.9 KeV, has been utilized since the other peak has an unacceptably low relative counting rate.

The scintillation activity of the isotopes is given at this point of analysis in "counts per minute" (CPM), related to the actual weight of the specimens in milligrams. Since the counting process is done at different although consecutive moments in time, these values have to be corrected in order to neutralize the decay time. This is done by means of the application of the equation

$$A_0 = A_t e^{+\lambda t}$$

where

- A_0 is the corrected activity of the ion
- A_t is the activity as actually measured regardless of time (in CPM)
- λ is a constant factor given by the value 0.692 divided by the half-life time (in minutes) of the isotope
- t which corresponds to the time in which the counting started relative to the time at which the counting process for the first standard began

These calculations were made on a programmable calculator.

Once the values are corrected, the next step is to obtain a factor for the conversion of the CPM values into weight values. For this purpose the standards activity are averaged and the results are assumed to correspond with the known amounts of sodium and manganese. The activity for one milligram of each isotope is easily calculated and a simple direct function is utilized to obtain a mass of these isotopes in each gram of mass in the obsidian specimen. The first six digits after the decimal point gives the converted value, which can be transformed into useful and comparable values: Parts per Million (PPM) and percentages of the total amounts.

Normal statistical distribution of the results, represented by Na:Mn ratios and the plotting of these ratios in an x-y diagram are utilized in this report in order to illustrate results and document conclusions.

RESULTS

The obsidian specimens have been grouped into 16 categories according to their Na:Mn ratios, at an interval for each category equal to unity. The range within which all specimens fall runs from a ratio of 70.54 to a ratio of 45.46, and a calculated standard deviation distribution gives a value of 3.46 representing 6.74% of the mean Na:Mn ratio (51.37). Table 10 summarizes the distribution of ratios calculated for all 131 specimens. Figure 1 provides a graphic version of the same. A complete and detailed list of the values for each specimen is also provided in Table 11.

Table 10

Distribution of Obsidian Specimens Categorized by their Na:Mn Ratios

Group	Group Range	Frequency	Relative Frequency
I	60.00-Higher	4	3.05 %
II	59.00-59.99	2	1.53 %
III	58.00-58.99	1	0.76 %
IV	57.00-57.99	0	0.00 %
V	56.00-56.99	1	0.76 %
VI	55.00-55.99	2	1.53 %
VII	54.00-54.99	5	3.82 %
VIII	53.00-53.99	8	6.11 %
IX	52.00-52.99	17	12.98 %
X	51.00-51.99	21	16.03 %
XI	50.00-50.99	32	24.43 %
XII	49.00-49.99	15	11.45 %
XIII	48.00-48.99	10	7.63 %
XIV	47.00-47.99	6	4.58 %
XV	46.00-46.99	5	3.82 %
XVI	45.00-45.99	2	1.53 %
	n =	131	100.01

A total of 125 specimens, 95.42%, fall within $\pm$ 2 standard deviations from the mean Na:Mn ratio; giving a range from 58.29 to 44.45. All of these specimens are considered to have derived from a single geological source. Identification of the source as El Chayal was accomplished by reference to neutron activation analysis of obsidian quarry material undertaken at The Pennsylvania State University (Rice 1972).

Examination of Figure 1 makes clear the unimodal distribution of the obsidian specimens falling within the range identified as the El Chayal geological source. It also illustrates the fact that the remaining specimens are distributed in such a way as to suggest the presence of at least one other major geological source. On the basis of published data available for other geological sources, it seems quite clear that the second cluster represents the lower part of the range calculated for Ixtepeque. The third cluster of two specimens can be best visualized in Figure 2 which illustrates a scatter plot based on sodium and manganese percentages. The Ixtepeque cluster is seen at the lower end of the distributional axis, the El Chayal cluster in the lower center, and the two specimens of unknown geological source affinity are plotted in the upper corner of the plot axis. We do not as yet know what the source is for these two specimens, a distant source such as Pachua or unknown Oaxacan are possible candidates (Pires-Ferreira 1972) but perhaps also an unknown local source.

CONCLUSIONS

The final results (Table 11) give 94.65%, or 124 out of the 131 specimens as being from the same geologic source which we have identified as El Chayal while the balance formed by seven specimens splits into two geologic sources, Ixtepeque with five specimens (3.82%), and an undetermined source with two specimens representing a scarce 1.53% of the sample. If the time span covered by these specimens as reflected in their hydration dates is considered--over 1300 years--it can be concluded that an obsidian hydration rate calculated for El Chayal obsidian will have a high degree of validity when applied to Kaminaljuyu assemblages regardless of what cultural phase is being considered. However, although sodium and manganese have proven to be effective diagnostics in identifying geologic sources it should be kept in mind that other elements within the obsidian chemical make-up are more directly responsible for variation in hydration rate and until such elements as alumina, silica and relative water concentrations have been measured it is still possible that variation may occur in rates of hydration for El Chayal obsidian.

Table 11

A Detailed List of Obsidian Specimens
from Kaminaljuyu Analyzed through Neutron
Activation of Sodium and Manganese--Results

Irradiation Number	Obsidian Dating Lab No.	Sodium (mg)	Manganese (mg)	Na:Mn Ratio	Group
45	51-8566	.031179	.000442	70.54	I
2	51-5248	.051981	.000805	64.57	I
1	51-6561	.049135	.000773	63.56	I
83	51-7376	.029727	.000474	62.72	I
6	51-7137	.028867	.000487	59.23	II
27a	51-5575	.027483	.000464	59.23	II
61	51-5200	.030083	.000518	58.08	III
-	--	--	--	--	IV
3	51-5249	.025624	.000451	56.82	V
36	51-8901	.033839	.000609	55.56	VI
21	51-7450	.031285	.000566	55.27	VI
17	51-8896	.030243	.000551	54.89	VII
55	51-8917	.033268	.000609	54.63	VII
54	51-8914	.033092	.000610	54.25	VII
13	51-8900	.031015	.000572	54.22	VII
56	51-8918	.031257	.000577	54.17	VII
42a	51-5576	.028859	.000537	53.74	VIII
9	51-6371	.031174	.000582	53.56	VIII
20	51-8565	.025226	.000472	53.44	VIII
16	51-8927	.027493	.000515	53.38	VIII
19	51-8165	.031958	.000602	53.09	VIII
80	7-216	.031738	.000598	53.07	VIII
7	51-6375	.030402	.000573	53.06	VIII
11	51-7098	.032523	.000613	53.06	VIII
57	51-8906	.035486	.000671	52.89	IX
65	51-8899	.031141	.000589	52.87	IX
63	51-8929	.031615	.000598	52.87	IX
73	51-7467	.031867	.000603	52.85	IX
26a	51-5580	.030812	.000583	52.85	IX
38a	51-8159	.029266	.000555	52.73	IX
26	51-7830	.030336	.000576	52.67	IX
18	51-8908	.032058	.000611	52.47	IX
38	51-8925	.030963	.000591	52.39	IX
15	51-8924	.033468	.000639	52.38	IX
46	51-7375	.034632	.000663	52.24	IX
81	7-214	.031160	.000597	52.19	IX
5	51-7136	.029902	.000574	52.09	IX
10	51-8915	.028110	.000540	52.06	IX

Table 11 (continued)

Irradiation Number	Obsidian Dating Lab No.	Sodium (mg)	Manganese (mg)	Na:Mn Ratio	Group
84	51-7451	.030078	.000578	52.04	IX
9a	51-8146	.031775	.000611	52.01	IX
45a	51-5563	.030161	.000580	52.00	IX
43a	51-8186	.027750	.000535	51.87	X
16a	51-5584	.031123	.000601	51.79	X
59	51-8922	.032099	.000620	51.77	X
4	51-7829	.029480	.000570	51.72	X
40	51-8897	.033242	.000643	51.70	X
12a	51-6214	.033743	.000654	51.59	X
22a	51-8160	.030651	.000596	51.43	X
13a	51-8143	.031188	.000607	51.38	X
70	51-7377	.030476	.000594	51.31	X
29a	51-7953	.030615	.000597	51.28	X
20a	51-8147	.030591	.000597	51.24	X
23	51-6572	.029150	.000569	51.23	X
25	51-5246	.029798	.000582	51.20	X
66	51-8911	.032411	.000633	51.20	X
14a	51-5585	.030353	.000593	51.19	X
32a	51-5587	.029890	.000584	51.18	X
7a	51-6201	.031981	.000625	51.17	X
11a	51-7943	.031623	.000619	51.09	X
14	51-5173	.029016	.000568	51.08	X
49	51-5251	.033757	.000661	51.07	X
15a	51-5588	.031302	.000613	51.06	X
71	51-7832	.032222	.000632	50.98	XI
41a	51-5568	.029916	.000587	50.96	XI
25a	51-6200	.032229	.000637	50.96	XI
22	51-7452	.032713	.000642	50.95	XI
32	51-8916	.030315	.000595	50.95	XI
34a	51-7704	.029602	.000581	50.95	XI
12	51-8920	.029415	.000578	50.89	XI
37a	51-7945	.029305	.000576	50.88	XI
40a	51-7960	.029886	.000588	50.83	XI
53	51-8895	.031892	.000628	50.78	XI
18a	51-8182	.032848	.000647	50.77	XI
3a	51-5581	.032458	.000640	50.72	XI
2a	51-8154	.030009	.000592	50.69	XI
17a	51-5583	.032954	.000651	50.62	XI
6a	51-7959	.032344	.000640	50.54	XI
79	7-209	.031380	.000621	50.53	XI
68	51-8168	.029488	.000584	50.49	XI
8a	51-5565	.032550	.000645	50.47	XI
39a	51-5564	.028711	.000569	50.46	XI
47	51-6573	.031696	.000629	50.39	XI
44a	51-8158	.029418	.000584	50.37	XI

Table 11 (continued)

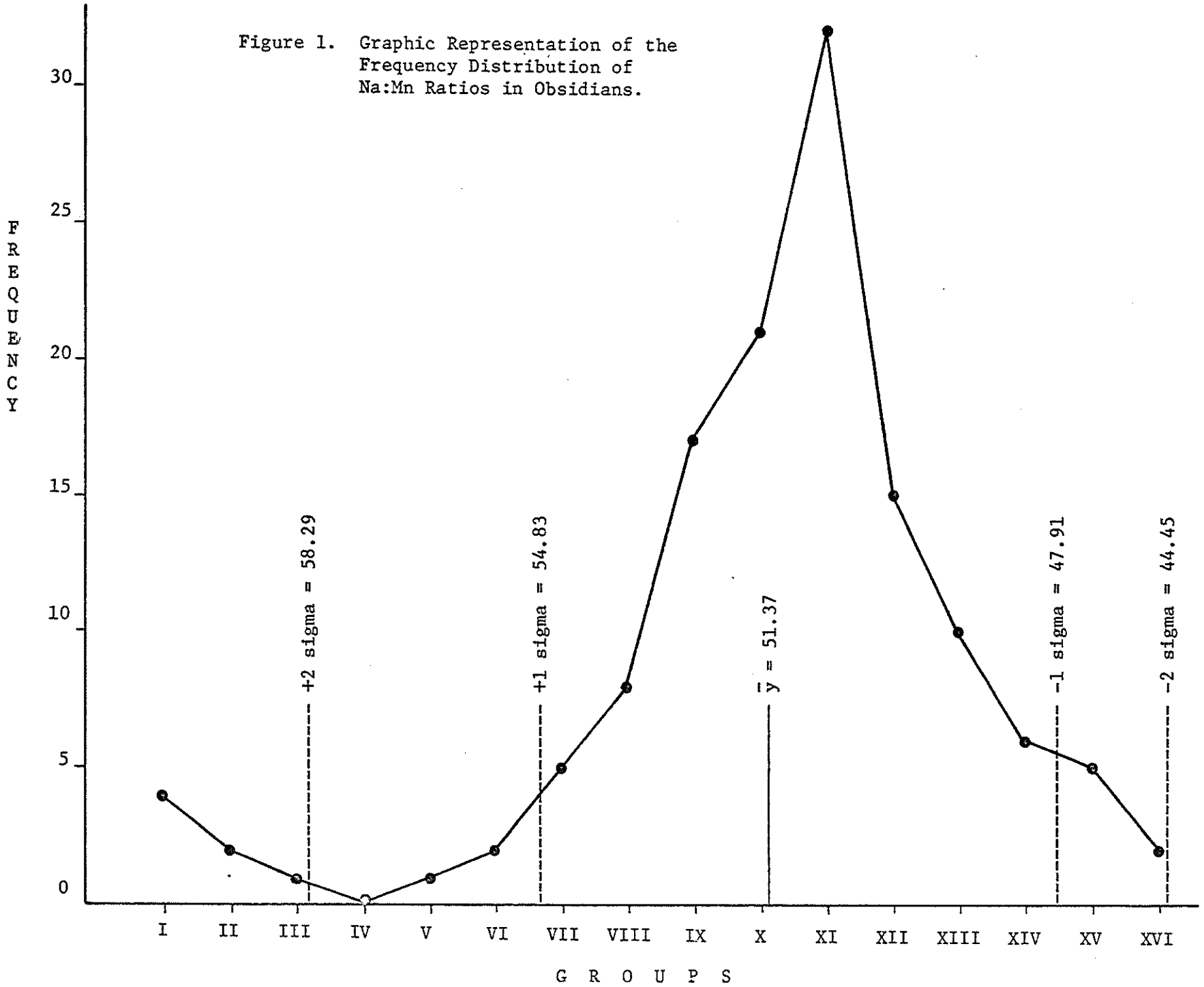
Irradiation Number	Obsidian Dating Lab No.	Sodium (mg)	Manganese (mg)	Na:Mn Ratio	Group
19a	51-6212	.031119	.000618	50.35	XI
5a	51-5590	.031711	.000630	50.34	XI
30	51-6373	.032357	.000643	50.32	XI
60	51-8903	.032134	.000639	50.29	XI
74	51-7468	.032432	.000645	50.28	XI
34	51-8905	.031014	.000618	50.18	XI
52	51-8892	.033813	.000674	50.17	XI
78	51-8909	.032094	.000641	50.07	XI
31a	51-5577	.028480	.000571	50.05	XI
42	51-8910	.035021	.000700	50.03	XI
10a	51-5591	.030555	.000611	50.01	XI
33	51-8904	.031653	.000634	49.93	XII
24a	51-5573	.031183	.000625	49.89	XII
28a	51-7705	.028807	.000578	49.84	XII
47a	51-5571	.028143	.000565	49.81	XII
28	51-8894	.029819	.000600	49.70	XII
21a	51-6205	.029568	.000596	49.61	XII
35a	51-8156	.029392	.000593	49.56	XII
23a	51-7956	.032018	.000646	49.56	XII
76	51-8919	.030516	.000616	49.54	XII
48	51-5247	.031832	.000643	49.51	XII
1a	51-8157	.031233	.000631	49.50	XII
43	51-8164	.033149	.000670	49.48	XII
58	51-8907	.031917	.000645	49.48	XII
64	51-8930	.029503	.000598	49.34	XII
72	51-8913	.031176	.000633	49.25	XII
82	7-215	.030177	.000616	48.99	XIII
33a	51-8155	.029467	.000602	48.95	XIII
35	51-8921	.030937	.000634	48.80	XIII
49a	51-7946	.028899	.000593	48.72	XIII
62	51-8923	.031252	.000642	48.68	XIII
67	51-8167	.027592	.000569	48.49	XIII
31	51-8912	.028997	.000599	48.41	XIII
27	51-8893	.030543	.000633	48.25	XIII
75	51-7099	.028520	.000592	48.18	XIII
48a	51-8183	.028597	.000594	48.14	XIII
51	51-7831	.030924	.000647	47.80	XIV
29	51-6372	.020118	.000421	47.79	XIV
50	51-5263	.032835	.000687	47.79	XIV
77	51-8926	.029881	.000633	47.21	XIV
24	51-5250	.029395	.000624	47.11	XIV
8	51-6374	.031358	.000666	47.08	XIV

Table 11 (continued)

Irradiation Number	Obsidian Dating Lab No.	Sodium (mg)	Manganese (mg)	Na:Mn Ratio	Group
36a	51-5578	.028484	.000607	46.93	XV
69	51-8567	.027698	.000592	46.79	XV
46a	51-8145	.028750	.000619	46.45	XV
37	51-8902	.032090	.000693	46.31	XV
39	51-8928	.03819	.000666	46.27	XV
44	51-8166	.031963	.000695	45.99	XVI
41	51-8898	.030683	.000675	45.46	XVI

Note. The a after the Irradiation Number identifies the specimens corresponding to the preliminary part of the project. Rabbit designation: A and B.

Figure 1. Graphic Representation of the Frequency Distribution of Na:Mn Ratios in Obsidians.



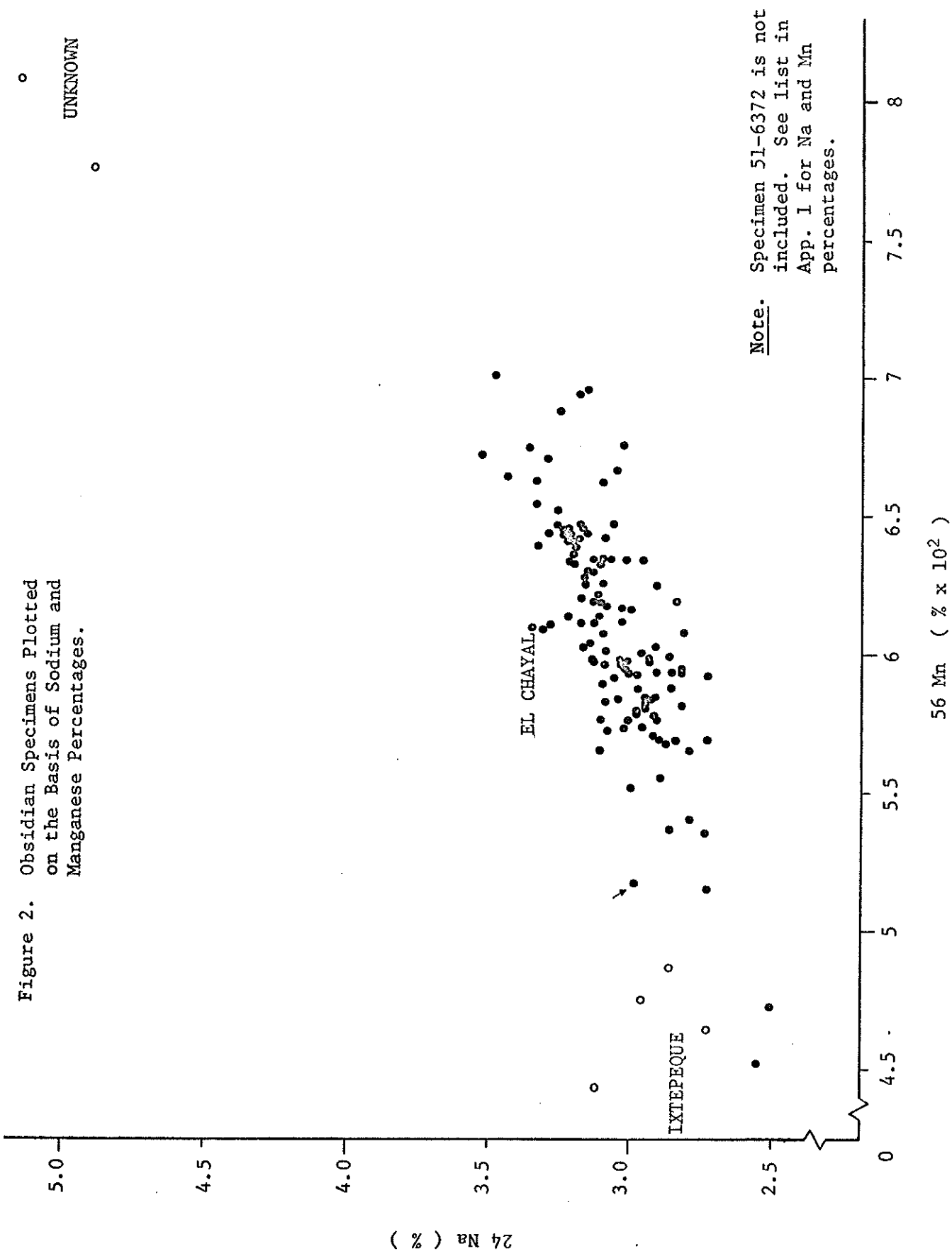


Figure 2. Obsidian Specimens Plotted on the Basis of Sodium and Manganese Percentages.

APPENDIX 2

CALENDAR CONVERSION TABLES FOR HYDRATION MEASUREMENTS:

RATE = 7.03 μ^2/1000 YRS.

Rate = (7.03 μ^2/1000 yrs.)
Date = 1971
Stan. Dev. = $\pm$ 0.1 μ

MICRON VALUE	M-1SD	M	M+1SD	M-1SD	M	M+1SD
0.01	0	0	0 BP	1972 AD	1972 AD	1972 AD
0.02	0	0	0 BP	1972 AD	1972 AD	1972 AD
0.03	0	0	0 BP	1972 AD	1972 AD	1972 AD
0.04	0	0	0 BP	1972 AD	1972 AD	1972 AD
0.05	0	0	0 BP	1972 AD	1972 AD	1972 AD
0.06	1	1	1 BP	1971 AD	1971 AD	1971 AD
0.07	1	1	1 BP	1971 AD	1971 AD	1971 AD
0.08	1	1	1 BP	1971 AD	1971 AD	1971 AD
0.09	1	1	1 BP	1971 AD	1971 AD	1971 AD
0.10	1	1	1 BP	1971 AD	1971 AD	1971 AD
0.11	0	2	6 BP	1972 AD	1970 AD	1966 AD
0.12	0	2	7 BP	1972 AD	1970 AD	1965 AD
0.13	0	2	8 BP	1972 AD	1970 AD	1964 AD
0.14	0	3	8 BP	1972 AD	1969 AD	1964 AD
0.15	0	3	9 BP	1972 AD	1969 AD	1963 AD
0.16	1	4	10 BP	1971 AD	1968 AD	1962 AD
0.17	1	4	10 BP	1971 AD	1968 AD	1962 AD
0.18	1	5	11 BP	1971 AD	1967 AD	1961 AD
0.19	1	5	12 BP	1971 AD	1967 AD	1960 AD
0.20	1	6	13 BP	1971 AD	1966 AD	1959 AD
0.21	2	6	14 BP	1970 AD	1966 AD	1958 AD
0.22	2	7	15 BP	1970 AD	1965 AD	1957 AD
0.23	2	8	16 BP	1970 AD	1964 AD	1956 AD
0.24	3	8	16 BP	1969 AD	1964 AD	1956 AD
0.25	3	9	17 BP	1969 AD	1963 AD	1955 AD
0.26	4	10	18 BP	1968 AD	1962 AD	1954 AD
0.27	4	10	20 BP	1968 AD	1962 AD	1952 AD
0.28	5	11	21 BP	1967 AD	1961 AD	1951 AD
0.29	5	12	22 BP	1967 AD	1960 AD	1950 AD
0.30	6	13	23 BP	1966 AD	1959 AD	1949 AD
0.31	6	14	24 BP	1966 AD	1958 AD	1948 AD
0.32	7	15	25 BP	1965 AD	1957 AD	1947 AD
0.33	8	16	26 BP	1964 AD	1956 AD	1946 AD
0.34	8	16	28 BP	1964 AD	1956 AD	1944 AD
0.35	9	17	29 BP	1963 AD	1955 AD	1943 AD
0.36	10	18	30 BP	1962 AD	1954 AD	1942 AD
0.37	10	20	31 BP	1962 AD	1952 AD	1941 AD
0.38	11	21	33 BP	1961 AD	1951 AD	1939 AD
0.39	12	22	34 BP	1960 AD	1950 AD	1938 AD
0.40	13	23	36 BP	1959 AD	1949 AD	1936 AD
0.41	14	24	37 BP	1958 AD	1948 AD	1935 AD
0.42	15	25	39 BP	1957 AD	1947 AD	1933 AD
0.43	16	26	40 BP	1956 AD	1946 AD	1932 AD
0.44	16	28	42 BP	1956 AD	1944 AD	1930 AD
0.45	17	29	43 BP	1955 AD	1943 AD	1929 AD
0.46	18	30	45 BP	1954 AD	1942 AD	1927 AD
0.47	20	31	46 BP	1952 AD	1941 AD	1926 AD
0.48	21	33	48 BP	1951 AD	1939 AD	1924 AD

0.49	22	34	50 BP	1950 AD	1938 AD	1922 AD
0.50	23	36	51 BP	1949 AD	1936 AD	1921 AD
0.51	24	37	53 BP	1948 AD	1935 AD	1919 AD
0.52	25	39	55 BP	1947 AD	1933 AD	1917 AD
0.53	26	40	57 BP	1946 AD	1932 AD	1915 AD
0.54	28	42	58 BP	1944 AD	1930 AD	1914 AD
0.55	29	43	60 BP	1943 AD	1929 AD	1912 AD
0.56	30	45	62 BP	1942 AD	1927 AD	1910 AD
0.57	31	46	64 BP	1941 AD	1926 AD	1908 AD
0.58	33	48	66 BP	1939 AD	1924 AD	1906 AD
0.59	34	50	68 BP	1938 AD	1922 AD	1904 AD
0.60	36	51	70 BP	1936 AD	1921 AD	1902 AD
0.61	37	53	72 BP	1935 AD	1919 AD	1900 AD
0.62	39	55	74 BP	1933 AD	1917 AD	1898 AD
0.63	40	57	76 BP	1932 AD	1915 AD	1896 AD
0.64	42	58	78 BP	1930 AD	1914 AD	1894 AD
0.65	43	60	80 BP	1929 AD	1912 AD	1892 AD
0.66	45	62	82 BP	1927 AD	1910 AD	1890 AD
0.67	46	64	84 BP	1926 AD	1908 AD	1888 AD
0.68	48	66	87 BP	1924 AD	1906 AD	1885 AD
0.69	50	68	89 BP	1922 AD	1904 AD	1883 AD
0.70	51	70	91 BP	1921 AD	1902 AD	1881 AD
0.71	53	72	93 BP	1919 AD	1900 AD	1879 AD
0.72	55	74	96 BP	1917 AD	1898 AD	1876 AD
0.73	57	76	98 BP	1915 AD	1896 AD	1874 AD
0.74	58	78	101 BP	1914 AD	1894 AD	1871 AD
0.75	60	80	103 BP	1912 AD	1892 AD	1869 AD
0.76	62	82	105 BP	1910 AD	1890 AD	1867 AD
0.77	64	84	108 BP	1908 AD	1888 AD	1864 AD
0.78	66	87	110 BP	1906 AD	1885 AD	1862 AD
0.79	68	89	113 BP	1904 AD	1883 AD	1859 AD
0.80	70	91	115 BP	1902 AD	1881 AD	1857 AD
0.81	72	93	118 BP	1900 AD	1879 AD	1854 AD
0.82	74	96	121 BP	1898 AD	1876 AD	1851 AD
0.83	76	98	123 BP	1896 AD	1874 AD	1849 AD
0.84	78	101	126 BP	1894 AD	1871 AD	1846 AD
0.85	80	103	129 BP	1892 AD	1869 AD	1843 AD
0.86	82	105	131 BP	1890 AD	1867 AD	1841 AD
0.87	84	108	134 BP	1888 AD	1864 AD	1838 AD
0.88	87	110	137 BP	1885 AD	1862 AD	1835 AD
0.89	89	113	140 BP	1883 AD	1859 AD	1832 AD
0.90	91	115	142 BP	1881 AD	1857 AD	1830 AD
0.91	93	118	145 BP	1879 AD	1854 AD	1827 AD
0.92	96	121	148 BP	1876 AD	1851 AD	1824 AD
0.93	98	123	151 BP	1874 AD	1849 AD	1821 AD
0.94	101	126	154 BP	1871 AD	1846 AD	1818 AD
0.95	103	129	157 BP	1869 AD	1843 AD	1815 AD
0.96	105	131	160 BP	1867 AD	1841 AD	1812 AD
0.97	108	134	163 BP	1864 AD	1838 AD	1809 AD
0.98	110	137	166 BP	1862 AD	1835 AD	1806 AD
0.99	113	140	169 BP	1859 AD	1832 AD	1803 AD
1.00	115	142	172 BP	1857 AD	1830 AD	1800 AD
1.01	118	145	176 BP	1854 AD	1827 AD	1796 AD
1.02	121	148	179 BP	1851 AD	1824 AD	1793 AD
1.03	123	151	182 BP	1849 AD	1821 AD	1790 AD
1.04	126	154	185 BP	1846 AD	1818 AD	1787 AD
1.05	129	157	188 BP	1843 AD	1815 AD	1784 AD
1.06	131	160	192 BP	1841 AD	1812 AD	1780 AD
1.07	134	163	195 BP	1838 AD	1809 AD	1777 AD
1.08	137	166	198 BP	1835 AD	1806 AD	1774 AD

1.09	140	169	202 BP	1832 AD	1803 AD	1770 AD
1.10	142	172	205 BP	1830 AD	1800 AD	1767 AD
1.11	145	176	209 BP	1827 AD	1796 AD	1763 AD
1.12	148	179	212 BP	1824 AD	1793 AD	1760 AD
1.13	151	182	216 BP	1821 AD	1790 AD	1756 AD
1.14	154	185	219 BP	1818 AD	1787 AD	1753 AD
1.15	157	188	223 BP	1815 AD	1784 AD	1749 AD
1.16	160	192	226 BP	1812 AD	1780 AD	1746 AD
1.17	163	195	230 BP	1809 AD	1777 AD	1742 AD
1.18	166	198	233 BP	1806 AD	1774 AD	1739 AD
1.19	169	202	237 BP	1803 AD	1770 AD	1735 AD
1.20	172	205	241 BP	1800 AD	1767 AD	1731 AD
1.21	176	209	244 BP	1796 AD	1763 AD	1728 AD
1.22	179	212	248 BP	1793 AD	1760 AD	1724 AD
1.23	182	216	252 BP	1790 AD	1756 AD	1720 AD
1.24	185	219	256 BP	1787 AD	1753 AD	1716 AD
1.25	188	223	260 BP	1784 AD	1749 AD	1712 AD
1.26	192	226	263 BP	1780 AD	1746 AD	1709 AD
1.27	195	230	267 BP	1777 AD	1742 AD	1705 AD
1.28	198	233	271 BP	1774 AD	1739 AD	1701 AD
1.29	202	237	275 BP	1770 AD	1735 AD	1697 AD
1.30	205	241	279 BP	1767 AD	1731 AD	1693 AD
1.31	209	244	283 BP	1763 AD	1728 AD	1689 AD
1.32	212	248	287 BP	1760 AD	1724 AD	1685 AD
1.33	216	252	291 BP	1756 AD	1720 AD	1681 AD
1.34	219	256	295 BP	1753 AD	1716 AD	1677 AD
1.35	223	260	299 BP	1749 AD	1712 AD	1673 AD
1.36	226	263	304 BP	1746 AD	1709 AD	1668 AD
1.37	230	267	308 BP	1742 AD	1705 AD	1664 AD
1.38	233	271	312 BP	1739 AD	1701 AD	1660 AD
1.39	237	275	316 BP	1735 AD	1697 AD	1656 AD
1.40	241	279	320 BP	1731 AD	1693 AD	1652 AD
1.41	244	283	325 BP	1728 AD	1689 AD	1647 AD
1.42	248	287	329 BP	1724 AD	1685 AD	1643 AD
1.43	252	291	333 BP	1720 AD	1681 AD	1639 AD
1.44	256	295	338 BP	1716 AD	1677 AD	1634 AD
1.45	260	299	342 BP	1712 AD	1673 AD	1630 AD
1.46	263	304	347 BP	1709 AD	1668 AD	1625 AD
1.47	267	308	351 BP	1705 AD	1664 AD	1621 AD
1.48	271	312	356 BP	1701 AD	1660 AD	1616 AD
1.49	275	316	360 BP	1697 AD	1656 AD	1612 AD
1.50	279	320	365 BP	1693 AD	1652 AD	1607 AD
1.51	283	325	369 BP	1689 AD	1647 AD	1603 AD
1.52	287	329	374 BP	1685 AD	1643 AD	1598 AD
1.53	291	333	378 BP	1681 AD	1639 AD	1594 AD
1.54	295	338	383 BP	1677 AD	1634 AD	1589 AD
1.55	299	342	388 BP	1673 AD	1630 AD	1584 AD
1.56	304	347	393 BP	1668 AD	1625 AD	1579 AD
1.57	308	351	397 BP	1664 AD	1621 AD	1575 AD
1.58	312	356	402 BP	1660 AD	1616 AD	1570 AD
1.59	316	360	407 BP	1656 AD	1612 AD	1565 AD
1.60	320	365	412 BP	1652 AD	1607 AD	1560 AD
1.61	325	369	417 BP	1647 AD	1603 AD	1555 AD
1.62	329	374	421 BP	1643 AD	1598 AD	1551 AD
1.63	333	378	426 BP	1639 AD	1594 AD	1546 AD
1.64	338	383	431 BP	1634 AD	1589 AD	1541 AD
1.65	342	388	436 BP	1630 AD	1584 AD	1536 AD
1.66	347	393	441 BP	1625 AD	1579 AD	1531 AD
1.67	351	397	446 BP	1621 AD	1575 AD	1526 AD
1.68	356	402	451 BP	1616 AD	1570 AD	1521 AD

1.69	360	407	456 BP	1612 AD	1565 AD	1516 AD
1.70	365	412	462 BP	1607 AD	1560 AD	1510 AD
1.71	369	417	467 BP	1603 AD	1555 AD	1505 AD
1.72	374	421	472 BP	1598 AD	1551 AD	1500 AD
1.73	378	426	477 BP	1594 AD	1546 AD	1495 AD
1.74	383	431	482 BP	1589 AD	1541 AD	1490 AD
1.75	388	436	488 BP	1584 AD	1536 AD	1484 AD
1.76	393	441	493 BP	1579 AD	1531 AD	1479 AD
1.77	397	446	498 BP	1575 AD	1526 AD	1474 AD
1.78	402	451	503 BP	1570 AD	1521 AD	1469 AD
1.79	407	456	509 BP	1565 AD	1516 AD	1463 AD
1.80	412	462	514 BP	1560 AD	1510 AD	1458 AD
1.81	417	467	520 BP	1555 AD	1505 AD	1452 AD
1.82	421	472	525 BP	1551 AD	1500 AD	1447 AD
1.83	426	477	531 BP	1546 AD	1495 AD	1441 AD
1.84	431	482	536 BP	1541 AD	1490 AD	1436 AD
1.85	436	488	542 BP	1536 AD	1484 AD	1430 AD
1.86	441	493	547 BP	1531 AD	1479 AD	1425 AD
1.87	446	498	553 BP	1526 AD	1474 AD	1419 AD
1.88	451	503	558 BP	1521 AD	1469 AD	1414 AD
1.89	456	509	564 BP	1516 AD	1463 AD	1408 AD
1.90	462	514	570 BP	1510 AD	1458 AD	1402 AD
1.91	467	520	575 BP	1505 AD	1452 AD	1397 AD
1.92	472	525	581 BP	1500 AD	1447 AD	1391 AD
1.93	477	531	587 BP	1495 AD	1441 AD	1385 AD
1.94	482	536	593 BP	1490 AD	1436 AD	1379 AD
1.95	487	542	599 BP	1485 AD	1430 AD	1373 AD
1.96	493	547	604 BP	1479 AD	1425 AD	1368 AD
1.97	498	553	610 BP	1474 AD	1419 AD	1362 AD
1.98	503	558	616 BP	1469 AD	1414 AD	1356 AD
1.99	509	564	622 BP	1463 AD	1408 AD	1350 AD
2.00	514	570	628 BP	1458 AD	1402 AD	1344 AD
2.01	520	575	634 BP	1452 AD	1397 AD	1338 AD
2.02	525	581	640 BP	1447 AD	1391 AD	1332 AD
2.03	531	587	646 BP	1441 AD	1385 AD	1326 AD
2.04	536	593	652 BP	1436 AD	1379 AD	1320 AD
2.05	542	599	658 BP	1430 AD	1373 AD	1314 AD
2.06	547	604	665 BP	1425 AD	1368 AD	1307 AD
2.07	553	610	671 BP	1419 AD	1362 AD	1301 AD
2.08	558	616	677 BP	1414 AD	1356 AD	1295 AD
2.09	564	622	683 BP	1408 AD	1350 AD	1289 AD
2.10	570	628	689 BP	1402 AD	1344 AD	1283 AD
2.11	575	634	696 BP	1397 AD	1338 AD	1276 AD
2.12	581	640	702 BP	1391 AD	1332 AD	1270 AD
2.13	587	646	708 BP	1385 AD	1326 AD	1264 AD
2.14	593	652	715 BP	1379 AD	1320 AD	1257 AD
2.15	599	658	721 BP	1373 AD	1314 AD	1251 AD
2.16	604	665	728 BP	1368 AD	1307 AD	1244 AD
2.17	610	671	734 BP	1362 AD	1301 AD	1238 AD
2.18	616	677	740 BP	1356 AD	1295 AD	1232 AD
2.19	622	683	747 BP	1350 AD	1289 AD	1225 AD
2.20	628	689	754 BP	1344 AD	1283 AD	1218 AD
2.21	634	696	760 BP	1338 AD	1276 AD	1212 AD
2.22	640	702	767 BP	1332 AD	1270 AD	1205 AD
2.23	646	708	773 BP	1326 AD	1264 AD	1199 AD
2.24	652	715	780 BP	1320 AD	1257 AD	1192 AD
2.25	658	721	787 BP	1314 AD	1251 AD	1185 AD
2.26	665	728	793 BP	1307 AD	1244 AD	1179 AD
2.27	671	734	800 BP	1301 AD	1238 AD	1172 AD
2.28	677	740	807 BP	1295 AD	1232 AD	1165 AD

2.29	683	747	814 BP	1289 AD	1225 AD	1158 AD
2.30	689	753	820 BP	1283 AD	1219 AD	1152 AD
2.31	696	760	827 BP	1276 AD	1212 AD	1145 AD
2.32	702	767	834 BP	1270 AD	1205 AD	1138 AD
2.33	708	773	841 BP	1264 AD	1199 AD	1131 AD
2.34	715	780	848 BP	1257 AD	1192 AD	1124 AD
2.35	721	787	855 BP	1251 AD	1185 AD	1117 AD
2.36	728	793	862 BP	1244 AD	1179 AD	1110 AD
2.37	734	800	869 BP	1238 AD	1172 AD	1103 AD
2.38	740	807	876 BP	1232 AD	1165 AD	1096 AD
2.39	747	814	883 BP	1225 AD	1158 AD	1089 AD
2.40	753	820	890 BP	1219 AD	1152 AD	1082 AD
2.41	760	827	897 BP	1212 AD	1145 AD	1075 AD
2.42	767	834	905 BP	1205 AD	1138 AD	1067 AD
2.43	773	841	912 BP	1199 AD	1131 AD	1060 AD
2.44	780	848	919 BP	1192 AD	1124 AD	1053 AD
2.45	787	855	926 BP	1185 AD	1117 AD	1046 AD
2.46	793	862	933 BP	1179 AD	1110 AD	1039 AD
2.47	800	869	941 BP	1172 AD	1103 AD	1031 AD
2.48	807	876	948 BP	1165 AD	1096 AD	1024 AD
2.49	814	883	955 BP	1158 AD	1089 AD	1017 AD
2.50	820	890	963 BP	1152 AD	1082 AD	1009 AD
2.51	827	897	970 BP	1145 AD	1075 AD	1002 AD
2.52	834	905	978 BP	1138 AD	1067 AD	994 AD
2.53	841	912	985 BP	1131 AD	1060 AD	987 AD
2.54	848	919	993 BP	1124 AD	1053 AD	979 AD
2.55	855	926	1000 BP	1117 AD	1046 AD	972 AD
2.56	862	933	1008 BP	1110 AD	1039 AD	964 AD
2.57	869	941	1015 BP	1103 AD	1031 AD	957 AD
2.58	876	948	1023 BP	1096 AD	1024 AD	949 AD
2.59	883	955	1031 BP	1089 AD	1017 AD	941 AD
2.60	890	963	1038 BP	1082 AD	1009 AD	934 AD
2.61	897	970	1046 BP	1075 AD	1002 AD	926 AD
2.62	905	978	1054 BP	1067 AD	994 AD	918 AD
2.63	912	985	1062 BP	1060 AD	987 AD	910 AD
2.64	919	993	1069 BP	1053 AD	979 AD	903 AD
2.65	926	1000	1077 BP	1046 AD	972 AD	895 AD
2.66	933	1008	1085 BP	1039 AD	964 AD	887 AD
2.67	941	1015	1093 BP	1031 AD	957 AD	879 AD
2.68	948	1023	1101 BP	1024 AD	949 AD	871 AD
2.69	955	1031	1109 BP	1017 AD	941 AD	863 AD
2.70	963	1038	1117 BP	1009 AD	934 AD	855 AD
2.71	970	1046	1125 BP	1002 AD	926 AD	847 AD
2.72	978	1054	1133 BP	994 AD	918 AD	839 AD
2.73	985	1062	1141 BP	987 AD	910 AD	831 AD
2.74	993	1069	1149 BP	979 AD	903 AD	823 AD
2.75	1000	1077	1157 BP	972 AD	895 AD	815 AD
2.76	1008	1085	1165 BP	964 AD	887 AD	807 AD
2.77	1015	1093	1173 BP	957 AD	879 AD	799 AD
2.78	1023	1101	1181 BP	949 AD	871 AD	791 AD
2.79	1031	1109	1190 BP	941 AD	863 AD	782 AD
2.80	1038	1117	1198 BP	934 AD	855 AD	774 AD
2.81	1046	1125	1206 BP	926 AD	847 AD	766 AD
2.82	1054	1133	1214 BP	918 AD	839 AD	758 AD
2.83	1062	1141	1223 BP	910 AD	831 AD	749 AD
2.84	1069	1149	1231 BP	903 AD	823 AD	741 AD
2.85	1077	1157	1240 BP	895 AD	815 AD	732 AD
2.86	1085	1165	1248 BP	887 AD	807 AD	724 AD
2.87	1093	1173	1256 BP	879 AD	799 AD	716 AD
2.88	1101	1181	1265 BP	871 AD	791 AD	707 AD

2.89	1109	1190	1273 BP	863 AD	782 AD	699 AD
2.90	1117	1198	1282 BP	855 AD	774 AD	690 AD
2.91	1125	1206	1290 BP	847 AD	766 AD	682 AD
2.92	1133	1214	1299 BP	839 AD	758 AD	673 AD
2.93	1141	1223	1308 BP	831 AD	749 AD	664 AD
2.94	1149	1231	1316 BP	823 AD	741 AD	656 AD
2.95	1157	1240	1325 BP	815 AD	732 AD	647 AD
2.96	1165	1248	1334 BP	807 AD	724 AD	638 AD
2.97	1173	1256	1342 BP	799 AD	716 AD	630 AD
2.98	1181	1265	1351 BP	791 AD	707 AD	621 AD
2.99	1190	1273	1360 BP	782 AD	699 AD	612 AD
3.00	1198	1282	1369 BP	774 AD	690 AD	603 AD
3.01	1206	1290	1378 BP	766 AD	682 AD	594 AD
3.02	1214	1299	1387 BP	758 AD	673 AD	585 AD
3.03	1223	1308	1395 BP	749 AD	664 AD	577 AD
3.04	1231	1316	1404 BP	741 AD	656 AD	568 AD
3.05	1240	1325	1413 BP	732 AD	647 AD	559 AD
3.06	1248	1334	1422 BP	724 AD	638 AD	550 AD
3.07	1256	1342	1431 BP	716 AD	630 AD	541 AD
3.08	1265	1351	1440 BP	707 AD	621 AD	532 AD
3.09	1273	1360	1449 BP	699 AD	612 AD	523 AD
3.10	1282	1369	1459 BP	690 AD	603 AD	513 AD
3.11	1290	1378	1468 BP	682 AD	594 AD	504 AD
3.12	1299	1387	1477 BP	673 AD	585 AD	495 AD
3.13	1308	1395	1486 BP	664 AD	577 AD	486 AD
3.14	1316	1404	1495 BP	656 AD	568 AD	477 AD
3.15	1325	1413	1504 BP	647 AD	559 AD	468 AD
3.16	1334	1422	1514 BP	638 AD	550 AD	458 AD
3.17	1342	1431	1523 BP	630 AD	541 AD	449 AD
3.18	1351	1440	1532 BP	621 AD	532 AD	440 AD
3.19	1360	1449	1542 BP	612 AD	523 AD	430 AD
3.20	1369	1459	1551 BP	603 AD	513 AD	421 AD
3.21	1378	1468	1561 BP	594 AD	504 AD	411 AD
3.22	1387	1477	1570 BP	585 AD	495 AD	402 AD
3.23	1395	1486	1579 BP	577 AD	486 AD	393 AD
3.24	1404	1495	1589 BP	568 AD	477 AD	383 AD
3.25	1413	1504	1598 BP	559 AD	468 AD	374 AD
3.26	1422	1514	1608 BP	550 AD	458 AD	364 AD
3.27	1431	1523	1618 BP	541 AD	449 AD	354 AD
3.28	1440	1532	1627 BP	532 AD	440 AD	345 AD
3.29	1449	1542	1637 BP	523 AD	430 AD	335 AD
3.30	1459	1551	1647 BP	513 AD	421 AD	325 AD
3.31	1468	1561	1656 BP	504 AD	411 AD	316 AD
3.32	1477	1570	1666 BP	495 AD	402 AD	306 AD
3.33	1486	1579	1676 BP	486 AD	393 AD	296 AD
3.34	1495	1589	1686 BP	477 AD	383 AD	286 AD
3.35	1504	1598	1695 BP	468 AD	374 AD	277 AD
3.36	1514	1608	1705 BP	458 AD	364 AD	267 AD
3.37	1523	1618	1715 BP	449 AD	354 AD	257 AD
3.38	1532	1627	1725 BP	440 AD	345 AD	247 AD
3.39	1542	1637	1735 BP	430 AD	335 AD	237 AD
3.40	1551	1647	1745 BP	421 AD	325 AD	227 AD
3.41	1561	1656	1755 BP	411 AD	316 AD	217 AD
3.42	1570	1666	1765 BP	402 AD	306 AD	207 AD
3.43	1579	1676	1775 BP	393 AD	296 AD	197 AD
3.44	1589	1686	1785 BP	383 AD	286 AD	187 AD
3.45	1598	1695	1795 BP	374 AD	277 AD	177 AD
3.46	1608	1705	1805 BP	364 AD	267 AD	167 AD
3.47	1618	1715	1815 BP	354 AD	257 AD	157 AD
3.48	1627	1725	1826 BP	345 AD	247 AD	146 AD

3.49	1637	1735	1836 BP	335 AD	237 AD	136 AD
3.50	1647	1745	1846 BP	325 AD	227 AD	126 AD
3.51	1656	1755	1856 BP	316 AD	217 AD	116 AD
3.52	1666	1765	1867 BP	306 AD	207 AD	105 AD
3.53	1676	1775	1877 BP	296 AD	197 AD	95 AD
3.54	1686	1785	1887 BP	286 AD	187 AD	85 AD
3.55	1695	1795	1898 BP	277 AD	177 AD	74 AD
3.56	1705	1805	1908 BP	267 AD	167 AD	64 AD
3.57	1715	1815	1918 BP	257 AD	157 AD	54 AD
3.58	1725	1826	1929 BP	247 AD	146 AD	43 AD
3.59	1735	1836	1939 BP	237 AD	136 AD	33 AD
3.60	1745	1846	1950 BP	227 AD	126 AD	22 AD
3.61	1755	1856	1960 BP	217 AD	116 AD	12 AD
3.62	1765	1867	1971 BP	207 AD	105 AD	1 AD
3.63	1775	1877	1982 BP	197 AD	95 AD	10 BC
3.64	1785	1887	1992 BP	187 AD	85 AD	20 BC
3.65	1795	1898	2003 BP	177 AD	74 AD	31 BC
3.66	1805	1908	2014 BP	167 AD	64 AD	42 BC
3.67	1815	1918	2024 BP	157 AD	54 AD	52 BC
3.68	1825	1929	2035 BP	147 AD	43 AD	63 BC
3.69	1836	1939	2046 BP	136 AD	33 AD	74 BC
3.70	1846	1950	2057 BP	126 AD	22 AD	85 BC
3.71	1856	1960	2068 BP	116 AD	12 AD	96 BC
3.72	1867	1971	2078 BP	105 AD	1 AD	106 BC
3.73	1877	1982	2089 BP	95 AD	10 BC	117 BC
3.74	1887	1992	2100 BP	85 AD	20 BC	128 BC
3.75	1898	2003	2111 BP	74 AD	31 BC	139 BC
3.76	1908	2014	2122 BP	64 AD	42 BC	150 BC
3.77	1918	2024	2133 BP	54 AD	52 BC	161 BC
3.78	1929	2035	2144 BP	43 AD	63 BC	172 BC
3.79	1939	2046	2155 BP	33 AD	74 BC	183 BC
3.80	1950	2057	2166 BP	22 AD	85 BC	194 BC
3.81	1960	2068	2178 BP	12 AD	96 BC	206 BC
3.82	1971	2078	2189 BP	1 AD	106 BC	217 BC
3.83	1982	2089	2200 BP	10 BC	117 BC	228 BC
3.84	1992	2100	2211 BP	20 BC	128 BC	239 BC
3.85	2003	2111	2222 BP	31 BC	139 BC	250 BC
3.86	2014	2122	2234 BP	42 BC	150 BC	262 BC
3.87	2024	2133	2245 BP	52 BC	161 BC	273 BC
3.88	2035	2144	2256 BP	63 BC	172 BC	284 BC
3.89	2046	2155	2268 BP	74 BC	183 BC	296 BC
3.90	2057	2166	2279 BP	85 BC	194 BC	307 BC
3.91	2068	2178	2290 BP	96 BC	206 BC	318 BC
3.92	2078	2189	2302 BP	106 BC	217 BC	330 BC
3.93	2089	2200	2313 BP	117 BC	228 BC	341 BC
3.94	2100	2211	2325 BP	128 BC	239 BC	353 BC
3.95	2111	2222	2336 BP	139 BC	250 BC	364 BC
3.96	2122	2234	2348 BP	150 BC	262 BC	376 BC
3.97	2133	2245	2359 BP	161 BC	273 BC	387 BC
3.98	2144	2256	2371 BP	172 BC	284 BC	399 BC
3.99	2155	2268	2383 BP	183 BC	296 BC	411 BC
4.00	2166	2279	2394 BP	194 BC	307 BC	422 BC
4.01	2178	2290	2406 BP	206 BC	318 BC	434 BC
4.02	2189	2302	2418 BP	217 BC	330 BC	446 BC
4.03	2200	2313	2429 BP	228 BC	341 BC	457 BC
4.04	2211	2325	2441 BP	239 BC	353 BC	469 BC
4.05	2222	2336	2453 BP	250 BC	364 BC	481 BC
4.06	2234	2348	2465 BP	262 BC	376 BC	493 BC
4.07	2245	2359	2477 BP	273 BC	387 BC	505 BC
4.08	2256	2371	2489 BP	284 BC	399 BC	517 BC

4.09	2268	2383	2501 BP	296 BC	411 BC	529 BC
4.10	2279	2394	2513 BP	307 BC	422 BC	541 BC
4.11	2290	2406	2525 BP	318 BC	434 BC	553 BC
4.12	2302	2418	2537 BP	330 BC	446 BC	565 BC
4.13	2313	2429	2549 BP	341 BC	457 BC	577 BC
4.14	2325	2441	2561 BP	353 BC	469 BC	589 BC
4.15	2336	2453	2573 BP	364 BC	481 BC	601 BC
4.16	2348	2465	2585 BP	376 BC	493 BC	613 BC
4.17	2359	2477	2597 BP	387 BC	505 BC	625 BC
4.18	2371	2489	2609 BP	399 BC	517 BC	637 BC
4.19	2383	2501	2621 BP	411 BC	529 BC	649 BC
4.20	2394	2513	2634 BP	422 BC	541 BC	662 BC
4.21	2406	2525	2646 BP	434 BC	553 BC	674 BC
4.22	2418	2537	2658 BP	446 BC	565 BC	686 BC
4.23	2429	2549	2670 BP	457 BC	577 BC	698 BC
4.24	2441	2561	2683 BP	469 BC	589 BC	711 BC
4.25	2453	2573	2695 BP	481 BC	601 BC	723 BC
4.26	2465	2585	2708 BP	493 BC	613 BC	736 BC
4.27	2477	2597	2720 BP	505 BC	625 BC	748 BC
4.28	2489	2609	2733 BP	517 BC	637 BC	761 BC
4.29	2501	2621	2745 BP	529 BC	649 BC	773 BC
4.30	2513	2634	2758 BP	541 BC	662 BC	786 BC
4.31	2525	2646	2770 BP	553 BC	674 BC	798 BC
4.32	2537	2658	2783 BP	565 BC	686 BC	811 BC
4.33	2549	2670	2795 BP	577 BC	698 BC	823 BC
4.34	2561	2683	2808 BP	589 BC	711 BC	836 BC
4.35	2573	2695	2821 BP	601 BC	723 BC	849 BC
4.36	2585	2708	2833 BP	613 BC	736 BC	861 BC
4.37	2597	2720	2846 BP	625 BC	748 BC	874 BC
4.38	2609	2733	2859 BP	637 BC	761 BC	887 BC
4.39	2621	2745	2871 BP	649 BC	773 BC	899 BC
4.40	2634	2758	2884 BP	662 BC	786 BC	912 BC
4.41	2646	2770	2897 BP	674 BC	798 BC	925 BC
4.42	2658	2783	2910 BP	686 BC	811 BC	938 BC
4.43	2670	2795	2923 BP	698 BC	823 BC	951 BC
4.44	2683	2808	2936 BP	711 BC	836 BC	964 BC
4.45	2695	2821	2949 BP	723 BC	849 BC	977 BC
4.46	2708	2833	2962 BP	736 BC	861 BC	990 BC
4.47	2720	2846	2975 BP	748 BC	874 BC	1003 BC
4.48	2733	2859	2988 BP	761 BC	887 BC	1016 BC
4.49	2745	2871	3001 BP	773 BC	899 BC	1029 BC
4.50	2758	2884	3014 BP	786 BC	912 BC	1042 BC
4.51	2770	2897	3027 BP	798 BC	925 BC	1055 BC
4.52	2783	2910	3040 BP	811 BC	938 BC	1068 BC
4.53	2795	2923	3053 BP	823 BC	951 BC	1081 BC
4.54	2808	2936	3067 BP	836 BC	964 BC	1095 BC
4.55	2821	2949	3080 BP	849 BC	977 BC	1108 BC
4.56	2833	2962	3093 BP	861 BC	990 BC	1121 BC
4.57	2846	2975	3106 BP	874 BC	1003 BC	1134 BC
4.58	2859	2988	3120 BP	887 BC	1016 BC	1148 BC
4.59	2871	3001	3133 BP	899 BC	1029 BC	1161 BC
4.60	2884	3014	3146 BP	912 BC	1042 BC	1174 BC
4.61	2897	3027	3160 BP	925 BC	1055 BC	1188 BC
4.62	2910	3040	3173 BP	938 BC	1068 BC	1201 BC
4.63	2923	3053	3187 BP	951 BC	1081 BC	1215 BC
4.64	2936	3067	3200 BP	964 BC	1095 BC	1228 BC
4.65	2949	3080	3214 BP	977 BC	1108 BC	1242 BC
4.66	2962	3093	3227 BP	990 BC	1121 BC	1255 BC
4.67	2975	3106	3241 BP	1003 BC	1134 BC	1269 BC
4.68	2988	3120	3254 BP	1016 BC	1148 BC	1282 BC

4.69	3001	3133	3268 BP	1029 BC	1161 BC	1296 BC	
4.70	3014	3146	3282 BP	1042 BC	1174 BC	1310 BC	
4.71	3027	3160	3295 BP	1055 BC	1188 BC	1323 BC	
4.72	3040	3173	3309 BP	1068 BC	1201 BC	1337 BC	
4.73	3053	3187	3323 BP	1081 BC	1215 BC	1351 BC	
4.74	3067	3200	3337 BP	1095 BC	1228 BC	1365 BC	
4.75	3080	3214	3350 BP	1108 BC	1242 BC	1378 BC	
4.76	3093	3227	3364 BP	1121 BC	1255 BC	1392 BC	
4.77	3106	3241	3378 BP	1134 BC	1269 BC	1406 BC	
4.78	3120	3254	3392 BP	1148 BC	1282 BC	1420 BC	
4.79	3133	3268	3406 BP	1161 BC	1296 BC	1434 BC	
4.80	3146	3282	3420 BP	1174 BC	1310 BC	1448 BC	
4.81	3160	3295	3434 BP	1188 BC	1323 BC	1462 BC	
4.82	3173	3309	3448 BP	1201 BC	1337 BC	1476 BC	
4.83	3187	3323	3462 BP	1215 BC	1351 BC	1490 BC	
4.84	3200	3337	3476 BP	1228 BC	1365 BC	1504 BC	
4.85	3214	3350	3490 BP	1242 BC	1378 BC	1518 BC	
4.86	3227	3364	3504 BP	1255 BC	1392 BC	1532 BC	
4.87	3241	3378	3518 BP	1269 BC	1406 BC	1546 BC	
4.88	3254	3392	3532 BP	1282 BC	1420 BC	1560 BC	
4.89	3268	3406	3547 BP	1296 BC	1434 BC	1575 BC	
4.90	3282	3420	3561 BP	1310 BC	1448 BC	1589 BC	
4.91	3295	3434	3575 BP	1323 BC	1462 BC	1603 BC	
4.92	3309	3448	3589 BP	1337 BC	1476 BC	1617 BC	
4.93	3323	3462	3604 BP	1351 BC	1490 BC	1632 BC	
4.94	3337	3476	3618 BP	1365 BC	1504 BC	1646 BC	
4.95	3350	3490	3632 BP	1378 BC	1518 BC	1660 BC	
4.96	3364	3504	3647 BP	1392 BC	1532 BC	1675 BC	
4.97	3378	3518	3661 BP	1406 BC	1546 BC	1689 BC	
4.98	3392	3532	3676 BP	1420 BC	1560 BC	1704 BC	
4.99	3406	3547	3690 BP	1434 BC	1575 BC	1718 BC	
5.00	3420	3561	3705 BP	1448 BC	1589 BC	1733 BC	
5.01	3434	3575	3719 BP	1462 BC	1603 BC	1747 BC	
5.02	3448	3589	3734 BP	1476 BC	1617 BC	1762 BC	
5.03	3462	3604	3748 BP	1490 BC	1632 BC	1776 BC	
5.04	3476	3618	3763 BP	1504 BC	1646 BC	1791 BC	
5.05	3490	3632	3778 BP	1518 BC	1660 BC	1806 BC	
5.06	3504	3647	3792 BP	1532 BC	1675 BC	1820 BC	
5.07	3518	3661	3807 BP	1546 BC	1689 BC	1835 BC	
5.08	3532	3676	3822 BP	1560 BC	1704 BC	1850 BC	
5.09	3547	3690	3837 BP	1575 BC	1718 BC	1865 BC	
5.10	3561	3705	3851 BP	1589 BC	1733 BC	1879 BC	
5.11	3575	3719	3866 BP	1603 BC	1747 BC	1894 BC	
5.12	3589	3734	3881 BP	1617 BC	1762 BC	1909 BC	
5.13	3604	3748	3896 BP	1632 BC	1776 BC	1924 BC	
5.14	3618	3763	3911 BP	1646 BC	1791 BC	1939 BC	
5.15	3632	3778	3926 BP	1660 BC	1806 BC	1954 BC	
5.16	3647	3792	3941 BP	1675 BC	1820 BC	1969 BC	
5.17	3661	3807	3956 BP	1689 BC	1835 BC	1984 BC	
5.18	3676	3822	3971 BP	1704 BC	1850 BC	1999 BC	
5.19	3690	3837	3986 BP	1718 BC	1865 BC	2014 BC	
5.20	3705	3851	4001 BP	1733 BC	1879 BC	2029 BC	
5.21	3719	3866	4016 BP	1747 BC	1894 BC	2044 BC	
5.22	3734	3881	4031 BP	1762 BC	1909 BC	2059 BC	
5.23	3748	3896	4046 BP	1776 BC	1924 BC	2074 BC	
5.24	3763	3911	4062 BP	1791 BC	1939 BC	2090 BC	
5.25	3778	3926	4077 BP	1806 BC	1954 BC	2105 BC	
5.26	3792	3941	4092 BP	1820 BC	1969 BC	2120 BC	
5.27	3807	3956	4107 BP	1835 BC	1984 BC	2135 BC	
5.28	3822	3971	4123 BP	1850 BC	1999 BC	2151 BC	

	5.29	3837	3986	4138	BP	1865	BC	2014	BC	2166	BC
	5.30	3851	4001	4153	BP	1879	BC	2029	BC	2181	BC
	5.31	3866	4016	4169	BP	1894	BC	2044	BC	2197	BC
	5.32	3881	4031	4184	BP	1909	BC	2059	BC	2212	BC
	5.33	3896	4046	4200	BP	1924	BC	2074	BC	2228	BC
	5.34	3911	4062	4215	BP	1939	BC	2090	BC	2243	BC
	5.35	3926	4077	4231	BP	1954	BC	2105	BC	2259	BC
	5.36	3941	4092	4246	BP	1969	BC	2120	BC	2274	BC
	5.37	3956	4107	4262	BP	1984	BC	2135	BC	2290	BC
	5.38	3971	4123	4277	BP	1999	BC	2151	BC	2305	BC
	5.39	3986	4138	4293	BP	2014	BC	2166	BC	2321	BC
	5.40	4001	4153	4309	BP	2029	BC	2181	BC	2337	BC
	5.41	4016	4169	4324	BP	2044	BC	2197	BC	2352	BC
	5.42	4031	4184	4340	BP	2059	BC	2212	BC	2368	BC
	5.43	4046	4200	4356	BP	2074	BC	2228	BC	2384	BC
	5.44	4062	4215	4372	BP	2090	BC	2243	BC	2400	BC
	5.45	4077	4231	4387	BP	2105	BC	2259	BC	2415	BC
	5.46	4092	4246	4403	BP	2120	BC	2274	BC	2431	BC
	5.47	4107	4262	4419	BP	2135	BC	2290	BC	2447	BC
	5.48	4123	4277	4435	BP	2151	BC	2305	BC	2463	BC
	5.49	4138	4293	4451	BP	2166	BC	2321	BC	2479	BC
	5.50	4153	4309	4467	BP	2181	BC	2337	BC	2495	BC
	5.51	4169	4324	4483	BP	2197	BC	2352	BC	2511	BC
	5.52	4184	4340	4499	BP	2212	BC	2368	BC	2527	BC
	5.53	4200	4356	4515	BP	2228	BC	2384	BC	2543	BC
	5.54	4215	4372	4531	BP	2243	BC	2400	BC	2559	BC
	5.55	4231	4387	4547	BP	2259	BC	2415	BC	2575	BC
	5.56	4246	4403	4563	BP	2274	BC	2431	BC	2591	BC
	5.57	4262	4419	4579	BP	2290	BC	2447	BC	2607	BC
	5.58	4277	4435	4595	BP	2305	BC	2463	BC	2623	BC
	5.59	4293	4451	4611	BP	2321	BC	2479	BC	2639	BC
	5.60	4309	4467	4628	BP	2337	BC	2495	BC	2656	BC
	5.61	4324	4483	4644	BP	2352	BC	2511	BC	2672	BC
	5.62	4340	4499	4660	BP	2368	BC	2527	BC	2688	BC
	5.63	4356	4515	4676	BP	2384	BC	2543	BC	2704	BC
	5.64	4371	4531	4693	BP	2399	BC	2559	BC	2721	BC
	5.65	4387	4547	4709	BP	2415	BC	2575	BC	2737	BC
	5.66	4403	4563	4726	BP	2431	BC	2591	BC	2754	BC
	5.67	4419	4579	4742	BP	2447	BC	2607	BC	2770	BC
	5.68	4435	4595	4758	BP	2463	BC	2623	BC	2786	BC
	5.69	4451	4611	4775	BP	2479	BC	2639	BC	2803	BC
	5.70	4467	4628	4791	BP	2495	BC	2656	BC	2819	BC
	5.71	4483	4644	4808	BP	2511	BC	2672	BC	2836	BC
	5.72	4499	4660	4825	BP	2527	BC	2688	BC	2853	BC
	5.73	4515	4676	4841	BP	2543	BC	2704	BC	2869	BC
	5.74	4531	4693	4858	BP	2559	BC	2721	BC	2886	BC
	5.75	4547	4709	4874	BP	2575	BC	2737	BC	2902	BC
	5.76	4563	4726	4891	BP	2591	BC	2754	BC	2919	BC
	5.77	4579	4742	4908	BP	2607	BC	2770	BC	2936	BC
	5.78	4595	4758	4925	BP	2623	BC	2786	BC	2953	BC
	5.79	4611	4775	4941	BP	2639	BC	2803	BC	2969	BC
	5.80	4628	4791	4958	BP	2656	BC	2819	BC	2986	BC
	5.81	4644	4808	4975	BP	2672	BC	2836	BC	3003	BC
	5.82	4660	4825	4992	BP	2688	BC	2853	BC	3020	BC
	5.83	4676	4841	5009	BP	2704	BC	2869	BC	3037	BC
	5.84	4693	4858	5026	BP	2721	BC	2886	BC	3054	BC
	5.85	4709	4874	5042	BP	2737	BC	2902	BC	3070	BC
	5.86	4726	4891	5059	BP	2754	BC	2919	BC	3087	BC
	5.87	4742	4908	5076	BP	2770	BC	2936	BC	3104	BC
	5.88	4758	4925	5093	BP	2786	BC	2953	BC	3121	BC

MOUND B-V-6:

A LATE FORMATIVE CEREMONIAL STRUCTURE

by

Carl A. Bebrich and Jack T. Wynn

TABLE OF CONTENTS

	Page
GENERAL DESCRIPTION	73
EXCAVATION STRATEGY	74
EXCAVATION METHODOLOGY	76
Vertical Control	76
Horizontal Control	76
RESULTS	77
Premound Occupational Components	77
Unit 55 Stratified Activity Areas	78
Burial 1	79
Construction of the Mound	82
Materials Used in Construction of the Mound	82
Major Fill Types	83
Functional Surfacing	84
Construction Sequence	84
Structural Interpretation of the Construction Sequence	87
Construction of the Apron	88
Architectural Plan	89
Construction Techniques	92
Construction Sequence: Repairs and Modifications	92
Phase 1	93
Phase 2	94
Dating	94
Construction of the Plaza	95
Intrusive Burials Placed in the Mound and Plaza	96
Burial 2	96
Burials 3 and 4	100
APPENDIX 1: Description of the Profiles	110

LIST OF TABLES

Table		Page
1	Obsidian from Mound B-V-6, Submitted for Hydration Dating	79
2	Summary of Basal Ring Structure Dimensions	85
3	Summary of Apron Dimensions	90
4	Mortuary Furnishings Associated with Burial 2	98
5	Mortuary Furnishings Associated with Burials 3 and 4	101
6	Summary of Total Artifacts Recovered during Excavation of Mound B-V-6	106
7	Cross-Correlation of Excavation Strata	111

LIST OF FIGURES

Figure		Page
1	Contour Map and Excavation Plan, Mound B-V-6	141
2	Planview Unit 55	142
3	Planview Burial 1	143
4	Reconstructed View of Mound Construction Sequence	144
5	Reconstructed East-West Cross-Sectional View of the Mound, Apron and Plaza Along Grid Line 41N	145
6	Cross-Sectional View of Apron Along Grid Line 45N	146
7	Reconstructed View of Apron Construction Sequence	147
8	Planview of Burial 2	148
9	Planview of Burials 3 and 4	149
10	Stratigraphic Profile: 100 Series Strata	150
11	Stratigraphic Profile: 200 Series Strata	151
12	Stratigraphic Profile: 300 Series Strata	152
13	Stratigraphic Profile: Unit 55 Series Strata	153
14	Stratigraphic Profile: 400 Series Strata	154
15	Stratigraphic Profile: 500 Series Strata	155

LIST OF PLATES

Plate		Page
1a	View of Mound B-V-6, East Side	156
1b	Burial 2	156
1c	Burial 3	156
2a	600 Series Profile	157
2b	Stratigraphic Interpretation	157

GENERAL DESCRIPTION

Mound B-V-6 is located in the Finca El Mirador equidistant between Mounds B-IV-2 and B-V-5 about 80 meters south of the Pan American Highway and 100 meters west of 21 Avenida (Figs. 1 and 2, Foreword). In the Kaminaljuyu Project Grid System the mound has been designated Zone 46, Area 32, Sector 092. B-V-6 is situated on the west side of a large plaza area which in recent times has been used for the cultivation of maize and for the pasturage of dairy cattle. In ancient times this area lay just south of a shallow lake or marsh.

When our work began the area around the mound was grass-covered and included a few small trees; the mound itself was also covered with a thick mantle of grass as well as scattered bushes and a few small trees. The mound rose 7.6 meters above the present land surface and 10.6 meters above the surface on which it was constructed. It measured about 62 meters in diameter, covered a basal area of approximately 3020 m^2 and included about 11,500 m^3 of earth fill.

The mound's north side was the only area not extensively damaged by bulldozing in recent years during nearby factory construction. Most of the west half of the mound was completely sheared away, leaving a vertical cross-section which provided a clear view of the structure's interior (Fig. 10). The plaza area to the north and east of the mound had been cleared of top soil to a depth of 20-30 cm. The south face of the mound had been severely gouged and partially backfilled (eg., see Fig. 13, upper section of South Wall, Unit 55). The east face was even more severely chopped: (1) the lower flank had been sheared away (Plate 1a), and (2) a trench had been gouged several meters into the remaining east face along the central east-west axis of the mound (Fig. 12, east section). A large quantity of disturbed soil resulting from destruction of portions of the mound's east face was redeposited along the eastern and southern perimeter of the mound (eg., see Figs. 14 and 15).

In the long run, these uncontrolled cuts actually aided rather than hindered our excavation of the mound as well as our developing understanding of its construction. The large amount of fill removed during bulldozing considerably reduced the amount of excavation required to obtain adequate information concerning construction techniques, fill material composition, construction sequence, etc. It also substantially hastened clearing of a portion of the basal area of the mound, again by reducing the amount of fill we would otherwise have had to clear along its central east-west axis.

These positive remarks in no way condone the thoughtless damage done to the mound; we were simply fortunate that no external architectural details were destroyed beyond the point of reconstruction and that the mound contained no internal structures, details of which would have been lost to the bulldozer. Somewhat ironically, at about mid-season we pleaded a strong case for use of a bulldozer to remove the remaining portion of the mound, for by then it was clear that: (1) it contained no internal structures and no special activity-units (burials [beyond that on its summit], caches, etc.); (2) technical details of its construction and fill composition were well-understood; and (3) excavation of the basal area of the mound was

producing provocative results which could be properly interpreted only by extensive investigation of the component. We felt that clearing of the basal area might provide the only definitive information concerning the immediate purpose for construction of the mound. Unfortunately, the machine arrived just in time to backfill the excavations. Perhaps as a result the basal area of B-V-6 still remains something of an enigma.

EXCAVATION STRATEGY

Excavation of B-V-6 was undertaken to illucidate the construction, contents, dating, and function(s) of Late Formative mounds at Kaminaljuyu. Structures similar to B-V-6 in method of construction and types of materials used as fill have been investigated in the past, but none has been reported in detail in the literature. The Guatemalan archaeologist, Gustavo Espinoza Aguilar, conducted extensive excavations at Mounds B-IV-1, C-III-4 and C-V-12, revealing burials at the base of the first and last of these. In addition, Shook (1951: 250) reported on a formally constructed rectangular pit in C-III-6 which produced a large number of ceremonially buried items radiocarbon dated to B.C. 375 ± 50 (Y-370; Deevey, Gralenski and Hoffren 1959: 163).

Mounds of this general time period (Late Formative: Providencia Phase) are generally referred to in the literature as "Burial" or "Ceremonial" structures (eg., Borhegyi 1965: 12), and they are most often found in linear chains or rectilinear arrangements around plazas. However, no burials have ever been reported from the fill of these mounds. Thus it was not clear whether the burials found by Espinoza at the base of B-IV-1 and C-V-12 were functionally related to the structures overlying them or whether they were fortuitously located beneath them. The fact that the burials were accompanied by a small quantity of high quality furnishings (comparable in quantity to, but of overall higher quality than, Burials 2, 3 and 4 reported here for B-V-6) has always been interpreted to indicate high relative status of the deceased individuals and a functional relationship to the mounds constructed over them. Arrangement of the mounds along and around plazas further suggested that they served a continuing use after their construction.

Thus the excavation of B-V-6 was undertaken to determine:

(1) if burials were included in its fill or were restricted to the basal area of the mound;

(2) the kinds and degree of social differentiation manifested in burial remains;

(3) the functional role(s) of the mound within the plaza complex;

(4) the kinds of materials and techniques used to construct the mound; and

(5) the chronometric provenience of the mound.

Prior to excavation we had received conflicting reports concerning the location of burials beneath B-IV-1 and C-V-12. In the face of this uncertainty, the large area covered by the mound, its height, and its present gutted condition, we opted to begin our excavations with a trench along what we believed to be the central east-west axis of the mound (40-41N), so as to take advantage of the sizable bulldozer cut into the east face, as discussed above. The west end of the trench was located in the presumed center of the mound and became the focal point, though not exclusive area, of our investigation of the mound's base. In spite of the large amount of fill previously removed by bulldozing, an even greater amount lay before us. Progress was slower than anticipated, partly because the soft nature of the fill required considerable expansion of the upper sidewalls of this deep sounding as a safeguard against cave-ins.

Meanwhile, we suspected that the east side of the mound articulated with the plaza-like area to the east via an apron. This suspicion was confirmed by the Main Trench excavation along the central east-west axis of the mound, and further exploration of the apron feature was conducted with a series of excavation units to both the north and south of the Main Trench (Fig. 14).

Discovery of a burial with abundant furnishings on the summit of the mound led to more extensive investigation of this area, resulting in a north-south trench.

Our excavations thus concentrated on four areas of the mound and its surroundings: (1) the mound summit; (2) the mound base; (3) the mound apron; and (4) the plaza. Excavations in these four areas brought forth a number of unanticipated findings which are presented in the results section of this report. Excavations began on 16 June 1969 and were directed by Bebrich, Wynn and Kathleen Dutt, assisted by 12-16 Guatemalan laborers, until 22 August, following which Bebrich continued with a reduced crew of 4-6 laborers until 12 September 1969. During the course of excavation 19,498 artifacts were recovered (Table 6).

The mound summit was excavated to recover several kinds of information:

(1) evidence of the structural remains of buildings;

(2) evidence of special preparation (including functional surfacing, platform construction, etc.)

(3) evidence concerning construction sequence and techniques for the mound as a whole; and

(4) evidence of human interments (a) within the fill of the mound, or (b) on and/or within central area of the submound soil horizon.

This operation involved approximately one-half of the crew for the entire field season and focused on Units 9 and 25; these two units were combined and redesignated Unit 55 below Stratum 306 and subsequently became our deepest sounding. Eight additional units were excavated in the summit and upper north slope area: 3 and 4 (Burial 2); 56, 3, 4, 21 and 54 (expansion

of the upper perimeter of Unit 55 to prevent cave-ins; 3, 14, 24 and 23 (a short trench cut across the upper north slope and summit to provide a partial cross-section of the mound along its central north-south axis (Plate 2).

Excavations in the apron area of the mound were conducted to answer a number of questions concerning architectural details, construction techniques and materials, construction sequence, manner of articulation with the mound and plaza, dating and function(s). Exclusive of the Main Trench Line excavations, 22 units were opened to investigate these problems (Units 32-35 and 62 south of the Main Trench; Units 16-20, 22, 26-31, 36, 41, 59 and 60-61 north of the Main Trench). Half of these form a discontinuous trench adjacent to Grid Line 43W, providing a partial north-south cross-sectional view of the apron (Fig. 14). Although the excavations left a number of unresolved questions, they nevertheless permitted reconstruction of the major architectural and constructional features of the apron.

Investigation of the plaza-like area to the east of the mound apron was accomplished (1) by a series of 1 x 2 meter Settlement Pattern Test Trenches placed at 60 meter intervals along Grid Line 5W (46-32-074, 093, 113, 152, and 171); and (2) by the eastward extension of the Main Trench Line across the width of the plaza. These excavations were intended to reveal information concerning the plaza's areal extent, materials and techniques used in its construction, and dating.

EXCAVATION METHODOLOGY

Vertical Control

An arbitrary datum plane was established for all of the excavations in the vicinity of Mound B-V-6. A Zero Elevation Plane was established 20 meters below the present land surface, i.e., lower than any anticipated excavations. All vertical measurements were designated in meters Above the Zero Elevation Plane (m AZEP), thus eliminating the need for negative designations in elevation recordings. The measurements were taken from a datum point designated 20.00 meters AZEP. This point was a large nail in a tree centrally located for all of the Mirador operations. Our work at B-V-6 recorded elevations in the range 15-28 m AZEP. Most elevations were calculated from one of the several secondary datum points established on the mound to minimize measurement error.

Horizontal Control

Arbitrary base lines were established for the entire Finca El Mirador. Mound B-V-6 was located 32-94 meters west of the North-South base line and 9-21 meters north of the East-West base line (see excavation plan, Fig. 1).

After clearing away the brush and small trees scattered over the mound, the Main (east-west) Trench Line was staked out along 40-41N. It crossed what was thought to be the original high point of the mound and followed

approximately its central east-west axis. We were interested in recovering a maximum of information with a minimum of excavation. Thus, instead of digging a continuous trench we reasoned that a segmented one, consisting of 1 x 2 in excavation units, would provide adequate controls on stratigraphy, construction techniques, etc. As special problems arose which required additional excavation, new units could be opened to fill out the picture. In addition to Grid Coordinates, each excavation unit, both in and out-side of the Main Trench Line, was assigned a Unit Number for ease of data recording. Numbers were assigned as the units were opened. Units 1, 5, 6, 7, 10 and 12 in the Main Trench Line were excavated in arbitrary 50 cm levels; in Units 3 and 14 levels were reduced to 30 cm. After we understood the natural stratigraphy, the excavations were conducted by natural soil strata. The artifacts from each level or stratum were placed in cloth bags and tagged according to the procedures established in 1968. Field numbers were assigned to items for which exact provenience was desired, and these received special handling in the laboratory. In all, 62 units were excavated, their dimensions varying according to the needs of the particular problems involved (Fig. 1).

RESULTS

The results of our investigations at B-V-6 are discussed below in approximate temporal sequence as follows:

(1) Premound Occupational Components

(2) Construction of the Mound

(3) Construction of the Apron

(4) Construction of the Plaza

(5) Instrusive Burials Placed in the Mound and Plaza

Throughout the discussion reference will frequently be made to the numerous soil strata encountered during excavations. Each stratum was assigned a separate three-digit code defining its location, and a full description of the various strata is presented in Appendix I.

Premound Occupational Components

Information concerning components predating construction of the mound was obtained from Units 1, 2, 5, 6, 10 and 55, all of which penetrated the soil horizon immediately underlying the mound (Strata 208, 310A-C, 422, 507A-B, and 522A-B). These excavations revealed a natural brown sandy clay stratum measuring about 1.5 m in thickness and overlying a natural deposit of talpetate (Stratum 311) of undetermined depth. The upper 50-75 cm of the stratum contained a variety of artifactual materials dating from possibly as early as 1000 B.C. to about 500 B.C. The more or less regular spacing of

undulations were also observed in the same stratum at the base of Mound B-V-4. It thus seems likely that during this period the Mirador area was farmed on a regular basis and that most of the cultural items recovered constitute residential refuse. Determination of whether the area sustained a dispersed hamlet or a more compact settlement must await functional and distributional analyses of the remains recovered from all of the Mirador excavations which penetrated this component.

Unit 55 Stratified Activity Areas

Unit 55 produced a more complicated stratigraphic situation than observed elsewhere in this stratum, as well as a number of findings the full implications of which are not yet clear. Stratum 310 was found to consist of six superimposed layers of slightly differing composition (Strata 310A-F), some containing greater relative amounts of sand and others greater relative amounts of clay. Only 310A-C, the upper three substrata, produced cultural items and features. Artifact density was highest in 310A, considerably reduced in 310B and near zero in 310C. Three possible post molds were found projecting from 310B into 310C, while in the northeast corner of Unit 55 a series of four superimposed hearths was uncovered in 310B (Fig. 2). Numerous fired clay lumps were also found in 310B (as well as 310A) along with household artifactual refuse. Viewed in the context of the above-mentioned maize hillocks, these findings are interpreted as the remains of a house and associated agricultural fields.

The upper surface of Substratum 310A had been partially oxidized by fire throughout the entire 12 m^2 area of Unit 55, leaving a residue of black carbon and greasy gray-white ash and a hardened surficial layer of baked earth. Our profiles (Figs. 13 and 15) clearly showed that this area of the sub-mound soil horizon exhibited the same unevenness observed elsewhere. It is thus clear that no special attempt was made to even-out and prepare this area of the landscape before beginning construction of the mound. It was evident that the burned surface extended beyond the confines of Unit 55, but time did not permit further exploration to determine the boundaries of the feature. It was not observed in Unit 10, so that it appears to have been fairly limited in areal extent, occupying no more than 200 m^2 and no less than 50 m^2. The ground was cool, however, before construction of the mound began, as we found a cache of obsidian blades and flakes draped over two small talpetate blocks resting directly on the oxidized surface, none of which showed any indications of heat alteration. The talpetate blocks were typically light yellow in color rather than reddened, as they would have been if exposed to the intense heat that baked the earth beneath them. The obsidian cache included five segments of prismatic blades and 28 amorphous flakes, three specimens of which were submitted for Hydration Dating. None of the dated artifacts showed signs of heat alteration and yielded consistent chronometric results falling well within one sigma ($\pm$ 119 years) of the mean value 497 B.C. (see Table 1). This date is also consistent with the ceramic phasing of Burial 1 found in Unit 10 and the refuse recovered from Substrata 310A and B of Unit 55 (predominantly Providencia).

In Unit 10 (Stratum 208), at a depth equivalent to the possible post molds in Substratum 310C, we encountered the only sub-mound burial of the B-V-6 excavations, specific details of which are as follows.

Table 1

Obsidian From Mound B-V-6, Submitted for Hydration Dating

Group	Obsidian Dating Lab Sample No.	Hydration Value (μ)	Catalogue No.	Date	(Range)	Provenience
I	51-6997	3.07	KJ69-5249	641 AD ± 87	(553 -726 AD)	Burial atop Mound
	51-6998	3.78	KJ69-5249	45 BC ± 107	(153 BC- 60 AD)	
	51-6999	2.96	KJ69-5250	734 AD ± 84	(648 AD-816 AD)	
II	51-6996	3.82	KJ69-3531	88 BC ± 108	(197 BC- 18 AD)	Burial at Base of Mound
	51-7000	3.37	KJ69-6658	368 AD ± 95	(272 AD-462 AD)	
	51-7001	2.74	KJ69-6658	911 AD ± 78	(832 AD-987 AD)	
III	51-7002	4.62	KJ69-8462	1040 BC ± 131	(1172 BC-911 BC)	Burned Surface at Base of Mound
	51-7003	4.19	KJ69-8462	506 BC ± 119	(626 BC-389 BC)	
	51-7004	4.52	KJ69-8523	911 BC ± 128	(1040 BC-785 BC)	
	51-7005	3.67	KJ69-8737	70 AD ± 104	(34 BC-173 AD)	
	51-7006	3.77	KJ69-8737	34 BC ± 107	(142 BC- 71 AD)	
	51-7007	4.24	KJ69-8737	565 BC ± 120	(686 BC-447 BC)	
IV	51-7008	4.18	KJ69-8839	494 BC ± 118	(613 BC-378 BC)	Obsidian Cache at Base of Mound
	51-7009	4.20	KJ69-8839	518 BC ± 119	(638 BC-401 BC)	
	51-7010	4.11	KJ69-8839	412 BC ± 116	(530 BC-298 BC)	

Burial 1 (Figure 3)

Location: Unit 10 (40-42N/55-56W); 17.72-17.62 mAZEP (ca. 75-85 cm below top of Stratum 208; Stratum 208 (sub-mound soil horizon equivalent to 310C, 422, 522B).

Post Mortem Treatment Prior to Interment: Evidence for post mortem treatment is either lacking or negative in character--there was no indication, for example, of an attempt to prolong preservation of the corpse, nor was there evidence of mutilation of any kind (dismemberment, breakage, disfiguration, etc.).

Burial Facility: Appears to have been a simple grave pit dug into the existing land surface; the outlines of the facility, however, could not be discerned in any of the wall profiles, leaving two possibilities: (1) the dimensions in all directions of the grave pit exceeded those of Unit 10 (106 x 200 cm); or (2) the dimensions of the grave pit were less in all directions than those of Unit 10 and went unrecognized during excavation. The second alternative seems the more likely of the two because of (a) the

tightly flexed position of the corpse and (b) the homogeneity of Stratum 208, making it exceedingly difficult to initially detect very slight differences in soil compaction.

No materials (such as clay lining, daubing and the like) appear to have been used in preparation of the pit, as stains, post molds and/or other definitive features were not observed during excavation (several attempts were made to locate and identify such features, but none was successful).

Disposition:

1. Type of Disposal - Primary inhumation, including all portions of the corpse in their normal anatomical relationships.

2. Condition of the Osseous Remains - Articulated, but in a poor state of preservation. Bones of the hands, wrists, feet and ankles have completely decomposed. Knee and shoulder joints have completely decomposed or are barely traceable. Rib bones in some cases are completely decomposed or nearly so. Portions of the cranium in the temporal, maxillary and nasal areas have completely decomposed. The pelvix and spinal column are nearly decomposed.

3. Position of the Body - Tightly flexed, with the right hand brought up under the chin; the left arm is less tightly flexed and parallel to each other, with the left leg partially overlying the right. The right shoulder was tucked under (as in sleeping position) bringing the right portions of the corpse more to the west than the left portions.

4. Position of the Head - On right side and aligned in a normal manner with the body.

5. Orientation of the Body and Head - Exactly Grid North-South (head to north), 27° 55' 30" east of Magnetic North. The body and head both face Grid West.

6. Age and Sex - Adult (probably not over 50 years of age); probably a male.

7. Pathology - No fractures, abnormalities (except for possibly one or more supernumerary molars in the left mandibular corpus), lesions or other pathologies were observed.

Burial Furniture: Apparently no grave goods of any kind were placed with the corpse. Artifacts were recovered from the fill surrounding the burial (principally above and to the sides of the osseous remains, but not below it), but these were not arranged in a patterned manner and appear to be those already present in the ground at the time the grave pit was excavated.

Dating: The most recent artifacts among those found near the burial set a probable maximal limit on the antiquity of the interment. A minimal limit

is set by the mound which completely covers the burial pit to a depth of several meters. Ceramic artifacts in both cases were Providencia in phase (Late Formative).

In spite of the consistency in ceramic phasing of Burial 1 and the refuse recovered from Substrata 310A and B of Unit 55, the temporal juxtaposition and functional context(s) of these several premound elements is by no means clear. We seek a model that satisfactorily interrelates all of the elements: (1) the post molds in substrata 310B and 310C; (2) the superimposed hearths observed in 310B; (3) the household refuse recovered from 310A, 310B, 208 and 422; (4) the burial lacking offerings in Unit 10; (5) the burned uneven surface of 310A; and (6) the obsidian cache of Unit 55.

It has already been suggested that the post molds, hearths, household refuse and undulating surface of the terrain are the remains of one or more residential components and associated agricultural fields. What is not clear is the relationship, if any, between these remains and the burial in Unit 10, the burned surface and cache in Unit 55, and construction of the mound. Four alternatives present themselves:

(1) the elements are functionally unrelated;

(2) the burial and burned surface are functionally connected with events surrounding the house and milpa, while the functional context of the cache lies in events leading to construction of the mound;

(3) the burial is functionally tied to the house and milpa, while the burned surface and cache are functionally connected with events leading to construction of the mound;

(4) the burial, burned surface and cache are all unconnected with events surrounding the house and milpa and are functionally tied to construction of the mound.

The first alternative seems unlikely, if for no other reason than it leaves all of the elements in the unsatisfactory state of each having its own independent functional context within the initial portion of a single ceramic phase (Providencia). We would argue that too little time is involved for none of the elements to be related.

The second alternative runs counter to stratigraphic evidence which clearly shows that no substantial amount of time accrued between burning of the existing earth surface, deposition of the cache and construction of the mound; no trace of wind or water-deposited soil was found along the interface of these components.

The third alternative is appealing because it provides a fuller view of, and is consistent with, what we might expect of hamlet life. In this view, the individual buried in Unit 10 is seem as occupying a low status position requiring little or no special handling upon death. This alternative has the advantage of accounting satisfactorily for the absence of burial furnishings and for the expedient burial facility in which the individual was placed.

At the same time, lack of furnishings and the expediency of interment cast at least some doubt on the fourth alternative. The findings of Espinoza at B-IV-1 and C-V-12 (personal communication) indicate that the individuals buried at these locations occupied relatively high status positions during their life times, and their interment was functionally linked to events leading to construction of the respective mounds. All of the burials were fully extended, and all were accompanied by variable quantities of high quality furnishings. Moreover, all of the burials were laid out on, not in, the sub-mound soil horizon. We conclude, therefore, that Burial 1 at B-V-6 was probably not functionally linked to the later events which led to the mound's construction, but more likely constitutes a deceased member of one of the residential units predating ceremonial use of the area.

Our limited excavations in Unit 55 throw no light on the immediate source of the fire that scorched and hardened the surface of Substratum 310A. We can only speculate that the stratum's condition must have resulted from the burning of either piled brush or a formally constructed structure (such as a pole and thatch house or special purpose building, probably the latter). While the burned surface, the cache, and the mound all appear to be intimately related stratigraphically, the same cannot be said of the post molds in 310C and the burned surface of 310A, which are separated by 80 cm or more and show no visible connection. Our interpretation of these findings is that the post molds relate to an earlier structure functioning at a time when the area around B-V-6 sustained a dispersed hamlet, possibly as early as 1000 B.C., but probably somewhat later (ca. 500-600 B.C.). This pattern of use continued up to the time the area was transformed into a "ceremonial center" sometime around 400-600 B.C. The burned surface of Substratum 310A may thus represent remains of either (1) the latest in a series of residential structures to have been built in the general vicinity; or (2) a special purpose building intentionally burned as part of the activities resulting in construction of the mound. Because of the coincidence of its central location with respect to the mound we favor the latter alternative. Most of the obsidian specimens included in the cache overlying the burned surface showed evidence of use, and it may be that they were utilized in the preparation of perishable paraphernalia which also functioned in the context of premound-construction ceremonial events.

Construction of the Mound

This section deals with three aspects of the mound's construction: (1) the kinds, composition and sources of the materials used in its construction; (2) the sequence of deposition of the various fill compounds; and (3) a structural interpretation of construction techniques.

Materials Used in Construction of the Mound

Three different classes of soils were used in the construction of B-V-6: arena, talpetate, and clay. All are highly accessible and occur naturally within 100-200 meters of the mound as thick water or volcanic-deposited strata. These materials were used singly and in various combinations.

Arena is a coarse volcanic tuff resembling sand and is normally found as a bedded formation which is white in color. Redeposited arena is frequently yellow in color. Both varieties were used in the construction of B-V-6, both singly and in combination with other materials.

Talpetate is a hard, relatively dry clay-like material. Alternating strata of talpetate and arena constitute the greater part of the valley floor to an undetermined depth. Talpetate was used in the construction of B-V-6 in two ways: (1) in the form of relatively large chunks (locally called terrones de talpetate) measuring 10-30 cm in diameter and generally weighing one kilogram or more; and (2) in a crushed form. In either case, talpetate was always mixed (most often dry-mixed) with other materials (arena and/or clay).

Clay occurs in the vicinity of B-V-6 as a rusty-brown colored, tenacious subsurface formation. It was used in several ways: (1) in pure form as massive fill components; (2) as terrones in combination with talpetate and arena; (3) as small lumps and discontinuous lenses in combination with arena (the most common and distinctive use); and (4) as a binder and foundation for functional surfaces.

No stone of any kind was used in the construction of B-V-6, and it is conspicuous by its almost total absence; what stone was found consisted of mano and metate fragments incidentally included as fill.

Major Fill Types

Three major types of fill and numerous variations were used to construct the mound:

(1) Banded Fill - consists of small lumps and thin lenses of clay in an arena matrix. The clay functions as an adhesive imparting greater rigidity to the predominantly arena deposit and at the same time gives it a banded or streaked appearance clearly showing the pattern of deposition.

This is the most voluminous fill type used in the construction of B-V-6, occurs in almost endless variation (reflecting the variable propositions of clay and sand used in each stratum), and is the single most characteristic fill type used in Late Formative mounds at Kaminaljuyu. At B-V-6, banded fill strata were generally very substantial and often occurred as thin alternating layers with relative high or low clay content (cf., Fig. 10: Strata 104A-F; Fig. 11: Strata 203-205; Fig. 15: Strata 504, 508).

(2) Block Fill - talpetate and clay were frequently utilized as large amorphous chunks or blocks (locally called terrones) measuring 10-30 cm in diameter and weighing on the average one kilogram or more. This gave a mottled appearance to some fill strata, as the chunks were usually in a matrix of arena sometimes including smaller clay and talpetate lumps.

Block fill strata were most often found to be relatively thick, but also occurred as isolated small deposits (eg., Stratum 306, shown in Figs. 12 and 13). In some cases block fill strata interdigited and intergraded with adjacent strata (cf., Strata 303 and 304, Unit 55, Fig. 13).

(3) Clay Fill (Fig. 13, Stratum 301) - In addition to its use in the form of small lumps, large blocks and thin-to-thick lenses, clay was also deposited on a massive scale in nearly pure form. The most substantial deposit of clay (Stratum 304) occurred in the center of the mound, from which small lenses radiated outward into surrounding fill components. Another substantial deposit of clay (Stratum 302) was again found in the center of the mound near its summit; this deposit had very well-defined, pit-like boundaries on the west, south and north, but blended into a block-type fill component and lensed out to the north.

All of these fill types (and their variations) were prepared and deposited as dry-mixes, i.e., the breaking down and puddling of raw materials did not involve the use of water. This stands in sharp contrast to methods used in the preparation of laminated functional surfaces (discussed below) and fill types used during the Terminal Formative and later periods, all of which were wet-mixes, often quite thoroughly puddled before deposition or application.

Functional Surfacing

This refers to the special treatment of certain classes of surfaces designed to protect them against rapid weathering and to make some of them serviceable for regular use. These classes include such architectural surfaces as temple and residential platforms, aprons, plazas and other special purpose activity areas.

A special technique of functional surfacing appears to have first been used during the Late Formative and became universal during the Terminal Formative period. This technique is a lamination process involving the wet-mix application of alternating layers of two types of materials: (1) a well-puddled mixture of finely crushed arena, clay and talpetate; and (2) pure, tenacious clay. Most often only three laminations in a 1-2-1 sequence were used, although as many as eight have been observed. Each lamination measures from 5 to 23 mm in thickness. The result is a very hard (when dry), weather resistent, durable surface which can easily be repaired by the addition of new laminae. This type of surfacing was used on the mound apron and in the plaza.

Construction Sequence (Figure 4)

Construction of the mound began with the deposition of a large, nearly circular ring of banded arena (Strata 104C, 104F, 207, 309, 404 [408, 409], 504) measuring approximately 62 meters in outside diameter, 40 meters across peak-to-peak and 2-3 meters in height. This was the first of three superimposed ring components to be deposited, which taken together measured 5-6 meters in height and 24 meters across peak-to-peak (Fig. 5). The ring

structure formed a large basin 4.5 meters deep, with the central depression raised about 1.5 meters off the premound soil horizon. Additional measurements on the three components of the ring structure are presented in Table 2.

Table 2

Summary of Basal Ring Structure Dimensions

Basal Ring Structure Component	Height Above Premound Soil Horizon (m)	Peak-to-Peak Distance (m)	Depth of Central Depression (m)	Height of Central Depression Above Premound Soil Horizon (m)	Outside (Maximum) Diameter (m)	Stratum Designations
Lower Component	2.2-3-2	ca. 40	2.5	0.4-0.5	ca. 62	104C, 104F, 207, 309, 404, 504
Intermediate Component	4.0-4.8	26	3.7	0.9-1.0	ca. 39.5	104B, 104E, 206, 308B, 509
Upper Component	5.1-6.0	24	4.5	1.3-1.5	ca. 44.0	104A, 104D, 205A-D, 308A, 508A-D

In contrast to the upper and lower components of the basal ring structure whose predominant constituent was yellow arena, the intermediate component consisted almost entirely of white arena, making it easily distinguishable wherever encountered. Artifact density in each of the basal ring components was characteristically very low (1-5 artifacts/m^3 or less). This suggests that the areas exploited for the raw materials included as fill contained relatively little cultural refuse. There was no indication of weathering or natural soil accumulation on any of the arena surfaces, indicating that deposition of each of the three basal ring components and overlying fill followed in quick succession.

Filling in of the central depression of the ring structure and completion of the mound construction involved a more complex pattern of fill component deposition.

(1) The central depression was partially filled with 0.4-1.3 meters of clay with a relatively high talpetate inclusion (Stratum 307).

(2) Next, 1-3.9 meters of block fill of variable composition (Strata 303, 303A, 303B, 306) was added. On its periphery, this layer graded into areas of nearly pure arena (Stratum 105) and banded arena (Strata 203A-E and 204A-D).

(3) Over the block fill a layer of clay admixed with small amounts of talpetate and arena was deposited to a depth of 0.4-2.8 meters (Strata 106, 304, 305). These first three operations completely filled the original basal ring depression but maintained the bowl-like configuration of the central area of the mound.

(4) A 1.8-2.5 meter layer of banded yellow arena with small talpetate lumps (Stratum 302) was then added over the clay. This layer graded into similar strata on its periphery (Strata 103C and 203A-E).

(5) While operations 1-4 were in progress two massive but highly localized fill components, measuring 4.0-6.5 meters high by several meters across, were deposited side-by-side just to the west of the center: (1) clay with talpetate inclusions (Stratum 102), and (2) white arena evidencing little indication of clay banding (Stratum 105). The arena component (105) graded into the block fill component of operation 1 (303), while the clay component (102) graded into Strata 106, 304, 305 and 307, all very similar clay layers deposited in operation 3.

(6) Over these earlier fill component a 1.5-2.0 meter layer of clay (Stratum 301) was added in the center of the mound, bringing the structure to its final height of 10.6 meters above the sub-mound soil horizon. This stratum had well-defined, pit-like boundaries on the west, south and east periphery of the summit, but on the north it graded into a block-like fill type of talpetate terrones in a clay matrix, finally lensing out altogether towards the periphery.

(7) Simultaneously with operation 6, banded arena was deposited around the clay core on the east, south and west (Strata 103A, 103B, 202, 312), bringing the mound to completion.

Undoubtedly, other stratigraphic components were included in those portions of the mound not investigated. We believe, however, that they represent structural equivalents and compositional variations of the strata discussed above and more fully described in Appendix I. As stated earlier, all of the fill components were prepared and deposited as dry mixes. Arena, which constitutes more than 85% of the fill, is an easily mined material and has the further advantage of having a low density relative to clay and talpetate. These properties make it well-suited for the building of large structures having simple architectural features or lacking them altogether, especially where manpower resources are relatively limited. It is cheap in

man-hours of labor to mine, to transport, and to mix with clay and talpetate to form banded arena and block fill components. There is little wonder, therefore, that it constitutes the most abundant material found in Late Formative mounds at Kaminaljuyu.

On completion, the mound covered an estimated area of about 3020 m^2 at its base and included about 11,500 m^3 of earth fill, over 85% of which consisted of the banded arena variety (see Table 7, Appendix 1). The mound's basal ring structure included the greatest portion of the fill, amounting to some 9400 m^3, while the central depression contained only about 2100 m^3.

Construction of the mound appears to have involved a single continuous effort rather than a succession of discrete episodes over several years. We believe that even with a modest labor force construction of the mound could have been completed within the agriculturally inactive period of a single year. Materials for its construction were available in the immediate vicinity and were easily mineable. The pulverizing and mixing of raw materials was expediently conducted and was anything but thorough (in contrast to Terminal Formative and later fill types). In short, little time went into pre-preparation of materials for deposition. Because of its low mass per unit volume, large amounts of arena could be deposited at a lower man-hour cost than other materials. Thus the relatively large volume of B-V-6 compared to single construction phases of the Terminal Formative does not necessarily imply a greater investment of man-hours of work; it may and probably does reflect the same or even fewer number of man-hours than smaller structures of later periods. That is to say, many of the man-hours invested in the production of sheer bulk during the Late Formative appear to have been redirected to the production of more thoroughly puddled (and therefore structurally superior) fill types and to the execution of more elaborate architectural features.

Structural Interpretation of the Construction Sequence

The construction of B-V-6 demonstrates a great deal of sophistication in planning, workmanship, and knowledge of the problems of structural stresses involved in the erection of large conical mounds of early. Two structural principles were made use of: (1) cantering of fill components to prevent slippage; and (2) the use of clay as a structural stabilizer.

The cantering of mound fill functions to direct the cumulative weight of superimposed strata vertically downward over a broader area rather than outward along the mound's surface. Stress directed in the latter manner could, if of sufficient magnitude, produce outward movement of the mound's sides, resulting in partial collapse of the mound under its own weight.

In the case of B-V-6, cantering was initially achieved through construction of the mound's basal ring structure, which simultaneously established the maximum perimeter of the mound and the basin-like feature that was to receive the remainder of the fill. The ring structure was massive in comparison to the fill it supported (9400 m^3 vs. 2100 m^3), and the cantering of fill within the ring enclosure was continued upward with a gradual reduction in degree of slope through Stratum 302. The final stratum (301) consisted of a thick copping of clay.

Arena by itself is a very light material with relatively weak adhesive characteristics; under even relatively weak stress it tends to behave like a fluid. Clay can behave the same way, but because of its strong adhesive qualities (tenacity) and greater density, considerable stress is required before it will develop flow-like properties. Thus, clay might be used to stabilize less tenacious materials by containing them (eg., damming up or sealing off weaker adhesives) and by increasing their adhesive qualities (ie., structural strength) through the inclusion of clay addatives.

However, because of its greater tenacity and density clay is also a considerably more expensive material to mine and process than arena, given a neolithic level of technology. Fortunately for Late Formative populations in the Guatemala Valley, the addition of even small amounts of clay in the form of lumps and lenses will markedly improve the adhesive qualities of arena. This fact apparently was well understood, since as noted above, over 85% of the material used to construct B-V-6 consisted of banded arena; moreover, most of the banded arena is located in the basal ring structure, which accounts for more than three-fourths of the total bulk of the mound. If we include block fill in the same category as banded arena, then well over 90% of the mound consists of arena with clay as an adhesive addative. The remaining 10% of the fill consists of predominantly clay components (sometimes with talpetate and arena addatives) which were used as daming and sealing devices (eg., Strata 102, 301, 304 and 307).

Construction of the Apron

Prior to excavation, inspection of the mound suggested that it may have had an apron-like appendage projecting from its eastern lower flank into a large rectangular plaza area to the east. However, bulldozing had been so extensive on the mound's east side that we could not be certain that the topographic layout of the landscape was not an artifact of disturbance. Thus, the central east-west trench (Figs. 12 and 15) was extended across the apron-like feature and into the plaza area in hopes of locating the probably buried structural feature.

To our satisfaction, portions of the apron's functional surfacing were soon found in Units 5, 7 and 8. This area of the apron had been well buried by soil washing off the mound during the previous centures; and bulldozing of the mound's east side had added still more protective earth. The wall profiles of the trench clearly showed that this was the western terminus of the apron, ie., where its functional surfacing lensed out as it ascended across the zone of puncture defining the articulation of the lower flank of the mound with the apron. To the east, progressively less protective soil had accumulated, and as a result weathering processes had almost completely destroyed the laminated functional surfacing that was originally applied over it. For example, in Units 2, 1 and 42 no traces of the surfacing were found, and in Unit 57 (where the apron joined the plaza) only bare traces were extant. In general, then, the western portions of the apron surface (where it joined with the mound) were better preserved than those to the east (where the apron articulated with the plaza).

Further exploration of the apron was conducted with a series of excavation units both to the north and south of the main east-west trench. These provided additional details concerning the apron's architectural plan, construction techniques, repairs and modifications, and dating.

Architectural Plan

Although our investigation left a number of unresolved questions concerning certain details of the apron's architectural plan, we nevertheless were able to obtain an overivew of its major structural characteristics. As all too often happens, it was only at the end of the field season that the problem areas could be clearly defined, and by then it was too late to proceed with their investigation. Laborers had been retired and the bulldozer once again came, this time to fill in the 10 meter deep hole (Unit 55) we had excavated in the mound's center, as well as other deep soundings which presented a hazzard to local children and livestock.

A reconstructed plan view of the apron superimposed on a contour map of the site area is presented in Figure 1. The reconstruction was prepared independently of the contour map data and the degree of conformation between the two turned out to be greater than even we anticipated. A complete and a partial cross-sectional view are presented in Figures 5 and 6, respectively; the former is a view along Grid Line 41N and the latter along 45N. Our excavations yielded data concerning the configurations and metric dimensions of the north side of the apron only. The planview reconstruction thus assumes bilateral symmetry in these particulars for the apron's south side. This procedure seems justified in at least two ways: (1) the demonstrated congruence between the north side apron configuration and the contour of the present landscape overlying it; and (2) the bilateral symmetry of contour intervals to the north and south, with those to the south occurring in a manner (ie., in configuration and metric dimensions) that would be expected if the apron also was bilaterally symmetrical.

The apron thus appears to have been laid out in a fairly precise geometric manner, with recessed corners giving it a stubby T-like configuration. Metric dimensions are summarized in Table 3. The two east-west cross-sectional views along 41N and 45N illustrate two other major features of the apron:

(1) A centrally located ramp-like swell in its surface (along 40-41N), rising from east to west about 100 cm relative to the surrounding apron surface over a distance of 9.50 m during Phase 1 and 12.24 m during Phase 2. This feature rose very gradually out of the apron surface from the north, east and south and lacked the well-defined boundary characteristics usually associated with true rampways.

(2) A trough-like depression apparently running along the zone of juncture joining the basal portion of the mound slope to the apron. This depression was interrupted by the ramp-like feature described above, as illustrated in Figure 7. Time did not permit an extensive exploration of this feature, and its areal limits and exact configuration therefore remain uncertain.

Table 3

Summary of Apron Dimensions

PHASE							
1a	North-South Length: 29.8 m	East-West Length (to edge of trough along central axis): 7.0 m	Upper Riser Height (east side of apron): 18 cm	Lower Riser Height (east side of apron): 21 cm Lower Tread Length (east side of apron): 60 cm	Riser Height (north and south side of apron): 26 cm	Drainage Trough Width: ca. 4.5 m Height: 55 cm	Ramp/Apron Elevation Differential Along 35W 0cm Along 41W 72cm
1b	Lower Tier (north and south sides) Riser Height: 10 cm Tread Length: 115 cm						
1c	Lower Tier Extension (north and south sides of apron) Riser Height: More than 15 cm Tread Length: Undetermined, but more than 0.5 m and less than 6.1 m						
1d	Upper Tier Extension (north and south sides of apron) Riser Height: 18 cm Tread Length: 76 cm						
2	North-South Length: 29.7 m	East-West Length (to edge of trough along central axis): 10.0 m	Riser Height (east side of apron): 18 cm	Upper Riser Height (north and south sides of apron): 20 cm	Lower Riser Height (north and south sides of apron): 14 cm Lower Tread Length (north and south sides of apron: 62 cm	Drainage Trough Width: ca. 2.5 m Height: 60 cm	Ramp/Apron Elevation Differential Along 32W 0cm Along 35W 10cm Along 41W 82cm

Both of these features were maintained throughout Phases 1 and 2 of the apron construction sequence (discussed in detail below). If the trough-like feature extended in the manner suggested there can be little doubt that it functioned as a drainage facility to direct run off from the mound away from the apron during rains. The mound area affecting the apron amounts to roughly 500 m^2. With an annual rainfall of about 1500 mm this area might deliver up to 700 m^3 of run-off (after absorption) each year, with most of it coming during the rainy season months of June through November for an average of 4 m^3/day. These figures suggest that unchecked run off might do fairly rapid structural damage to the apron; they also suggest the functional interpretation of the trough-like feature indicated above.

This drainage facility is interrupted by the ramp-like feature described above precisely where the central east-west axis of the mound and apron cross-cuts the trough. The ramp rises gently above the surrounding apron and drainage facility to join in a continuous arc with the lower slope of the mound. These properties are interpreted to indicate that the mound's summit and apron were functionally linked during the interval of time that the apron was maintained, ie., that the interruption of the drainage facility by the ramp-like feature was a planned structural component of the apron designed to provide access to the mound's summit.

This interpretation raises a number of questions concerning architectural properties and function(s) of the mound itself:

(1) What was the manner of ascent to the summit (log or earth stairway; paved slope; unaltered natural surface, etc.)?

(2) Was the entire mound paved with the laminated surfacing material found in the apron and plaza areas or was it grass covered as it is today?

(3) What was the functional context of the summit, and in what manner, if any, was it architecturally prepared?

Regarding the manner of ascent to the summit, no structural remains from the mound's surface have survived the ravages of time. Since step-like features were found as part of the apron complex, a laminated stairway cannot be ruled out. If there had been a stairway of any kind, the laminated type characteristic of the succeeding Terminal Formative period is the most likely form to have been constructed. However, a stairway is not inherently required to reach the summit, since the angle of inclination is relatively small and offers no obstacle to sure footing even on the wet turf.

Our observations concerning surfacing of the mound suggest that most if not all of its surface may have been grass covered. No evidence for special surfacing of any kind was found despite our repeated attempts to investigate areas of the mound where such materials probably would have been preserved if originally present. The thick turf characteristic of the area today appears to hold the soil well and to effectively reduce the rate of erosion to a very low level. There is no reason to believe that this was not also the case during the Late Formative period.

Our excavations on the summit area of the mound produced no evidence concerning its function during the Late Formative period. This data void is the result of soil erosion and sod formation, grave excavation and recent bulldozing. By Middle Classic times erosion and sod formation had reduced the mound's height by more than 30 cm and converted mound fill within 20-30 cm of the surface to a mantle of black humus. While the collapse of a pole and thatch structure with fired daub walls will often bury and thus protect the summit area of a mound from this kind of destruction, leaving much of the functional activity surface intact, fired daub fragments, which were so common on and in the fill of structures re-used or built during later periods, were conspicuous by their absence at B-V-6. During the Middle Classic period the mound summit was modified (at least in part) for mortuary purposes (Burial 2), resulting in further disturbance of this area. Finally, the southern half of the summit was completely removed in recent times by bulldozing (this was followed by our own systematic destruction of what remained of the summit area). These pre-excavation disturbances, erosion and sod formation, alteration through grave excavations and bulldozing completely destroyed all traces of the original Late Formative summit. From our largely negative findings we draw the following limited conclusions: (1) during the Late Formative period the summit was the locus of some kind of special purpose activity functionally related to use of the apron; and (2) if a structure were present on the summit it was constructed entirely of perishable materials (pole and thatch).

Construction Techniques

The major portion of the apron construction did not involve special types or unusual qualities of materials beyond those used in construction of the mound's basal ring structure. The only departure from these materials and procedures concerned the apron's surfacing. In the 500 Series Stratigraphic Profile (Units 8, 7, 5, 2, 1, 42 and 57) it can be seen that the apron was constructed over the lower most component (Stratum 504, 104C, 104F, 208, 309, 404) of the basal ring structure. The laminated functional surfacing of the apron was bonded to this foundation by a layer of tenacious clay of variable thickness (range: 0-20 cm), but generally less than 5 cm.

Construction Sequence: Repairs and Modifications

Our excavations uncovered a number of repairs and modifications of the apron and plaza complex. These may conveniently be grouped into two major phases of construction involving major and minor undertakings. While the construction associated with Phases 1 and 2 was everywhere easily differentiable, the cross-correlation of repairs and minor modifications within a construction phase at different locations on the apron and plaza was made less confidently. The space of time involved in these changes did not exceed a single ceramic phase and was well within the standard deviation associated with obsidian hydration measurements (ca. $\pm$ 100-120 years for the Late Formative period). Moreover, the samples of artifacts obtained from the repaired and modified areas were in all cases so small (often lacking altogether) that artifactual remains could not serve as a meaningful basis for correlation of the changes. Only if the alterations (1) were fairly extensive so as to involve several excavation units, and/or (2)

exhibited differential patterns of preservation could correlations be made with some degree of confidence.

Phase 1

This phase includes the initial construction of the apron and plaza complex plus subsequent repairs and modifications hereafter referred to as Phases 1a, 1b, 1c, and 1d.

Phase 1a constitutes the initial laminated functional surface overlying the mound's basal ring structure and a specially prepared foundation in the plaza area. The strata involved are as follows:

(1) 400 Series Strata: Phase 1a = 412, 421; Phase 1a overlies 404, 408, 409 (lower most component of basal ring structure).

(2) 500 Series Strata: Phase 1a overlies 504 (lower most component of basal ring structure); 511 (clay foundation in Unit 7); and 521 (prepared foundation in plaza area).

Phase 1b includes repairs and modifications made on the southern portion and recessed northeast corner of the apron, respectively, involving the following strata:

(1) 400 Series Strata: 411 (addition of a lower tier or step to the recessed northeast and presumably southeast corners); 420 (resurfacing of most of the south side of the apron in conjunction with addition of the lower tier or step to the southeast corner).

(2) 500 Series Strata: No changes except for possible resurfacing of weathered portions of the plaza area (during Phase 1b the Phase 1a surface of the plaza continued in use).

Phase 1c includes modifications of the recessed northeast and southeast corners of the apron involving an extension (Stratum 414) of the lower tier or step added to the apron during Phase 1b. Other portions of the apron and plaza appeared to have continued unaltered.

Phase 1d includes a small extension (Stratum 416) of the upper tier or step of the recessed northeast and southeast corners. The upper tier was first laid down during Phase 1a when the recessed corners of the apron joined the plaza level directly via a single riser. Phase 1b modified the corners from a single to a double tier unit by the addition of a lower tier or step (411), over which Phase 1d (416) was extended.

Thus, most of the changes associated with Phase 1 appear to have concerned primarily the recessed corners of the apron and involved the addition and extension of the existing system of tiers or steps. None of the changes could be regarded as major renovations, since each involved small volumes of earth fill and relatively slight alteration of the overall architectural plan. Portions of the apron and plaza were periodically resurfaced in response to weathering.

Phase 2

This phase represents the first and only major renovation of the apron and plaza complex during the Late Formative period. It entailed the deposition of a relatively large volume of fill (Stratum 403) over Phase 1d and an extension of the apron 3 meters to the east (Stratum 520). The overall architectural plan, however, remained essentially unchanged. The two-tier, recessed configuration of the northeast and southeast corners continued as before, while extension of the eastern side of the apron was accompanied by a reduction in the number of tiers from two to one. Most of the plaza area was raised 20 or more centimeters in elevation. Functional surfaces were constructed in the same laminated fashion as before. Although the Phase 2 functional surface must have required periodic refurbishing, no evidence of repair work was found during excavation, largely because little of the Phase 2 laminated functional surfacing survived the weathering effects of time. Phase 2 diminished still further the elevation differential between the ramp-like feature and surrounding apron, so that it now constituted only a slight swell near the mound/apron zone of juncture.

Strata included in Phase 2 of the apron construction sequence are as follows:

(1) 400 Series Strata: 403, 407, 415

(2) 500 Series Strata: 510, 520

Dating

Strong continuity in architectural details and maintenance of the same overall plan through both phases of construction suggest that the entire apron construction sequence occurred over a relatively short period of time. Ceramic analysis indicates that the apron was built during Late Formative period. Phases 1 and 2 could not be ceramically distinguished, and obsidian samples from the two components have not yet been processed, so that a chronometric evaluation of the construction sequence remains to be conducted.

A tentative assessment, however, may be attempted based on dating of an obsidian cache found at the base of the mound in Unit 55. This cache was deposited subsequent to partial oxidation of the surface of Stratum 310A by fire[1] and just prior to construction of the mound. The cache was placed on two talpetate blocks directly resting on the oxidized surface of Stratum 310A. Neither of the blocks showed any trace of heat alteration however. These events are believed to be functionally linked and to have occurred in rapid succession. The cache and Stratum 310A were buried by deposition of the lower most component of the mound's basal ring structure, over which

---

[1]The exposure of an obsidian artifact to the high temperatures of such an event will severely alter the hydrated portion of the specimen and thus make it unreliable for dating purposes; it was for this and other reasons that the specimens from Stratum 310A cannot be relied upon for controlled chronometric information and were not used in this analysis.

the apron was constructed on the east side of the mound. Results of the dating are presented in Table 1 and indicate that the mound (and thus the apron) may have been built sometime during the period 400-500 B.C.

Construction of the Plaza

Prior to our work at Mound B-V-6 we were assigned the task of initiating a series of test pits in the Mirador Mound complex area as part of a Settlement Pattern Test Trench program (see Sanders 1969 for a discussion of the objectives of this program). Inspection of the Shook/Johnson contour map of Kaminaljuyu and first hand observation of the area to be test pitted suggested that Mounds B-V-2, B-V-3, B-V-4, B-V-5 and B-V-6 were arranged in linear chains along the west and (on a smaller scale) the east sides of a long, relatively flat area which we interpreted to be a plaza. To test this hypothesis we excavated five 1 x 2 meter Test Trenches at 60 meter intervals along the North-South Base Line of the Mirador excavations (Settlement Pattern Test Trenches 46-32-074, 093, 113, 152 and 171). We reasoned that if a buried plaza were present it should show a regular pattern of elevation readings at these different locations. Moreover, the excavations should provide evidence of special preparation such as functional surfacing, foundations, alteration of uneven features of the natural topography, etc.

Our probes revealed two superimposed plaza-like levels meeting the above criteria. Each varied by less than 50 cm in elevation over the 240 meter length tested. The lower of the two was later found to be coterminous with Phases 1 and 2 of the apron construction sequence at B-V-6. It was furnished with a laminated surfacing (at least in some areas), and its preparation required the leveling of "high" areas and the filling in of "low" ones to produce a relatively flat surface. Mound B-V-8 is believed to have also been articulated with it. This phase of the plaza construction dates to the Late Formative period.

The upper plaza level dates to the Middle Classic period and is associated with a primarily Amatle 1-2 settlement (including Mounds B- V-9, B-V-10, B-V-11, B-V-14 and B-V-15). The "fill" of this plaza level amounted to 30-50 cm and was designated Stratum 503 in the B-V-6 excavations. It was not surfaced in the manner of the earlier plaza level, and may be a result of natural soil accumulation during the 10 or 11 centuries between Late Formative and Middle Classic use of the area. The remains of two burials (Burials 3 and 4) were found at the base of this stratum, and complete ceramic vessels were found at two other locations where additional burials may be located (west end of Unit 57; and Settlement Pattern Test Trench 46-32-073). This plaza level was subsequently buried by continued soil accumulation following abandonment of the area as a fairly dense settlement zone. The accumulation eventually produced Stratum 502 and the modern land surface.

Intrusive Burials Placed in the Mound and Plaza

During our investigations two sets of intrusive burials were encountered: (1) a single burial placed in the summit of the mound (Burial 2); and (2) a double burial placed in the plaza area (Burials 3 and 4). Both sets of burials post date construction of the mound by 900-1200 years and thus were not involved in the ceremonial activity surrounding its use during the Late Formative period. The summit burial is, however, indicative of the mound's continued significance long after it ceased to serve its original purpose. Formal descriptions of the burials follow below.

Burial 2 (Figure 8)

Location: Units 3 and 4 (43-44N/65.5-68W); 28.95-29.10 m AZEP (ca. 28 cm below the summit surface of the mound: Stratum 300).

Post Mortem Treatment Prior to Interment: Evidence for post-mortem treatment of the corpse is either lacking or of a negative nature, due largely to the very poor state of preservation of the osseous remains. There was no evidence for prolonged preservation, nor was there any indication of mutilation of any kind. Although so little of the osseous portions of the corpse were preserved for archaeological investigation that dismemberment cannot be categorically ruled out, the evidence at hand indicates that this is unlikely and that the corpse was interred as a complete anatomical unit.

Burial Facility: The corpse appears to have been deposited on an exposed earthen surface on the north end of the mound's centrally located summit. Although the burial zone was heavily infested with grass roots, and thus the soil highly weathered by organic as well as physical agencies to a depth of 30 cm and more, there was no indication of a surface specially prepared (or architecturally planned) to receive the corpse. No evidence of post molds, cribbing, clay lining, or pit excavation was found during our investigation. In sum, the corpse and associated burial furniture appear to have been laid out on an earthen surface cleared of grass and then covered over with soil probably obtained from the mound itself.

Disposition:

1. Type of Disposal - Probably primary inhumation, including all portions of the corpse in their normal anatomical relationships. This is not a confident appraisal of the situation, and secondary inhumation involving rearticulation of the long bones, vertibrae and cranium, though unlikely, cannot be ruled out.

2. Condition of the Osseous Remains - Partially articulated and in an extremely poor state of preservation. The osseous remains include: (a) The mandibular array of teeth (Item 29) in their approximate articulated arrangement, plus unarticulated maxillary teeth. Only the "ghost" remains of the mandible were found. (b) Two or three articulated cervical vertibrae (all in very poor condition), followed by several indistinct but articulated vertibrae of the upper spinal area. (c) Mid-sections of the left and right humerus (Items 27 and 28),

also in very poor condition. The left and right humerus fragments were oriented parallel to one another in a grid northwest-southeast alignment. (d) Small highly decomposed fragments of what may have been the femurs or tibias (Items 25-26). (e) Other osseous fragments too small and scattered to include in Figure 8 but located under and around Items 16 and 19 and Items 14 and 29.

The post-pelvic area of the burial was recently disturbed by bulldozing of the mound. The areal limits of disturbance are defined by an arc running through Item 6 and just to the south of Items 7, 19, 16, and 20.

3. Position of the Body - From these remaining portions and their more or less orderly distribution from north-to-south it is concluded that the individual was laid out in a very loosely flexed or extended position, probably the latter. More difficult is the question of whether the corpse was laid out on its back, front, or side. The position of the humerus fragments relative to the vertibral axis suggests that the corpse may have been placed on its left side in an extended "sleeping position" facing east.

4. Position of the Head - Probably on left side facing east and aligned in a normal manner with the body; but again, the paucity of remains leaves considerable room for alternative possibilities (eg., facing up).

5. Orientation of the Body and Head - Approximately 5° east of Grid North-South (head to north), ca. 32° 55' east of Magnetic North.

6. Age and Sex - Probably an adult (based on teeth and development of the humerus). Sex of the individual could not be determined from the osseous remains alone, but associated burial furnishings indicate that the interred individual was a male.

7. Pathology - The remains were of insufficient quantity and quality to make meaningful observations concerning pathological conditions.

Burial Furniture (Table 4):

1. Ceramic Vessels - 12 originally complete ceramic vessels of three types:

   Type 1 - Simple basal-break hemispherical bowls; crudely made; coarse reddish paste. Two sub-types (based on size) were noted:

   a. Large, coarse plainware bowls averaging 17.5 cm in diameter and 5.5 cm high; flat base averaging 8 cm diameter; crudely-modeled with exterior and interior concentric striations. Only two bowls of this variety were recovered (Items 1 and 6), both of which appear to have been inverted when entered with the corpse. Item 6 had been broken into several fragments by the bulldozer which crushed many osseous and artifactual remains in the southwestern portion of the burial area

Table 4

Mortuary Furnishings Associated with Burial 2
(Figure 8)

Item	Accession Number	Description
1	KJ69-5208, DOT 11	Inverted bowl
2	KJ69-5203, DOT 12	Inverted bowl
3	KJ69-5204, DOT 13	Inverted bowl
4	KJ69-5206, DOT 14	Inverted bowl
5	KJ69-5209, DOT 15	Inverted bowl
6	KJ69-5201, DOT 16	Inverted bowl
7	KJ69-5202, DOT 17	Dish
8	KJ69-5210, DOT 18	Effigy vase, with tripod supports
9	KJ69- DOT 19	Obsidian blade fragment
10	KJ69- DOT 20	Obsidian blade fragment
11	KJ69- DOT 21	Obsidian blade fragment
12	KJ69-5241, DOT 22	Jade bead, drilled longitudinally
13	KJ69-5247, DOT 23	Red pigment (hematite?)
14	KJ69-5246, DOT 24	Small jade bead
15	KJ69-5243, DOT 25	Bead of schist or mica-imbedded greenstone
16	KJ69-5200, DOT 26	Inverted bowl
17	KJ69-5199, DOT 27	Tripod support bowl
18	KJ69-5248, DOT 28	Pumice pebble with mica incrustations
19	KJ69-5249, DOT 29	Obsidian blade fragments
20	KJ69-5250, DOT 30	Obsidian blade fragments, one obsidian flake
21	KJ69-5257, DOT 31	Radiocarbon sample, botanical remains
22	KJ69-5207, DOT 32	Bowl (under Item 1)
23	KJ69-5240, DOT 33	Obsidian blade fragments, nine sherds (under Item 7)
24	KJ69-5205, DOT 34	Small bone (under Item 16)
25	KJ69-5253, DOT 35	Large bone fragment
26	KJ69-5254, DOT 36	Large bone fragment
27	KJ69-5251, DOT 37	Humerus fragment
28	KJ69-5255, DOT 38	Humerus fragment
29	KJ69-5252, DOT 39	Mandibular fragments and dentition

(including Items 16 and 17). It is likely that Item 6 was moved during this disturbance from a location slightly to the southwest of Item 7.

b. Smaller, coarse plainware bowls averaging 14.0 cm in diameter (range: 13.5-15 cm) and 2.5-3.0 cm high; flat ware averaging 5.5-6.0 cm in diameter. Eight bowls of this variety were recovered (Item numbers 12-15, 17, 26, 32 and 34) all except one of which (Item 7) were found inverted.

Type 2 - Tripod support effigy vase; fine, almost friable paste, black-bown in color; sharp basal angle with nearly flat base; slob-type tripod supports. Strongly resembles San Agustin Acosaguastlan tripod support, effigy vase on exhibit in the Guatemala Museum, Guatemala City.

Type 3 - Tripod support bowl with a concave base and slightly out-flaring sides; hard reddish paste; burnished. Diameter: ca. 26 cm; total height: ca. 13 cm.

2. Obsidian - Four discrete clusters, including a total of 31 whole or fragmentary blades and one flake.

a. Items 9-11, three small fragments between the left and right humerus.

b. Item 19, nine blades and blade fragments generally having a Grid East-West orientation. Some of these blades was partially covered by Item 16, a small, inverted hemispherical bowl. Four show no wear, two light wear and three moderate wear chippage.

c. Item 20, ten blades and one flake; post depositional disturbance may have altered their arrangement. Eight specimens show no wear; one shows light wear and another moderate wear chippage.

d. Item 23, eight blades and blade fragments, plus nine sherds beneath Item 7, a small hemispherical bowl. The blades were generally oriented either Grid NE-SW or NW-SE. Seven specimens show light and one moderate wear chippage.

3. Other Stone Artifacts

a. Item 12, jade; drilled longitudinally; 15 mm in length; 12 mm outside diameter, 6 mm inside diameter.

b. Item 14, jade; very small; drilled; associated with madibular array of teeth; measures 3 mm in diameter.

c. Item 15, shist or mica-imbedded greenstone; drilled longitudinally; 20 mm in length by 7 mm diameter.

d. Item 13, red hematite.

e. Item 18, pumice pebble with mica incrustations.

Dating: Ceramic evidence alone indicates an Amatle I-Esperanza date for the burial. This assessment is supported by Obsidian Hydration dates obtained on specimens from Items 19 and 20; two of these dates (Sample Numbers 6997 and 6999 - see Table 1) indicate the mortuary event probably occurred between A.D. 629 and 724. A third specimen (Sample Number 6998) yielded a Terminal Formative date of 63 B.C. ± 108 years and suggests that not all of the blades included as offerings were manufactured specifically for mortuary use; some may have been conveniently salvaged from local surface refuse to assume a new functional context.

Burials 3 and 4 (Figure 9)

These two burials are treated together because of their close proximity to one another and formal similarities in type of disposal and associated burial furniture. Both were found in the same stratum (503) within a meter of each other, and burial furnishings indicate that they are ceramically contemporaneous. It is likely that they were interred at the same time.

Location:

Burial 3 - Units 40, 45, 46 (40.6-42.3N/4.7-6.0W); 19.37-18.94 AZEP (Stratum 503)

Burial 4 - Units 46, 51-53 (40.7-43N/3.1-5.1W); 19.34-18.79 AZEP (Stratum 503)

Post Mortem Treatment Prior to Interment: Evidence for post mortem treatment of the corpses is either lacking or is of a negative nature, due largely to the poor state of preservation of the osseous remains. There was no evidence for prolonged preservation, nor was there any indication of mutilation of any kind, including dismemberment, disfiguration or breakage. Both corpses appear to have been deposited as complete anatomical units, since the remaining osseous portions were arranged in a manner consistent with primary inhumation.

Burial Facility: Both corpses appear to have been deposited in shallow graves dug down to, and in one case slightly into, the underlying Late Formative plaza level (Stratum 521). No special planning and/or construction was involved in preparation of the burial facility, and it is likely that both corpses and their furnishings were deposited in a single grave pit. However, exact dimensions of the facility remain unknown, as the side walls could not be detected during excavation. Since the grave was dug at some point during the accumulation of Stratum 503, its total depth could not have been more than about 70 cm maximum (the elevation differential between the highest and lowest items included as furnishings with the burials was 58 cm).

Disposition:

1. Type of Disposal - Primary inhumation, probably including all portions of the corpses in their normal anatomical relationships.

Table 5

Mortuary Furnishings Associated with Burials 3 and 4
(Figure 9)

Item	Accession Number	Description
		BURIAL 3
1	KJ69-5960, DOT 48	Olla with flaring neck and rim; orange
2	KJ69-5960, DOT 48	Two obsidian blades (inside Item 1)
3	KJ69-5917, DOT 59	One prismatic obsidian blade
4	KJ69-5962, DOT 47	Olla, orange
5	KJ69-6640, DOT 62	Ten obsidian flakes
6	KJ69-6660, DOT 53	Olla, orange
7	KJ69-5894, DOT 58	Two obsidian flake-blades
8	KJ69-5896, DOT 52	One prismatic obsidian blade
9	KJ69-5893, DOT 51	Two prismatic obsidian blades
10	KJ69-6073, DOT 50	Half of a small bowl
11	KJ69-6102, DOT 49	Four ceramic sherds
12	KJ69-9947, DOT D	Tibia and fibula fragments
13	KJ69-9947, DOT C	Femur fragment
14	KJ69-6647, DOT B	Humerus fragment
15	KJ69-7517, DOT A	Cranial fragments
		BURIAL 4
16	KJ69-6124, DOT 57	Ceramic sherds
17	DOT 71	Celt or pendant-like piece of ground red slate
18	KJ69-6067, DOT 56	Olla, orange
	KJ69-7150, DOT 70	Associated obsidian flakes
19	KJ69-6635, DOT 69	Four obsidian flake-blades
20	KJ69-6666, DOT 55	Olla, orange; associated obsidian flakes
21	KJ69-7171, DOT 68	Bowl with thumb-impressed handles
22	KJ69-7221, DOT 66	One prismatic obsidian blade
	KJ69-7222, DOT 67	Two obsidian flake-blades
23	KJ69-8795, DOT 74	One piece of unworked jadeite
24	KJ69-7230, DOT 73	Olla, orange
25	KJ69-6668, DOT 75	One prismatic obsidian blade
26	KJ69-7149, DOT 63	Ground stone fragment and two sherds
27	DOT 75	Tibia or fibula fragment
28	KJ69-7516, DOT 72	Cranial fragments

2. Condition of the Osseous Remains: Many of the osseous remains had decomposed prior to our exhumation of the burials; all that remained of Burial 3 were portions of the cranium (including maxillary and mandibular areas and associated in situ dentition) and long bone fragments of the arms and legs (most lacking epiphises). "Ghost" remains of some vertibrae were also observed during excavation.

   The remains of Burial 4 were even less substantial and included only poorly preserved portions of the cranium, plus the maxilla and mandible (with associated in situ dentition); "ghost" traces of portions of the long bones were also observed during excavation and these made possible the determination of body position, orientation, etc., as discussed below.

3. Position of the Body - The distributions of the osseous remains indicate that both corpses were laid out on their right sides in an almost completely extended "sleeping" position, with heads to the south, and with the legs flexed slightly at the pelvis and knees. In the case of Burial 3, the legs were superimposed, and the arms were flexed at the elbows so that the hands rested in front of the stomach. Burial 4 is believed to have been similarly positioned. Both corpses faced the east.

4. Position of the Head - The heads of both corpses lay on their right sides facing east and were aligned in a normal manner with their respective bodies.

5. Orientation of the Body and Head - The precise orientation of both burials can be only approximately given because of the fragmentary nature of the remains. The figures presented below are estimates based on burial axes reflecting the distributions of osseous remains. Both sets of figures are probably accurate to within $\pm$ 3°. Because of more complete preservation, those for Burial 3 are more reliable than those for Burial 4.

   Burial 3 - ca. 5° 45' West of Grid North; ca. 22° 10' East of Magnetic North

   Burial 4 - ca. 3° 30' West of Grid North; ca. 24° 25' East of Magnetic North

6. Age and Sex - Both individuals were adults over 30 years of age. Sex, however, was impossible to determine from the osseous remains and associated burial furniture is not highly indicative in either case. Both burials were accompanied by utilitarian items including ollas, serving bowls and obsidian blades and flakes. However, Burial 4 was accompanied by a celt-like piece of red-slate situated near its chest and an unworked piece of jadeite just behind the knees. The presence of these items may symbolize a status distinction based on sex, and if so Burial 4 is interpreted to be that of a male. In view of the general lack of distinguishing characteristics, however, sexing of the remains is best left as indeterminate at this time.

7. Pathology - The remains were of insufficient quantity and quality to make meaningful observations concerning pathological conditions. None were evident in the teeth in any case.

Burial Furniture (Table 5): Both individuals were provided with a variety of mundane furnishings probably intended to serve them after death. Neither was equipped with exotic items indicative of high status or special office, and the small quantity of contributed goods further suggests that the individuals were not held in great esteem by the corporate community in which they lived. If sex differentials are symbolized in the remains (see discussion under Age and Sex) the distinction is by no means obvious: both individuals received similar quantities, quality, and kinds of goods. Only two differences were noted:

(1) Burial 4 received a celt-like piece of worked slate (Item 17) and a small piece of unworked jadeite (Item 23); similar or comparable items were not found in Burial 3.

(2) Burial 3 received a collection of small obsidian flakes strung-out between its legs (along both the upper and lower segments of the right leg); because of its poorer state of preservation we cannot be absolutely certain that this was not also done with Burial 4, but no linear arrangement of small flakes in the post-pelvic area was observed (although a number of flakes was associated with two of the ollas: Items 18 and 20; these however were not arranged in a special manner).

Thus, a status distinction based on sex is by no means clear: the celt-like piece of slate and the unworked jadeite fragment could be interpreted as male paraphernalia, but we can offer no supporting evidence for this hypothesis. Patterns of mortuary practices unfortunately have not been worked out for Kaminaljuyu during any of its phases. Perhaps at some later date the evidence presented here will fall into clearer relief than we can offer now as these patterns are worked out.

Burial 3

1. Ceramic Vessels

   a. Three ollas with an orange-colored paste (Items 1, 4 and 6). Two of the ollas (Items 1 and 4) were of a flaring rim variety, while the third (Item 6) had a direct lip. All three ollas were collapsed.

   b. One-half of a small basal angle flat-bottomed bowl with out-flaring walls (Item 10); the other was not found during excavation. This item was placed directly east of Burial 3's face.

   c. Four sherds (Item 11), which may have been incidentally included as fill, were found over the cranial area of the burial.

2. Obsidian - Six clusters of obsidian accompanied the burial.

   a. Two prismatic blades (Item 2) inside one of the three ollas (Item 1).

b. One lone prismatic blade (Item 3) between Items 1 and 4 (both ollas.

c. Ten small flakes (Item 5) strung along the inner area of the right leg.

d. Two large flake blades (Item 7) beneath and to the east of Item 6.

e. One prismatic blade (Item 8) beneath and to the northeast of Item 6.

f. Two prismatic blades (Item 9) between Items 6 and 10.

3. Osseous Remains

a. Fragments of the tibias and fibulas (Item 12).

b. Fragments of the femurs (Item 13).

c. Fragments of the left humerus (Item 14).

d. Fragments of the madible and maxilla (Item 15).

Burial 4

1. Ceramic Vessels

a. Three ollas with an orange-colored paste (Items 8, 20 and 24). All three were of a flaring rim variety.

b. One flat-bottomed bowl with thumb-impressed handles (Item 21) situated beneath Item 20 (an olla).

c. A small cluster of sherds (Item 16) between the burial's head (Item 28) and Item 18; this cluster may be incidentally included material deriving from the fill of the grave pit.

2. Obsidian - Two principal clusters accompanied the burial; in addition two other clusters were associated with Items 18 and 20.

a. Four prismatic blade fragments (Item 19).

b. One complete prismatic blade (Item 25) and three fragments (Item 22).

c. Small cluster of flakes beneath Items 20 and 21.

d. Small cluster of flakes beneath Item 18.

3. Other Stone

a. One celt-like piece of worked red slate (Item 17) associated with a cluster of sherds (Item 16).

b. One piece unworked jadeite (Item 23) between Items 20, 24 and 25.

c. One ground stone fragment (Item 26), possibly incidentally included as part of the grave pit fill,

4. Osseous Remains

a. Fragments of the tibias and/or fibulas (Item 27)

b. Fragments of the cranium, maxilla and mandible.

Also associated with Burial 4 was a small blackened depression measuring about 50 cm in diameter and located just to the east of the burial's chest area (east of Item 18). It is believed to be the remains of a hearth used during the interment activities.

Table 6

Summary of Total Artifacts Recovered during Excavation of Mound B-V-6

Artifact Name	Material Code	Item	Sub-Item	Frequency
Rim sherd	1	1	0	2,006
Body sherd	1	2	0	13,270
Unclassified ceramic artifact	1	3	0	3
Burnt clay lumps	1	4	1	1,067
Burnt clay lumps	1	4	3	38
Burnt clay lumps	1	4	4	15
Clay figurine	1	5	0	31
Effigy sherd	1	6	0	2
Adorno	1	7	0	19
Effigy whistle	1	8	0	1
Rattle ball	1	11	0	2
Sherd disc	1	12	2	2
Incensario	1	14	1	9
Pottery vessel (whole)	1	16	0	18
Candelero	1	19	0	1
Candelero	1	19	2	2
Obsidian blade	2	1	0	574
Obsidian flake	2	2	0	1,096
Obsidian core	2	3	0	12
Shaped obsidian artifact	2	4	0	9
Obsidian quarry nodules	2	6	0	11
Stone building material	3	1	0	1
Unclassified stone artifact	3	3	0	2
Mineral pigment	3	6	0	2
Green stone detritus	3	8	0	5
Soap stone detritus	3	9	0	2
Utilized stone cobbles	3	11	0	77
Pumice	3	12	0	268
Shaped mano	3	14	0	1
Shaped mano	3	14	1	2
Shaped mano	3	14	2	7
Shaped mano	3	14	4	1
Cylindrical mano	3	15	0	1
Misc. non-artifact detritus	3	19	0	738
Hammer stone	3	20	1	2
Abrading pebble	3	21	3	7
Polishing pebble	3	22	1	2
Shaped metate	3	23	0	13
Shaped metate	3	23	1	4
Shaped metate	3	23	2	2
Shaped metate	3	23	10	1
Rubbing platform	3	24	1	4
Rubbing platform	3	24	2	4

Table 6 (continued)

Artifact Name	Material Code	Item	Sub-Item	Frequency
Stone mortar	3	25	1	1
Digging stick weight	3	27	0	3
Stone club	3	29	3	6
Lime stone	3	32	0	13
Thin stone slab	3	35	0	10
Celt	3	36	0	1
Stone bead	3	37	1	2
Stone bead	3	37	2	1
Stone pendant	3	39	1	1
Basalt flake artifact	3	41	0	6
Chalcedony flake artifact	3	42	0	3
Shaft smoother	3	43	0	1
Stone pounder	3	48	0	2
Radiocarbon sample	4	1	0	10
Radiocarbon sample	4	1	1	2
Radiocarbon sample	4	2	0	2
Unclassified bone	5	0	0	3
Human bone	5	3	0	1
Human burial	5	5	0	82
Soil sample	7	1	1	8
Soil sample	7	1	2	1
Soil sample	7	1	3	1
Ecological specimen	9	1	0	2
Ecological specimen	9	8	0	1
Unidentified object	11	1	0	1
			TOTAL COUNT	19,498

(Complete artifact code can be found in Table 1 of Foreword.)

APPENDIX

APPENDIX 1

DESCRIPTION OF THE PROFILES

The following appendix describes the stratigraphic profiles presented at the end of this report. They were compiled from: (1) individual square profiles; (2) drawings of long trench walls after excavation and cleaning; and (3) exposed cuts into the mound made prior to our investigations. The latter were also cleaned before profiling and in a few cases were trimmed to present a vertical face.

Each of the resulting profiles was assigned a three-digit stratigraphic series number (eg., 100, 200, 300, etc.). The first digit identifies the profile and the last two digits the various soil strata shown in the profile. A widespread soil stratum may thus be identified by a different set of numbers in different profiles, and in such cases the various designations are correlated in the descriptions that follow below. A summary of the interrelationships are presented in Table 7. Stratum numbers within a stratigraphic series generally follow a consecutive order from top to bottom, but exceptions to this general rule will occasionally be found.

Five types of information concerning each stratum are presented:

(1) Soil Type: A brief descriptive title defining the stratum's composition and color.

(2) Thickness: The range of thickness observed for the stratum.

(3) Consistency: A Brief descriptive characterization of the stratum's compactness, friability, tenacity, hardness, etc.

(4) Artifact Density: A characterization of artifact density of the stratum relative to the highest and lowest observed in the mound. None of the densities observed during excavation were very high when compared to the refuse found in village sites in the Guatemala Valley. The terms sterile, virtually sterile, low, moderate, and high indicate densities of the following magnitudes:

Sterile: 0 artifacts/m^3
Virtually Sterile: 2 artifacts or less/m^3
Low: 3-9 artifacts/m^3
Moderate: 10-50 artifacts/m^3
High: 51 or more artifacts/m^3

(5) Remarks: Includes comments concerning relationships between strata, additional details of composition where pertinent, and clarifying statements deemed valuable to the discussion of the mound.

Table 7

Cross Correlation of Excavation Strata

Stratum Number	Structurally and Functionally Equivalent to	Grades Into (Structurally and Functionally Related to)	Fill Type Classification			
			Banded Arena	Block Fill	Clay	Other
101	201; 300					Weathered "A" Horizon
102	304; 307	106			x	
103A	202; 312		x			
B			x			
C	103A; 302		x			
D			x			
104A	104D; 205A-D; 308A; 508A-D	(Upper component basal ring structure)	x			
B	104E; 206; 308B; 509	(Intermediate component basal ring structure)	x			
C	104F; 207; 309; 404 (408; 409); 504	(Lower component basal ring structure)	x			
D	104A; 205A-D; 308A; 508A-D	(Upper component basal ring structure)	x			
E	104B; 206; 308B; 509	(Intermediate basal ring structure)	x			
F	104C; 207; 309; 404 (408; 409); 504	(Lower component basal ring structure)	x			
105		303	x			
106	302	102			x	
201	101; 300					Weathered "A" Horizon
202	103A; 312		x			
203A-E	302; 303?		x			
204A-D	303		x			

Table 7 (continued)

Stratum Number	Structurally and Functionally Equivalent to	Grades Into (Structurally and Functionally Related to)	Fill Type Classification			
			Banded Arena	Block Fill	Clay	Other
205A-D	104A; 104D; 308A; 508A-D	(Upper component basal ring structure)	x			
206	104B; 104E; 308B; 509	(Intermediate component basal ring structure)	x			
207	104C; 104F; 309; 404 (408; 409); 504	(Lower component basal ring structure)	x			
208	310A-C; 422; 507A-B; 522A-B					Premound Soil Horizon
300	101; 201					Weathered "A" Horizon
301					x	
302		103C; 203A-E	x			
303(303 A-B)		203A-E?; 204A-D; 105		x		
304	102				x	
305	304				x	
306				x		
307	102				x	
308A	104A; 104D; 205A-D; 508A-D	(Upper component basal ring structure)	x			
B	104B; 104E; 206; 509	(Intermediate component basal ring structure)	x			
309	104C; 104F; 207; 404 (408; 409); 504	(Lower component basal ring structure)	x			
310A-C	208; 422; 507A-B; 522A-B					Premound Soil Horizon

Table 7 (continued)

Stratum Number	Structurally and Functionally Equivalent to	Grades Into (Structurally and Functionally Related to)	Fill Type Classification			
			Banded Arena	Block Fill	Clay	Other
311						Premound Soil Horizon
312	103A; 202		x			
401						Artificially Redeposited Mound Fill
402A						Weathered "A" Horizon
402B						Wash off Mound
403	(Separates Phases 1 and 2 of Apron)				x[1]	
404	104C; 104F; 207; 309; 408; 409; 504	(Lower component basal ring structure)	x			
405	402B					Wash off Mound
406	402B; 405					Wash off Mound
407	403				x	
408	104C; 104F; 207; 309; 404; 409; 504	(Lower component basal ring structure)	x			
409	104C; 104F; 207; 309; 404; 408; 504	(Lower component basal ring structure)	x			
410	403; 510				x[2]	
411		(Phase 1b of apron)			x[2]	
412	413; 511				x	
413	412; 511				x	

Table 7 (continued)

Stratum Number	Structurally and Functionally Equivalent to	Grades Into (Structurally and Functionally Related to)	Fill Type Classification			
			Banded Arena	Block Fill	Clay	Other
414		(Phase 1c of apron)			x[2]	
415	407?				x[2]	
416		(Phase 1d of apron)			x[2]	
420	520	(Phase 1b of apron)			x[2]	
421	521	(Phase 1a of apron)			x[2]	
422	208; 310; 507A-B; 522A-B					Premound Soil Horizon
501						Artificially Redeposited Mound Fill
502A						Weathered "A" Horizon
502B					Wash off Mound & Natural Soil Accumulation	
503		(Post-Phase 2 plaza)			Probably Natural Soil Accumulation	
504	104C; 104F; 207; 309; 404 (408; 409)	(Lower component basal ring structure)	x			
505	(A component of 504)				x[2]	
506	104C; 206; a component of 504					Premound Soil Horizon
508A-D	104A; 104D; 205A-D; 308A	(Upper component basal ring structure)	x			

Table 7 (continued)

Stratum Number	Structurally and Functionally Equivalent to	Grades Into (Structurally and Functionally Related to)	Fill Type Classification			
			Banded Arena	Block Fill	Clay	Other
509	104B; 104E; 206; 308B	(Intermediate component basal ring structure)	x			
510	410				x[2]	
511	412; 413				x	
520	420	(Phase 2 of plaza)			x[2]	
521	421	(Phase 1 of plaza)			x[2]	
522	208; 310A-C; 422; 507A-B					Premound Soil Horizon

[1] Stratum 403 and its equivalents are composed of clay, crushed talpetate and arena with clay as the principal component. It is also fairly homogeneous in composition and differs from the clay components of the mound.

[2] These strata may all be classed as sandy clays because of their relatively high arena content; in contrast to clay strata incorporated as mound fill these strata are well puddled (and therefore more homogeneous) wet mixes and are associated with laminated functional surfaces.

100 Series Stratigraphic Profile

This profile (Fig. 10) was exposed during construction of a factory on the west side of the mound. Since it provided a complete cross-section only 4 or 5 meters to the west of the central north-south axis of the mound it presented the most valuable view of its construction prior to excavation.

Stratum 101

Soil Type - Topsoil: Black humus and dark brown sandy loam, with grass, brush and tree roots.
Thickness - 30-50 cm.
Consistency - Friable to firm.
Remarks -
(1) Where the topsoil was more than 30 cm deep, there was a marked decline in artifact density below that depth.
(2) After a cave-in of this profile, the stratum produced one collection of artifacts which may have been a trash dump, as there were only unmodified stones and worn body sherds. Exact provenience is unknown, but it came from near 53N, on the north slope of the mound.
(3) Stratum 101 is identical to 300.

Stratum 102

Soil Type - Dark brown clay with slightly oblique talpetate banding.
Thickness - 450-650 cm.
Consistency - Heavy and very tenacious.
Artifact Density - Virtually sterile.
Remarks -
(1) This was a major component of the mound's core; the sides of the stratum interdigited with those of the adjacent strata.
(2) Stratum 102 is structurally equivalent to and intergrades with 304 and 307; it also intergrades with 106.

Stratum 103A

Soil Type - Yellow arena matrix, horizontally banded with talpetate and brown sandy clay.
Thickness - 30-100 cm; thicker around the sides of the core (102)
Consistency - Arena bands very friable; clay and talpetate lenses firm.
Artifact Density - Virtually sterile.
Remarks - Stratum 103A is structurally and compositionally equivalent to 202 and 312.

Stratum 103B

Soil Type - Horizontal band of yellow arena.
Thickness - 15 cm (23.35-23.50 m AZEP).
Consistency - Very friable.
Artifact Density - Sterile.
Remarks - Stratum 103B extended from north edge of mound to clay core; not observed elsewhere.

Stratum 103C

Soil Type - Yellow arena with talpetate and clay lumps and lenses, horizontally banded.
Thickness - 40-250+ cm; average 100+ cm.
Consistency - Friable in predominantly arena portions; firm in predominantly clay and talpetate portions.
Artifact Density - Very low.
Remarks - Stratum 103B is structurally equivalent to and grades into 103A and 302.

Stratum 103D

Soil Type - Yellow arena more strongly banded with clay and talpetate than 103A.
Thickness - 0-250 cm.
Consistency - Friable to firm.
Artifact Density - Virtually sterile.
Remarks - Oblique banding slopes down towards the center of the mound.

Comment on Strata 103A-C

These three substrata are all very similar in composition and thus are grouped under a single stratum number. They also are very similar to Strata 104A, C, D, and F.

Stratum 104A

Soil Type - Yellow arena, conchoidally banded with lumps and lenses of clay and talpetate.
Thickness - 30-120 cm.
Consistency - Very friable, except for upper surface, firm.
Artifact Density - Sterile.
Remarks -
(1) The upper surface of Stratum 104A is covered with hard-packed layer of reddish arena in a clay matrix.
(2) Stratum 104A is structurally equivalent to and intergrades with 104D, 205A-D, 308A and 508A-D.

Stratum 104B

Soil Type - White arena, conchoidally banded with talpetate.
Thickness - 0-220 cm.
Consistency - Very friable, except for firm upper surface.
Artifact Density - Sterile.
Remarks -
(1) The upper surface of this stratum consists of hard-packed arena.
(2) Stratum 104B is structurally equivalent to and intergrades with 104E, 206, 308B, and 509.

Stratum 104C

Soil Type - Yellow arena, banded conchoidally with brown sandy clay.

Thickness - 106+ cm.
Consistency - Very friable, except for firm upper surface.
Artifact Density - Sterile.

Strata 104D, 104E, 104F

Soil Types - Arena conchoidally banded with talpetate.
Thickness - D (0-175 cm); E (0-150 cm); F (0-120+ cm).
Consistency - Very friable, except for the hard-packed upper surfaces.
Artifact Density - Virtually sterile to sterile.
Remarks -
(1) These three strata correspond to 104A, 104B, and 104C, respectively. The upper surface of 104D consisted of hard-packed dark arena; Strata 104D and 104E were separated by a thin layer of brown lumps and discontinuous lenses of brown clay. Strata 104E and 104F were separated by a layer of small talpetate lumps. These latter boundary layers were not as hard-packed as the one between 103C and 104D.
(2) See the Remarks sections of 104A, B, and C for comments concerning stratigraphic and structural relationships.

Stratum 105

Soil Type - White arena, with some bands of yellow arena and talpetate.
Thickness - 400 cm.
Consistency - Very friable.
Artifact Density - Virtually sterile.
Remarks -
(1) Included a lens of mottled brown clay and yellow arena near its base which was associated with Stratum 306.
(2) Stratum 105 intergrades with 303.

Stratum 106

Soil Type - Dark brown clay banded with talpetate lumps. Grades into Strata 102, 103, 302 and 304.
Thickness - 50-250 cm.
Consistency - Friable to firm.
Artifact Density - Virtually sterile.
Remarks -
(1) The oblique banding sloping downward toward center of mound.
(2) Stratum 106 contains less dark brown clay relative to talpetate than 102.
(3) Stratum 106 is structurally equivalent to and intergrades with 302; it also intergrades with 102.

Discussion

We were impressed with the overall bilateral symmetry of the mound as seen in this profile. It appeared that Strata 104A and 104D might have been connected beneath the present surface (now a dirt alley leading to the back of the factory to the west). To test this hypothesis, a small trench was excavated along the base of the exposed profile. It extended about 80 cm below the surface to the point where it could be clearly seen that the

northern and southern ridges met in a depression filled by Stratum 102, the brown clay core. Similarities between Strata 104A-C and 104D-F led us to postulate the ring base construction technique which was later tested and confirmed by excavations on the eastern periphery of the mound (see Stratigraphic Profiles: 300 and 500 Series).

200 Series Stratigraphic Profile

This profile (Fig. 11) shows the east face of the mound, which was gutted by a bulldozer a year or two prior to the Kaminaljuyu Project work at B-V-6. The profile includes the west wall of Unit 10, extending 4.7 meters below the bulldozer cut, to 17.28 m AZEP.

A 3.5 meter wide section of the gutted area was trimmed back about 1.4 meters and cut down 1.4-1.5 meters to get a larger vertical profile. This also helped to clarify the slope of the visible strata. On its north end, the basal stratum (204) of this cut exhibited very subtle complex banding, a characteristic of the profile as a whole. Also evident here is the concoidal pattern seen on the north and south perimeters of the 100 Series Stratigraphic Profile.

Stratum 201

Soil Type - Black topsoil, with grass and brush roots (same as 101).
Thickness - 30 cm.
Consistency - Friable to firm.
Artifact Density - Low by most standards but relatively high compared to other fill components.
Remarks -

(1) This stratum contained a small cache of five "donut stones" (DOTS 1-5) located near the north end of the bulldozer cut in Unit 15. They were all roughly circular, 12-15 cm in maximum diameter and 7-10 cm thick, with the holes having a minimum diameter of 3.5 cm. All had multiple, linear gadrooned depressions which were more or less symmetrically placed around the exterior. The stones were situated in a tight group about 30 cm below the surface of the mound. It is not unlikely that they were stashed there for periodic use during the Late Classic period.
(2) Stratum 201 is dispositionally equivalent to 101 and 300.

Stratum 202

Soil Type - Light brown arena with low clay content; faintly banded with clay.
Thickness - 155 cm.
Consistency - Friable to firm.
Artifact Density - Very low artifact density.
Remarks - This stratum corresponds structurally to Stratum 103A, but contained slightly less arena, and the banding was less obvious. It is also equivalent to 312.

Stratum 203

Soil Types - Five alternating and superimposed layers following in quick succession.
(a) Chunky brown sandy clay.
(b) Yellow arena with brown sandy clay.
(c) Light brown sandy clay.
(d) Yellow arena.
(e) Light brown sandy clay.
Consistency - Friable.
Artifact Density - Very low artifact density.
Remarks - Stratum 203A-E intergrades with 302 and possibly 303.

Stratum 204

Soil Types - This is another set of alternating and superimposed layers following in quick succession. All are virtually sterile.
(a) Small talpetate lumps in a yellow arena matrix; hard-packed.
(b) Brown sandy clay matrix, with discontinuous bands of yellow arena. A single rimshered (DOT 10) was taken from this substratum.
(c) Yellow arena and crushed talpetate.
(d) Chunky dark brown clay with talpetate lumps.
Thickness - 90-110 cm.
Consistency - Friable.
Artifact Density - Virtually sterile.
Remarks - Stratum 204A-D intergrades with 303.

Stratum 205

Soil Types - Four superimposed arena layers of slightly differing composition, constituting a third set of closely spaced substrata:
(a) Yellow arena.
(b) Brown arena, with brown sandy clay.
(c) White arena.
(d) Yellow arena.
Thickness - 30-40 cm.
Consistency - Very friable.
Artifact Density - Virtually sterile.
Remarks - Stratum 205A-D is structurally equivalent to and intergrades with 104A, 104D, 308A, and 508A-D. All of these strata constitute one component of the basal ring structure of the mound.

Comment on Strata 203-205

Although for purposes of profiling these strata (and their substrata) have been separately designated, they may better be thought of as collectively constituting a single fill type and as altered forms of Strata 302, 303 and 308A out of which they grade.

Stratum 206

Soil Type - White arena.
Thickness - 140 cm.

Consistency - Very friable.
Artifact Density - Virtually sterile.
Remarks - Stratum 206 is structurally equivalent to and intergrades with 104B, 104E, 308B and 509. Together they constitute one component of the mound's basal ring structure.

Stratum 207

Soil Type - Hard-packed talpetate lumps in an arena matrix.
Thickness - 90-100 cm.
Consistency - Extremely firm.
Artifact Density - Sterile.
Remarks - Stratum 207 is structurally equivalent to and intergrades with 104C, 104F, 309, 404 (408; 409) and 504. Together these strata constitute one component of the mound's basal ring structure.

Stratum 208

Soil Type - Dark brown sandy clay.
Thickness - 120+ cm.
Consistency - Very tenacious, heavy.
Artifact Density - Relatively high in the upper 30 cm; decreasing rapidly to sterile below that point.
Remarks -
(1) Burial 1 (Fig. 3) was found at 70-90 cm below the top of this stratum in the equivalent of 310C.
(2) The upper 20-30 cm of Stratum 208 corresponds to Stratum 310A, which also contained a relatively high density of artifacts.

300 Series Stratigraphic Profile

This profile (Fig. 12) incorporated a portion of the bulldozer cut into the east face of the mound and is a continuation of the 500 Series Profile. Together these two profiles offer an east-west cross-section of the plaza, apron and eastern half of the mound. Profile 300 took advantage of a westward-directed bulldozer cut to obtain a maximum of information with a minimum of earth moving. A modern pit, measuring 260 cm high x 250 cm wide x 113 cm deep, had been dug into the profile to obtain arena. It later became a refuse dump and contained some modern metal cooking utensils and skeletal portions of a dog and a rat.

On its west end the 300 Series Profile terminated in Unit 55 (Units 9 and 25) and on the east in Unit 10. The stratum numbers used for the profiling of Unit 55 continue with those assigned to the 300 Series profile.

Stratum 300

Soil Type - Topsoil; black loamy humus, containing grass and bush roots, grading into Stratum 301.
Thickness - 30 cm.
Consistency - Firm to tenacious.
Artifact Density - Relatively high.

Remarks -
(1) This soil layer is structurally equivalent to the upper 30 cm of Strata 101 and 201.
(2) Burial 2 was found in this stratum on the mound's summit in Units 3 and 4.

Stratum 301

Soil Type - Dark brown chunky clay.
Thickness - 130-180 cm.
Consistency - Firm, tenacious.
Artifact Density - Very low.
Remarks -
(1) This was a large clay block occupying the center of the mound summit. It was surrounded on the east, south and west (and also underlain) by Stratum 302. On the north it desolved into a layer of talpetate blocks in a matrix of dark brown chunky clay.
(2) A very thin yellow arena band rises from the lower east corner of the stratum to the center, where it lenses out. This band probably represents a temporary working surface from which basket loads of arena fill were deposited around Stratum 301.

Stratum 302

Soil Type - Banded yellow arena and talpetate lumps.
Thickness - 120-250 cm.
Consistency - Friable.
Artifact Density - Virtually sterile.
Remarks -
(1) This stratum was laid below and around the sides of Stratum 301.
(2) Banding was horizontal in the center, and sloped upward on the sides.
(3) Stratum 302 is structurally equivalent to and intergrades with 106; it also intergrades with 102 and 203A-E.

Stratum 302A

Soil Type - A white arena lens within Stratum 302; several other white arena lenses were observed within this stratum, but because of their very small size and areal extent they were not recorded on the profile drawing.
Thickness - 0-45 cm.
Consistency - Friable, but compact.
Artifact Density - Sterile.

Stratum 303

Soil Type - White arena with minor inclusions of talpetate and scattered small clay lumps.
Thickness - 180-350 cm.
Consistency - Very friable.
Artifact Density - Sterile.
Remarks -
(1) Corresponds to Stratum 103B.

(2) A wall-like cluster of talpetate and clay chunks (306) was found at the base of the stratum.

Stratum 303A

Soil Type - Uneven mixture of white arena, talpetate, and clay lumps with little visible banding.
Thickness - ca. 50-140 cm.
Consistency - Friable.
Artifact Density - Very low.
Remarks - This substratum is a minor variation on the theme of 303.

Stratum 303B

Soil Type - Large talpetate and clay lumps, with little banding evident, in a white arena matrix.
Thickness - ca. 30-60 cm.
Consistency - Firm.
Artifact Density - Virtually sterile.

Comment on Strata 303, 303A and 303B

(1) Stratum 303 grades very gradually into 303A and 303B. All three substrata contain white arena as the basic matrix. Although they are virtually indistinguishable in the west wall of Unit 9, differences become more pronounced on the east end of the 300 Series Profile (just to the west of Unit 10).
(2) In thickness, Strata 303, 303A and 303B collectively measure 160-360 cm.
(3) These substrata intergrade with 204A-D and possibly with 203A-E.

Stratum 304

Soil Type - Mottled dark brown chunky clay in light brown sandy clay matrix.
Thickness - 100-280 cm.
Consistency - Firm.
Artifact Density - Very low.
Remarks - Stratum 304 intergrades with 102.

Stratum 305 (= Stratum 304)

These were two portions of basically the same stratum, as seen in the profile of Unit 55 (Fig. 13). Stratum 305 was distinguished primarily by the inclusion of a greater quantity of talpetate.

Stratum 306

This stratum number was assigned to an elongated cluster of amorphous clay and talpetate blocks at the base of Stratum 303 (west wall and southwest corner of Unit 9). During excavation the regularity of their distribution at first led us to believe that they may have been a special constructional feature--perhaps a small temporary retaining wall. The blocks were aligned north-south, then turned east at 41N/69.5W (at the west end of Profile 300). There were no artifacts associated with the feature. In retrospect, Stratum

306 perhaps can best be thought of as an extension of the same basic materials included in Strata 304, 305 and 307, all of which are situated adjacent to Stratum 306.

Unit 55 Profile Sequence (Figure 13)

The upper strata of this excavation unit (300-306) have been described under the 300 Series Profile (Fig. 12). This unit was begun as a 2 x 4 meter pit (Unit 9) with the intention of expanding its dimensions as it went deeper. As time went on the upper dimensions were enlarged to 4 x 4 meters by the addition of Unit 25, and the entire excavation was redesignated Unit 55 beginning with Strata 307 and 308. With two exceptions artifacts occurred in extremely low densities throughout the excavation of this unit: only Strata 300 and 310A produce a relatively high density of artifactual materials. During excavation of Unit 55 deterioration of the upper portions of the side walls under wind and rain made it necessary to remove certain sections before they could be properly profiled. In order to "fill-in" the missing portions of the wall profiles, cross-sectional views of the cut-back portions of the walls have been inserted. Two such areas can be seen on the profile: (1) the upper portion of the north wall was cut back 200 cm (as Unit 4); and (2) the top of the south wall was cut back 120 cm (as Unit 56). In addition, the upper portion of the south half of the east wall was lost to the bulldozer prior to excavation.

Stratum 307

Soil Type - Dark brown clay with light-brown arena banding.
Thickness - 40-125 cm.
Consistency - Dense and heavy; very tenacious.
Artifact Density - Low to moderate, including one isolated Usulutan brown ware sherd with negative black painting and one piece of wood charcoal.
Remarks -

(1) Only the topsoil (Stratum 300) and Stratum 310A had a greater density of cultural debris than 307.
(2) Stratum 307 is structurally equivalent to and intergrades with the basal portion of 102.

Comment on Strata 304, 305 and 307

These strata have one basic feature in common: they all contain dark brown clay as the dominant component. Stratum 304 has the highest clay content, while the other strata include a greater proportion of talpetate and arena. Thus all can be thought of as variations within a single basic fill type.

In the 100 Series Stratigraphic Profile Strata 304 and 307 correspond to Stratum 102. Here no distinction is shown between the two (304 and 307), and both are shaded with the legend key (large dots) used for Stratum 307.

Stratum 308A

Soil Type - Dark arena mixed with clay, grading to lighter arena at the base.
Thickness - 20-140 cm.

Consistency - Very friable.
Artifact Density - Very low.
Remarks -
(1) Portions of Stratum 308A interdigited with those of adjacent strata, 307 and 309. The lowest point of the stratum occurs in the northwest corner of Unit 55, and the entire deposit appeared to slope in that direction.
(2) Stratum 308A is structurally equivalent to and intergrades with 104A 104D, 205A-D, and 508A-D.

Stratum 308B

Soil Type - White arena with lumps of clay.
Thickness - 50-80 cm.
Consistency - Very friable.
Artifact Density - Very low.
Remarks -
(1) Stratum 308B is structurally equivalent to and intergrades with 104B, 104E, 206, and 509.
(2) Stratum 308B appears to intergrade with 308A in which the predominant variety of arena is yellow in color. Thus, the clear division that occurs elsewhere between the upper (most recent) and the intermediate components of the mound's basal ring structure, is blurred in Unit 55.

Stratum 309

Soil Type - Mixture of crushed talpetate, brown clay and arena, with a few small kaolinite inclusions.
Thickness - 75-200 cm.
Consistency - Even textured, moderately friable.
Artifact Density - Very low generally; the tunnel yielded one small piece of worked jadeite.
Remarks -
(1) A tunnel was begun in the northeast corner of the pit to explore the hearths discovered in Stratum 310B, but cave-ins forced termination after 50 cm.
(2) Stratum 309 is structurally equivalent to and intergrades with 104C, 104F, 207, 404 (408; 409), and 504.
(3) Kaolinite inclusions created small water pockets in the stratum.
(4) A cache of 25 obsidian blade and flake tools was found at the base of the stratum. The tools all showed use chippage along their edges. They were found on two contiguous, irregular talpetate chunks measuring 15-20 cm in diameter and 6-8 cm thick. No ceramics were associated with the obsidian. The talpetate chunks appeared to be sitting on the charred surface of Stratum 310A.

Stratum 310 (310A, 310B, 310C)

Soil Types - A, dark brown sandy clay; B, dark brown clay; C, dark brown sandy clay.
Thickness - A (25-30 cm); B (40 cm); C (65-75 cm).
Consistency - All three were very tenacious, but A and C were slightly more friable than B.

Artifact Density -

310A. Two small fired areas and a very thin layer of charred earth and ash covered the entire pit area. An obsidian cache was resting on top of 310A, but it appeared to be unburned. Artifact density was overall the highest observed in any of the excavations in the mound.

310B. Artifact density decreased rapidly to zero with depth. A series of four superimposed hearths was found in the northeast corner of the pit, sloping down towards the corner (cf. Fig. 1). No significant artifact associations were observed.

310C. Artifactually sterile, but the remains of three possible post molds or old rodent burrows were present near the northeast corner.

Remarks -

(1) In Stratum 310C a series of superimposed hearths was found in the northeast corner of Unit 55 (tunnel area; see Fig. 2). The highest of these contained a lens of black ash 45-50 cm in diameter and 15 cm thick. The hearths and ash were culturally sterile.

(2) Stratum 310(A-C) is structurally equivalent to 208, 422 and 522(A-B). All of these strata predate construction of the mound, apron and plaza.

(3) Unit 55 was reduced to 1.5 meters square in Stratum 310C and was continued down 150 cm through Substrata 310D-F into a deposit of natural talpetate (Stratum 311).

Strata 310D, 310E, 310F

Soil Types - Horizontally undulating bands of: D, brown sandy clay; E, dark brown clay; F, brown sandy clay.
Total Thickness - 40-65 cm.
Consistency - D and F moderately friable; E firm, tenacious.
Artifact Density - Sterile.
Remarks - This smaller "test pit" in the center of Unit 55 was continued down to determine the depth of Stratum 310.

Stratum 311

Soil Type - Mottled pale green talpetate with thin, undulating bands of a reddish-brown rust-like material.
Thickness - More than 60 cm.
Consistency - Firm to very hard.
Artifact Density - Sterile.

Stratum 312

Soil Type - Yellow arena matrix, horizontally banded with talpetate and brown sandy clay.
Thickness - 0-140 cm; average thickness is about 100 cm.
Consistency - Arena bands very friable; clay and talpetate lenses firm.
Artifact Density - Virtually sterile to low.
Remarks - Stratum 312 is structurally and compositionally equivalent to 103A.

400 Series Stratigraphic Profile

This profile (Fig. 14) was compiled from excavation units laying adjacent to Grid Line 43W, including from south to north: 35, 34, 33, 32, 5, 17, 26, 16, 28, 19, 20 and 22. These units, along with several others (18, 29, 30, 31, 41, 36, 27, and 59), were excavated to investigate the relationship of the apron to the mound proper, including areal extent, construction sequence and techniques, dating, and function.

In addition to this north-south cross-section of the apron, two other cross-sectional views are also provided (both oriented east-west). One of these (along Grid Line 41N) constitutes part of the 500 Series Stratigraphic Profile (Fig. 15). The other (Fig. 6) is only a partial cross-sectional view along Grid Line 45N and was prepared from drawings of the north wall of Unit 29 and the south walls of Units 16, 30 and 31.

These three profiles show all of the important structural details discovered during excavation and serve as the basis for all discussion of the apron.

Stratum 401

Soil Type - Mixed overburden from mound fill; primarily arena.
Thickness - 15-100 cm; greatest near the mound/apron juncture and progressively thinner as the distance from the mound increases.
Consistency - Very friable.
Artifact Density - Generally low.
Remarks - This stratum constitutes mound fill which has been recently redeposited by bulldozing.

Stratum 402A, 402B

Soil Types - A, topsoil, black humus; grades into 402B. B, dark brown loam.
Thickness - A (20-30 cm); B (0-30 cm).
Consistency - Soft.
Artifact Density - High in 402A; low in 402B.
Remarks -

(1) Stratum 402 (A and B) represents a natural accumulation of soil which has washed off the mound during the period of time since it went into disuse. These substrata are equivalent to the "A" and "B" horizons, respectively, found elsewhere in the Colonia El Mirador mound complex. In the apron area of B-V-6 these soil horizons have recently been buried by the bulldozing of portions of the mound (Stratum 401).
(2) The differential distribution of artifact density found in the substrata apparently relates to reuse of the mound during the mid-Late Classic period, by which time a substantial soil layer had already accumulated over the original apron surface.
(3) Stratum 402 (A and B) directly overlies the latest functional surface of the mound apron.

Stratum 403

Soil Type - Brown sandy clay with talpetate lumps; high clay content.

Thickness - 12-80 cm.
Consistency - Firm; variably textured, even to lumpy.
Artifact Density - Low.
Remarks -

(1) This stratum ended abruptly in Unit 20 where a specially prepared, puddled mix (Stratum 407), associated with the recessed northeast corner of the apron, was laid up against Stratum 403.
(2) Stratum 403 was surfaced with a laminated weather-resistent material consisting of alternating layers of (a) puddled arena, clay, and talpetate; and (b) clay. In general, the lamination sequence involved only three layers, one of clay only.
(3) Only traces of the laminations originally included in the surfacing material have survived the weathering effects of time. Areas where they are still preserved are those that were artificially or naturally well buried before the elements could take their toll. The fact that in most cases we were able to ascertain their original location (on the basis of soil characteristics alone) is sufficient testimony to the durability of this material, even under adverse conditions.
(4) Stratum 403 was the most extensive and voluminous soil zone encountered during excavation of the apron and everywhere separated Phases 1 and 2 of the apron construction sequence and served as the fill for Phase 2.

Stratum 404

Soil Type - White or yellow arena mixed with small lumps of talpetate and clay.
Thickness -
Consistency - Friable to firm, dependong in talpetate and clay lump density.
Artifact Density - Generally very low; a few pockets of artifactual debris were found at the junction of 404 and Phase 1 functional surface (which directly overlies 404).
Remarks -

(1) Stratum 404 is equivalent to 408 and 409 in terms of its stratigraphic relationship to Phase 1a of the apron construction sequence. All three strata constitute arena fill components which in the 500 Series Profile have been designated Stratum 504. The proliferation of stratum numbers in the case of the 400 Series Profile was the result of early excavations in the apron area at widely separated points before the stratigraphic sequence was completely understood.
(2) Stratum 404 is structurally equivalent to and intergrades with Strata 104C, 104F, 207, 309 and 504.
(3) In the mound apron area, Stratum 404 directly underlies Phase 1a functional surface. Like the others which followed it, this surface was laminated with alternating layers of (a) puddled arena/clay/talpetate and (b) clay, generally in an (a)/(b)/(a) sequence of three layers.

Stratum 405

Soil Type - Yellowish brown loam.
Thickness - 20-25 cm.
Consistency - Friable.

Artifact Density - Low.
Remarks -
(1) This stratum number was assigned to a substratum (later redesignated 402B) resting on Phase 2 of the apron construction in Excavation Units 20, 22, 27, 36, and 41 (all located adjacent to the northeast recessed corner of the apron).
(2) The original distinction was based on its yellowish, as opposed to dark brown, color which resulted from the inclusion of a greater amount of talpetate than occurred elsewhere in 402B.

Stratum 406

Soil Type - Yellowish brown sandy clay.
Thickness - 20-25 cm.
Consistency - Firm.
Artifact Density - Low.
Remarks -
(1) Stratum 406 was distinguished from 405 primarily by a suble textural difference; both were identical in color and other properties. It is possible that the distinction is an arbitrary one and that the two strata are really portions of the same depositional unit. If the distinction is valid 406 may represent an extension of the apron to the north.
(2) Stratum 406 was found only in Unit 22, where it overlies the Phase 2 functional surface of the northeast recessed corner of the apron.
(3) DOT 91, a diagnostic sherd, was taken from this stratum.

Stratum 407

Soil Type - Yellowish brown sandy clay.
Thickness - 20-50 cm.
Consistency - Firm.
Artifact Density - Low.
Remarks -
(1) Stratum 407 constitutes the fill for the Phase 2 functional surface forming the northeast recessed corner of the apron. It represents a structural extension of Stratum 403 both to the east and to the north in Units 20 and 22.
(2) Stratum 407 is very similar to both 405 and 406. The functional surface covering 407 (Phase 2) lacked the laminations found elsewhere and was detected as a very fine sandy-textured surfacing of the coarser fill. This fine sandy material is probably all that remains of the initial arena/clay/talpetate lamination that covered Stratum 407 in a three-lamination sequence. When tapped with the blade or wooden handle of a butcher knife a hollow sound resulted which was not duplicated by arbitrarily digging risers and treads in the 407 fill; apparently only laminated surfaces yield a hollow sound when tapped, since they are harder and more compact relative to the fill underlying them.

Stratum 408

Soil Type - Yellow and white arena with lumps of talpetate and clay.

Thickness - 140-160 cm.
Consistency - Friable.
Artifact Density - Very low.
Remarks -
(1) Stratum 408 is equivalent to 504 and underlies Phase 1a of the mound apron construction sequence.
(2) Stratum 408 includes 404 and 409, which also are equivalent to Stratum 504, and is structurally equivalent to 104C, 104F, 207, 309, and 504.

Stratum 409

Soil Type - Yellow and white arena.
Thickness - 40-100 cm.
Consistency - Friable and well-packed.
Artifact Density - Virtually sterile.
Remarks - Stratum 409 is structurally equivalent to Strata 104C, 104F, 207, 309, 404, 408 and 504, all of which underly Phase 1a of the mound apron construction sequence.

Stratum 410

Soil Type - White arena in a brown clay and talpetate matrix.
Thickness - 5-30 cm.
Consistency - Very firm and tenacious; well-puddled.
Artifact Density - Sterile.
Remarks -
(1) This stratum appears to be a more thoroughly puddled version of Stratum 403, having both a higher clay and arena content. It is both harder and more tenacious than 403 and seems to be restricted in distribution to the trough area of the apron. Its hardness and tenacity make it particularly impervious to water.
(2) Like Stratum 403, Stratum 410 also separates the functional surfaces of Phases 1 and 2 of the mound apron.
(3) Stratum 410 is structurally equivalent to 403 and 510.

Stratum 411

Soil Type - Brown sandy clay.
Thickness - 5-15 cm.
Consistency - Homogeneous and fine textured; firm.
Artifact Density - Very low, sterile.
Remarks -
(1) Stratum 411 was found only in Units 22 and 59 and represents the minor addition of a small step or terrace with a 10 cm riser and 115 cm tread to the recessed northeast corner of the apron.
(2) Stratum 411 was surfaced in the same tri-lamination manner observed elsewhere. The laminations were unusually well preserved here and offered a good opportunity for investigating their composition.
(3) The addition of Stratum 411 and its associated functional surface constitutes Phase 1b of the mound apron construction sequence.

Stratum 412

Soil Type - Chunky tenacious clay and arena.
Thickness - 5-20 cm.
Consistency - Tough; tenacious.
Artifact Density - Generally almost sterile; a small trash dump of potsherds and obsidian was found in this stratum in Unit 22.
Remarks -
(1) Stratum 412 served as a subflooring foundation for the laminated functional surface of Phase 1a of the mound apron. It served also to bind the surface to the underlying stratum of arena (408).
(2) Stratum 412 was used as a stratum designation only in Units 20, 22 and 36. A similar material was found beneath the Phase 1a functional surface in Units 5 and 7 (Stratum 511) and Unit 18 (Stratum 413).

Stratum 413

Soil Type - Tenacious brown clay.
Thickness - 20 cm.
Consistency - Very firm, compact and tenacious.
Artifact Density - Sterile.
Remarks - This stratum is identical to 511 in Units 5 and 7, and it is very similar to 412 in Units 20 and 22.

Stratum 414

Soil Type - Brown sandy clay.
Thickness - 10-15 cm.
Consistency - Firm and homogeneous.
Artifact Density - Sterile.
Remarks -
(1) Stratum 414 was capped with a laminated surface of the usual kind. It represents an extension of the small terrace or step (Stratum 411) formed during Phase 1b of the apron construction sequence.
(2) This extension (414), designated Phase 1c, continues through the north and east walls of Unit 22. It is very unlikely that Phase 1c extends beyond the northern most perimeter of the upper tier of the Phase 1 apron (to the northwest of Unit 27), ie., beyond the 61N Grid Line. But unfortunately its exact location remains uncertain, and the best that can be said is that it probably lies between Grid Lines 57N and 61N.

Stratum 415

Soil Type - Yellowish-brown sandy clay.
Thickness - 20 cm.
Consistency - Firm and compact.
Artifact Density - Virtually sterile.
Remarks -
(1) This stratum is very similar to 407 and the distinction may be fortuitous. Stratum 415 appeared to be slightly more compact than 407 and may possibly represent an extension of Stratum 416 (Phase 1d of the apron construction sequence). No supporting evidence, other

than that already cited, could be found for 415 having been a functional component of the apron.
(2) Stratum 415 was found only in Unit 22.

Stratum 416

Soil Type - Brown sandy clay.
Thickness - 18-22 cm.
Consistency - Firm, compact and relatively fine textured.
Artifact Density - Virtually sterile.
Remarks - Stratum 416 represents a small extension of the upper portion (second tier) of the Phase 1b/c apron and was found only in Unit 22. Although originally capped with the usual laminated surfacing material, only portions of the first (arena/clay/talpetate) lamination were found. As in other cases of poor preservation, tapping the surface with the blade or handle of a butcher knife produced a hollow sound which is characteristic only of laminated surfaces.

(Strata 417-419 were not used)

Stratum 420

Soil Type - Dark brown clay with talpetate lumps.
Thickness - 7-25 cm.
Consistency - Tough, tenacious.
Artifact Density - Sterile.
Remarks -
(1) Stratum 420 constitutes the filler and bonding material between the functional surfaces of Phases 1a and 1e of the apron construction sequence. It was found only in Units 33, 34 and 35. Plase 1e of the apron is the functional surface which covers Stratum 420.
(2) Stratum 420 is very similar to 403, which also has a high clay content, and together with its associated functional surface (Phase 1b), appears to have constituted a minor repair of Phase 1a involving resurfacing of the southern portion of the apron adjacent to its juncture with the mound.
(3) The Phase 1b functional surface did not appear to be laminated in the manner found elsewhere, but consisted of coarse arena puddled throughly with clay and talpetate, forming a very hard and durable coating.

Stratum 421

Soil Type - Chunky brown clay.
Thickness - 5-15 cm.
Consistency - Firm and tenacious.
Artifact Density - Virtually sterile.
Remarks -
(1) Together with its associated functional surfacing Stratum 421 constitutes the earliest construction phase (Phase 1a) of the apron's south side.
(2) Stratum 421 serves primarily as a bonding material and foundation for the functional surface and underlying arena (Stratum 408).

Nowhere in the units excavated in the southern portion of the apron (33, 34 and 35) was 421 found to be more than a few centimeters in thickness, which stands in contrast to other areas (Units 5, 7, 18, 20, 22, and 36) where similar materials (Strata 511, 410, 413 and 412) ranged up to 20 or more centimeters.

(3) The functional surfacing associated with 421 had the same composition as that capping Stratum 420: coarse arena puddled thoroughly with clay and talpetate, producing a very hard and durable surface. Although it may originally have been laminated, individual laminae could not be clearly discerned in cross-section.

Stratum 422

Soil Type - Dark brown clay.
Thickness - More than 100 cm.
Consistency - Firm, heavy and somewhat tenacious.
Artifact Density - Low (sterile in the miniscule portion sampled in Unit 35).
Remarks -

(1) Stratum 422 is identical to 522 (presumably 522A, since it constitutes the upper portion of the stratum).

(2) Stratum 422 represents the original submound soil horizon. Elevations taken at various locations indicate that this soil layer slopes very gently downward toward the west, dropping 80-90 cm over a distance of about 40 meters.

500 Series Stratigraphic Profile

This profile (Fig. 15) is an eastward extension of Profile 300; the two describe a single segmented trench 65 meters long from the center of the mound to the north-south base line of the Mirador excavations (cf. plan, Fig. 1). It shows the articulation of the mound with the surrounding plaza surfaces along Grid Line 41 North.

Stratum 501

Soil Type - Overburden: mixture of topsoil with large amounts of yellow arena, and light brown sandy clay.
Thickness - Varying, 0-120 cm, generally 40-50 cm.
Consistency - Very friable (probably due to high arena content).
Artifact Density - Moderate.
Remarks - Distrubed mound fill mixed with topsoil and redeposited by bulldozer.

Stratum 502A

Soil Type - Topsoil; black humus with grass and brush roots.
Thickness - 30 cm near mound; 10-15 cm in plaza.
Consistency - Soft.
Artifact Density - Very high.
Remarks - 520A grades almost imperceptably into 502B.

Stratum 502B

Soil Type - Dark brown grading to brown sandy clay subsoil.
Thickness - 20-40 cm.
Consistency - Firm.
Artifact Density - Moderate to low.
Remarks -

(1) A number of square (80 x 80 cm) pits filled with almost sterile humus were found extending 80 cm below the present land surface (through Stratum 502A into 502B). These were apparently located at regular intervals around the field and always occurred below small hillocks. It is believed that they were dug to receive small trees (which never materialized) and were subsequently refilled.
(2) Stratum 502B was very difficult to distinguish from Stratum 503. It differs from the latter in being coarser and just a little more friable. In other characteristics the two are essentially identical.

Stratum 503

Soil Type - Brown sandy clay.
Thickness - 20-60 cm; its greatest depth occurred farthest from the mound at about the North-South Baseline of the Mirador excavations.
Consistency - Friable to firm.
Artifact Density - Normally low, except for a heavy concentration of obsidian in Unit 37.
Remarks -

(1) Stratum 503 was separated from 520 by a laminated functional surface, portions of which were found in Squares 37, 38 and 39. Although badly weathered in some areas and eroded away in others, some fairly well preserved sections provided us with clear information concerning its construction. The surface consisted of alternating thin layers of crushed talpetate and arena, then clay, then another layer of crushed talpetate and arena. A minimum of three such sequential layers define the functional surface, but in general additional alternating laminations were observed (up to eight or more laminations were found in Square 60). Together, they formed a hard, thin paving which was resistent to weathering. A footing consisting of fine, homogeneous brown sandy clay (Strata 520 and 521) were specially prepared for the laminated functional surface.
(2) Square 37 yielded 62 pieces of worked obsidian, over half of which were blade tools. They may be remains of a possible workshop in the vicinity, but redeposition cannot be ruled out.
(3) Stratum 503 appears to have been deposited to bring the plaza level up to that of the easternmost leading edge of the mound apron (in effect, eliminating the apron as a discrete functional component). Although preliminary ceramic analysis of sherds and burial offerings (see discussion of Burials 3 and 4) indicates a Classic date for the stratum, it may well date from an earlier period. No humus zone equivalent to a buried "A" horizon was observed between Stratum 503 and functional surface separating it from Stratum 520, suggesting that no great amount of time elapsed between construction of the functional surface and deposition of Stratum 503.

Stratum 504

Soil Type - Light yellow arena with talpetate lumps, conchoidally banded with discontinuous lenses of dark brown clay and talpetate.
Thickness - 70-160 cm.
Consistency - Arena, very friable; clay and talpetate lenses firm.
Artifact Density - Very low.
Remarks -
(1) Stratum 504 grades into 207 (which has a higher talpetate lump content than 504). Stratum 504 also grades into 104C, 104F, 309 and 404.
(2) As one moves toward the center of the mound from its periphery (east to west), the talpetate content of Stratum 504 appears to increase considerably and then decrease somewhat, so that by Unit 10 (Stratum 207) it is quite high relative to the arena, but by Unit 55 it has decreased again and forms a very homogeneous mixture with brown clay in addition to the arena (Stratum 309). Stratum 404 (including 408 and 409) is more similar to the peripheral component of Stratum 504, in that its principal component is arena.

Stratum 505

Soil Type - Mottled brown clay (dark and light colored) with talpetate lumps.
Thickness - 20-100 cm.
Consistency - Firm, heavy.
Artifact Density - Very few artifacts.

Stratum 506

This stratum number was utilized to designate material later incorporated as a substratum of 504; it is a little more homogeneous than Stratum 504 and appears as a separate stratum in Units 1 and 2 where it is separated from 504 by a lens of mottled brown sandy clay (Stratum 505).

Stratum 507A and 507B

Soil Type - Dark brown clay.
Thickness - More than 180 cm; 507A was the upper 30 cm.
Consistency - Firm, tenacious.
Artifact Density - 507A had a high artifact density; 507B was almost sterile.
Remarks - Stratum 507A is equivalent to 310A and constitutes the artifact bearing zone (generally the upper 30-50 cm) of the natural brown sandy clay submound soil layer. Stratum 507B is sterile below a depth of 75 cm but is compositionally identical to 507A. 507 (A and B) are also structurally equivalent to 208, 422 and 522A and B.

Stratum 508

Soil Types - Four superimposed layers of slightly differing composition, constituting a set of closely spaced banded fill substrata:
(a) Yellow arena.
(b) Brown arena, with brown sandy clay.
(c) White arena.

(d) Yellow arena.
Thickness - 30-40 cm.
Consistency - Very friable.
Artifact Density - Virtually sterile.
Remarks -
(1) These substrata are identical to those of Stratum 205 and appear on the north wall of Unit 10, while those of 205 appear on the west wall. See also remarks under Stratum 205.
(2) Stratum 508A-D is structurally equivalent to Strata 104A, 104D, 205A-D and 308A. These strata constitute portions of the upper component of the mound's basal ring structure.

Stratum 509

Soil Type - White arena.
Thickness - 87-130+ cm.
Consistency - Friable, but closely packed.
Artifact Density - Sterile.
Remarks - This stratum is structurally equivalent to and intergrades with 104B, 104E, 206, and 308B. These strata constitute portions of the intermediate component of the mound's basal ring structure.

Stratum 510

Soil Type - Homogeneous dark brown sandy clay with a high white arena content.
Thickness - 5-20 cm.
Consistency - Hard, tightly packed.
Artifact Density - Virtually sterile.
Remarks -
(1) This stratum appears to have been specially prepared to serve as a footing for the laminated functional surface directly overlying it.
(2) It also appears to be very limited in distribution, occurring only in the Unit 5/7 area beneath the functional surface of Phase 2 of the apron construction sequence.
(3) Stratum 510 is structurally and compositionally equivalent to 410.

Stratum 511

Soil Type - Tenacious brown clay.
Thickness - 5-50 cm.
Consistency - Very firm, compact and tenacious.
Artifact Density - Sterile.
Remarks - Stratum 511 directly underlies Phase 1a functional surface in Units 5 and 7, where it acts as both a foundation and binder for the surface and underlying arena (Stratum 504). A similar material was found underlying Phase 1a functional surface and providing the same function in Units 20 and 22 (Stratum 412). Almost everywhere that the Phase 1a surface has been cut through a layer of clay varying from 1 to as much as 20 cm has been observed. Stratum 511 is identical to 413 in Unit 18.

(Strata Numbers 512-519 were not used)

Stratum 520

Soil Type - Light brown sandy clay.
Thickness - 0-50 cm.
Consistency - Firm, well packed.
Artifact Density - Low.
Remarks -
(1) See Remark No. 1 under Stratum 503.
(2) Stratum 520 appears to have been part of a repair of an earlier functional surface separating 520 and 521. This surface was prepared in the same manner as that separating 503 and 520 and seems to have been the original plaza level to the east of B-V-6. Stratum 520 extended the mound apron 3.0 meters and continued eastward, lensing out between Units 38 and 39. The result was an apron with only one step, instead of two, and about one-quarter more area (ca., 300 vs. 390 m^2).
(3) Strata 520 and 521 are essentially identical in composition. Both served as footings for laminated functional surfaces.

Stratum 521

Soil Type - Light brown sandy clay.
Thickness - 30 cm.
Consistency - Firm, well packed.
Artifact Density - Low.
Remarks -
(1) See Remarks No. 2 and 3 under Stratum 520.
(2) Stratum 521 directly overlies the natural brown sandy clay substratum underlying the mound (Strata 522, 422, and 310). There was no apparent humus development between the two strata. Presumably Stratum 522 at one time had a grass cover, but the "A" horizon associated with it either was altered by natural agencies (after being buried by Stratum 521) so as to be indistinguishable from Stratum 522 (as seen today); or was removed prior to the deposition of Stratum 521. The latter alternative seems more likely.
(3) Stratum 521 was specially prepared to serve as a footing for the laminated functional surface applied to it.

Stratum 522

Soil Type - Dark brown clay.
Thickness - 25-50 cm.
Consistency - Firm, heavy and somewhat tenacious.
Artifact Density - Light to moderate.
Remarks - In terms of soil composition, this stratum is in no way different from 522B. The sole distinction between the two is artifact content: Stratum 522A represents the principle (if not exclusive) artifact bearing component of Stratum 522 and includes the upper 35-50 cm of the stratum. Below 50 cm artifact density drops off rapidly to zero by 75 cm, so that Stratum 522B is virtually sterile and for practical purposes is considered culturally barren.

Stratum 522B

Identical to 522A, but artifactually sterile. Stratum 522 is the natural substratum which underlies the mound.

Discussion

This profile together with Profile 300 provides a good cross-sectional view of Mound B-V-6, the apron on its east side, and the plaza with which the apron articulates. Clearly evident is the basal ring support feature (Strata 504, 509 and 508) which replicates the stratigraphic sequence seen in Strata 104C/F, 104B/E and 104A/D, respectively, in Profile 100.

More important, however, is the confirmation of the apron and plaza features which in the past had only been hypothesized for this and a few other mounds (eg., B-V-3 and C-III-7) of the Late Formative period (Providencia phase) at Kaminaljuyu. The excavation of B-V-6 demonstrates conclusively that not only were mounds laid out in formal arrangements, they were also equipped with special architectural features (aprons and perhaps other appendages). Moreover, plazas were formally constructed as well as planned. These properties have obvious implications for occupational specialization and level of social organization.

One further point remains to be mentioned: use of the laminated functional surfacing technique has now been demonstrated to have a greater antiquity than previously suspected. Its use apparently began during the Providencia phase and later became the principal technique of the Terminal Formative period.

600 Series Stratigraphic Profile

The 600 Series Profile was partially exposed by excavation (Units 3, 14, 24, 23) and, at the end of the field season, by bulldozing. At that time photographs of the entire cross-section were taken and a composite of these photos is presented in Plate 2a. This plate together with Plate 2b offers the clearest view of the mound's construction. Strata definitions are as follows:

Stratum 600

Sandy loam topsoil, grading into Stratum 601 below. Equivalent to Stratum 300.

Stratum 601

Banded arena, including blocks of clay and talpetate towards the base of the stratum. Equivalent to Stratum 312.

Stratum 602

Lumpy chocolate clay with blocks of talpetate. Equivalent to Stratum 301.
(a) South: almost pure (see pit-like feature in Unit 55 Profile).
(b) North: contains increasing amounts of talpetate blocks and pockets of arena, finally grading into banded arena.

Stratum 603

Inclined formation of yellow and white arena with talpetate lumps. Equivalent to Stratum 302, and fully continuous with Stratum 302.

(a) South and East: becomes white arena with various sizes and colors of clay and talpetate blocks.
(b) North: lenses down and terminates about where clay (Stratum 304) abruptly terminates.

Stratum 604

Chocolate brown clay. Equivalent to Stratum 304.

(a) South: includes blocks of talpetate and pockets of arena; termination is ragged and articulates with Stratum 303.
(b) North: nearly pure and terminates abruptly.

Stratum 605

Banded yellow and white arena with lenses of clay and talpetate; clay and talpetate more abundant than in Stratum 607; horizontal banding.

(a) South: this layer lenses out as a fine stratum of white arena which can be seen in Stratum 301 of the 300 Series Profile. This fine lense of arena obliquely crosses through Stratum 301, dividing it into two sections, then thickens to the north to become a substantial deposit.

Stratum 606

Blocks of clay and talpetate in an arena matrix.

Stratum 607

Banded arena and clay-talpetate; primary component is arena; extensive deposit; horizontal to oblique banding.

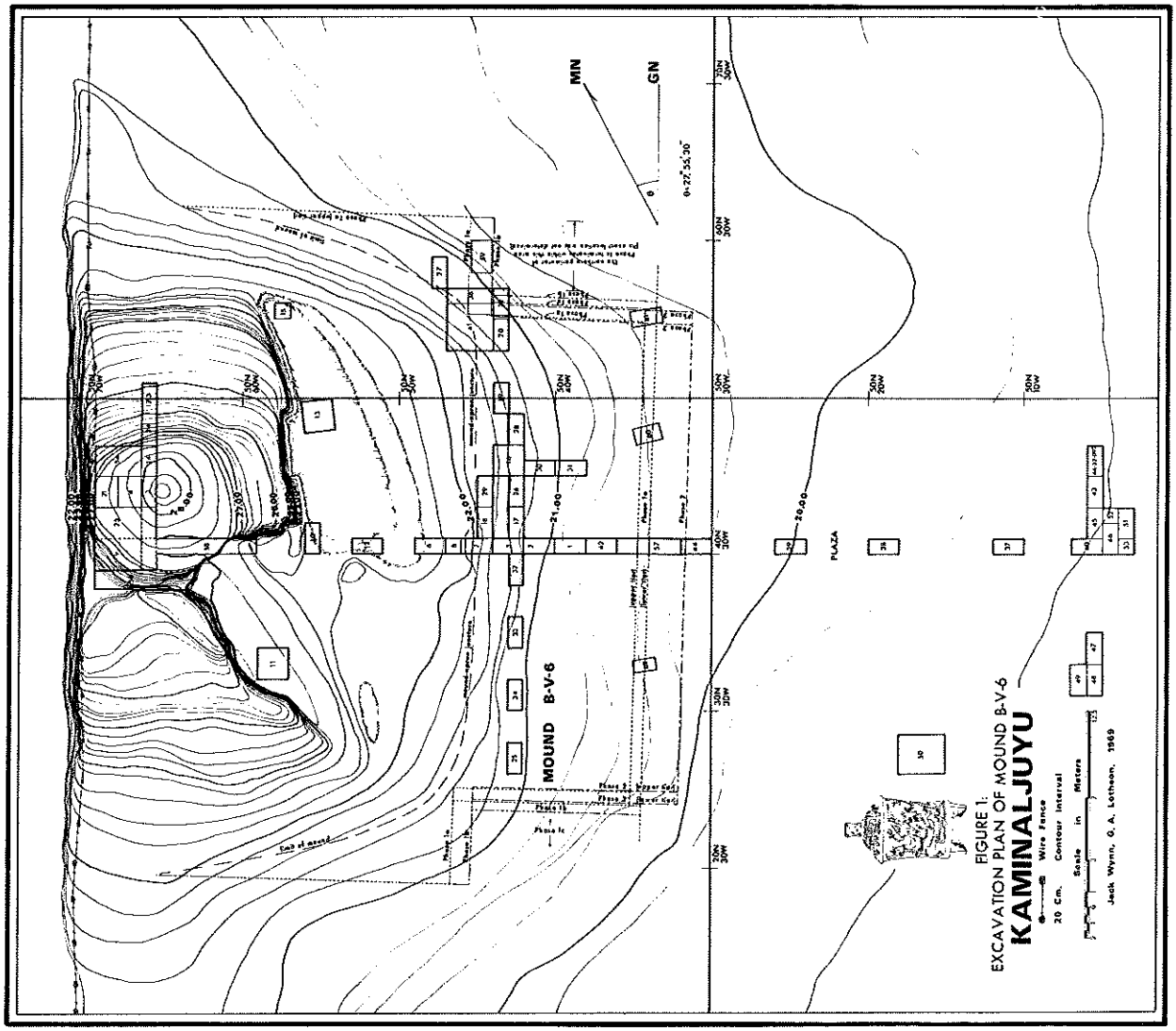


FIGURE 1:
EXCAVATION PLAN OF MOUND B-V-6
KAMINALJUYU

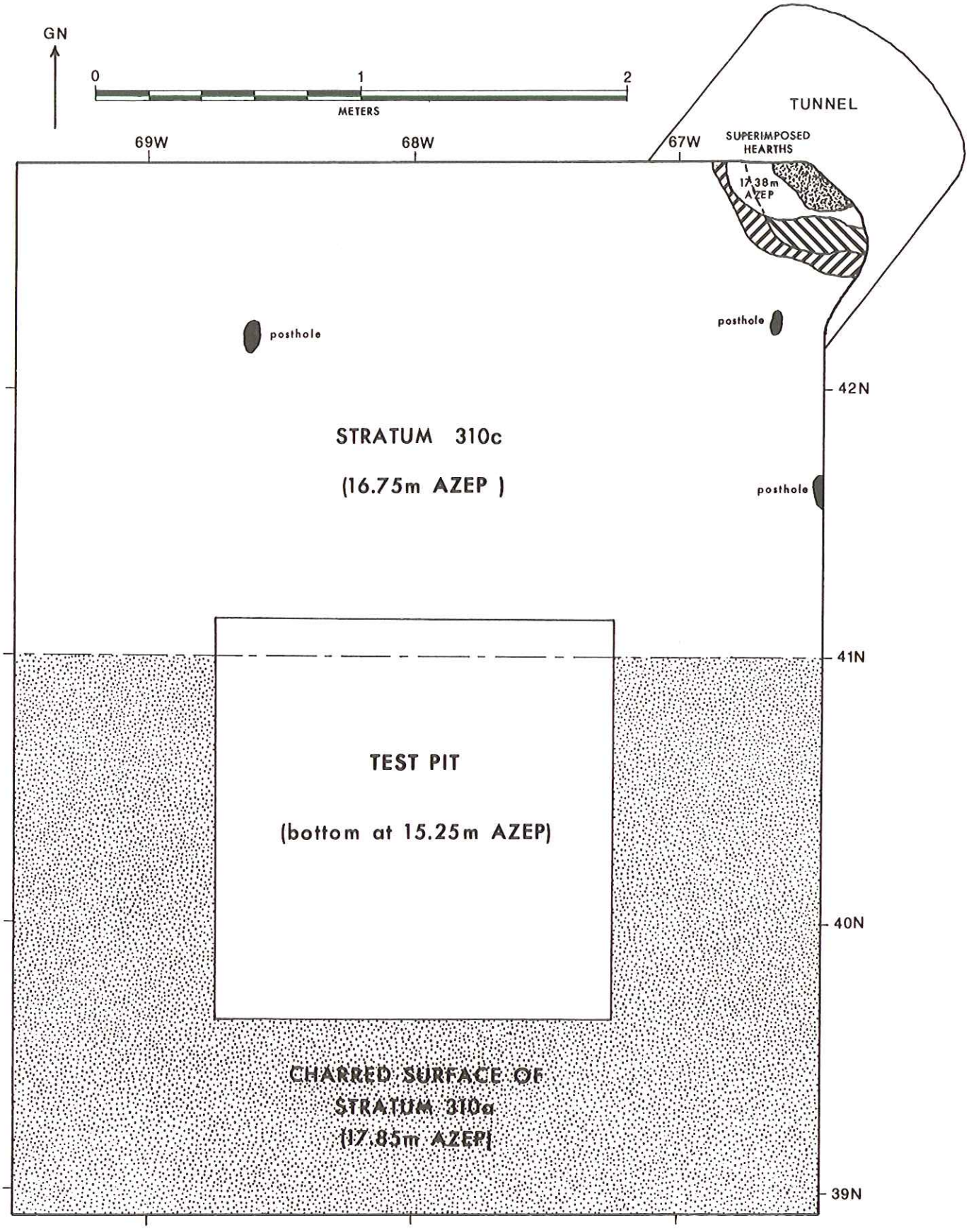


FIGURE 2: PLANVIEW OF UNIT 55, STRATA 310a & 310c

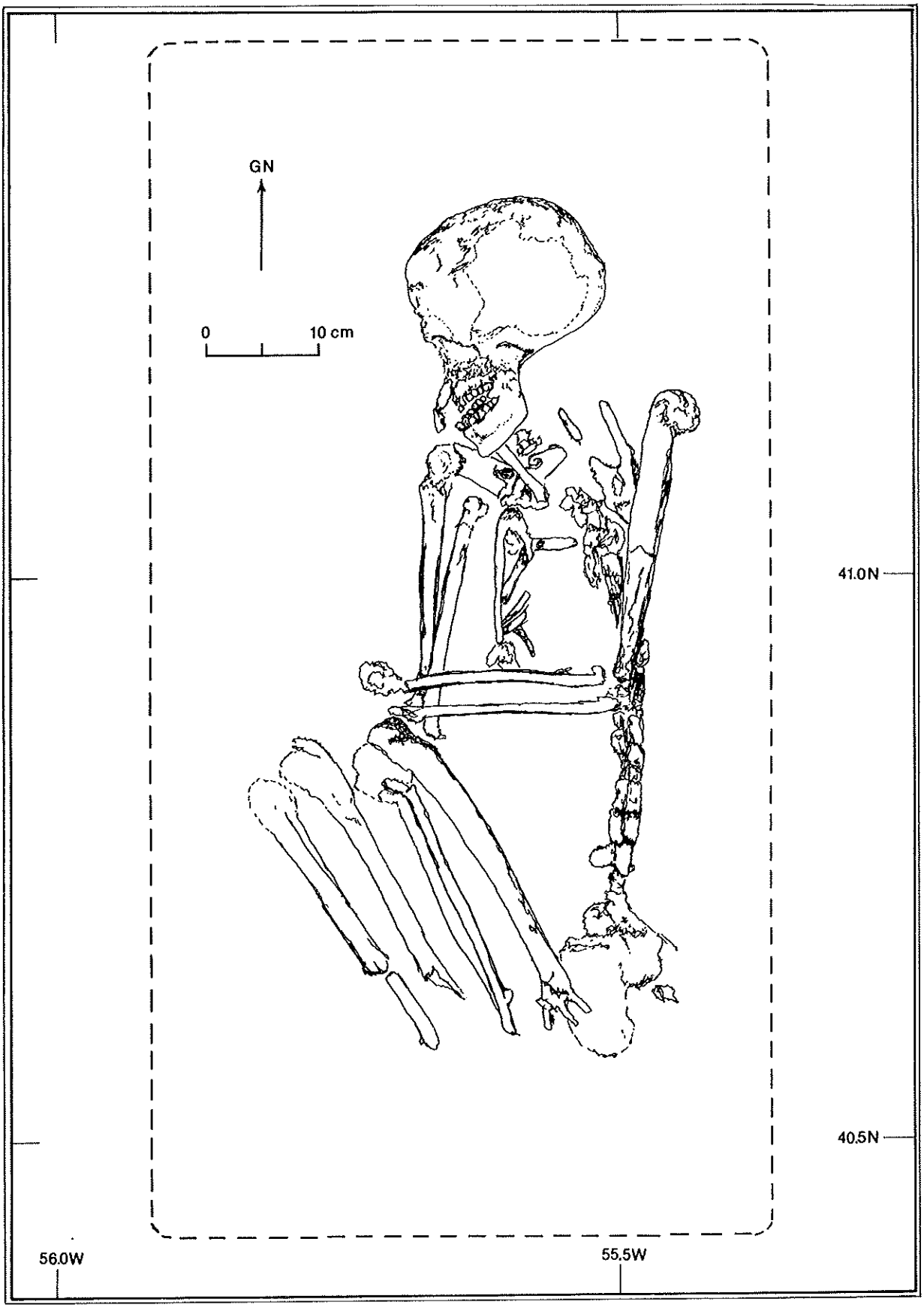


FIGURE 3: BURIAL 1, MOUND B-V-6, UNIT 10

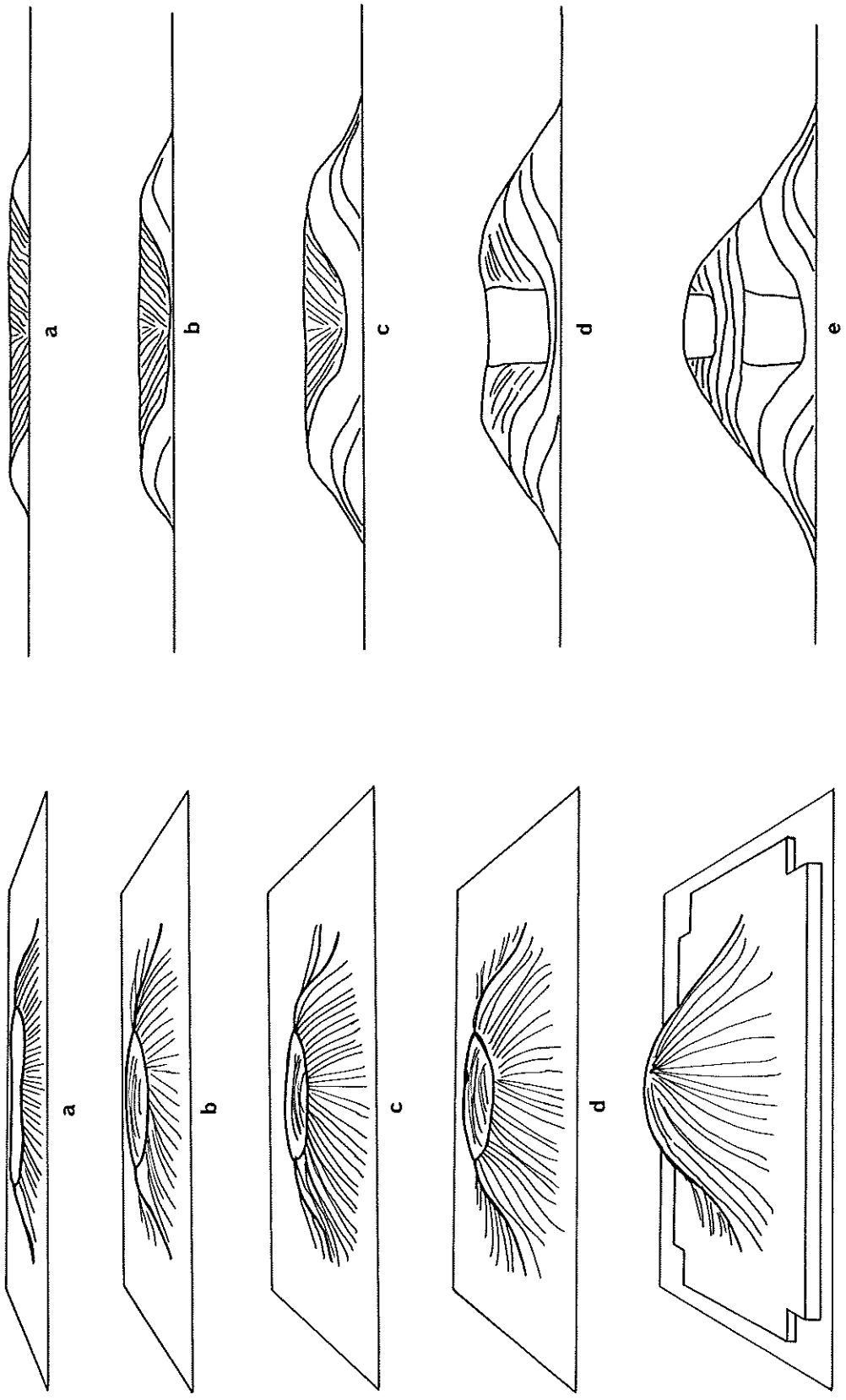


FIGURE 4: RECONSTRUCTED VIEWS OF MOUND CONSTRUCTION SEQUENCE

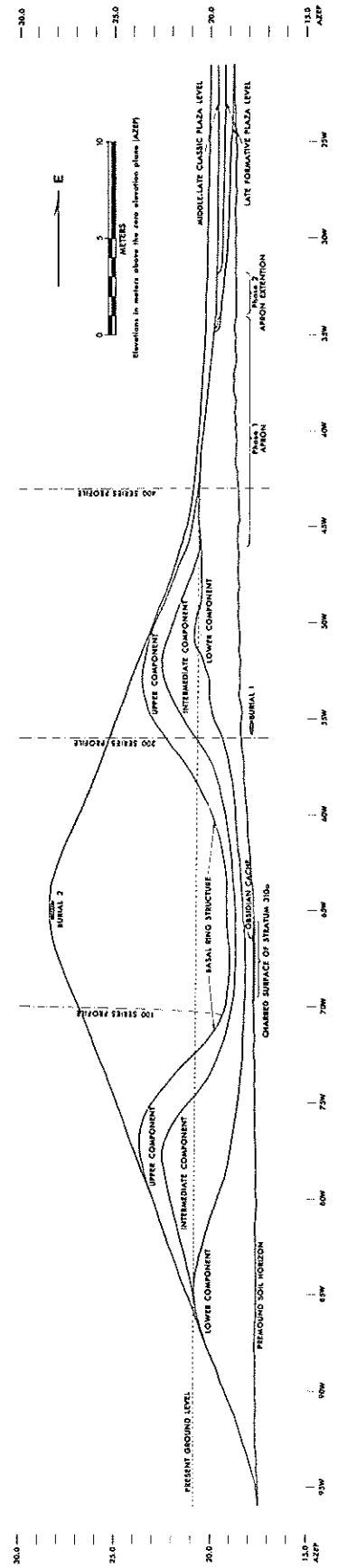


FIGURE 5: RECONSTRUCTED EAST-WEST CROSS-SECTIONAL VIEW OF MOUND B-V-6

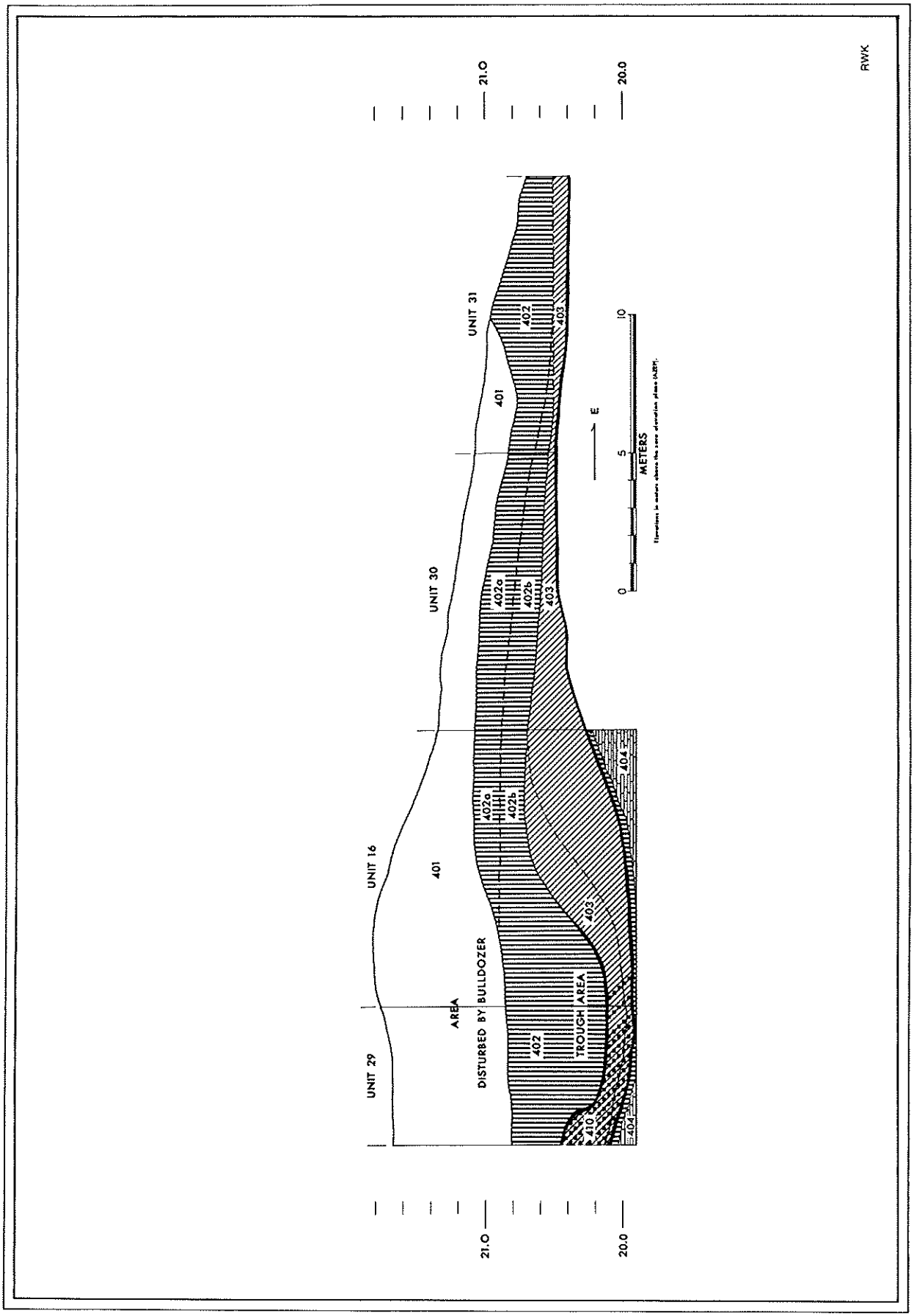
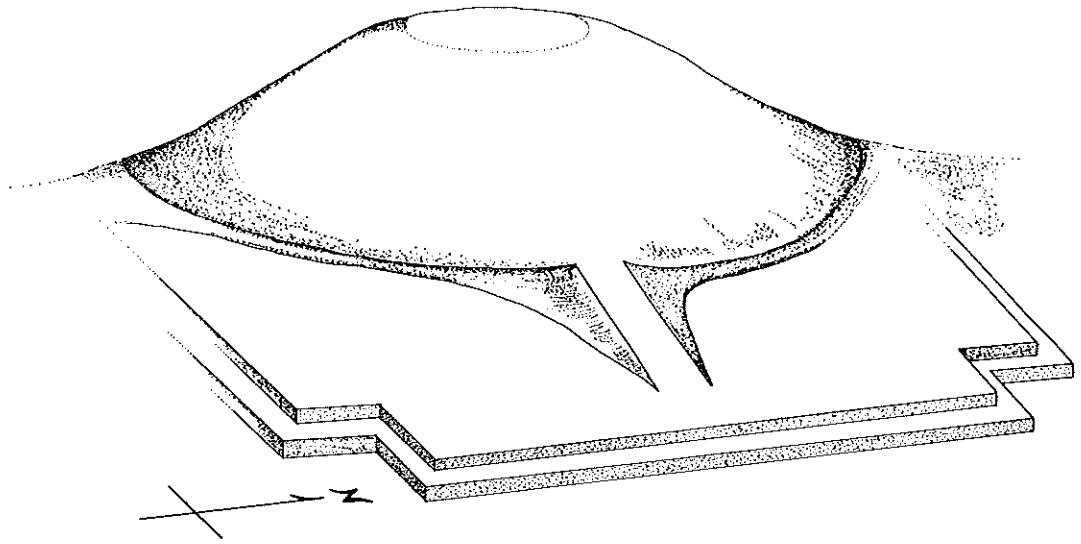
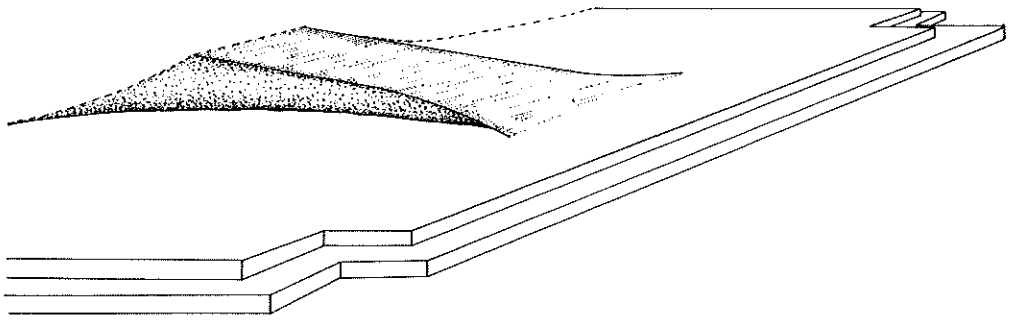


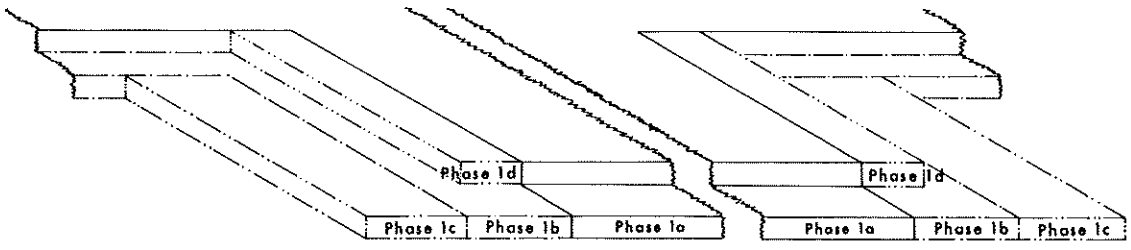
FIGURE 6: CROSS-SECTIONAL VIEW OF APRON ALONG GRID LINE 45N



a. Reconstruction of Mound B-V-6



b. Detail of Ramp and Apron



c. Sequence of Apron Construction

FIGURE 7: ARCHITECTURAL FEATURES OF MOUND B-V-6

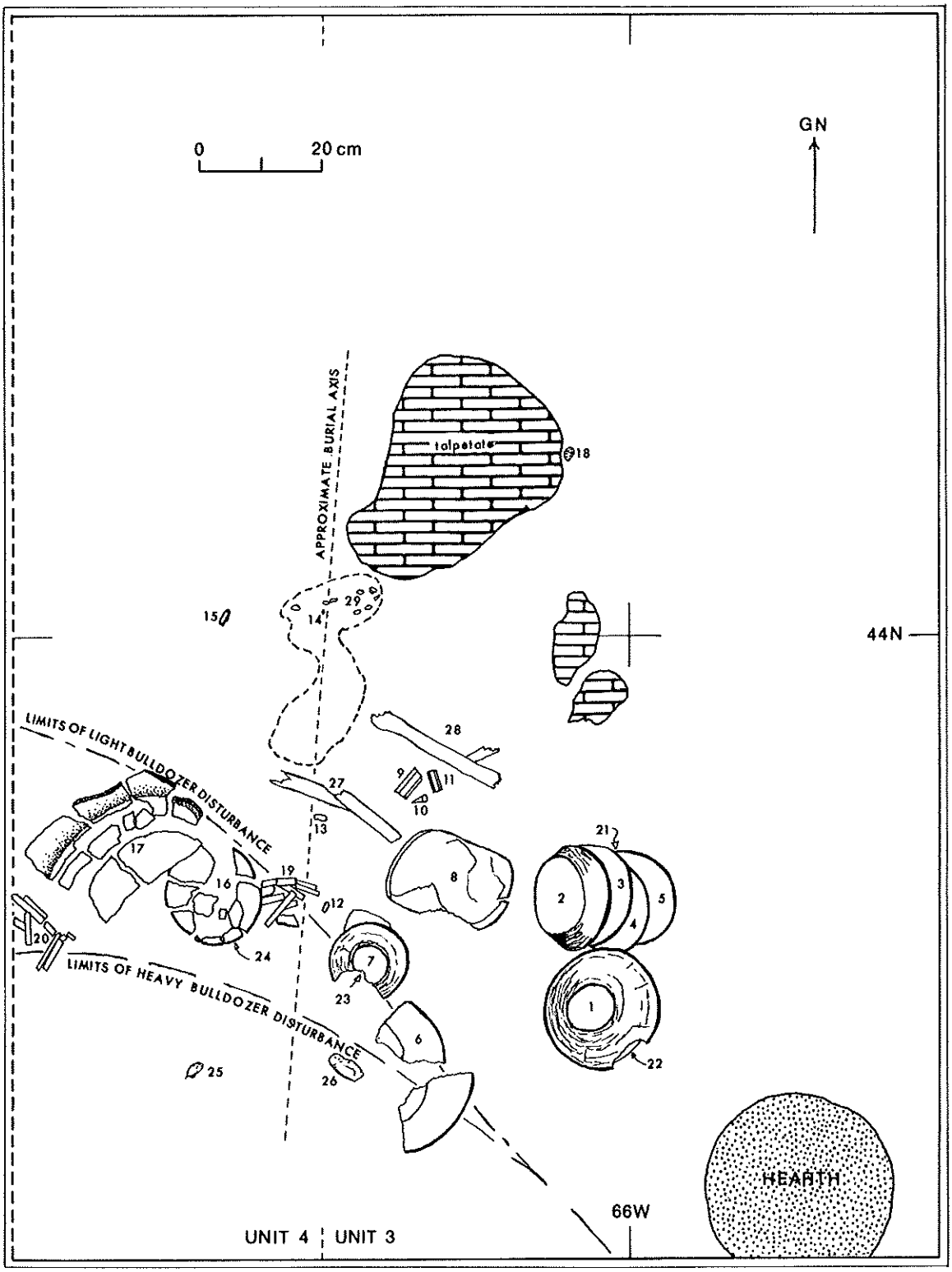


FIGURE 8: BURIAL 2, MOUND B-V-6

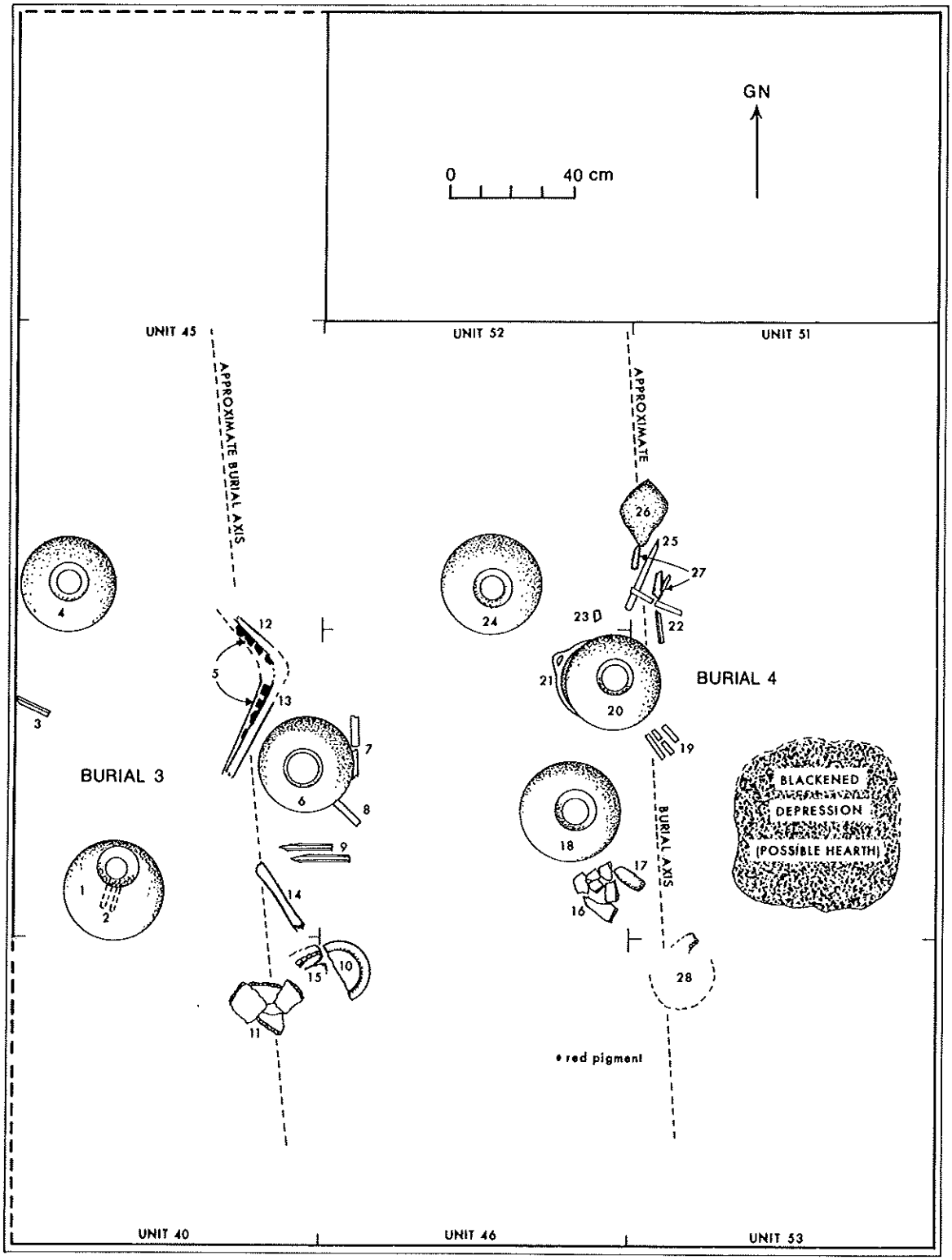


FIGURE 9: BURIALS 3 AND 4, MOUND B-V-6

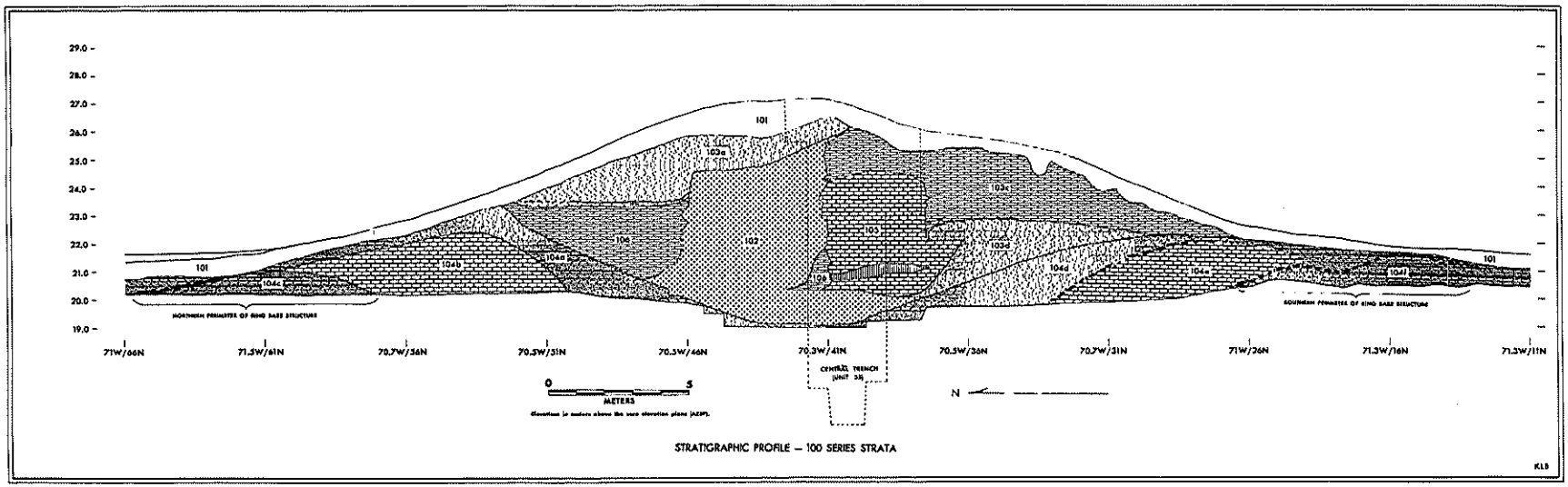


FIGURE 10: STRATIGRAPHIC PROFILE - 100 SERIES STRATA

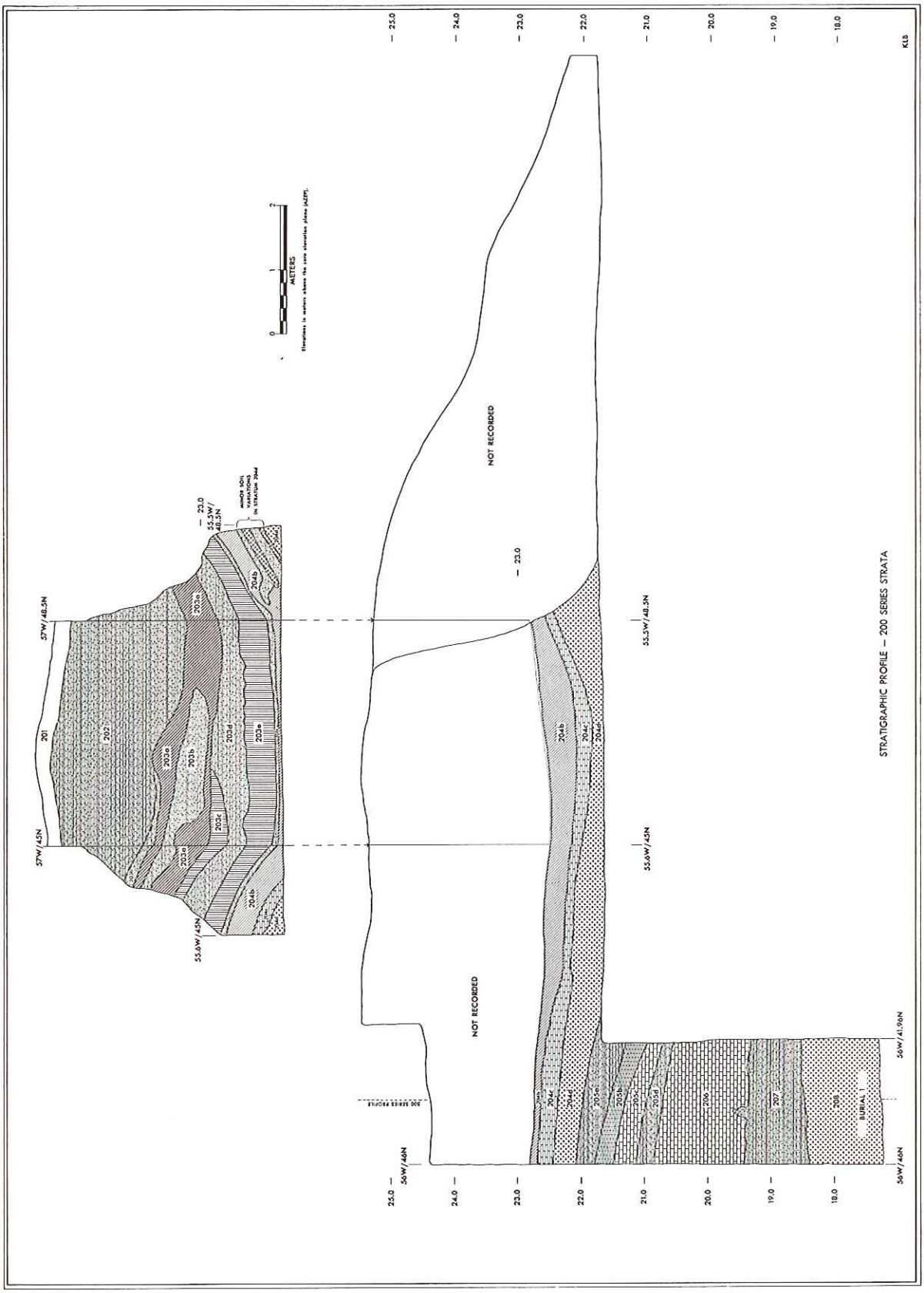


FIGURE 11: STRATIGRAPHIC PROFILE - 200 SERIES STRATA

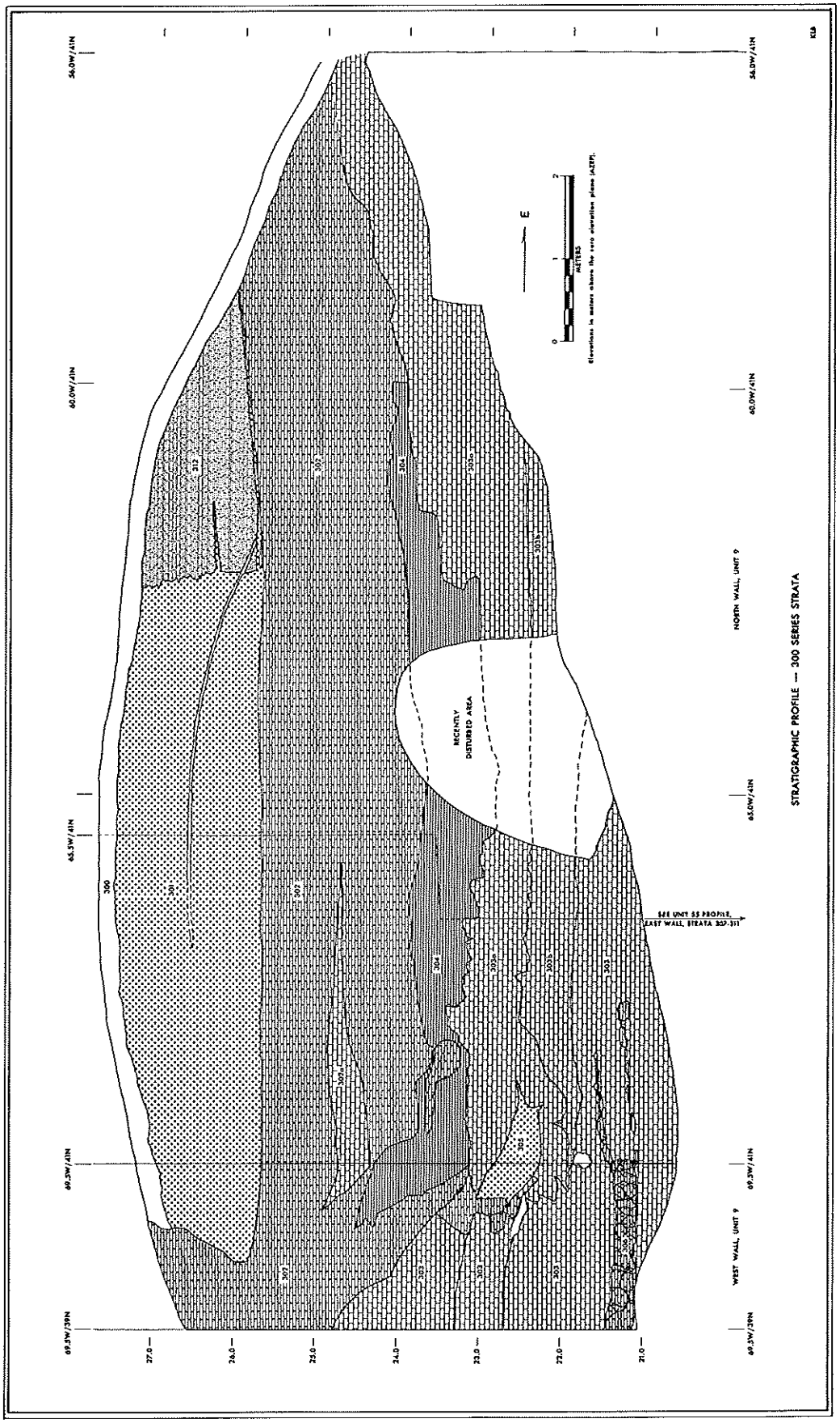


FIGURE 12: STRATIGRAPHIC PROFILE - 300 SERIES STRATA

FIGURE 13: STRATIGRAPHIC PROFILE - UNIT 55 SERIES STRATA

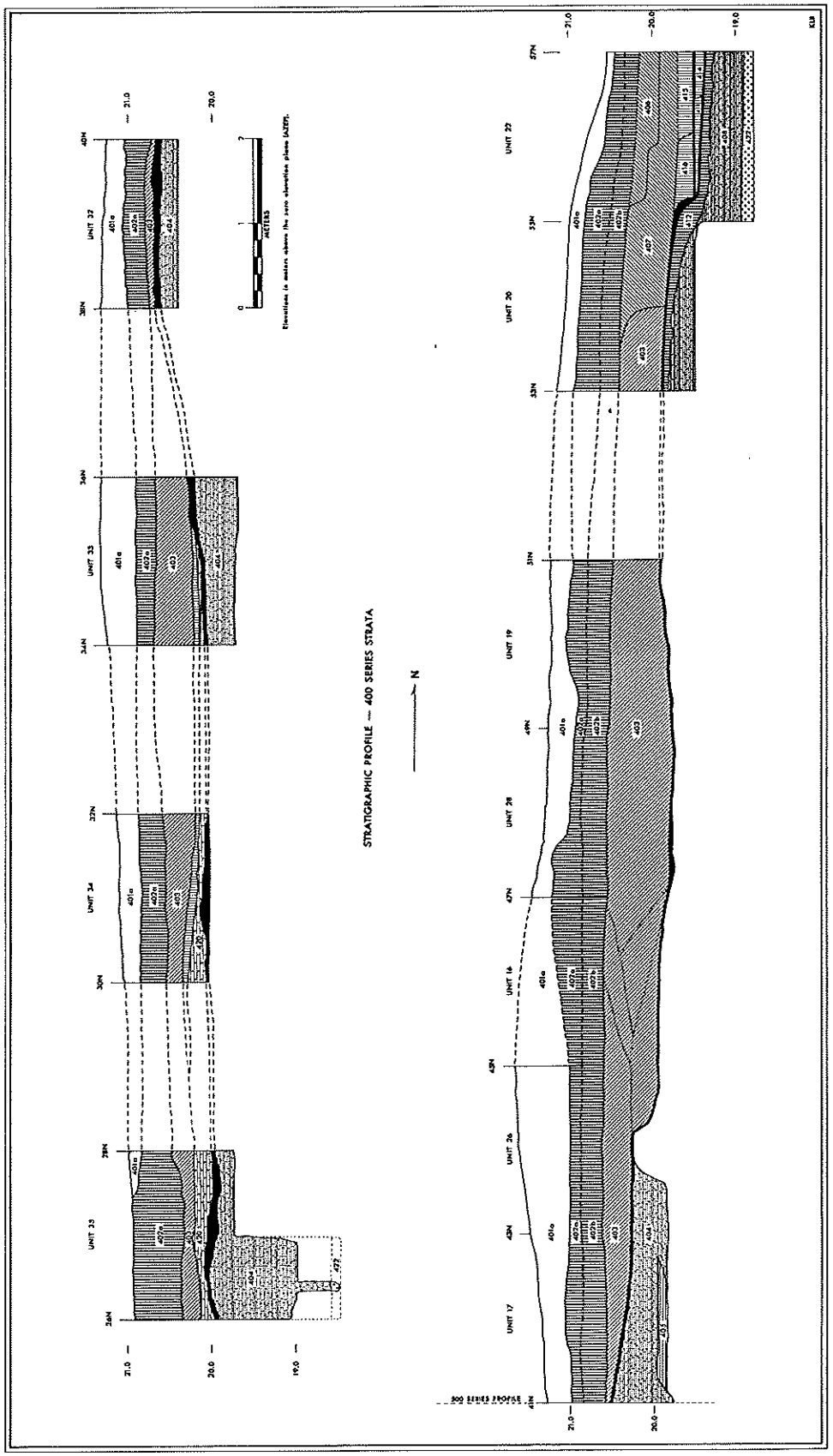


FIGURE 14: STRATIGRAPHIC PROFILE - 400 SERIES STRATA

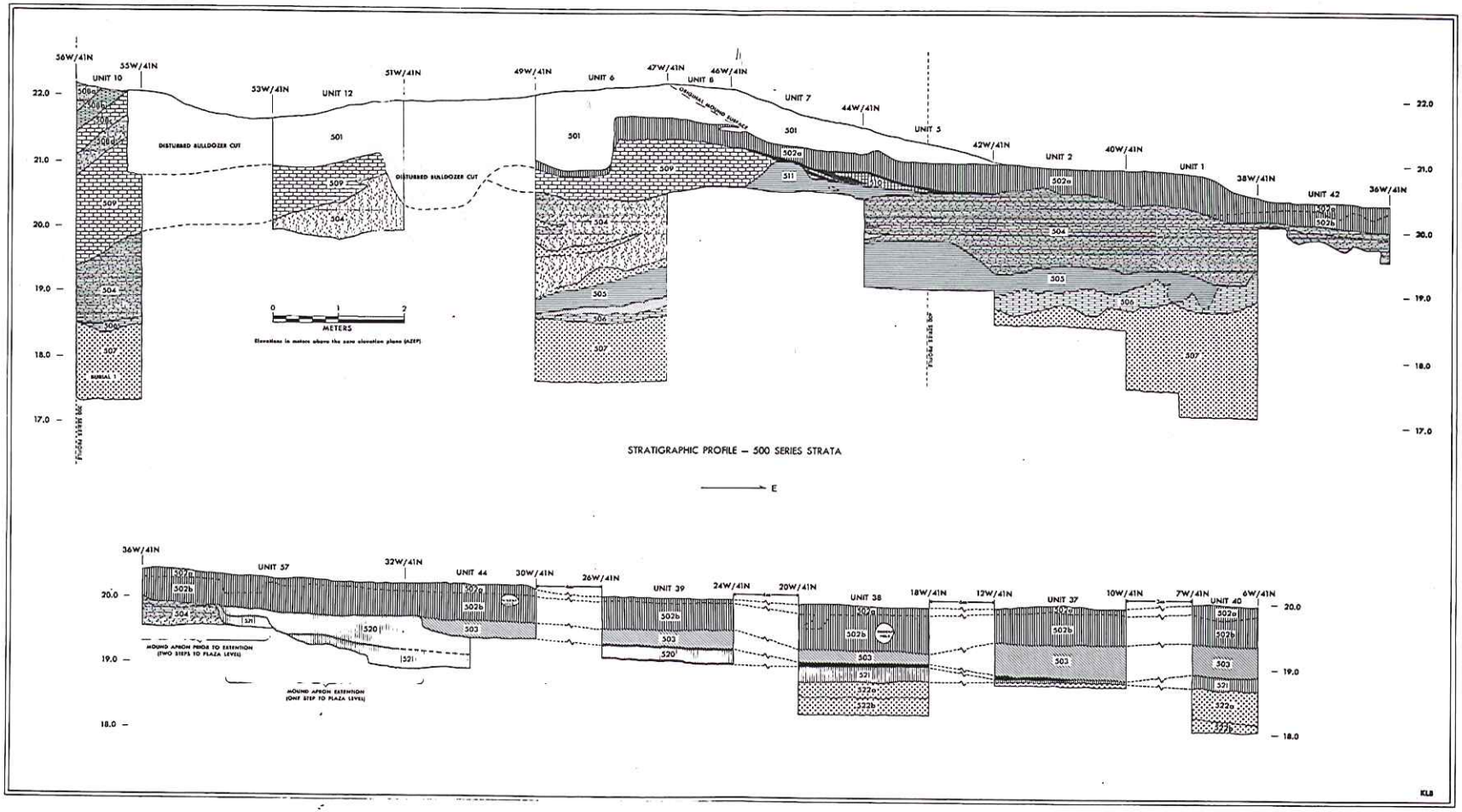


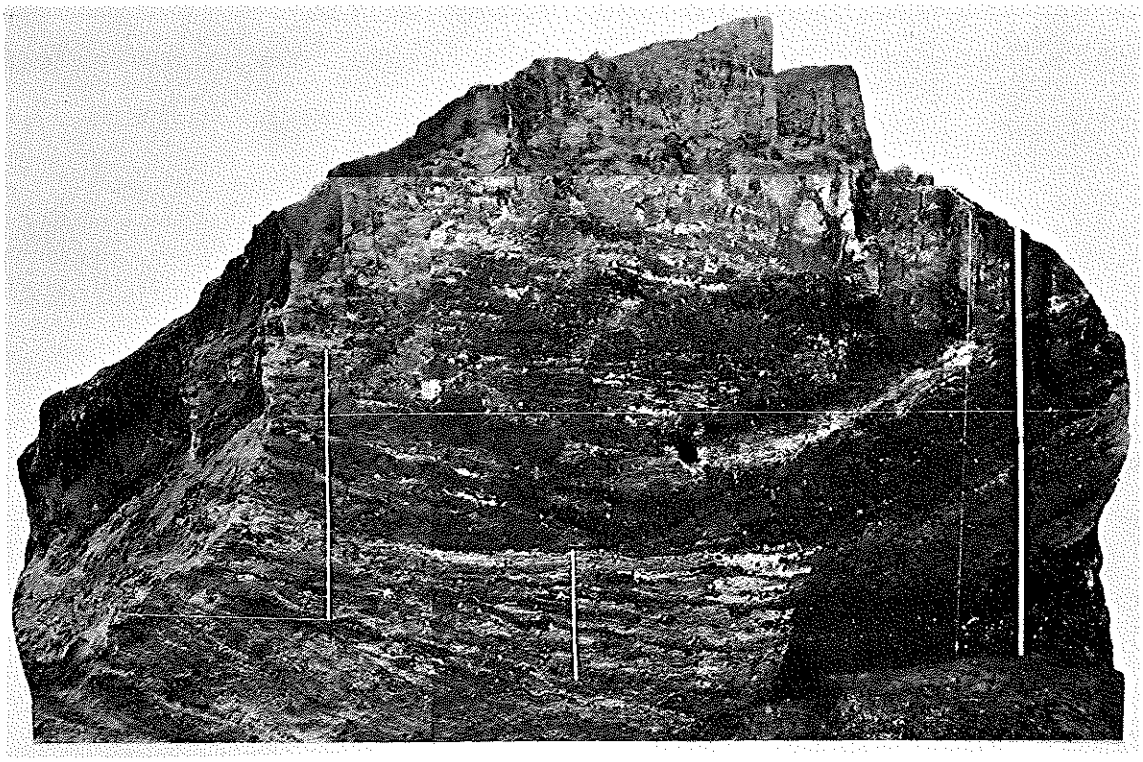
FIGURE 15: STRATIGRAPHIC PROFILE - 500 SERIES STRATA

a. Mound B-V-6, East Side

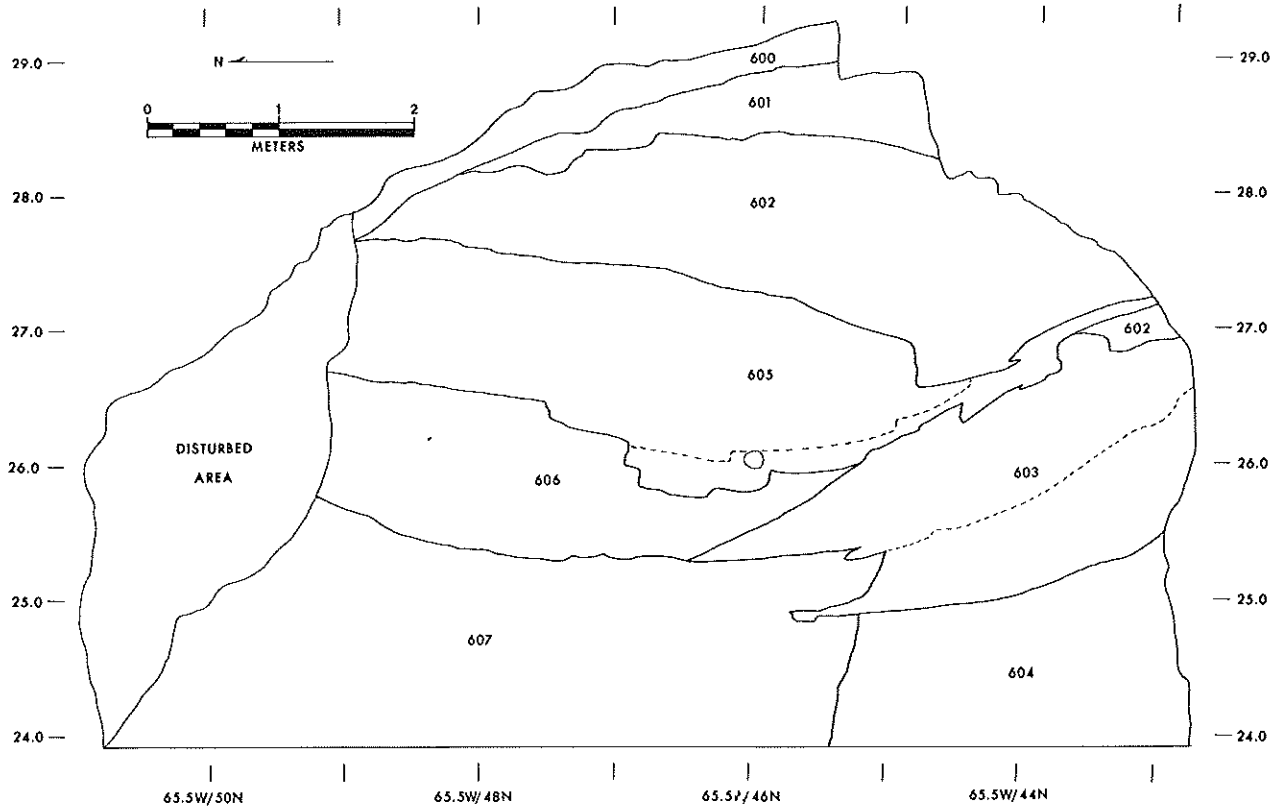
b. Burial 2

c. Burial 3

PLATE 1



a. 600 Series Profile



b. Stratigraphic Interpretation

PLATE 2

B-V-8 MOUND GROUP: A LATE FORMATIVE AND MIDDLE CLASSIC ELITE RESIDENCE COMPLEX

by

Joseph W. Ball

TABLE OF CONTENTS

	Page
INTRODUCTION	165
LOCATION AND SETTING	165
CONDITION, SIZE AND ORIENTATION	168
EXCAVATION METHODOLOGY	169
NATURAL STRATIGRAPHY	170
MOUND B-V-8 EXCAVATION	170
The Stratigraphic Trench	171
Structure A-1	171
Artifact Content	172
Structure A-2	173
Constructional Features	173
Artifact Content	174
Discussion	177
MOUND B-V-14 AND B-V-15 EXCAVATIONS	177
Mound B-V-14: The Stratigraphic Trench	178
Mound B-V-15: The Stratigraphic Trench	179
Structure C-1	180
Constructional Features	180
Burial 1	181
Artifact Content	182
Discussion	183
Structure B-1	184
Structures B-2a and B-2b	184
Constructional Features (B-2a)	184
Artifact Content (B-2a)	186
Constructional Features (B-2b)	186
Artifact Content (B-2b)	187
Structure C-2	189
Constructional Features	189
Artifact Content	192
Burial 2	193
Discussion	194
DATING OF B-V-8 MOUND GROUP	194
SUMMARY	196

LIST OF TABLES

Table		Page
1	Summary of Total Artifacts Recovered during Excavation	166
2	Obsidian Dates from the B-V-8 Mound Group	195

LIST OF FIGURES

Figure		Page
1	Contour Map of the B-V-8 Mound Group	197
2	Excavation Plan of Mound B-V-8	198
3	Excavation Plan of Mounds B-V-14 and B-V-15	199
4	Profile, North Wall, Units 216 and 8	200
5	Profile, South and West Walls, Unit 216	200
6	Planview of Unit 216, 20.35 AZEP	200
7	Profile, South Wall, Unit 95	200
8	Profile, East Wall, Units 8, 7, 98, 97, 96, 95	201
9	Profile, South Wall, Units 210, 207, 214, 213	201
10	Feature 2, Mound B-V-8	202
11	Profile, West and North Walls, Unit 137	203
12	Profile, South Wall, Unit 107	203
13	Profile, East Wall, Units 130, 99, 100, 101	203
14	Composite Profile, West Wall, Mound B-V-15	204
15	Profile, North Wall, Unit 313	204
16	Profile, North Wall, Unit 325	204
17	Profile, North Wall, Unit 306	204
18	Burial 1 (Feature 9), Mound B-V-15	205
19	Planview and Elevation, Structure C-1, Mound B-V-15	206
20	Planview of Eastern Terrace, Mound B-V-14	207
21	Planview of Structure B-2b, Mound B-V-14	208
22	Planview of Structure C-2, Mound B-V-15	209
23	Burial 2 (Feature 3), Mound B-V-15	210
24	Profile, North Wall, Units 315, 323	211
25	Profile, North Wall, Units 308, 26, 84	211
26	Planview of Structures C-2, B-2a, B-2b	212
27	Isometric Reconstruction of B-V-14/B-V-15	213

LIST OF PLATES

Plate		Page
1a	Structure A-2	214
1b	Domestic Altar, Structure A-2	214
1c	Domestic Altar, Structure B-2b	214
1d	Burial 1, Mound B-V-15	214

INTRODUCTION

This report deals with the complex of three mounds designated as B-V-8, B-V-14, and B-V-15 on the Carnegie grid map of Kaminaljuyu. As in the case of the other mounds occupying the Finca El Mirador portion of the Kaminaljuyu site, excavations were undertaken at the B-V-8 complex during the summer of 1969 in the face of imminent destruction by encroaching urban development. Field work was conducted by Joseph Ball, Dora Gonzalez, Martin McAllister and Dennis Dickinson, with the assistance of up to 15 local laborers. These investigations revealed the complex to be Middle Classic in age with an underlying Late Formative component. During the Middle Classic two of the three mounds were found to contain residential structures, one of these adjoining what may have functioned as a small ceremonial platform which appeared to have been primarily funerary in nature. The group's significance is immediately apparent in that it presents a well-rounded albeit limited sample of domestic and religious architecture and material culture. The Late Formative component consisted of two small sub-structures that may have served as platforms for thatch dwellings occupied by the priests which administered the El Mirador ceremonial complex (Mounds B-V-2, B-V-3, B-V-4, B-V-5, B-V-6).

This report will focus on the architectural features of the mounds and their possible interpretations. A preliminary discussion of associated artifacts will also be included. Detailed analysis of the artifact materials recovered during these operations is now in progress and will be discussed in future reports. Table 1 offers a summary of the artifacts recovered during excavation.

Chronological determinations are based on a combination of architectural stratigraphy, obsidian dating and preliminary examination of ceramics.

LOCATION AND SETTING

The B-V-8 group occupies part of the Finca El Mirador on the southwestern outskirts of Guatemala City (Foreword, Fig. 1). The major axis lines of a north-south grid were used to quarter the finca into sectors and each of these was treated as a separate operational unit. The B-V-8 mound group fell within the northeast sector (Foreword, Fig. 2) and was designated 46-32-094 (Zone 46, Area 32, Sector 094) in accordance with the methodology outlined in the general introduction to this set of reports (Sanders and Michels 1969: 7).

The B-V-8 mound group sector (see Foreword, Fig. 2) is bordered on its southern edge by a double, east-west row of tall pines. Some 80 meters east of Grid 0, the trees halt at a north-south extension of dense brush and wire fence. Avenida 21 lies immediately adjacent and parallel to the other side of this fence. A similar line of brush and fencing forms the northern edge of the finca which there fronts on Roosevelt Highway. A single row of pines stretches the 140 meters from the highway back to the southern line of trees at about 10 meters east of Grid 0.

Table 1

Summary of Total Artifacts Recovered during Excavation

Artifact Name	Material Code	Item	Sub-Item	Frequency
Rim sherds	1	1	0	6,506
Body sherds	1	2	0	66,674
Burnt clay lumps	1	4	1	25,299
Burnt clay lumps	1	4	2	13
Burnt clay lumps	1	4	3	2,102
Burnt clay lumps	1	4	4	298
Burnt clay lumps	1	4	5	61
Clay figurines	1	5	0	109
Effigy sherds	1	6	0	43
Adornos	1	7	0	53
Effigy whistle	1	8	0	7
Clay beads	1	9	1	2
Clay beads	1	9	4	2
Rattle balls	1	11	0	12
Sherd discs	1	12	0	2
Sherd discs	1	12	2	6
Clay pendant	1	13	2	1
Incensario	1	14	1	16
Incensario	1	14	2	2
Miniature vessel	1	15	0	1
Pottery vessel (whole)	1	16	0	8
Clay spindle whorl	1	18	0	6
Candelero	1	19	1	1
Candelero	1	19	2	3
Clay ear plug	1	21	0	2
Obsidian blades	2	1	0	4,814
Obsidian flakes	2	2	0	4,460
Obsidian cores	2	3	0	42
Obsidian shaped artifacts	2	4	0	91
Obsidian quarry nodules	2	6	0	28
Stone building material	3	1	0	4
Unidentified stone artifact	3	3	0	3
Mica	3	4	0	1
Quartz crystal	3	7	0	6
Green stone detritus	3	8	0	9
Steatite flakes	3	9	0	5
Stone sculpture	3	10	0	6
Utilized cobble	3	11	0	87
Pumice	3	12	0	2,530
Shaped mano	3	14	1	2
Shaped mano	3	14	2	10
Shaped mano	3	14	3	2
Pebble mano	3	16	0	4
Non-artifact detritus	3	19	0	2,731

Table 1 (continued)

Artifact Name	Material Code	Item	Sub-Item	Frequency
Hammerstone	3	20	0	2
Hammerstone	3	20	1	3
Hammerstone	3	20	2	3
Hammerstone	3	20	5	2
Abrading pebbles	3	21	1	2
Abrading pebbles	3	21	2	5
Abrading pebbles	3	21	3	11
Polishing pebble	3	22	1	5
Shaped metate	3	23	0	22
Shaped metate	3	23	1	4
Shaped metate	3	23	2	1
Shaped metate	3	23	5	1
Shaped metate	3	23	7	1
Rubbing platforms	3	24	1	5
Rubbing platforms	3	24	2	5
Rubbing platforms	3	24	3	1
Shaped pestle	3	26	2	1
Digging stick weight	3	27	0	5
Stone club	3	29	2	2
Stone club	3	29	3	2
Bark beater	3	30	0	2
Conical abrader	3	31	0	2
Lime stone	3	32	0	5
Stone anvil	3	34	0	3
Thin stone slab	3	35	0	28
Celt	3	36	0	8
Stone beads	3	37	2	1
Stone beads	3	37	5	1
Stone pendant	3	39	1	1
Carved stone vessel	3	40	0	1
Basalt flake artifact	3	41	0	2
Chalcedony flake artifacts	3	42	0	8
Stone figurine	3	50	0	2
Radiocarbon sample	4	1	0	5
Radiocarbon sample	4	2	0	1
Unclassified bone	5	0	0	6
Human burial	5	5	0	1
Shell artifact	6	2	0	1
Soil sample	7	1	1	3
Soil sample	7	1	2	2
Ecological specimen	9	1	0	1
Ecological specimen	9	3	0	1
Stucco surfacing	13	1	0	1
			TOTAL COUNT	116,233

(For full artifact code see Table 1 of Foreword.)

At the time of our operations, the finca was in grass and being used to pasture cattle. The presence of numerous maize hillocks suggested recent agricultural activity.

CONDITION, SIZE AND ORIENTATION

When first brought to our attention in 1968, the B-V-8 group was found to consist of three low, earthen mounds. These were designated as A, B, and C from west to east (B-V-8, B-V-14, B-V-15 respectively) and treated as independent units of excavation (Fig. 1). The slight elevation and gentle slope of the mounds had resulted in their inclusion within the area formerly under cultivation and the presence of numerous maize hillocks on their surfaces suggested that immediately subsurface features had probably been destroyed or at least severely damaged by agricultural activity. In addition, Mound B-V-15 had apparently been the scene of "earth robbing" operations which had gouged out the major portion of its northeastern quarter to a depth of about 40 cm. Excavation subsequently revealed that these operations had exposed and badly damaged a Middle Classic grave at the mound's center. The fact that a portion of the grave, including some skeletal remains, had been exposed and scooped away while the remainder of the burial was left intact suggests to me that the damage was the result of "earth robbing" rather than systematic looting.

Mound B-V-8 is roughly oval in plan with a maximum length of 15 meters along its north-south axis. At its highest point it is about 50 cm above the surrounding land surface. Mounds B-V-14 and B-V-15 are both rectangular in outline. Mound B-V-14 measures some 16 meters in length by 13 meters in width and attains a maximum height of 50 cm above the present surface. Mound B-V-15 is slightly higher than an elevation of about 60 cm. Its outer edges suggest a structure somewhat under 14 meters in length and 11 meters in width.

Mounds B-V-14 and B-V-15 appear to be in right angle relationship to each other. During the initial stage of excavation, this relationship was not recognized. However, later operations demonstrated that the two mounds did apparently form a single functional unit. The longitudinal axis of B-V-14 suggested an orientation of about 15° east of magnetic north. That of B-V-15 was taken to indicate a similar latitudinal orientation. Mound B-V-8, separated from the others by a distance of some 35 meters, was also judged to have a 15° east of magnetic north orientation prior to excavation.

A slight groundswell in the vicinity of 20 meters east on the northern edge of the finca suggested the former presence of a fourth mound (B-V-7) destroyed by construction of the Roosevelt Highway. Several fired clay floors were visible in the earth cut fronting on the highway and a collection was obtained from the extensive ceramic and obsidian debris eroding out of this face. Workmen also reported the recovery of skeletal remains and artifactual material from a point near the finca's northeastern corner during road cutting and this may indicate yet a fifth now vanished mound. Finally, comparison of the spatial arrangement of Mounds B-V-14 and B-V-15 with that of B-V-9, B-V-10, and B-V-11 located some 90 meters to their south (see

Foreword, Fig. 2) suggests the possibility that still another low mound, unnoticed and unrecorded, formerly occupied the area to the immediate east of B-V-14 and B-V-15. The presence of such a mound would produce an enclosed court bounded on the west, north, and east by structures and open on the south. This would closely resemble the layout of the B-V-11 mound group, also Middle Classic in age. Unfortunately, the construction of Avenida 21 and the residential zone east of it have destroyed any possibility of establishing the validity of this suggestion.

EXCAVATION METHODOLOGY

Operations within the B-V-8 mound group sector were tied into a numerical north-south grid laid out so as to encompass the finca as a whole (see Foreword, Fig. 2). A primary horizontal datum point was established by means of a large "X" painted on the trunk of one of the pines in the east-west double row. The finca was then gridded in with orange stakes at 15 meter intervals. Stake locations were shot in by transit and chain. Grid 0-0 was arbitrarily designated to be 20 meters above vertical datum 0 and elevations were taken for and recorded on each of the orange stakes based on this assignation.

The excavation of the B-V-8 mound group can be divided into two methodologically distinct stages. The first, lasting from mid-June to mid-July, consisted of exploratory surface stripping and the application of an approach designed to obtain maximum artifact recovery from a limited area. The second, from mid-July to early September, emphasized the total exposure of culturally significant (in the excavator's judgment) features and the recovery of an artifact sample sufficient to allow valid reconstruction of Middle Classic life as preserved at the B-V-8 mound group. The sampling was conducted, moreover, with a view for the utility of the material recovered in phasing and absolutely dating the occupational levels involved.

During the first stage of excavation, each mound was placed under the immediate supervision of an individual graduate student (Martin McAllister, Dora Gonzalez, and Joseph Ball) each operating a crew of five laborers. One by one meter square units were sequentially laid out and excavated. Each unit was first planed to the level of its lowest corner, all artifact material being retained. The units were then continued in 20 cm levels with total retention of artifact material. Where structural layers were recognized, the arbitrary 20 cm level was abandoned and unit depth was determined by the visible stratigraphy.

During stage two of the season, the mound group sector was treated as an integrated complex and the total labor force, which during this period varied from three to nine workers, was shifted from one mound to the next as the situation demanded. Sector supervision during this phase fell to Dennis Dickinson and Joseph Ball. Natural and architectural strata were employed as vertical control units. Squares were opened in the sizes and places which appeared most likely to answer specific structural questions. Ceramic control for structures was assured through total retention of materials from selected

stratigraphic columns. Samples were also retained from the architectural trenches. However, given the sizes and natures of the structures and our own operational logistics, it was found unfeasible to recover all cultural material if satisfactory salvage of the architectural remains was to be accomplished.

NATURAL STRATIGRAPHY

The natural stratigraphy of the Valley of Guatemala has been described by Kidder, Jennings and Shook (1946: 10), Shook and Kidder (1952), and discussed at length in Sanders and Michels (1969: 21-25). Further eleaboration in this report would seem to be superfluous, however, the major points of these previous discussions are here reviewed.

The uppermost layer of soil at Kaminaljuyu is a black, loamy humus. Beneath this lies dark brown, alluvially deposited clay. This is generally underlaid by a white, pumiceous, volcanic ash (arena) which in turn overlies a tightly compacted, yellow, volcanic earth (talpetate).

Stone is notably scarce in the vicinity of Kaminaljuyu and this lack is reflected in the absence of stone architecture at the site. A limited supply of cobble and slab material was available from nearby barrancas, and this was employed as foundational and buttressing material as well as in some small scale structural features such as drains and hearths.

MOUND B-V-8 EXCAVATION

Operations at Mound B-V-8 fell into the two major stages previously described. During stage one, the surface of the mound was removed over a 3 m by 9 m area and a badly eroded cap of puddled yellow clay overlying an inner core of mottled adobe exposed. The mangled condition of the cap negated any possibility of ascertaining the nature of the structure it represented and confirmed our fears with respect to possible subsurface agricultural damage. No surface features (postholes, walls) were encountered and artifact remains were light and badly fragmented. It was judged to be fruitless to continue exposure of the feature, and these operations were terminated.

Stage two consisted of driving a meter wide trench through the mound from south to north. Two by two meter control pits were dug off the southern edge of the mound and through its center and all artifact material from these two columns was retained by strata for computer analysis. An exploratory pit off the mound's north side encountered extensive cultural debris and this excavation was extended until the entirety of a well-preserved structural unit (Structure A-2) was exposed. In the following sections, the stratigraphic trench will be discussed first followed by a description of Structure A-2.

The Stratigraphic Trench
(Figures 2, 4, 5, 6, 7, 8)

The central trench through Mound B-V-8 reveals a sequence of six differentiable strata. From lowermost to uppermost they have been designated as follows:

1a.	Dark brown clay grading into arena	Presence: natural
1b.	Dark brown clay	Presence: natural
2.	Brown sandy clay	Presence: natural
3.	Brown, yellow, and gray mottled fill, sandy	Presence: artificial
4.	Brown, yellow, and gray mottled fill, clayey	Presence: artificial
5.	Puddled, yellow-white talpetate-arena	Presence: artificial
6.	Gray-black topsoil	Presence: natural

Stratum 1a is a dark brown clay with inclusions and fingerings of pumiceous arena. This layer was found to be sterile with respect to cultural material. Its presence is quite natural and it very probably represents the transitional zone between two ancient soil horizons. Distinguishable above this was an equally sterile layer, 1b, which consisted of a pure dark brown clay. This also would appear to have been an ancient subsoil, probably of alluvial origin.

Of greater interest is Stratum 2, a brown sandy clay. Scattered cultural material in the form of ceramic sherds and obsidian flakes was recovered from this layer. A fine black stained band, presumably of organic origin, separates Stratum 2 from overlying soils. Wherever observed (in Mounds B-V-14 and B-V-15 as well as in B-V-8), structural features were found to directly overlie this brown sandy clay and it is believed to represetn an ancient topsoil and land surface. Especially interesting is the apparent presence of an ancient milpa preserved in the walls and plan of Unit 216 (see Figs. 4, 5, 6). The north and south walls of this unit present what might easily be sections through the maize hillocks of a present day milpa. At elevation 20.35 m above datum zero, the unit's planed floor shows two inter-row furrows clearly delineated by the mottled clay fill of the post-milpa structure which covered them.

Structure A-1

A coarse, pumiceous sand with inclusions of brown and yellow clay lumps composes Stratum 3. This is decidedly not a natural soil but represents a structural feature, here designated Structure A-1a.

Structure A-1a rests directly on the land surface represented by Stratum 2. It was apparently a dry-laid mixture of arena, arena-mixed clay (Stratum 1a), and pure clays (Stratum 1b and talpetate). It is the resulting mottled compound which so nicely silhouettes the milpa furrows of Unit 216. At its highest observed point (in Unit 7), the stratum rises about 50 cm above its contemporary land surface. Its north-south dimension was probably no more than 7 m; the east-west size is unknown. Lack of surfacing and the well preserved condition of this dry-laid mass suggest that it was intended as a core for the more ambitious unit which covers it, Structure A-1. Two additional factors imply such a function. The highest section of A-1 overlies a

noticeable depression in the ancient land surface. A-1a serves to fill in this depression and provide an elevated base for the summit. Furthermore, the recorded southern edge of A-1a (see Fig. 8, Unit 98) appears to be designed so as to re-enforce A-1's central mass and prevent outward slippage. All in all, it seems reasonable to designate A-1a as a structural component of A-1.

Strata 4 and 5 together complete the architectural unit here designated Structure A-1. Stratum 4 consists of a mottled brown, yellow, and gray clay matrix with lenses of dark brown clay and pumiceous sand. It is an obviously artificial material of compacted texture. Stratum 5 is a rarely preserved layer of shaped and smoothed talpetate-arena adobe. It is not present as a continuous stratum in the accompanying profiles, however, it was encountered at a number of spots during the early surface stripping. Its eroded, spotty preservation is considered to result from a combination of one time exposure to the elements and subsequent subjection to the destructive effects of hoe agriculture. Where located, it was never more than 15 cm beneath the existing surface.

Stratum 4 is a highly compacted adobe. Subsurface clays, arena, and topsoil were apparently puddled together and applied wet to the existing land surface and the structural core represented by Structure A-1a. Lumps of clay, humus, and sand were thrown into the mass dry. As it dried, the mixture was packed down tightly to produce a compact finished product. The next step consisted of surfacing this solid core with a fine whitish-yellow adobe composed of puddled talpetate and arena. This unfortunately, has fared badly and much of the arena has eroded out leaving islands of talpetate to mark the former surface. What form constructional activity on top of the unit may have taken is unknown. Most of the ancient surface has been destroyed, and what remains was examined fruitlessly for indications of a superstructure. Architecturally, no valid statements may be made as to the nature or presence of a superstructure. It is hoped that analysis of the scant cultural material recovered from the structural surface may shed some light on the unit's general nature, however, my belief is that destruction and post-destruction mixing were probably too severe to justify inferring much even from such analysis.

The loamy, gray-black topsoil of the valley's current A horizon comprises Stratum 6. Cultural content is variable in intensity and on B-V-8 showed an admixture of Middle Class through Recent materials resulting from agricultural disturbance of the stratum's integrity. As indicated by the profiles, the natural topsoil was notably thin on and around Mound B-V-8, averaging only about 10 cm in depth.

Artifact Content

At the time of this writing, detailed analysis of the trench's artifactual content is still in progress. As noted above, content was light. Strata 1a and 1b were found to be sterile. Strata 2 and 3 contained a moderate amount of sherd and flake material including some recognizable Formative red-on-white pottery. As Stratum 2 constituted ancient topsoil and Stratum 3 a dry-filled derived in part from this soil, the presence of fragmentary debris is understandable. The prepared adobe of Stratum 4 was notably scanty

in artifact content, probably as a result of care taken during its preparation. Stratum 5 contained no artifacts, however, material was recovered from the topsoil overlying its surface. This of course, must be treated with caution, since contemporaneity between the topsoil contents and the buried structure cannot be assumed.

Cache A1. A nearly complete ceramic vessel (KJ69-3658, DOT 2) containing fragments of another and several obsidian blades was recovered from just inside Stratum 4 on the mound's southern slope (in the central-west wall of Unit 96). This vessel and a small baked clay figurine, or adorno (KJ69-2769, DOT 1) found 80 cm to its southwest were judged to be the contents of a small, subsurface cache in a southern terrace of Structure A-1. The vessel appeared to be of Formative age.

Analysis of the material from Cache A1 should prove a reliable means of establishing Structure A-1's age, and should support the Late Formative date suggested by obsidian dates from B-V-15 (Table 2).

It is a regrettable fact that post-occupational destruction has probably eliminated the possibility of establishing anything further about the nature of A-1 through its artifact assemblage.

Structure A-2
(Figures 2, 9, 10; Plate 1a)

A test trench sunk off the northern edge of Mound B-V-8 (Unit 200) encountered extensive cultural debris almost immediately beneath the surface (30 cm into the topsoil). This debris was exposed and it was decided to open adjoining squares to explore its extent and nature. A system of exploratory units (the 200 series; see Fig. 2) resulted in the complete exposure of a finely preserved residential structure which preliminary ceramic analysis and Sector 094 obsidian dates places within the Middle Classic period of Maya settlement at Kaminaljuyu.

Constructional Features

The builders of Structure A-2 were apparently influenced in their choice of a house site by the readily available clay source and pre-constructed platform represented in the remains of Structure A-1. The initial construction phase of A-2 consisted of quarrying clay from and leveling off an area on the northern side of the earlier mound. This provided an elevated, durable platform with a minimum expenditure of labor. The quarried clay was then available to the builders for further constructional activity. They appear to have pulverized it and puddled it with water to obtain a pliable substance. This mixture was then applied wet to a 6 x 6 m square area, packed down, and permitted to harden into a tough, smooth floor about 4 cm in thickness. An extensive area of the southeastern corner of this floor had at some time undergone firing.

On the west, north, and east sides of the structural debris, no direct evidence of walling was observed. Attempts to plane down the excavated surface above, level with, and below the prepared floor were unproductive with

respect to postholes or wall bases. The southern edge proved more productive, yielding evidence of a wattle-and-daub structure erected on a clay base. A packed, unfired clay wall extended along the southern edge of the floor from east to west with a single 1.5 m gap at its center. Ten centimeters wide, the wall is preserved to a height of 30 cm above the floor of the structure. The section of wall east of the central gap was fired. No post impressions were observed in the wall itself, however, covering the area of baked flooring immediately to its north was an extensive pile of fired clay rubble from a collapsed superstructure. This rubble suggested the former existence of a line of vertical pole daubed with a thick, baked clay plaster on their inward facing side. Impressions in the upper, ie., outward facing, surfaces of the debris clearly indicated the existence of a vanished line of closely spaced poles. There was no evidence that these had extended down into the wall base and, in view of its excellent condition, it is rather more likely that they rested on it. Similar pole walls can be conjectured for the remaining three sides as well, however, these do not appear to have rested on bases. This is possibly explained by the spatial relationship of A-2 to the remains of A-1. The younger structure's southern side faced directly into a slope of the older mound and the wall may well have been a retaining surface designed to prevent washoff from flowing through the open wattle work and into the house.

Three large slabs of rock were found clustered at the southeastern corner of the structure and these were taken to be the remains of an ancient hearth. The presence of such a heat source at that point would explain the extensive firing of floor and wall clay previously mentioned. The thick "plastering" of the pole framework is thus also clarified, since a hearth in close proximity to untreated cane or wood poles would have represented a considerable fire hazard.

A blanket of black, carbonaceous debris was found overlying all else throughout the structure. This presumably represents the remains of a burned or collapsed and decayed roofing of organic material. The peaked, thatched roofs of present day Maya houses immediately come to mind.

As mentioned, entrance seems to have been via a doorway on the southern side of the structure. This entrance-gap is presently somewhat over a meter in breadth. No evidence of the closure method was found. Of interest was the occurrence of a small primary midden precisely where such is generally found in modern contexts--about a hand's toss out the front door!

Artifact Content (Figure 10)

The living surface of Structure A-2 presented an extraordinarily rich look at the material possessions of a Maya peasent in Middle Classic times. Through analysis of the assemblage recovered from this structure, including reconstruction of the several complete vessels represented in the sherd material, should provide a unique and valuable vignette of ancient peasant life. Here, the inventory will be briefly described and some interpretive suggestions posited. The value of further study, however, cannot be sufficiently stressed. Presentation is by means of functional rather than compositional categories and represents an experimental attempt to avoid reducing behaviorally meaningful data into a mere descriptive catalog of objects.

Utilitarian Implements

1. Food Production

Ground Stone. Four complete celts of polished greenstone were found within the house (KJ69-8881, 7232, 7223, 8910). These averaged 8 to 10 cm in length by 6 cm in width. All showed considerable polish.

Two intact (KJ69-7399, DOT 22; KJ69-7732, DOT 24) and two broken (KJ69-7219, DOT 23; KJ69-7397, DOT 25) digging stick weights of ground vesicular basalt were found scattered on the floor. Based on hole diameters, the weights were fitted onto the ends of pointed wooden shafts somewhat over 4 cm in diameter.

Chipped Stone. A single obsidian projectile point (KJ69-7254) was found imbedded in the floor at the rear of the house. Although conceivably a hunting implement, its context suggested an extra-domestic origin and function which is discussed below.

2. Food Preparation and Storage

Ground Stone. Half of a ground stone metate (KJ69-7607, DOT 17) with two legs intact was found near the presumed rear wall of the house. A mano (DOT 26) and a hammer stone (KJ69-7382, DOT 27) lay nearby. The rear of the structure also produced a pestle (KJ69-7223, DOT 30), and a stone anvil (KJ69-7339). Two large rock slabs were also located in this rear area and they undoubtedly provided additional working surfaces.

Chipped Stone. Numerous blades and chips of obsidian were found scattered throughout the house and presumably were of functional, domestic nature. Analysis of wear patterns could conceivably yield some detailed functional implications. A number of scraper and knife forms were recognized, as well as several core fragments. Accurate quantification of this material must await further study of the computer printouts for Structure A-2. The available evidence does suggest heavy utilization of obsidian flakes and blades in domestic tasks.

Pottery. An enormous body of sherd material was recovered from the structure's interior, including the fragments of at least eight recognizably complete vessels. All appeared to be plain domestic wares and it is believed that reconstruction will yield the wide-mouthed olla and constricted-neck jar forms so typical of present day food and liquid storage among the Highland Maya. Sherd concentrations were observed to be composed of closely concentrated, large fragments at the edges of the structure and of scattered, small fragments towards the center. This suggests a model of storage vessels ranged on the floor against the interior walls of the structure and suspended from roofing beams throughout. Structural collapse would have crushed the wall-lining vessels in place but badly shattered the suspended vessels which, of course, dropped from a height. Such a model closely parallels that found within most present day Maya houses. A large, two-handled comal was found beneath the fallen rubble in the presumed hearth area. This is consistent with expectations based on ethnographic analogy.

An unidentifiable conical pottery object (DOT 19) was found near the rear wall. It possibly functioned as a vessel cover.

3. Non-Subsistence Activities

Two ceramic spindle whorls (KJ69-6130, DOT 5; KJ69-6115, DOT 7) suggested the production of cotton thread by the house's occupants.

A pecked stone bark-beater (KJ69-8576, DOT 31) further enhanced this rare glimpse of textile manufacture and suggested the utilization of beaten bark as well as spun cotton cloth.

Ceremonial Objects

The Domestic Altar (Plate 1b). Components: Groundstone - broken, greenstone celt, 1 (KJ69-7232, DOT 10); Chipped stone - obsidian scrapers, 2 (KJ69-7254, DOT 9; KJ69-7401, DOT 12); Pottery - vessel (sherds thereof), 2, figurine heads (canine), 2 (KJ69-7331, DOT 8; KJ69-7233, DOT 11).

This group of objects was found associated together in a context highly suggestive of their placement on a small domestic altar of unfired clay in the northeastern corner of A-2. Unfortunately, the clay platform itself was not recognized during excavation and, excepting the small pedestals left intact beneath each of the altar-top objects, no traces of it were observed. Similar altars should be watched for in future excavations within residential structures. The form of the 5 or 6 cm high altar base is, therefore, unknown. Two ceramic canine heads were placed on its surface some 45 cm apart. Both face southward. Between them were placed the two obsidian implements and the broken celt. In reflecting on these offerings, it is interesting to note that they represent on a smaller scale an inventory quite similar to that recovered by Webter on top of B-V-11, a Middle Classic temple platform. The small altar group of A-2 may represent a peasant class replication of the more formal religious practices conducted at B-V-11. The similarity of offerings would certainly seem to suggest shared intents. The fact that a broken celt was offered on the household altar while complete examples are found within the same house and as part of the more elaborate B-V-11 group suggests permanent retirement of offered objects from the tool kit. This, of course, is purely speculative.

Other Objects

The halves (KJ69-6126, DOT 4; KJ69-6125, DOT 16) of a micaceous schist figurine were found some 3 meters apart. The somewhat over 15 cm long piece had been broken at the waist. Facial and body features were grooved into the ground stone body. Its function is indeterminate.

A small chip of quartz crystal (DOT 6) was picked off the top of the southeastern wall-debris.

Discussion

Excavation revealed Mound B-V-8 to represent the remains of a composite platform (Structure A-1) consisting of a dry-laid clay core, a puddled clay structural mass and a talpetate-arena surfacing. It quite possibly was terraced. However, this was not determinable due to erosive and agricultural damage. Preliminary ceramic analysis suggests a possible Late Formative period dating for the structure, as does obsidian dates from elsewhere in Sector 094. Structure A-1 appears to be aligned with the large Late Formative mound across the finca to its west (B-V-6), and such a relationship would be consistent with the apparent ceramic phasing. I would suggest that A-1 represented a secondary structure of a postulated B-V-6 complex, separated from the latter by an open court or plaza. Future reports would do well to treat the two as parts of a single architectural complex. Little more can be said about the function of A-1. However, its spatial associations could imply either a ceremonial or residential function.

Sealed beneath the core of A-1 was an ancient land surface which preserved in its contours a rare look at Formative agricultural technique. Two inter-furrowed rows of maize hillocks were recorded on this surface suggesting a pattern similar to that of present times.

Structure A-2 represented a later reoccupation of the abandoned mound during the Middle Classic period. A flat, elevated plane was cut out of the mound's northern side and on this was erected a small (6 m^2) residential structure. The contents of this wattle-and-daub house are indicative of peasant class life based on digging stick agriculture. The size of the house suggests nuclear family occupation, however, extensive test trenching in areas surrounding this well-preserved unit are advisable before any conclusions are drawn with respect to the nature of the community pattern of which it formed a part.

Comparison of the artifacts found in Structure A-2 with those recovered from Structure B-2b suggests marked status differentiation among the Middle Classic occupants of Kaminaljuyu. This will be more fully discussed following presentation of Mounds B-V-14 and B-V-15.

MOUND B-V-14 AND B-V-15 EXCAVATIONS

Stage one stripping exposed extensive cultural remains at both B-V-14 and B-V-15 mounds. Architecturally, B-V-14 was found to contain the remains of two adjacent units (Structures B-2a and B-2b) of puddled adobe and fired clay. The artifact inventories suggested these to have been functionally differentiated. At Mound B-V-15, surface stripping exposed a large unit (Structure C-2) of puddled adobe and fired clay. Upon recognition of the probability that B-2a, B-2b and C-2 comprised a single structural complex, it was decided to completely expose these units if possible. Stage two operations involved the sinking of control columns into the mounds and the exposure of the above mentioned complex. During this stage Structure C-1

was encountered beneath the overlying units and an attempt was also made to trace out as much of this unit as feasible.

Logistical problems resulting from supervisory crew changes, labor difficulties and heavy rains severely hampered operations on the B-V-14/15 complex, it being not unusual for entire weeks to go by without any progress on one unit while the other was being excavated with a crew of only two or three workmen. For these reasons, the full potential of the mounds could not be exploited. In the following sections, stratigraphic trench data for each mound is summarized. This is followed by descriptions of Structure C-1 and the B-V-14/15 complex.

Mound B-V-14: The Stratigraphic Trench
(Figures 12, 13)

The central trench through Mound B-V-14 reveals a sequence of eight differentiable strata. From lowermost to uppermost they have been designated as follows:

1.	Fine yellow-white sand (arena)	Presence: natural
3.	Dark brown clay	Presence: natural
4a.	Light gray-brown sandy clay	Presence: artificial
4b.	Light gray-brown sandy clay	Presence: artificial
7.	Dark brown sandy clay, no pumice	Presence: natural
8a.	Dark brown sandy clay, pumice inclusions	Presence: artificial
9.	Yellow-brown clay, pumice inclusions	Presence: artificial
10.	Black sandy soil, debris layer	Presence: artificial
11.	Gray-black topsoil	Presence: natural

Stratum 1 appeared to be a culturally sterile deposit of yellow-white volcanic ash (arena).

The dark brown alluvial clay of Stratum 3 was found to contain light artifactual debris, presumably of intrusive origin. It had been artificially leveled and prepared for the overlying, artificial strata.

Stratum 4a appears to have been trowelled into place wet and permitted to dry before 4b was applied over it. The two are bonded together firmly and are of cement-like hardness. Each layer measures approximately 10 cm in thickness. These undoubtedly represent the subsurfacing and outer face of an occupational level at an elevation of 19.90 meters above datum zero. Their function and age are indeterminate. Large quantitites of artifactual material were recovered from their surface and from the stratum above them, however, analysis of this material is presenbly unavailable.

Stratum 7 is a dark brown sandy clay believed to represent an ancient topsoil. Temporal and functional analysis of this layer's occupational content, which was heavy, is now in progress.

A pumice chip impregnated layer of brown sandy clay comprises Stratum 8a. It is believed to be a structural unit of possible Middle Classic date and is discussed below as Structure B-1.

Stratum 8a bore a yellow-brown adobe structural mass (Stratum 9) and a black, pumice and clay chip impregnated debris layer (Stratum 10) associated with this mass. These are discussed below as Structures B-2a and B-2b.

The valley's normal gray-black topsoil composed Stratum 11 of our control pits. Cultural content was variable and reflected a mixture of Middle Classic through Modern debris.

Mound B-V-15: The Stratigraphic Trench
(Figures 14, 15)

The central trench through Mound B-V-15 reveals a sequence of nine differentiable strata. From lowermost to uppermost they have been designated as follows:

2.	Yellow talpetate	Presence: natural
4.	Light gray-brown sandy clay	Presence: artificial
5.	Dark brown clay	Presence: artificial
6a.	Yellow-brown pumiceous clay, reddish tinge	Presence: artificial
6b.	Yellow-brown pumiceous clay	Presence: artificial
7.	Dark brown sandy clay, no pumice	Presence: natural
8b.	Dark brown sandy clay, pumice inclusions	Presence: artificial
8c.	Brown sandy clay	Presence: artificial
9.	Yellow-brown clay, pumice inclusions	Presence: artificial
10.	Black sandy soil, debris layer	Presence: artificial
11.	Gray-black topsoil	Presence: natural

Stratum 2 appeared to be a culturally sterile deposit of volcanic talpetate. Although of natural origin, this stratum had been artificially modeled and planed so as to produce a flat upper surface (elevation 19.34 above datum zero). This then served as a base for further structural activity. From Grid 65.50 east eastward, this took the form of a 2 cm thick flooring of compacted and fired clay laid directly over the talpetate. At 65.50 east, this flooring abutted on the structural layer represented by Stratum 4.

Stratum 4 was a granular, light gray-brown sandy clay. It is similar in composition to Mound B-V-14's Stratum 4a and 4b, but is thicker and not so carefully prepared as those two bands. As its upper surface possesses an elevation nearly equivalent to theirs (about 20.00 above datum zero) it is not unlikely that they represent similar structural activity in the form of an elevated occupational surface. Mound B-V-15's Stratum 4 represents an outer, supportive edge of this platform and is consequently massive and homogeneous whereas at Mound B-V-14 we are dealing with final surface paving over a prepared clay core (Stratum 3).

Stratum 4 possessed a high ceramic sherd and obsidian flake content. In addition, the living surfaces of both Strata 2 and 4 produced heavy occupational debris. Preliminary analysis indicated the pottery from both within and on these strata to be of Formative date.

Stratum 5 was a sterile, artificial unit of compacted brown clay. It is discussed below as Structural Unit C-1a.

Stratum 6a was also a sterile artificial unit (C-1b) of puddled talpetate, pumice, and brown clay. It is discussed below.

Stratum 6b, discussed below as Structural Unit C-1c, was found to consist of puddled talpetate and pumice.

A natural layer of alluvially deposited, dark brown, sandy clay (Stratum 7) covered all lower strata. Stratigraphic indications are that this ancient topsoil postdated Mound B-V-8's Stratum 2 in deposition. Stratum 7 produced heavy concentrations of cultural debris throughout its depth. In general, heavy obsidian flake and fine ceramic materials occurring in its lower third were recognizably Formative, while fine obsidian blades and plain orange wares occurring near and on its upper surface were identifiable as Amatle in age. Structural activity carried out above this deposit was presumed to be Middle Classic in overall age. However, at least two distinct phases of construction are represented by the B-V-14 and 15 complex remains and detailed ceramic analysis will be necessary before the intra-period relationship can be clearly understood.

Strata 8b, 8c, 9 and 10 were judged to be B-V-14 and 15 complex components and are dealt with in the discussion of Structure C-2.

As previously described, Stratum 11 consisted of the valley's current gray-brown topsoil and contained an admixture of Middle Class/Recent cultural debris.

Structure C-1
(Figures 14, 15, 16)

Indication of C-1's presence was first encountered in the form of an area of fired clay flooring at an elevation of 19.36 meters above datum zero in Square 312. This 2 cm thick floor directly overlay the prepared talpetate surface previously described (Stratum 2) but did not extend over its entirety. In the area excavated, it was restricted to a 50 cm wide strip between the eastern trench wall and a western edge where it abutted on the artificial structural layer, Stratum 4 (see Fig. 15). Its relationship to Stratum 4 and Structure C-1 suggests that it might represent a lower plaza or court area surfaced in conjunction with the latter constructional activity. Further data was obtained from the profiles of a 17 m trench north through Mound B-V-15 and subsequent east-west extensions thereof. Three structural components were revealed by this trenching activity.

Constructional Features

Structural Unit C-1a (Stratum 5) consisted of a small platform of very dark brown clay. Its total north-south length was recorded as 2 meters; east-west dimensions were not determined. Surface elevation was found to be 20.25 meters above datum zero. The frontward (southern) placement of this unit as well as the pristine condition of its untreated clay surfaces,

indicative of immediately post-constructional burial, suggested that it functioned as an internal support for a stairway on C-1's southern side. No artifact material was recovered from either the surface or interior of C-1a.

Structural Unit C-1b (Stratum 6a) consisted of a reddish-yellow pumiceous talpetate mass enclosing C-1a and extending northwards for an overall length of 7 meters. The structural material appears to have been composed of puddled yellow talpetate, ground pumice, and some dark brown clay. The composite mixture was applied wet over C-1a and built up to a height of 55 cm above the talpetate living floor (Stratum 2) with an upper surface elevation of 20.20 meters above datum zero. Some 7 m in its north-south dimensions by 9 m east-west, Unit C-1b does not appear to have been intended as a complted unit but rather as an internal core. This may explain the inclusion of the more easily quarryable, less durable brownish clays which give this unit its reddish tinge. Shaping of its form does not seem to have been taken beyond compaction into a slope-sided rectangular mass with smoothed surfaces. As with C-1a, the unit was found to be artifactually sterile.

Unit C-1c completed the platform here designated as Structure C-1. The unit was composed of a tough, compacted talpetate-pumice chip adobe. This mixture was evidently spread over the C-1b core unit and modeled into a terraced, southward facing platform while still wet. It measured about 8 m north-south by 9 m east-west. A surface elevation of 20.40 meters above datum zero indicated a finished height of 75 cm above the Stratum 2 surface.

Structure C-1 straddled a split-level occupational surface represented by Strata 2 and 4. This resulted in considerable height variance in its basal terrace. The eastern segment of this terrace rose directly from Stratum 2 and was some 60 cm in height. The western portion of the unit rested on the artificial platform represented by Stratum 4. As this platform possessed an elevation of 40 cm above the surfaced talpetate, it was necessary to raise the terrace only 20 cm more in this area (Figs. 15 and 19). Large rocks were employed for supportive buttressing beneath the outer edges of this terrace (Fig. 16). Access to the terrace was by means of a short stairway rising from the Stratum 4 platform on its southern side.

C-1's second terrace was set back about 1 meter from the edge of the first on the north and south sides, 2 meters on the east and west. It rose an additional 20 cm to a summit platform 6 meters north-south by 5 meters east-west. This was crowned by a slightly elevated (about 5 cm) unit 3 meters north-south by 2.5 meters east-west. This was found to contain an oval burial pit. The grave, here designated Burial C1, is described below.

C-1 appears to have been faced with a thin coat of indeterminate substance which has left traces of its former presence on several areas of the outer surface. These were in the nature of a blackish organic stain, 2 cm in thickness.

Burial 1 (Figures 14, 18; Plate 1c)

This unit consisted of a centrally located oval pit, 1.70 meters north-south by 2.30 meters east-west in upper diameter. The pit's sides sloped inward to a basal diameter of 1.30 meters by 1.90 meters at 70 cm depth.

The sides and floor of the pit were fired-clay lined and a 4 cm thick cap of fired clay covered its mouth. A 10-15 cm thick bedding of fist-sized stones covered the entire floor of the grave and a single line of these stones ringed its interior to a height of 25 cm.

The loosely flexed skeleton of an adult male individual lay face down on the stone bedding. The body had been oriented in a north-south direction with the head to the south. Soil pressure had pushed the skull downward and sideways so that, when found, it faced the west. Initially, however, the head most probably faced directly downwards. The skull exhibited extreme artificial broadening. Arms lay loosely alongside the body, but the legs were turned sideways and drawn up towards the pelvis.

There were no special grave goods. Rather, the pit was filled with the fragments of apparently common domestic wares; a large number of obsidian scrapers, knives, and flakes; and a single, broken mano.

Preliminary examination of the ceramics indicated a Formative phase date for the burial. This is consistent with the phasing suggested by the rest of the materials associated with Structure C-1 and with the obsidian dates from Cache C/1.

Artifact Content

Artifactual debris on and around Structure C-1 was heavy. Vessel fragments were of easily recognizable Formative types.

Pottery was represented by a rather fine class of wares including black-brown incised and red-on-white carved vases. Adorno and figurine fragments were also heavy.

Obsidian debris was extensive and consisted of numerous heavy flakes and flake tools. Cleaver, scraper and knife forms were well represented. Only one core was recovered, and this had been reworked into scraper form.

Ground-stone metate, mano and grinder detritus was scattered around the base of C-1, primarily on and in Stratum 4.

Several basal fragments of a nubbin-supported bowl or vase of carved and polished serpentine lay among the ceramic vessel and obsidian flake debris on C-1's upper terrace.

Cache C/1. An inverted calvarium and several large obsidian blades (which were subsequently obsidian dated) were encountered at an elevation of 19.88 meters above datum zero in Square 309. These were in association with a large (60 cm in diameter) concentration of carbonaceous material from which a C_{14} sample adequate for running was procured (KJ69-5842, DOT 11). Sherd material in association was scarce and quite fragmentary.

The skull cap, obsidian blades and presumed hearth lay directly on the structural unit represented by Stratum 4 and beneath the central southern mass of Structure C-1. Its precise horizontal provenience is indicated by the "X" in Figure 19.

The fact that Formative phase materials were recovered directly from C-1's surface, the split level occupational floor on which it was constructed, Burial 1, and from within the fill of both Stratum 4 and Structure C-1 would suggest a Late Formative dating for this structure. This evidence is supported by the obsidian dates from the Cache. They indicate a chronometric range of 555 B.C.-321 B.C. (see Table 2).

Discussion

Structure C-1 represents a terraced, clay platform of Late Formative age. This unit was constructed so as to straddle the dividing line of a split-level occupational surface. Consequently, its eastern face is some 40 cm greater in height than its western side. The change in plaza level, with a lower floor to the west, and the straddling position of C-1 calls to mind the situation encountered at Mound B-V-2 (Cardenas 1969) several hundred feet to its south and the possibility exists that some spatial/functional relationship existed between the two (B-V-2 is also Late Formative).

The human skull cap and several obsidian blades found in association with a possible hearth beneath the structure's southern side (Cache C/1) and on the upper occupational floor were in such condition as to have necessitated their intentional incorporation with the structural mass. Whether they represented the remains of a ritual meal or a dedicatory cache is, however, indeterminate. The in situ activity represented by these remains presumably occurred very shortly prior to or during the initial stages of C-1's construction. The feature recalls Lothson's similar find at the Late Terminal Formative elite residential platform B-II-1 (Austin 1969). There also, a human skull cap was found in association with a hearth and other cultural debris on a southern platform terrace.

No evidence of a superstructure was observed on either of the terraces, however, it is not impossible that the upper at one time supported a unit of perishable material. The amount and nature of occupational debris mound and on C-1 suggest to my mind that the platform was initially residential in function. Certainly, such a role is not negated by the presence of Burial 1, which appears to represent a minor, sub-floor interment. The ceramic inventory on and around the mound appears to consist of fine quality domestic wares; the grave pit was elaborate in preparation but contained ordinary domestic items. The quality and nature of the non-grave inventory, the grave itself, and the grave goods suggest a minor-elite status for the individuals involved.

Postulation of the unit as a minor-elite family's residential platform and of the grave as the sub-house floor burial of a member thereof would appear to fit the recorded date. Alternative explanations, ie., a primarily ceremonial or burial function for the unit or an absence of direct relationship between the grave and the extra-burial occupational remains should, however, be kept in mind.

Structure B-1
(Figures 11, 13)

The remains of Structure B-1 were observed in the profile of Mound B-V-14's stratigraphic trench. The condition of this unit was such that detailed data recovery was not attempted and even recognition of its presence proved extremely problematic. A brown clay had been mixed with pumice chip temper and deposited directly on a leveled soil surface to form the substructure of this unit (Stratum 8a). After modeling, the unit had been covered with a 4 cm thick surfacing of clay and this had been fired in place. Post-abandonment destruction had apparently been severe. This was further complicated by incorporation of the unit within the foundational mass of Structure B-2 and the compaction-distortion resulting from the latter's overburden. Although traces of B-1 appeared in somewhat better condition at a number of points, the overall data recorded was found to be unsatisfactory with respect to obtaining a meaningful understanding of the unit's appearance or function.

Artifacts in association with B-1 consisted solely of some badly crushed sherds on its surface. It is hoped, however, that analysis of the ceramics from the soil horizon beneath this unit and from Structure B-2 will at least serve to bracket the time of structural activity. Beyond this, nothing can be said.

Structures B-2a and B-2b
(Figures 3, 11, 20, 21, 26, 27)

In far better condition was Structure B-2. Actually composed of two distinct units, B-2a and B-2b, this structure consisted of a rectangular platform (B-2a) situated on the western edge of an elevated court (Stratum 8c). A broad stairway rose from court level (20.50 above datum zero) to its eastern summit. On the west, the platform dropped directly to a 20.40 above datum zero surface. A small, apparently residential unit (B-2b) adjoined it on the south. The artifact inventory of this unit suggested a residential function, but one in some way differentiated from Structure A-2.

Constructional Features (B-2a)

The primary step in B-2a's construction had been the deposition of a solid structural core of prepared adobe. Compositionally, this was observed to be a yellow-brown pumiceous clay. Color, texture and homogeneity indicated a high talpetate and pumice chip to brown clay ratio. These ingredients had been puddled, poured and roughly shaped while wet, subsequently drying into an extremely compact, durable mass. This activity had been carried out on the site of B-1 and had incorporated portions of the earlier unit. While still pliable, the core was apparently modeled into its intended form and surfaced with 2 cm of brown clay. This was baked in place to a hard, dull-red finish. The completed platform rose to an elevation of 21.22 above datum zero, suggesting a height of 82 cm above its contemporary land surface. A rectangular base 13 m north-south by 11 m east-west made up the first 46 cm of this height. The upper platform was set back some 50 cm from this base's edge. On the west, the base rested directly on the 20.40 above datum zero

land surface. On the north, east and south, however, elevation had been gained through utilization of the B-1 substructure and to the east an elevated court had been created through the addition of 10 cm of tamped, sandy brown clay to the 20.40 above datum zero surface. The B-2 platform, therefore, would appear to have stood on the western edge of an artificial terrace of brown sandy clay. This terrace, which was encountered by several test trenches and shows up exceptionally well in Figure 14 as Stratum 8c has been designated Structural Unit B-C Platform. Its eastern and southern extensions were not determined, however, it is known to terminate at Structure C-2 on the north and B-2 on the west. Most probably it served to elevate and set off the small architectural complex represented by these and a third, postulated unit to their east.

The most impressive aspect of Structure B-2 was the stone terrace and stairway on its east (Fig. 20). Stone work is rare at Kaminaljuyu, and B-2's eastern terrace represents utilization on a much larger than usual scale. A double row of carefully selected flat rocks, each about 10 cm in thickness, was set out parallel to and just in front (east) of the platform's basal footing. This line of stones maintains a breadth of 60 cm along its entire 11 meter length. Their uniform 20.55 above datum zero elevation indicates a step up of some 7 cm from the surface of Structural Unit B-C- Platform to this terrace (an eroded 2 cm baked clay surfacing is included). Behind and supported by the stone rows is the basal mass of B-2a. The stones curve around to the west at both their southern and northern extremes, and on the north were observed to terminate against the basal footing of B-2a. On the south, they continue past B-2a's edge to include the area occupied by B-2b. Sixty centimeters back from the edge of this terrace, a single row of massive rocks delineated the stepped approach to B-2a's summit. Arranged along the lower terrace in a 6.5 meter long line, they presumably functioned as the medial buttressing of a broad, two step stairway. Wear on the stairway's 2 cm thick baked clay surfacing had been sufficiently constant to require two subsequent refacings. The second of these had substantially altered the appearance of the structure, reducing its approach to an outcurved, narrow (2 meter wide) center way (see Fig. 20).

B-2a's upper surface proved a disappointment. Its proximity to the current land surface, which is actually below the platform level in several places, had resulted in severe damage to even its constructional features. In my judgment, hoe damage and post-occupational mixing was sufficient to negate the possibility of obtaining any usable artifact data from this platform surface, however, analysis should be carried out on the chance that the debris may be suggestive of a broad range functional context.

Agricultural damage to the northern end of the platform was severe enough to eliminate all traces of a superstructure, however, its southern portion was found to have fared somewhat better.

Two meters back from the southern edge of the platform, an intact area of baked caly, 70 cm in diameter, was encountered. Set into the floor at this point was a conical depression, 30 cm in diameter and 20 cm deep. The sides and bottom of this pit were baked-clay lined. A semi-circular depression 2 cm deep intersected the northwestern quarter of the pit mouth. Its only contents were four pumice blocks jammed up against the basal pit wall.

Placement and similarity of this feature to two depressions encountered by Webster on B-V-11 strongly suggest it to have functioned as a posthole. The pumice blocks might feasibly have served to wedge a main support post in place. Post-occupational reuse of this post might explain the absence of decayed residue in the pit itself. If this interpretation of the feature is correct, one might postulate the former existence of a similar unit in the destroyed northern part of the platform. No indications of such were, however, recovered.

One meter further north and slightly west of the previous feature was located an elevated concentration of a fired clay, pumice and broken rock. As isolated, it rose some 34 cm (to 21.56 meters above datum zero) above the platform floor and was rougly 60 cm in diameter. While apparently a non-descript mass of rubble, its similarity to two features of Structure C-2 and its spatial relationship to the eastern stairway and traces of vertical facing running between it and the stairway suggest that it stood at the head of an elevated balustrade. A 10 cm in diameter substairway support brace of talpetate was located just inside the line of this hypothetical balustrade at a depth of 20 cm below the structural surface.

Artifact Content (B-2a)

Cache B/1. An exploratory trench through the center of B-2a's eastern side revealed a substairway cache consisting of a complete mano and an intact hemispherical orange ware bowl filled with specular red hematite. These had apparently been placed on the basal terrace (20.57 meters above datum zero) prior to construction of the stairway.

As observed, surface destruction had been severe and cultural debris from the upper platform was scattered and fragmentary. A large collection of good quality orange ware sherds was obtained from rubble on the stairway and around the base of the structure. Vase and pitcher forms were recognized and applique decoration was common.

Obsidian occurred in fine long blade and heavy implement forms which did not appear to be utilitarian in nature.

Constructional Features (B-2b) (Figures 21, 26)

The southern face of Unit B-2a was found to function also as the northern wall of a second, terrace-level (20.50 above datum zero) structure which was designated as Structure B-2b.

As at Structure A-2, a 4 cm thick coat of tamped clay formed the living floor of this unit. Areas of firing were found adjacent to the western interior wall of the unit, and these might have represented either kitchen or ceremonial activities. The overall width of the unit (east-west) was determined to be 6 meters. Its total north-south expanse was not established, however, it appeared to exceed 4 meters.

Wall bases and extensive clay debris were present on the unit's north and northwest sides. No evidence of walling was observed on the east or south. Extending southward from B-2b's northwest corner for a distance of

2.80 meters was a solid wall base of fired clay covered pumice blocks. Fist-sized blocks of pumice had been set in a 30 cm wide line to a height of 30 cm. They had then been plastered with 2 to 4 cm of brown clay which was subsequently smoothed and fired. Eastward from the corner, the basal footing and south face of B-2a served as a northern wall for B-2b. The 50 cm setback of B-2a's first terrace thus provided a bench across B-2b's north interior. A single, 20 cm diameter posthole was encountered in the presumed area of B-2b's northeastern corner post and this suggested a southward extending wattle work wall to have stood at about 58.50 east, ie., about 6 meters east of the western wall base (about 52.50 east).

Immediately outside (east) of this a 1 meter wide, 4 meter long terrace of cut pumice blocks had been laid down (Fig. 20, 21). The placement and elevation (20.57 above datum zero) of this surface suggested identity with the previously described lower terrace of B-2a, and it was no doubt intended as an extension of the latter.

Again, a blanket of carbonaceous debris suggested the former presence of a burned or decayed roofing of organic material.

No certain evidence of an entrance way was discovered, however, this presumably was on the terrace facing (eastward) side and may have been associated with the semi-circular stone arrangement at the terrace's southern end.

Artifact Content (B-2b) Figure 21)

The artifactual inventory of B-2b was neither so rich nor so varied as that of A-2. Even the limited sample of material recovered, however, was sufficient to suggest notable differences between the life-styles represented by the two units. The implications of these differences are discussed following a brief presentation of the inventory. As before, functional rather than compositional categories are employed to facilitate comparison.

Utilitarian Implements

1. Food Production

Ground Stone. Celts: absent.
Digging stick weights: absent.

Chipped Stone. Absent.

2. Food Preparation and Storage

Ground Stone. Half of a ground stone metate with two legs was found against the rear wall of the house. A mano and a small grinding stone lay nearby. A large rock slab located in this rear area probably provided additional working surface.

Chipped Stone. Blades and chips of obsidian were found scattered throughout the house and at least some presumably were of functional,

domestic nature. Analysis of wear patterns could conceivably yield some detailed functional implications.

Pottery. An enormous body of sherd material was recovered from the structure's interior, including the fragments of at least six recognizably complete vessels. All were of a noticeably finer grade of orange ware than the A-2 vessels had been. Applique decoration and modeling was common and of high quality. The decorative appeal of even the larger storage vessels was marked. At least one fragment of plumbate was noted among the debris.

Ceremonial Objects

The Domestic Altars. Components: Ceramic - effigy altar of baked clay in form of squatting canine (KJ69-7602, DOT 50; DOT 53). Large, constricted neck jar with applique decoration (KJ69-8591, DOT 51; DOT 52).

A squatting canine altar and accompanying jar was found in both the northwest and northeast interior corners of Structure B-2b. That occupying the northwest corner was found in situ in a fine state of preservation (Plate 1d). It consisted of a baked clay effigy of a curled up, reclining canine. The animal's back had been modeled as a flat surface with a central perforation. The figure is hollow and could conceivably have served as an incensario or incensario cover, however, no evidence of fire smudging was detected. As in the case of the A-2 domestic altar, the effigy faced due south. A tall jar stood just behind (north of) the altar.

The northeast corner altar had been deliberately smashed and scattered. However, sufficient material was recovered to permit reconstruction of its appearance. The large vessel which had accompanied it was found broken on the pumice block surface adjacent to the presumed northeast corner.

Discussion (B-2b)

Several contrastive observations about B-2b and A-2 are immediately apparent from the above. While domestic equipment for the preparation and storage of food was present in both houses, items indicative of food production were notably absent from B-2b. (Dispersal of production equipment throughout the 36 square meters of A-2 was such that I am reasonably certain some evidence would have been recovered, had any been present, from the 19 square meters excavated in B-2b.) The domestic pottery recovered from B-2b was of a finer grade than the plain wares of A-2 and there was evidence, in the case of the plumbate material, for the presence of more valued trade ware in B-2b. Ceremonial objects were given far more emphasis in B-2b than in A-2 and were of far better quality. Finally, B-2b was directly associated with an architectural complex and seems to have been included as an integral part of that complex's design.

I would draw several inferences from the foregoing observations.

First, if genuinely contemporary, as they appear to be, then Structures A-2 and B-2b represent the residences of individuals or families of clearly differing status. The nature and quality of the two assemblages imply class

distinction, moreover, the occupants of B-2b would appear to have been members of a class enjoying higher social status than that of A-2's occupants.

Second, the absence of visible means of food production from the B-2b inventory suggests that such activities were not the concern of members of the class therein represented but rather than their subsistence needs were provided for by members of the class represented in A-2.

Third, the emphasis on ceremonial objects within B-2b and its spatial association to the B-V-14/15 complex suggest that its occupant was a religious functionary of some type. This role may have been the source of the occupant's elevated status or an adjunct of it.

Structure C-2
(Figures 14, 17, 22, 23, 24, 26, 27)

Extensive trenching revealed Structure C-2 to have been a 1 meter high rectangular platform set back immediately north and east of Structure B-2a. Access was by means of a stairway on the south side which rose from the elevated court area (Stratum 8c) flanked by B-2 on the west and C-2 on the north. A 15 cm high basal platform extended 12 meters north-south and 16.5 meters east-west. On the north, this platform dropped directly to a 2 cm thick flooring of fired clay overlying Stratum 7 at 20.40 meters above datum zero. Careful planing of the southwestern corner showed these to have been rounded and indented (see Fig. 22).

One meter back from the edge of this basal unit on the south and about 3 meters back on the east, north and west, the main platform rose 85 cm more to a surface elevation of 21.32 meters above datum zero. This upper surface measured some 8 meters north-south by 12 meters east-west. Vertical faces appeared to be plumb, corners rounded. Two circular masses of fired clay and stone rubble apparently doubled as balustrade heads and elevated posthole bases. Unfortunately, the stairway was not recovered, however, sufficient indication of its internal structure and the flanking balustrades were recognized to permit estimation of its probable appearance.

A small burial pit, described below as Burial 2 was located beneath the floor at the platform's center. Although no other indications of its presence were observed, a perishable material superstructure of unknown form was probably associated with the balustrade-head/posthole bases.

Constructional Features

Internally, C-2 showed two distinct phases of construction, however, the temporal relationship of these and the initial nature of Constructional Unit C-2a were indeterminate.

Constructional Unit C-2a (Stratum 8b) consisted of a terraced mound of pumice chip impregnated, dark brown sandy clay. It had been laid down directly over the Stratum 7 land surface so as to take advantage of the "natural" elevation offered by the remains of Structure C-1. As observed in our profiles, C-2a measured 7.5 meters north-south and rose about 85 cm

above its contemporary land surface. The east-west extent of this unit was not determined. C-2a's lower terrace sloped upward and inward to a 30 cm high platform. Fifty-five centimeters back from the edge of this, a second inward sloping face rose 55 cm to the upper platform. Talpetate blocks had been set into the fill behind the upper terrace face to act as structural supports.

Black, carbonaceous stains at several points suggested either eroded facing or pre-C-2b activity on C-2a's surface. The fine condition of C-2a would seem to argue against long exposure to the elements, and this in turn would seem to suggest that the carbonaceous streaks, obsidian blades and crushed pottery found on its surface reflected either occupational or ceremonial activity carried out in conjunction with construction of the final unit (C-2b). The nature of C-2 and the direct association of the carbonaceous streaks and artifacts with balustrade footings would seem to suggest a dedicatory context for these remains. A radiocarbon sample was obtained from one such deposit (KJ69-7746, DOT 24) along with the fragments of a complete vessel. Comparative phasing of C-2a and C-2b surface sherds should go far in determining whether the former unit was strictly a structural component of C-2 or whether it represented the incorporated remains of an earlier building. Should the former prove to be the case, the carbon sample obtained would nicely date the time of structural activity represented by C-2.

Structural Unit C-2b consisted primarily of a series of additions to C-2a, enlarging and modifying its form so as to produce the composite structure designated C-2.

On the south, a 20 cm high apron of dark brown clay was extended out some 2.5 meters from the lower terrace. This was buttressed across its southern edge by an east-west line of large, water worn cobbles (see Fig. 22).

On the north, 10 cm square cubes of talpetate were set in an east-west line across the face of C-2a's lower terrace and a puddled talpetate and pumice chip adobe was poured over them and modeled into an inward sloping platform. This was faced with a fine baked-clay plaster which joined directly to a thick flooring of the same material. This 2-4 cm thick surface, which had been laid directly over Stratum 7, extended north for an undetermined distance from the base of C-2. It possibly represents the remains of a formal plaza level on that side of the structure.

For some unknown reason, the design apparently being followed in C-2's construction up to this point (ie., the erection of an insloping, terraced platform) was abandoned and the unit completed in for simpler fashion. A large mass of pumiceous talpetate was puddled into place to form the upper, central platform described earlier. On the south, this unit was started some 2 meters back from the edge of the basal extension. On the north, however, it completely covered and enclosed the lower terrace and about 2-4 meters of plaza floor. Unfortunately, post-occupational damage was severe and the form of the new northern terrace was indeterminate. It is presumed, however, that its design closely paralleled that of the better preserved southern and western sides.

The outer surfacing of C-2 consisted of a dark brown clay, fired to dull brick red. Vertical faces appear to have been simply plastered, while horizontal areas showed as much as 4 cm thickness of baked clay. Erosional damage had been extreme and with the exception of a few fortuitously preserved patches, most of this facing had disintegrated and was detectable only as a component of Stratum 10, a blackish band of debris-bearing soil thoroughly shot through with chips of fired clay and pumice.

To the south of C-2, an artificial layer of brown sandy clay (Stratum 8c) had been laid down over Stratum 7 to produce a slightly elevated central court (assuming a third structure to the east). This was the B-C Platform, previously mentioned in connection with Structure B-2. A narrow stairway, approximately 4.5 meters wide, led up to C-2's summit from the B-C Platform.

Logistical and operational problems unfortunately resulted in the loss of properly observed and recorded data for this stairway and its balustrades, however, a sufficient amount of information was collected to permit the reconstruction in Figures 26 and 27. Large rocks were employed to brace the basal footing of C-2 across its southern face (Fig. 22) and southward extensions of rock presumably served to help buttress the projecting stairway. At least the first step down from the platform summit (about 21.12 meters above datum zero) was re-enforced with a pumice block core, and possibly similar features were originally to be found beneath each step. A compacted clay sidewall was found to extend somewhat further south than the 21.12 step on the west and was noted to be baked clay plastered at several points. On the east, traces of baked clay plaster extended in a slightly curved line from the edge of the summit platform back (north) to one of the previously mentioned circular concentrations of fired clay rubble. Its resemblance to a balustrade is marked (see Fig. 22). In section, the interior side of the west balustrade was found to reach a depth of only 20.73 above datum zero and it is therefore presumed that the wall did not extend beyond the step at this level (see Fig. 25).

Two 60 cm in depth, 12 cm high concentrations of fired-clay rubble were encountered on C-2's summit (Fig. 22). The easternmost of the two clearly showed the remains of a clay lined, rubble chinked circular depression in its upper surface and it is on this basis that the two are postulated to have functioned as elevated postholes. Fired clay plaster also stretched south from both, in the case of the easternmost joining directly into the stairway balustrade. For this reason, they are also postulated as balustrade heads. In section, the two presented similar, somewhat unusual profiles (see Fig. 17).

It would appear that a small pit was either left open or excavated down into the upper surface of Unit C-2a to a depth of 60 cm (ie., to 20.72 above datum zero). At this level, a 70 centimeter in diameter base of flat stone slabs was laid down and coursed to a height of about 16 cm. The pumiceous yellow brown clay of C-2b's final stage was then added above and around this foundation, leaving a 56 cm in diameter circular shaft open above it. The sides of this shaft were plastered with 2-4 cm of brown clay and an extremely hot fire started on the shaft floor. This had been hot enough to badly crack the underlying foundation stones. As near as can be determined, clay and stone rubble was then dumped down the shaft and packed tightly into the

desired posthole-mount form at its top. The entire unit was in this way baked internally to a rock-hard consistency. A large radiocarbon sample (DOT 25) was obtained from the charred rubble at the base of the shaft. This should nicely date the activity represented by the balustrade and C-2's completion.

As noted above, no remains of a superstructure were recognized, however, it is my opinion that a beam supported, thatch roofed unit did at one time crown C-2 and that the balustrade head/posthole bases were key elements in its construction.

Artifact Content

Artifact remains from Structure C-2 were rich and should prove adequate for phasing this structure. Absolutely all material from C-2b's and C-2a's surfaces was retained and fed into the computer process so that thorough analysis of the artifactual inventory will eventually be available. This will be presented in detail in subsequent reports. For purposes of the present report, an abbreviated description of the inventory will, therefore, suffice.

Obsidian. A large body of obsidian blade, flake and chip material was collected. This differed from the worked obsidian of Substratum 7 levels in that whereas heavy flake material had predominated in the lower levels, parallel sided blades were the more common form in the upper. This replacement of one form class by another may indicate a distinction in the nature of activity associated with Structures C-1 and C-2.

Cut Stone. A single fragment of a carved stone slab (KJ69-4932, DOT 2) was recovered from the surface of C-2. It lay directly between and slightly north of the two balustrade heads. Workmanship was of good quality and it may feasibly represent the remains of a smashed stela originally set in place directly above and behind Burial 2.

Pottery. Pottery was fragmentary on C-2b's surface and absent from its fill. A sufficient body of material was recovered from around the base of the unit, however, to permit comparison with that from C-2a's surface and consequent subphasing of the two collections. Overall evaluation of the pottery from above Stratum 7 indicated an Amatle occupation.

A ceramic dish (KJ69-8732, DOT 20) of unknown function was recovered from a small elevated section of C-2's lower terrace (Fig. 22).

Cache C/2 (see Figures 24, 25). This cache represents a large pit either left open during C-2's construction and subsequently filled or later excavated and refilled. I favor the former view. It would appear to me that at the time of C-2's construction, a 1 meter wide pit was excavated into Stratum 7 just east of Structure C-1. This was continued down 60 cm to the talpetate surface of Stratum 2 by which point its breadth had decreased to 60 cm. Dedicatory material (consisting of numerous broken ceramic vessels) was thrown into this pit and it was refilled to the Stratum 7 level. At that point a clay capping was spread across its mouth and fired in place.

Among the objects recovered from the pit was a piece of pumice which had been cut into a life-sized human heart effigy. A hole had been drilled through the heart, perhaps to ritually "kill" it. Analysis of the pit's ceramic inventory was still in progress at the time of this writing.

Above the fired clay seal, the pit widened rapidly until, at the surface of C-2b, it was some 3.20 meters in diameter. Its southern limit extended to just behind the vertical face of C-2's upper terrace. At this point the pit was lined with a coursed wall of clay-plastered talpetate bricks (Fig. 25). An intact, spiked incensario rested on the upper chamber's floor, directly beneath C-2's center. The entire chamber was filled with a yellow brown sandy clay containing inclusions of ground pumice.

Structure C-2's central pit most probably was of the nature of a dedicatory unit. The probability of this would appear to be increased by its relationship to Burial C/2 which occupied a central point within the pit, just below C-2b's surface.

Burial 2 (Figure 23)

This feature consisted of the subsurface interment of a single adult individual in the center of Structure C-2. The grave itself was an unlined pit beneath the C-2b surface and it is conceivable that the burial took place during the filling of the large central pit. A space seems to have been left open at the top of the pit to receive the corpse and its accompanying grave goods. After interment, this was apparently filled with a sandy brown soil and sealed by the fired clay surface of C-2b. The previously mentioned stone marker might have been subsequently set in place above and slightly behind the grave.

The pit contained the badly damaged remains of an adult individual. Earth robbing operations had gouged out the northern portion of the grave, together with part of the body and proximity to the current land surface had resulted in further agricultural and erosional damage to the skeleton. Examination revealed only that it was that of an adult. The body appeared to have been buried in an eastward facing, seated position with the knees drawn back to the head.

Grave goods accompanying the burial were well preserved and consisted of the following inventory (for arrangement, see Fig. 23):

Ground Stone. Intact mano: 1 (KJ69-7723, DOT 19).

Chipped Stone. Obsidian blades; 3 (found inside olla, DOT 5).

Ceramic. Orange ware cylinder vase; 2 (DOT 3; KJ69-7737, DOT 16).
Orange ware ollas; 1 (KJ69-4949, DOT 5).
Orange ware dish; shallow; 2 (DOT 6; KJ69-7724, DOT 15).
Orange ware bowl, incurved rim; 1 (KJ69-7736, DOT 18).
Orange ware jar, constricted neck; 1 (KJ69-7734, DOT 17).

The pottery was entirely Amatle phase orange ware.

Discussion

Structure C-2 appears to have been a two-stage terraced platform designed and used as a burial monument and subsequently as a temple. During construction of the platform, a large, deep pit appears to have been prepared and left open in the structure's center. The lower portion of this pit may have been filled and sealed as a dedicatory unit at some time prior to its complete filling. The context of the above mentioned incensario indicates that some activity occurred after sealing of the lower chamber and prior to closure of the upper. The latter may have remained open until the interment of Burial 2's occupant. At that time, the entire shaft was filled to thelevel of C-2's upper surface and fired clay sealed. A carved stone marker may also have been erected above the grave. A perishable material superstructure possibly covered the entire upper platform.

Erection of a monument of Structure C-2's size and complexity for the burial of a single individual would seem to re-enforce the suggestion made above for the presence of a resident elite group at each of the small architectural complexes characteristic of the Middle Classic settlement pattern. Presumably, this would be the tomb of an important primary member or ancestor for each elite family. The idea of a permanent, lineage determined elite class is thus given greater credence by the inclusion of a Structure C-2 type burial unit as a part of each Middle Classic compound.

DATING OF THE B-V-8 MOUND GROUP

In addition to the preliminary ceramic analysis that have established the presence of both a Late Formative and a Middle Classic component within the B-V-8 mound group, 14 obsidian artifacts underwent hydration dating at The Pennsylvania State University's Obsidian Dating Laboratory, under the direction of Joseph W. Michels. The results are given in Table 2.

The dates group into three tight clusters. The earliest cluster (Lab Numbers 8920, 8921, 8922, 6444) yield a mean date of 438 B.C. and a mean standard deviation of $\pm$ 117 years. Three of the specimens come from the cache in Structure C-1, the other comes from the B-V-14 mound. Collectively they may be regarded as dating those structures for which a Formative date has been suggested based on ceramic evidence--Structures C-1 and A-1. Their construction and utilization would thus have occurred sometime between 555 B.C. and 321 B.C. (given the S.D. of the mean date), and would therefore fall within the Late Formative period as defined by the Kaminaljuyu Project (500 B.C.-200 B.C.).

The second cluster (Lab Numbers 6447, 6420) yield a mean date of 79 A.D. and a mean standard deviation of $\pm$ 104 years; resulting in a time range of 25 B.C. to 183 A.D. This largely coincides with the Late Terminal Formative, as defined by the Kaminaljuyu Project (0 A.D.-200 A.D.) These dates are regarded as debris relating not to the occupation of the B-V-8 mound group but rather to the occupation of Mound B-V-7, located less than 25 meters away, which is known through test pit excavations to have been

Table 2

Obsidian Dates from the B-V-8 Mound Group

Catalog Number	Obsidian Dating Lab. Number	Mound	Excavation Unit	Level	Feature	Micron Value	Date	S.D.
KJ69-4596	6447	B-V-15	300	2		3.69	32 A.D.	± 105
KJ69-4701	6448	B-V-15	94	4		3.18	531 A.D.	± 91
KJ69-8827	8919	B-V-15	309	5	6	3.22	495 A.D.	± 92
KJ69-8827	8920	B-V-15	309	5	6	4.17	505 B.C.	± 119
KJ69-8827	8921	B-V-15	309	5	6	4.19	529 B.C.	± 120
KJ69-8827	8922	B-V-15	309	5	6	4.06	376 B.C.	± 116
KJ69-2095	6420	B-V-14	10	1		3.60	126 A.D.	± 103
KJ69-2095	6421	B-V-14	10	1		3.39	335 A.D.	± 97
KJ69-2095	6422	B-V-14	10	1		3.23	486 A.D.	± 92
KJ69-2095	6423	B-V-14	10	1		3.43	296 A.D.	± 98
KJ69-2095	6424	B-V-14	10	1		2.85	815 A.D.	± 82
KJ69-3340	6444	B-V-14	77	1		4.03	342 B.C.	± 115
KJ69-4166	6445	B-V-14	58	3		2.95	732 A.D.	± 84
KJ69-4166	6446	B-V-14	58	3		2.33	1199 A.D.	± 67

*Chronometric dates based on the hydration rate 7.03 μ^2/1000 years established for El Chayal obsidian within the Valley of Guatemala by Joseph W. Michels.

the focus of an intensive settlement during the Late Terminal Formative period (Michels, personal communication).

The final cluster (Lab Numbers 6448, 8919, 6421, 6422, 6423, 6424, 6445) is the largest and yields a mean date of 527 A.D. and a mean standard deviation of ± 90 years; resulting in a time range of 437 A.D. to 617 A.D. The time range falls directly within the Middle Classic period as defined by the Kaminaljuyu Project (400 A.D.-700 A.D.). These specimens date Structures C-2, B-2a and B-2b directly, and Structure A-2 indirectly (by ceramic cross-dating).

The remaining date (Lab Number 6446) of 1199 A.D. ± 67 years must be interpreted as intrusive Postclassic debris. The settlement pattern test trenches have revealed light but extensive activity within the Finca El Mirador area during both Early and Late Postclassic periods (1000 A.D.-1200 A.D.; 1200 A.D.-1500 A.D. respectively) (Michels, personal communication).

SUMMARY

In summary, then, we may conclude that the B-V-8 mound group witnessed two episodes of construction and occupation. The earliest, accounting for the initial appearance of Mounds B-V-8 and B-V-15 (possibly also Mound B-V-14 [Structure B-1]) as Substructures A-1 and C-1. These were low, small platforms that could conceivably have supported priestly residences (thatch dwellings). Their location, on the eastern edge of a large plaza across which lay the imposing line of ceremonial platforms (B-V-3, B-V-4, B-V-5, B-V-6) would seem to support this view as does the clearly residential nature of the artifact assemblage from Structure C-1. Furthermore, their diminutive size relative to that of the mounds mentioned above would argue for a different function. The large mounds represent two kinds of ceremonial platforms (see reports elsewhere in this volume). This episode is Late Formative and is chronometrically defined as occurring between 555 B.C. and 321 B.C.

The second episode of occupation involved the construction of a residential complex consisting of Structures A-2, B-2a, B-2b, C-2 within the time frame of 437 A.D.-617 A.D. and designated Middle Classic. Taken together, Structures A-2, B-2a, B-2b and C-2 suggest a tentative settlement pattern model for Middle Classic times at Kaminaljuyu. This model posits a series of small, dispersed architectural compounds of minor ceremonial and residential import. Each consisted of three platform structures of ceremonial, funerary and residential function enclosing a central court. Resident at each of these complexes was a member of an economically non-productive elite class, possibly a religious functionary, together with his family. Each complex may have been surrounded by the dispersed residences of a small, agricultural supporting population. The full nature of the settlement pattern surrounding each compound must await the results of the settlement pattern test trench analysis.

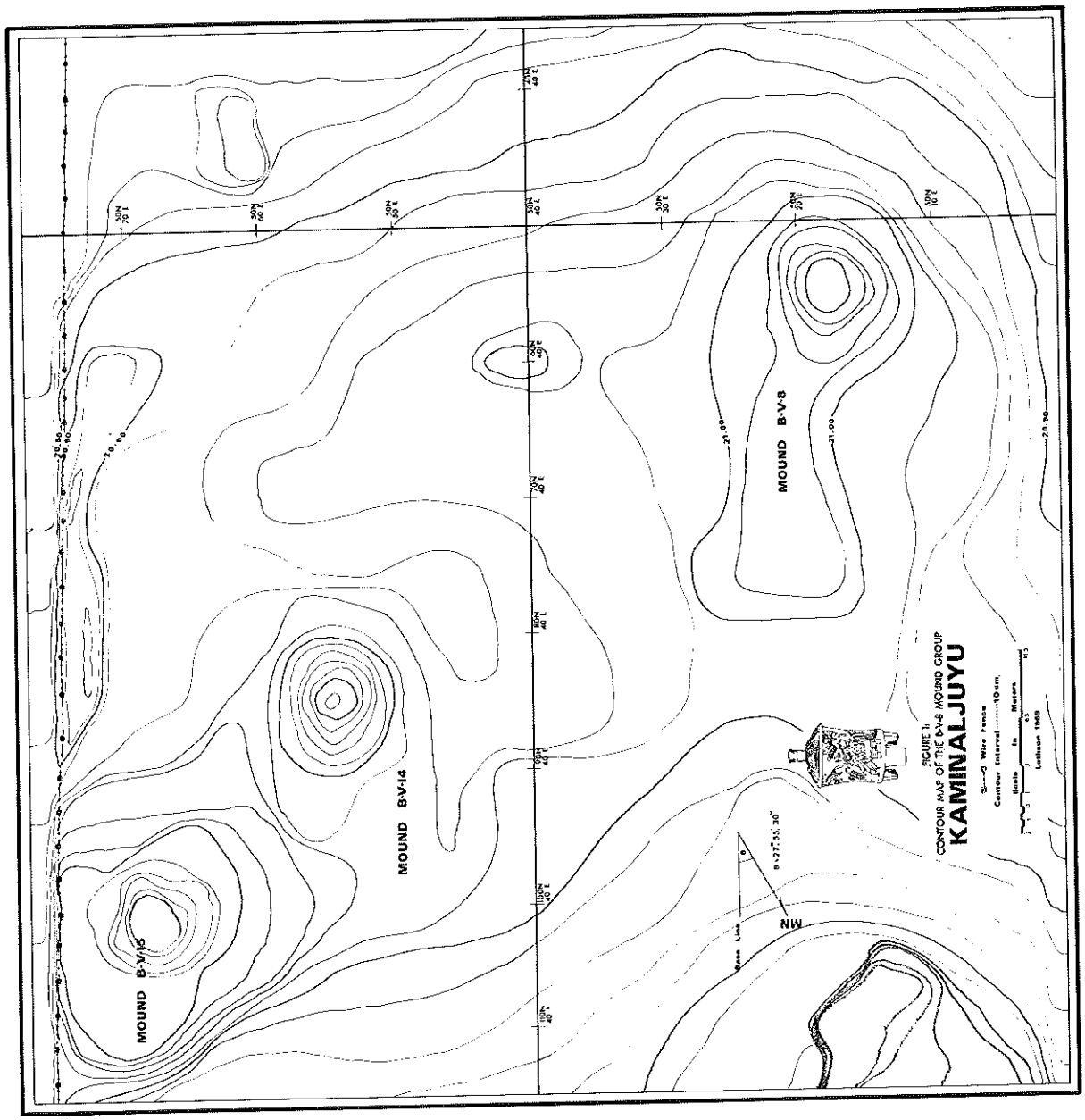


FIGURE 1:
CONTOUR MAP OF THE B-V-8 MOUND GROUP
KAMINALJUYU

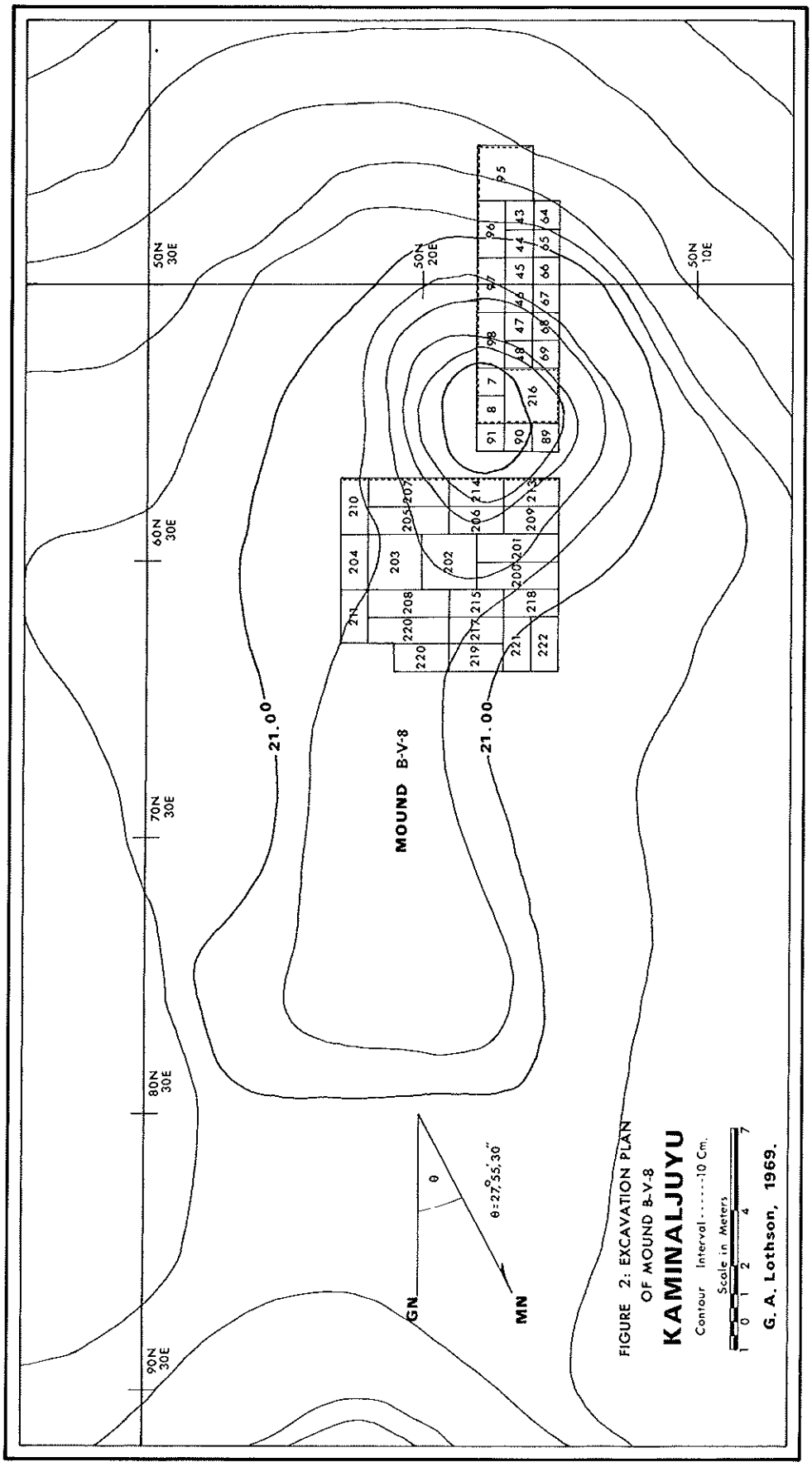


FIGURE 2: EXCAVATION PLAN OF MOUND B-V-8

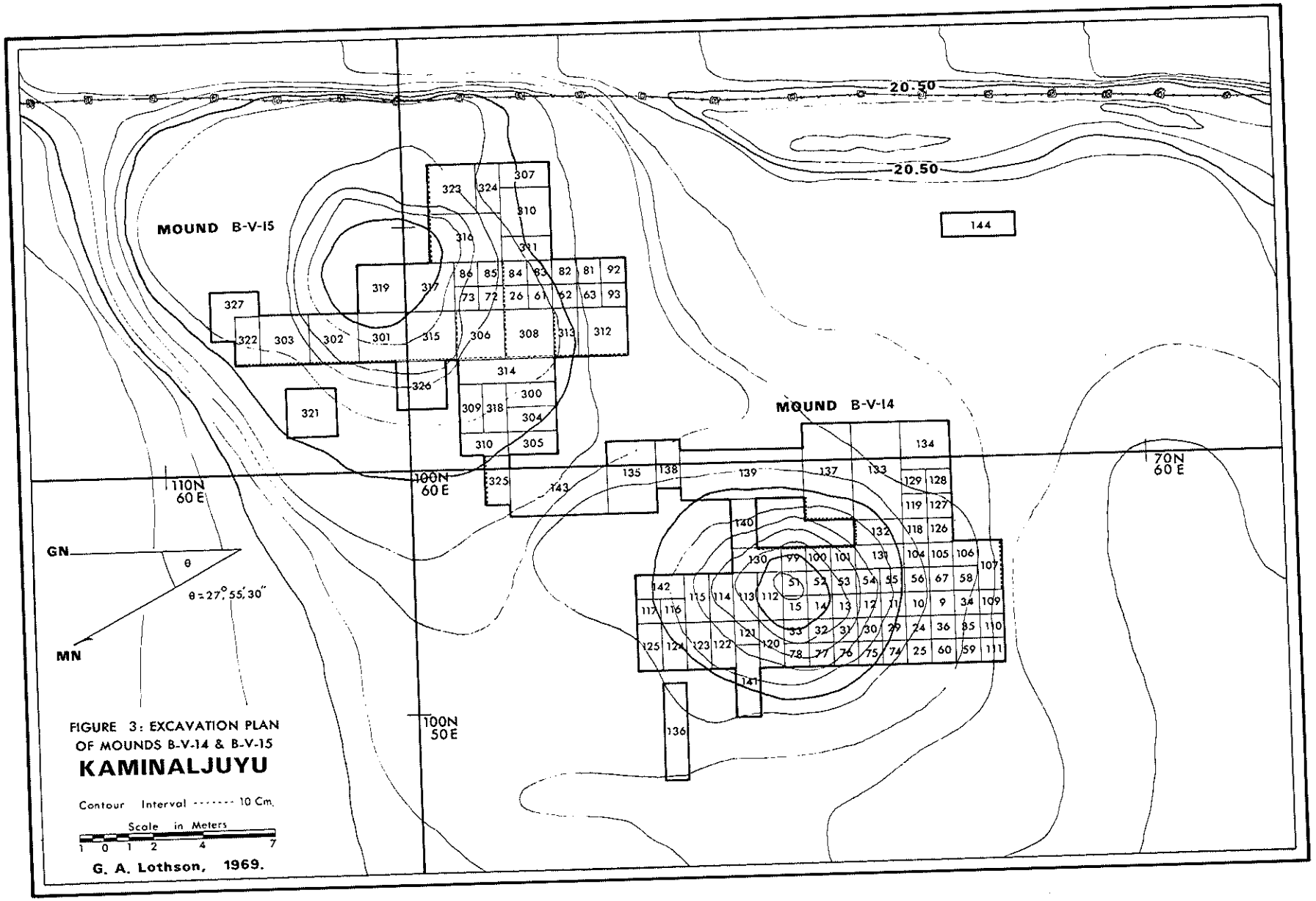
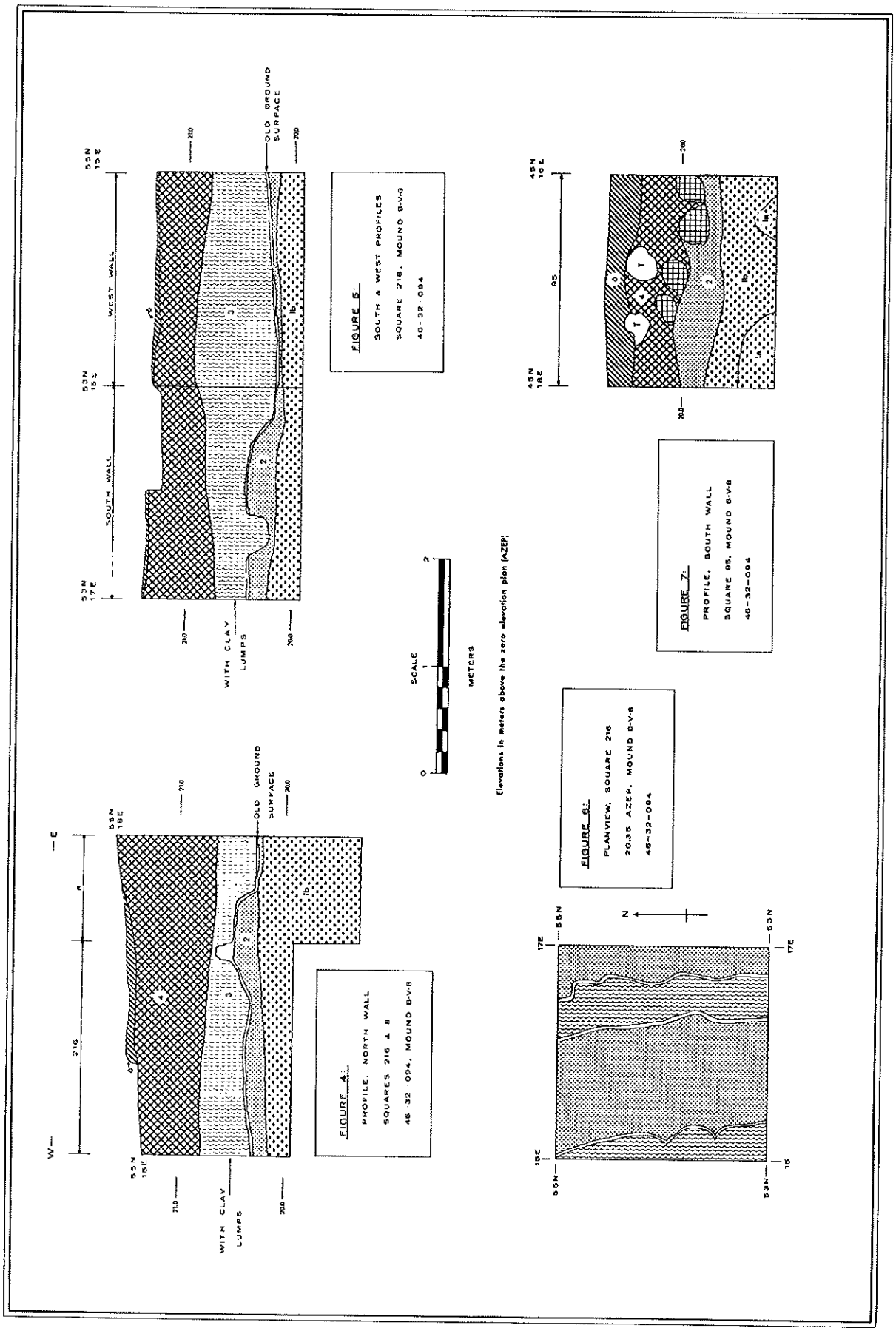
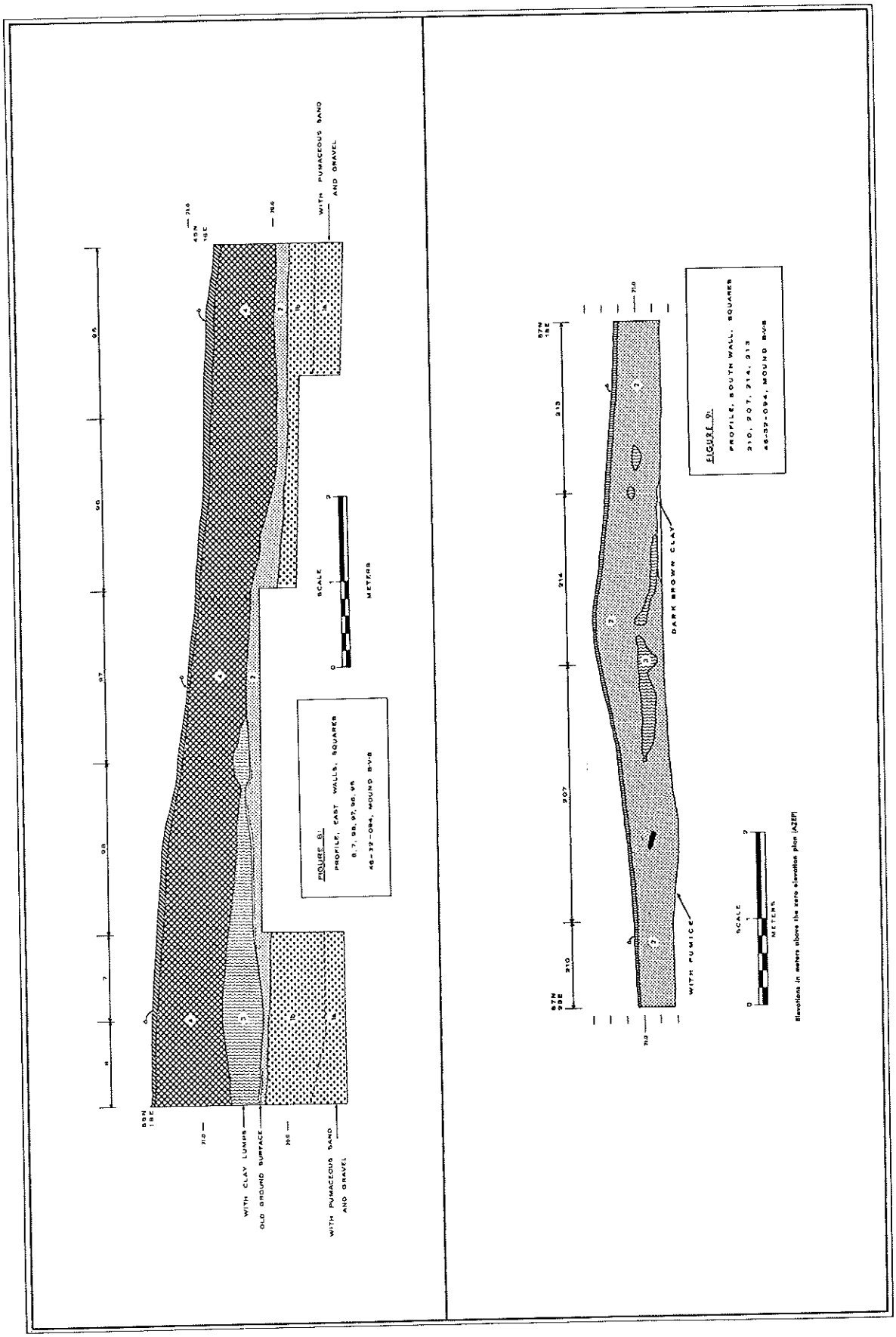


FIGURE 3: EXCAVATION PLAN OF MOUNDS B-V-14 & B-V-15

KAMINALJUYU

Contour Interval ------- 10 Cm.


W
E
216
8
55N 16E
55N 15E
53N 15E
53N 17E
SOUTH WALL
WEST WALL
OLD GROUND SURFACE
210
200
WITH CLAY LUMPS
SCALE
0
1
2
METERS
Elevations in meters above the zero elevation plan (AZEP)
45N 16E
45N 18E
95
FIGURE 4:
PROFILE, NORTH WALL
SQUARES 216 & 8
46-32-094, MOUND B-V-8
FIGURE 5:
SOUTH & WEST PROFILES
SQUARE 216, MOUND B-V-8
46-32-094
FIGURE 6:
PLANVIEW, SQUARE 216
20.35 AZEP, MOUND B-V-8
46-32-094
FIGURE 7:
PROFILE, SOUTH WALL
SQUARE 95, MOUND B-V-8
46-32-094
N
17E
15E
55N
53N


WITH PUMACEOUS SAND AND GRAVEL
WITH CLAY LUMPS
OLD GROUND SURFACE
WITH PUMACEOUS SAND AND GRAVEL
SCALE
METERS
FIGURE 8:
PROFILE, EAST WALLS, SQUARES
8, 7, 98, 97, 96, 95
46-32-084, MOUND B-V-8
DARK BROWN CLAY
WITH PUMICE
FIGURE 9:
PROFILE, SOUTH WALL, SQUARES
210, 207, 214, 213
46-32-084, MOUND B-V-8
Elevations in meters above the zero elevation plan (AZEP)

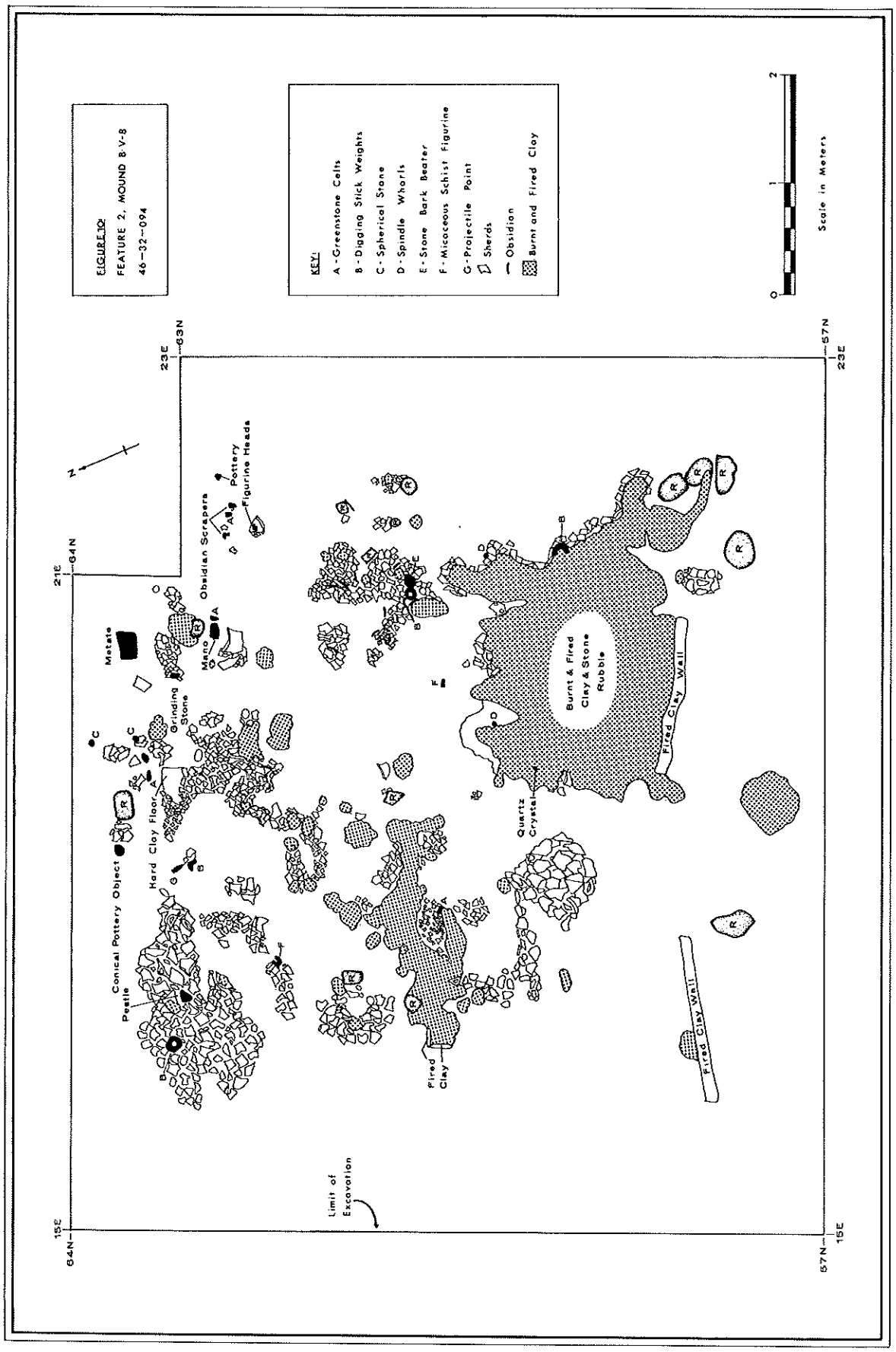


FIGURE 10:
FEATURE 2, MOUND B-V-8
46-32-094
KEY:
A - Greenstone Celts
B - Digging Stick Weights
C - Spherical Stone
D - Spindle Whorls
E - Stone Bark Beater
F - Micaceous Schist Figurine
G - Projectile Point
Sherds
Obsidian
Burnt and Fired Clay
Scale in Meters
0
1
2
N
Metate
Mano
Obsidian Scrapers
Pottery
Figurine Heads
Grinding Stone
Hard Clay Floor
Conical Pottery Object
Pestle
Burnt & Fired Clay & Stone Rubble
Fired Clay Wall
Quartz Crystal
Fired Clay
Limit of Excavation
15E
64N
21E
23E
63N
57N

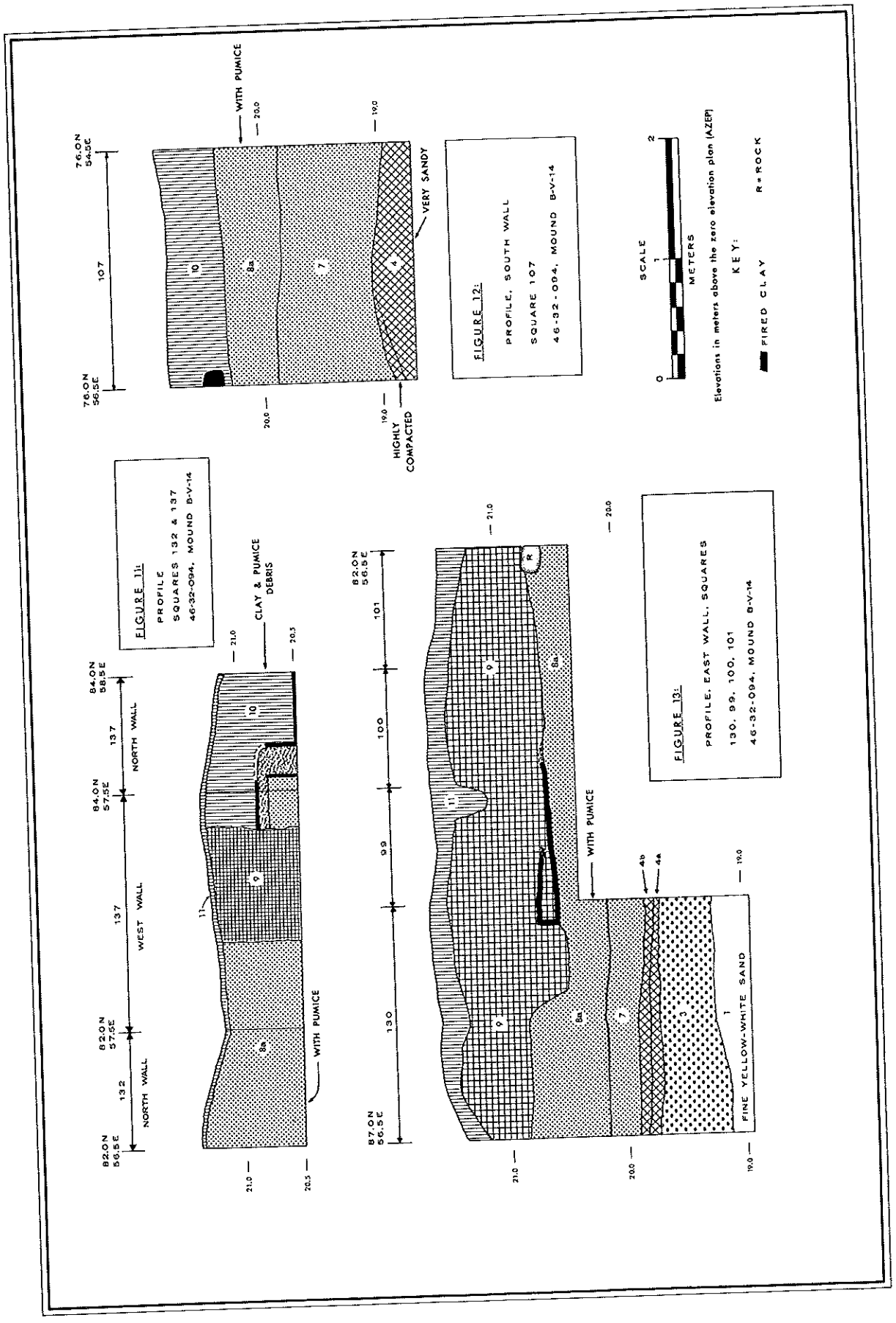
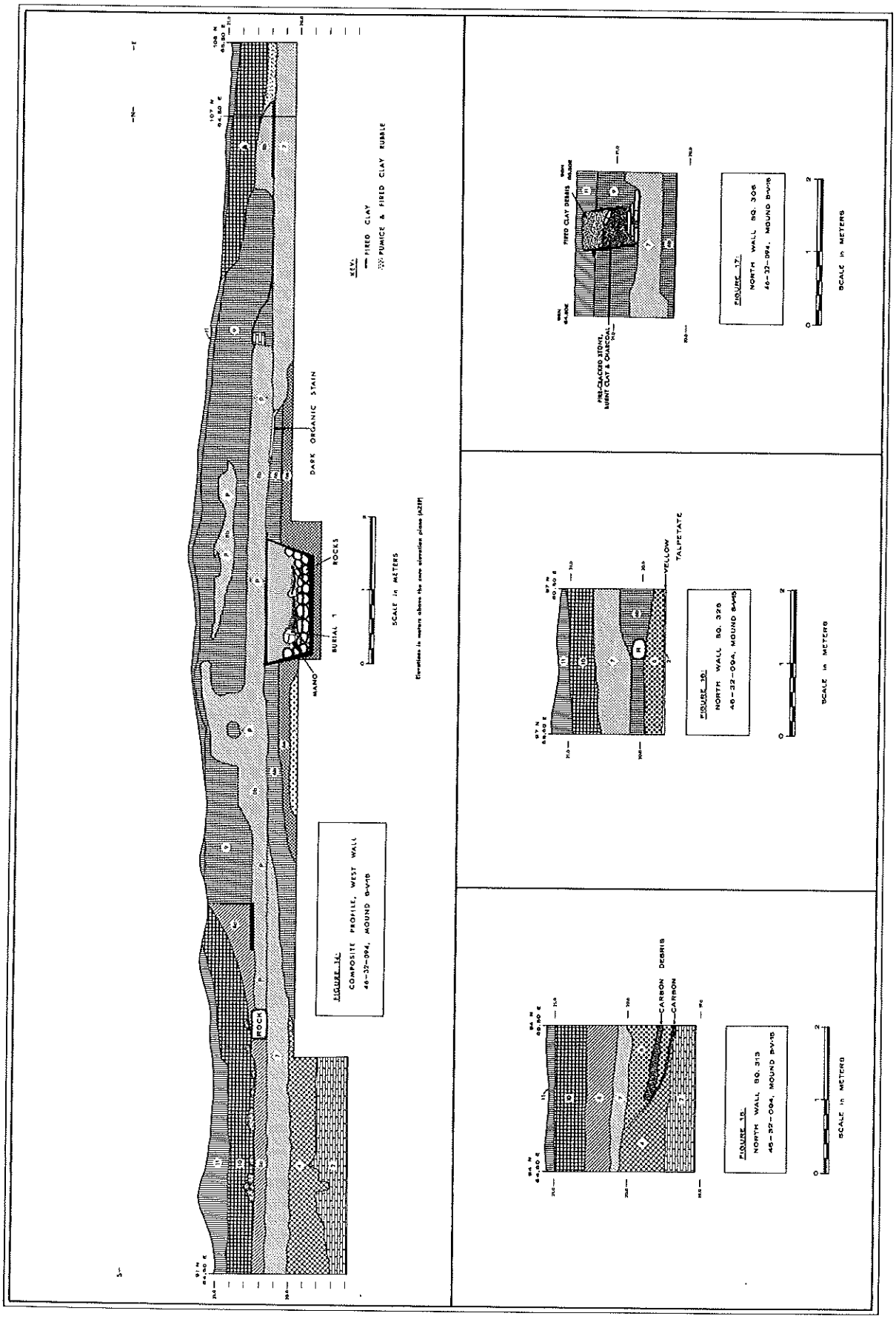


FIGURE 11:
PROFILE
SQUARES 132 & 137
46-32-094, MOUND B-V-14
FIGURE 12:
PROFILE, SOUTH WALL
SQUARE 107
46-32-094, MOUND B-V-14
FIGURE 13:
PROFILE, EAST WALL, SQUARES
130, 99, 100, 101
46-32-094, MOUND B-V-14
KEY:
FIRED CLAY
R = ROCK
Elevations in meters above the zero elevation plan (AZEP)
SCALE
METERS
WITH PUMICE
VERY SANDY
HIGHLY COMPACTED
CLAY & PUMICE DEBRIS
FINE YELLOW-WHITE SAND
NORTH WALL
WEST WALL
76.0N 54.5E
76.0N 56.5E
84.0N 58.5E
84.0N 57.5E
82.0N 57.5E
82.0N 56.5E
82.0N 58.5E
87.0N 56.5E
107
137
132
101
100
99
130


KEY:
FIRED CLAY
PUMICE & FIRED CLAY RUBBLE
DARK ORGANIC STAIN
ROCKS
BURIAL 1
MANO
ROCK
SCALE in METERS
FIGURE 14:
COMPOSITE PROFILE, WEST WALL
46-32-094, MOUND 84-18
FIRE-CRACKED STONE, BURNT CLAY & CHARCOAL
FIRED CLAY DEBRIS
FIGURE 17:
NORTH WALL SQ. 305
46-32-094, MOUND 84-18
SCALE in METERS
YELLOW TALPETATE
FIGURE 16:
NORTH WALL SQ. 329
46-32-094, MOUND 84-18
SCALE in METERS
CARBON DEBRIS
CARBON
FIGURE 15:
NORTH WALL SQ. 313
46-32-094, MOUND 84-18
SCALE in METERS

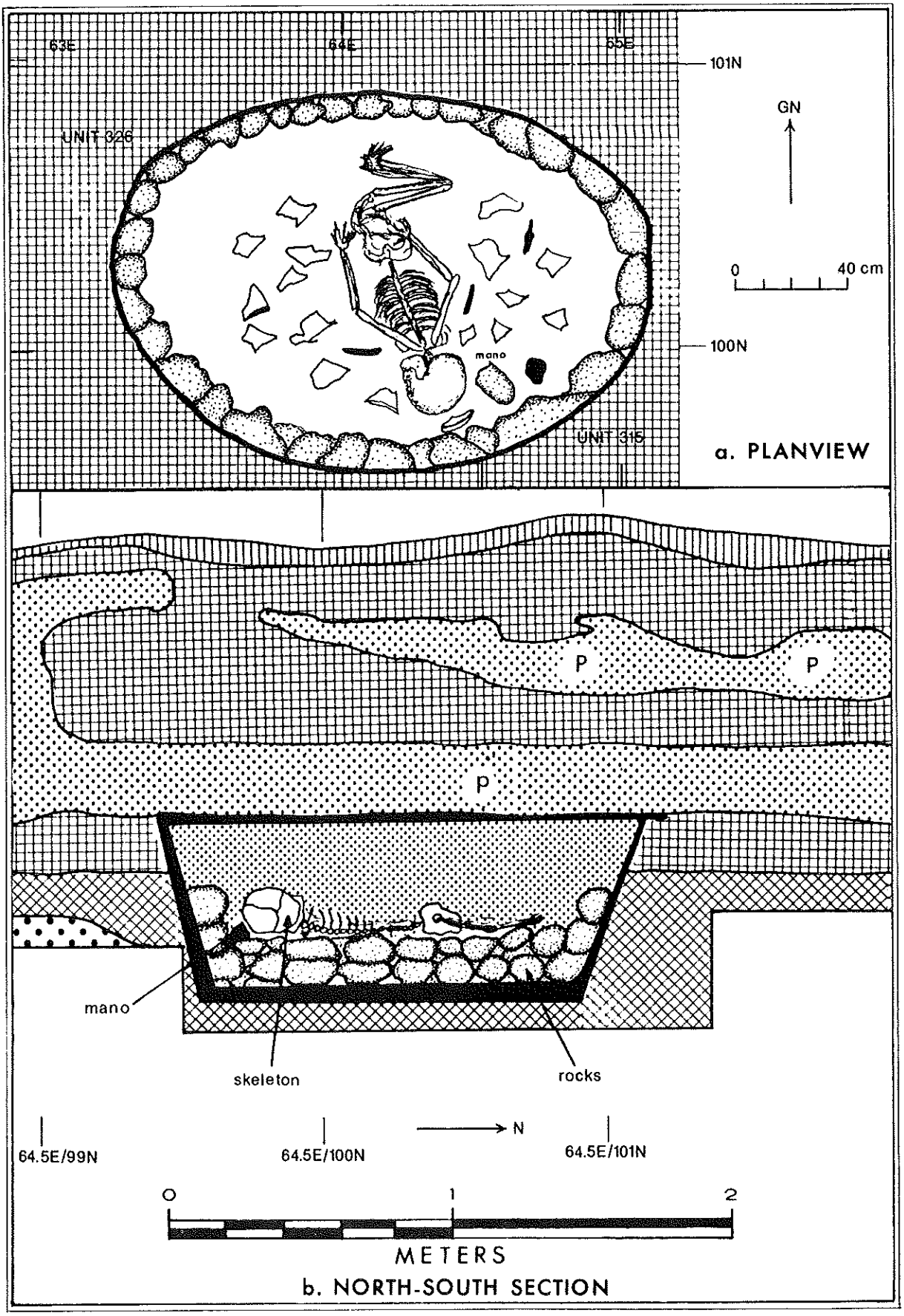


FIGURE 18: BURIAL 1 (FEATURE 9), MOUND B-V-15

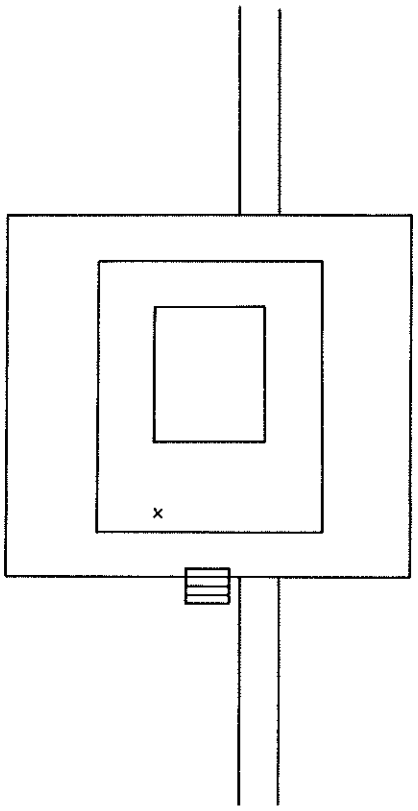


FIGURE 19:

Plan View and Elevation,

Structure C-1, 8-V-15

46 – 32 – 094

SCALE

0 1 2 3 4 5 10

METERS

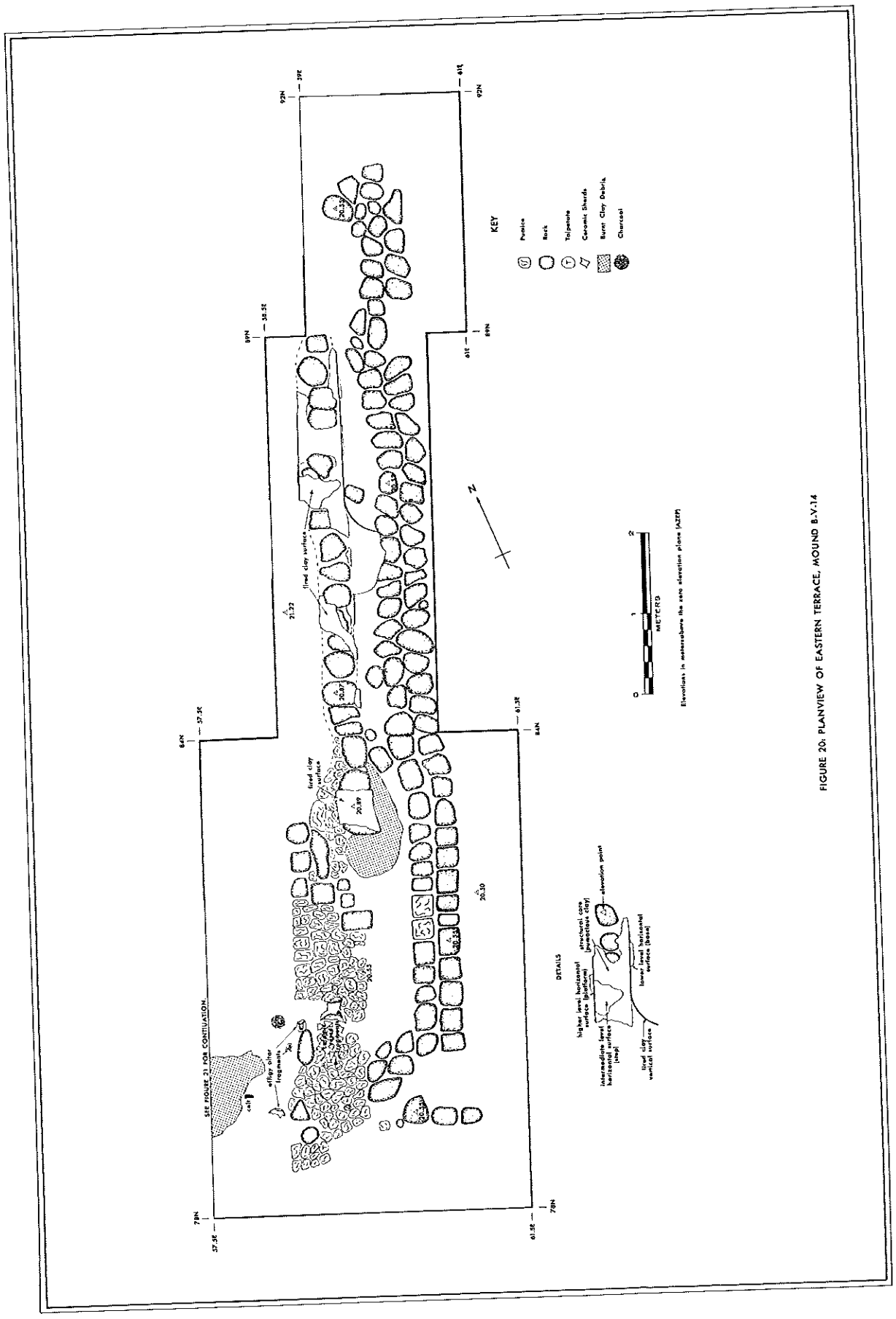


FIGURE 20: PLANVIEW OF EASTERN TERRACE, MOUND B.V-14

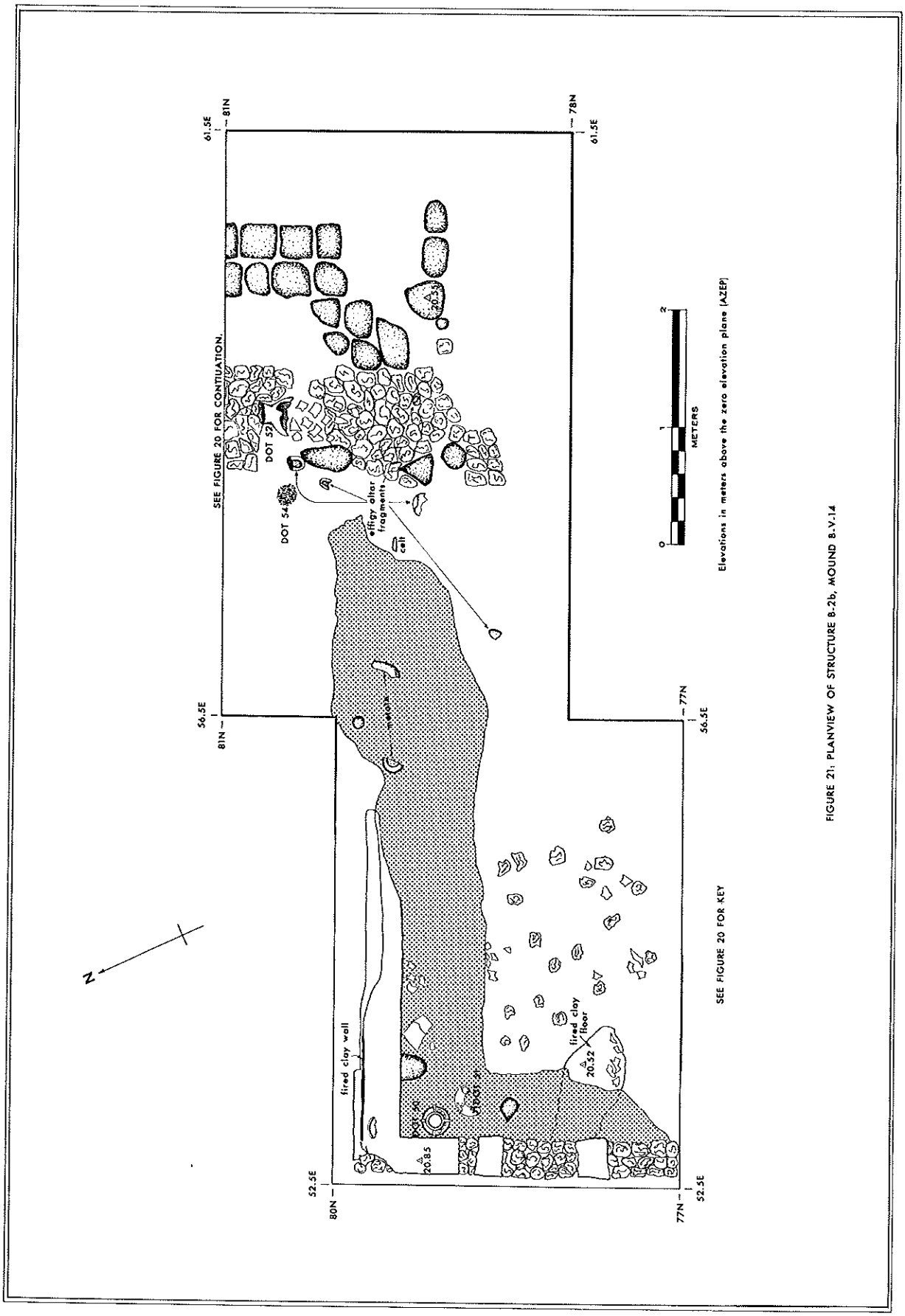


FIGURE 21: PLANVIEW OF STRUCTURE B-2b, MOUND 8-V-14

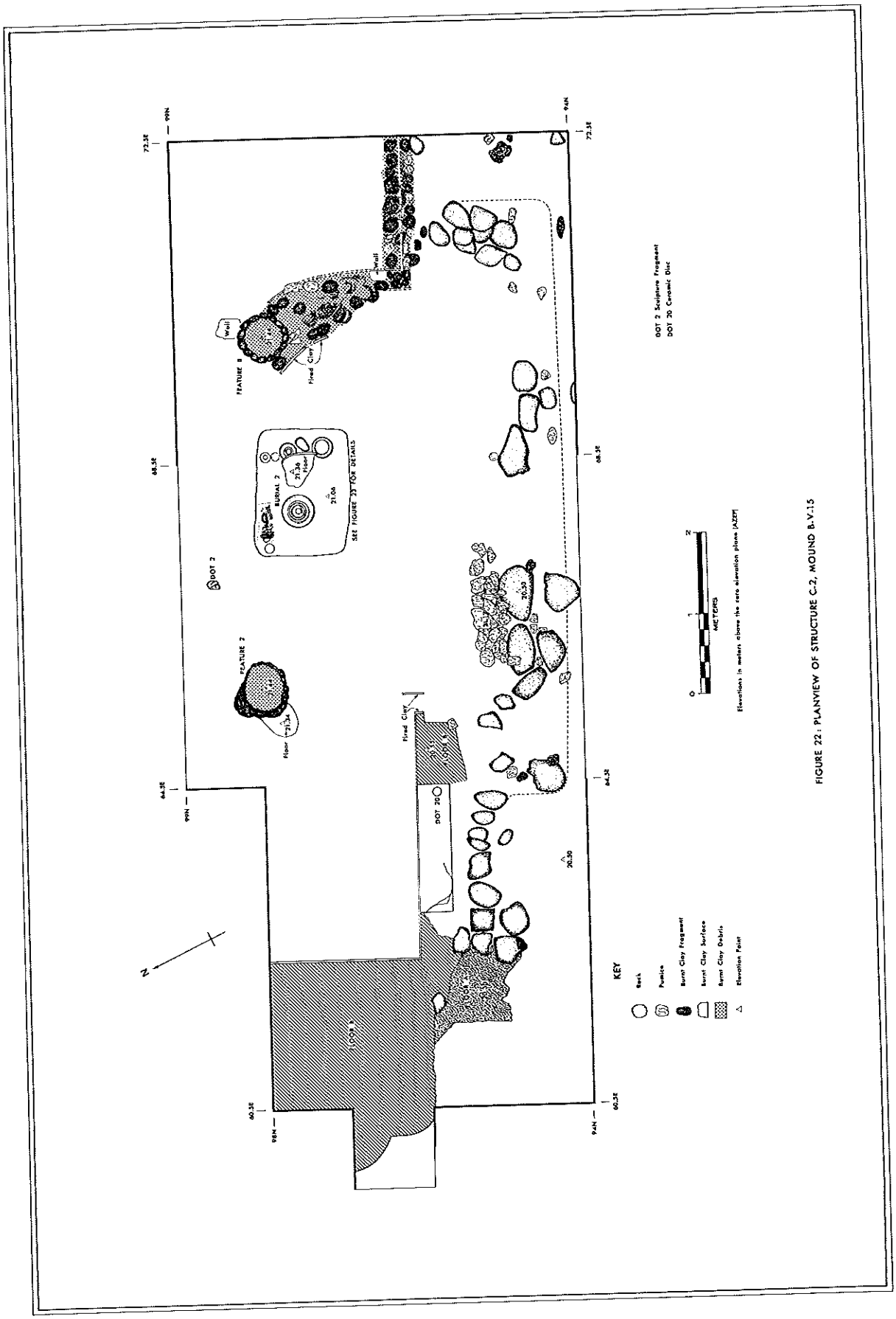


FIGURE 22 : PLANVIEW OF STRUCTURE C-2, MOUND B-V-15

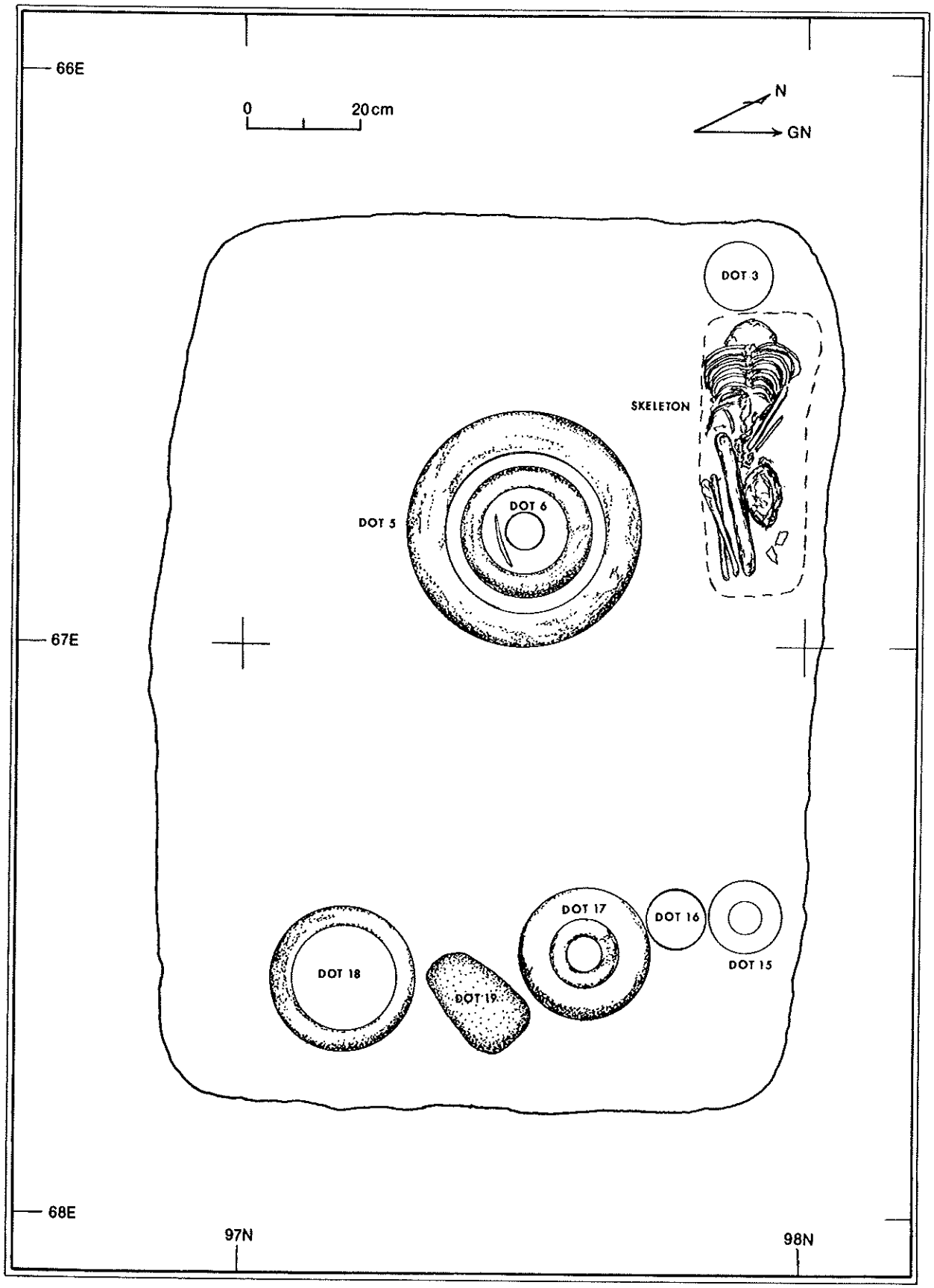


FIGURE 23: BURIAL 2 (FEATURE 3), MOUND B-V-15

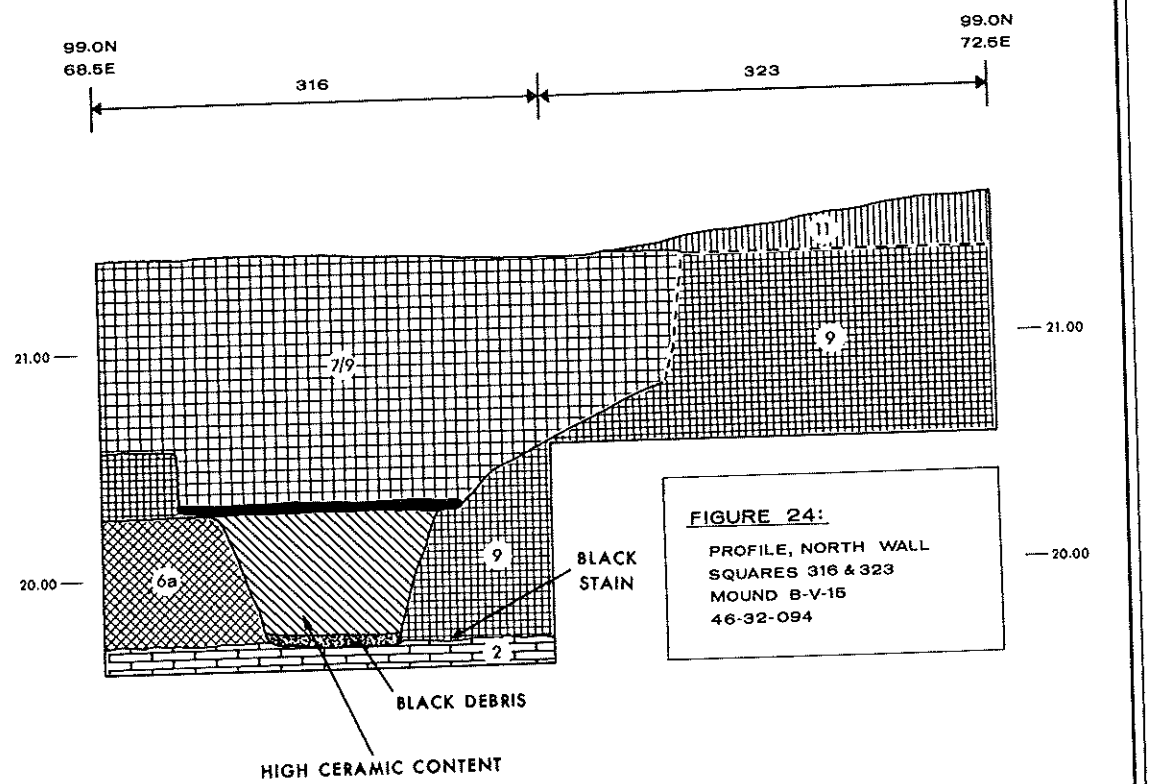
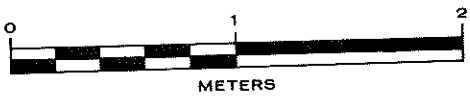


FIGURE 24:
PROFILE, NORTH WALL
SQUARES 316 & 323
MOUND B-V-15
46-32-094



Elevations in meters above the zero elevation plane (AZEP)

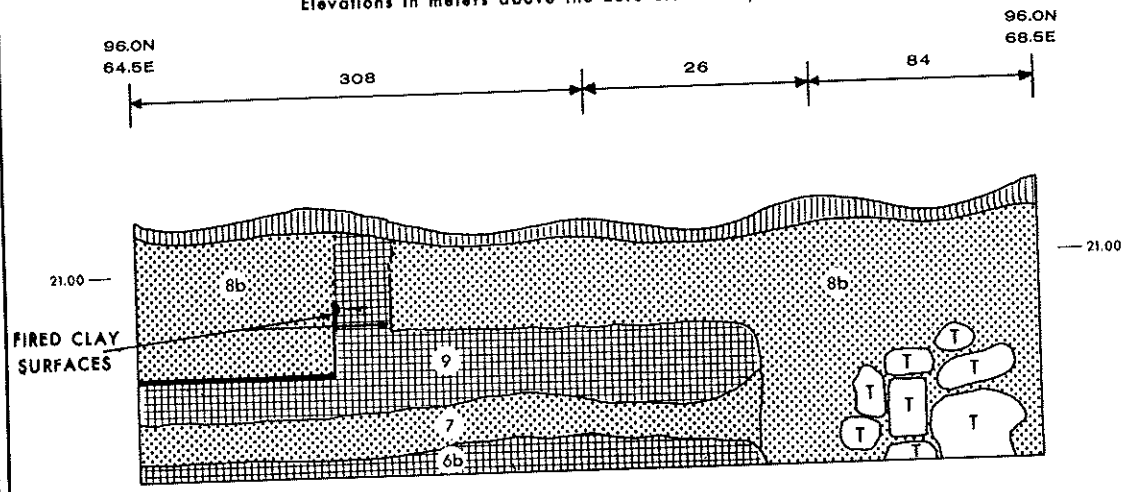


FIGURE 25:
PROFILE, NORTH WALL
SQUARES 308, 26 & 84
MOUND B-V-15
46-32-094

KEY
R Rock
T Talpetate
Burnt Clay Surface

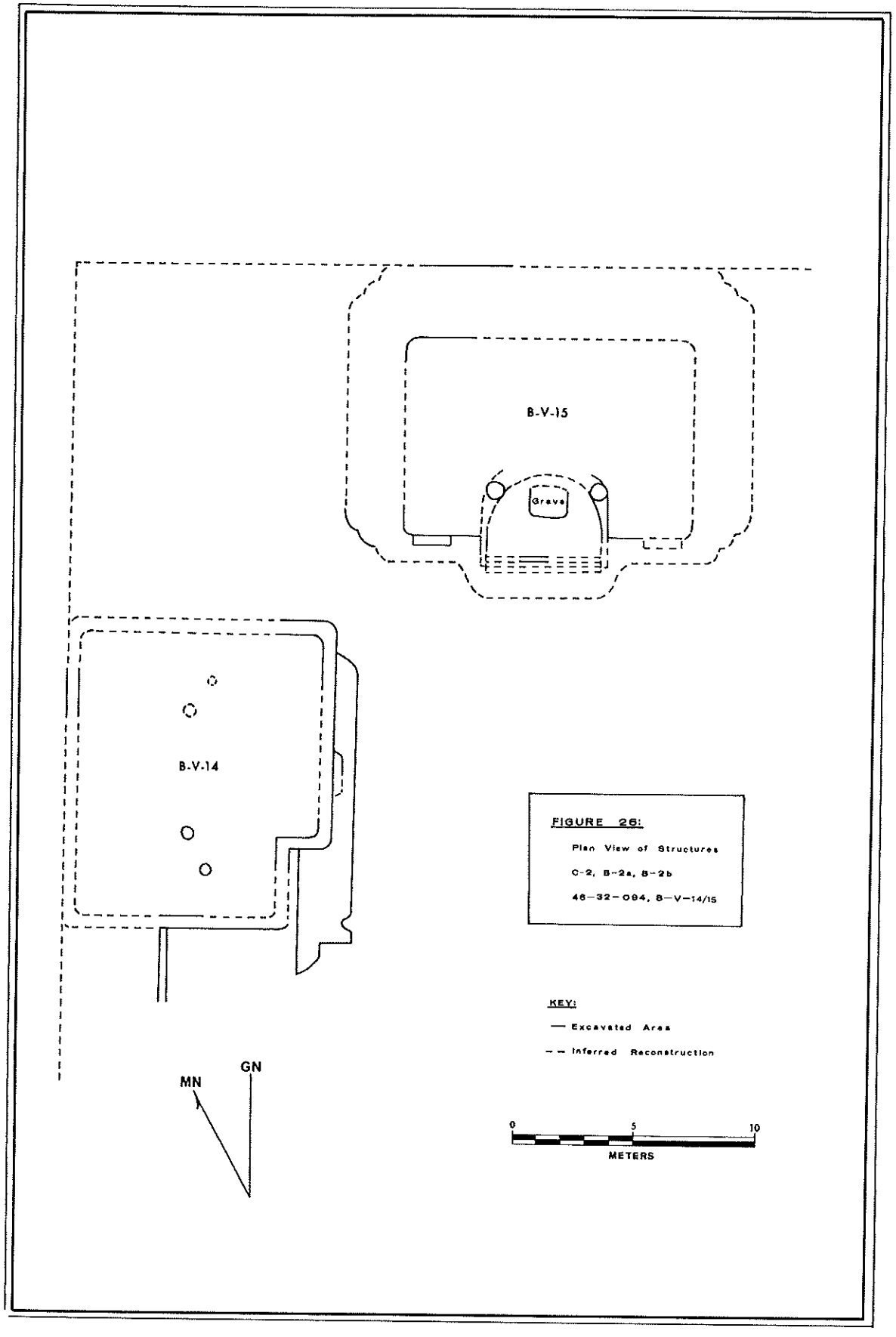


FIGURE 26:

Plan View of Structures

C-2, B-2a, B-2b

46-32-094, B-V-14/15

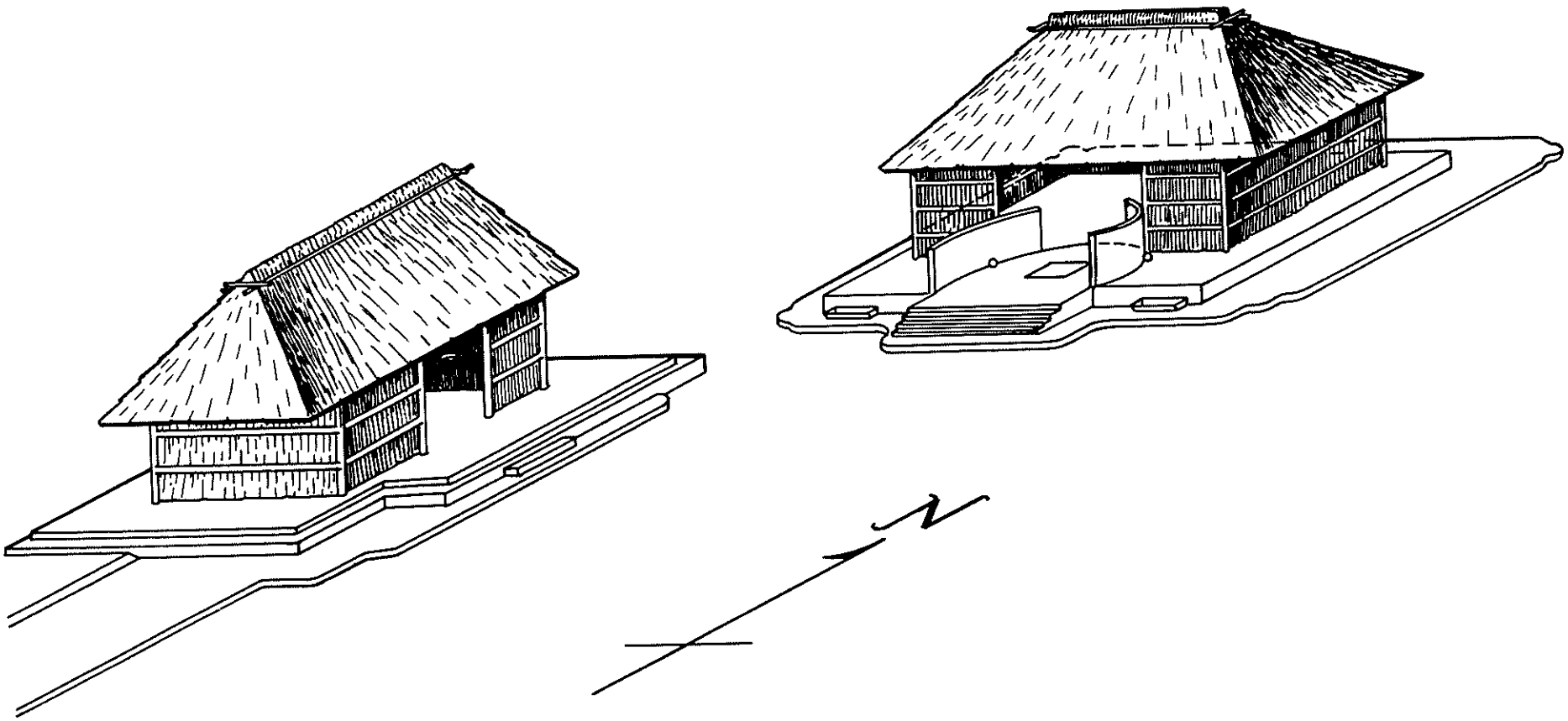
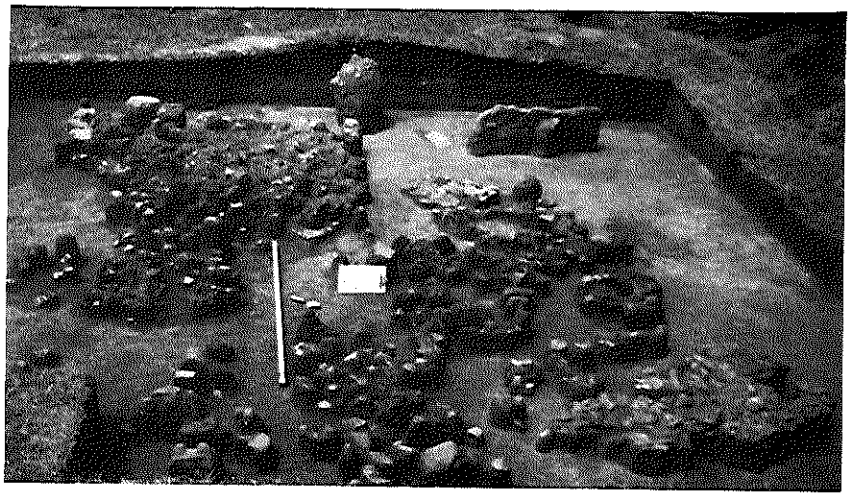
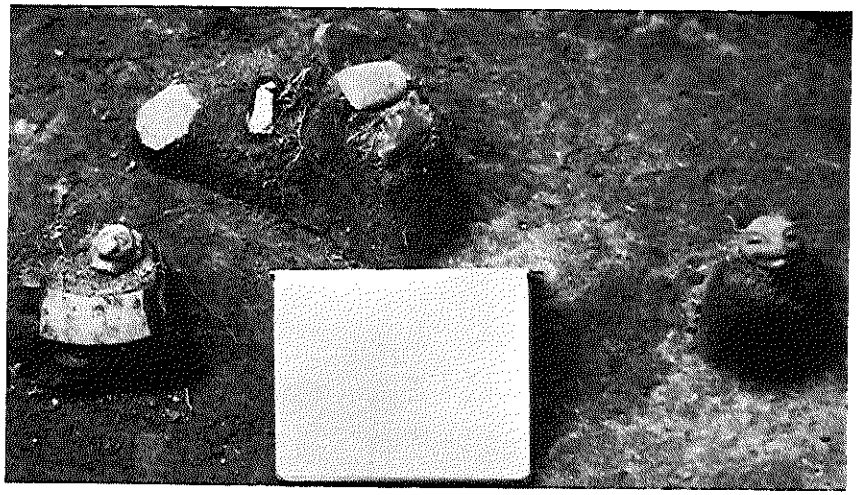


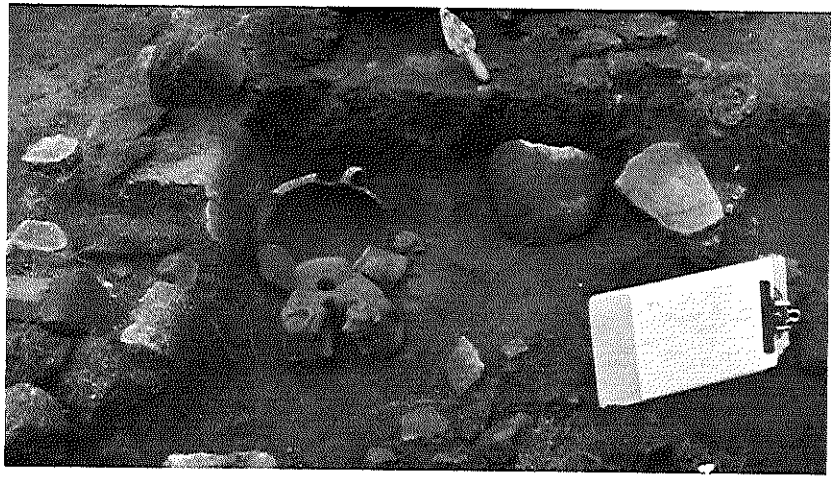
Figure 27: Isometric Reconstruction of B-V-14/15 Plaza



a. Structure A-2, Mound B-V-8



b. Domestic Altar, Structure A-2, Mound B-V-8



c. Domestic Altar, Structure B-2b, Mound B-V-14

d. Burial 1, Mound B-V-15

PLATE 1

MOUND B-V-4: A LATE FORMATIVE CEREMONIAL STRUCTURE AND MIDDLE CLASSIC RESIDENCE COMPLEX

by

John Reynolds and D. Sean Cardenas

TABLE OF CONTENTS

	Page
INTRODUCTION	221
LOCATION AND SETTING	224
CONDITION, SIZE AND ORIENTATION	224
EXCAVATION METHODOLOGY	225
Horizontal and Vertical Controls	225
Documentation	225
Excavation Strategy	225
STRATIGRAPHY	226
MOUND CONSTRUCTION	227
Construction Phase One	227
Construction Phase Two	228
Dating of Mound Construction	229
POST-CONSTRUCTION PHASES	231
Features 1 and 12	231
Features 2, 4, 5, 6, 9, 10, 11	233
Features 7 and 8	238
Features 3 and 13	239
DISCUSSION	240

LIST OF TABLES

Table		Page
1	Summary of Total Artifacts from Excavation	222
2	Obsidian Hydration Dates from Mound B-V-2	230
3	Obsidian Hydration Dates from Feature 4	234
4	Soil Stratigraphy of Mound B-V-4	245

LIST OF FIGURES

Figure		Page
1	Contour Map and Excavation Plan of Mound B-V-4	247
2	Profile of Mound B-V-4	248
3	Planview of Features 1 and 12	249
4	Schematic Profile of Feature Aggregate	250
5	Planview of Feature Aggregate	250
6	Reconstruction of Earthen Platform with Superstructure and Adjacent Structure	251

LIST OF PLATES

Plate		Page
1a	View of Mound B-V-4 during Excavation, Northeast Side	252
1b	Feature 5	252
1c	Feature 7	252
1d	Feature 3 and 13	252

INTRODUCTION

Mound B-V-4 was selected for excavation together with Mound B-V-6 (discussed elsewhere in this volume) in order to investigate the nature of a Late Formative mound grouping in the Finca El Mirador. In 1968, the Kaminaljuyu Project excavated Mound B-V-2 (Cardenas 1969), located approximately 25 meters east of Mound B-V-4. The excavation revealed a relatively uncomplicated earthen platform with a low summit of modest dimensions. Although the artifact assemblage recovered was not particularly large or rich in variety (see "Kaminaljuyu Mound Artifact Summaries" elsewhere in this volume) it did supply sufficient ceramic data to permit us to date its construction to the Late Formative period. Beyond that, it failed to yield much of a clue as to its function or its original architectural relationship to the other mounds in the immediate vicinity. The 1969 Field Season, therefore, provided an opportunity to gain additional information about the Finca El Mirador mound group, especially about those mounds suspected of being contemporaneous with Mound B-V-2.

Five mounds in the Finca El Mirador group were believed to date to the Late Formative period. One, Mound B-V-2, had been excavated previously, and the remaining four constituted a north-south alignment series a short distance west of it. This series thus became an important objective of the 1969 season. The four mounds could be classified into two groups. The two outlying members of the alignment series were high, steeply sloped mounds with small summits (B-V-3 and B-V-6). Whereas the two interior members of the alignment were low mounds with relatively broad level summits (B-V-4 and B-V-5). It was believed, prior to excavation, that the two large mounds at either end were elite burial mounds and that the two smaller, low-lying mounds were of some other function; perhaps elite residences or ceremonial platforms. An analysis of the nature of the large, peripheral mounds can be found in the report by Bebrich and Wynn in this volume. This report concerns the excavation and interpretation of Mound B-V-4 as illustrative of the low-lying, intermediate positioned mounds.

As the title suggests, excavation of Mound B-V-4 revealed a complex history of utilization with the mound initially being constructed during the Late Formative period and then later modified and reutilized during the Middle Classic period. Actually, five specific chronological phases of utilization and/or construction have been delineated as a result of excavation.

The field operation spanned a period of more than two and a half months of continuous work, from 10 June to 29 August 1969. The excavation was under the supervision of Gordon Lothson, James Dutt, Dennis Dickenson, and Michael Steffy. Over 30,000 artifacts were recovered (Table 1).

Table 1

Summary of Total Artifacts from Excavation

Artifact Name	Material Code	Item	Sub-Item	Frequency
Rim sherds	1	1	0	2,106
Body sherds	1	2	0	17,185
Burnt clay lumps	1	4	0	17
Burnt clay lumps	1	4	1	6,042
Burnt clay lumps	1	4	2	3
Burnt clay lumps	1	4	3	1,229
Burnt clay lumps	1	4	4	295
Burnt clay lumps	1	4	5	9
Clay figurines	1	5	0	101
Effigy sherds	1	6	0	16
Adornos	1	7	0	15
Effigy whistle	1	8	0	2
Clay beads	1	9	4	1
Rattle balls	1	11	0	1
Sherd discs	1	12	1	1
Sherd discs	1	12	2	2
Incensario	1	14	1	5
Miniature vessel	1	15	0	2
Pottery vessel (whole)	1	16	0	7
Clay spindle whorl	1	18	0	1
Candelero	1	19	2	1
Obsidian blades	2	1	0	727
Obsidian flakes	2	2	0	918
Obsidian cores	2	3	0	18
Shaped obsidian artifact	2	4	0	13
Obsidian quarry nodules	2	6	0	3
Building material	3	1	0	8
Unclassified stone artifacts	3	3	0	1
Mica	3	4	0	1
Quartz crystal	3	7	0	1
Green stone flakes	3	8	0	2
Stone sculpture	3	10	0	2
Utilized cobbles	3	11	0	120
Pumice	3	12	0	382
Shaped manos	3	14	0	1
Shaped manos	3	14	1	1
Shaped manos	3	14	2	8
Shaped manos	3	14	4	4
Pebble manos	3	16	0	1
Non-artifact detritus	3	19	0	922
Hammer stone	3	20	1	1
Hammer stone	3	20	2	1
Abrading pebbles	3	21	3	3
Metates	3	23	0	38

Table 1 (continued)

Artifact Name	Material Code	Item	Sub-Item	Frequency
Metates	3	23	1	37
Metates	3	23	2	1
Metates	3	23	3	2
Metates	3	23	4	9
Metates	3	23	7	11
Rubbing platforms	3	24	1	2
Digging stick weights	3	27	0	5
Stone club	3	29	1	2
Stone club	3	29	2	1
Lime stone	3	32	0	11
Stone slabs	3	35	0	11
Celts	3	36	0	2
Carved stone vessel	3	40	0	2
Basalt flake artifacts	3	41	0	4
Chalcedony flake artifacts	3	42	0	3
Steatite tabs	3	44	0	1
Dressed pumice blocks	3	47	0	6
Stone pounder	3	48	0	1
C-14 sample	4	1	0	5
Soil sample	7	1	0	2
Soil sample	7	1	1	1
Ash	8	1	0	2
Ecological specimen	9	8	0	3
			TOTAL COUNT	30,341

(Complete artifact code can be found in Table 1 of Foreword.)

LOCATION AND SETTING

As already indicated, Mound B-V-4 is one of a group of mounds located in the Finca El Mirador (see Fig. 2 of Foreword) in the southwestern portion of Kaminaljuyu (see Fig. 1 of Foreword). The mound complex is actually in a vacant area bounded on the east by 21 Avenida Street, which separates the complex from the Colonia El Mirador, a contemporary suburb. This vacant area is slated for eventual residential development, and is currently being used to pasture cattle. The presence of scattered maize hillocks testifies to its prior function as cultivation land. In the Kaminaljuyu Grid System, Mound B-V-4 is designated Zone 46, Area 32, Sector 151.

Directly across and east of B-V-4, is B-V-2, which was excavated during the previous field season. Adjoining Mound B-V-4 to the south is Mound B-V-3, a large mound believed to have been contemporaneous. To the north of B-V-4 is a smaller mound designated B-V-5 and also believed to be contemporaneous. A clothing factory is located immediately west of Mounds B-V-4 and B-V-5.

CONDITION, SIZE AND ORIENTATION

Unlike several other mounds in the complex (notably B-V-6 and B-V-9), Mound B-V-4 appeared to have escaped the extensive obliteration caused by being used as a source of construction material, or through the work of pot hunters. The entire area surrounding and including the mound was mantled with grass and dotted by a scattering of maize hillocks. On and beneath the surface of the dark topsoil, the concentration of pottery sherds and obsidian fragments increased from occasional to moderate as one moved up the mound's slope to its summit.

A face view of the mound indicates an oval shape, with a north to south measurement of approximately 48 m, and 42 m from east to west. Measuring vertically from the summit to the level of the plaza on the east, the mound attains a height of 4 m. There also appears to be a subtle but definite continuation of the lower slopes of B-V-4 and B-V-3, indicating a probable functional connection between the two mounds at one time.

The orientation of Mound B-V-4 conforms to the general pattern established for most of the mounds in this group. Its longitudinal axis is aligned along a north-south axis, though not exactly aligned. The north-south base line is actually 27.5° east of magnetic north.

EXCAVATION METHODOLOGY

Horizontal and Vertical Controls

Control over the horizontal provenience of archaeological materials was achieved by instituting a grid system (Fig. 1). The fundamental units comprising the grid were 1 meter by 3 meter trenches (Plate 1a) although several of the first units excavated are 2 meters by 3 meters. Moreover, several units that contain features and are not within the "T-shaped" trench pattern are as large as 3 m by 5 m; depending upon the size of the feature. Each unit is identified by a "square" number in addition to its grid coordinates relative to the primary datum point. The grid was laid out with the aid of a transit and conformed to the basic alignment established for all of the Finca El Mirador mounds (see Fig. 2 of Foreword). The datum point also corresponds to the primary datum established for the Finca El Mirador group.

Vertical provenience control was maintained by utilizing the pre-established primary datum point and several secondary datum points that were established closer to the mound for measuring convenience. The excavation generally involved the employment of arbitrary levels measuring 20 cm in depth. However, sufficient flexibility was allowed so that levels could be defined by the size of structural features when they were encountered.

Documentation

All provenience information was transferred to the laboratory along with the artifacts recovered. This was accomplished by bagging the materials from each level of each square separately and tagging each bag with such information as the date, site designation, horizontal and vertical provenience, feature number, and identification of the person supervising the excavation.

A preliminary record of content was made for each level of each square prior to bagging. All of this and other data were included in a daily field record which detailed the daily thrust of the excavation. Radiocarbon samples were carefully taken and listed in a radiocarbon record. Also, any particularly significant artifacts uncovered, including the radiocarbon samples, were designated by special field numbers (DOT). Finally, numerous soil profiles were recorded so as to provide supplementary stratigraphic data.

Excavation Strategy

Practical limitations (such as time and money) usually preclude the possibility of thoroughly excavating any mound entirely, and Mound B-V-4 is no exception. Also, since the speculated functions of the mound were at best unclear, it was felt that a 3 meter wide trench patterned in the form of a "T" would provide sufficient probing area for detecting anything significant (Fig. 1). The bar of the "T" ran from north to south through the summit of the mound while the body of the "T" extended east from the summit.

In addition, several pits were dug outside of the "T" to test for the presence of various features. During the first few weeks various units at and near to the peripheries of the mound were excavated. Gradually there was a concentration of units near the summit as well as toward the central portions of each trench leading from the summit. Towards the close of the field season various units outside of the trench pattern were excavated for reasons indicated above.

STRATIGRAPHY

It is necessary to preface the discussion of the mound's construction (Fig. 2) with a description of the soil constituents (Table 4). There are five basic soil constituents present: humus topsoil, clay, sand, pumaceous ash, and talpetate. These basic soil selements occur alone or in various combinations to define at least 13 recognizable soil types or strata. The 13 strata were arrived at after careful observation of the stratigraphic profiles of the main north-south trench. When the actual construction phases are discussed the stratigraphic profile of the east-west trench will also be relied upon to provide supportive information where this is desirable.

Topsoil represents the first soil type. It is generally black to dark brown in color and highly organic in content. The topsoil forms a stratum that covered the entire mound surface and varied in thickness from 20 cm to over 1 meter.

Stratum 2 is composed of granular sand mixed with clay, forming a dark reddish brown layer that commonly appears beneath Stratum 1. It is not continuous in occurrence but interspersed, varying from 0 cm to 75 cm in thickness.

Where Stratum 2 is absent Stratum 3 can usually be found in the form of two substrata. Substratum 3a consists of blocky clay mixed with small amounts of pumice and ash. Substratum 3b underlies Substratum 3a and consists of blocky clay with bands of pumice and talpetate. Both substrata occur in a fairly restricted section of the main trench which will later be discussed as the area where the first construction phase occurred. Both substrata are dark reddish brown and together vary in thickness from 2 cm to 1.5 meters.

Stratum 4 is a significant layer of dusky red clay that will be fully discussed in Construction Phase One.

Stratum 5 through Stratum 8 represent various combinations of mound fill in connection with Construction Phase Two. They will be briefly discussed now and elaborated upon later. Stratum 5 consists of two substrata; one composed of clay with chunks and modules of pumice; the other composed of clay with quite large blocks of pumice and talpetate. Both substrata are dark reddish brown in color. Stratum 6 is a dark brown mixture of sand and clay with very little pumice present. Stratum 7 largely consists of unsorted sand which is dark reddish brown in color. Stratum 8 is a granular textured mixture of sand, talpetate and pumice that occurs in slanted bands within

Stratum 7. Stratum 6 is adjacent to Stratum 7 and all four strata underlie the topsoil at and near the apex of the mound.

Stratum 13 also represents a restricted layer of mound fill that is associated with Construction Phase One. It consists of light clay with a great deal of fine talpetate.

The four remaining strata represent the original surface soil and subsoils in this area. Stratum 9 represents the original surface soil and it forms a continuous band beneath all previously mentioned strata throughout the entire mound. Its thickness varies between 20 cm and 35 cm and has the familiar color of dark reddish brown. Within this stratum is a light concentration of potsherds and several obsidian blades. Directly underlying this layer is Stratum 10, a natural deposit of blocky clay subsoil that is sterile. It is considerably thicker than Stratum 9, measuring over 1 meter in several places. It has a dusky red appearance. Stratum 11 lies beneath Stratum 10 and is a mixture of sand, clay, talpetate and pumice. It is yellow to yellowish-brown in color, depending upon the relative composition of the soil constituents. Stratum 11 is similar to Stratum 10 in that it also contains no cultural remains. Finally, Stratum 12 represents the lowest level encountered during the excavation. It is a sterile, natural subsoil deposit of bedded sand and pumice. This layer has a yellowish-brown color and an undetermined thickness.

MOUND CONSTRUCTION

The two construction phases present in Mound B-V-4 were revealed through examination of the stratigraphic profiles for the north-south trench, especially the profile constructed along the west wall. Supportive evidence was also obtained through reference to the stratigraphic profiles of the east-west trench.

Construction Phase One

Underlying Stratum 1 and Stratum 3a, a gently slanting dome-shaped construction cap appears that marks the probable surface of a purposely constructed mound. Designated as Stratum 4, the construction cap mainly consists of fairly hard clay--probably a prepared surface of puddled adobe. It forms a sedate arc that spans 15m, extending from 130 S to 115 S along the west wall of the main trench (ie., 49W). Stratum 4 is fairly uniform in thickness; measuring nearly 45 cm at the summit and tapering gradually in both directions until it vanishes completely.

The construction cap rests on Stratum 3b, a combination of blocky clay and bands of pumice and talpetate that provides substantial texture contrast with the fine clay particles of Stratum 4. Stratum 3b extends no further than the limits established by the construction cap, indicating its probable function as mound fill. It is difficult to determine whether it was dry fill or puddled adobe. However, its chunky, cohesive texture plus the presence of

small concentrations of pumice and talpetate lend credence to a puddled adobe type of fill. Stratum 3b measures 1.25 m beneath the summit and tapers off to nothing as its flat base meets the sloping dome at both ends.

Beneath Stratum 3b is a localized band of light clay, designated Stratum 13. It extends along the interior two-thirds of the mound only and likely represents the first layer of mound fill positioned by the mound builders. Stratum 13 measures 35 cm directly beneath the summit and decreases in thickness, disappearing before extending to either edge of the mound.

Stratum 9 underlies the entire mound and is conjectured to be the original surface soil. The horizontal character of Stratum 9 and those below contrasts greatly to the vaulted nature of the strata connected with the construction of the mound. This contrast provides the most obvious clue to the mound's presence.

Overlying the entire mound construction is Stratum 3a, composed of blocky clay, and Stratum 1, a layer of topsoil. Stratum 3a likely owes its existence to the second construction phase, a somewhat later and more ambitious undertaking.

An argument could be made for Construction Phase One having been a structural end in itself, since it was so obviously well prepared. Yet, several factors indicate that a more plausible hypothesis lies elsewhere. If Mounds B-V-4 and B-V-2 (which is directly east) are compared, it becomes apparent that the size and composition of Construction Phase One (B-V-4) and Substructure 2a (B-V-2) are identical. The original surface underlying both mounds is sloping terrain; sloping downward from north to south under B-V-4 and west to east beneath B-V-2. On such terrain, slippage would undoubtedly pose a threat to the mounds' stability. Thus, it is no coincidence that Construction Phase One of Mound B-V-4 and Substructure 2a of Mound B-V-2 are situated downslope of the main structure for their respective mounds. This supports the supposition that Construction Phase One functioned primarily as a retaining mound and that Phase One and Phase 2 collectively represent a single structural phase, hence a single phase occupation of the area.

Construction Phase Two

Although there is no construction cap to indicate this phase as there was for Construction Phase One, the nature and probable origin of the strata involved testify to its existence. It appears that the second construction phase was initiated after a lapse of time (for reasons to be discussed presently) although it is difficult to say how much later.

The first stage in the construction of Phase Two was the deposition of a layer of fill over the construction cap of Phase One. This layer, designated Stratum 3a, consists of blocky clay mixed with very small concentrations of pumice and ash. It extends beyond the construction cap in both directions but conforms to the curved shape produced by Stratum 4. At this stage it would appear as though the plan were to construct a new mound directly over Phase One.

However, the subsequent addition of Stratum 5a reveals that the mound was intended to extend further to the north as construction of Phase Two continued. Stratum 5a appears only to the north of Construction Phase One and abuts the upper surface of Stratum 3a which arches downward. Stratum 5a consists of clay and pumice nodules that contributes a 1.2 m thickness of mound fill.

Still further to the north and adjacent to Stratum 5a is Stratum 5b, which has a similar composition except that the pumice nodules are much larger. In addition, large blocks of talpetate are present; creating a very blocky type of mound fill. Stratum 5b represents the highest level of visible construction to the north, joining with Strata 3a and 5a to form a fairly flat surface that stretches for 20 m (126 S to 106 S). Within Stratum 5b are several slanted bnads of granular snad, pumice and talpetate, designated Stratum 8. This 20 m surface was probably capped at one time, but extensive erosion has removed all traces.

As the mound beings to slope downward to the north, Stratum 5 terminates giving way to Stratum 2. This stratum, composed of granular sand mixed with clay, seems to serve as the surface fill for the northern slope.

Below all of these fill layers, Stratum 9, the original surface soil, continues to define the boundary between fill soils and those that are natural deposits. But there is one interesting exception. Further along the northern slope of Phase Two, Stratum 9 comes to an end and Stratum 10, the original subsoil beneath Stratum 9, appears near the surface. The fill stratum terminates at this point but continues several meters down the slope. Also the topsoil above this point is thin whereas it becomes very thick on either side. All of these coincidences can be explained by imagining the past presence of an unwanted rise in the surface that tended to spoil the slope effect. Consequently the builders scraped this particular area, depositing fill and topsoil in several directions.

Looking at the east-west trench profile, it becomes apparent that several strata of mound fill extended east from the apex for a distance of 12 m. Stratum 5b is the lowest, lying directly above the old surface soil. Stratum 5a overlies this layer and is in turn overlain by another type of mound fill, Stratum 7. This layer consists of unsorted sand.

Stratum 7 also occurs along the southern slope of the Phase Two construction in the alternate north-south profile map (ie., 111-120S/46W). This leads to the inclusion of the only previously unmentioned fill stratum, designated Stratum 6. This layer also appears in the alternate north-south profile and is located directly beneath the surface summit. It is composed of mixed sand and clay with small concentrations of pumice.

Dating of Mound Construction

Since the obsidian and radiocarbon dates obtained from Mound B-V-4 refer to post-constructional utilization of the mound and not to its initial construction, we must rely upon the evident structural similarity between Mounds B-V-2 and B-V-4 to supply this information. The discussion just completed

should have made it clear that B-V-2 and B-V-4, located only some 25 meters apart, share a number of highly specific structural affinities. If we assume that these traits imply contemporaneity it is appropriate for us to examine the chronometric dating of Mound B-V-2 in order to cross-date Mound B-V-4.

Table 2

Obsidian Hydration Dates from Mound B-V-2*

Sample Number	Accession Number	Micron Value	Correlated Date (S.D.)	Square	Provenience Level
4637	KJ68-228	3.87	161 B.C. ± 110	PN-12	5
4638	KJ68-231	3.18	531 A.D. ± 91	PN-13	1
4639	KJ68-243	3.96	262 B.C. ± 113	PN-24	1
4640	KJ68-255	2.52	1067 A.D. ± 72	PN-13	2
4641	KJ68-255	3.58	146 A.D. ± 102	PN-13	2
4642	KJ68-269	3.92	217 B.C. ± 112	PN-12	4
4643	KJ68-269	3.71	11 A.D. ± 106	PN-12	4

*Hydration rate used in computation of chronometric values is 7.03 μ^2/1000 years.

The presence of an intact Las Majadas vase (Cardenas 1969: 28) deep within the adobe fill of Structure 2 provides a basis for evaluating the set of obsidian dates given in Table 2. Las Majadas (currently under reevaluation by Wetherington) has been conventionally assigned to the Late Formative period (Sanders and Price 1968: Fig. 2). The fact that it was recovered intact (the only whole vessel so recovered during excavation of B-V-2) suggests that its placement was intentional and not merely the product of accidental redeposition in connection with mound construction. For these reasons, it appears appropriate to focus upon the three earliest obsidian dates:

(4637)	271 B.C.	----------	51 B.C.
(4639)	375 B.C.	----------	149 B.C.
(4642)	329 B.C.	----------	105 B.C.
Mean =	325 B.C.	Mean =	101 B.C.

The Late Formative period is defined chronometrically at Kaminaljuyu as the time between 500 B.C. and 200 B.C. The obsidian dates cited above suggest that the mound was constructed sometime between 325 B.C. and the end of the

Late Formative period (ca. 200 B.C.). A similar date should therefore be assigned to the construction of Mound B-V-4.

POST-CONSTRUCTION PHASES

Features 1 and 12 (Figure 3)

These two contiguous features appear to be remnants of a post-construction "plastered" floor and adjacent structure found at the eastern end of the east-west trench. The floor surface, structural debris, and associated artifacts were first exposed in the east-west trench (ie., Squares 1-4, 56-60, 76) and designated Feature 1. Later extensions to the south (ie., Squares 93-94, 100) uncovered more structural debris and associated artifacts, and these were designated Feature 12. Despite the separate feature designations, it is clear that the two features constitute a single structural unit and should be treated as such.

The full extent of the apparent floor surface is not known. The field notes only mention its presence in Squares 1 and 2 at a vertical provenience of about 20.01 m AZEP (Above the Zero Elevation Plane), the floor being more easily detected in the southern half of these two squares. Although the floor's existence in other squares of the east-west trench was not noted by the original excavators, it is presumed that it was present, especially in the adjoining squares. Perhaps their silence on this point was due, at least in part, to difficulty in detecting the floor surface in the northern half of the adjacent squares (ie., Squares 3-4, 56-57), any floor surface in the southern half being overlain by structural debris. It also seems likely that the floor continued southward into Squares 100 and 94, although these two squares were never excavated to a vertical provenience of 20.01 m AZEP and consequent verification. The good preservation of the floor in the southern half of Squares 1 and 2, however, supports the probability of its continuance to the south. If these assumptions are correct, then the floor would have extended along both the eastern and northern sides of the adjoining structure, at least from 108-115S and 15-22W respectively. It is also presumed that the floor continued beyond the limits of excavation. The floor itself was very hard and had hundreds of Amatle potsherds in place on its surface and slightly imbedded in it. In addition, there was a moderate concentration of obsidian blades and fragments and many small fired clay lumps in association with or immediately above it.

The evidence for an adjacent structure consisted of an extensive concentration of burnt clay lumps (23% of the artifact types from Features 1 and 12), ceramics (68%), and lithic material (7%). Included in the fired clay rubble were many large pieces of fired clay with unpainted surfacing (29%) or pole impressions (18%). There was also a large quantity of pumice (31%) and non-artifactual detritus (18%) relative to the remaining lithic material. Such a high concentration of burnt clay lumps and stone rubble can easily be interpreted as the remains of a cane or wooden frame-and-mass adobe structure as described by Wauchope (1938: 80-81, 87-88). It should also be noted that this type of structure is probably the one most frequently found throughout

Guatemala, with the exception of Santiago Atitlan in the highlands and the Department of Peten in the lowlands, and that it shows a considerable antiquity (Wauchope, 1938).

It is, of course, possible that this accumulation of debris represents nothing more than a fallen pile of rubble from Mound B-V-4's summit, as in the case of Features 2, 4, 5, 6, 9, 10, and 11 (see below), but this seems unlikely for several reasons. First, there was a definite perpendicular arrangement to the debris. One arm extended east-west, between 110S and 111S, from about 19W to beyond 25W, with a distinct gap between 22W and 23W. The other arm ran north-south, between 19W and 20W, from about 110S to 114S. Second, there was a double line of large stones running north-south below the corresponding arm of debris. Third, several of the large fired clay lumps were found positioned in a linear fashion along the east-west arm mentioned above. It seems unlikely that such obvious patterning would be found in a haphazardly formed pile of discarded rubble from somewhere else. A more probable interpretation is that the double line of large stones functioned as a wall foundation; while the linear arrangement of fired clay lumps suggests the one-time existence of a perpendicular adjoining wall. Consequently, the debris is believed to represent the remains of the collapsed eastern and northern walls of a frame-and-adobe structure of unknown dimensions (at least 6 m x 6 m), with perhaps an entrance in its northern wall indicated by the 1 meter gap in the debris. It is probable that the structure was destroyed by fire, as evidenced by the extensive fired clay rubble (showing both low and high intensity firing) and the overlying blanket of black, carbonaceous debris. This blanket presumably was formed by the collapse of a burning thatch roof.

Although a complete analysis of the artifacts is not presently available, a brief preliminary inventory of some of the functional categories represented in the assemblage will be helpful later in interpreting the data (see Discussion). At least three different activities appear to have been carried out by the builders and users of the structure and adjoining floor surface, suggesting that the structure functioned as a residence.

1. Food Production

Ground Stone. One broken piece of a "doughnut" shaped ground stone (KJ69-9562, DOT 108) was found on top of the collapsed fired clay wall debris. It is likely that such stones served as digging stick weights, having been fitted onto the ends of pointed wooden shafts somewhat over 4 cm in diameter.

2. Food Preparation and Storage

Ground Stone. Two tabular mano fragments were found within the structure (KJ69-8486, DOT 104c; KJ69- , DOT 101), one of which was never catalogued, and a third tabular mano fragment was found on top of the fired clay debris (KJ69-8647, DOT 105). One ovate flat stone about 10 cm in diameter (KJ69-8565, DOT 103) was found toward the postulated rear of the structure and appeared to have been used as a pebble mano. Only one relatively small fragment from a simple slab metate (KJ69-8564, DOT 102) was found in the entire assemblage, again within the structure. The absence of metate

fragments is somewhat suspicious in an assemblage presumably associated with a residential structure. It is suggested, however, that this situation derives from the deliberate collection of metate fragments for use as hearth stones on the mound's summit (see Features 3 and 13) by a later group of post-construction occupants. Finally, a stone with a naturally occurring flat surface (KJ69-8486, DOT 104d) was also found in the presumed rear portion of the structure and was apparently utilized as a rubbing platform.

Chipped Stone. A number of blade and flake artifacts of obsidian (27% of the lithic material) were found scattered throughout the debris and probably were of a functional, domestic nature. Such evidence would suggest heavy utilization of obsidian blades and flakes in domestic food preparation.

Pottery. A large body of sherd material of Amatle plain domestic ware was recovered, among which there were at least two reconstructable wide-mouthed olla forms: one found outside the structure (KJ69-8354, DOT 107) and the other (KJ69-8486, DOT 104b) at the rear of the structure with a small pot (KJ69-8490, DOT 104a) inside it. It has been suggested by Lischka (1972) that ollas were primarily used for cooking food, although food and liquid storage was an alternative usage. The evidence at hand would seem to support the latter usage in this instance, the small pot within the larger olla suggesting storage.

3. Non-Subsistence Activities.

Ground Stone. One spherical stone club-head with a medial groove (KJ69-8414, DOT 106) was found at the rear of the structure. The most probable use of such an artifact, once hafted to a wooden handle, would be as an offensive-defensive weapon (Michels, personal communication).

Features 2, 4, 5, 6, 9, 10, and 11 (Figures 4 and 5)

These seven features comprise a series of rubble piles found encircling the apex of Mound B-V-4. Time did not allow for the complete exposure of any of these features, making it impossible to say whether some of them continued and merged with others or not, eg., Feature 2 and Feature 6, Feature 4 and Feature 9, etc. It is believed that these concentrations of debris represent the remnants of a post-construction frame-and-adobe structure, located originally on the mound's summit. In all cases these features were downslope of the apex and located in Squares 13-15, 40-41, 95 and 97, 92, 62, 83-85, and 96 respectively. The rubble piles consisted of varying concentrations of fired clay lumps, potsherds, pumice, and other artifacts covered by black topsoil. Wtih the exception of Feature 2, the features rested on a reddish brown clay mound fill matrix which is probably the same surface discussed in Features 7 and 8 (see below). Although these seven features are being considered together for obvious reasons, a brief description and preliminary inventory of artifact types for each feature will be helpful in demonstrating their relationship.

Feature 2 (Squares 13-15), located north of the mound's apex, consisted solely of fired clay lumps and had a vertical provenience of 23.16-23.94 m AZEP. Among the fired clay rubble, 33% were without surfacing or pole impressions, 6% had unpainted surfacing, and 60% had pole impressions.

Feature 4 (Squares 40-41) located east of the mound's apex, revealed a surprisingly regular (ie., straight) western and eastern edge and had a vertical provenience of 23.25-24.10 m AZEP. The debris rested on a fired clay surface which sloped down from west to east. Amatle domestic ware sherds, including three figurine fragments, represented 52% of the artifact types from the debris, the remainder comprising lithic material (7%), burnt clay lumps (39%), and carbonized wood (0.61%). The majority of the lithic material (63%) consisted of miscellaneous pumice fragments, non-artifactual detritus, and stone building material in the order of their decreasing frequency. The rest of the lithic material included two unclassified, utilized cobble stones (5%), one celt (2%), one stone pounder (2%), four prismatic obsidian blades (11%), and four obsidian flake artifacts (11%). Five of the obsidian artifacts (three blades and two flake artifacts) were dated by the obsidian hydration method (see Table 3).

Table 3

Obsidian Hydration Dates from Feature 4*

Sample Number	Accession Number	Micron Value	Correlated Date	Square	Provenience Level	Elevation
8927	KJ69-8751	3.07	638 A.D. $\pm$ 88	41	1	23.25-24.10
8928	KJ69-8751	3.20	513 A.D. $\pm$ 91	41	1	23.25-24.10
8929	KJ69-8751	3.92	758 A.D. $\pm$ 83	41	1	23.25-24.10
8930	KJ69-8763	2.23	1264 A.D. $\pm$ 64	41	1	23.25-24.10
8931	KJ69-8763	4.05	364 B.C. $\pm$ 116	41	1	23.25-24.10

*Hydration rate used in computation of chronometric values is 7.03 μ^2/1000 years.

Twenty-nine percent of the burnt clay lumps showed no evidence of surfacing or pole impressions; while 66% had unpainted surfacing, 0.52% had painted surfacing, 2% had pole impressions, and 1% had both surfacing and impressions. Beneath the debris were three pieces of carbonized wood (KJ69-7060, DOT 19; KJ69-7066, DOT 20; KJ69-7063, DOT 21). A radiocarbon assay was obtained from the KJ7066 specimen located in Unit 40 at an elevation of 23.31 m AZEP. The sample consisted of chunks of carbonized wood weighing a total of 155.7 grams. The sample was submitted to Isotopes Incorporated (Sample # I-6270) and yielded an age range of 667 A.D. to 853 A.D. after applying a half-life of 5730 years and a MASCA Correction Factor. When taken together with the first three obsidian dates, which cluster nicely with a mean of 636 A.D., it appears likely that Feature 4 dates somewhere between 650 A.D. and 700 A.D., which would represent the final half-century of the Middle Classic period (400 A.D.-700 A.D.).

Feature 5 (Squares 95 and 97, Plate 1b), located west of the mound's apex, showed a striking similarity to Feature 4 in the straightness of its eastern edge and had a vertical provenience of 23.80-24.34 m AZEP. This feature was also the largest of the rubble piles exposed around the mound's summit. Amatle domestic ware sherds, including six figurine fragments, made up 58% of the rubble, with lithic material comprising 9% and fired clay lumps making up the rest (31%). Just over half of the lithic material (50%) consisted of miscellaneous pumice fragments, non-artifactual detritus, and stone building material. The rest of the lithic material included one unclassified, utilized cobble stone (1%), one rubbing platform (1%), three metate fragments (4%), 21 prismatic obsidian blades (29%), and ten obsidian flake artifacts (13%). The fired clay lumps were distributed as follows: 35% without surfacing or pole impressions, 21% with unpainted surfacing, 41% with pole impressions, and 0.86% with both surfacing and pole impressions.

Feature 6 (Square 92), located northwest of the mound's apex, contained broken ceramics for the most part and had a vertical provenience of 23.43-24.10 m AZEP. Amatle domestic ware sherds accounted for 85% of the artifact types from the debris, lithic material representing only 4% and fired clay lumps only 9%. The lithic material included one miscellaenous pumice fragment (11%), one piece of non-artifactual detritus (11%), three prismatic obsidian blade fragments (33%), and three obsidian flake artifacts (33%). Among the fired clay lumps, 33% bore no evidence of surfacing or pole impressions, 44% had unpainted surfacing, and 22% showed pole impressions.

Feature 9 (Square 62), located northeast of the mound's apex, was one of the smaller rubble piles and had a vertical provenience of 23.24-23.48 m AZEP. Amatle domestic ware sherds represented 58% of the debris, while lithic material made up 8% and fired clay lumps 33%. The lithic material consisted of two metate fragments. All the fired clay lumps were without surfacing or pole impressions.

Feature 10 (Squares 83-85), located south of the mound's apex, consisted primarily of fired clay debris and had a vertical provenience of 24.14-24.57 m AZEP. Amatle domestic ware sherds constituted 13% of the rubble and the lithic material accounted for another 17%, but the burnt clay lumps made up a large 69%. A substantial portion of the lithic material (42%) comprised pumice fragments and non-artifactual detritus. The remainder included 21 unclassified, utilized cobble sontes (52%) and one obsidian flake artifact (2%). The fired clay lumps were distributed as follows: 23% without surfacing or pole impressions, 73% with unpainted surfacing, and 1% with pole impressions.

Feature 11 (Square 96), located southwest of the mound's apex, was another small rubble pile (not shown in Fig. 4) and had a vertical provenience of 24.02-24.20 m AZEP. The debris included Amatle domestic ware sherds (46%), lithic material (26%), and fired clay lumps (26%). Once again the greater part of the lithic material (62%) consisted of miscellaneous pumice fragments and non-artifactual detritus. The rest of the lithics were made up of one unclassified, utilized cobble stone (12%), one prismatic obsidian blade (12%), and one obsidian flake artifact (12%). All of the fired clay lumps showed either no surfacing or pole impressions (75%) or unpainted surfacing (25%).

As mentioned at the outset, these seven rubble piles are believed to represent the burnt remains of a post-construction frame-and-adobe superstructure which once existed on top of a multi-tiered earthen platform (Figs. 5 and 6). This hypothesis is supported by several lines of evidence: material remains, location, and chronology.

A large proportion of the lithic material from each feature (excepting Features 2 and 9) was made up of pumice fragments, non-artifactual detritus, and stone building material. These three different artifact type categories can be reasonably lumped into one functional category: stone rubble used in construction. It is probable that a fourth artifact type, unclassified, utilized cobble stones, should also be considered as falling within the functional category of stone rubble used in construction in an unknown number of instances. Furthermore, a large proportion of the material remains of all these features consisted of fired clay lumps, many with unpainted surfaces or pole impressions or both surfaces and impressions. Such high concentrations of stone building material and burnt clay lumps can be interpreted, without difficulty, as the burnt remains of a cane or wooden frame-and-mass adobe superstructure similar to modern Maya houses that have been described by Wauchope (1938).

In looking at Figure 5, it is apparent that the seven features encircled an area roughly 7 m by 6 m, which included the apex of the mound. If these features were related to the same structure, the elevations should be comparable for the most part. Excluding Features 10 and 11 for the moment, there are only two features--Feature 5 (23.80-24.34 m AZEP) and Feature 9 (23.24-23.48 m AZEP)--which do not show any overlap as might be expected. However, these differences might be accounted for by the difference in distance from the mound's apex of these two features. As Feature 9 is further away from the apex, it would be on a slightly lower elevation, if the mound substructure consisted of terraces sloping away from the apex, something on the order of 25 cm per meter or less (estimating from Feature 5). The case of Features 10 and 11 is somewhat different. The elevations of these two features suggests that they lay on a second, higher terrace than the other features. It was on this higher terrace that the platform for the frame-and-adobe superstructure was located. When the frame-and-adobe superstructure was destroyed by fire, fragments of the burning walls (as represented by the burnt clay lumps found in the features) were scattered around, falling from the platform onto the lower level terraces where the features were discovered. No debris was found on the mound's apex, where the uppermost platform should have been located, because erosion and subsequent human disturbance (see Features 3 and 13) have since removed any material remains (including postholes). Structural evidence only survived where the debris fell over on lower terraces, particularly where these terraces articulated with the walls of the next higher terrace or the upper platform. Such a situation would account for the relatively straight eastern edge of Feature 5, because this edge abutted the west wall of the uppermost terrace and platform which once existed to the east. Similar arguments would account for the relatively straight western edge of Feature 4, which abutted the eastern wall of the uppermost terrace and platform, and northern edge of Feature 10, which abutted the southern wall or stairs of the platform. Figures 5 and 6 summarize this supposition.

Definite chronological evidence of the relationship between these features must await completion of the ceramic analysis. However, as the ceramic debris from the features consisted entirely of Amatle domestic ware, it seems likely that such analysis will confirm the contemporaneity of the rubble piles.

The superstructure, which must have been 7 m by 6 m in size, was so completely disturbed that little can be said about it beyond the fact that it was of frame-and-adobe. The artifactual inventory of the seven features, however, suggests that it functioned as a residence. The metate fragments, rubbing platform, stone pounder, and numerous obsidian blade and flake artifacts found in the rubble are direct evidence that food preparation was one of the activities carried out by the inhabitants. Interestingly enough, the five metate fragments were all relatively small, as was the case with the one fragment from the house at the base of the mound. Again it is suggested that the absence of large metate fragments from among the debris is due to their subsequent collection for use as hearth stones (see Features 3 and 13) by a later group of people. The large body of Amatle plain domestic ware sherds is further evidence of the residential nature of the superstructure. It will be important to compare the vessel types represented in this assemblage with those from the house at the base of the mound. Such a comparison may help substantiate the possibility of economic or status differences having existed between the occupants of the two houses. Several factors presently lead us to suspect that such differences did exist. The presence of several effigy sherds and adornos among the debris on top of the mound, contrasted with their absence from the rubble at the base, indicates a possible difference in the quality of ceramics used in the two residences. Nine figurine fragments were also found in the features on the summit and none in the features at the base. In addition, ollas were not a recognizable vessel type among the summit debris, but were prominent in the assemblage of Features 1 and 2, suggesting greater emphasis on storage in the latter. Finally, the retrieval of one fragmentary celt from among the rubble of the superstructure indicates an affinity with the superstructure of Mound B-V-11 (Webster: this volume) where celts were also found, and which is decidedly an elite structure.

Before leaving this section, a word is in order concerning the probable appearance and method of constructing the multi-tiered earthen substructure (Fig. 6). The uppermost platform probably measured about 7 m by 6 m (estimating from the distances between the inner edges of the features) and must have been set at least 40-50 cm above the uppermost terrace to have had any practical function. The uppermost terrace, on which Features 10 and 11 were found, probably extended 7 meters east-west by at least 18 meters north-south and probably was set about 80 cm above the lower terrace on which Features 2, 4, 5, 6, and 9 were found. Evidence for the floor of this lower terrace is presumably represented in Feature 4, where some of the reddish brown clay mound fill matrix became burnt by the falling debris of the burning frame-and-adobe superstructure. This second terrace appears to have extended at least 18 meters east-west by at least 30 meters north-south and again was probably set about 80 cm above the next lower terrace. Evidence for a third and final terrace at an even lower elevation was inconclusive, although judging from the contour map of Mound B-V-4 (Fig. 1) and the profile drawings (Fig. 2), its original existence seems extremely probable. Given the probable existence of a third terrace, its overall dimensions would appear to have

been about 30 meters east-west by at least 42 meters north-south, with an elevation of approximately 80 cm above the surrounding plaza or land surface.

All the evidence suggests that the multi-tiered earthen substructure was constructed by the utilization and reshaping of an earlier Late Formative platform mound. In other words, the construction activity consisted not of building a new substructure or adding to an old one, but rather of sculpting an older mound to the desired dimensions. This hypothesis would readily account for the absence of capping for Construction Phase Two and the fact that Features 4, 5, 6, 9, 10, and 11, not to mention Features 7 and 8 (see below), were all found resting on the reddish brown clay fill matrix of Construction Phase Two. Figure 6 is perhaps an overly idealized reconstruction of the original appearance of the multi-tiered earthen substructure with superstructure and adjacent structure. It is based, however, on the belief that there probably were economic and/or status differences between the occupants of the superstructure and those of the residence at the base of the mound. This belief is suggested by the artifact type comparison of the assemblages from the two structures discussed above and further supported by the labor expenditure necessary for reshaping a large earthen substructure, as opposed to simply building a frame-and-adobe structure such as was found at the base of the mound. It is, of course, possible that the reshaping of the older Late Formative platofrm mound was nowhere near as extensive as Figure 6 would lead one to believe. If this were the case, then it would serve to lessen the probable economic and/or status differences which existed between the occupants of the two residences, but it probably would not negate these differences altogether.

Features 7 and 8 (Plate 1c)

These two features share with Feature 9 (discussed above) what appears to be a prepared surface of compact reddish brown clay, located slightly east of the northern portion of the north-south trench in Squares 89 and 90 respectively. The surface sloped downward from south to north (23.20-22.86 m AZEP) and probably represents the floor surface of the second terrace of the post-construction multi-tiered earthen substructure. Resting on this surface were four reconstructable ceramic vessels (apparently in situ) which were designated Feature 7. Three of these vessels (KJ69-7116, DOT 14; KJ69-7170, DOT 15; KJ69-7189, DOT 17) formed a triangular cluster, while the fourth (KJ69-7325, DOT 13) was found about 30 cm to the east. Only two of the four pots were of immediately recognizable vessel types. One was a shallow, long-handled, dish-shaped, thin, plain orange incensario (KJ69-7325, DOT 13) containing a prismatic obsidian blade; the other was a large bowl (KJ69-7170, DOT 15). A third vessel (KJ69-7116, DOT 14) contained three additional prismatic obsidian blades. Also found on the terrace surface was a seemingly random lumpage of talpetate which was designated Feature 8. All of these surface finds were surrounded and covered by black topsoil.

There are two factors which support the hypothesis that this prepared surface was related to post-construction occupation rather than to the Late Formative construction phases. First, the reconstructable pottery vessels were Amatle, which means they were post-construction artifacts. The second factor involves reasoning based on absence rather than presence, yet it

deserves consideration. Although there was no evidence of capping for Construction Phase Two, it seems reasonable to assume that it did in fact exist at one time. Since capping was used for the preliminary construction phase, it would seem strange not to have applied it to the final phase, especially as a similar and contemporaneous mound nearby (Mound B-V-2) had a capping to its final construction phase (Cardenas, 1969). Due in part to the severe amount of erosion apparent throughout Kaminaljuyu, however, it is hardly surprising that the capping disappeared. The reddish brown clay fill matrix underlying the capping was probably exposed to some degree before the first post-construction occupants arrived, and they would have removed any remaining capping in the process of reshaping the mound substructure for their own use.

The important question to be answered is whether these features are related to the first post-construction group, who built and lived in the two residential structures, or to the later group which was responsible for Features 3 and 13 (see below). It is not possible to give a definitive answer to this question at the moment. The evidence suggests that the second post-construction group must have come along before the rubble from the collapsed houses and the multi-tiered earthen platform were naturally covered over by topsoil. Consequently, the later group could have left the four ceramic vessels themselves, or the vessels could have been left by the previous occupants and then not disturbed by the later group. Admittedly the first hypothesis would seem to be more probable, particularly as the incensario and cluster of pots suggest a ceremonial offering or some other ritual context, rather than a domestice context. Perhaps dating of the four obsidian blades and comparison of the four ceramic vessels with the ceramics from the rubble of the two structures will determine the answer.

Features 3 and 13 (Plate 1d)

At the apex of Mound B-V-4 (Squares 44-45) was uncovered a curious concentration of metate fragments which was designated Feature 3. This feature appeared to be either a rubble pile or cache containing 63 metate fragments of all sizes (eg., KJ69-4599, DOT 8; KJ69-4600, DOT 8; KJ69-5679, DOT 8); one tabular mano fragment; one digging stick weight fragment; seven unclassified, utilized stone cobbles; and two stone lajas. The feature had a horizontal provenience of 109.10-110.40S/47.90-49.30W with a vertical provenience of 24.39-24.92 m AZEP. During excavation there seemed to be no organization or arrangement in evidence which would hint that it might have been a hearth. It was noticed, however, that a couple of metate fragments had orange soil on one side, indicating that they had been heated and the soil fired at a fairly low temperature. The soil matrix enclosing the fragments was almost devoid of ceramics but did yield two carbon samples (KJ69-4481, DOT 9; KJ69-4485, DOT 3) which, as it turned out, should nicely date the usage of the hearth. Upon removing the rubble comprising Feature 3, it was discovered that the stone fragments rested on a compact, fire-hardened area which was designated Feature 13. It was then noticed that the semicircular orientation of a number of the metate fragments did suggest that the area had been used as a hearth.

Although apparent that Features 3 and 13 comprised the remains of a hearth built on the summit of Mound B-V-4, it was also apparent that the hearth was not contemporaneous with the residential structure on the summit, but later in time. This interpretation is based on two factors. On the one hand, there were no floors associated with the hearth. Indeed, the burnt clay surface of Feature 13 appeared to be too high to represent the floor of the upper terrace, but too low to represent any floor of the upper platform. On the other hand, there was a virtual absence of metate fragments from the debris of either the house at the base of the mound (Features 1 and 2) or the house on the summit (Features 2, 4, 5, 6, 9, 10 and 11). Both of these factors could logically be expected to be present among the remains of a residential structure which had not been disturbed. That this is the case at Kaminaljuyu has been demonstrated by Ball (elsewhere in this volume) in his descriptions of Str. A-2 of Mound B-V-14 and Str. B-2b of Mound B-V-8, both of which happen to be Middle Classic residential structures located about 200 meters northeast of Mound B-V-4. In fact, it could be argued that their absence alone would be sufficient grounds on which to postulate past disturbance. Consequently, it is suggested that the hearth was built by a later group of occupants, some time after the destruction of the residential superstructure. Apparently this later group cleared off any existing rubble from the surface of the upper platform, prior to their own utilization of the surface, and deliberately collected numerous metate fragments from among the rubble on the summit and at the base of the mound for use as hearth stones.

DISCUSSION

Five chronological phases have emerged from the excavation; the first three falling within the Late Formative period (500-200 B.C.). The first phase consisted of light to moderate concentrations of occupation debris distributed around the entire area on and within the original surface soil. This represented the period of pre-construction occupation. Slight but regular undulations in the original surface stratum may represent the remains of corn hillocks; indicating that these early occupants of the area were farmers. On the basis of the data from the settlement pattern test trenches, it seems likely that this initial occupation occurred only shortly before mound construction began and would therefore date to the Late Formative period (Michels, personal communication).

Construction Phase One is the second phase in the chronological sequence of occupation. The phase was represented by a low, sloping mound which had an obviously well prepared surface of compact clay. There were no features associated with this platform, and its positioning seems to indicate that it functioned as a retaining mound for the main structure. Its location downslope of Construction Phase Two is identical to the location of Substructure 2a relative to Structure 2 in Mound B-V-2; a position crucial for the prevention of slippage.

Construction Phase Two represents the third chronological phase, most of which takes place upslope to the north of the slippage prevention mound.

This phase greatly expanded the mound's size, as Construction Phase One became merely the core for the fill of the southern slope leading up to the summit. At its completion, the surface capping probably covered a fairly flat area of about 20 meters in length (from north to south) and several meters in width. It was a platform structure with no trace of a superstructure built upon it.

As mentioned earlier, Mound B-V-4 was excavated because more was hoped to be learned about the Late Formative mound configuration in Colonia El Mirador. The mound occupied an interior position in the mound group series B-V-3, B-V-4, B-V-5, B-V-6. This series is evenly spaced and perfectly aligned, with two types of mounds represented. The large, peripheral mounds (B-V-3 and B-V-6) were thought to have contrasted with the smaller, interior-positioned mounds (B-V-4 and B-V-5) with respect to function since they have a significantly different form (see the Bebrich and Wynn paper in this volume for a discussion of B-V-6). B-V-4 and B-V-5 were believed to have functioned as either elite residences or ceremonial platforms during the Late Formative. The data obtained as a result of the excavation of B-V-4 supports the notion that Mound B-V-4 was built not as an elite residence platform but as low-lying, broad-topped platform upon which public ritual could be conducted. Furthermore, it is now evident that there was also a functional relationship between Mound B-V-4 and Mound B-V-2 (Cardenas 1969), as evidenced by their structural affinity, their relative positioning, and their contemporaneity.

We are now able to visualize a two-phase Late Formative presence in the Finca El Mirador area. Data from underneath the excavated mounds as well as from the settlement pattern test trenches indicate an initial phase in which a handful of farming families had erected pole and thatch dwellings amidst small fields devoted to maize cultivation. This episode comes to a close with the construction of a ceremonial complex consisting of steep temple mounds (B-V-3, B-V-6), ritual platforms (B-V-2, B-V-4, B-V-5) and priestly dwellings (B-V-15, B-V-8?). A deliberately leveled plaza area linked together the various architectural elements. The focus of residential activity shifts to Area 23 (Michels, personal communication).

It does not appear that the ceremonial complex served primarily as a mortuary center. On the basis of excavations, especially that of Mound B-V-6 where this hypothesis was specifically tested, the results were negative. The excavations of B-V-2, B-V-4, B-V-8, also failed to reveal any elite burials. Only Mound B-V-15 revealed an elite burial, and this was in a residential context.

It therefore appears that the Late Formative mound complex in Finca El Mirador served principally if not exclusively as a center for public religious ceremony and ritual. And that the five principal mounds represent platforms upon which dramatic spectacles could be performed and witnessed by large numbers of people located in the flat, open, plaza-like area bordered on the west by the four-mound alignment and on the east by Mound B-V-12 and Mounds B-V-8 and B-V-15 (see Discussion by Ball elsewhere in this volume).

The first post-construction occupation of the mound constitutes the fourth chronological phase (Middle Classic period, ca., 700 A.D.), and also the phase which provides the most information about the lives of its creators. As previously mentioned, the Amatle ceramic debris from the two house structures demonstrates a relatively long time-lapse of at least 800 years between the abandonment and subsequent reutilization of Mound B-V-4 by a different kind of group for a different reason. Although the residential superstructure was too disturbed to allow for adequate reconstruction, it is suggested that it probably was similar in structure, function, and time of occupancy to the more intact house at the eastern base of the mound. This interpretation is based on the fact that both were frame-and-adobe structures of apparently similar size; the ceramic material from both structures was Amatle plain domestic ware; and there was a notable absence of large metate fragments among the debris of both structures, even though other domestic artifacts were found.

It is suggested, therefore, that the residential structures of Mound B-V-4 were the homes of two Middle Classic Maya families, at least one of whom (perhaps both) was a peasant family and formed part of the supporting population of an Amatle settlement in the area. A similar argument has been convincingly presented by Ball (elsewhere in this volume) in his interpretation of the relationship between the "peasant" Stra. A-2 of Mound B-V-14, on the one hand, and the "elite" Strs. B-2a and B-2b of Mound B-V-8 and Str. C-2 of Mound B-V-15 of the same complex on the other (located only 200 meters to the northeast). It can be argued that an analogous pattern existed between the B-V-4 house structures themselves, to a certain extent, and between them and the nearby Amatle complex of Mounds B-V-9, B-V-10, and B-V-11 (Webster: this volume) only 75 meters to the northeast.

Although the contemporaneity of these three complexes has not been previously established, it now seems a certainty. As mentioned earlier, the tight cluster of three obsidian dates, and one radiocarbon date from Feature 4 suggest a date somewhere between 650 A.D. and 700 A.D. Similarly, the obsidian dates and radiocarbon date from the superstructure of B-V-11 (Webster, elsewhere in this volume) indicates a Middle Classic date for the construction and occupation of the B-V-11 complex. Finally, the obsidian dates from the B-V-8 complex, together with ceramic indicators, particularly the presence of an Esperanza Flesh Color bowl in the substairway cache of Str. B-2a of Mound B-V-8 [Ball, 1973]) attests to a Middle Classic date for the construction and occupation of this complex also.

In addition to the evidence supplied by these three complexes (ie., the B-V-4, B-V-8, and B-V-11 complexes), the settlement pattern test trenches also reveal extensive Middle Classic deposits (Michels, personal communication). It is premature to analyze the settlement as a whole since the test trench data is still undergoing analysis, but various aspects of Middle Classic life as revealed by the mound complexes deserves comment.

Ball (Ibid) has postulated the existence of two distinct social classes during Middle Classic times, based on the evidence from the B-V-8 complex: an economically non-productive elite class and a lower class agricultural supporting population. The evidence from the excavation of Mound B-V-4, however, suggests the existence of perhaps a third social class or, at the

very least, demonstrates the existence of measurable economic differences within the peasant class itself. Similarly, evidence from the B-V-11 complex suggests the possible existence of a fourth social class or of ranking within the elite class, assuming the complex was, at least in part, residential in nature.

The easiest way to demonstrate this postulated fourfold division of Middle Classic society is in terms of the time and energy required in constructing the structural components of the various complexes. The labor requirements necessary to build the simple frame-and-adobe house (Category 1) evidenced at the base of Mound B-V-4 and on Mound B-V-14 (ie., Str. A-2) do not begin to compare with that required in the sculpting of the multi-tiered earthen substructure of Mound B-V-4 and subsequent construction of the frame-and-adobe superstructure (Category 2). Similarly, the labor expended in sculpting an older mound to the desired substructural dimensions (ie., Mound B-V-4) does not approach that required for the construction of new substructures overlying older mounds as evidenced by Mounds B-V-8 and B-V-15 (Category 3). And finally, the labor necessary in building the B-V-8 complex was much less than that required in the construction of the entire B-V-11 complex with its surrounding embankment (Category 4).

Further evidence of the distance between the elite and the common man is seen in the lack of any indications of food production as an activity carried out by anyone within the elite complexes. Digging stick weights, for instance, seem to be an artifact type found only in association with residences of the peasant class. It is the lack of such artifacts in association with the frame-and-adobe superstructure of Mound B-V-4 that have, in part, led to the hypothesis of its having been occupied by a class of people above that of the peasant. In any case, it is suggestive that the elite were dependent upon the supporting peasant population for the food they consumed.

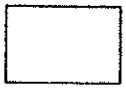
The last source of evidence suggesting the existence of social differentiation is to be found in the ceramic material. The absence from Str. A-2 of Mound B-V-14 and the structure at the base of Mound B-V-4 of any sherd material representing quality Amatle 1 orange ware and plumbate ware, or showing applique decoration and modeling, suggests that peasants did not have access to such items. The use of finer Amatle 1 wares was apparently restricted to the elite, as indicated by their widespread occurrence in both the B-V-8 and B-V-11 complexes. It is the absence of quality Amatle 1 ceramics from the superstructure of Mound B-V-4 which suggests that the occupants probably did not belong to the elite class, yet the presence of figurines and adornos among the rubble also suggests that they may not have been peasants either. The question of whether the ceramic material from the Mound B-V-4 superstructure is indeed of a better quality than that from the structure at the base of the mound and from Str. A-2 (Mound B-V-14) or not will have to await completion of the ceramic analysis.

Finally, in conclusion to our summary of B-V-4 chronological phasing reference must be made to the second post-construction occupation. It marks the fifth and final chronological phase indicated by the data, and probably dates to the Late Classic or Early Postclassic period. It is represented by the remains of an apparent hearth built on the summit of Mound B-V-4. There were no floors or structures in association with the hearth, which

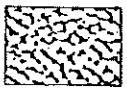
would suggest that it represents a short occupation of the mound, possibly no more than several nights. On the one hand, perhaps it merely represents the remnants of a farmer's overnight camp near his milpa, as are still used today. On the other hand, Features 3 and 13 may have served as an altar for the burning of incense and/or sacrifice, similar to the Quiché altars used today on the hilltops outside of Chichicastenango. The incensario and three ceramic vessels of Feature 7 support the latter hypothesis, assuming they are not related to the earlier Middle Classic occupation. The selection of Mound B-V-4 may have been based simply on its convenience as a local eminence for conducting such rituals. In any case, the heavy Amatle 1 occupation of the area had already come to an end and lay in ruins. The last occupants appear to have searched through the debris of the two house structures, looking for suitable hearth stones. In addition to collecting metate fragments, they also seem to have swept the summit clear of debris before building the hearth. After their departure, the occupation of this area of Kaminaljuyu seems essentially to have been over (Michels, personal communication).

Table 4

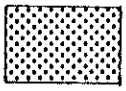
Soil Stratigraphy of Mound B-V-4 (46-32-151)



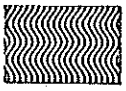
Stratum 1 Topsoil; high organic content; black (10YR 2/1) to dark brown (10YR 3/2).



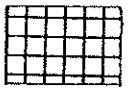
Stratum 2 Granular sand mixed with clay; dark reddish brown (5YR 3/3).



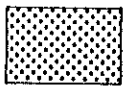
Stratum 3 a. Blocky clay with small amounts of pumice and ash; b. Blocky clay with bands of pumice and talpetate; dark reddish brown (5YR 3/3).



Stratum 4 Packed, fine partical clay; dusky red (2YR 3/2).



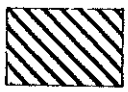
Stratum 5 Light clay, with large amounts of fine talpetate; dark yellowish brown (10YR 3/4).



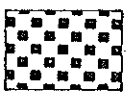
Stratum 6 a. Clay with chunks and nodules of pumice; b. Clay with large blocks of pumice and talpetate; dark reddish brown (5YR 3/3).

Stratum 7 Mixture of sand, talpetate and pumice; granular texture; yellowish brown (10YR 5/6).

Stratum 8 Unsorted sand; dark reddish brown (5YR 3/3).



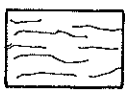
Stratum 9 Sand and clay mixture; very little pumice; dark brown (7.5YR 5/6).



Stratum 10 Original surface soil, with light concentrations of potsherds and obsidian blades; dark reddish brown (5YR 3/4).

Stratum 11 Blocky clay subsoil (sterile); dusky red (3YR 3/2).

Stratum 12 Mixture of sand, clay, talpetate and pumice (sterile); yellowish brown (10YR 5/6).



Stratum 13 Banded sand and pumice (sterile); yellowish brown (10YR 5/6).

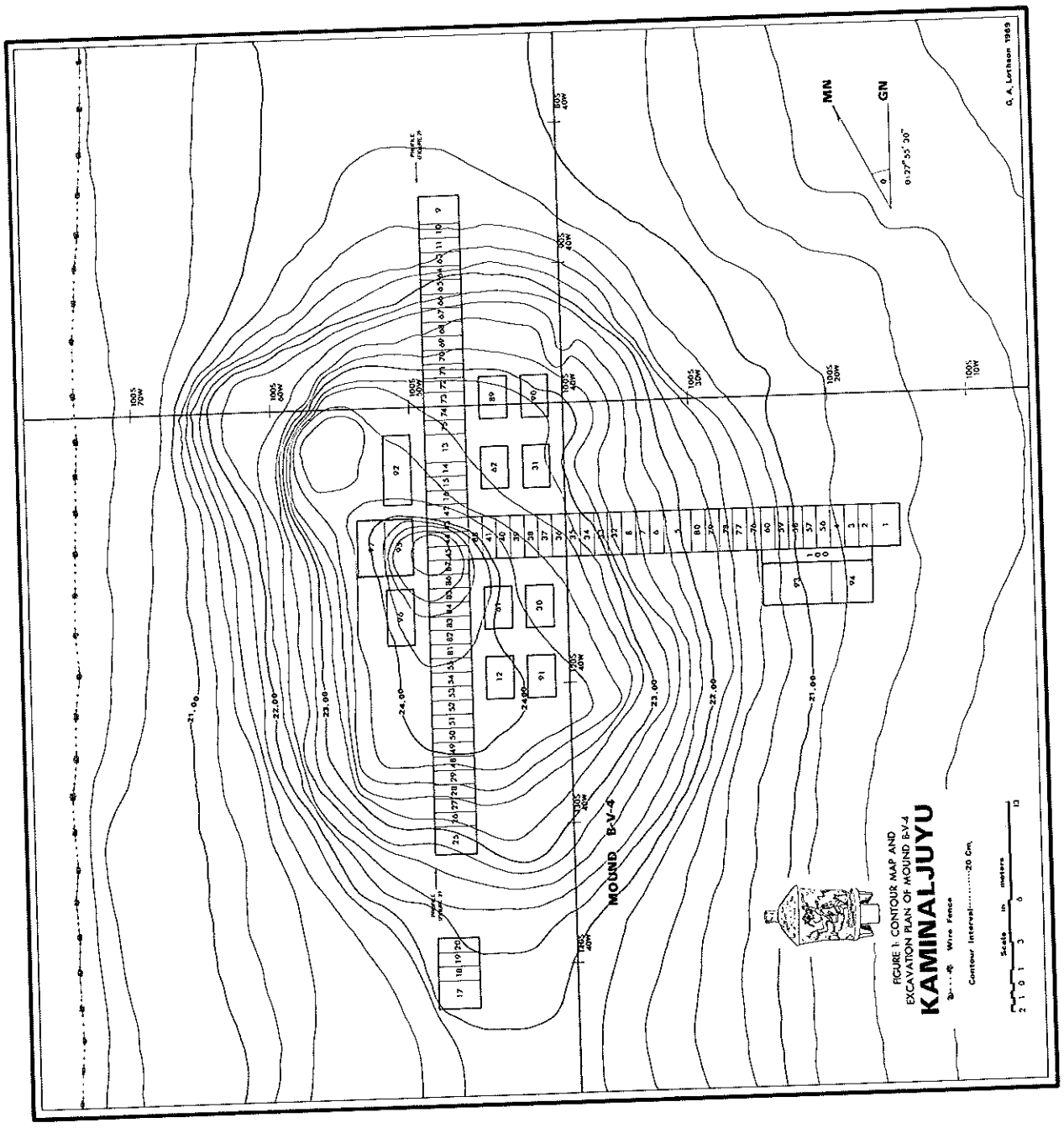


FIGURE 1: CONTOUR MAP AND EXCAVATION PLAN OF MOUND B-V-4

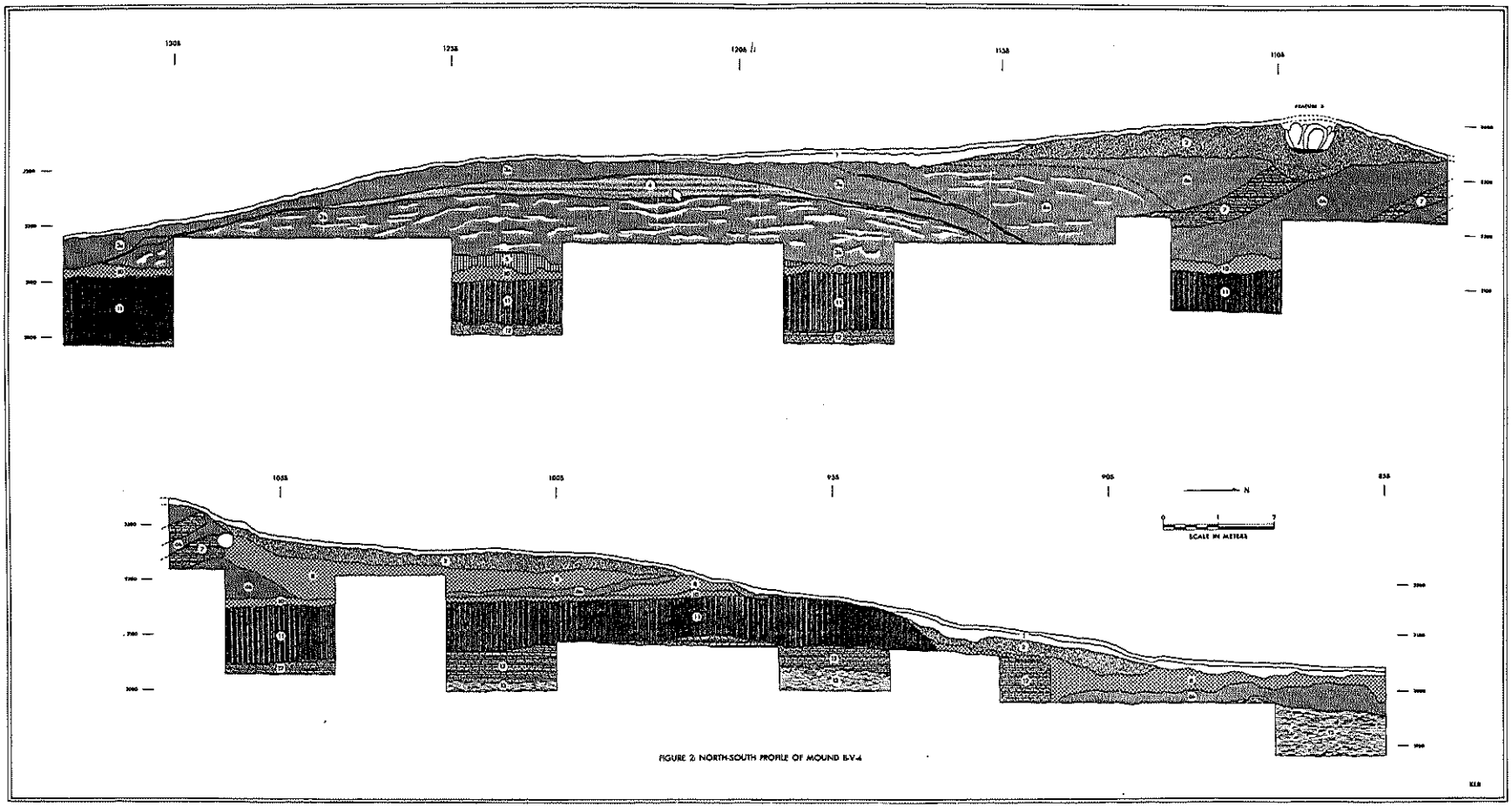


FIGURE 2: NORTH-SOUTH PROFILE OF MOUND B-V-4

FIGURE 2: PROFILE OF MOUND B-V-4

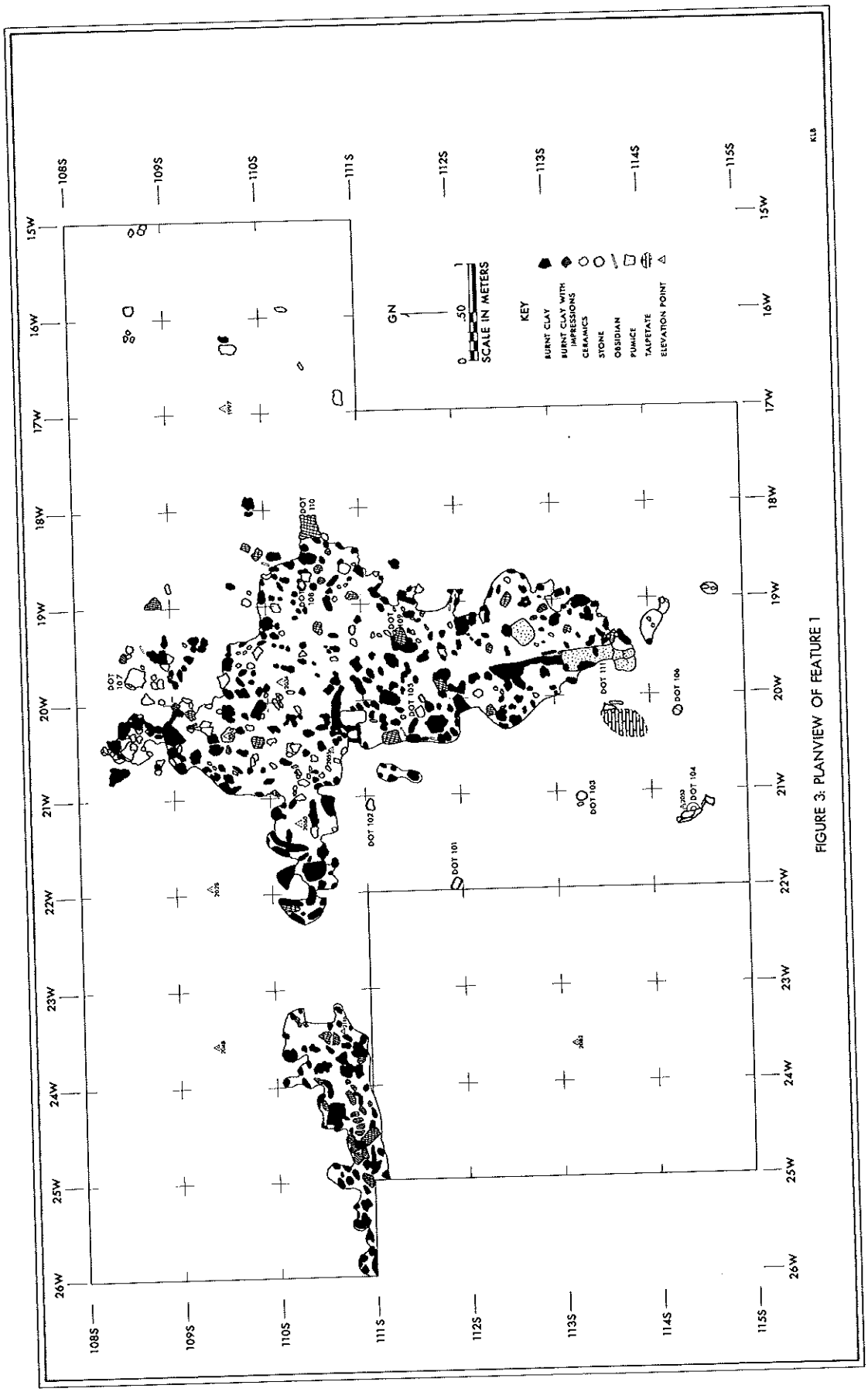


FIGURE 3: PLANVIEW OF FEATURE 1

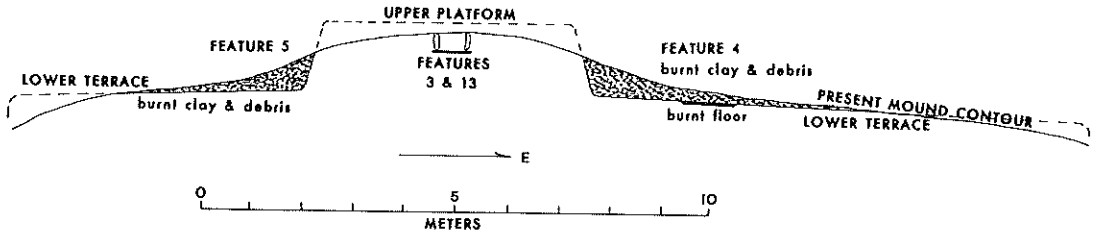


FIGURE 4: SCHEMATIC PROFILE

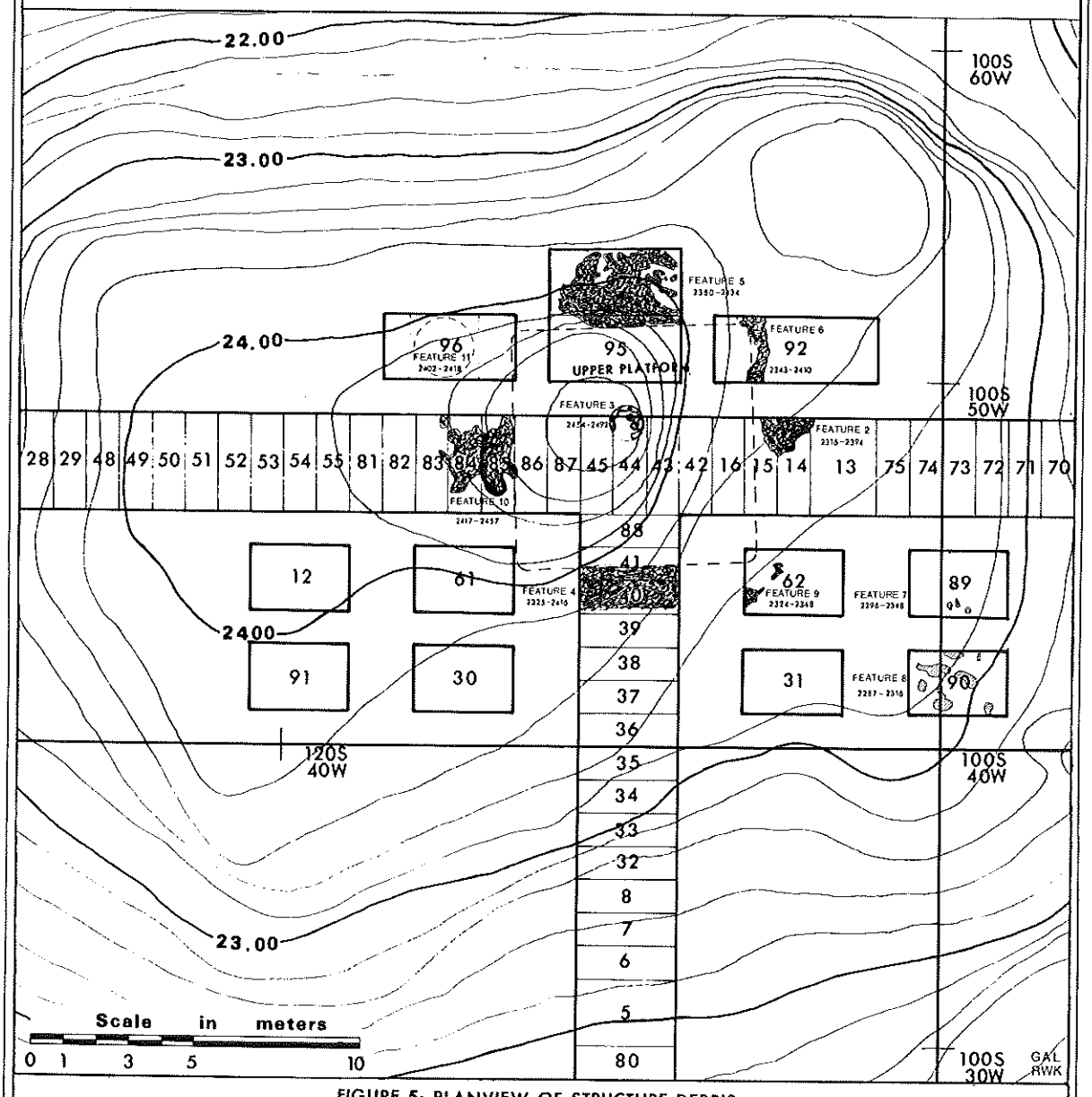


FIGURE 5: PLANVIEW OF STRUCTURE DEBRIS

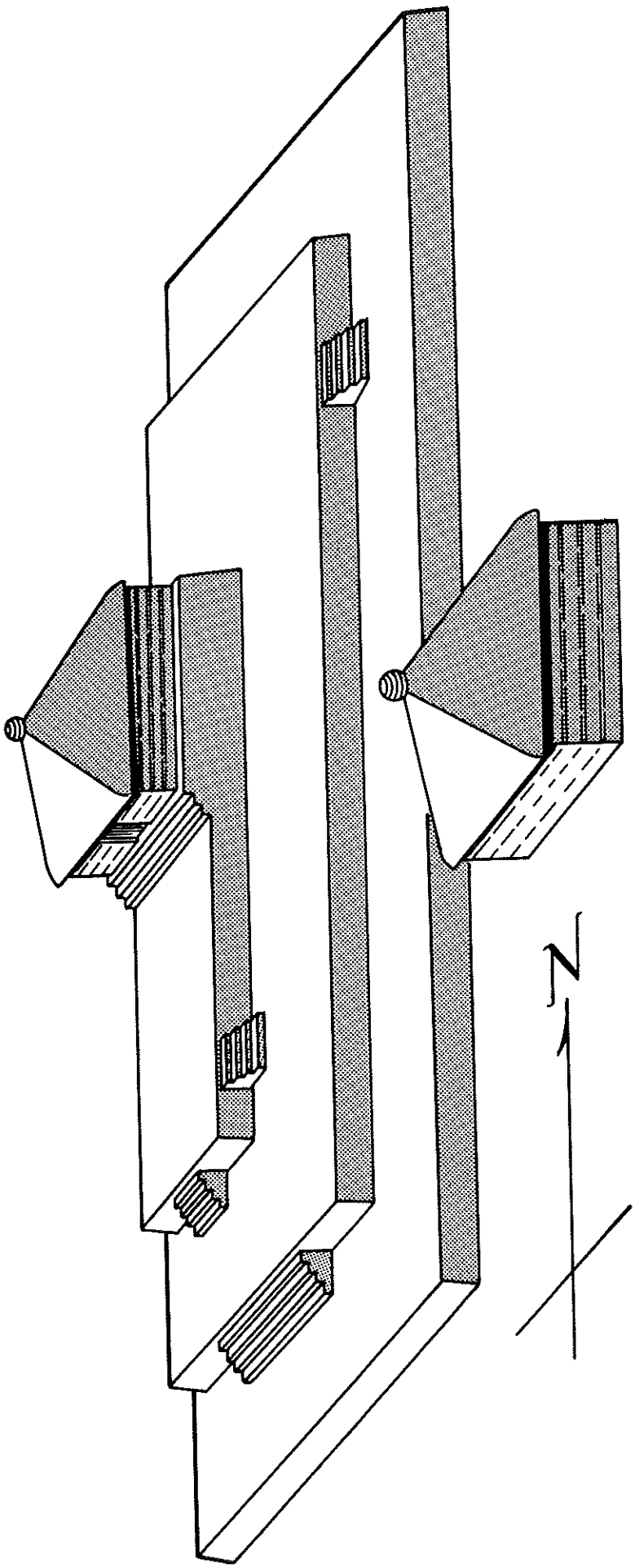
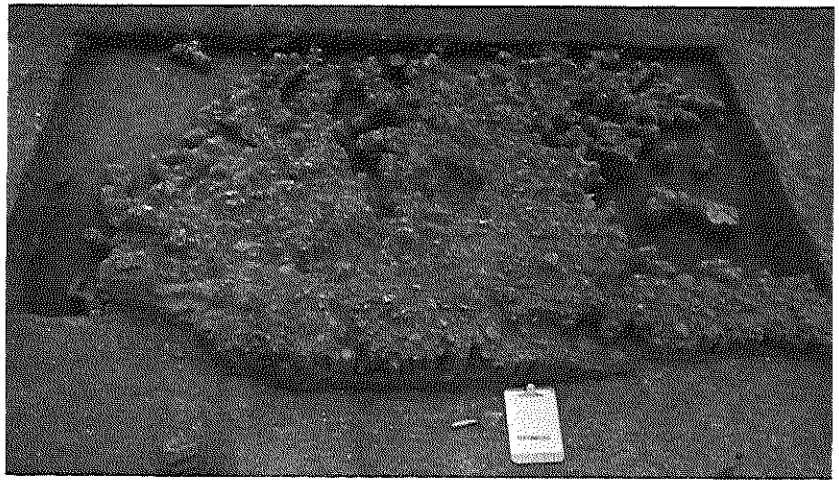
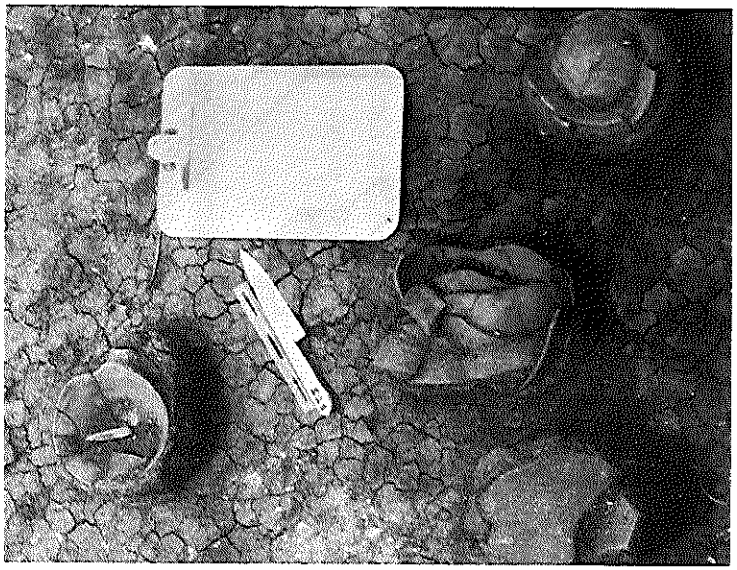


Figure 6: Reconstruction of the Platform with Superstructure and Adjacent Structure

a. Mound B-V-4, Northeast Side



b. Feature 5, Mound B-V-4



c.
Feature 7,
Mound B-V-4

d.
Feature 3&13
Mound B-V-4

PLATE 1

THE B-V-11 MOUND GROUP:

A MIDDLE CLASSIC ELITE RESIDENCE COMPOUND

by

David Webster

TABLE OF CONTENTS

	Page
INTRODUCTION	259
DESCRIPTION AND CONDITION	262
Mound B-V-10	262
Mound B-V-9	262
Mound B-V-11	263
The Embankment	263
FIELD OPERATIONS	263
FIELD TECHNIQUES	264
STRATIGRAPHY	265
ARCHITECTURE	267
The Plaza Floor	267
Mound B-V-10	268
Mound B-V-9	269
Mound B-V-11	272
The Superstructure of B-V-11	273
Feature 19	275
The Embankment	277
Feature 25	278
DATING OF THE B-V-11 MOUND GROUP	279
DISCUSSION	280

LIST OF TABLES

Table		Page
1	Total Artifact Summary of Mound Excavation	260
2	Material Items in Burial 6 (Feature 26), Mound B-V-9	271
3	Material Items in Burial Pit (Feature 19), Mound B-V-11 . . .	276
4	Obsidian Dates from B-V-11 Mound Group	279
5	Key to Soil Types, B-V-11 Mound Group	285

LIST OF FIGURES

Figure		Page
1	Contour Map of B-V-11 Mound Group	283
2	Excavation Plan for B-V-11 Mound Group	284
3	Profile: East-West Trench, Mounds B-V-10, B-V-11	286
4	Profile: South Wall, Mound B-V-10, Units 2, 5, 7, 11	287
5	Interior Profiles: Mound B-V-9	288
6	Profiles: East-West Wall of Units 24 and 27	289
7	Burial 6, Mound B-V-9, Planview	290
8	Burial 7, Mound B-V-9, Profile	290
9	Feature 14, Planview	291
10	Burial Pit, Mound B-V-11, Planview	292
11	Burial Pit, Mound B-V-11, Profiles	293
12	Profile, East Wall of Units 18 and 21	287
13	Feature 25, Profile	286

LIST OF PLATES

Plate		Page
1a	Feature 1, Mound B-V-10	294
1b	Feature 5, Mound B-V-10	294
1c	Feature 8, Mound B-V-10	294
1d	Feature 4, Mound B-V-10	294
2a	Feature 28, Mound B-V-9	295
2b	Feature 20, Mound B-V-11	295
2c	Clay Sculpture (KJ69-4159, DOT 8), Mound B-V-11	295
2d	Feature 25, Plaza	295

INTRODUCTION

During the 1969 field season of the Kaminaljuyu Project the decision was made to excavate a small complex of earthen structures which had tentatively been identified as Amatle in origin. This complex, consisting of three small mounds grouped around a central plaza bordered by an embankment, appears on the Carnegie survey map drawn up in the 1930's. On this map the three mounds are designated B-V-9, B-V-10, and B-V-11. The complex is located in the southwestern part of Kaminaljuyu (Foreword: Fig. 1), an area which is experiencing rapid urban growth. Only a few tracts of undeveloped land remain. One of these is part of the Finca El Mirador, a vast expanse of grassy fields destined soon to become a populous suburb-like Colonia Mirador which now threatens it. Dotting the old finca fields are many artificial mounds of various shapes and sizes, with a large concentration just south of the Pan American Highway; this concentration includes the mound complex that will be the subject of this report (Foreword: Fig. 2).

The overriding concern of the excavation, as already mentioned, was to gather as much information as possible before the mounds were destroyed. But even without this threat the site would certainly have deserved attention. It was perhaps the best preserved Amatle complex still remaining at Kaminaljuyu, and its excavation could reasonably be expected to shed light on a number of problems. These include the nature of the relationship between the Amatle and Esperanza phases and the absolute dating of the Amatle occupation. In addition we hoped to be able to make large, controlled collections of sherds and non-ceramic artifacts. Moreover the site was a very interesting architectural group with all three mounds obviously related to one another. Thus not only could we investigate in detail Amatle architectural techniques, but we might also be able to determine functional differences between the related structures. Finally, the complex was surrounded by a number of other mounds and it was essential to discover what, if any, cultural relationships existed between them. Immediately to the south was B-V-2, a long, low mound dug the previous season. About 100 meters to the north were several small, low mounds which apparently had residential functions (Mounds B-V-8, B-V-14, B-V-15). An alignment of very large mounds stretched for several hundred meters just to the west (B-V-3, B-V-4, B-V-5, B-V-6).

The following report is being written before the bulk of the ceramic and artifactual analysis has been completed. Therefore no detailed discussion of artifact distributions and their significance is offered. Table 1 offers the reader a summary of artifacts recovered during excavation. Rather we will concern ourselves with an examination of the stratigraphy and constructional features of the site, as well as some of the important features such as burials. Excavation of the B-V-11 mound group was directed by the author. The excavation was conducted throughout the summer of 1969, during which a local labor force of between nine and 11 workers was continuously employed. Valuable assistance was also provided by Brian Hayden, Robert Tiling, Tim Nowak and Robert Hirning.

Table 1

Total Artifact Summary of Mound Excavation

Artifact Name	Material Code	Item	Sub-Item	Frequency
Rim sherds	1	1	0	4,741
Body sherds	1	2	0	26,096
Unclassified ceramic artifact	1	3	1	2
Burnt clay lumps	1	4	1	8,420
Burnt clay lumps	1	4	2	19
Burnt clay lumps	1	4	3	633
Burnt clay lumps	1	4	4	199
Burnt clay lumps	1	4	5	31
Clay figurines	1	5	0	68
Effigy sherds	1	6	0	19
Adornos	1	7	0	32
Effigy whistle	1	8	0	1
Clay stamps	1	10	0	2
Clay stamps	1	10	1	1
Rattle balls	1	11	0	41
Sherd discs	1	12	2	3
Incensario	1	14	1	75
Incensario	1	14	2	2
Miniature vessel	1	15	0	2
Pottery vessel (whole)	1	16	0	13
Clay spindle whorl	1	18	0	1
Candelero	1	19	0	5
Candelero	1	19	1	5
Candelero	1	19	2	11
Clay sculpture	1	20	1	2
Clay sculpture	1	20	2	30
Ear plug	1	21	0	2
Obsidian blades	2	1	0	1,215
Obsidian flakes	2	2	0	1,244
Obsidian cores	2	3	0	15
Obsidian shaped artifact	2	4	0	58
Obsidian quarry nodules	2	6	0	13
Stone building material	3	1	0	3
Unclassified stone artifact	3	3	0	2
Mineral pigment	3	6	0	9
Green stone flakes	3	8	0	4
Stone sculpture	3	10	0	1
Utilized cobble	3	11	0	43
Pumice	3	12	0	1,731
Shaped mano	3	14	2	2
Pebble mano	3	16	0	2
Non-artifact detritus	3	19	0	1,271
Hammer stone	3	20	0	1
Hammer stone	3	20	1	3

Table 1 (continued)

Artifact Name	Material Code	Item	Sub-Item	Frequency
Abrading pebbles	3	21	1	1
Abrading pebbles	3	21	2	2
Abrading pebbles	3	21	3	9
Polishing pebble	3	22	1	1
Metate	3	23	0	17
Metate	3	23	1	3
Metate	3	23	3	1
Rubbing platform	3	24	0	2
Rubbing platform	3	24	1	4
Anvil	3	34	0	1
Anvil	3	34	2	1
Thin stone slab	3	35	0	12
Celt	3	36	0	3
Stone pendant	3	39	2	2
Basalt flake artifact	3	41	0	6
Chalcedony flake artifact	3	42	0	2
Dressed stone block	3	46	0	1
Dressed pumice block	3	47	0	2
Radiocarbon sample	4	1	0	6
Radiocarbon sample	4	2	0	2
Radiocarbon sample	4	3	0	2
Unclassified bone	5	0	0	6
Human bone	5	3	0	4
Human burial	5	5	0	9
Human burial	5	5	1	1
Soil sample	7	1	1	14
Soil sample	7	1	2	1
Soil sample	7	1	3	2
Soil sample	7	1	4	51
Ash	8	1	0	3
Ecological specimen	9	1	0	1
Unidentified object	11	1	0	1
Earth flooring	12	1	0	1
			TOTAL COUNT	46,248

(For complete artifact code see Table 1 of Foreword.)

DESCRIPTION AND CONDITION

The three mounds are situated around a central plaza and clearly form a single functional group (Fig. 1). The plaza itself is delineated by a broad, low earthen embankment, especially evident on the southern and western sides, and most easily seen from the summit of the largest mound, B-V-11. A roughly square enclosure measuring about 45 meters on a side is thus formed, with a mound set in the middle of the northern, western, and eastern embankments. The whole complex is fairly well oriented with respect to the cardinal points, with the western embankment falling on a line about 30° east of magnetic north. We laid out our base line for a horizontal grid pattern along this same line (actually 27° east of north), and all subsequent references to direction refer to grid orientation, not true compass bearings.

When we first began work the site was completely covered with grass and low scrub, as is the whole undeveloped part of the Finca El Mirador. Most of this land was formerly devoted to the cultivation of corn, and rows of small corn hillocks covered the plaza, the embankments, and the smallest mound, B-V-10. The other two mounds were covered with brush. Apparently no crops had been grown for some time, allowing the transition to grassy meadow. This made good pasture for a small herd of cows, which wandered about in complete freedom until our arrival.

Mound B-V-10

This mound, the smallest of the three, is located in the middle of the west embankment. It is roughly oval in shape with its long axis (east-west) measuring about 11 meters and its short axis about 10 meters. B-V-10 is a very low mound, showing only about 40-50 cm of maximum relief, and its exact dimensions were difficult to determine. Compounding the problem was the huge pit that pot-hunters had scooped out of its center right down to the old surface level, producing a plan view resembling a doughnut with a piece bitten out. Because B-V-10 was so low, corn had been grown on top of it and what remained of its surface was covered with grassy corn hillocks. Brush filled the central depression, into which drained water from the frequent rains.

Mound B-V-9

B-V-9 is roughly circular in shape with a diameter of about 11 meters. Its sides are quite steep and the level area on the summit is small, giving the whole mound a conical appearance. Maximum elevation above the modern plaza level is 2.1 meters. Unfortunately someone had dug an enormous hole through the northeastern side of the mound and into its center right down to the old surface level. The purpose of this disturbance was probably to uncover any central burial which might have been placed in the mound, and if one originally existed the pot-hunters must certainly have found it. Still, enough of the mound remained so that it could yield good architectural information, especially on the undisturbed south slope which was presumably the front of the structure. Although the steepness of its sides preserved

B-V-9 from cultivation it facilitated erosion. The cattle were apparently not intimidated by the slope either, and it was obvious that they had often climbed the mound while grazing. These factors combined, as we shall see, to destroy most of the architectural features that lay near the surface. When work began the whole mound was covered with brush.

Mound B-V-11

The largest of the mounds, B-V-11 is situated on the eastern side of the enclosure. It has a roughly rectangular shape with its long axis oriented north-south and measuring about 17 meters. The width is about 14 meters. B-V-11 has a fairly large, flat rectangular summit elevated approximately 2.9 meters above the present level of the plaza. Fortunately, with the exception of a small bite out of its northwestern corner, the mound had escaped disturbance. At first this seemed rather unusual considering that both of the smaller mounds had been plundered. B-V-11 probably owes its preservation to a thick layer of fired adobe fragments covering its summit. These were obviously the remains of a sizable wattle and daub structure and would have discouraged any clandestine diggers used to soft earth. The wattle and daub fragments, together with some alignments of pumice blocks outcropping on the western edge of the summit, suggested that interesting architectural remains lay near the surface. B-V-11 escaped cultivation because of its steep sides, but again there was a good deal of erosion aggravated by the feet of grazing cattle, which had worn well defined paths on its slopes. The eastern and southern slopes were particularly affected.

The Embankment

The low embankment which encloses the plaza has only about 50-60 cm of maximum relief and its boundaries are difficult to detect even on a close-interval contour map. Mounds B-V-10 and B-V-11, on the west and east sides of the plaza respectively, actually sit astride the embankment or, more properly, constitute enlargements of it. The embankment is most clearly seen on the south where there is no obscuring mound, and here measures at least 10 m across. Actually the embankment does not completely enclose the plaza. Instead it loops in from the east and west toward B-V-9 but does not join that mound. Possibly the resulting openings were the only means of access to the plaza and the buildings around it. At the time of the excavation the embankment was completely covered with corn hillocks; long cultivation is probably largely responsible for its blurred contours.

FIELD OPERATIONS

Faced with a short field season and a limited number of workers (9-11), it was necessary to design operations which could quickly uncover the basic information we wanted without moving too much dirt, and still allow sufficient flexibility so that we could expand to trace promising features. Using a previously surveyed horizontal grid system we laid out a 50 x 1 meter

trench running east-west, slicing directly through B-V-10, B-V-11, and the entire plaza (Fig. 2). This trench was our main operation; it provided us with a very long profile which included both mounds and clearly showed the manner in which they articulated with the plaza floor (Fig. 3). The long trench allowed us to quickly determine the nature of the stratigraphy that we would be encountering throughout the rest of the site. We also felt that the trench would pick up at least the southern edge of any tomb that might lie inside B-V-11. By first working small sections of the trench where it ran through the plaza we were able to obtain an initial stratified collection of artifacts. Last, but by no means least, by starting in the plaza in small, simple, level trenches we were able to initiate our inexperienced workmen into the mysteries of archaeological technique before they tackled the more complex problems of mound excavation. Although our long trench was only one meter wide throughout most of its length some segments were expanded to two meters in order to provide a better artifact sample and to facilitate digging in the interior of B-V-11, where the trench reached a depth of 4.5 meters.

Two narrow, deep trenches were laid out to give us artifact samples and profiles from the south and west embankments (Units 18 and 21, and Unit 31). A wide shallow trench was designed to collect an artifact sample from the surface refuse of the southern embankment and to expose any architectural features such as postholes (Unit 23). Finally a deep, narrow trench (Units 24 and 27) was excavated into the front of B-V-9 and out into the plaza to provide a profile of the mound and the approach to it. All other operations were undertaken to investigate features uncovered in these main trenches, or to obtain additional stratigraphic information.

FIELD TECHNIQUES

Summaries of the field techniques used at Kaminaljuyu can be found in the 1968 season report and in general can be applied to our work during the 1969 season. Suffice it to say that trenches were excavated in arbitrary (usually 20 cm) or natural levels, or no levels at all, as the situation dictated. Artifacts were bagged according to their vertical and horizontal proveniences. Features were given numbers and recorded separately from the daily field notes, and items of special interest such as unusual artifacts, radiocarbon or soil samples, or earth for flotation were given unique field numbers (DOT numbers) to ensure proper handling in the lab. One departure from last year's technique was a horizontal locational system based upon a grid pattern staked out directly on the site. Thus instead of the former alphabetic labels all of this season's excavation units are designated by numerical coordinates which pinpoint their actual locations with respect to a base line and datum stake. All elevations were shot in from a point given the arbitrary value of 20 meters, enabling us to assign positive elevations even in deep cuts.

STRATIGAPHY

The stratigraphy of the site turned out to be fairly simple. Our first task was to identify the original surface level on which the structures had been erected. Presumably this would be at or just below the level of the original plaza floor, unless there were earlier structures present. The following interpretation of the stratigraphy exposed in our main trench was made by Brian Hayden (Fig. 3).

Layer I (Zones A1.1 and A1.2), which averages 50-60 cm in thickness, represents deposition overlying what was once the plaza floor; whether the deposits are primarily midden material or natural soil development is unknown. Zone A1.1 is a brownish, sandy loam with a non-sticky, slightly plastic consistency and an amorphous structure. A Munsell Soil Chart reading of 7.5YR 3/2 was obtained for this zone. Undulations in the surface of A1.1 are corn hillocks. At the time of excavation the covering vegetation was grass but only a very thin sod layer had been built up. Zone A1.2 is a black loam containing much organic material. It is plastic and slightly sticky, with an amorphous structure like the overlying zone. The Munsell designation is 10YR 2/2. The boundary between the two zones is very diffuse.

Layer I can most easily be explained as a naturally developing soil. Zone A1.1, which is much lighter in color and more sandy than A1.2, has apparently lost a lot of clay and organic material through leaching, a process probably accelerated by cultivation. Both zones are rich in artifacts and it is obvious that a large proportion of depositional Unit 1 is in fact trash which accumulated on the plaza floor, with especially thick concentrations near the edges of the mounds.

Layer II is an obviously artificial layer put down in connection with the original construction of Mound B-V-11, it extends more than halfway across the plaza, gradually lensing out to the west. Its thickness is variable; contact between Layers I and II is at a depth of 40-50 cm below the surface. Various materials were used in the construction of Layer II including sand, pumice, loam, and lumps of clay and talpetate (a dense, yellowish, volcanic material). The primary purpose of Layer II seems to have been the leveling of the plaza floor in front of B-V-11. Note that the underlying stratum (IIIAp--the old surface level, see below) slopes distinctly toward the east. This slope would have caused drainage problems if left uncorrected. In order to create a level plaza the builders would either have had to scrape down the surface toward the west, or deposit fill on the east. They seem to have hit upon the latter solution, hence the existence of Layer II. It follows that the surface of Layer II once functioned as the plaza floor. In our profiles the boundary between Layers I and II was very indistinct because of cultivation and leaching. Layer II was constructed of remarkably clean fill and yielded only a small sample of artifacts.

Layer III (Zones Ap, Bp, and CP) has been identified as a buried soil; its contact with Layers I and II would consequently represent the old natural surface level before construction activity began. The contact between Layers II and III, or I and III (depending upon the position in the profile) is at a variable depth below the surface, but about one meter would be a good average.

The contact between Layers II and III is extremely sharp near Mound B-V-11 but becomes more and more indistinct as it continues west.

Zone Ap consists of brown clayey loam with a weak blocky structure and a sticky, plastic consistency. Its Munsell designation is 10YR 3/4. Thickness is variable, generally about 10-30 cm. Zone Ap produced very few artifacts, although it was obvious that there had been human activity on the site before construction began. One puzzling feature of this zone was the presence of iron concentrations. These in some places took the form of paper-thin layers, in others thick, curiously convoluted shapes resembling oyster shells. The iron content of these formations was so high that a sizable chunk could noticeably deflect a compass needle. All of these iron concentrations were found either at the contact between Layers II and III or immediately beneath it. An itinerant geologist assured us that they were natural and could easily have formed within the space of 1000 or 2000 years.

Zone Bp is composed of slightly loamy clay. Although our Munsell readings for Zones Ap and Bp are the same (10YR 3/4), the latter is obviously somewhat darker. Zone Bp has a strong blocky structure and is extremely plastic and sticky. Thickness averages about 30 cm. The zone was almost completely sterile; the few artifacts recovered from it could easily have been intruded downward. Zones Ap and Bp are separated by an indistinct contact.

Zone Cp is a pumice/sand mixture with a reddish-yellow color near Zone Bp, becoming lighter with increasing depth. The thickness of Zone Cp is unknown, although we dug a quick pit down about 1.5 m into it in Square 1. Strangely enough at a depth of about 50 cm below the Zone Bp-Cp contact the deposit began to show very definite laminations of alternating gray-brown layers about 4-5 cm thick. The explanation for these is unknown. Zone Cp is completely sterile.

It is now apparent that the identification of Layer III as a buried paleosol is correct, with Zones Ap, Bp, and Cp representing respectively the old A, B, and C horizons. Hayden notes that "there is ample evidence of a strong soil devlopment on a pumice/sand parent material. The B horizon is a very strong textural horizon, marked by increased clay content, clay films, and strong blocky structure. The A horizon has lost all (if any) of its organic color, and the C horizon is a nicely graded change from the B to oxidized pumice/sand" (field notes). This interpretation is borne out by the features of the buried soil, by its relationship to the overlying structures, and by its presence in similar contexts elsewhere. Cardenas, during his excavation of Mound B-V-2 immediately to the south, identified a similarly situated soil as the old surface (see 1968 season report, p. 22). It is interesting to note that his Strata 2 and 1a (corresponding to our III Ap and Bp respectively) also exhibit a decided easterly slope.

The stratigraphy may be summarized as follows. An old surface (top of Zone IIIAp) slopes to the east or northeast at a depth below the present surface of about one meter. Human activity on this old surface appears to have been rather limited since there are no obvious features such as hearths associated with it. A few artifacts found in the Old A horizon do, however, reflect some sort of occupation. Above this horizon are found most of the

constructional features of the site, as well as midden deposits and subsequently developed soil formations. Although the above discussion of the stratigraphy is derived from our investigations in the main trench it also applies to all our other operations unless exceptions are noted.

ARCHITECTURE

The complex consists of five main architectural elements: the plaza floor, the embankment, and the three mounds themselves. Each of these is discussed separately, below, along with significant associated features and artifacts.

The Plaza Floor

The plaza floor was not so much constructed as simply delineated by the surrounding structures, although some fill was deposited in front of Mound B-V-11, as noted above, to correct the easterly slope of the old surface level. No obvious features were found which would indicate a pre-constructional period of occupation, but occasional sherds and other artifacts in the A horizon plus several obsidian dates show that people were indeed present. One interesting feature of the old surface is that nowhere in our profiles does it exhibit evidence of corn hillocks. These are found elsewhere, such as beneath the nearby Mounds B-V-4 and B-V-6 (see reports elsewhere in this volume). It thus seems unlikely that cultivation was taking place on the area later covered by the Middle Classic complex. Of course the hillocks would have been removed in any case to produce a level plaza floor, but note that beneath mound B-V-11 and the fill to the west the profile of the old surface is extremely sharp and shows no undulations. Surely no one would have gone to the trouble of scraping down this area only to cover it immediately with construction material. There was no trace of any sort of surfacing on the plaza floor; as noted above the boundary between it and the overlying deposits is very indistinct. Root action, erosion, and leaching would very quickly have destroyed any prepared surface, especially if it were only packed earth.

The plaza, then, seems to have originally been a plot of gently sloping ground previously unused for agriculture. Possibly it was near an earlier occupied area, as suggested by the presence of sherds in the A horizon, the obsidian dates, and its sharp contact with the construction material which could reflect compaction caused by human feet. When Middle Classic building activity began, the eastern part of the plaza was leveled by clean fill and the mounds and embankment were erected to form the complex. Subsequent deposition on the plaza floor added 40-60 cm of midden soil. This deposition presumably began after the complex was abandoned. The remains of three vessels of apparent Amatle origin were recovered from Sq. 8, resting on or just above the original plaza floor. No signs of intrusion were noticed and the implication is that at the time the complex was abandoned there were still Amatle people about who dumped trash into the formerly occupied area.

Mound B-V-10

B-V-10 is the smallest of the three mounds and is in some respect quite unlike its larger neighbors. One obvious difference is its lack of height; originally it must have been elevated at most 1.5 meters above the plaza floor. Another difference is that instead of being laid directly upon the old surface level the fill of the mound intruded all the way down into the old "C" horizon, the arena parent material. Possibly the mound was built on the site of an old barrow pit, or perhaps it covered a subsurface burial. In the latter case the pot-hunters responsible for the gutting of the mound must have obliterated all traces of any interment.

Our profile through B-V-10 failed to show any sure evidence of internal building phases (Fig. 4). The basic material used in the construction of the mound was a light brown clay which contained numerous small pumice inclusions and lenses. This material dried rapidly upon exposure, making it difficult to distinguish subtle color changes in the profiles. The fill was very rich in artifacts, mostly sherds and obsidian blades.

At a depth of about 65 cm below the surface in Units 1 and 2 we hit a large mass of rubble that was much more resistant than the surrounding fill (Feature 1; Plate 1a). It was composed of large blocks of hardened adobe (some as large as basketballs), pumice fragments of first size, and a few unworked stones. Artifacts from Feature 1 were very scarce. When exposed the feature looked like a small mound of rubble with an exceedingly irregular surface. It seems highly unlikely that it could have represented a structure earlier than the larger mound of which it was a part. More plausible is the explanation that Feature 1 was simply a construction core of material different from the rest of the fill. Alternatively it could have been a cross-section of the west embankment of which B-V-10 is a part.

A small pocket of cultural debris including several large sherds was uncovered in Unit 2 about one meter below the surface (Feature 5; Plate 1b). This apparently represents trash thrown in with the fill since no signs of intrusion were noticed. Several of the rim sherds are probably of Amatle origin, suggesting that B-V-10 was built in Amatle times.

Several other features were discovered which indicate something about the original architecture of B-V-10. On the eastern side of the mound in Unit 5 we uncovered two large, roughly squared pumice blocks laid end to end and covered by a layer of adobe and pumice rubble (Feature 8; Plate 1c). Possibly this material is part of a retaining wall delimiting the peripheries of the mound inside of which the fill was thrown. Above Feature 8 in the same square we had previously discovered a sloping surface of hardened clay covering a scatter of small pumice blocks (Feature 4; Plate 1d). This suggested a floor fragment, except for the fact that it was not level; perhaps it was part of a slumping wall or step. Deposited on top of these constructional features at the mound's edge was a very black organic soil filled with sherds, obsidian, and other cultural debris. This organic layer was thickest near the plaza floor and lensed out toward the top of the mound; whether it was deposited while the mound was in use or after the abandonment of the complex is unknown. Several large chunks of fired adobe were found in the midden material, and these retained the impressions of large wooden

posts up to 10 cm in diameter, clear evidence of substantial wattle and daub construction. It is possible, however, that these fragments were brought in as trash from nearby areas, such as Mound B-V-11, where we know that a wattle and daub structure existed. They should not be taken as clear evidence that such a structure crowned B-V-10 as well.

Our investigations of B-V-10 were not expanded to trace the full extent of the features described above. It was felt that the ruinous condition of the mound did not warrant the expenditure of further time and labor.

Mound B-V-9

B-V-9, the second largest of the three mounds, sits on the northern side of the plaza. The contour map shows the extent to which it had been gutted by pot-hunters, who scooped out a huge hole right down into the sterile arena. Needless to say any important central burial would have been discovered and removed, and architectural remains on the summit were destroyed. As mentioned above, B-V-9 does not lie on the embankment as do the other two mounds; rather the embankment curls around toward it from the east and west but stops short, leaving narrow entrances into the plaza at either end of the mound.

Excavations in B-V-9 were aimed at producing profiles which would show structural details, and also at procuring well controlled artifact samples from the fill and the underlying strata. Two short interior profiles were obtained by simply trimming up the sides of the central disturbance (Fig. 5). Next a 1 x 9 m trench (Units 24 and 27) was driven right trhough the middle of the mound and out into the plaza. This trench (Fig. 6) was designed to show how the mound construction articulated with the plaza floor, and also to pick up architectural features such as stairways which might be preserved on the relatively undisturbed south face of the mound, presumably its front.

The architecture as exposed in our profiles presents a fairly coherent picture of the history of the mound. B-V-9 was built directly upon the old surface level which sloped slightly to the northeast (top of Stratum 6) in our profiles). There was minimal disturbance of the surface with no significant downward intrusion of the construction material. The old A horizon (Stratum 6) shows a fairly sharp contact with the fill, again suggesting that corn cultivation was not practiced in the immediate area.

Two distinct phases of construction are evident. First a low, flat platform composed of vari-colored blocky clay, chunks of talpetate, and pumice lumps and lenses was erected. This construction material had a maximum thickness of 1.5 meters beneath the mound itself, and continued for an undetermined distance toward the south, ie., toward the center of the plaza (see Strata 3 and 5), thinning out rapidly in that direction. It will be remembered that the same feature was found to the east of B-V-11; probably the function was the same also--to correct the slight northeasterly slope of the natural ground surface. I expect that if we had extended our trench from B-V-9 further into the plaza this artificial material would simply have lensed out as it does on our long east west profile. An alternative but unlikely possibility is that there was some sort of platform or

apron in front of B-V-9. All of the fill that went into this first construction phase was remarkably clean. Only a handful of artifacts were recovered from it.

The initial low platform was capped by a second layer of fill of very different character. This layer, also about 1.5 meters in thickness, consisted of a matrix of compact, light brown clay with small pumice inclusions scattered evenly throughout (Stratum 2). It is very rich in cultural debris and presented a strikingly different appearance from the blocky clay fill beneath. The original height of B-V-9 must have been about 3 meters.

We have then, two obvious constructional phases in B-V-9. The crucial question is whether or not they are also occupational phases. Evidence supporting the latter suggestion is largely lacking. Although the contact between the two layers of fill is reasonably sharp and level there was no sign of any sort of floor or concentration of refuse such as would normally be expected on an occupied surface. We did find a curious "pillar" of fired adobe fragments above a pile of flat rocks, resting on top of the blocky clay layer. If one has an active imagination this could be interpreted as the cross-section of an adobe wall on a stone footing, and its absence elsewhere explained away by disturbance. This seems to me to be a remote possibility, but the distribution of the adobe fragments and rocks could just as well indicate a pit. I think it is much more likely that the two distinct layers of fill represent only constructional phases. First the low platform of clean fill was laid down, then for some reason the source of the construction material was changed after a short cessation in building activity. I saw what looked like a definite Amatle rim sherd come out of the old "A" horizon directly beneath the mound, thus reinforcing the above interpretation. Of course if this identification proves incorrect, and if only pre-Amatle sherds are found in the blocky fill layer, the possibility of an earlier structure beneath the Amatle mound must be admitted.

Feature 28 (Plate 2a) is the remains of an adobe step on the southern side of B-V-9. It was discovered only after we noticed a curious step-like arrangement of talpetate blocks in the eastern profile of Unit 27. Closer examination revealed a vertical strip of fired adobe which, when traced to the east and west proved to be the riser of a step or terrace. When fully exposed this step ran along the front of B-V-9 for a distance of 4.2 meters, and had a height of 35 cm. Curiously only the riser was fired; perhaps the tread had originally been fired as well but had been worn down to the clay matrix. In any event the riser articulated nicely with a hard clay layer marking the top of what we had previously identified as the old plaza floor, thus confirming our initial interpretation. On the eastern periphery of the step was a very thick, heavy mass of fired adobe which was obviously in situ; it probably indicates the position of a balustrade flanking the stairway. Similar masses of adobe were found on the western end of the step but this area had been quite badly disturbed. Our attempts to find a second, higher step proved unsuccessful though the eastern profile of Unit 27 certainly suggests that one existed. Quite probably the rest of the south face of B-V-9, subject to erosion and the trampling feet of cattle, had been too badly damaged for architectural features to be preserved near the surface. The same erosion no doubt saved the lower step from destruction by covering it up.

While uncovering the step we ran across a concentration of fired adobe fragments in a black soil matrix near the western end of Unit 36. Some of these fragments were quite large and bore impressions of wooden posts--unmistakable evidence of wattle and daub architecture. Possibly a structure of this type crowned B-V-9, but if so it must have been rather small since the summit has a very limited surface area. No similar concentrations of fired adobe were noticed elsewhere at the base of the mound or on its slopes. This suggests that what little debris we did find represents trash from somewhere else, perhaps from the vicinity of B-V-11. Nevertheless the possibility of a wattle and daub structure on B-V-9 cannot be ruled out. Much of the evidence for such a structure would have been destroyed by the central disturbance.

Two burials were encountered during the excavation of B-V-9. The first (Burial 6) was found in Unit 24 and consisted of a single adult primary burial in a bell-shaped pit (Fig. 7). This pit shows up distinctly in the eastern profile of Units 24 and 27, and was clearly intruded down into the blocky fill layer referred to above as Construction Phase One. Just above is the fill of the second construction phase, which the fill of the pit closely resembles. Accompanying the skeleton, which was in very poor condition, were two reconstructable vessels. One of these contained enough charcoal for a C^{14} determination. A few sherds and an obsidian blade were scattered through the fill of the pit (Table 2). The individual was originally buried in a flexed or sitting position. Feature 26 is interesting

Table 2

Material Items in Burial 6 (Feature 26), Mound B-V-9

DOT and Accession Number	Description	Provenience
DOT 51 (KJ69-6705)	Ceramic vessel	32.42E/19.98S; 1950 AZEP
DOT 53 (KJ69-8655)	Ceramic vessel	32.21E/19.98S; 1955 AZEP
DOT 54 (KJ69-9840)	Human bone 1. femur 2. long bone 3. long bone 4. femur 5. radius 6. phlanges 7. calvaria	32.00E/19.75S; 1946-1951 AZEP
(KJ69-8842)	Obsidian blade	32.20E/18.55S; 1966 AZEP

because it was obviously placed in the mound before the beginning of Construction Phase Two, and the associated artifacts and charcoal should closely date that phase. Its position is interesting for another reason. The burial is obviously an integral part of the mound. Yet hardly seems impressive enough to be itself responsible for the existence of B-V-9. Certainly it is very different from the large, central burial chambers found in the Esperanza mounds by Kidder and Shook. One explanation is that Feature 26 might be an auxilliary burial flanking a more important central tomb, since destroyed. The possibility exists, as mentioned above, that an occupational surface may be indicated by the hiatus between construction Layers I and II in B-V-9. If this proves true, then the burial could have been dug through the floor of a house structure which was later destroyed.

Also found in Unit 24 was a skull burial (Burial 7). A small pit 20-30 cm deep was apparently intruded down into the plaza floor directly in front of, and partially beneath the lowest adobe step in front of the mound. A skull (or complete head) was then set upright in the pit, probably facing east, and covered (Fig. 8). No grave goods were included. The position of the pit shows that the burial was made after, perhaps long after, the mound was built. Skull burials, of course, are by no means uncommon in Mesoamerica, although these are usually parts of larger burial arrangements.

Mound B-V-11

From the beginning of our excavations it was clear that B-V-11 would be the most productive mound of the complex. It was the largest and most well preserved, and even a casual inspection of the mound's surface could not fail to turn up huge chunks of fired adobe from a wattle and daub structure. In several places near the summit, alignments of pumice fragments outcropped onto the surface. There were two basic sets of operations on B-V-11. One consisted of the continuation of our main trench right through the heart of the mound slightly to the south of its center (Fig. 3). This provided us with an excellent long profile and reasonably assured us that there was no central tomb of any size. A second set of operations involved careful clearing of the adobe/pumice debris from the mound's summit.

The constructional details of B-V-11 as exposed in our profiles are strikingly similar to those of B-V-9. It was built directly upon the natural surface and there are two distinct building phases represented. The first is a very thin but extensive layer of fill which served as the substructure for the mound and also leveled the whole eastern side of the plaza as previously described (see main profile, Strata 2 and 17). This initial layer of material was quite mixed, including clay of various colors (browns and yellows), loam, sand, disintegrated pumice, adobe, and talpetate. In most areas this fill was quite sterile and compact; immediately beneath the mound it reached a maximum thickness of about 1.3 meters. Next a much thicker but less extensive layer of buff-colored clay with small pumice inclusions was added (Stratum 14). This material contained abundant artifacts and strongly resembled the second construction layer in B-V-9. Its maximum thickness was about 3.3 meters, and this would have been the height of B-V-11 as measured from the level of the original plaza floor, excluding, of course, the superstructure of the mound.

The problem of constructional phases versus occupational phases again presents itself. The latter possibility seems rather unlikely, for the contact between the two layers of fill, although fairly sharp, is quite uneven and certainly does not present the appearance of a living surface. No floor fragments or accumulation of refuse marks the break. It looks like the situation is the same as in B-V-9; there was a short cessation in building activity and the source of the fill was changed. The essential similarity of the materials used in the corresponding construction phases of both mounds suggests that they were built at the same time.

Our profiles failed to reveal any sure evidence of architectural features on the slope or at the foot of B-V-11. One possible architectural element is a floor fragment at the extreme east end of our main trench (Feature 24). Actually this whole area is somewhat problematical and should have been excavated more extensively. A glance at the profile shows that here construction material is intruded down below the old surface level to an unknown depth, while elsewhere the material sits directly upon the surface. Two possible explanations occur to me. The first is that there may have been an earlier construction of which the floor was a part, a suggestion supported by the fact that the fill of B-V-11 seems to overlie the floor (note, however, that the floor level is slightly lower than the contact between construction Layers I and II and so they cannot have been contiguous). Alternatively the floor could represent an apron or platform on the east side of the mound which was covered up by eroded fill. The most plausible reason for the "intruded" material at the east end of the trench is that there was a small depression, perhaps an old barrow pit, that needed filling before the mound could be constructed.

The Superstructure of B-V-11

Our investigations of the mound's summit were much more profitable. A surface layer of fired adobe fragments was encountered which varied from 20-40 cm in depth. The soil around this debris was very black and greasy and we immediately came to the conclusion that we were dealing with a burned, collapsed wattle and daub structure. Many of the adobe fragments were as much as 20 cm thick and bore impressions of posts up to 10 cm in diameter (KJ69-5671, 4700, 5062). We cleared the adobe/pumice rubble very carefully because of the possibility of an underlying floor. Very few artifacts were recovered from the rubble layer. Several concentrations of charcoal were exposed, some of which were recognizable as burned poles. A C^{14} determination was run on one of these samples and is discussed in the chronology section of the report.

Immediately beneath the rubble we struck a layer of extremely hard clay which was obviously the expected floor. When cleared the floor was revealed as an irregular, enlongated, level surface of hard clay elevated about 3.4 meters above the plaza floor (Fig. 9). The northern and central portions were fairly well preserved, but the southern area was quite fragmentary and difficult to trace, particularly because the exposed mound fill soon dried to a color and consistency closely resembling that of the floor. Originally the floor must have been basically rectangular in shape, covering an area of

about 4 x 8 meters. It had been resurfaced two, and in some places three times, with each layer about 1 cm in thickness.

The following features were associated with the floor:

1) Two large, circular, clay-lined holes, one on the northern periphery of the floor and one on the south, the latter fragmentary. Each measured about 35 cm in diameter. The southern hole had a clay lining at a depth of about 25 cm but there was no hard bottom to the other. We initially identified these as postholes but this explanation is unsatisfactory for several reasons. The alignment of the holes does not correspond to that of the long axis of the mound or to other obvious architectural elements. Also, if the holes held uprights supporting a central gable pole they would have been too far to the rear of the structure, at least judging by the floor. No trace of post remains, burned or otherwise, was found in either, although there were a few charcoal flecks. Perhaps the holes were ritual firepits cleaned after each use, or something of the sort.

2) A small clay platform measuring 35 x 40 x 15 cm was found in the middle of the floor (DOT 17). Three superimposed floor levels ran beneath this little platform, while another butted up against it. Presumably the platform was a small altar. Nothing was found either inside or beneath it.

3) A large (approximately 88 x 75 x 10 cm) rectangular slab of dressed stone was exposed immediately to the east of the altar (KJ69-4442, DOT 7). The two were similarly aligned. The stone had one convex (lower) and one flat (upper) face, the latter roughly contiguous with the floor level. An irregularly shaped section had been cut out of the floor and the slab used to cover the opening, although it did not fit exactly. The mound fill beneath the slab was unusually loose and contained much trash, including a human mandible, but there was no sign of an intact burial or cache.

4) A fired adobe "step" or platform edge was found just to the southwest of the altar, at a distance of about one meter. It was about a meter in length, 12 cm wide, and 25 cm deep, running parallel to the western edge of the floor and the long axis of the mound. The top of the "step" was on exactly the same level as the floor and several floor fragments attached to the step showed that the two had been contiguous; the step thus marks the western extension of the floor. Although only a short segment of the step was still preserved in situ we discovered many fragments at the foot of B-V-11 which were obviously pieces of a similar construction. Running along the front of the mound's summit and beneath the step was an alignment of pumice fragments set in a hard adobe matrix (Plate 2b). These fragments were not coursed in the normal sense of the word since they usually did not touch one another. No trace of similar pumice or adobe constructions were found anywhere else on the surface of the mound. They seem to have been part of a foundation platform on which they superstructure was erected, and probably supported the facade of the building.

Many objects were lying directly upon the floor. Curiously enough all were to the north of the stone slab and altar, suggesting that the building had been divided in half at the time of its destruction. No fewer than 32 obsidian knives or projectile points were scattered about, some singly, some

in groups (KJ69-5062). On the western edge of the stone slab were two shallow, long-handled, dish-shaped incensarios (KJ69-5155, 5181). Both had been crushed by the falling debris but were otherwise intact. Each still contained charcoal residue and samples were taken for C^{14} determinations. Other artifacts on the floor included two ground stone celts (KJ69-5062), a number of small, round clay balls (the size of marbles), some lying in definite strings (KJ69-5062), which have been catalogued with rattle balls, and a few sherds and obsidian flakes (KJ69-5671, 5062, 5155). This collection of artifacts clearly reflects some sort of activity which took place very shortly before the disasterous fire sealed them below the rubble.

Several further clues about the superstructure come from excavations at the mound's western edge (Unit 26). In the upper 60-70 cm of this trench we uncovered great quantities of fired adobe and pumice fragments just like those on the summit. These were in a very black, greasy soil matrix which contained much charcoal--some pieces were still recognizable as the remains of poles. The fact that this concentration occurs only on the western edge of the mound indicates that the building probably collapsed in this direction as it burned. Two very spectacular finds come from this layer. These were life-sized, fired adobe portrait sculptures, each representing a rather gaunt, fierce-looking individual (Plate 2c). Both are fragmentary but one still retains large ear plugs and an impressive headdress. Presumably they, and perhaps others like them, originally enhanced the facade of the superstructure.

Careful examination of the areas to the north, south, and east of the floor failed to produce any evidence of wall footings or postholes. This was quite puzzling since the superstructure was obviously a substantial one and some traces of walls orposts should have been preserved. I can only think of one plausible explanation of this problem. Suppose that a large wattle and daub structure with a thatched roof caught fire. Such a fire would originate in the thatch, resulting in a very fierce and sudden blaze which would spread quickly to the upper portions of the walls--say the top three or four feet. But the fire may not have been communicated to the lower parts of the walls further removed from the blazing thatch (which would quickly have burned itself out), especially since the inflammable posts were thickly protected by adobe. If this is what occurred the burned roof and upper walls may have collapsed, sealing the floor but leaving the wall footings intact and unfired. These could easily have eroded completely away after a thousand years or more of seasonal downpours, especially since they were near the edge of the summit (this would also account for the destruction of the peripheries of the floor itself). Of course this is only speculation, but it seems not too improbable.

The superstructure of B-V-11 emerges as a large, substantial, impressively decorated structure crowning a high mound. The objects found on the floor do not suggest the presence of mundane domestic activities such as food preparation, nor is there any sizable amount of associated refuse of the kind so common near domestic structures.

Feature 19

A burial pit containing the remains of five individuals was found intruded into the mound fill on the western edge of B-V-11 (Figs. 10 and 11).

The pit was sub-rectangular in face view and shows up on our long profile as a slanted, bell-shaped wedge of brown sandy clay surrounded by the lighter blocky fill of the mound and plaza floor. Immediately above it was the layer of very dark, organic soil which contained the adobe and pumice debris from the top of the mound. It was obvious that the pit had been intruded down into the fill and later covered by the debris. Thus the burials must have been placed in the mound while it was still in use.

All five burials were in extremely bad condition. The long bones were quite well preserved in some cases but other bones, such as the skulls, often could only be traced as light stains in the dark soil matrix. Nevertheless Tim Nowak, who exposed the feature, feels that all five individuals were adults (teeth were well preserved). All were primary burials originally placed in flexed or sitting positions. The arrangement of the five skeletons was rather interesting. Four lay on the floor of the pit, one in each corner. The fifth burial was in the center at a somewhat higher level.

Among the grave goods recovered from the pit (see Table 3) were five reconstructable vessels (one flat dish and four shallow bowls), an effigy fragment, two ceramic "candeleros," and three small obsidian blades. All of these artifacts clustered about the central individual who seems to have been more highly regarded than his fellows. Note that the position of Feature 19 corresponds closely to that of the skull burial in B-V-9, at the foot of the front of the mound, possibly just in front of or beneath the lowest step.

Table 3

Material Items in Burial Pit (Feature 19), Mound B-V-11

DOT and Accession Number	Description	Provenience
DOT 14 (KJ69-4440)	Effigy head incensario fragment	40E/34S; 1872 AZEP
DOT 35 (KJ69-6081)	Flat dish; dia 24 cm	40.80E/33.85S; 1861 AZEP
DOT 36 (KJ69-6089)	Small bowl, dia 14 cm	40.93E/35.55S; 1874 AZEP
DOT 37 (KJ69-6135)	Shallow bowl; dia 21 cm; with handled cup candelario	41.08E/33.65S; 1874 AZEP
DOT 38 (KJ69-6084)	Flanged flat dish; dia 18 cm	40.45E/33.45S; 1873 AZEP
DOT 39 (KJ69-6320)	Redware bowl; dia 16 cm	40.79E/33.36S; 1874 AZEP
DOT 40 (KJ69-6426	Human bone	40.80E/33.45S; 1861-1907 AZEP
DOT 41 (KJ69-6428)	Human bone	40.55E/33.30S; 1873 AZEP
DOT 42 (KJ69-6427)	Human bone	40.60E/32.75S; 1874 AZEP
DOT 43 (KJ69-6425)	Human bone	41.15E/32.80S; 1874 AZEP
DOT 45 (KJ69-4440)	Human bone	40.60E/34.33S; 1886 AZEP
DOT 46 (KJ69-4440)	Human bone	41.10E/34.38S; 1886 AZEP

The Embankment

The southern section of the embankment was the obvious place to concentrate our investigations of this architectural feature. It was here that the embankment was most easily seen, lacking a superimposed mound, and it was only here that it seemed to suggest a structure which could have had functions other than simply controlling access to the plaza. One operation was aimed primarily at obtaining profiles which would reveal the constructional details of the embankment, while at the same time providing adequate artifact collections from the culturally significant stratigraphic units. This operation consisted of a long, narrow trench (1 x 17 meters, Units 18 and 21) slicing directly through the embankment (Fig. 12). The trench reached a maximum depth of 2.25 meters below the surface, at which point all three horizons of the previously identified buried soil were visible in our profile. Segments of the trench were excavated in both arbitrary (20 cm) and natural stratigraphic units.

Another operation (Unit 23) was designed to pick up a good artifact sample from the dark, organic soil which formed a distinct layer overlying the actual construction material of the embankment. Unit 23 measured 5 x 5 meters, and was excavated down as closely as possible to the construction material. The floor was then carefully scraped to reveal any postholes or other features.

The embankment, as exposed in the eastern profiles of Units 18 and 21, appears in cross-section as a low mound with gently sloping sides lensing out to the north and south. Its northern limits are apparently marked by the abuttment of the fill against the old "A" horizon (at about 44S/32E). Although our trench was not extended far enough to pick up the southern edge the width of the embankment at this point would seem to be about 15 meters; much more than would be necessary if its sole function were that of a barrier closing off the plaza.

Several kinds of construction material were used, including talpetate, disintegrated pumice, and blocky, vari-colored clays. The most common material was a brown loam-clay mixture not unlike that of the upper construction phases of the two larger mounds. This layer (Stratum 4) was very rich in cultural debris. Prior to construction the old "A" horizon had been removed, or at least highly disturbed, so that the embankment fill appears to be intruded down through it. At the eastern end of the trench are visible the three superimposed strata which were identified elsewhere in the plaza as the old "A", "B", and "C" horizons (Strata 3, 4, and 5).

No obvious architectural features such as stairs, floor fragments, terrace facings, or postholes were noticed during the excavation. Possibly the talpetate blocks (a favorite construction material) at the northern edge of the embankment mark the position of a former footing.

Strata 1 and 2 are two thin layers of dark, organic soil overlying the sloping sides of the embankment and lensing out toward the top. During the excavation of Units 18 and 21 it was noticed that this dark topsoil produced unusually large numbers of artifacts. Obsidian blades, flakes, and beautiful prismatic cores (KJ69-4717, 4727, 5733, 8445) comprised a very high proportion

of the artifacts collected from this area. No similar concentrations of obsidian were found elswhere on the site. This led us to suspect that the embankment may have been used for various domestic or industrial purposes, and that there may even have been perishable structures such as ramadas erected upon it. In Unit 23 we made a careful collection of artifacts from the dark, midden topsoil over an area of 25 sq. meters. The trench was then scraped down until the surface of the lighter construction material was exposed, but no signs of any structures were found. It seems very possible, however, that the embankment was used for mundane chores such as cooking and obsidian working.

Two small concentrations of pottery were found near the northern edge of the embankment during the excavation of Unit 21. The first (DOT 19) consisted of several sherds and an inverted dish. It was exposed in the western wall in a brown, sandy-clay matrix which was part of the initial layer of embankment fill. A similar concentration of large, utilitarian-looking sherds turned up in the east wall (KJ69-4854, DOT 22, see profile, Units 18 and 21). The sherds were surrounded by loose soil containing abundant charcoal and burned adobe fragments. This pocket of soil was in a matrix of hard brown clay which we identified as the old "A" horizon (Stratum 3). Although the sherds appeared to be intrusive the outlines of the pit were impossible to trace. C^{14} samples were obtained from both these sherd concentrations.

Feature 25

While working on the embankment we noticed several large, flat cobble-like stones outcropping onto the surface, forming a semi-circle just to the north of Unit 18. Such stones do not occur naturally nearby and would have had to be laboriously hauled in from a considerable distance, probably from the bottom of a barranca. When exposed the feature proved to be a curved stone retaining wall with a maximum height of about 1.4 meters. The wall had the shape of a half-oval with ends curving away to the north and then stopping abruptly (Fig. 13). At the base of the wall we struck a hard clay surface sloping to the north. We then cut a narrow trench (Unit 35) from the wall all the way to our main east-west trench across the plaza. The profile thus obtained shows the obvious retaining character of the wall, which leans into a thick layer of hard brown fill to the south (Plate 2d). Immediately to the north of the wall was a small, clay-lined depression about 4 meters across, 6 meters long, with a maximum depth below the old "A" horizon of about 30 cm. The depression was basin-shaped and sloped up on the north to meet the fill of the plaza floor, but there was no wall of stone on this side.

The fill of the depression was composed of several layers of clay, loam, and sand. All of this material was rich in cultural debris. Several rocks, obviously fallen from the wall, lay directly on the clay floor at its foot, as did a large fragment of an Amatle vessel. Another vessel fragment of the same type was found nearby about 10 cm above the floor.

The purpose of Feature 25 is unknown. Perhaps the most logical explanation is that it served to catch and hold water, as it unfortunately still did

after it was exposed. But except for a layer of gray clay no water-deposited sediments were found in the depression. Whatever its purpose the construction of the basin and the wall must have been a laborious affair.

The question of when Feature 25 was constructed is difficult to answer. Obviously the basin and retaining wall are integral parts of the embankment; this suggests that they were built in Middle Classic times either in conjunction with the embankment or as a later addition. The presence of Amatle sherds on the floor of the basin reinforces this interpretation--at the very least they prove that it was unfilled during the Middle Classic occupation.

DATING OF THE B-V-11 MOUND GROUP

Four different lines of evidence will ultimately be available with which to evaluate the dating of the B-V-11 mound group: ceramic cross-dating, radiocarbon dating, obsidian dating and archaeomagnetic dating. As of this writing two of these methods have already yielded mutually compatible chronometric determinations: obsidian dating and radiocarbon dating. These are summarized below.

Table 4

Obsidian Dates from B-V-11 Mound Group*

Lab No.	Catalogue Number	Hydration Measurement (μ)	Date	S.D.	Provenience
7818	KJ69-4717	2.90	774 A.D.	± 83	Embankment, Square 18
5173	KJ69-5062	3.23	486 A.D.	± 92	B-V-11, Feature 14
5200	KJ69-5062	3.26	458 A.D.	± 93	B-V-11, Feature 14
7819	KJ69-4717	3.53	197 A.D.	± 101	Embankment, Square 18
7822	KJ69-4727	3.54	187 A.D.	± 101	Embankment, Square 18
6450	KJ69-2304	3.65	74 A.D.	± 104	Plaza, Square 4
7820	KJ69-4727	3.89	184 B.C.	± 111	Embankment, Square 18
5200	KJ69-5062	4.11	434 B.C.	± 117	B-V-11, Feature 14
7817	KJ69-4717	4.30	662 B.C.	± 123	Embankment, Square 18
7821	KJ69-4727	4.54	964 B.C.	± 130	Embankment, Square 18

*33 additional shaped obsidian artifacts from the floor of the B-V-11 superstructure (Feature 4) were measured. Unfortunately, these specimens had anamolous hydration rims due to the effects of burning that resulted when the superstructure burned down and therefore had to be rejected (Michels, personal communication). Chronometric dates are based on a rate of $7.03\mu^2/1000$ years.

The obsidian dates basically fall into three clusters, only the first of which dates the construction and occupation of the B-V-11 mound group. The first cluster (Lab Numbers 7818, 5173, 5200) has a mean date of 572 A.D. and a mean standard deviation of 89 years; yielding a range of 483 A.D.-661 A.D. This corresponds nicely to a radiocarbon date taken from carbonized wood debris that resulted when the superstructure of B-V-11 burned down. The sample (KJ69-6434) was processed by Isotopes Inc. (I-6251). Using a half-life of 5730 years together with the Masca Correction Table, the sample yielded a radiocarbon date of 549 A.D. $\pm$ 93 (456 A.D.-642 A.D.). We can therefore conclude that the B-V-11 mound group belongs to the Middle Classic period (400 A.D.-700 A.D.) and, more specifically, that it was probably being used sometime between 450 A.D. and 650 A.D.

The second and third clusters (Lab Numbers 7819, 7822, 6450 and 7820, 5200, 7817, 7821 respectively) identify earlier periods during which the Finca El Mirador area was occupied. The remains of these prior occupational phases became incorporated within the dirt fill used in the construction of the B-V-11 mound group. Cluster two has a mean date of 119 A.D. and a mean standard deviation of 102 years; yielding a range of 17 A.D.-221 A.D. This is virtually coincident with the chronometric definition of the Late Terminal Formative (0 A.D.-200 A.D.) adopted by the Kaminaljuyu Project.

Cluster three, with dates ranging over 780 years is not really a cluster but rather a collection of dates that loosely suggests various episodes of utilization of the Finca El Mirador area over the period of the Middle and Late Formative (1000 B.C.-500 B.C., 500 B.C.-200 B.C. respectively). The Late Formative dates (7820, 5200) should not surprise us since evidence for a major Late Formative architectural complex in Finca El Mirador is well attested to in mound reports elsewhere in this volume. The Middle Formative dates (7817, 7821) reflect the existence at Kaminaljuyu of a scattered, light settlement that represents the earliest occupation at Kaminaljuyu (Michels, personal communication).

DISCUSSION

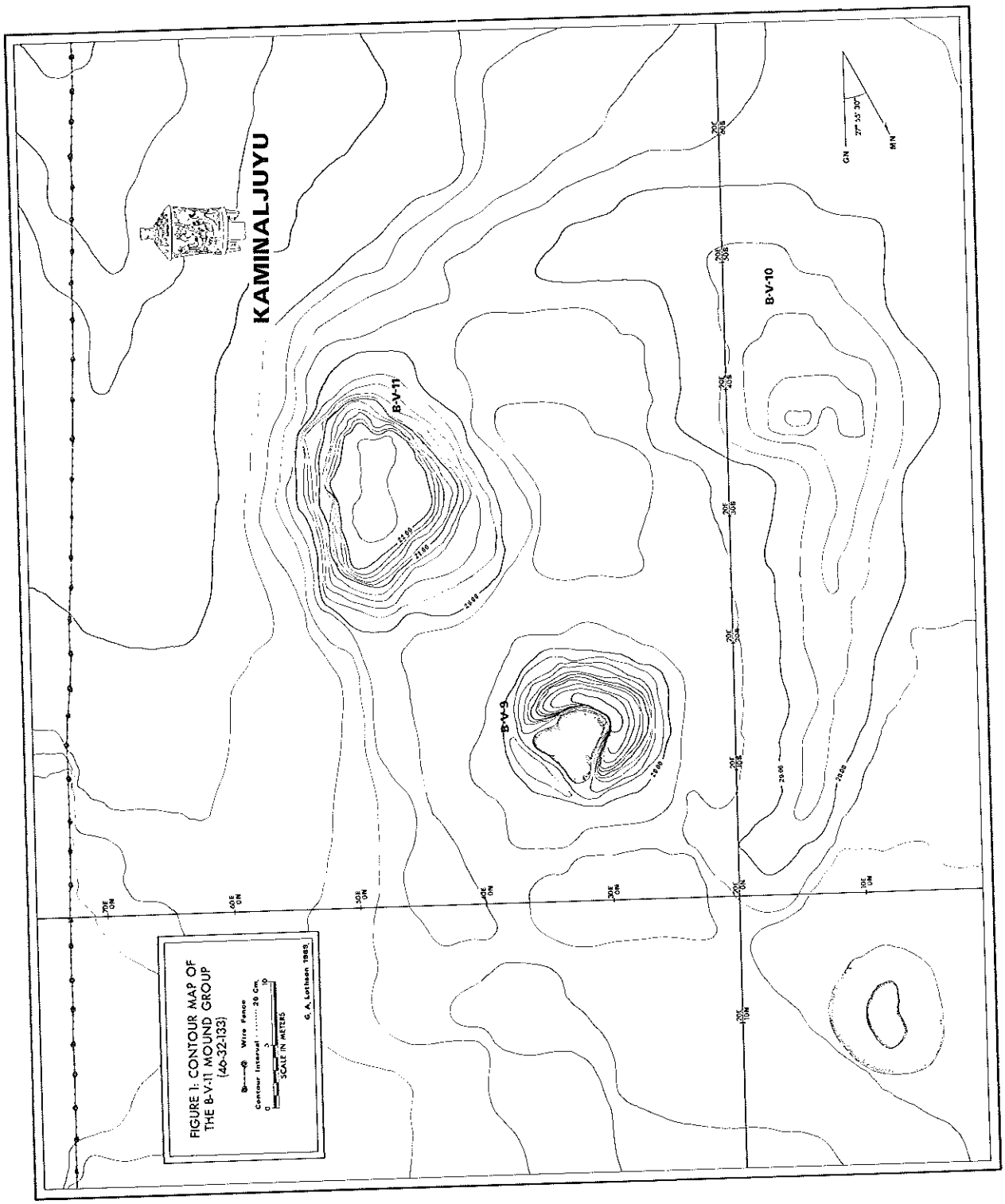
All of the major architectural elements appear to have been erected simultaneously as part of an overall, consistent, functionally integrated plan. Our evidence suggests that this was undertaken sometime between 450 A.D. and 650 A.D.: the heart of the Middle Classic period. We are thus provided with our first detailed look at a compact Middle Classic elite residential compound.

The organizational model which appears to best serve the interpretation of the evidence provided by this excavation would be that of a chiefdom. A chiefdom is a stratified society in which certain individuals, because of their kinship affiliations, occupy positions of particular ritual and political significance. Such individuals (and their families) often occupy dwellings or precincts of particular impressiveness, set apart from the rest of the community. Because of the complex nature of his social role, the chief's residential complex may have to also serve religious and

economic needs. It may be at once dwelling, temple, public square, and the workshop of craft specialists.

The B-V-11 mound group conforms well to this description. Mound B-V-11, itself, may have served as both the sleeping quarters for the chief as well as the principal temple of the compound. Its smaller neighbor, Mound B-V-9, may well have served as a burial mound crowned by a small shrine. B-V-10 and the embankment may have supported range structures that housed the chief's family and his immediate retainers, as well as the workshops of his craft specialists. The interior plaza would have been the heart of daily activity; involving not only the chief's family and retainers, but also members of the community having business with the chief. The possible cistern (Feature 25) inside the plaza together with the configuration of the embankment suggests not only an attempt to maintain restrictions on access to the compound but perhaps also a modest gesture towards constituting the compound as a defensive refuse for members of the immeidate community during times of conflict.

The "immediate community" may have been substantial and organizationally complex if we note the findings of Wynn and Cardenas for Mound B-V-4, and Joseph Ball's analysis of the B-V-8 mound group (both reports can be found elsewhere in this volume); as well as the yet to be published results of the settlement pattern test trench program (Michels; personal communication).


KAMINALJUYU
B-V-11
B-V-10
B-V-9
2150
2100
2050
2000
1950
GN
MN
FIGURE 1: CONTOUR MAP OF THE B-V-11 MOUND GROUP (46-32-133)
Wire Fence
Contour Interval ..... 20 Cm.
SCALE IN METERS
G. A. Lothson 1983

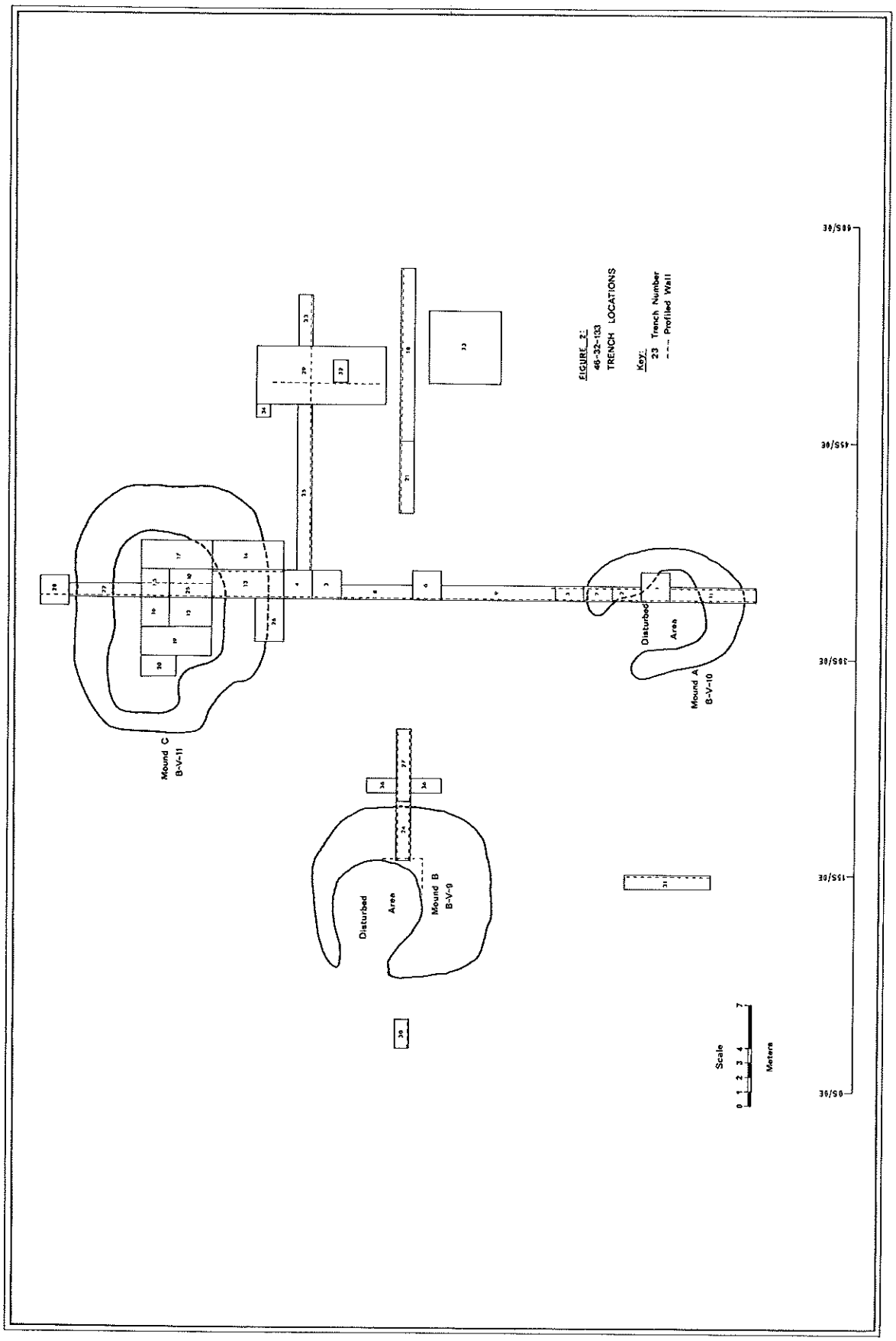
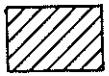


FIGURE 2:
46-32-133
TRENCH LOCATIONS
Key:
23 Trench Number
--- Profiled Wall
Mound C
B-V-11
Mound A
B-V-10
Disturbed
Area
Mound B
B-V-9
Disturbed
Area
Scale
0 1 2 3 4 7
Meters
30/S90
30/S45
30/S30
30/S15
30/S0

KEY TO 46 - 32 - 133, SOIL TYPES

LOAM

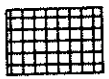
SANDY BROWN LOAM


BLACK LOAM

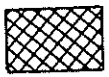
CLAYEY LOAM

CLAYEY SAND TO CLAYEY LOAM

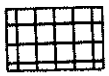
CLAY


BROWN/SANDY

SLIGHTLY LOAMY BROWN CLAY

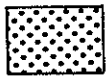

BROWN

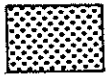
BUFF

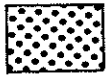

YELLOW

DARK BROWN

SAND

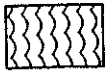

REDDISH YELLOW, PUMICE SAND MIXTURE


LIGHT BROWN


DARK

MIXTURES

CLAYS, LOAM TALPETATE LUMPS AND SAND/PUMICE LENSES


SAND CLAY/LOAM

SAND, PUMICE, CLAY

MISCELLANEOUS

DISINTEGRATED PUMICE

P PUMICE MIXTURE

T SOLID TALPETATE

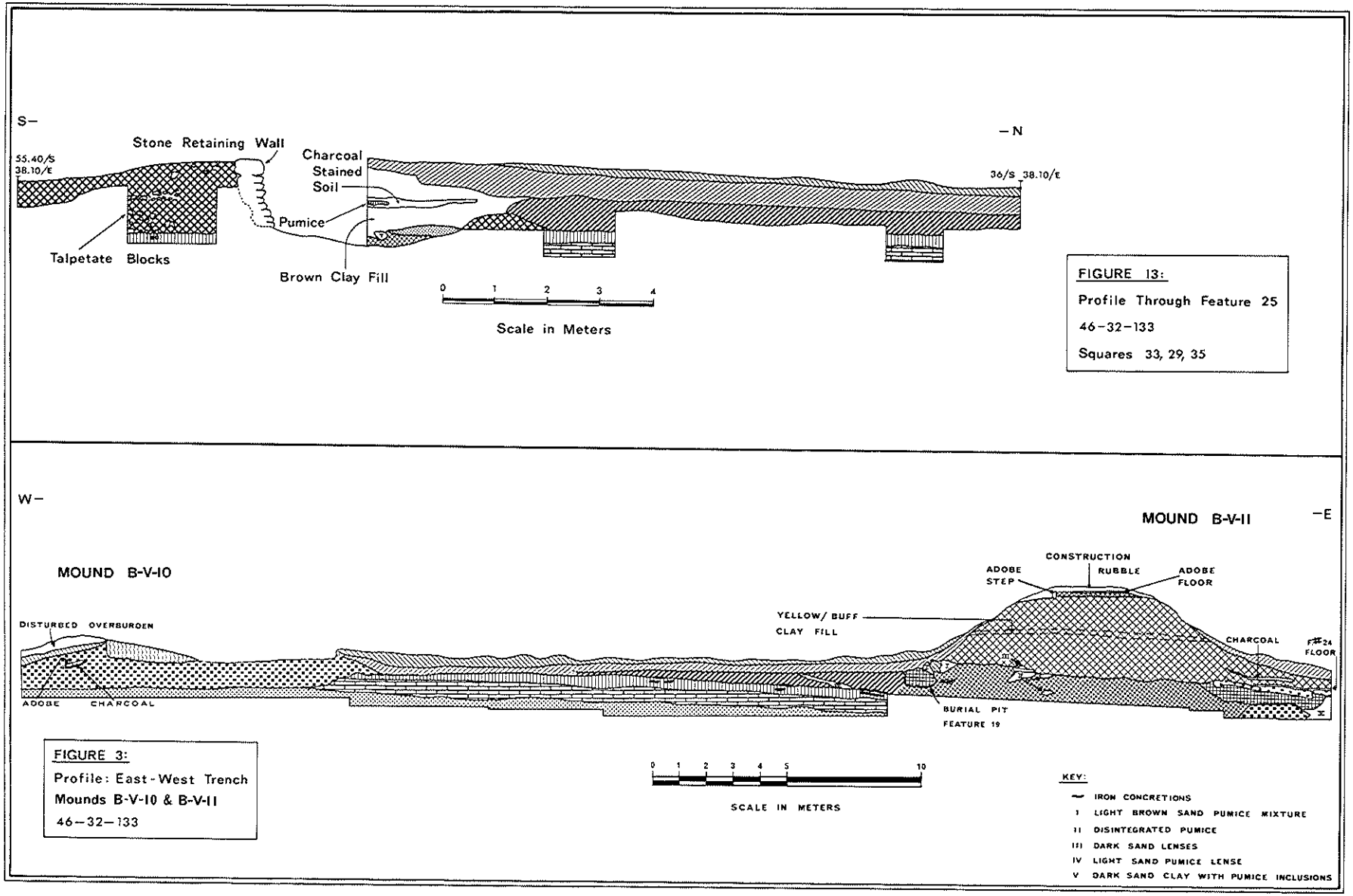


FIGURE 13:
Profile Through Feature 25
46–32–133
Squares 33, 29, 35

FIGURE 3:
Profile: East-West Trench
Mounds B-V-10 & B-V-11
46–32–133

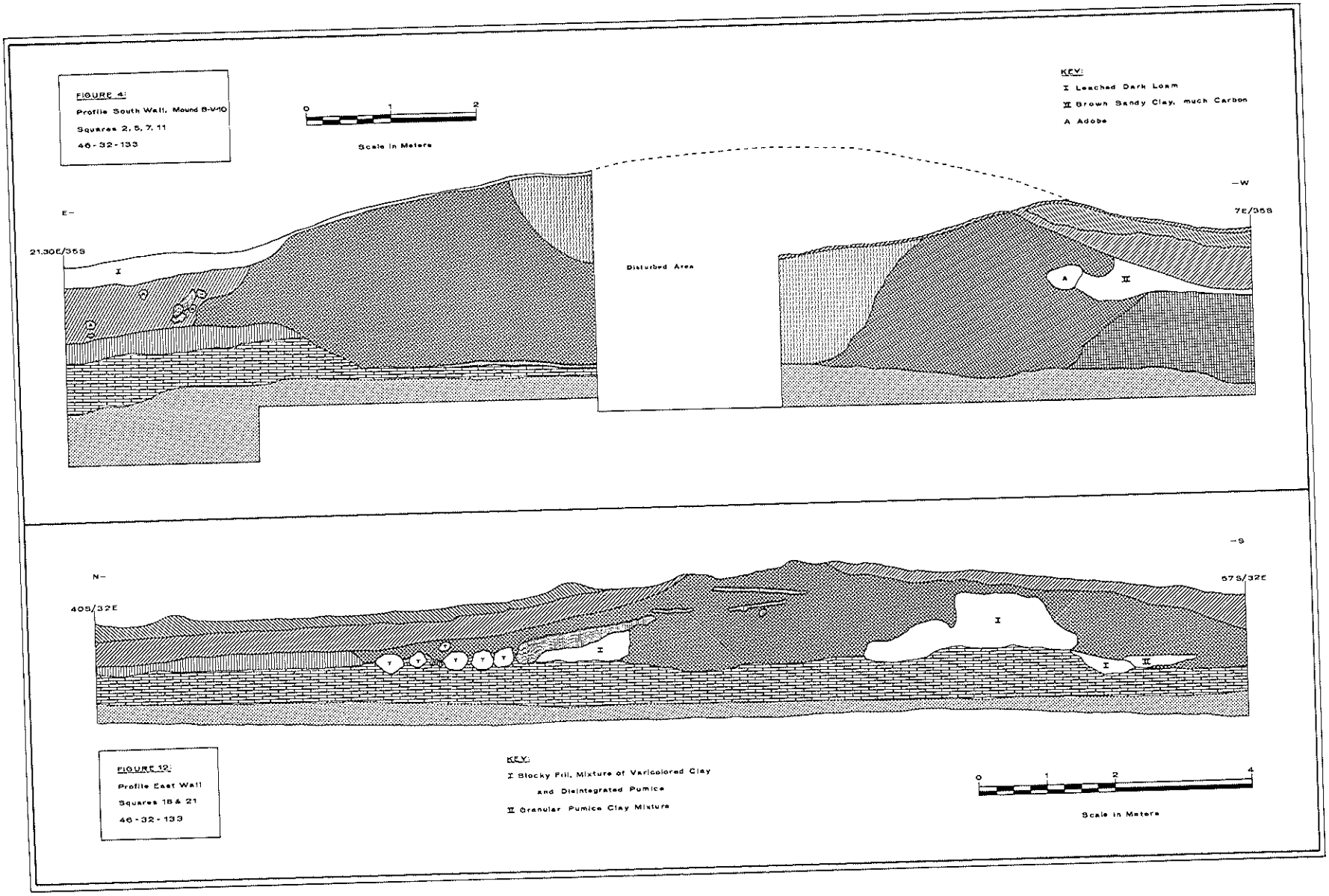


FIGURE 4:
Profile South Wall, Mound S-V-10
Squares 2, 5, 7, 11
46-32-133
0 1 2
Scale in Meters
KEY:
I Leached Dark Loam
II Brown Sandy Clay, much Carbon
A Adobe
E-
21.30E/35S
I
Disturbed Area
-W
7E/35S
A
II
N-
40S/32E
-S
57S/32E
I
II
FIGURE 12:
Profile East Wall
Squares 18 & 21
46-32-133
KEY:
I Blocky Fill, Mixture of Varicolored Clay
and Disintegrated Pumice
II Granular Pumice Clay Mixture
0 1 2 4
Scale in Meters

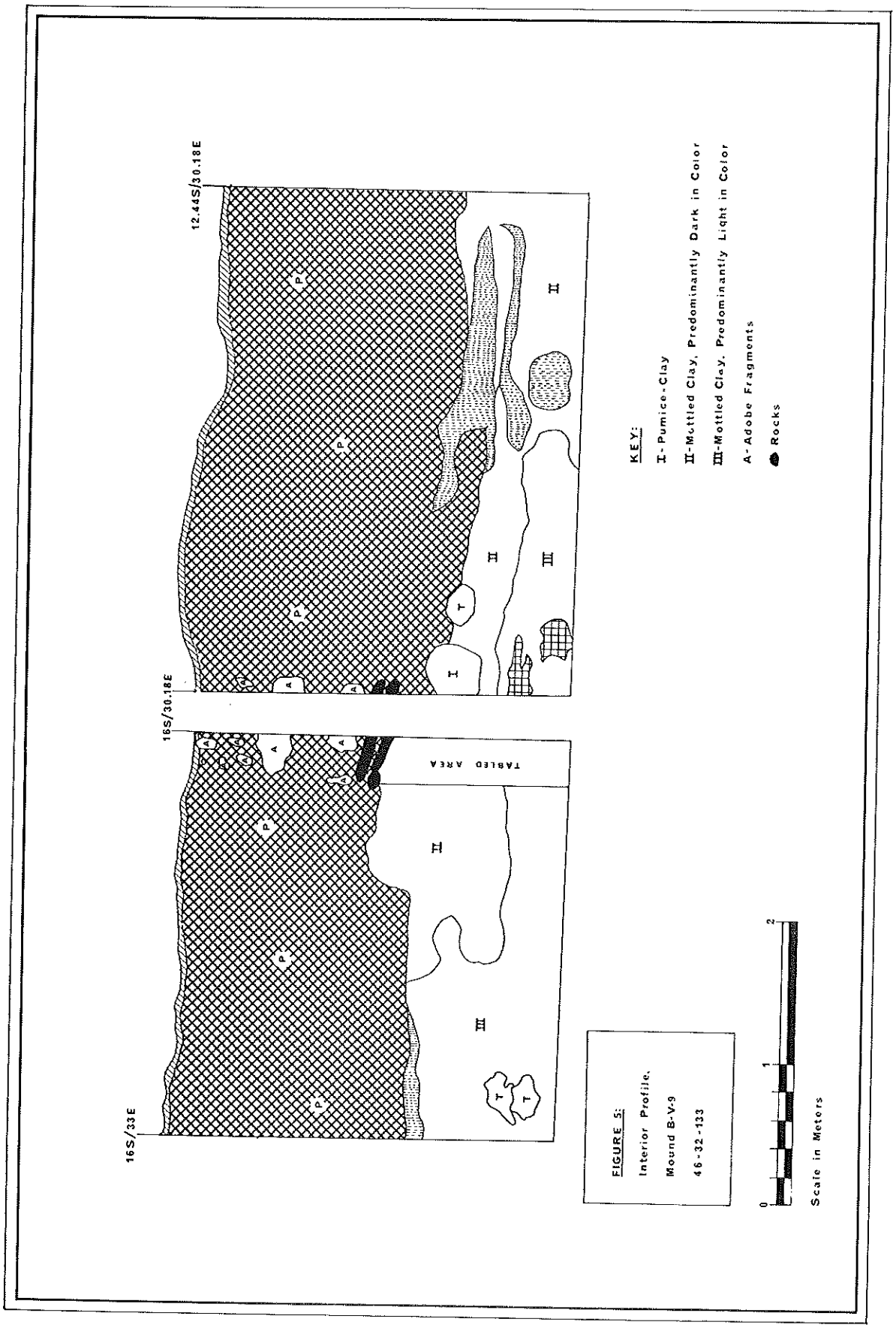
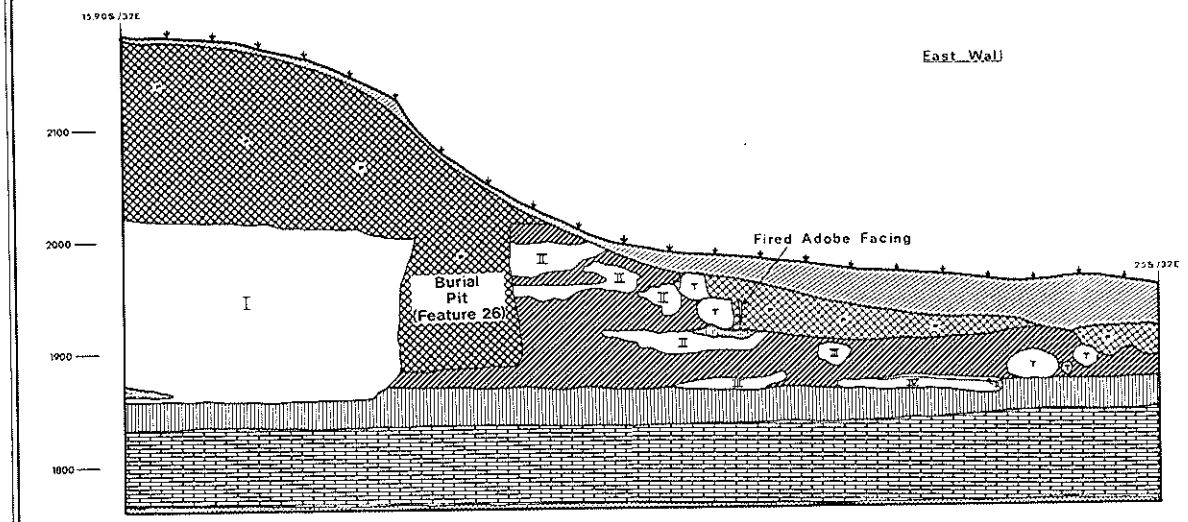


FIGURE 5:
Interior Profile,
Mound B-V-9
46-32-133



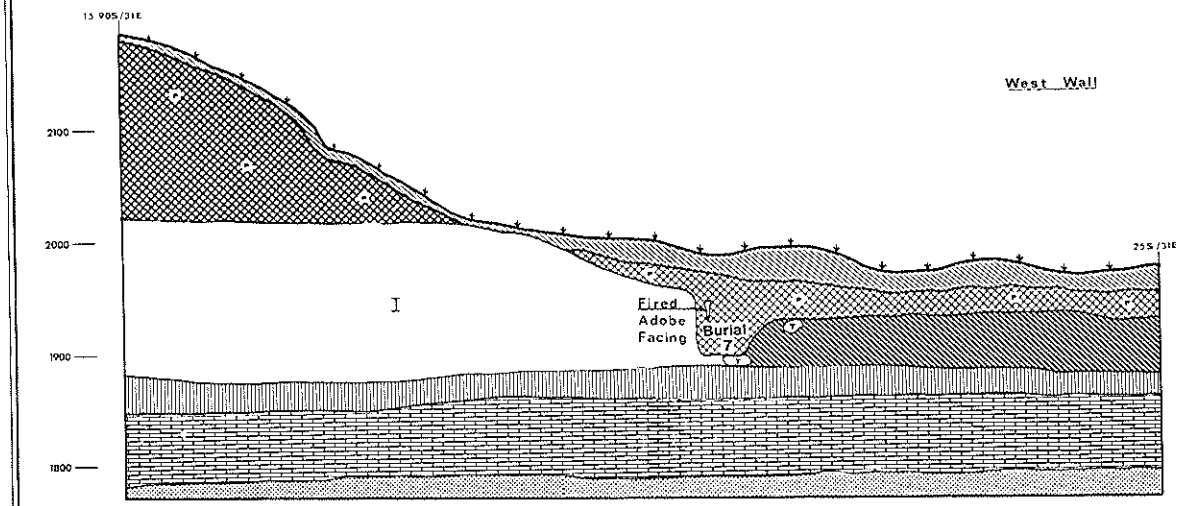


FIGURE 6:

Profiles of East-West Walls of Trenches 24 & 27

46-32-133

KEY:

I Light Colored Clay Mound Fill; Mixture of Mottled Clay Blocks

II Hard Dark Clean Clay

III Light Brown Clay

IV Gray Clay

N

0 1 2

Scale in Meters

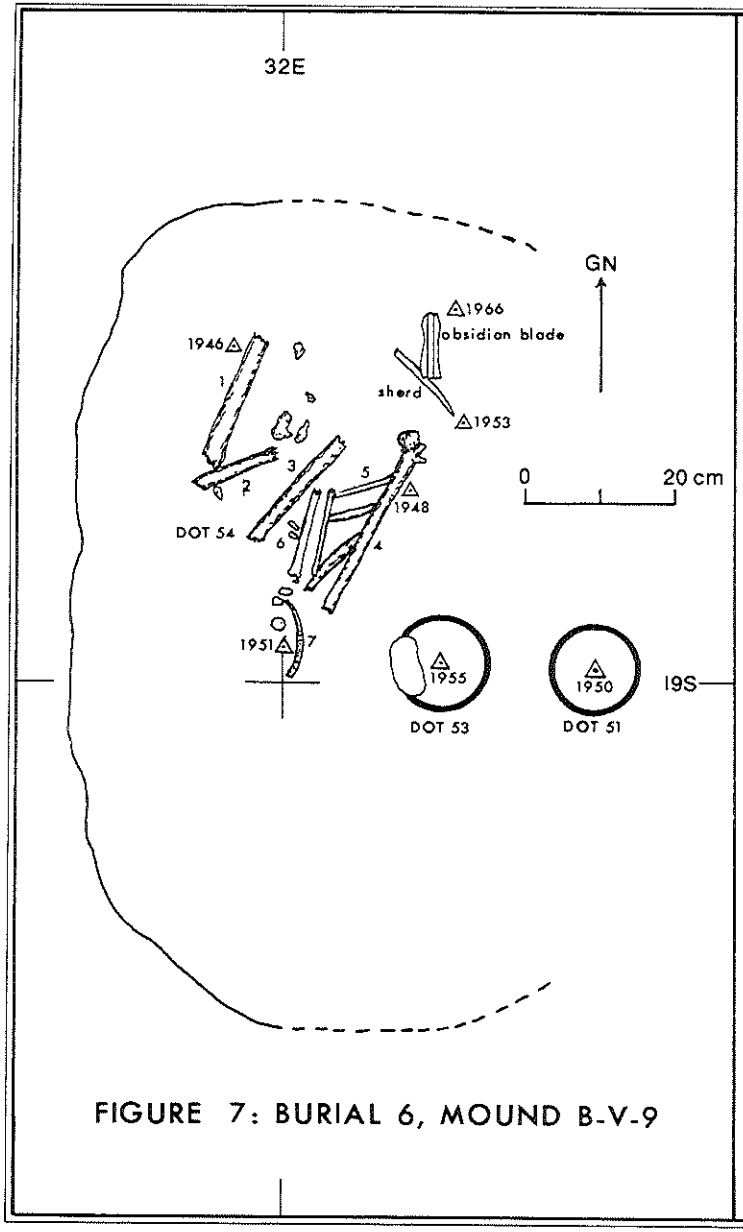


FIGURE 7: BURIAL 6, MOUND B-V-9

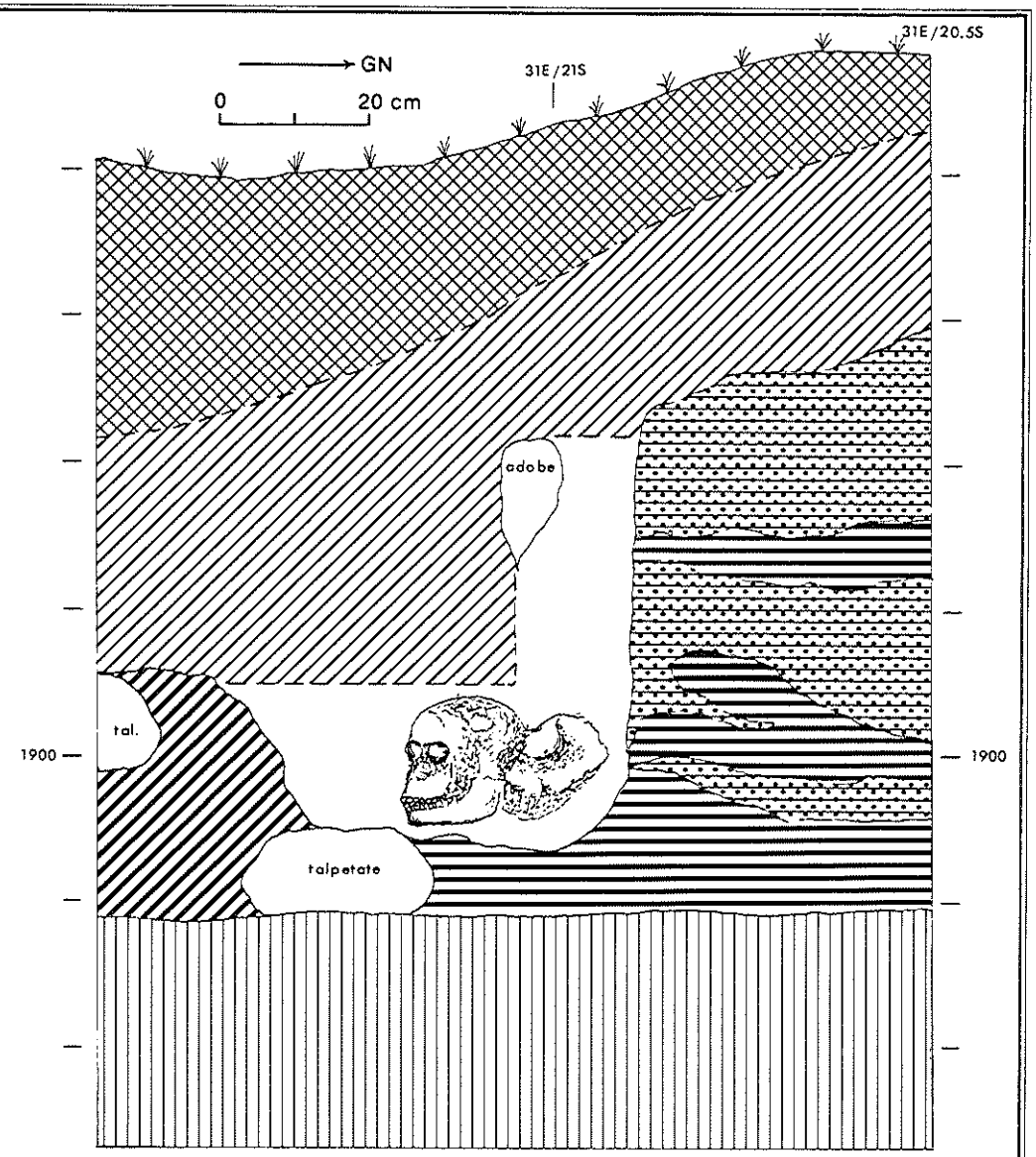


FIGURE 8: BURIAL 7, MOUND B-V-9

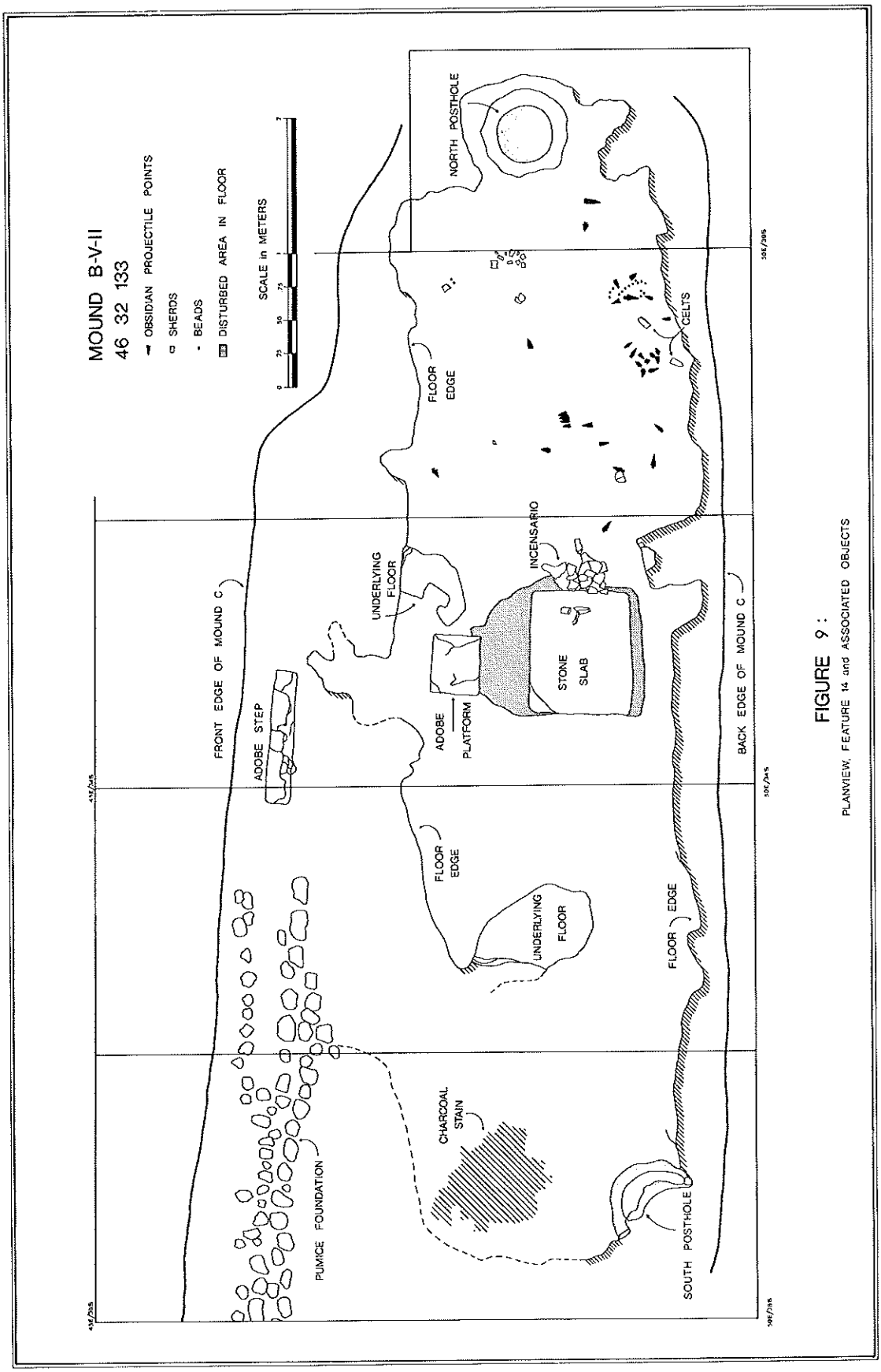


FIGURE 9 :
PLANVIEW, FEATURE 14 and ASSOCIATED OBJECTS

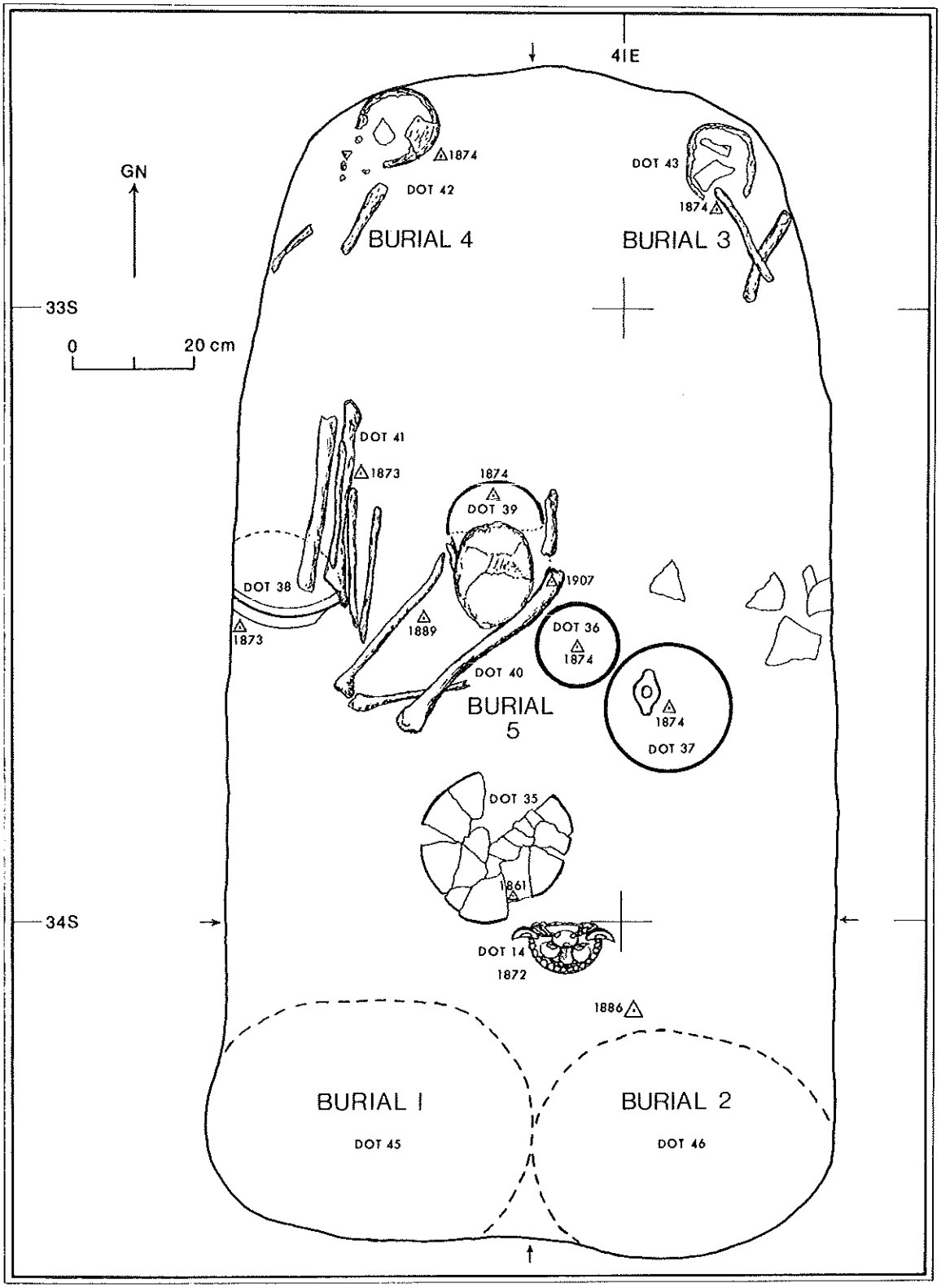


FIGURE 10: BURIAL PIT, MOUND B-V-11

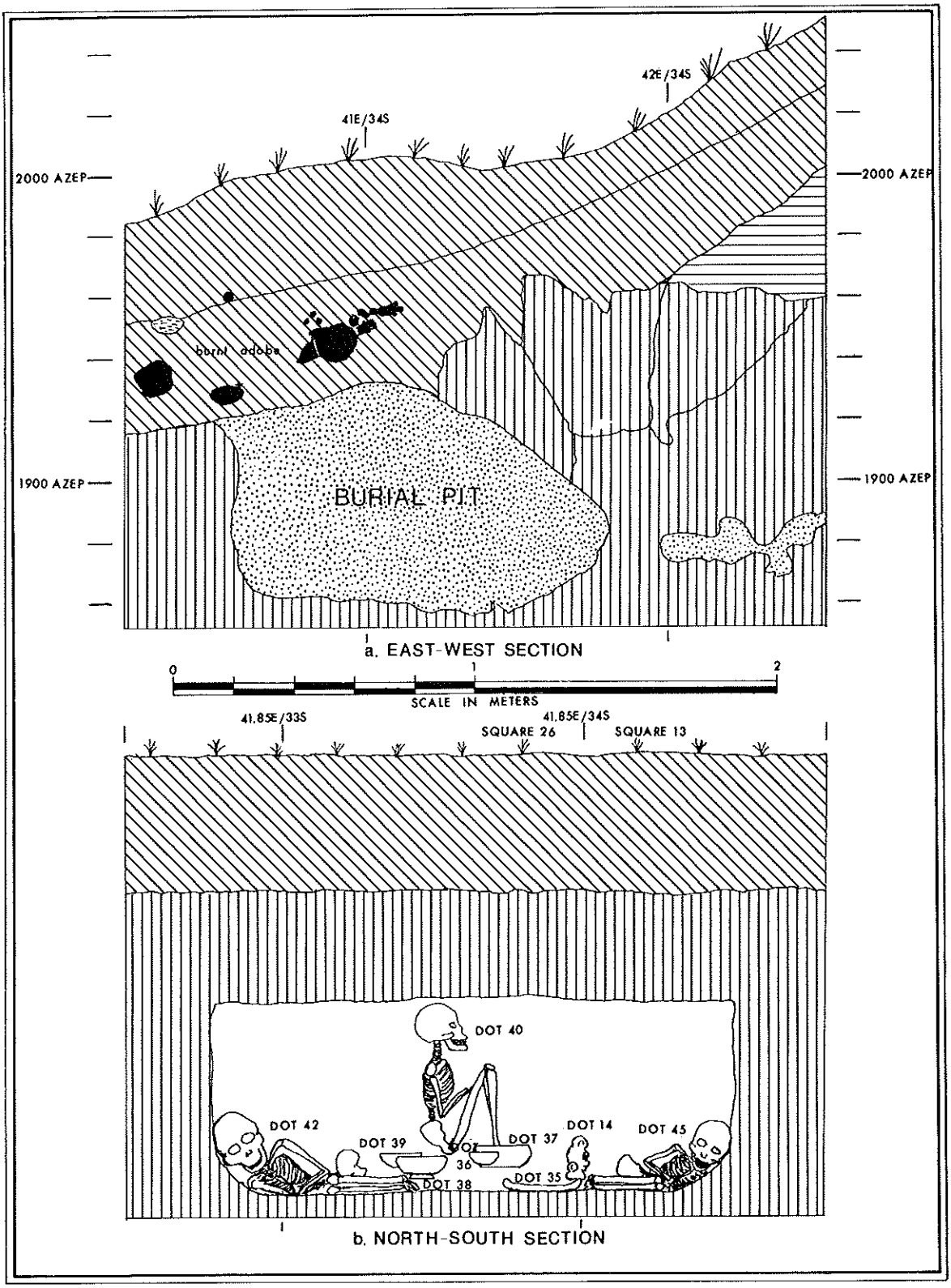
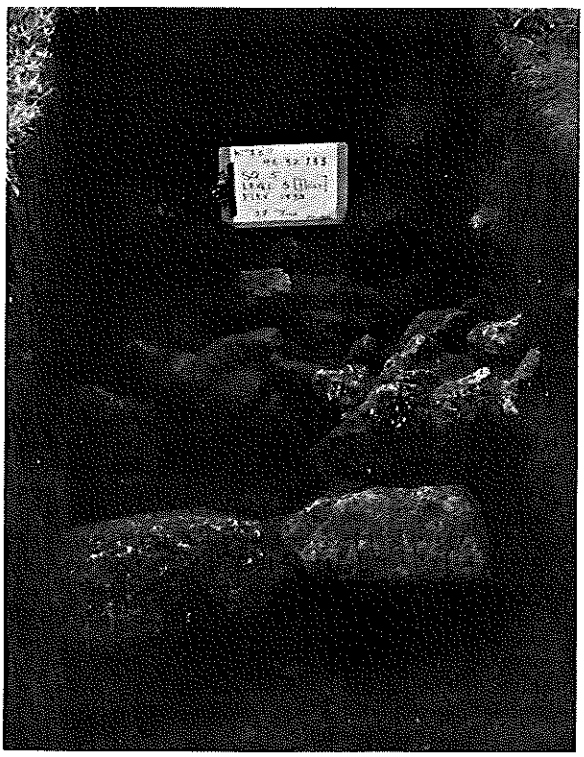


FIGURE 11: PROFILES OF BURIAL PIT

a. Feature 1, Mound B-V-10

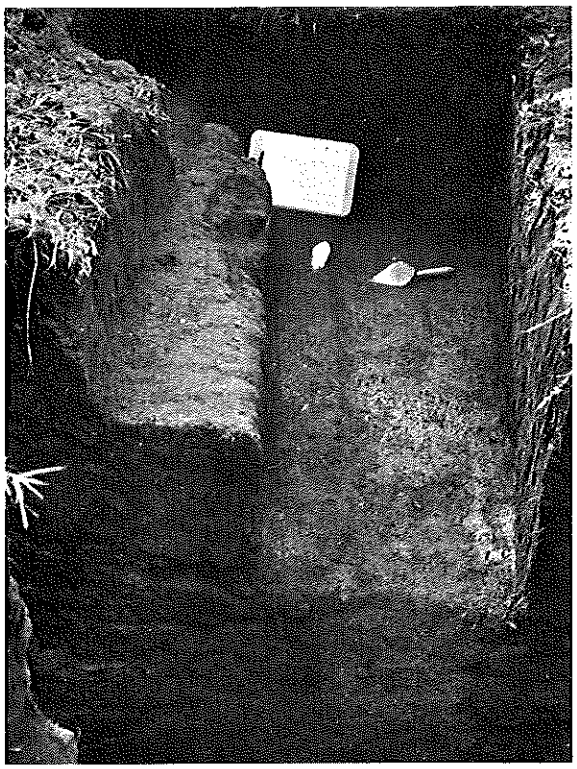
b. Feature 5, Mound B-V-10



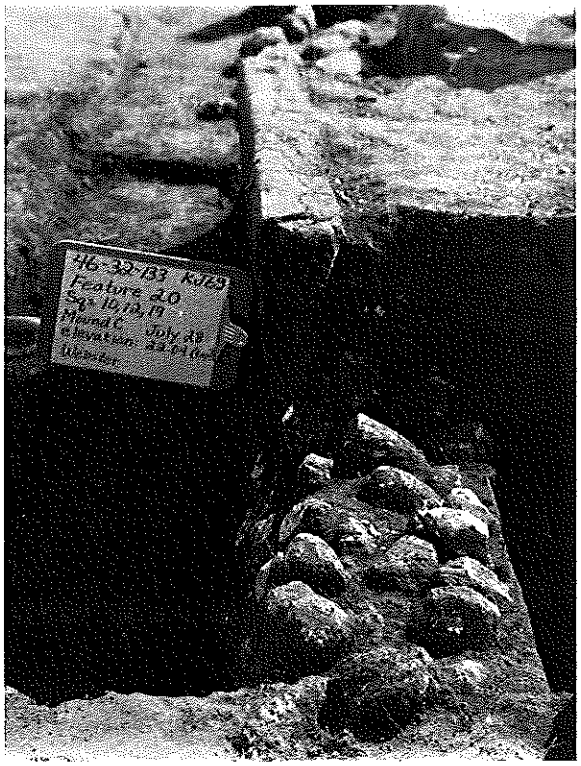
c. Feature 8, Mound B-V-10

d. Feature 4, Mound B-V-10

PLATE 1

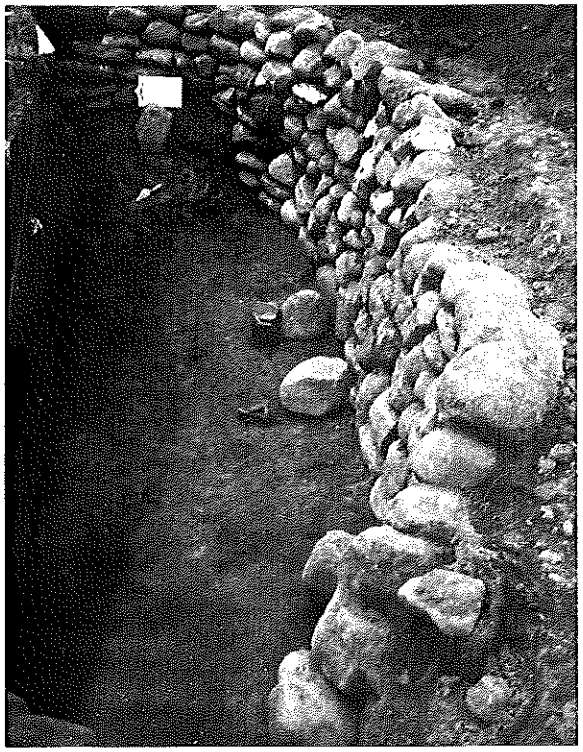


a. Feature 28, Mound B-V-9



b. Feature 20, Mound B-V-11

c. Burnt Clay Sculpture
(KJ69-4159, DOT 8)
Feature 10, Mound B-V-11



d. Feature 25

PLATE 2

MOUND A-VI-6: A TERMINAL FORMATIVE BURIAL SITE AND EARLY POSTCLASSIC HOUSE PLATFORM

by

Richard W. Kirsch

TABLE OF CONTENTS

	Page
INTRODUCTION	303
LOCATION AND CURRENT SETTING	304
EXCAVATION METHODOLOGY	305
Horizontal Control	305
Vertical Control	305
Excavation Procedure	306
Laboratory Analyses	307
TERMINAL FORMATIVE BURIAL COMPONENT	310
Early Occupation	310
Burial 1	311
Burial 2	312
Burial 3	314
Burial 4	316
Burial 5	317
Burial 6	318
Feature 17, Central Pit	319
Summary and Comparison	320
Discussion	328
EARLY POSTCLASSIC STRUCTURAL COMPONENT	330
Platform Construction	331
Structure Ruins	331
Artifact Assemblage	332
Early Postclassic Settlement	333
Discussion	335
APPENDIX 1: Artifact Frequency, Description, and Distribution	338
APPENDIX 2: Ceramic Vessels from the Burial Component	350
APPENDIX 3: List of Artifact and Architectual Features	362
APPENDIX 4: List of Field Numbers	367
APPENDIX 5: Obsidian Hydration Dating	373

LIST OF TABLES

Table		Page
1	Summary of Burial Data	324
2	Summary of Total Artifacts Recovered during Excavation	339
3	Obsidian Hydration Dates	373

LIST OF FIGURES

Figure		Page
1	Contour Map of A-VI Mound Group	375
2	Excavation Plan of Mound A-VI-6	376
3	Burial 1, Mound A-VI-6	377
4	Burial 2, Mound A-VI-6	378
5	Burial 3, Mound A-VI-6	379
6	Burial 4, Mound A-VI-6	380
7	Plan of Household Debris	381
8	Artifact Type Frequency and Distribution	382
9	Ceramic Vessels - Bowls	383
10	Ceramic Vessels - Cylindrical and Constricted Vessels	384
11	Ceramic Vessels - Effigy Vessels	385
12	Obsidian Hydration Dates	386
13	Soil Stratigraphy at Mound A-VI-6	387
14	Profiles of North-South Trench	388
15	Ceramic Stratigraphic Profile	389
16	Structure Profile	389

LIST OF PLATES

Plate		Page
1a	Mound A-VI-6, North Side	390
1b	Burial 2, Mound A-VI-6	390
1c	Burial 3, Mound A-VI-6	390
1d	Burial 4, Mound A-VI-6	390

INTRODUCTION

Mound A-VI-6 was selected for extensive excavation because of the opportunity which it presented to examine the function and chronology of a small, low-lying mound. It was only about 50 centimeters in height and covered about 37 square meters in basal area. Previous excavation at Kaminaljuyu had focused on large structures, which functioned variously as temple platforms, ball courts and other civic structures, or elite residential platforms. No effort had been made to gather information about the few unpretentious mounds which had remained intact and undisturbed. In many areas of the site, such mounds less than a meter in height were probably obliterated by the many years of intensive cultivation even prior to the encroachment by housing developments. Even when the mounds did exist, they were not always recognized as cultural features. Mounds measuring less than a meter in height were not often recorded in the site survey conducted by T. R. Johnson and E. M. Shook of the Carnegie Institution of Washington in the 1940's. The largest concentration of such small mounds is currently in the A-VI mound group, which contained four mounds ranging in height from 20 to 50 centimeters. Most of these mounds were tested by members of the Kaminaljuyu Project, and these structures contained ceramic materials which were diagnostic of the Late Classic and Early Postclassic periods. Only Mound A-VI-6 contained significant amounts of ceramic material from both the Late Classic-Early Postclassic periods and the Terminal Formative period. Because of this indication of an early utilization of Mound A-VI-6, it was decided to extensively excavate it to reveal what differences or similarities the two temporal components of the structure might have had.

The objectives of this report are: (1) to describe the results of the excavation of Mound A-VI-6; (2) to delineate its chronology; and (3) to discuss its function in comparison with contemporaneous features at Kaminaljuyu and in light of the sequence of cultural development in the Valley of Guatemala. The data is presented and discussed for each of the two temporal components, viewing each such component as a distinct unit for analysis. A major problem in this research was the proper analytical segregation of the data into functional and chronological units. To solve this problem, it was necessary to incorporate data provided by other specialists. The classification and tabulation of the artifactual materials was performed under the supervision of Joseph Michels, who also directed the dating of selected obsidian artifacts by hydration analysis. Data on the ceramic phasing of rim sherds and other diagnostic vessel fragments were provided by Ronald Wetherington. Further details on the technique and results of these analyses are provided in the next section and in the appendices at the end of this report. The integration of the data from these analyses with the observations made in the field form the basis for this report. It should be noted that the appendices provided include large blocks of descriptive data connected with the excavation of Mound A-VI-6. It appeared more convenient to present some data in this form rather than introduce them directly into the body of the text. While some of the data presented in the appendices may not be pertinent to the current discussion, such information may nevertheless be useful to other investigators with different research objectives.

LOCATION AND CURRENT SETTING

Mound A-VI-6 is one of five small mounds in the southwest quadrant of the site which constitute the A-VI mound group (Fig. 1). These mounds, designated A-VI-2, 4, 5, 6, 7, range in basal dimensions from 6 by 5 meters to 12 by 11 meters, and in height from 20 to 110 centimeters above the surrounding terrain. They form an amorphous cluster about 70 meters in diameter, located some 130 meters south of Mound A-V-11 and 90 meters west of A-VI-1, some 550 meters directly south of Kilometer 10.5 on the Carratera Roosevelt. Only the largest mound of this group, A-VI-2, was surveyed and designated by the Carnegie Institution of Washington during the mapping operations at Kaminaljuyu. The other mounds have been surveyed and designated by the Kaminaljuyu Project. Within this group of structures should also be included a small depression (10 x 8.5 m; 83 cm deep), located about 42 meters northwest of Mound A-VI-6. The group is on a tongue of land extending southward from the main part of Kaminaljuyu which lies to the north. The terrain slopes away gradually on the east and south sides, while more rapidly on the west side, with the edge of a ravine or barranca located about 90 meters west of Mound A-VI-6.

Because of the slope of the terrain and the proximity of the barranca, the area around the A-VI mound group is adequately drained. Water is available from small springs situated on the upper part of the barranca slopes, on the west side of the mound group. These springs occur in shallow depressions where the arena (sand-like granular pumice) is exposed near the surface. Today these springs are located far down the barranca slopes, but in earlier periods prior to the deep cutting of the barranca, when the water table was higher, such a spring perhaps existed in the shallow depression near the A-VI mound group. Since a rather impervious soil underlies the arena stratum, ground water tends to flow through the arena stratum until exposed to the surface. The availability of water would be an important consideration in the location of a settlement area.

The soil stratigraphy in the area around the A-VI mound group is generally similar to that found in other areas at Kaminaljuyu (Bryan 1945; Shook and Kidder 1952; Fig. 1). The typical stratigraphic section is as follows:

Stratum 1	Dark brown to black topsoil	0- 30 cm
Stratum 2	Brown sandy clay with a scattering of pumice	30- 95 cm
Stratum 3	Soft, medium brown sandy clay	95-110 cm
Stratum 4	Hard, dark brown clay grading into ligher shades	110-210 cm
Stratum 5	Coarse, yellowish brown granular pumice (arena)	210-220 cm
Stratum 6	Hard, compact talpetate and pumice mixture	below 220 cm

Cultural deposits are located within the first three strata, while Strata 4 to 6 were sterile. The talpetate encountered in Stratum 6 is a decomposed volcanic tuff. This material, which is buff in color, hardens when exposed to air and has been used as building material in prehispanic times. As has been noted by other authors, rock does not naturally occur anywhere in the immediate vicinity of Kaminaljuyu (Shook and Kidder 1952: 45). The approximately meter thick Stratum 4 is characterized by extremely hard, dark brown clay which grades into a reddish brown. This stratum is the presumed ancient

topsoil prior to occupation of the area. There is little that differentiates Strata 2 and 3 other than the texture and the relative quanity of pumice particles.

EXCAVATION METHODOLOGY

Horizontal Control

During the course of excavation at Mound A-VI-6, a series of provenience controls were used in the collecting of materials and recording of data. An extensive grid system, consisting of three major areal units, was established for the Kaminaljuyu Project as a uniform system of horizontal provenience designation (Sanders and Michels 1969: 7-11). The largest unit in this system was called a Zone, which designated an area measuring 5 km by 5 km. The Valley of Guatemala had been divided into 40 such Zones, of which Zone 46 encompassed the site of Kaminaljuyu. Within each Zone were 25 units called Areas, each measuring one kilometer square. Within each Area are 400 units called Sectors which measured 50 meters by 50 meters. By using the combined designations of a locale's Zone, Area, and Sector, its position could be located to the nearest 50 x 50 meter square. Thus Mound A-VI-6 at Kaminaljuyu was located in Zone 46, Area 32, Sector 184 (written 46-32-184).

The Zone-Area-Sector designation of an archaeological unit was the minimal horizontal provenience control used for all operations by members of the Kaminaljuyu Project. For extensive excavations, finer measurements were incorporated to designate smaller control units. For the excavation of Mound A-VI-6, a primary horizontal and vertical datum point was established at the top of a sawn pine stump, marked with a roofing nail driven into its center. From this datum point a grid system of 1 x 1 meter units was laid out over the mound. The secondary reference point for this grid system (designated 100E/100N) was located 35.0 meters from the primary datum point, on a bearing of 293° from magnetic north. From this secondary reference point, a north-south base line (designated 100E) was aligned 16° east of magnetic north, and all other grid lines were laid out either parallel or perpendicular to this base line. Each grid line was set a meter apart, and designated by number (eg., 101E or 99N) consecutively eastward and northward from 100E/100N. The 1 x 1 meter units which resulted from the grid pattern were designated by the coordinates of their southwest corner. For example, the designation 99E/101N refers to the one meter square bounded by 99E, 100E, 101N, and 102N.

Vertical Control

In order to control for vertical provenience, the primary datum point was arbitrarily designated to be 20 meters above an assumed zero elevation plane. In fact, this primary datum point was later measured to be 1959 centimeters above the zero elevation plane established for the entire site of Kaminaljuyu. Vertical measurements were made by use of a transit and stadia rod, with the readings recorded in centimeters "Above the Zero Elevation Plane" (abbreviated AZEP). This technique of provenience recording

allows for direct comparison of elevations from all other points measured from the same datum point. Thus readings from points of high elevation will be numerically higher than the readings from points of low elevation, and the problem of negative values is avoided.

Excavation Procedure

The excavation of Mound A-VI-6 was initiated on 23 June 1970 and was terminated on 8 August 1970. In the course of 34 work days, about 58 cubic meters of earth were removed from the mound (Fig. 2). The size of the work crew ranged from two to ten men, with the average being four men. The basic tools used by these excavators were picks, shovels, cobas (metal digging implements consisting of a 1.5 meter long tubular shaft with a chisel-shaped point at one end), trowels, and whisk brooms. The excavators worked in pairs, with one man, usually the most experienced, wielding the pick, while the other handled the shovel. The coba was used to maintain vertical excavation walls for the purpose of reference measurements and stratigraphic profiles. These men in general were quite experienced in archaeological excavations, having worked on the Kaminaljuyu Project for at least one year, often longer. It is a testament to their skill that many delicate features encountered at Mound A-VI-6 were revealed without damage. Numerous small artifacts, such as beads, mineral pigment, seeds and maize cobs were recovered solely by the keen sense of these men.

The sequence of operations during the excavation of Mound A-VI-6 was somewhat dictated by the specific problems to be solved. The first operation, conducted between 23 June and 1 July, was exposing parts of a structure which protruded from the surface. During this operation, 10 to 20 centimeters of soil were cleared from a 3 x 3 meter unit (100-103E/100-103N) in the southern section of the mound. The object of this operation was to reveal the remains of an Early Postclassic adobe structure containing household utensils. The second operation, conducted on 1-8 July, was to sink a 2 x 2 meter test trench (99-101E/100-102N) for the purpose of exposing the stratigraphy of the mound. This test trench was excavated to a depth of 140 cm below the surface, until sterile, hard, dark brown clay was encountered at an elevation of 1756 AZEP. Originally only a 1 x 1 meter unit was planned for this stratigraphic test trench, but the discovery of a Formative period olla (KJ70-7120, DOT 1) required the expansion into adjoining units. This test excavation revealed the presence of a Terminal Formative component in the mound, and the recovery of whole vessels suggested the possibility of burials. The third operation occurred between 9-15 July, and consisted of excavating two long trenches in order to reveal the dimensions and boundaries of the mound. One trench (97-104.5E/103N) was oriented east-west, while the other (100E/104-110N) was laid out perpendicular to the first, heading north. Both trenches were excavated until encountering Terminal Formative materials at an elevation of 1824 AZEP. The fourth operation, conducted from 16 July until 3 August, involved the expansion of the excavation to reveal the cultural features of the Terminal Formative component. During this operation, the remains of five burials were uncovered. The fifth and final operation, conducted on 3-8 August, involved the excavation of a 15 meter long north-south trench (100E/95-110N) down and into the sterile, hard dark brown clay. The purpose of this trench, part of

which had been excavated in earlier operations, was to provide a stratigraphic profile of Mound A-VI-6 (Fig. 14).

In most cases, the grid units were excavated in arbitrary 20 centimeter levels. These arbitrary levels were used in order to more easily control the vertical provenience of artifactual materials. This technique proved especially helpful when the soil stratigraphy was unknown or not clearly defined. Artifacts could later be associated with their appropriate strata after the stratigraphic profile had been completed. Exceptions to excavating in 20 cm levels were made during the excavation of the east-west trench and the north trench of Operation 3. These trenches were excavated in levels corresponding to the soil strata. Arbitrary excavation levels were also not used when excavating such features as burials, which were excavated as a unit. All artifactual materials were collected from each level of excavation, and after preliminary examination by the excavation supervisor, these materials were put into cloth bags and taken to the laboratory facilities in Guatemala City. Each bag was tied with an identification tag upon which were recorded the zone-area-sector designation of the excavation, the grid designation of the excavation unit, the level number and the top and bottom elevations of that level, the name of the excavation supervisor, and the date of collection. Cultural items of special significance were assigned a field number (DOT) and were bagged and tagged separately. Such items included whole ceramic vessels or lithic artifacts, unusual artifact clusters, items associated with features, soil samples, charcoal specimens, bone fragments, seeds and maize cobs, and any unique items (Appendix 4). Whenever possible, a more exacting designation of provenience was recorded for these cultural items, listing the center of their location to the nearest centimeter, and recording the exact elevation of the top (and sometimes also the bottom) of the item, and its feature association.

Laboratory Analyses

During the field research, the supervisor was responsible for the planning of the excavation, the recording of the results, and developing tentative interpretations based on his preliminary findings. Simultaneously, the artifacts from the excavation were collected for further analysis by personnel at the laboratory facilities in Guatemala City, which operated under the supervision of Joseph Michels. Initially, the artifacts from each lot were cleaned, assigned accession number, classified and counted, and recorded in a master catalog. Data from the master catalog, which included information from the tag which accompanied the artifact lots, were later tabulated on to computer cards, sorted according to zone-area-sector designations, excavation units and levels, and then a listing of these data was provided to the excavation supervisor for corrections and corroboration. A large part of these data on the types, quantity, and distribution of artifacts has been incorporated in Appendix 3.

Further laboratory analyses were conducted on certain types of cultural materials collected from the excavation. Rim sherds and other diagnostic vessel fragments were selected for ceramic phasing anlaysis by ceramic specialists under the direction of Ronald Wetherington, the ceramicist for the Kaminaljuyu Project. From previous research, a tentative sequence of

ceramic phases had been established for the pottery artifacts from the Valley of Guatemala (Wetherington 1969). The sequence of ceramic phases, and their associated chronological periods, is as follows: Las Charcas (Middle Formative), Sacatepequez (Late Formative), Verbena-Arenal (Terminal Formative), Aurora (Early Classic), Amatle 1-Esperanza (Middle Classic), Amatle 2 (Late Classic), Amatle 3 (Early Postclassic), Chinautla (Late Postclassic). Utilizing this ceramic sequence, 274 ceramic lots from Mound A-VI-6 were chronologically phased by Wetherington and his assistants. It was found that sherds from all ceramic phases were represented at Mound A-VI-6, though the bulk of the material was from the Verbena-Arenal phases of the Terminal Formative period. Aurora (Early Classic) and Las Charcas (Middle Formative) phases had very few sherds represented, and there was found only one sherd from the Chinautla phase (Late Postclassic). From the data provided by Wetherington, the phased ceramic lots were correlated with the stratigraphic profile (Fig. 15), making it possible to segment the excavation into three cultural strata. On the basis of these three cultural strata, a distributional analysis of the artifacts from Mound A-VI-6 was performed, as discussed below.

Data from the ceramic phasing analysis indicates that there are two temporal components for Mound A-VI-6: a Terminal Formative component represented by burials in the bottom cultural stratum; and an Early Postclassic component represented by the platform fill and structure rubble in the upper two cultural strata. An examination was made to see if any other components might be present in the excavation. The results showed that although sherds from other ceramic phases, such as Las Charcas, Sacatepequez, Aurora, Amatle 1 or Chinautla, were present, their occurrence was not consistent in a manner to suggest another temporal component. In most cases, sherds from these other ceramic phases were mixed with Verbena-Arenal or Amatle 2-3 materials, and often they had been displaced stratigraphically. Hydration analysis of selected obsidian artifacts (Appendix 5) provided further chronological data on the Terminal Formative and Early Postclassic components of the mound. The mean value of nine obsidian samples from the Terminal Formative component (samples 7370, 7371, 7374, 7378, 7448, 7470, 7471, 7472, 7473) dated to 72 B.C. $\pm$ 107. These data imply that the Terminal Formative burials probably occurred between 180 B.C. and 35 A.D. On the other hand, the Early Postclassic structure dates to about 1134 A.D. $\pm$ 69, based on the hydration analysis of three samples (7375, 7450, 7452) associated with its remains. This chronological segmentation and clustering appears to correspond with the intensity of occupation as reflected in the artifact frequency from each cultural strata (Figs. 8, 12).

Finally, a distributional analysis of artifacts was performed, incorporating data from the excavation stratigraphy, the ceramic phasing analysis, and the artifact catalog for Mound A-VI-6. This analysis was conducted in order to segregate and group the data according to functional and chronological components. To accomplish this analysis, the catalog data on nearly forty thousand items recovered from the excavation had been tabulated on to computer cards. A program devised by Gabriele Michels provided the frequency of material categories, artifact types and sub-types, and their percentage relative to either the entire artifact assemblage or to the material categories. The data could be organized in whatever grouping that the investigator desired, with a summary provided for all the data analyzed. A preliminary analysis was run with the data grouped according to the arbitrary levels

used during the excavation. In order to assure comparability of results for all these levels, a selected sample of the data was used for analysis. This sample was selected from the central part of the mound between 98E to 104.5E and 98-99N to 103N, which had been excavated uniformly to the same depth. This sample represented about 70% of all the artifacts recovered during the excavation, selected from about 53% of the total excavated volume, and included materials from most of the burials. The preliminary analysis showed a concentration of cultural materials in the upper and lower levels, with the intermediate levels rather sparce. These results suggested two levels of occupation, which seemed to correlate with the burials and the structure debris. The ceramic phasing analysis further confirmed that there were two temporal components, a Terminal Formative one associated with the burials, and an Early Postclassic component associated with the structure above and with the intermediate fill of the structure platform.

In the final analysis, the data was organized into three groups, based on the initial distribution of artifacts in the primary analysis, the stratigraphic profile, and the ceramic phasing analysis. These three groups, or cultural strata, were defined as follows: (1) the top levels of the excavations, from the surface to an elevation of 1875-1880 AZEP, associated predominantly with Amatle 2-3 ceramics of the Late Classic-Early Classic periods; (2) the intermediate levels between 1875-1880 AZEP to about 1834-1840 AZEP, associated with a mixture of ceramic phases ranging from Sacatepequez (Late Formative) to Amatle 3 (Early Postclassic); and (3) the bottom levels of the excavation, from 1835-1840 AZEP to about 1765-1775 AZEP, in which Verbena-Arenal are the latest phase to be represented in a majority of the ceramic lots (Appendix 1: 338). The first cultural stratum is associated with the debris of an Early Postclassic structure exposed during Operation 1 and the excavation of the initial levels of other grid units. The second cultural stratum is associated with the construction of the platform which supported the Early Postclassic structure above. The third cultural stratum corresponds with the Terminal Formative burials which were found in the lower levels.

Partial results of this artifact distributional analysis are presented in Appendix 1, especially Figure 8. The percentages are based on the frequency of the artifact type relative to all artifacts of a particular material in that stratum. Therefore the comparisons are believed to show the relative occurrence of the artifact types in each stratum and reflect the significance of that artifact type in the artifact assemblage from that stratum. If the relative occurrence of the artifact type in a particular stratum is approximately that of the total sample, then there is no significant difference between the strata in regard to that artifact type. If, however, the relative occurrence of the artifact type in a particular stratum varies considerably from that of the total sample, then this artifact type is a differentiating characteristic of that strata. The results show that the Terminal Formative cultural stratum, which is associated with the burials, is characterized by the relatively high occurrence of the following cultural items: whole ceramic vessels, effigy sherds, incensario vessel sherds, rim-head vessel sherds, figurines, cylindrical ceramic beads, obsidian blades, mineral pigment, building stone, mica flakes, pumice, human bones, seeds and maize cobs. The Early Postclassic cultural stratum associated with the structure debris is characterized by the relative high occurrence of the

following: adornos, obsidian points, obsidian flakes, obsidian cores, lithic detritus, and burnt clay fragments. It is interesting to note that the intermediate cultural stratum, which is associated with the platform fill, is not very different in its artifact assemblage from the total sample, and there is an implication of artifact mixture similar to that found in the ceramics. The cultural significance of these characteristic artifact types will be discussed in the succeeding sections.

TERMINAL FORMATIVE BURIAL COMPONENT

Early Occupation

The earliest evidence of occupation at Mound A-VI-6 is the cultural materials found in the dark brown soil of Stratum 3a (Figs. 13, 14). This stratum appears to occur in five other test excavations in or near the A-VI mound group, although recorded by different investigators in slightly different descriptions. This stratum has been variously identified as "sandy brown clay" (46-32-185), "mottled brown sand and brown clay" (46-32-204, Lot 2), "yellow brown sandy clay" (46-32-205), "brown clay with yellow sand" (46-32-223), "soft medium brown sandy clay" (46-32-224). The evidence that these designations refer to the same stratum are (1) the width of this stratum in most cases is between 15 to 25 cm, and (2) this stratum occupies the same relative position in each of the stratigraphic profiles. These data would appear to suggest a wide Terminal Formative occupation in the area. However, the ceramic phase data presently available do not indicate any Terminal Formative occupation other than that found at Mound A-VI-6. The ceramic phase data do not preclude the possibility of a Terminal Formative occupation in the vicinity of the A-VI mound group, since a few Verbena-Arenal sherds were found, as well as some non-diagnostic sherds, and some of the ceramic phase data are not available. But such evidence does not support the proposition of a Terminal Formative occupation throughout the A-VI mound group.

Stratum 3a at Mound A-VI-6 was laid down directly above the sterile hard, dark brown clay (Stratum 4a) that is believed to be the ancient topsoil in the area. Included within Stratum 3a are sherds from the Sacatepequez, Verbena and Arenal phases, indicating a deposition during the Terminal Formative period, with some inclusions of earlier materials. The stratum varies between 20 and 30 cm in thickness, at an elevation from 1745 AZEP to 1770 AZEP. There is nothing within this stratum to suggest that it was ever a part of a structure or a habitation floor. It appears to be simply a deposition of cultural materials that might accumulate with an occupation of the area.

A low platform, the remains of which were found in the southern part of Mound A-VI-6 (100.82E/95-98.18N, 1775-1794 AZEP), had been built during the Terminal Formative period, directly above the dark brown soil of Stratum 3a. The structure, the earliest architectural feature found during the excavation, was only detected in the soil profile (Fig. 16) and by the preservation of a small segment of the west wall which had been burnt (Feature 14). It consisted of a low, rectangular platform, approximately 20 cm high, and at

least 3.20 meters in length north-south. Its total length is unknown since the platform was only partially excavated along the west side, and only 68 cm of its width east-west was exposed. The platform had been constructed with brown soil similar to that found in Stratum 3a. Above this brown soil, an 8 cm thick layer of tan coarse arena, pumice flakes, and talpetate chunks covered the platform. This layer perhaps served as sub-flooring, for the material could not endure the wear that might be expected on a floor. However, no flooring material was found. The clay wall of the platform was vertical, flat, without any evidence of decoration. Not enough of the platform was excavated to determine its function, though it is probable that it served as an altar or a house platform. There was no evidence of a superstructure above the platform, but this lack of data may be due to the limited scope of excavation.

Later during the Terminal Formative period, portions of Stratum 3a in the central part of Mound A-VI-6 (between 100N and 107N in the stratigraphic profile presented in Figure 14) was dug into, and sections of this stratum were removed down to the hard, sterile, dark clay of Stratum 4a. New depositions of materials were laid down (Strata 3b, c, d, e, f), along with the remains of at least six human bodies. All materials in these strata date to the Terminal Formative period or earlier, except for later intrusions which occurred in Units 98E/98N and 100E/105-106N. Within the deposit of soft dark brown soil (Stratum 3b), a dense concentration of mostly Terminal Formative sherds (Feature 15) was found. Although items in this feature suggest a Terminal Formative burial, the inclusion of Middle Classic ceramics indicates a disturbance during Classic times. The burials from Mound A-VI-6 were all found within the cultural stratum from 1765-1775 AZEP to 1835-1840 AZEP. Each of these burials is described below in the sequence in which they were discovered.

Burial 1 (Figure 3)

This burial was located at 102.5-104E/101.5-103N, at an elevation of 1806-1835 AZEP. The body was extended in an east-west direction, possibly lying on its back, with the top of the body oriented toward the east. The skeletal remains consist mostly of the femur and tibia of both legs, part of the ilium (KJ70-10157), possibly an ulna, a humerus and scapula (Feature 4, KJ70-8086). A cranium (KJ70-10160), which may or may not belong to the body, was found about 70 cm south of the legs. Preservation of these bones in general was rather poor. The epiphyses of the long bones had disappeared, and the diaphyses were found decaying into short segments which would fall apart upon touching. The cranium was barely recognizable, for the back of the skull was completely missing and the rest was in an advanced state of decomposition. The remains of the dental arcade indicated that the head was face down, with the crown oriented northwest.

It is difficult to determine age, sex, or stature of the individual from the available skeletal material. It appears that the deceased was an adult, and possibly a male because of the robustness of the long bones, though any inference of sex from these materials is highly speculative. Because of the poor state of preservation of the bones, it was not feasible to calculate the reconstructed stature based on such regression formulae

devised by Karl Pearson and others (Pearson 1899: 196; Trotter and Gleser 1952, 1958). There was no evidence of any pathology, though it appeared that one femur, possibly the left one, had been broken and bent sometime after death.

Among the artifacts associated with Burial 1 were the fragments of an undecorated brown-gray ware vessel with a small pointed handle, which were found with a concentration of other artifacts (Feature 3, KJ70-8127) about 40 cm north of the body. South of the body were a cylindrical ceramic bead (KJ70-10020, DOT 21), a hammerstone (KJ70-9747, DOT 20), a large rock (KJ70-11218, DOT 104), and fragments of a large red ware vessel (KJ70-9750, DOT 19). Near the cranium were a concentration of Verbena-Arenal and Amatle 1-2 sherds (KJ70-9832, DOT 18), a deer antler (KJ70-11668, DOT 17), and a complete black-brown, fine incised fluted vessel (KJ70-11518, DOT 16). East of the body there were found ten sherds from an incensario vessel (KJ70-10043, DOT 27), and three fragments of a Verbena white ware flat bottom bowl (KJ70-10042, DOT 28). The fill material around and over the burial contained a high density of artifact fragments, mostly 488 sherds, including a rim-head vessel sherd.

In regard to the chronological placement of this burial, it is certain that it occurred during the Terminal Formative period, although its stratigraphic position is near the Terminal Formative-Early Postclassic interface. The two whole or reconstructed ceramic vessels (KJ70-11518, DOT 16; KJ70-10042, DOT 28) which were included among the mortuary offerings, date to the Verbena phase of the Terminal Formative period. Of the six ceramic lots collected from the burial and later submitted to ceramic phasing analysis, two lots (KJ70-9750, DOT 19, KJ70-10026, DOT 23) were phased as Sacatepequez through Arenal, and three others (KJ70-9609; KJ70-9744; KJ70-9807) were phased as Verbena or Verbena-Arenal. Only one ceramic lot (KJ70-9832, DOT 18) contained Amatle 1-2 sherds as well as Verbena-Arenal. This occurrence of Late Classic sherds can be explained by the fact that the ceramic lot was near the Terminal Formative-Early Postclassic interface, and perhaps some later sherds were collected along with the Terminal Formative materials. A chronometric date of 197 B.C. $\pm$ 111 was obtained by hydration analysis of an obsidian fragment (sample 7370), which had been included among the fill material containing Verbena-Arenal ceramics. This date is compatible with the ceramic phase data from the burial.

Burial 2 (Figure 4)

The skeletal remains and mortuary offerings of this burial were found at 103-104.5E/99-100.5N, at an elevation of 1798-1810 AZEP. The remains of two individuals were interred together. The principal body was dorsally extended in a north-south direction, with the head oriented toward the south. The remains of the second individual, represented mostly by an inverted cranium facing to the north, were found beneath the legs of the first body. Although it is possible that the remains of the second individual are the result of an earlier burial, over which was later laid the extended body, it is more probable that the remains are a secondary inhumation, buried simultaneously with the extended body.

The skeletal material from Burial 2 (KJ70-12116; KJ70-12117; KJ70-13729) was in a fairly good state of preservation. The cranium and mandible of the extended burial was fairly complete, though the facial bones had deteriorated. The skull appeared to have a frontal deformity, probably artificially produced. The cranium of the secondary interment was rather robust in its structure, suggesting a male characteristic. Other bones included the right and left clavicle, rib fragments, right and left humerus, right ulna and radius, right metacarpals and phalanges, right ilium, right and left femur, right and left tibia, probably a fibula fragment, and some miscellaneous unidentifiable bones.

From the skeletal material, it is evident that both individuals represented in the burial were mature adults. While it is believed that the individual which was secondarily interred was probably a male, the sex of the extended body is difficult to determine. The contrast between the two crania in degree of robustness, and the slender appearance of the post-cranial bones in general, suggest that the extended body was possibly that of a female. These osteological inferences are somewhat corroborated by the presence of a mano and metate (KJ70-11217, DOT 105; KJ70-11191, DOT 54) among the mortuary offerings, these artifacts traditionally associated with female activities. In counter-evidence, it should be noted that manos and metates were found in ten of the 12 Middle Classic tombs discovered at Mounds A (F-VI-1) and B (F-VI-2). In only two of these cases were the manos and metates definitely associated with females. So the supposition that the extended body in Burial 2 is a female is rather tenuous.

The mortuary offerings in Burial 2 included four whole or reconstructable ceramic vessels which were found near the skeletons. A small hemispherical effigy cup (KJ70-11523, DOT 137) was located near the left shoulder of the extended body, while a red flat base bowl (KJ70-11522, DOT 52) which nested inside a black-brown incised bowl (KJ70-11524, DOT 53), and a black-brown fine incised effigy vase (KJ70-11526, DOT 51) were all located between the legs of the body. A handled cup candelero (KJ70-10040, DOT 143) was recovered in the vicinity of the burial. East of the right shoulder of the extended body was a dense concentration of 271 sherds, mostly from orange ware vessels (KJ70-11210, 12065, DOT 69), and ten sherds of a large shallow black-brown dish (KJ70-11112, DOT 68). This dish, which was discovered inverted and broken in situ, appeared to have been destroyed during interment. Fragments of a red ware vessel (KJ70-11116, DOT 65) were also found among the artifacts. To the east of the legs of the extended body, there was deposited a complete simple slab metate (KJ70-11191, DOT 54), underneath which was a fragment of a tabular mano (KJ70-11217, DOT 105). The metate had been inverted, and two holes had been punched through the base. This action effectively rendered the metate useless for grinding maize or seeds, and perhaps signified the ritual "killing" of the artifact, to release its soul from its material manifestation. The destruction of artifacts for this reason has been noted by other authors for other Mesoamerican peoples and elsewhere (Linné 1942: 126; Ucko 1970: 265). Near the metate were two large rocks (KJ70-11220, DOT 61; KJ70-11221, DOT 62), one of which had been utilized as a rubbing platform. To the north was an artifact cluster, which mostly included 63 sherds, among which was an incensario sherd. From the fill immediately over and around the burial, an extremely high density of artifact fragments were encountered. There were 1313 vessel fragments recovered from the burial

fill, including three incensario sherds, as well as eight fragments of burnt clay.

The evidence from ceramic phasing analysis of the mortuary offerings and ceramic lots, and from obsidian hydration analysis indicates that the burial occurred during the Terminal Formative period. Of the four complete ceramic vessels found near the skeleton, three vessels (KJ70-11526, DOT 51; KJ70-11522, DOT 52; KJ70-11524, DOT 53) are wares which are typical of the Verbena phase, while the fourth vessel (KJ70-11523, DOT 137) is of a type of ware which occurred during the Sacatepequez through Arenal phases (Appendix 2). Nine ceramic lots from Burial 2 were analyzed and chronologically phased. Of these lots, four (KJ70-11513; KJ70-11911; KJ70-11970; KJ70-12054) were phased as Sacatepequez through Arenal, three other lots (KJ70-1161, DOT 64; KJ70-11210, DOT 69; KJ70-12065, DOT 69) contained only Verbena and Arenal sherds, while two lots (KJ70-11894, KJ70-13729) contained Aurora or Amatle 1 sherds as well as Terminal Formative sherds. It is possible that these later sherds might have been from the higher adjoining stratum, and collected unintentionally along with the Terminal Formative sherds by excavation technique which was used. Another possibility is that some diagnostic traits of the Terminal Formative period also occur in the Early and Middle Classic periods. One sample of obsidian (7372) was analyzed for chronometric dating, and the date of 355 B.C. $\pm$ 115 was obtained. This date is slightly older than would be expected for the Terminal Formative period. Although no ceramic phase data are available for the artifact lot from which this obsidian sample was drawn, it is possible that Late Formative materials were included. It would not be unexpected that these earlier materials would have been mixed and deposited with the burial, which occurred during the Terminal Formative period.

Burial 3 (Figure 5)

The best preserved burial of all those encountered at Mound A-VI-6 was located at 98E/98-100N, at an elevation of 1766-1816 AZEP. The grave had been dug through an artifact concentration (Feature 11, 1791-1793 AZEP), perhaps associated with some other burial, and continued almost to the top of the sterile soil stratum (Stratum 4). The body was placed facing south in what might be best described as semi-recumbent position. The torso had been inclined backwards about 45 degrees, with the head slumped forward over the chest. The right leg had been bent together, the thigh straight out from the body, and the lower leg doubled back underneath, with the right foot below the right hip. The left leg had also been bent back, with the knee raised about 30 centimeters, and the left foot in front of the pelvis. The arms were in front of the body, with the elbows bent outward from the torso, while the hands were placed near the top of the thighs. This position of the body is similar to that found in the Esperanza tombs of Mounds A and B. The position of the head, torso and arms is nearly identical to that found in some of these tombs (see Kidder, Jennings, and Shook 1946: Fig. 140b). The position of the legs is different from the typical pose assumed in the Esperanza tombs.

The skeletal material for the body (KJ70-12113) was nearly complete. All the long bones of the arms and legs were present, as well as most of the

carpals, metacarpals, tarsals, metatarsals, and phalanges. The innominate was complete, though slightly distorted and compressed from the top. The vertebral column was evident, but individual vertebrae were indistinguishable, and the upper portion of the column had shifted laterally to the left. None of the ribs were found. The cranium was not quite as well preserved as the rest of the body, for the features of the face were obliterated, and part of the right side of the head had deteriorated. No pathological evidence or artificial deformity were noticed.

It is apparent that the body is that of an adult, probably between the ages of 20 to 35 years. Sex determination of the body is tentatively figured to be that of a female, based both on osteological evidence and the artifact assemblage in the immediate vicinity of the body. The osteological evidence considered for sex determination was as follows: (1) the innominate, though slightly distorted, appeared to be generally broad, and to have a wide sciatic notch, indicative of a female; (2) the slender appearance of the long bones, particularly those of the arm, suggest a female; and (3) the cranium appeared proportionally smaller than the rest of the body, a characteristic which is generally regarded as feminine.

The mortuary offerings in front of the body included a unique rectilinear tetrapod effigy vessel, decorated with Usulutan resist painting (KJ70-11527, DOT 80). Nine complete obsidian prismatic blades (KJ70-10821, DOT 81; KJ70-10825, DOT 82; KJ70-11989, DOT 101; KJ70-12134, DOT 124) were also found in front of the body, as well as a human bone fragment (KJ70-12134, DOT 125), charcoal (KJ70-10834, DOT 83), and some wood fragments (KJ70-10832, DOT 84). To the left of the body was a large rock (KJ70-12136, DOT 136) of unknown function, while a large, flaring neck jar with handles (KJ70-12151, DOT 138) similar to those used today for carrying water, was behind the body. Immediately over the body were artifacts which could have been utilized for food preparation and other domestic tasks. Here were found two tabular manos (KJ70-10817, DOT 86; KJ70-10815, DOT 88) and a vesicular basalt rubbing platform (KJ70-10816, DOT 87). Above the right elbow of the body, there was a large plain red ware bowl (KJ70-11529, DOT 59) similar to the type presently used for preparing tortilla dough (Appendix 2). Beneath the rubbing platform (KJ70-10816), DOT 86), there was an unclassified perforated ceramic artifact (KJ70-10829, DOT 89) of unknown function. Three small red cylindrical ceramic beads (KJ70-10826, DOT 85) were found near the neck of the body. A large number of artifact fragments were contained in the fill which was deposited with the body. Among these artifact fragments were 596 sherds, including one incensario sherd, 15 burnt clay fragments, and the reconstructable fragments of a black-brown fine incised bowl with a flat base and medial flange (KJ70-12113).

The chronology for this burial is somewhat confusing, for there is evidence from both Terminal Formative and Early-Middle Classic periods. Examining the whole and reconstructed vessels found in Burial 3, the large jar (KJ70-12151, DOT 138) appears to date to the Terminal Formative period, though this type of ceramic ware is not particularly diagnostic of any particular phase. The reconstructed fragments of the black-brown fine incised bowl (KJ70-12113) are diagnostic of the Verbena phase of the Terminal Formative period, but since these fragments were found in the fill of the burial, it is possible that these fragments are an inclusion of earlier

materials. In regard to the rectilinear tetrapod effigy vessel (KJ70-11527, DOT 80), the variants of Usulutan ware have not been fully reported so as to chronologically phase this ware, which otherwise occurs from the Late Formative period through the Middle Classic period (Wetherington 1969). The plain red ware bowl (KJ70-11529, DOT 59) is of a ceramic type which occurs in the Arenal and Aurora phases (Appendix 2). The ten rim sherds collected with the skeleton (KJ70-12113) were analyzed as being from the Las Charcas and Sacatepequez phases. Of the six other ceramic lots from Burial 3 which were collected and analyzed, three lots (KJ70-10976; KJ70-11593; KJ70-13612) were phased as Verbena-Arenal, while two other lots (KJ70-11691; KJ70-13515) contained Aurora and Amatle 1 sherds in addition to the predominantly Terminal Formative material. Only one lot (KJ70-11623), from 98E/98N, 1764-1784 AZEP, contained solely Aurora and Amatle 1 ceramics.

Hydration analysis of five samples (7371, 7373, 7448, 7472, 7473) associated with Burial 3 provide a range of dates which parallel that derived from the ceramic phasing analysis (Appendix 5). This range extended from 347 B.C. (7473) to 492 A.D. (7373), which while agreeing with the span of ceramic phases from Las Charcas-Sacatepequez through Aurora-Amatle 1, did not resolve the chronological problem of dating the event of the interment. Solution to this problem is perhaps best approached by careful selection of the samples used for dating the burial. It was noticed that the date ranges of four samples (7371, 7448, 7472, 7473) overlap, forming a cluster with a mean date of 88 B.C. $\pm$ 109. This cluster suggests that the most probable date for the burial is between 200 B.C. and 20 A.D. An even better estimation would be based on the two samples (7448, 7472) which were taken from complete obsidian blades that were found in the burial. It is more likely that these complete blades constitute part of the mortuary offerings, while blade fragments in the fill could very well be earlier material. If the values from samples 7448 and 7472 are averaged, a mean date of 12 A.D. $\pm$ 110 is obtained, which represents the best estimate presently available. The date ranges of these two samples very closely overlap, while the date range obtained from another complete blade (sample 7373) does not agree with any other sample from the burial.

Burial 4 (Figure 6)

The remains of an extended burial were located at 99E/102-104N at an elevation of 1777-1814 AZEP. The body, in a rather poor state of preservation, was extended ventrally in a north-south direction, with the head face down and oriented to the south. The skeletal material (KJ70-12141; KJ70-12142) had greatly deteriorated. The cranium, with mandible and dentition, was lying downward on its left side. Among other bones present and identifiable were fragments of the cervical vertebrae, clavicle, right humerus and ulna, right and left femur, right and left tibia. It appears that the body is that of an adolescent, judging from the development of the cranium and mandible, and the general size of the bones. Determination of sex was not possible because of the youthful age of the body and the poor condition of skeletal material. In regard to the stature of the individual, the body was at least 132 cm, considering the present extent of the skeletal remains.

Among the mortuary offerings were a nested set of ceramic vessels (Feature 6) 22 cm southeast of the head. In this set, a shallow hemispherical tetrapod bowl (KJ70-9608, DOT 9) had been placed on top of and partly inside a black-brown fine incised cylindrical vase (KJ70-9482, DOT 10). Closer to the head, there was a mottled orange bowl (KJ70-13551, DOT 60) which had been leaning against the cranium. About 60 centimeters north of the legs, a large artifact cluster was encountered, including a large wide-mouth, round bottom jar (KJ70-11528, DOT 79). The interior bottom of the jar had been blackened with carbon deposits, and a charcoal specimen (KJ70-10833, DOT 78) was recovered near the mouth of the vessel, implying that the jar had been used as an incensario or as an ash container. Nearby, there had been found a small pumicestone pebble (KJ70-10838, DOT 91). Above and slightly west of the legs there was a concentration of 54 sherds (Feature 1). Among these sherds were fragments of a flesh-orange tripod bowl (KJ70-8141) and a small, shallow brown-gray bowl with a medial flange. These vessels may have been broken intentionally as part of the interment ritual. Collected from the fill around Burial 4 were 491 sherds, including 12 incensario sherds, and six fragments of burnt clay.

The various features of this burial suggest a Terminal Formative date, possibly coeval with Burial 2. The body was laid out in a manner similar to that of Burial 2, accompanied by offerings of a similar type. The black-brown fine incised cylindrical vase (KJ70-9482, DOT 10) which was part of the nested set near the head, is diagnostic of the Verbena phase of the Terminal Formative period. The temporal provenience for the large jar (KJ70-11528, DOT 79) is more equivocal, for while the form is typical of the Middle Formative period, especially the Las Charcas phase, the reddish-brown ware is common in the Aurora and Amatle 1 phases of the Early and Middle Classic periods. The shallow tripod bowl (KJ70-8141) found above the legs has all the attributes of Usulutan ware except for the resist painting. The Verbena-Arenal phase sherds which were found along with this Usulutan bowl effectively date it to the Terminal Formative period. Of the four ceramic lots which were collected in the vicinity of Burial 4, two lots (KJ70-11578; KJ70-12066) were phased as Sacatepequez, Verbena and Arenal, while two other lots (KJ70-13564; KJ70-13695) included Aurora and Amatle 1 sherds as well as Late and Terminal Formative materials. These Early and Middle Classic materials could have been collected because of the proximity of the burial to the Early Postclassic mound fill above. One obsidian hydration sample (7469), collected near the large jar (KJ70-11528, DOT 79), dated to 332 B.C. $\pm$ 114. Such a date, while consistent with some of the Late Formative materials found in the fill, probably does not date the event of interment, which most likely occurred during the Verbena phase of the Terminal Formative period.

Burial 5

The remains of a secondary interment were found at 100E/104N, at an elevation of 1794-1805 AZEP. The very fragmentary remains of a body were located within an area measuring 38 cm east-west by 20 cm north-south. The skeletal material (KJ70-11214) consisted of possible cranial fragments (in extremely poor condition), two long bone fragments, and some miscellaneous bone fragments. None of these bones were articulated or in a position to suggest that they were the remains of a primary interment. From these

remains, it was not possible to determine age, sex, or stature of the deceased. Next to the presumed cranial fragments on the west end, there was a large hemispherically shaped rock (KJ70-12135, DOT 128), with its flat side toward the skeletal remains. Two cylindrical lithic beads, one a large black bead (KJ70-12084, DOT 127), and the other a small bead (KJ70-12101, DOT 132) were found among the artifacts included with the burial. Some 40 cm southwest of the remains were an unperforated disc worked from a sherd (KJ70-11995, DOT 130) and a large rock (KJ70-12137), both of unknown function. Immediately over the remains, there was a dense layer of 734 sherds, including one incensario sherd, and other artifact fragments (KJ70-11803, 11804, 11804, 11893, DOT 129).

The chronological placement of this burial is somewhat difficult, for no complete ceramic vessels were included among the mortuary offerings. Of the five ceramic lots collected from Burial 5, one lot (KJ70-11803, DOT 129) was phased as Sacatepequez and Verbena, another (KJ70-11893, DOT 129) contained sherds from Sacatepequez through Amatle 1, and two lots (KJ70-11804, KJ70-11805, DOT 129) were phased as Verbena through Amatle 1. One lot (KJ70-11901) contained sherds from the Verbena phase of the Terminal Formative period through the Amatle 2 phase of the Late Classic period. Of the two obsidian samples submitted for hydration analysis, one sample (7470) dated to 81 A.D. $\pm$ 104, while another sample (7449) dated to 1330 A.D. $\pm$ 60. Though these two samples were drawn from the layer of artifacts immediately over the burial (DOT 129), the dates are widely divergent, and while the date provided by the first sample (7470) conforms with the ceramic phase designation of the lot, the latter sample (7449) is clearly anomalous. The chronological evidence suggests either a very late Terminal Formative burial or an Early-Middle Classic re-interment.

Burial 6

The remains of this burial, located at 100E/107N, at an elevation of 1814-1823 AZEP, were not recognized as such until the data collected by two different persons had been correlated during analysis. The skeletal material from this burial was in a very poor state of preservation. The largest of these remains was the diaphysis of a long bone (KJ70-12115, DOT 133), possibly a femur. The position of this bone indicates that the body was extended in a north-south direction, possibly with the head to the south, if the burial was analogous to Burial 2 and 4. Judging from the size and thickness of the long bone, the deceased was an adult, possibly a male. Some unidentified bone fragments (KJ70-8085) were found about 30 centimeters west of the long bone, on the same level. No other remains of the body were found in the same level. However, there is evidence in the stratigraphic profile that Units 100E/105-106N immediately to the south had been intruded sometime during the Middle Classic period, for Aurora and Amatle 1 sherds were found mixed with Terminal Formative materials down to an elevation of 1733 AZEP. Within Units 100E/105-106N, three bone fragments (KJ70-7778, DOT 57; KJ70-11473; KJ70-12099, DOT 126) were found at various levels, a rather high occurrence of bone material in an excavation unit. The scattered distribution of these bone fragments would be consistent with the other evidence of disturbance mentioned above.

As an offering, a black-brown fine incised cylindrical vase (KJ70-8159) had been deposited some 40 centimeters west of the long bone fragment (KJ70-12115, DOT 133). Among the artifact fragments recovered near the skeletal remains were 316 sherds. From the artifact evidence, it is certain that interment occurred during the latter part of the Terminal Formative period. The complete black-brown cylindrical vase (KJ70-8159) which was found in the burial had been analyzed as belonging to the Arenal phase of the Terminal Formative period. The single ceramic lot (KJ70-12055) from the vicinity of Burial 6 was phased as contained sherds from the Sacatepequez through Arenal phases of the Late and Terminal Formative periods. A small obsidian fragment (sample 7488) which was collected near the vase, dated to 458 B.C. $\pm$ 117 by hydration analysis. This obsidian sample probably represents earlier material which was included with the fill during interment.

Feature 17, Central Pit

Although not a burial, this feature occupies a central position in Terminal Formative stratum of Mound A-VI-6, located at 100.30-101.50E/100.00-102.20N, at an elevation between 1751-1825 AZEP. It consists of a pit measuring roughly 120 cm east-west by 220 cm north-south, and 75 cm in depth. The pit had been dug into a dark brown soil (Stratum 3), down to the hard dark brown clay of the ancient topsoil (Stratum 4). It appeared that the western edge of the pit had been lined with four talpetate blocks, with their flatten sides facing the pit. The entire pit had been filled with coarse yellow arena, and covered with an 8 cm thick layer of hard pumice-clay material. Artifact fragments were only found in the layer of pumice-clay; the coarse yellow arena fill was sterile. Among the cultural materials which were collected (KJ70-9737; KJ70-9751; KJ70-9967), there were 139 sherds (Sacatepequez-Arenal), five obsidian fragments, two fragments of lithic detritus, and a lump of burnt clay. A date of 56 B.C. $\pm$ 107 was determined by hydration analysis of one of the obsidian fragments (sample 7378).

At the north end of the pit, there was a cluster (Feature 9, KJ70-9830) of 76 sherds from the Sacatepequez through Arenal phases, and biconvex mano fragment. Most of the sherds appeared to be incensario fragments, and since fragments of burnt earth were found with the sherds, this ceramic cluster might be the remains of some ritual observance, perhaps concerned with the rites for the dead. It appeared that the ceramic vessels were destroyed during or after use, and covered with soil. On the west side of the pit, at an elevation of 1817-1843 AZEP, there was a complete but fragmented olla (KJ70-7120, DOT 1), which appeared to be resting on a small bench. Among the artifacts inside the olla was a figurine head (KJ70-7156, DOT 1), possibly dating to the Arenal phase of the Terminal Formative (see Kidder 1965: Fig. 7b). On the east side, above the pumice-clay layer, there was another complete vessel, a shallow flat bottom dish (KJ70-11520, DOT 25) which had been turned upside down. Another ceramic cluster (Feature 8, KJ70-9827), consisting mostly of 103 sherds (Verbena-Arenal-Aurora), including an incensario sherd, was on top of and partly imbedded in the hard pumice-clay surface that covered the central pit.

Considering the central pit and the associated artifacts, this feature has the appearance of a Terminal Formative tomb, except for the absence of

a burial. The pit had been sealed by the pumice-clay layer during the Terminal Formative period, and had not been disturbed during later periods. It is possible that the pit had been prepared for the future burial of a particular individual, and had been filed with non-cohesive arena to reserve it for the time when the individual died. For some reason, however, the pit was never used for its intended purpose. Another possible interpretation is that the individual died in such a manner that his body was not recovered, though mortuary observances were held over an empty grave. Such an interpretation would explain the presence of ceramic vessels and artifact clusters nearby the pit.

Summary and Comparison

The burials of Mound A-VI-6 exhibit some common characteristics among themselves and among other burials of the Terminal Formative period at Kaminaljuyu. Careful examination of these characteristics should reveal some details of the mortuary practices which were occurring at this time. Considering the placement of the body, the most common position is with the body laid out in a fully extended position, either on its back (dorsally extended) or on its chest (ventrally extended), with arms straight along the sides of the body, and the head in normal position (that is, facing straight, and not turned in any direction independent of the body). From the evidence available at Mound A-VI-6, this general statement on the position of the body can be made in descending order of confidence. Of the six burials discovered at Mound A-VI-6, four were extended, and of these extended burials, the bones of the arms were found in only three cases (Burials 1, 2, and 4). The head likewise was directly associated with the body in only three cases (Burials 2, 3, and 4). There also appears to be a tendency to orient the body toward the south, for the upper part of the extended bodies in Burials 2 and 4 are directed on bearing of 197° and 208.5° from magnetic north, respectively. The orientation of the semi-recumbent burial (Burial 3), based on the direction which the head is facing, is also toward the south. This pattern of position and orientation is only suggestive if based on the six burials from Mound A-VI-6. However, the pattern becomes clearer after examining the 17 other Terminal Formative burials which have been reported from Kaminaljuyu (see Table 1). Extended burials occur in 13 of these additional cases, with the bodies oriented toward the south in six of these cases.

A common characteristic among all the burials in the Termimal Formative stratum of Mound A-VI-6 is that there was no architectural elaboration of the grave. The bodies and mortuary offerings were simply laid in shallow pits, measuring from 20 cm to 70 cm in depth. The burials were then covered with the same soil as the surrounding stratum, making it virtually impossible to define the exact dimensions of the grave. The arena filled central pit (Feature 17) was the only occasion when there was a definite contrast between the fill and the surrounding soil. It should be noted that tombs had been constructed for the Terminal Formative burials in Mound D-IV-2 (Borhegyi 1956) and Mound E-III-3 (Shook and Kidder 1952). At Mound A-VI-6, there were one to three large rocks accompanying the bodies in four of the six burials. The ten large rocks recovered from the burials were irregular in shape, ranging in length from 14 to 26 cm and in width from 9 to 11 cm.

Although such rocks have been classified as building stone, their specific function in these burials is problematical. These rocks do not appear to form a stone cist or any other structural feature, yet their presence in the burials was intentional, since stone is not naturally found in the immediate vicinity of Kaminaljuyu (Shook and Kidder 1952: 45).

Another characteristic of the burials is that they invariably were covered with a fill containing a large number of sherds. In the layer immediately over the body, sherd frequencies ranged from a low of just over 300 sherds to a high of about 1300. These frequencies may be compared with an average density of 591 sherds per cubic meter, 118 sherds in an average 20 cm thick level, the typical unit of excavation. This noticeable concentration of sherds was often used during the excavation as an indication that we were coming down upon a burial. It appeared that the grave had been littered with pottery fragments after interment, and in fact it was possible to reconstruct one vessel (KJ70-11519, DOT 48) from fragments collected above Burial 2. This high density of artifacts has been noticed to cover at least one other Terminal Formative burial at Kaminaljuyu. When the burial pit on the east side at the base of Mound C-II-12 was excavated, a layer of broken pottery fragments was encountered near the top (Cheek, personal communication). This evidence suggests that ceramic vessels were perhaps broken over the grave as part of the mortuary observances.

A high incidence of incensario vessel fragments is associated with the Terminal Formative stratum at Mound A-VI-6, particularly with Burials 1 and 4. In fact, Burial 6 is the only burial in which incensario sherds did not occur among the artifacts found in the fill. It is quite likely that incensarios played some role in the mortuary practices during the Terminal Formative period. It is possible that incense was burned in these vessels during or after interment, then they were destroyed, and their fragments scattered over the grave. It is curious no incensario vessel, with the possible exception of the large jar in Burial 4 (KJ70-11528, DOT 79), was included among the complete vessels of the mortuary offerings. The inclusion of incensario vessels among the mortuary offerings has been reported in only one other Terminal Formative burial. Two three-pronged incensarios with plain solid prongs and vertical side flanges were found in the tomb of Mound D-IV-2 (Borhegyi 1956: 286). The rarity of incensarios among the mortuary offerings is perhaps due to their restricted function, which was in a ceremonial context. In this context, incensarios would be used during the rites for the dead, and perhaps destroyed afterwards, with their remains left at the grave. But they would not normally be included with the mortuary offerings interred with the dead, for such offerings might be considered as personal property of the deceased, objects which he had used in life or were appropriate to his status, and perhaps useful to him in the after-life. It is possible that the person buried in the tomb of Mound D-IV-2 held some religious office, and therefore the inclusion of incensarios among the mortuary offerings would have been appropriate. In such a context, however, incensario vessels probably were not considered appropriate for interment with the dead at Mound A-VI-6.

It is interesting to note the types of ceramic vessels which were present as mortuary offerings in the Terminal Formative stratum of Mound A-VI-6. These vessels may be classified into two broad types, utility wares and

fine wares. The utility wares are those vessels which might be used daily for domestic tasks, such as preparing meals, serving food, or carrying water. In general, the form of these vessels was specifically designed to perform these household functions, and decorative treatment is minimal and relatively simple. The primary characteristic of these vessels is that their form be serviceable to the function for which they were designed. Examples of utility wares among the vessels found at Mound A-VI-6 include the following: a shallow flat bottom dish (KJ70-11520, DOT 25), a plain red bowl (KJ70-11522, DOT 52), a large deep bowl (KJ70-11525, DOT 116), a large red bowl (KJ70-11529, DOT 59), a large flaring neck jar (KJ70-12151, DOT 138), and possibly the large olla (KJ70-7120, DOT 20). Fine wares may have similar forms as the utility wares, but their fabrication and decoration was treated with more care. In vessels of this type, finer quality of pastes were used in their construction, and such decorative techniques as surface burnishing, fine incision, resist painting, and fluting were often incorporated. These wares could have been used for food serving and other domestic tasks, however, they were probably only rarely used as such. Their most important function was perhaps displaying the wealth and status of their owner, similar to the fine china found in European and American households today. The relative value of these wares is reflected in their greater occurrence among the higher status burials discovered in the tombs of Mound E-III-3 (Shook and Kidder 1952). Among the fine wares from Mound A-VI-6, there were vessels of Verbena White (KJ70-10042, DOT 28), Usulutan (KJ70-9608, DOT 9; KJ70-11521, DOT 31; KJ70-8141; KJ70-11527, DOT 80), Fine Red (KJ70-11522, DOT 52), and Black-Brown Fine Incised (KJ70-12113; KJ70-11524, DOT 53; KJ70-9482, DOT 10; KJ70-11526, DOT 51; KJ70-8159; KJ70-11518, DOT 16). Black-brown fine incised vessels are the most common of the fine wares to be included among mortuary offerings during the Terminal Formative period. Two such vessels were found with burials in Mound B-III-1 (Orrego 1968), three vessels at Mound C-II-12 (Cheek, personal communication), and 105 vessels in Tomb I and 35 vessels in Tomb II at Mound E-III-3 (Shook and Kidder 1952: 119).

Another common implement included among the mortuary offerings at Mound A-VI-6 are obsidian prismatic blades. Eleven complete blades were found with the burials, nine from Burial 3 alone. Many of these blades appear to have been freshly struck, for there was little evidence of wear along the cutting edges. Prismatic blades are the most common obsidian artifact in the Terminal Formative stratum, where they comprise 60% of the obsidian artifact assemblage. This occurrence can be contrasted with the 38% representation by prismatic blades in the obsidian artifact assemblage of the Early Post-classic period (Fig. 8). Obsidian blades have been frequently associated with the Terminal Formative burials at Mounds B-III-1, C-II-12, D-IV-2, and E-III-3 (see Table 1).

Items of personal adornment, such as ceramic, lithic and bone beads were found in three of the burials from Mound A-VI-6. Three small red cylindrical ceramic beads (KJ70-10826, DOT 25) were in Burial 5, two cylindrical lithic beads (KJ70-12084, DOT 127; KJ70-12101, DOT 132) from Burial 5, and a cylindrical ceramic bead (KJ70-10020, DOT 21) was found near the legs of of the body in Burial 1. Such occurrence of these types of artifacts would be expected among the burials, where personal ornaments might be interred with the deceased. What was not expected was the relatively high occurrence of bead artifacts throughout the Terminal Fromative stratum as a

whole. Of the 12 ceramic, lithic, and bone beads recovered during the excavation, ten were from the Terminal Formative stratum, and even the remaining two ceramic beads were found in the fill of the Early Postclassic structure platform, and not among the household debris.

Manos and metates were encountered among the mortuary offerings of only Burials 2 and 3 at Mound A-VI-6. Fragments of these domestic implements were found in association with only two other Terminal Formative burials at Kaminaljuyu. Two metate fragments were found buried with a cranium in Mound B-III-1 (Orrego 1968), and one mano fragment was included among the artifacts in the burial pit at the eastern base of Mound C-II-12 (Cheek, personal communication). The data from the skeletal materials is not complete enough to determine if there is any relation between sex of the deceased and the presence of manos or metates among the mortuary offerings. These types of artifacts are traditionally associated with female activities, yet manos and metates were found in ten of the 12 Middle Classic tombs discovered at Mounds A (F-VI-1) and B (F-VI-2). In only two of these cases were the manos and metates definitely associated with females.

Two other artifact types which appear to be significant in Terminal Formative mortuary practices at Kaminaljuyu are mica and mineral pigment. Although all 15 specimens of these substances were found in the Terminal Formative stratum of Mound A-VI-6, none were found in direct association with any of the burials. The largest cluster of these materials occurred in Units 99E/104N and 100E/103-106N. Mica flakes have been found among other Terminal Formative burials at Mound D-IV-2 (Borhegyi 1956: 287) and Mound E-III-3 (Shook and Kidder 1952: 118). The mineral pigments, usually a reddish substance which is called hematite, an oxide of iron, seem to have functioned rather importantly in the Terminal Formative mortuary practices. The teeth and a small jade bead in the mouth of one body buried at the eastern base of Mound C-II-12 had been stained with a red ocher (Cheek, personal communication). The floor beneath the principal body in Tomb I of Mound E-III-3 was covered with a bright red mineral paint, while in Tomb II this red substance surrounded the area where the principal body had lain, indicating that the corpse or its wrappings had been painted red (Shook and Kidder 1952: 118).

The significance of the antler (KJ70-11668, DOT 17) found near the cranium in Burial 1 of Mound A-VI-6 is difficult to determine. Perhaps it signifies that the deceased was a hunter, or possibly the antler has some ritual symbolism, unknown at the present time. In any event, another antler (DOT 509) was found over the east end of the burial pit at the eastern base of Mound C-II-12 (Cheek, personal communication). At the present time, the function of these antlers in the burials remains a mystery.

The Terminal Formative cultural stratum in Mound A-VI-6 is also characterized by the relative high occurrence of figurines, pumice, effigy sherds, rim-head vessel sherds, seeds and maize, although none of these items were recovered from the burials. The relative high occurrence of figurines is consistent with the prevalence of this type of artifact during the Formative period at Kaminaljuyu, as has been noted by other authors (Kidder 1965; Rand 1965). The cultural significance of the pumice in the Terminal Formative stratum is unknown, for the pumice chunks were not

TABLE 1: SUMMARY OF BURIAL DATA

Burial Number	Skeleton							Mortuary Offerings												
	Age	Sex	Orientation	Position	Head facing	Sherds	Incensario Sherds	Ceramic Vessels	Ob. Blades	Beads (non-jade)	Mano/Metate	Stone Vessels	Eccentrics	Mushroom Stones	Jade Artifacts	Mica	Pigment	Antler	Stingray Spines
A-VI-6																X	X		
Burial 1	A	♂?	→	E	?	488	10	3	1	1	.	.	.	.	.	.	.	1	.
Burial 2	A	♀?	↓	Ed	o	1313	3	5	.	.	2	.	.	.	.	.	.	.	.
Burial 3	A	♀	↓	SR	o	596	3	4	9	3	2	.	.	.	.	.	.	.	.
Burial 4	Y	?	↓	Ev	o	491	12	6	1	.	.	.	.	.	.	.	.	.	.
Burial 5	?	?				868	1	.	.	2	.	.	.	.	.	.	.	.	.
Burial 6	A	♂?	|	E	?	316	0	1	.	.	.	.	.	.	.	.	.	.	.
B-III-1 (Bebrich, 1969a; Orrego, 1968)																			
Burial 1	C	?	↓	Ed	→			1	1	.	.	.	.	.	.	.	.	.	.
Burial 2	C	?			→			1	.	.	.	.	.	.	.	.	.	.	.
Burial 3	A	?			←			.	.	.	2	.	.	.	.	.	.	.	.
Burial 4	A	?	|	Ev	→			4	.	.	.	.	.	.	.	.	.	.	.
Burial 5	A	?	↓	Ev	→			1	1	.	.	.	.	.	.	.	.	.	.
Burial 6*	A	?	|	Ed	o			3	.	.	.	.	.	.	.	.	.	.	.
C-II-12 (Cheek, 1971a; 1971b)																		1	
Burial 5	Y	?						.	.	.	.	.	.	.	.	.	.	.	.
Burial 6	YA	?	↓	S	o			6	4	.	1	.	.	.	1	.	X	.	.
Burial 7	A	♂?	↓	E	?			.	.	.	.	.	.	.	.	.	.	.	.
D-IV-2 (Borhegyi, 1956)							X	71+	X	.	.	.	.	.	X	X	.	.	.
Retainer	YA	♂	→	Ev	↓														
E-III-3 (Shook and Kidder, 1952)																			
Tomb I								298	12	78	.	17	1	1	X	X	.	.	.
Skeleton 1*	?	?	|	E	?			.	1	.	.	.	.	.	.	X	X	.	.
Skeleton 2	A	?	—	E	?			.	.	.	.	.	.	.	.	.	.	.	.
Tomb II								157	16	.	.	.	.	.	X	X	.	.	.
Skeleton 1*	A	♂	↓	Ed	?			.	.	.	.	.	.	.	.	.	X	.	7
Skeleton 2	C	?	↑	Elr	←			.	.	.	.	.	.	.	.	.	.	.	.
Skeleton 3	C	?	↓	Ev	o			.	.	.	.	.	.	.	.	.	.	.	.
Skeleton 4	YA	?	↓	Ev	o			.	.	.	.	.	.	.	.	.	.	.	.
Finca Miraflores (Kidder, 1935; 1948; Kidder, Jennings and Shook, 1946: 241)																			
Burial 1	A?	?	↑	Ev	?			X	.	.	.	.	.	.	X	.	.	.	.

Table 1 (continued)

NOTES: *indicates principal body. Age: C=child, Y=youth, YA=young adult, adult, A=adult. Orientation: ↑=north, ↓=south, →=east, ←=west, |=north-south, –=east-west. Position: S=seated, SR=semi-recumbent, E=extended, d=dorsally, v=ventrally, lr=laterally right. Head facing: o=normal position, unturned; otherwise direction indicated. X=present but quantity unknown.

recovered in association with any cultural features. Nor were the pumice chunks shaped into any recognizable artifact, or used in construction, as was the case in the Early and Middle Classic periods.

The highest concentration of effigy sherds (five) and rim-head vessel sherds (four) occurs in Unit 100E/105N between an elevation of 1764-1804 AZEP. Within the same levels of this unit were found a large orange bowl (KJ70-11525, DOT 116) which had been broken in situ, a large rock (KJ70-12133, DOT 123), and an artifact cluster of 38 Verbena-Arenal sherds (KJ70-11447, 11482, DOT 124). All these materials were found just above a large ceramic cluster (Feature 15), which included other items such as an incensario vessle sherd (KJ70-13409), some bone fragments (KJ70-12099, DOT 126), and a complete obsidian blade (KJ70-12009, DOT 142). Such an artifact assemblage is quite similar to that encountered in the Terminal Formative burials, and it is possible that this feature is the remains of a disturbed burial, perhaps the southern part of Burial 6. Also in the vicinity of this feature were encountered three carbonized maize cobs and seeds, all the seeds and maize cobs recovered during the excavation. It is tempting to consider these seeds and maize cobs as food offerings to accompany the dead, but there is no direct association of these items with any of the burials.

One of the problems to be considered concerning the burials from Mound A-VI-6 is what are the chronological relationships among the burials. From the ceramic phasing analysis and obsidian hydration analysis discussed previously, it is certain that most of the burials, if not all, occurred within the Verbena phase of the Terminal Formative period. The evidence from Burials 3 and 5 is somewhat equivocal, admitting the possibility that these burials could have occurred during the Early or Middle Classic periods. The ceramic vessels which were included among the mortuary offerings with the other four burials are clearly diagnostic of either the Verbena phase or possibly the Arenal phase (Burial 6) of the Terminal Formative period. Hydration analysis of obsidian samples associated with the burials indicates that the interments most probably took place sometime between 180 B.C. and 35 A.D.

The spatial distribution of the burials in the Terminal Formative cultural stratum of Mound A-VI-6 suggests some formal arrangements in the layout of these burials. Other than Burial 6, the bodies appear to have been interred symmetrically with respect to the central pit (Feature 17), with Burials 1 and 2 on the east side, Burials 3 and 4 on the west side, and Burial 5 at the north end, all within two meters distance from the pit. Indeed, such an arrangement appears as a prototype of the prepared tombs found in Mound E-III-3, with the principal personage occupying the central position, and subordinate persons laid out on benches along the sides (Shook and Kidder 1952). However, such was not the case with the burials at Mound A-VI-6. The burials of Mound A-VI-6 appear to be successive interments rather than simultaneous interments, as was the case with the tombs at Mound E-III-3. This conclusion is supported by the following evidence:

(1) The burials vary considerably in the position and orientation of the bodies. One body in Burial 2 is dorsally extended in a southern direction, while in its supposedly complementary burial (Burial 3), the body is semi-recumbent, with its head facing south. In Burial 1, the body is extended in an easterly direction, while in Burial 4, its symmetrical partner, the

body is extended in a southerly direction. So the arrangement of the burials is not as symmetrical as it first appears.

(2) The burials vary in regard to the depth of interment. If just the extended burials are considered, the elevations of the burials range between 1777-1804 AZEP (Burial 4) and 1806-1835 AZEP (Burial 1). No two burials lie at the same elevation plane, nor do they lie in some pattern which might suggest step-terraced benches adjoining the central pit (Feature 17).

(3) The ceramic vessels among the mortuary offerings appear to vary chronologically between some burials. The ceramic vessels included with Burial 2, and to a lesser extent with Burial 1 and Burial 4, are typical of the Verbena phase of the Terminal Formative period, while the single vessel found with Burial 6 belongs to Arenal phase of the Terminal Formative period. The phase designations of the ceramic vessels in Burial 3 are too equivocal to be used for certain chronological placement. In general, the variation between the types of vessels found within all the burials is broader than would be expected for simultaneous interments.

(4) The range of chronometric dates, derived from obsidian samples associated with each of the burials and submitted for hydration analysis, is broader than would be expected for simultaneous interments. If the upper and lower limits of the best associated samples (7370, 7471) are considered, the combined span of values within one standard deviation is 442 years, more than twice the standard deviation range of 214 years for the mean value between these two samples. A tentative sequence of the interments appears to be Burial 2, Burial 1, Burial 4, followed by Burial 6, Burial 5, and Burial 3. The construction of the central pit appears to have occurred about midway in the sequence.

In summary, although most of the burials at Mound A-VI-6 took place during the Terminal Formative period, probably between 180 B.C. and 35 A.D., the bodies were interred successively. Each burial was prepared by digging a shallow pit into the soil, usually laying the body out in an extended position, generally oriented toward the south. Mortuary offerings, consisting of both utility and fine ware vessels, obsidian blades, domestic implements such as manos and metates, and items of personal adornment were placed along side and over the body. The rite for the dead were commemorated by burning incense at the grave site, then the ashes and fragments of the incensarios were placed over the burial. As the grave was filled in, broken pottery was also scattered over the burial. Even though the interments were in succession at Mound A-VI-6, there appears to have been some formal arrangment in the layout of the burials. It should be noted that none of the burials were disturbed by intrusions during the Terminal Formative period. These intrusions, when they did occur, seem to be associated with the Early or Middle Classic periods. It appears that knowledge of the locations of the burials was maintained during the period that the Terminal Formative cultural stratum of Mound A-VI-6 functioned as a burial site. From the quality and the quantity of the mortuary offerings, there is little evidence to suggest any status differentiation among the burials at Mound A-VI-6, at least no differentiation on the basis of wealth or prestige. Some of the artifact assemblages suggest differences in sex-associated roles. For example, the manos and metates found in Burials 2 and 3, and the antler found in Burial 1

suggest possible sexual differentiation, but differentiation on any other basis is not evident. For these reasons, it may be argued that the burial component of Mound A-VI-6 represents a cemetery for some coherent social unit, possibly a lineage. In any event, the cemetery probably did not function for a period longer than two hundred years, possibly even a shorter period of time.

Discussion

In order to discuss the significance of the burial component of Mound A-VI-6 in relation to the Terminal Formative level of cultural development at Kaminaljuyu, some review of the changing patterns in mortuary practices is necessary to place this discussion in proper perspective. These changes in the mortuary practices at Kaminaljuyu reflect in part the sequence of cultural development in the Valley of Guatemala. During the Formative and Classic periods in this area, there was a transition from a simple society with little differentiation evident to a more complex, socially stratified society (Borhegyi 1965; Sanders and Price 1968). There is a parallel development in the mortuary practices of Kaminaljuyu which appears to correspond to this trend of increasing social complexity.

From the evidence presently available, no architectural structures have been associated with the Las Charcas phase, the earliest ceramic phase firmly defined for Kaminaljuyu, dating from the Middle Formative period. Las Charcas deposits have been associated solely with pre-hispanic storage pits, which were later used for the disposal of refuse. On one occasion at least, these pits were also used for simple burials. In Pit 1 the skeleton of a young adult was found in an extended position, face up (Shook 1950-51: 198). No ornaments or formal burial offerings were found with the body, but a mixed deposit of soil, ash, carbonized plant material, disarticulated animal and human bones, broken stone artifacts and pottery fragments appeared to have been dumped into the grave.

It is during the Late Formative period that mortuary architecture appears at Kaminaljuyu. Mounds of this period are described in the preceding reports (Bebrich, Ball). Considering the few burials in Late Formative mounds that have been excavated and reported (Espinoza 1966), the position of interment seems to be extended, with offerings of pottery, obsidian, and other artifacts placed around the body. Since the excavations at Mounds B-IV-1 and C-VI-12 have not been fully reported as of yet, it is difficult to determine if any status differentiation, as might be shown by the central location of a principal body, numerous valuable offerings, or sacrificial victims, can be detected among these multiple burials. In any event, such differentiation is not as obvious as in the case for mortuary customs during the Terminal Formative and later periods.

During the Terminal Formative period, it appears that a new type of structure, the mortuary temple, came into existence. In this type of structure, the mound was constructed first, and incorporates other architectural elements, such as stairways and terraces. The tomb was then constructed at the summit of the structure, in the form of step-terraced pit, with each level decreasing in size. Mound E-III-3, with its two tombs, is

an excellent example of this type of structure (Shook and Kidder 1952). The principal body in the tomb was interred on a litter in the center of the lowest level; subordinate persons, perhaps servants sacrificed for the occasion, were laid out on the terraced benches of the tomb. All the skeletons in these burials were placed in an extended position, with the principal body on its back, head toward the south. The other bodies in the tombs were placed face down, with either the head toward the south or the face turned to the south. An extremely large collection of black-brown fine incised ware, fine red ware, Verbena white ware, and Usulutan ware were among the ceramic vessels deposited with the bodies. Also included among the mortuary offerings were rare and exotic items such as stingray spines and jade artifacts. The entire tomb was covered with a log roof, then filled with earth to the original summit level. A similar type of burial was encountered during the excavation of Mound D-IV-2 (Borhegyi 1956). Less elaborate burials, also dating to the Terminal Formative period, have been found at Mound B-III-1 (Bebrich 1969a; Orrego 1968), at Mound C-II-12 (Cheek, 1971), and at Finca Miraflores (Kidder, Jennings and Shook 1946: 241; Kidder 1948: 228-229).

The pattern of extended burials appears to continue into the Early Classic period (Berlin 1952: 14-15), and even into the beginning of the Middle Classic period, as is evident in Tombs A-I and A-II of Mound F-VI-1 (Kidder, Jennings and Shook 1946). However, most of the bodies in these early Esperanza phase tombs are oriented with the head toward the north rather than the south. Another interesting feature of these two tombs is that they were used for successive interments. Ten other Esperanza phase tombs were also found during the excavation of Mounds F-VI-1 and F-VI-2 (Mounds A and B reported in Kidder, Jennings and Shook 1946). Each of these 12 Esperanza tombs, consisting of rectangular pits ranging in size from 1.30 x 1.30 m to 3.50 x 4.50 m, 1 to 4 m deep, were placed in front of some ceremonial structure (probably a shrine in the early period, a pyramid-temple in the latter period). Both tomb and structure were then covered by the next increment of rebuilding. Later Esperanza burials are characterized by placement of the bodies in seated positions, with legs crossed tailor-fashion, and the head facing south. Among the typical mortuary offerings were cylindrical tripod vases, Thin Orange effigy vessels, "cream-pitchers," "Tlaloc" effigy jars, pyrite mosaic plaques, sea shells and turtle shells.

There are several noticeable differences between the mortuary practices of the Middle Classic period and those of the Terminal Formative period. Middle Classic tombs, such as those at Mounds F-VI-1 and F-VI-2 (Mounds A and B) were placed in front of the temple substructure, and not in the floor of the temple at the summit, as was the case in the Terminal Formative tombs at Mounds E-III-3 and D-IV-2. The Middle Classic tombs were straight-sided rectangular pits, whereas the Terminal Formative tombs were step-terraced constructions. The position of the body during the Middle Classic period, as exemplified by the later Esperanza tombs, was seated with the legs crossed tailor-fashion, the hands spread between the thighs, the head facing south. This position contrasts with the Terminal Formative practice of burying the body dorsally extended (at least for the principal body), the head oriented towards the south. The pottery included as mortuary offerings in the Esperanza tombs exhibits influences from Teotihuacan and other Mexican regions to the northwest. Of the ceramic vessels among the mortuary offerings during the Terminal Formative period, only the Usulutan ware suggests

foreign influences, in this case from the Lenca area in eastern Salvador, to the southeast. Also new with the Middle Classic burials are the inclusion of pyrite mosaic plaques, turtle shells, and sea shells among the mortuary offerings.

From the mortuary practices existing during the Terminal Formative period at Kaminaljuyu, it is evident that status differentiation was present. The variation in the quantity and quality of mortuary offerings in these Terminal Formative burials (see Table 1) demonstrates that such status differentiation occurred. On the basis of this variation in quantity and quality of mortuary offerings, the burials may be ranked in ascending order: A-VI-6, B-III-1, C-II-12, D-IV-2, and E-III-3. Fine ware vessels occurred in all burials, but in conspicuously higher quantities in Mounds D-IV-2 and E-III-3. Rare and exotic items, such as jade and stingray spines, were found in some burials and not in others. Jade artifacts were found with the bodies in Mounds C-II-12, D-IV-2, and E-III-3. Tomb I of Mound E-III-3 is unique in the occurrence of stone vessels, stingray spines, eccentrics, and mushroom stones, the latter three artifact types perhaps reflecting a particular office which was held by the deceased. Similar eccentric implements have been portrayed on relief sculptures dating to the Terminal Formative period (see Stelae 10 and 11, Miles 1965: Fig. 13, 15a.).

In regard to funerary constructions and special treatment of the body, none of these indicators of status were present among the burials of Mound A-VI-6. However, increasing amount of construction was involved in the erection of the structures for the burials at Mounds B-III-1, C-II-12, D-IV-2, and E-III-3. Moreover, tombs were constructed in Mounds D-IV-2 and E-III-3, with the principal body placed on a litter and occupying the central position in the tombs of Mound E-III-3. These structures, such as Mounds B-III-3 and D-IV-2, and particularly Structures 5 and 6 of Mound E-III-3, differ considerably from the earlier Late Formative burial tumuli, in that the stairways and terraces of these Terminal Formative structures indicate that they functioned as substructures for a mortuary temple.

EARLY POSTCLASSIC STRUCTURAL COMPONENT

The upper two cultural strata of Mound A-VI-6 represent the remains of an Early Postclassic structure and its platform. These cultural strata ranged in elevation from 1835-1840 AZEP to the top of the mound at 1944 AZEP. No intermediate occupation levels were recognized as existing between the Terminal Formative stratum discussed previously and these cultural strata. Sherds from the Aurora and Amatle 1 phases occur randomly, with no consistent pattern which might represent an occupation level. The evidence from the ceramic phasing analysis suggests that the platform for the Early Postclassic structure was constructed immediately above the Terminal Formative component. An interface between the Terminal Formative and Early Postlcassic components appears at an elevation between 1835 and 1840 AZEP.

Platform Construction (Figure 16)

The platform for the Early Postclassic structure was constructed of brown sandy clay with varying amounts of pumice particles mixed together (Strata 2a and 2b). There appear to have been two tiers constructed, each roughly 40 cm in height. The lowest tier measured approximately 9 m north-south, by possibly 5 m east-west, estimated on the basis of elevation contours. The only firm evidence of this tier of the platform was the remains of a burnt clay structure (Feature 13) in Unit 100E/107N. This architectural feature apparently was part of the north side of the lower tier, and several burnt clay fragments with unpainted surfaces were collected from the debris. Based on this evidence, this tier of the platform was originally between 35-40 cm high, and covered with adobe, which possibly was fired by the destruction of the structure above.

The upper tier of the platform was differentiated from the lower one by a slightly compact surface occurring at about 1873-1878 AZEP. This surface probably represents simply a construction phase, for the material of both tiers is similar in composition. The upper tier possibly measured about 5 meters north-south by about 4 meters east-west, estimating on the basis of the elevation contours. No surfacing of this tier was detected, as was the case for the lower tier. If there ever was such surfacing, it could have easily eroded away, since this surface would have been exposed. The upper limit of this tier was at an elevation of about 1925 AZEP, which was marked by the floor covered with structure debris (Fig. 8).

The fill of the platform contained a mixture of sherds from several ceramic phases, indicating that the material had been collected from areas of earlier occupation. The latest ceramic phase represented in the artifact lots was Amatle 2-3, dating the construction of the platform to the Early Postclassic. The location of the platform over the Terminal Formative burials was probably more fortuitous than intentional. The site for the platform was perhaps selected because a slight mound of about 20 cm height already covered the central pit of the burial component. The Early Postclassic people had simply chosen this slight eminence to be the place upon which to erect their structure.

Structure Ruins

Above the platform, there had been constructed a frame-and-adobe structure, approximately the same size as the upper tier of the platform. Evidence for this structure consists mostly of the 1572 burnt clay fragments recovered from the upper cultural strata, between 1875-1880 AZEP and 1930 AZEP. Of these burnt clay fragments, the largest construction consists of 1379 fragments found in a 9 m^2 area bounded by 100E and 103E and by 100N and 103N. Among these fragments, 26 had flat unpainted surfaces, while another 18 fragments showed impressions of posts, poles, or mating, and two other fragments had both surfaces and impressions. An intensive fire probably destroyed the structure, for some thick fragments had been fired quite thoroughly. When the structure collapsed, burnt clay fragments were scattered over the terraces of the platform (eg., KJ70-13605, 13633, 13635, DOT 71).

The excavated adobe material from Mound A-VI-6 had some similarity to burnt frame-and-adobe houses which have been examined ethnographically in the highlands of Guatemala (Wauchope 1938: 87-88). When such a frame-and-adobe house was destroyed by fire, the charred stumps of the main posts remained standing, but the walls had disappeared, their outline marked by a bright red low mound of burnt adobe all around the house. Intense heat from the blazing thatch and the wooden framing had burnt the adobe mud of the walls to a bright red. With the burning of the wood or cane framework of the structure, the burnt adobe collapsed into an even red mound (Wauchope 1938: 87-88).

Construction of a frame-and-adobe has also been described ethnographically. A structure of this type is constructed by erecting a wooden frame, consisting of small trees serving as the upright members. Cane stalks, serving as horizontal members, are lashed to both the exterior and interior surfaces of the uprights. These stalks are usually lashed together in pairs, with strips of henequen or vine. Adobe mud mixed with grass is then built up around on both sides of this framing. The mud is packed in between the horizontal stalks, covering them thinly (Wauchope 1938: 80-81). References to this type of structure, built of adobe over a wooden frame, can be found in the literature as far back as the 17th century. Structures of this type probably occur more frequently in the Guatemalan highlands today than any other type (Wauchope, 1938: 81). This type of construction has sometimes been called "bird cage" style (Gamio 1926-27: 20), which consists of walls made of woven strips of wood or simple rods whose interstaces are filled with mud. On drying, this form of construction makes a relatively solid and compact block. It is believed that this type of construction is an attempt to counteract the effects of seismic activity (Gamio 1926-27: 20). The supposedly earthquake resistent qualities of this type of structure has made it more popular in some areas of the Guatemalan highlands (Adams 1957: 323).

Artifact Assemblage

Upon the floor of the Early Postclassic structure (1925 AZEP) there was an extremely heavy concentration of artifactual materials, consisting of 8072 items recovered from a 9 m^2 area bounded by 100E and 103E and by 100N and 103N (Fig. 7). A large amount of these materials were the 1379 burnt clay fragments, representing the remains of the frame-and-adobe structure discussed above. Although this structure was probably destroyed by fire, no charcoal was recovered among the adobe debris. However, such evidence could have disappeared through erosion, since the remains were within 20 cm of the top of the mound.

Other artifacts recovered from the rubble included such domestic implements as two ceramic spindle whorls (KJ70-4377; KJ70-6014), five tabular mano fragments (KJ70-4493; KJ70-4609; KJ70-4733; KJ70-7664), four metate fragments (KJ70-4517; KJ70-4269; KJ70-4608; KJ70-4609), two digging stick weights (KJ70-4533; KJ70-7758), an ovate stone club (KJ70-4609), and an obsidian point (KJ70-4377). This assemblage of artifacts suggests that the structure was perhaps used as a residence, though the spatial relationships among these items is not clear. No hearth feature, such as that found at

Mound A-VI-5 (Feature 4, Extention 3 and 4, 46-32-204) was identified at Mound A-VI-6.

Associated with the Early Postclassic structure was a concentration of some 65 lithic tool fragments (Feature 16) on the south side of the platform. This feature appeared to be a refuse pile of broken lithic implements and detritus. In fact, throughout the Early Postclassic cultural stratum, there was a significant proportion of lithic detritus recovered (Fig. 8i). This evidence suggests that the residents of the Early Postclassic structure perhaps manufactured some lithic implements. A higher percentage of obsidian flakes were found among the obsidian artifact assemblage, and most of the obsidian cores were found either in the platform fill or among the structure debris above. This evidence is again suggestive of some manufacturing activity, perhaps on the household level, since the quantities of these materials were not very extensive.

The chronology of the structure definitely dates to the Early Postclassic period. Of the 31 ceramic lots collected from the remains of the structure, 12 lots contained solely Amatle 2-3 phase sherds, while another ten lots contained Amatle 2-3 sherds as the latest ceramic phase represented. Obsidian hydration analysis tends to confirm this temporal placement. On the basis of a cluster of three samples (7375, 7450, 7452), a date of 1134 A.D. $\pm$ 69 may be associated with the Early Postclassic structure. Another gross temporal indicator is the occurrence of obsidian points among the platform fill and the structure debris. Obsidian points have not been associated with any chronological period earlier than the Middle Classic period, when 28 points were recovered among the Esperanza phase tombs of Mounds A (F-VI-1) and B (F-VI-2) (Kidder, Jennings and Shook 1946: 136-138, Fig. 157, 168). Similarly, the increase of adorno fragments among the artifacts associated with the structure ruins probably reflects the chronology of the structure. Adornos are most often used in the complex incensario vessels which were probably introduced to the Valley of Guatemala during the period of Teotihuacan influence and continued on in the Late Classic period.

Early Postclassic Settlement

During the Early Postclassic period, all the mound structures of the A-VI mound group were utilized (Fig. 1). Sherds dating to the Amatle 2-3 ceramic phases were found in all four test excavations of these low mounds. Beside Mound A-VI-6, evidence of residential structures and household artifacts were uncovered at Mounds A-VI-4 and A-VI-5. Mound A-VI-4 (46-32-204, LOT 2) was a low platform mound, about 40 cm in height, and measuring approximately 11 m north-south by 6 m east-west. Among the materials recovered from this mound were several burnt clay fragments and a spindle whorl, along with more than 500 sherds and some obsidian fragments. No floors were detected during the excavation.

The evidence from Mound A-VI-5 (46-32-204, LOT 1) is much more substantial. This mound measured approximately 5 m north-south by 6 m east-west, and about 20 cm high. During the test excavation of this mound, a post hole (Feature 3, Extension 1) was found in the eastern part, and a hearth area (Feature 4, Extention 3 and 4) toward the center of the mound. Burnt clay

fragments were found throughout the upper levels of the excavation, and more than 40 mano and metate fragments were recovered, mostly in the vicinity of the hearth area. Although Mound A-VI-7 was not tested, it is similar in size and configuration to the other mounds discussed above, and probably also functioned as a house platform. Rough dimensions of this mound were 7 m north-south by 6 m east-west, and about 35 cm high.

Mound A-VI-2 (46-32-185) appeared somewhat different from the other small house mounds in the A-VI mound group. First, it was larger than any of the others, measuring approximately 12 m north-south by 11 m east-west along the base, and 2 or 3 m across the summit, with a height of about 1.75 m. A fired clay floor (Feature 1, 99-101E/100-102N) was exposed just below the surface. Only a small segment of the floor was found; probably the remainder of the feature that had eroded away. The bulk of the ceramic materials date to the Amatle 2 or 3 phase, but no unusually large cluster of sherds was found. Nor were any domestic implements, such as manos, metates, or spindle whorls, noticed during the excavation of this mound. Apparently Mound A-VI-2 did not function as a residential platform in the same manner as other mound structures in the A-VI mound group. The size of its summit, covering a 4 to 9 m^2 area, is smaller than would be expected for a residential unit. It is possible, though highly conjectural, that Mound A-VI-2 served as an altar or shrine for the A-VI mound group.

One other feature in the A-VI mound group should be considered, and that is the shallow depression (46-32-163), located about 42 meters northwest of Mound A-VI-6, on the upper slopes of the barranca to the west of the A-VI mound group. This depression measured approximately 10 meters by 8.5 meters, and about 83 cm deep, sloping downward in a northwesterly direction. A 9 m long test trench was excavated across the minor axis of the depression in order to determine the possible function of this feature. In the center part of the depression, sterile coarse brown arena with chunks of pumice was encountered at a depth of 40 cm. Below this soil stratum, at a depth of 110 cm, a stratum of layered arena was revealed. This stratum, about 65 cm thick, consisted of layers of white arena alternating with layers of light brown arena. An extremely hard brown clay, similar to decomposed talpetate, underlayed the layered arena stratum, at a depth of 175 cm. Blocks of talpetate appeared to surround the depression, for such blocks were encountered in the southern end of the test trench, and talpetate blocks were visibly projecting from the southwest wall, partially blocking the downward slope of the depression.

The soil stratigraphy of this depression, particularly the coarse brown arena and the layered arena so close to the surface, suggests that this feature could have functioned as a spring. Arena formations are below most of the terrain in the vicinity of the A-VI mound group. This material is quite suitable for allowing water to pass through its stratum. The somewhat impervious talpetate stratum below, however, would prevent any further drainage downward. So the water would flow through the arena stratum in a somewhat lateral direction. Should this water-bearing arena stratum be exposed on the sloping sides of the barranca, then perhaps a spring would be formed. Such a spring is presently functioning further down the barranca slope, where it is used for watering the cattle which graze in the area. But perhaps in the prehispanic period, when the barranca was not as deep as it is today and

when the water table was higher, the depression likewise functioned as a spring. The talpetate blocks surrounding the depression could have served to retain the water which came to the surface. The sherds which were collected from the upper levels of the excavation date from the Verbena through the Amatle 3 phases. Although the evidence is not conclusive, it appears quite probable that the depression functioned as the water source for the A-VI mound group during the Terminal Formative, Classic, and Early Postclassic periods.

Discussion

It would appear that the A-VI mound group during the Early Postclassic period was composed of four residential platforms (A-VI-4, A-VI-5, A-VI-6, A-VI-7), a possible altar platform (A-VI-2), and a nearby water source. All these structures were contemporaneous, as demonstrated by the presence of Amatle 2-3 ceramics from the excavations. The structures formed a compact though structurally amorphous cluster, measuring about 70 meters in diameter. This cluster was territorially isolated from other contemporary mound groups of similar configuration. Such criteria as contemporaneity, compactness, and discreteness have been used to define settlement units at other localities at Kaminaljuyu (Bebrich 1969b). This evidence would suggest that the A-VI mound group probably functioned as a corporate residential unit during the Early Postclassic period.

The situation of the A-VI mound group, located near the edge of a barranco, with a spring possibly functioning nearby, bears some similarity with the situation of Cotio, a Late Classic or Early Postclassic civic center located about three kilometers further west. Although Cotio has two large mounds and a ball court (Shook 1952), it is similarly situated near a barranca with a functioning spring. As noted elsewhere (Cardenas 1969; Michels 1969), there appears to have been a population decline at Kaminaljuyu during the Late Classic period, while the population size in the Valley of Guatemala as a whole reached its maximum extent. Part of the resulting change in settlement distribution may have been caused by the necessity for securing water for domestic use. At one time, a shallow lake is believed to have existed in the depressed area northwest of Mound B-IV-1 and southeast of the B-III-5 mound group, on land which was formerly part of Finca Miraflores (Gamio 1926-27: 73-74). It is possible that by Late Classic or Early Postclassic times, the barrancas around the site of Kaminaljuyu had developed to such a depth so as to effectively lower the water table at the site. The lake may have been in the process of dissicating, reducing the availability of household water in the central area of Kaminaljuyu. Such a situation would favor settlements along the barranca edges, where water provided by accessible springs would still be available. These circumstances might explain why areas at Cotio and the A-VI mound group were selected for occupation during the Late Classic or Early Postclassic periods, when there is no evidence at either locale for earlier usage as residential units.

APPENDICES

APPENDIX 1

ARTIFACT FREQUENCY, DISTRIBUTION, AND DESCRIPTION

Over forty thousand items of material culture were collected during the excavation of Mound A-VI-6, and subsequently catalogued by laboratory personnel of The Pennsylvania State University Kaminaljuyu Project, under the supervision of Joseph Michels. The analysis of ceramic materials, particularly rim sherds and diagnostic vessel fragments, was conducted by Ronald Wetherington, who is preparing a monograph on the ceramic chronology at Kaminaljuyu. Approximately three hundred ceramic lots from Mound A-VI-6 were analyzed and phased according to the ceramic sequence provisionally established for the Valley of Guatemala (Wetherington 1969). Although more detailed information on all the artifacts recovered by the Kaminaljuyu Project will be provided by Michels and Wetherington in later publications, preliminary information on the artifacts from Mound A-VI-6 is provided in this appendix to the excavation report (Table 2).

Ceramics

Vessel Fragments

Twenty-three whole or reconstructable ceramic vessels, all recovered from the burial component of Mound A-VI-6, are described in detail in Appendix 2 of this report. The rim sherds and diagnostic vessel fragments were used by Ronald Wetherington to chronologically phase 274 ceramic lots. All ceramic periods are represented at Mound A-VI-6, with the bulk of the material from the Verbena-Arenal phases of the Terminal Formative period. Aurora and Las Charcas phases have the fewest sherds represented. Based on data provided by Wetherington, it was possible to analytically segment the excavation into three cultural components: (1) the top levels of the excavation, from the surface to an elevation of 1875-1880 AZEP; (2) the intermediate levels between 1875-1880 AZEP to about 1835-1840 AZEP; and (3) the bottom levels of the excavation, from 1835-1840 AZEP to about 1765-1775 AZEP. From a sample of 48 lots selected from the first cultural stratum, in the central area of the mound between 98E to 104.5E and 98-99N to 103N, the latest phase represented in 35 of these lots were Amatle 2-3 ceramics. Further, Amatle 2-3 ceramics were the only diagnostic sherds present in 17 lots from the first cultural stratum, firmly dating this stratum to the Early Postclassic period. In the second cultural stratum, only five lots out of 43 were phased purely as Amatle 2-3, and another six lots were phased purely as Verbena-Arenal. The majority of the ceramic lots in the second cultural stratum, some 25 lots, are mixtures of several phases, ranging from Sacatepequez to Amatle 3. Out of the 82 ceramic lots from the third cultural stratum, 47 lots had Verbena-Arenal sherds as the latest ceramic phase represented, and 29 of these lots contained only Terminal Formative ceramics. The first cultural stratum is associated with the debris of the Early Postclassic structure, the second with the mound fill below the structure but above the burials, and the third with the Terminal Formative burials.

Table 2

Summary of Total Artifacts Recovered during Excavation

Artifact Name	Material Code	Item	Sub-Item	Frequency
Rim sherd	1	1	0	3,449
Body sherd	1	2	0	30,952
Unclassified ceramic artifact	1	3	0	3
Burnt clay lump	1	4	1	2,044
Burnt clay lump	1	4	3	100
Burnt clay lump	1	4	4	33
Burnt clay lump	1	4	5	5
Clay figurine	1	5	0	70
Effigy sherd	1	6	0	19
Adorno	1	7	0	24
Effigy whistle	1	8	0	1
Clay bead	1	9	1	5
Clay bead	1	9	4	2
Rattle ball	1	11	0	1
Sherd disc	1	12	1	1
Sherd disc	1	12	2	9
Incensario	1	14	1	60
Miniature vessel	1	15	0	2
Pottery vessel (whole)	1	16	0	30
Sherd abrader	1	17	0	1
Spindle whorl	1	18	0	3
Candelero	1	19	2	1
Rim head vessel sherd	1	24	0	7
Obsidian blade	2	1	0	1,034
Obsidian flake	2	2	0	1,114
Obsidian core	2	3	0	14
Shaped obsid-an artifact	2	4	0	13
Obsidian quarry nodule	2	6	0	1
Stone building material	3	1	0	10
Unclassified stone artifact	3	3	0	1
Mica	3	4	0	5
Mineral pigment	3	6	0	8
Green stone detritus	3	8	0	2
Utilized stone cobble	3	11	0	33
Pumice	3	12	0	69
Shaped mano	3	14	0	3
Shaped mano	3	14	1	11
Shaped mano	3	14	2	9
Shaped mano	3	14	3	1
Shaped mano	3	14	4	5
Pebble mano	3	16	0	3
Misc. non-artifact detritus	3	19	0	1,119
Misc. non-artifact detritus	3	19	4	6
Hammer stone	3	20	1	2

Table 2 (continued)

Artifact Name	Material Code	Item	Sub-Item	Frequency
Hammer stone	3	20	2	1
Hammer stone	3	20	5	1
Abrading pebble	3	21	1	1
Abrading pebble	3	21	2	1
Abrading pebble	3	21	3	13
Shaped metate	3	23	0	15
Shaped metate	3	23	1	5
Shaped metate	3	23	2	2
Shaped metate	3	23	7	1
Rubbing platform	3	24	1	9
Stone mortar	3	25	2	1
Stone mortar	3	25	4	1
Digging stick weight	3	27	0	4
Stone club	3	29	2	1
Conical abrader	3	31	0	1
Thin stone slab	3	35	0	3
Celt	3	36	0	2
Stone bead	3	37	1	2
Carved stone vessel	3	40	0	3
Chalcedony flake artifact	3	42	0	4
Steatite tab	3	44	0	1
Stone pounder	3	48	0	1
Radiocarbon sample	4	1	0	5
Unclassified bone	5	0	0	10
Animal bone	5	1	2	1
Human bone	5	3	0	1
Human bone artifact	5	4	0	1
Human burial	5	5	0	11
Soil sample	7	1	1	6
Soil sample	7	1	2	2
Ash	8	1	0	1
Ecological specimen	9	1	0	11
Ecological specimen	9	2	0	2
Ecological specimen	9	5	0	3
			TOTAL COUNT	40,412

(Complete artifact code can be found in Table 1 of Foreword.)

All of the rim-head vessel sherds and a plurality of the effigy sherds (50%) are from the Terminal Formative stratum, mostly from unit 100E/105N. The largest number of incensario sherds (75%) are also from the Terminal Formative stratum, where they constitute 0.24% of all ceramic materials from this stratum. Most of these incensario sherds were located near Burial 1 in Unit 103E/102N (KJ70-10043, DOT 27, 10 sherds) and with Burial 4 in Unit 99E/103N (KJ70-13564, 7 sherds; KJ70-13695, 5 sherds). In contrast, only two incensario sherds were found in the Late Classic stratum (constituting 0.02% of the total ceramic materials from the stratum), and eight sherds in the mound fill (constituting 0.13% of the total ceramic materials from the stratum). On the other hand, small ceramic decorative elements, called adornos, which are applied to ceramic vessels, occur slightly more often in the upper two cultural strata than in the third.

Figurines

Most of the 70 figurines collected from Mound A-VI-6 consisted simply of human heads. Some of these figurine heads were crudely incised with thick features, others were more carefully incised, with considerable delineation of detail, and still others were mold-made, wearing headdress and large ear flares. One female torso was noted (KJ70-9491, DOT 12), as were four animal figures (KJ70-11996, DOT 32; KJ70-10029, DOT 46; KJ70-10041, DOT 55), appearing to be some quadruped, all occurring in the Terminal Formative stratum. Figurines are relatively evenly distributed throughout all three cultural strata, with a slightly higher occurrence in the Terminal Formative stratum.

Beads

These items occur mostly in the Terminal Formative stratum (six), a few in the mound fill (two), but none among the ruins of the Early Postclassic structure. Of the five cylindrical beads, three were red, 15 mm long, about 3 mm in diameter (KJ70-10826, DOT 85); one was white, 18 mm long, 8 mm in diameter (KJ70-12087, DOT 98). Measurements were not taken on two other cylindrical beads (KJ70-10020, DOT 21; KJ70-10665, DOT 74). The two spherical beads (KJ70-10038, DOT 24; KJ70-10022, DOT 26) measured about 8 to 10 mm in diameter.

Lithics

Obsidian Blades

These artifacts, consisting mostly of broken fragments, were found in abundant quantities in all levels of Mound A-VI-6. They constitute 60% of all obsidian artifacts in the Terminal Formative stratum, and 38% in the Early Postclassic stratum. All blades, as well as all other obsidian artifacts recovered from the excavation, were fashioned from the dark gray variety of obsidian which is indigenous to the Central Highlands of Guatemala. The technique of manufacture for such prismatic blades has been described in detail in other excavation reports (Kidder, Jennings, and Shook 1946: 135-36). Complete prismatic blades from Mound A-VI-6 ranged 15-18 cm in length, 2.0-2.4 cm in width, and 3-5 mm in thickness. Dimensions for a selected sample of prismatic blades are as follows:

	Accession Number	Length	Width	Thickness	Mass
(d)	KJ70-11989, DOT 101	11.8 cm	2.4 cm	4 mm	15.2 gm
(e)	KJ70-9477, DOT 13b	13.2 cm	2.0 cm	3 mm	12.1 gm
(f)	KJ70-9477, DOT 13a	12.4 cm	2.4 cm	5 mm	19.5 gm
(g)	KJ70-10821, DOT 81	15,5 cm	2.1 cm	3-5 mm	14.2 gm
(h)	KJ70-10032, DOT 47	14.7 cm	2.0 cm	5 mm	18.9 gm
(i)	KJ70-12009, DOT 142	15.5 cm	2.2 cm	6 mm	25.2 gm
(j)	KJ70-10045, DOT 56	18.0 cm	2.2 cm	4 mm	20.9 gm

Obsidian Cores

All of the 14 parabolic cores collected from Mound A-VI-6 were either broken or "exhausted" (Kidder 1947: 15), and therefore useless for striking off further prismatic blades. Their diameters ranged between 2 to 4 cm. This size may be contrasted with that of a functioning core having a diameter of 8 cm and a length of 16 cm, as deduced from examining a complete blade specimen (KJ70-10045, DOT 56). The highest occurrence of obsidian cores is in the upper two cultural strata; only two fragments were found among the Terminal Formative materials. Blade-core ratios ranged from 86 blades per core in the Early Postclassic stratum, 43 in the intermediate stratum, to 145 in the Terminal Formative stratum. While a low blade-core ratio in itself cannot indicate that manufacturing activity had occurred, a high ratio certainly makes the possibility of such activity very remote.

Obsidian Points

The six obsidian points recovered during the excavation of Mound A-VI-6 were all from the upper two strata, and were mostly associated with Amatle 2-3 ceramics. Four types of points occur in the collected sample: (1) stemmed, equilateral triangular points; (2) stemmed, elongated triangular points; (3) lanceolated points with rounded or flat bases; and (4) large, elongated triangular points, with side notches and expanding stem. Detailed descriptions of all specimens are given below:

KJ70-9477, DOT 13c. Equilateral triangular point with a straight stem. Dimensions: length 4.6 cm, width 2.6 cm, thickness 7-9 mm, stem length 2.0 cm, notch width 1.6 cm, mass 9.9 gm. Provenience: 101E/100N, 1838-1858 AZEP.

KJ70-4377. Elongated triangular point with a stem fashioned by slight side notching and fluting. Dimensions: length 7.5 cm, width 3.0 cm, thickness 8-10 mm, stem length 2.1 cm, notch width 1.8 cm, mass 27.1 gm. Provenience: 100E/100N, 1930-1940 AZEP.

KJ70-10046, DOT 7c. Lanceolate point with broken base. Dimensions: length 6.3 cm, width 3.0 cm, thickness 10-12 mm, mass 21.6 gm. Provenience: 101E/100N, 1878-1898 AZEP.

KJ70-7862a. Lanceolate point with rounded base. Dimensions: Length 8.1 cm, width 3.1 cm, thickness 8-10 mm, basal width 2.4 cm, mass 27.1 gm. Provenience: 101E/103N, 1873-1930 AZEP.

KJ70-10024, DOT 15. Large, elongated triangular point, with its base broken off, but perhaps similar to the one described below (KJ70-7862b). Because of its size, this specimen functioned either as a lance point or as a hafted knife blade. Dimensions: incomplete length 8.4 cm, width 3.5 cm, thickness 8-10 mm, mass 31.0 gm. Provenience: 100E/99N, 1878-1905 AZEP.

KJ70-7862b. Basal section of a point similar to KJ70-10024, DOT 15, with a short expanding stem formed by side-notching, and a flat base. Dimensions: incomplete length 5.1 cm, width 3.6 cm, thickness 8-10 mm, stem length 1.8 cm, notch width 3.0 cm, basal width 3.3 cm, mass 23.7 gm. Provenience: 101E/103N, 1873-1930 AZEP.

Tabular Manos

All specimens, both complete and fragments, were manufactured from vesicular basalt. In general, these manos are somewhat rectangular in form, with either relatively flat or slightly convex working surfaces. These implements show a wear pattern perpendicular to their longitudinal axis, as would be expected from grinding seeds or maize into a meal by a back-and-forth motion on top of their complementary implement, the metate. Five types of tabular manos, as well as their frequency of occurrence, were found at Mound A-VI-6:

(1) bi-plano in longitudinal cross-section (thick) -- 5
(2) bi-plano in longitudinal cross-section (thin) -- 11
(3) bi-convex in longitudinal cross-section -- 9
(4) triangular in transverse cross-section -- 1
(5) unclassifiable -- 3

It is possible that the thick and thin bi-plano manos are essentially the same type of artifact, with the difference between them simply the result of wear. Most of the fragments of the thick bi-plano manos were all located in a deposit of lithic artifact debris (Feature 16) associated with the Early Postclassic structure. Thin bi-plano manos were found almost evenly distributed among all cultural strata. On the other hand, bi-convex manos, with one exception, were all found in the upper two cultural strata, as was the triangular mano. While most of the tabular manos recovered from Mound A-VI-6 were broken fragments, measurements were made on three complete specimens listed below:

KJ70-12132, DOT 120 - thick, bi-plano, length 23 cm, width 10 cm, thickness 8 cm.

KJ70-10817, DOT 86 - thin, bi-plano, length 19 cm, width 9 cm, thickness 4 cm.

KJ70-10815, DOT 88 - thin, bi-plano, length 14 cm, width 8.5 cm, thickness 4 cm.

KJ70-12138, DOT 121 - fragment, thin, bi-plano, width 8 cm, thickness 4 cm.

Metates

These artifacts, used along with manos in grinding seeds and maize, were equally as varied in their formal characteristics. Four types of metates were present at Mound A-VI-6. These types are listed below, as well as the number of representative specimens:

(1) simple slab metate, with open-ended, shallow trough -- 5
(2) simple slab metate, with ridged, shallow trough -- 2
(3) large, bipedal metate -- 1
(4) unclassifiable -- 15

Fifteen fragments were located in the upper two cultural strata, with four specimens from a deposit of lithic artifact debris (Feature 16, 100E/95-96N, 1839-1853 AZEP) and three specimens from 101E/104N. A fragment of a large bipedal metate (KJ70-13839) was recovered among the artifacts in Burial 3, and was associated with Verbena-Arenal ceramics. The only complete metate recovered from the excavation was included among the mortuary offerings in Burial 2 (Fig. 4). This complete specimen (KJ70-11191, DOT 54) was a simple slab metate, with an open-ended shallow trough, measuring 46 cm long, 27 cm wide, and 9 cm high.

Rubbing Platforms

These artifacts consist of large, irregularly shaped, coarse-grained cobbles or slabs with a naturally occurring flat surface which shows signs of use. It is conjectured that these artifacts functioned in a similar manner as the metates, and were perhaps used in conjunction with the pebble manos, which are naturally shaped rocks with evidence of mano-like wear patterns (Michels, personal communication). Rubbing platforms occur either in the Early Postclassic cultural stratum or in the Terminal Formative burial stratum, with no occurrence in the intermediate stratum. One specimen recovered from Burial 3 (KJ70-10816, DOT 87) measured 15.0 cm by 12.2 cm by 5.5 to 7 cm, with a volume of 575 m^3, and a mass of 1456 grams, implying a density of 2.53 gm/cm^3.

Mortars

Two stone mortars were recovered during the excavation, both from the upper two cultural strata. One specimen (KJ70-11657) was a miniature vesicular basalt mortar (provenience: 99E/104N, 1876-1896 AZEP), while the other (KJ70-10047, DOT 40) was a well-shaped portable mortar (provenience: 101E/99N, 1858 AZEP).

Celts

Two specimens (KJ70-8077; KJ70-12000, DOT 106b) were both recovered from the intermediate cultural strata in the fill of Mound A-VI-6. A hammerstone (KJ70-12000, DOT 106a) was also recovered with one of the celts.

Stone Clubs

The lithic head of a club was collected near the surface of Mound A-VI-6, among the rubble of the Late Classic structure. The artifact (KJ70-4609f) was ovate in shape, with a medial groove for hafting a wooden handle.

Digging Stick Weights

Relatively smooth, round, perforated stones, often known as "doughnut" stones because of their suggestive shape. In general these artifacts range in size from 10-17 cm in diameter, approximately 8 cm thick, with biconically drilled holes about 3.5 cm in diameter (Kidder, Jennings and Shook 1946: 141-142; Borhegyi 1969: 272-273). Of the four specimens collected from Mound A-VI-6, three fragments (KJ70-4533, KJ70-7758, KJ70-11855c) were associated with the Early Postclassic structure, and one fragment (KJ70-7258b) in the Terminal Formative cultural stratum.

Conical Abraders

Granular abrasive stones in the form of an elongated cone. Such implements are believed to have reamed out the perforations in the doughnut-shaped lithic artifacts (Michels, personal communication). The only specimen from Mound A-VI-6 (KJ70-12083, DOT 113a) was found in the Terminal Formative stratum, along with a bone bead (KJ70-12083, DOT 113b).

Abrading Pebbles

Rather amorphous stones characterized by a gritty surface showing extensive wear. These implements were probably used in the process of shaping other ground stone artifacts. The surface texture of these stones vary from a coarse to a fine grit, and were probably selected in succession for finishing certain ground stone artifacts (Michels, personal communication). Three varieties of these implements, with their frequency indicated, were recovered from Mound A-VI-6: (1) a powder-fine abrasive pebble -- 1; (2) a granular abrasive pebble -- 1; and (3) a non-granular abrasive pebble -- 13.

Hammerstones

Pieces of hard, dense rock which were used for working other lithic artifacts. Three types of hammerstones, in the quantities indicated, were found at Mound A-VI-6: (1) large, angular chunk -- 1; (2) bi-terminal cobble -- 1; (3) small, multiple facet rock -- 2. In distribution, the large, angular chunk hammerstone (KJ70-9947, DOT 20) was found next to the hip of the skeleton in Burial 1, and the bi-terminal cobble hammerstone (KJ70-11898) was also from the Terminal Formative stratum. Both specimens of the small, multiple facet variety (KJ70-6021; KJ70-12000, DOT 106a) were found in the upper two cultural strata, the latter hammerstone collected along with a celt (KJ70-12000, DOT 106b).

Beads

Two cylindrical, stone beads, both from Burial 5, were recovered during the excavation of Mound A-VI-6. One specimen (KJ70-10284, DOT 127) was carved

from a black stone, and measured 22 mm long by 7 mm diameter. The second specimen (KJ70-12101, DOT 132) was smaller, measuring 9 mm long and 3 mm in diameter.

Pigments

Eight specimens of a reddish mineral substance, probably hematite, an oxide of iron, were collected during the excavation of Mound A-VI-6. Total amount of mineral pigment collected probably weighs less than 50 grams. Seven of these pigment specimens examined in the field were a vivid red, while one other was purple in color. All specimens were discovered in the Terminal Formative cultural stratum, although none were directly associated with any of the burials. More direct association of mineral pigments has been reported for Terminal Formative burials in the tombs of Mound E-II-3 (Shook and Kidder 1952: 118) and among the mortuary offerings in Mound C-II-12 (Cheek, personal communication). Apparently red mineral pigments functioned importantly in the Terminal Formative mortuary practices at Kaminaljuyu. The accession listings of mineral pigment specimens from Mound A-VI-6, and their provenience, are given below:

KJ70-9458, DOT 11	red	101E/100N	1838-1858 AZEP
KJ70-10114, DOT 42	purple	103E/ 99N	1838 AZEP
KJ70-10115, DOT 29	red	100E/103N	1818-1838 AZEP
KJ70-12080, DOT 103	red	102E/103N	1804-1824 AZEP
KJ70-12081, DOT 92	red	99E/104N	1816-1836 AZEP
KJ70-12096, DOT 99	red	98E/ 98N	1764-1784 AZEP
KJ70-12102, DOT 35	red	103E/101N	1794-1814 AZEP
KJ70-12104, DOT 95	red	99E/104N	1796-1816 AZEP

Mica

Six unmodified sheets of mica were recovered from the Terminal Formative cultural stratum in Mound A-VI-6. These mica flakes had no recognizable shapes, but ranged in size from about 5 to 25 cm^2, all less than a millimeter thick. Mica flakes also seem to have some function with Terminal Formative mortuary practices, for they have been found among other burials at Mound E-III-3 (Shook and Kidder 1952: 118) and at Mound D-IV-2 (Borhegyi 1956: 287). The accession numbers and provenience of all mica flakes from Mound A-VI-6 are listed below:

KJ70-10116, DOT 44	103E/ 99N	1836-1856 AZEP
KJ70-12098, DOT 96	99E/104N	1796-1816 AZEP
KJ70-12015, DOT 100	100E/104N	1796-1816 AZEP
KJ70-12097, DOT 112	100E/105N	1784-1804 AZEP
KJ70- DOT 114	100E/105N	1784-1804 AZEP
KJ70-12094, DOT 115	100E/ 97N	1790-1800 AZEP

Building Stones

This category is perhaps a misnomer, for all ten specimens from Mound A-VI-6 which have been so classified are associated with the Terminal Formative burial stratum, and not with the Early Postclassic structure. These irregularly shaped rocks range in length from 14 to 26 cm and in width from

9 to 17 cm. Except for Burials 4 and 6, one to three of these rocks were found along side or near each of the skeletons. Their function is conjectural, for they do not appear to form a stone cist or any other structural feature, and yet they were intentionally placed with the burials, since stone is not naturally found in the vicinity of Kaminaljuyu (Shook and Kidder 1952: 45).

Lajas

In form, these items are large thin stone slabs, frequently used in building construction. Functionally, the term laja specifically denotes such large thin stone slabs which are used in cornice and molding supports often used in the construction of temple platforms (Kidder, Jennings, and Shook 1946: 15, Fig. 6). None of the three lajas recovered from Mound A-VI-6 were found in situations to suggest such a function. Therefore the term laja is used in this report only in its formal aspect, and not its functional aspect. One laja (KJ70-12139, DOT 119) was found among the burnt clay rubble of the terrace platform for the Early Postclassic structure (Feature 13), but it was not examined in situ. The other two lajas (KJ70-9609; KJ70-9837b) were recovered from the Terminal Formative cultural stratum, and were not associated with any structural feature.

Bone

Beads

Two small tubular bone beads (KJ70-12083, DOT 113b; KJ70-12103, DOT 117) were found in the Terminal Formative cultural stratum of Mound A-VI-6, but not directly associated with any of the burials. One specimen (KJ70-12083, DOT 113b) was found along with a conical stone abrader.

Antler

One specimen of a deer antler (KJ70-11668, DOT 17) was discovered near the cranium in Burial 1 of Mound A-VI-6. It measured approximately 3 cm in diameter and 24 cm in length. Deer antler (DOT 509) has also been found in association with a Terminal Formative burial from Mound C-II-12 (Cheek, personal communication).

Adobe

Burnt Clay Lumps

The greatest concentration of this material is among the rubble of the Early Postclassic structure which stook on top of Mound A-VI-6. In a 9 m^2 area bounded by 100E and 103E and by 100N and 103N, some 1379 fragments of burnt clay, constituting 17% of all cultural materials found in the topmost stratum of this area, were recovered from the central section of the mound. Twenty-six of these fragments appeared to have flat, unpainted surfaces, while 18 other fragments showed impressions of posts, poles, and matting, and another two fragments had both surfaces and impressions. These burnt clay fragments were evidently the remains of a wooden frame and adobe

structure, which was destroyed by fire, either accidentally or intentionally. The fire which hardened these fragments must have been quite intense, for some thick fragments were fired all the way through. There is no evidence to say whether or not the platform surfaces were intentionally fired as a technique of increasing resistence to wear and erosion. In all probability such hardening of the platform and floor was the result of the destruction of the structure.

Plant

Seeds

The carbonized remains of at least three seeds or nuts were recovered during the excavation of Mound A-VI-6. All specimens were found in the Terminal Formative cultural stratum, ranging in eleavation from 1784 AZEP to 1816 AZEP. Although none of these seeds or nuts were found directly associated with any of the known burials, they seemed to cluster along with the three carbonized maize cobs in the northern part of the excavation, in Units 99E/104N and 100E/105N. Botanical identification of these specimens was assisted by Anton J. Kovar, Department of Botany, The Pennsylvania State University.

One specimen (KJ70-12085, DOT 110) appeared to be a relatively smooth, ovoid nut, measuring between 2 and 2.5 cm in diameter, with internal convolutions similar to that found inside a walnut shell. This specimen probably belongs to the walnut family (Juglandaceae), but its specific identification is in doubt. In appearance, the nut conforms to the description for Alfaroa costaricensis: "...oval or obovoid fruits, about 2.5 cm long and 2 cm thick, densely velutinous-hirsute, ...nut smooth, broadly rounded at base and apex, the wall ("endocarp") less than 1 mm thick" (Standley and Steyermark 1952: 354-355). In any event, both genera are presently found in the highlands of Guatemala, although not specifically reported in the Valley of Guatemala. The habitat for these trees is moist or wet, mixed forest, at elevations between 1200 and 2300 meters above sea level (Standley and Steyermark 1952: 353, 355).

Another specimen (KJ70-12086, DOT 97) consisted of half of an ellipsoidal seed, similar in form to half a peanut kernel. This specimen measured 21 mm in length, 7 mm across its flat side, and 6 mm thick. Fragments of a similar seed or nut were recovered among the remaining specimen (KJ70-12090, DOT 111). These specimens were too fragmentary to positively identify.

Maize Cobs

Three small carbonized maize cobs were recovered during the excavation of Mound A-VI-6. As with the seeds discussed above, all these specimens were recovered from the Terminal Formative cultural stratum, but none were directly associated with any of the known burials. In distribution, they were found in the northern part of the excavation, in Units 99E/104N, 100E/103N, and 100E/105N, at elevations ranging between 1744 AZEP to 1836 AZEP. All specimens were about 1 cm in diameter and less than 5 cm in length.

The best preserved specimen (KJ70-12106, DOT 141) measured about 4 cm in length, 1 cm in diameter, with six rows of kernels. The other two specimens (KJ70-12091, DOT 93; KJ70-12089, DOT 108), though more fragmentary, also appeared to belong to the same variety of Zea mays. Dimensional data on all specimens is given below:

Accession Number	Cob Length	Cob Diameter	No. of Rows
KJ70-12089, DOT 108	3.0 cm	10 mm	
KJ70-12091, DOT 93	2.5 cm	8-10 mm	7
KJ70-12106, DOT 141	4.0 cm	10 mm	6

APPENDIX 2

CERAMIC VESSELS FROM THE BURIAL COMPONENT

Hemispherical Effigy Cup (Figure 9d), KJ70-11523, DOT 137

Description: Hemispherical cup with painted and appliqued decorations suggestive of a bird. The surface has traces of what may have been a matte creamy slip or wash. A rounded, unmodified rim, with a beak projecting from the front and two small tabs (suggesting a tail) in the rear. Two coffee-bean applique eyes, with horizontal gashes, are on either side of the beak, just below the rim. The horizontal portion of the rim and a scroll design (suggesting a wing) are painted red. The scroll extends from either side of the beak, curves under each eye, and terminates in a small loop on the side of the vessel.

Dimensions: 9.4 x 10.9 cm diameter; 4.4 cm high; 4 mm thick; approximately 180 ml capacity.

Provenience: 103E/99N; 1809 AZEP.

Comment: This artifact was located near the left shoulder of the skeleton in Burial 2. The vessel is a representative of a red-on-unslipped buff ware, which occurs in the Sacatapequez, Verbena and Arenal phases of the Terminal Formative period (Wetherington, 1971).

Hemispherical Tetrapod Bowl (Figure 9b), KJ70-9608, DOT 9

Description: Shallow hemispherical bowl, with four solid nubbin supports. The surface is covered with a matte pale orange slip. Decoration is confined to the externally bolstered rim, which has four oval facets impressed on the outside. A narrow line is incised just below the top of the rim, as well as arcs above each of the facets.

Dimensions: 14.7 cm diameter; 6 cm high; approximately 400 ml capacity.

Provenience: 99.55E/10.87N; 1790-1796 AZEP.

Comment: This tetrapod bowl was found nesting on top of a black-brown fine incised cylindrical vase (Fig. 10c) at the head of the skeleton in Burial 4. The shape and color of this bowl is typical of Usulatan ware in its earlier style and this particular specimen is quite closely related in form and decoration to a fine cream-colored ware from Guaytan in the Motagua Valley (Smith and Kidder 1943: Fig. 23c). Stylistic similarities indicate that these two tetrapod bowls were made in the same community, if not by the same potter.

Tripod Bowl (Figure 9a), KJ70-11521, DQT 31

Description: Shallow basal angle bowl, with three solid nubbin supports, and a wide, variegated, labial flange. The bowl has light orange paint on a creamy-buff slip in the interior, with a negative design revealing the slip in parallel wavy lines. The surface of the vessel has been highly burnished. Grooved decoration is present on the interior surface of the outflaring modeled labial flange. These grooves accent the rim protuberances, generally following the contour of the rim. Four small round indentations, appearing as unfinished small holes, are in the center of each of the four rounded protuberances that are equally spaced on the rim. A single encircling groove is found on the inside of the labial flange, just before it joins the wall of the bowl. A slight basal concavity is present on this bowl.

Dimensions: 22.5 cm maximum external diameter; 15.2 cm diameter at basal angle; 6.7 cm high; 5 mm thick; approximately 650 ml capacity to top of vessel wall.

Provenience: 103.22E/101.04N; 1791-1798 AZEP.

Comment: This tripod bowl was found upside down between Burials 1 and 2, and cannot be definitely associated with either of them. The artifact was broken in situ, but whether this was done ritually as part of the mortuary practice, or by pressure from the overburden, cannot be determined at this point. A flat bottom bowl (Fig. 9c) was likewise found upside down and broken, and another tripod bowl (see below) was discovered broken in twelve large fragments. Vessel form, surface treatment, color, and particularly the painted decoration of groups of broad parallel lines, are characteristic of Usulutan ware described by Lothrop (1927, 1933). This particular tripod bowl is an excellent example of Usulutan ware during the Terminal Formative period (Wetherington, 1971). Nine similar Usulutan tripod bowls are reported among the mortuary offerings in the tombs of Mound E-III-3 at Kaminaljuyu (Shook and Kidder 1952: 100-101). While many similarities exist between this specimen and those from Mound E-III-3, such as general vessel form, finish, color, painted parallel lines, rim protuberances, and encircling groove, there are some distinct differences. The Mound A-VI-6 specimen has a wall height to total vessel height ratio of about .40, while the E-III-3 specimens have a ratio of about .60. Also none of the E-III-3 specimens have the prominent rim flange. Though Usulutan ware has a wide distribution in the Guatemalan highlands, Salvador, and western Honduras, its greatest frequency and possible origin is in the Lenca speaking area of eastern Salvador, in the Department of Usulutan (Lothrop 1933: 48). Lothrop (1933: 48, 107) concludes that Usulutan ware was an early trade ware of non-Maya origin.

Tripod Bowl, KJ70-8141

Description: Shallow basal angle bowl, with three solid nubbin supports, similar to the tripod bowl described above (Fig. 9a). The bowl is flesh-orange in color. The wide outflaring labial flange is scalloped in sections of its rim, with small round indentations similar to an incompletely perforated hole, incised in some of the rim protuberances. A medium wide grooved line encircles the interior of the vessel slightly over 1.5 cm in from the rim.

Dimensions: approximately 26.5 to 29 cm maximum external diameter; approximately 8.9 cm high.

Provenience: 99.58E/103.00N; 1831-1835 AZEP.

Comment: This shallow tripod bowl was found broken in twelve large fragments above the legs of the skeleton in Burial 4. In form, color, and incised decoration, this vessel is quite similar to the Usulutan tripod bowl discussed above (Fig. 9a). This specimen is slightly larger in size than the one discussed previously, and no painted decoration was in evidence. While this vessel has all the attributes of Usulutan ware except the resist painting, it has probably faded away, as is common among some examples. Because of the similarities in form and color, this vessel may also be considered a representative of Usulutan ware. Other sherds collected along with the fragments of the tripod bowl date to the Verbena-Arenal phase of the Terminal Formative period (Wetherington 1971).

Flat Bottom Bowl (Figure 9c), KJ70-11520, DOT 25

Description: Shallow flat bottom bowl, with a plain matte black exterior surface, and an unsmoothed dull gray-brown interior surface. The walls of the vessel are slightly concave, inclined outward about 70° from a flat base, and the rim has an interior taper.

Dimensions: 19 cm rim diameter; 15 cm basal diameter; 5 cm high; 6 mm thick; approximately 870 ml capacity.

Provenience: 101.62E/100.60N; 1842-1847 AZEP.

Comment: This flat bottom bowl was discovered upside down and broken in situ, similar to the condition of the tripod bowl discussed above. The bowl is a coarse brown utility ware (often grades into black), which occurs rather broadly from the Terminal Formative through the Early Classic periods (Wetherington 1971). Vessels of a similar size and form are reported among the mortuary offerings of the tombs at Mound E-III-3 (Shook and Kidder 1952: Fig. 27a), but these specimens are black-brown wares. Perhaps the Mound A-VI-6 specimen is the functional equivalent of these black-brown bottom bowls, but on a more modest scale, more consistent with the general quality of the ceramic vessels which were included as mortuary offerings in Mound A-VI-6.

Flat Base Bowl (Figure 9e), KJ70-11522, DOT 52

Description: Plain red bowl, with slightly concave walls and a flat base. Rim is rounded, fairly smooth surface, but with slight vertical striations.

Dimensions: 14.5 cm rim diameter; 8.5 cm basal diameter; 8 cm high; 6.5 mm thick; approximately 730 ml capacity.

Provenience: 103.22E/100.13N; 1798-1806 AZEP.

Comment: This red bowl was found nested inside a black-brown incised bowl (Fig. 9f) between the legs of the skeleton in Burial 2, along with a black-brown fine incised effigy vessel (Fig. 10d). This bowl bears some similarity in form and finish to some coarse red-on-buff bowls from the tombs of Mound E-III-3 (Shook and Kidder 1952: Fig. 40b, d), though the E-III-3 specimens are about a third larger than the A-VI-6 specimen. Interestingly, one of the bowls from Tomb I at Mound E-III-3 is also part of a nested set. However, the bowl from Mound A-VI-6 is classified as a crude example of fine red ware found in the Verbena phase, on the basis of paste and slip (Wetherington, 1971).

Flat Base Bowl (Figure 9g), KJ70-11525, DOT 116

Description: Large deep bowl, with straight walls, inclined outward about 65° from a flat base. The vessel is orange in color, with a plain smooth surface. The rim has a heavy semicylindrical exterior bolster.

Dimensions: 32 cm rim diameter; 18 cm basal diameter; 15.5 cm high; 9.0 mm thick wall; 15 mm thick base; approximately 6240 ml capacity.

Provenience: 100E/105N; 1771-1781 AZEP.

Comment: This large vessel was discovered in large broken fragments, as if thrown down on the surface on which it was found. All fragments of the vessel were recovered, so that it appears that this large bowl was intentionally broken at the place where it was found. This artifact cannot be clearly associated with any of the known burials of Mound A-VI-6, though it was found in the same stratum as the burials. Some poorly preserved bone fragments (KJ70-11473) were found in the vicinity, but not sufficient to indicate a human burial. Large vessels of this type are sometimes used to contain infant burials, but no evidence of small bones was found with the vessel fragments, and its broken condition tends to argue against such an interpretation in this case. This specimen appears to be a utility ware, classified as a variation of fine red ware, and such large thick walled vessels are frequently used today for the soaking of maize as part of the food preparation (Arnold 1971).

Black-Brown Flat Bottom Bowl, KJ70-11112, DOT 68

Description: Large shallow flat bottom bowl, similar to the flat bottom bowl described above (Fig. 9c).

Dimensions: 30 cm maximum external diameter; 25 cm basal diameter; 5.1 cm high; approximately 2545 ml capacity.

Provenience: 103.92E/99.12N; 1810 AZEP.

Comment: This large flat bottom bowl was discovered inverted and broken in situ, among the mortuary offerings in Burial 2. Ten fragments of this vessel, about one fourth the original, were recovered. This specimen was found in a similar condition as the flat bottom bowl (Fig. 9c)

discussed above. Both bowls are similar in form, though this specimen is considerably larger and is an example of black-brown ware.

Black-Brown Incised Bowl (Figure 9f), KJ70-11524, DOT 53

Description: Black-brown bowl with a flat base, slightly convex wall projecting out at 55°, terminating in an almost vertical section 1.9 cm high. The surface of the vessel has a low burnish, and is plain everywhere except for the incised design on the vertical wall section below the rim. This design, executed in a somewhat coarse manner, consists of five roughly parallel incised lines encircling the vessel. Between the second and third lines and the third and fourth lines from the top, there are repeated groups of about six closely spaced vertical lines.

Dimensions: 16 cm diameter at mouth; 8 cm diameter at base; 7.3 cm high; 4.0 mm thick; approximately 830 ml capacity.

Comment: This black-brown incised bowl was found containing a red bowl (Fig. 9e) nesting inside, and along with a black-brown fine incised effigy vessel (Fig. 10d), these artifacts were located between the legs of the skeleton in Burial 2. This specimen is one of four black-brown wares which were found among the mortuary offerings in Mound A-VI-6. Among the mortuary offerings in Mound E-III-3, black-brown ware is the most abundant of all Verbena phase wares, constituting some 51% of the ceramic vessels from the tombs (Shook and Kidder 1952: 68, 119-120). Black-brown ware, particularly its fine incised variant, is a good diagnostic indicator of the Verbena ceramic phase (Wetherington 1969, 1971).

White Flat Bottom Bowl, KJ70-10042, DOT 28

Description: Flat bottom bowl fabricated from a reddish brown paste, and covered with a relatively hard white slip. A design consisting of a fine scalloped line with vertical lines ("pseudo-gadrooning" - see Shook and Kidder 1952: Fig. 17b) was incised on the exterior wall.

Dimensions: 26.5 cm internal rim diameter; 7.3 cm high.

Provenience: 103E/102N; 1814-1832 AZEP.

Comment: Three fragments of this white slipped vessel were among the ceramic sherds recovered from Burial 1. This specimen has been typed as being Verbena white ware (Wetherington 1971). Four bowls of a similar type, form, and size are reported among the mortuary offerings from Tomb II, Mound E-III-3 (Shook and Kidder 1952: 96, Fig. 76e, f). This type ware definitely dates to the Verbena phase of the Terminal Formative period.

Black-Brown Fine Incised Bowl, KJ70-12113

Description: Black-brown bowl with a flat base and a medial flange. Decoration consists of two fine incised horizontal lines encircling the vessel above the flange on the exterior rim.

Dimensions: approximately 14.0 cm internal rim diameter; 5.6 cm high.

Provenience: 98E/99N; 1766-1816 AZEP.

Comment: Fragments of this vessel were among the sherds collected with the skeleton in Burial 3. Black-brown fine incised vessels are diagnostic of the Verbena ceramic phase of the Terminal Formative period (Shook and Kidder 1952, Wetherington 1969).

Flat Base Bowl (Figure 9h), KJ70-11529, DOT 59

Description: Plain red bowl with flat base, convex walls, square lip. The surface of the vessel is covered with a matte dull red slip, which has a tendency to flake off in certain places. The paste is somewhat gritty, a buff-brown mixture of volcanic ash and sand.

Dimensions: 22 cm rim diameter; 8 cm basal diameter; 10 cm high; 8 mm thick; approximately 1680 ml capacity.

Provenience: 98.42E/99.15N; 1807-1817 AZEP.

Comment: This large red bowl was located above the right arm of the skeleton in Burial 3. Vessel form and the absence of any special decoration indicates that this specimen is an utility ware artifact. Similar size and shape bowls are used today in the Valley of Guatemala for the preparation of the masa for cooking tortillas (Arnold 1971). A functional interpretation of this vessel as being used in food preparation would be consistent with other artifactual evidence, such as the two manos (KJ70-10817, DOT 86; KJ70-10815, DOT 88) and the large cobble (KJ70-10816, DOT 87) used as a rubbing platform, which were interred with the body in Burial 3. This flat base bowl is a variant of the polished deep red ware, having a medium texture buff paste, sandy ash inclusions, and a deep red slip which is often matte. This type of ware occurs in the Arenal and Aurora phases (Wetherington 1971).

Olla, KJ70-7120, DOT 1

Description: Large basal angle bowl, with thick, slightly concave walls. The vessel was fabricated from a gritty orange or buff clay. Sections of the wall exterior contained an incised design consisting of two sets of short horizontal and vertical parallel lines, crossed to form a square. Within the square are four incised dots, also arranged in the form of a square.

Dimensions: 59 cm diameter; 26 cm high.

Provenience: 100.00E/101.00N; 1817-1843 AZEP.

Comment: This large olla was discovered on the west side of Feature 17, an arena-filled, talpetate-lined pit, measuring 2.20 by 1.20 meters, 75 centimeters deep, and located in the center of Mound A-VI-6. Though vessels

as large as this specimen have sometimes been used as burial urns, no evidence of such a function was detected in this case. Little can be said about the chronology of this ware other than it is generally Formative.

Black-Brown Fine Incised Cylindrical Vase (Figure 10c), KJ70-9482, DOT 10

Description: Cylindrical vase with a flat base and a slightly flaring rim. The vessel is black-brown in color, with a medium burnished surface. The decoration consists of a fine incised scroll band (Motif C, Series 31), about 3.2 cm wide, encircling the vessel on the exterior surface just below the lip, and below this a discontinued series of vertical lines connected by scalloped lines at the top (Motif B), representing in fine incising, the technique of fluting. Similar design motifs have been depicted for black-brown vessels from the tombs of Mound E-III-3 (Shook and Kidder 1952: Fig. 17e, 24c).

Dimensions: 14.2-14.7 cm rim diameter; 9.8 cm basal diameter; 12 cm high; 3 mm thick; approximately 1190 ml capacity.

Provenience: 99.55E/101.87N; 1782-1794 AZEP.

Comment: This black-brown cylindrical vessel was discovered containing a small hemispherical tetrapod bowl (Fig. 9b) nested inside and covering the vessel's mouth. This nested pair of vessels were located near the head of the skeleton in Burial 4. Black-brown fine incised vessels are a diagnostic ware of the Verbena ceramic phase (Shook and Kidder 1952, Wetherington 1969).

Black-Brown Fine Incised Effigy Vase (Figure 10d), KJ70-11526, DOT 51

Description: Barrel-shaped vessel with a flat base, converging convex walls, and an incurving, rounded rim. The vessel is black-brown in color, with a medium burnished surface. The vessel is decorated by both fine incision and applique techniques. On the front of the vessel is portrayed a human face. The eyes and mouth are depicted by applique coffee-bean shaped elements, with the eyes gashed obliquely, the mouth horizontally. On either side of the face are elongated applique elements representing ears, with slightly indentations at the ends. Two fine incised parallel lines encircle the vessel just below the rim. A series of short scalloped loops, their arcs pointed downward, are incised on the front of the vessel, just below the encircling parallel lines. The loops are slightly larger in the center, and decrease in size toward the sides of the vessel, perhaps representing either hair or a headdress. The back of the vessel is decorated with a fine incised spiral design similar to one pictured on a black-brown fine incised goblet from Mound E-III-3 (Shook and Kidder 1952: Fig. 70a). The front and back decorative elements on the vessel are separated by two parallel vertical fine incised lines, extending from the encircling parallel lines to the base, on both sides of the vessel.

Dimensions: approximately 8 cm rim diameter; 12.5 cm maximum diameter; 10 cm basal diameter; 12.5 cm high; 4.5 mm thick; approximately 940 ml capacity.

Provenience: 103.23E/100.33N; 1802-1815 AZEP.

Comment: This black-brown effigy vessel was located between the legs of the skeleton in Burial 2, along with a nested pair of vessels (Fig. 9b, 10c) described previously. The vessel had been broken, with only the base and the back wall remaining in their original position. About half of the original vessel was recovered. A similar coffee-bean eye motif was also found on a small effigy cup (Fig. 9d) from the same burial. Black-brown effigy vessels with strikingly similarities in portraying faces by means of applique elements have been found in Tomb I of Mound E-III-3 (Shook and Kidder 1952: Fig. 67c) and from the cemetery at Salcaja, near Quetzaltenango, Guatemala (Gamio 1926-27: 217). A nearly identical fine incised spiral design was carved on a black-brown triple cup (KJ70-7007, DOT 526) found among the mortuary offerings at the base of Mound C-II-12. All these vessels date to the Verbena ceramic phase.

Black-Brown Fine Incised Cylindrical Vase (Figure 10e), KJ70-8159

Description: Cylindrical vase with convex base, straight walls, and an everted, beveled rim. Small horizontal external ridges are present at the junction points; one at the basal angle, the other where the rim joins the wall. A small shallow groove encircles the interior surface of the rim. A fine incised design, consisting of repeated groups of three vertical lines with hatchured corners (not shown in illustration), was carved on the straight walls of the vessel.

Dimensions: approximately 13 cm rim diameter; approximately 15 cm high; approximately 740 ml capacity.

Provenience: 100.80E/107.64N; 1814-1835 AZEP.

Comment: This small cylindrical vessel was located some 30 centimeters west of a few poorly preserved bone fragments (KJ70-8085; KJ70-12115, DOT 133) which have been designated as Burial 6. The vessel was discovered complete but fragmented into 37 pieces, probably because of the pressure of the overburden. The fine incised design on this black-brown ware vessel occurs in the Arenal phase of the Terminal Formative period (Wetherington 1971; Shook and Kidder 1952: 77). A black-brown fine incised cylindrical vase, with a similar design motif, incised on its lowest band, was discovered among the mortuary offerings of Tomb II at Mound E-III-3 (Shook and Kidder 1952: Fig. 21c).

Coarse Brown Goblet, KJ70-12100, DOT 33

Description: Small round bottom goblet, with a slight basal concavity. This vessel was fabricated from a gritty, red-brown clay; the surface is unsmoothed. The only decoration is a simple tooled fillet encircling the rim.

Dimensions: approximately 9.5 cm diameter; approximately 10 cm high.

Provenience: 102.73E/101.33N; 1813 AZEP.

Comment: This small goblet was found associated with an animal effigy whistle (KJ70-11996, DOT 32) between Burials 1 and 2. Also in the vicinity were a black-brown fine incised fluted vessel (Fig. 10b) and an Usulutan tripod bowl (Fig. 9a).

Red-Orange Composite Silhouette Vessel (Figure 10a), KJ70-11519, DOT 48

Description: Composite silhouette vessel with a flat base, a Z-profile wall, and a rounded rim. The vessel is covered with a low burnished red-orange slip on the exterior, and a matte creme-orange slip on the interior. The decoration consists of six pairs of short (about 1 cm long), parallel, vertical grooves on the medial segment of the wall just above the junction point with the lower wall segment.

Dimensions: 12.3 cm rim diameter; 10.6 cm diameter at constriction; 13.3 cm maximum diameter; 7.2 cm basal diameter; 8.5 cm high; 7 mm thick; approximately 460 ml capacity to constriction.

Provenience: 103E/99N; 1816-1836 AZEP.

Comment: Fragments of this composite silhouette vessel were found scattered in a 20 cm level of a one square meter area, about six centimeters above the skeleton in Burial 2. The vessel had either been broken sometime previous to the interment, and the sherds had been gathered up with other ceramic refuse and deposited over the burial, or the vessel was broken as part of the interment ritual, and its sherds scattered over the burial. This vessel is a polished orange ware, which is most common during the Sacatepequez phase, but this ware does continue into the Terminal Formative period (Wetherington 1971).

Black-Brown Fine Incised Fluted Vessel (Figure 10b), KJ70-11518, DOT 16

Description: Composite silhouette vessel with flat base, spherical lower segment of wall, straight outward slanting upper segment of wall, and a rounded rim. The surface of the vessel is highly burnished, black-brown in color. Decoration consists of slightly oblique fluting on the spherical segment of the wall, and a fine incised band design, with a motif similar to one incised on a black-brown vessel from Mound E-III-3 (Shook and Kidder 1952: Fig. 19b), encircling the slanting segment of the wall.

Dimensions: 12.9 cm rim diameter; 11.5 cm diameter at constriction; 12.5 cm diameter of spherical segment; 8.5 cm basal diameter; 8.2 cm high; 5 mm thick; approximately 390 ml capacity to constriction.

Provenience: 102.90E/101.59N; 1806-1814 AZEP.

Comment: This black-brown fine incised vessel was found in association with the mortuary offerings of Burial 1. This ware is diagnostic of the Verbena ceramic phase at Kaminaljuyu (Rands and Smith 1965: 101; Wetherington

1969). A similar fine incised design motif was carved on a black-brown vessel from Tomb I of Mound E-III-3 (Shook and Kidder 1952: Fig. 19b). A black-brown fluted vessel of vaguely similar form and size has been reported from Zacualpa (Wauchope 1948: Z-359, Fig. 28g). However, black-brown wares are diagnostic of the Balam phase at Zacualpa, which correlates with both the Terminal Formative and the Early Classic periods (Wauchope 1948: 29).

Flaring Neck Round Bottom Jar (Figure 10f), KJ70-12151, DOT 138

Description: Large round bottom jar with a medium flaring neck and two loop handles attached vertically on the shoulders. The vessel was fabricated from a gritty buff paste. A poor cream slip is evident on the exterior surfaces of the neck; the lower surfaces of the vessel are blackened. The rim is externally thickened, and painted red. A 1.6 cm wide red band is also painted at the base of the neck.

Dimensions: 18.5 cm rim diameter; 12.6 cm diameter at constriction; 28 cm maximum diameter; 29 cm high; 4 to 5 mm thick; handles - 3.4 cm long, 1.8 cm wide; approximately 9400 ml capacity to neck constriction.

Provenience: 98.40E/99.65N; 1738-1767 AZEP.

Comment: This large jar was located some 30 centimeters northwest of the skeleton in Burial 3. The vessel was discovered fractured, probably by the weight of the overburden. This ceramic type has been found elsewhere at Kaminaljuyu and the Valley of Guatemala, and these wares apparently date to the Terminal Formative period (Wetherington 1971). Vessels of a similar size and form are used today in the Valley of Guatemala as water carrying or water storage containers (Arnold 1971).

Wide-Mouth Round Bottom Jar (Figure 10g), KJ70-11528, DOT 79

Description: Squat, round bottom jar with high shoulder, low flaring neck, and wide mouth. The vessel was fabricated from a reddish-brown clay. The surface is a low or medium burnish, with a cinnamon slip applied to the exterior of the shoulder and neck, the color grading into dark brown below the shoulder, almost black at the base. The rim has a heavy external semi-cylindrical bolster, with a tool-impressed fillet encircling the lip. Other decoration consists of an applique fillet encircling the vessel just above the shoulder, and ten groups of 7 or 8 oblique lines incised on the shoulder.

Dimensions: 18.4 cm rim diameter; 13.6 diameter at constriction; 29 cm maximum diameter; 17.8 cm high; 5 mm thick; approximately 5980 ml capacity to constriction.

Provenience: 99.60E/103.85N; 1782-1801 AZEP.

Comment: This round bottom jar was discovered complete but in a fractured condition (probably because of pressure from the overburden) about 60 cm from the feet of the skeleton in Burial 4. The form of this vessel is typical of Las Charcas phase jars, but cinnamon ware vessels are

common in the Aurora and Amatle 1 phases of the Early and Middle Classic periods. The chronological position of this vessel is equivocal (Wetherington 1971). This particular vessel functioned as an incense burner or ash container, for the interior bottom of the jar was blackened with carbon deposits.

Plate, KJ70-11504, DOT 66

Description: Large, circular, flat plate with a raised rim.

Dimensions: approximately 32 to 36 cm diameter; approximately 11 mm thick.

Provenience: 104.27E/101.10N; 1803 AZEP.

Comment: This vessel was found lying broken among the mortuary offerings in Burial 2. Fifty-eight fragments, constituting about one-third of the original artifact, were recovered. Forty sherds of a similar size comal (KJ70-11109, DOT 67; approximately 32 cm diameter) were also located in the same burial. It is possible that these large flat plates are comales. The term comal properly refers to a flat clay griddle used for cooking tortillas (flat maize cakes), and similar utensils are still made and used today in Indian communities in the Valley of Guatemala. Comales are abundantly represented in Terminal Formative deposits (Kidder, Jennings, and Shook 1946: 208), although some authorities claim that the true comal did not appear in the Guatemalan highlands until the Early Postclassic (Borhegyi 1965: 55). According to this latter interpretation, various comal-like artifacts occurring in the earlier periods have been identified as incensario covers (Borhegyi 1959: 56-57). However, from the evidence at hand, such as the position of the two specimens from Mound A-VI-6, with their rims upturned rather than downward (as in the case of a vessel cover), and the absence of incensario vessels in the immediate vicinity, it is probable that these objects did not function as incensario covers, and considering other food preparation artifacts present nearby, the comal interpretation seems to have more support.

Tetrapod Rectilinear Effigy Vessel (Figure 11), KJ70-11527, DOT 80

Description: Flat bottom, rectilinear vessel with straight vertical walls, rounded corners, and a flange almost encircling the vessel on three sides, 1.5 cm below the rounded rim. The vessel is supported by four solid, long (5.5 cm) legs attached vertically at the corners. At the narrow ends of the vessel, level with the flange, double loops are attached to serve as handles. At one end, between the loop handles, a cylinder with applique elements depicting facial features has been attached. The ears are represented by two concave lugs attached to both sides of the head, the eyes and nose by conical element with small holes punctured for the pupils and nostrils, and the mouth by a short, flatten ridge with a horizontal groove in the center. The vessel is red-orange in color, with a pale orange swirl design painted by the resist technique on the interior bottom. The surface has a low burnish.

Dimensions: 37 cm long; 20 cm wide; 11.5 cm high (with legs); approximately 1660 ml capacity.

Provenience: 98.49E/98.31N; 1768-1791 AZEP.

Comment: This rectilinear effigy vessel was discovered canted upside down 20 centimeters south of the skeleton in Burial 3. The vessel was complete and undamaged, except for missing loop handles at the end opposite the head. From the color and fine texture of the paste, the resist painted design, and the surface treatment, this vessel may be classed as an Usulutan ware. As to the vessel's form, it appears to be unique among the reported sites where Usulutan ware is distributed. The closest analogy in form at Kaminaljuyu is the black-brown serpent-fillet and crab-applique bowl from Tomb II of Mound E-III-3 (Shook and Kidder 1952: 84-84, Fig. 30, 66b). Both vessels have rectilinear bodies with rounded corners, and tetrapod supports. The encircling body of the snake in the E-III-3 specimen may be considered the analogous element of the flange in the A-VI-6 specimen. Beyond these few correlations between these two vessels, the analogy fails to hold up. The uniqueness of these vessels suggests a similarly restricted function.

APPENDIX 3

LIST OF ARTIFACTUAL AND ARCHITECTURAL FEATURES

1. Ceramic Cluster (KJ70-8141); 99.58E/103.00N; 1831-1835 AZEP.

   This cluster of 54 sherds, measuring 28 cm east-west, 29 cm north-south, was found some 50 cm above the legs of the skeleton in Burial 4. The ceramics have been phased as Verbena-Arenal. Among the sherds were 12 large fragments of a flesh-orange tripod bowl (KJ70-8141). Also present were 21 sherds of a small, shallow brown-gray bowl with a medial flange.

2. Ceramic Cluster (KJ70-8180, 8111); 103.00E/103.82N; 1822-1834 AZEP.

   This feature consists of a cluster of 79 sherds in an area measuring 63 cm east-west and 36 cm north-south. Included among the sherds were two fragments of incensario vessels. The ceramics (KJ70-8180) have been phased as Verbena-Arenal and Amatle 2. Associated with the ceramics were an obsidian blade and some unidentifiable bone fragments (KJ70-8111). This feature is in the vicinity of Burial 1, but possibly not associated with it. Instead it might be associated with an undiscovered burial possibly lying in the unexcavated unit to the north.

3. Ceramic Cluster (KJ70-8127); 103.45E/103.40N; 1800-1810 AZEP.

   This feature consists mostly of 62 sherds of indeterminate phase concentrated in an area 25 cm in diameter. The vast majority of the sherds appear to be from a brown-gray ware vessel, which had a small, slightly pointed handle. Also found with this feature was an obsidian blade. This feature is probably associated with Burial 1, the skeleton of which was found lying 40 cm to the south. Some human molars were found in the same vicinity, only 20 cm above (103.45E/103.28N; 1830 AZEP).

4. Bone Fragments (KJ70-8086); 103.86E/103.00N; 1829-1834 AZEP.

   This feature, consisting of poorly preserved human bone fragments, is undoubtedly part of the skeleton in Burial 1. The fragments which were exposed during the excavation of the east-west stratigraphic trench appeared to be a scapula and a long bone, possibly the humerus.

5. Ceramic Vessel and Bone Fragments (KJ70-8159, 8089); 100.80E/107.64N; 1814-1823 AZEP.

   A small cylindrical vase (KJ70-8159), dating to the Arenal phase of the Terminal Formative, was the major item in this feature. This vessel was found directly beneath the burnt clay structure (Feature 13) which is probably part of the terrace platform associated with the Early Postclassic structure. A small obsidian fragment (KJ70-8159) was collected with the vase, and later dated by obsidian hydration analysis (459 B.C. $\pm$ 117). Associated with this vessel, 5 cm to the east, were

unidentifiable bone fragments (KJ70-8089) in very poor condition. The subsequent discovery of a human long bone, possibly a femur (KJ70-12115, DOT 133), some 30 cm eastward in the level, makes apparent that Feature 5 is part of some burial, which has been designated Burial 6.

6. Two Ceramic Vessels (KJ70-9482, 9608); 99.55E/101.87N; 1791-1796 AZEP.

This feature consists of two complete ceramic vessels which were placed together as a nested set. A shallow hemispherical tetrapod bowl (KJ70-9608, DOT 9) has been put on top of and inside a black-brown fine-incised cylindrical vase (KJ70-9482, DOT 10). Both vessels were part of the mortuary offerings for Burial 4, having been located about 22 cm southeast of the cranium. These vessels date to the Terminal Formative period.

7. Four Ceramic Artifacts; 102E/101N; 1798-1813 AZEP.

This assemblage of items contained the following:

DOT 31 (KJ70-11521); Tripod bowl; 103.22E/101.04N; 1791-1798 AZEP
DOT 32 (KJ70-11996); Animal figurine; 102.82E/101.12N; 1808 AZEP
DOT 33 (KJ70-12100); Coarse brown goblet; 102.72E/101.33N; 1813 AZEP
DOT 34 (KJ70-11991); Red, incised sherd; 102.55E/101.38N; 1798 AZEP

It is difficult to make any functional interpretation of this feature, for this association of artifacts may be fortuitous rather than intentional. These items could be part of the mortuary offerings for Burial 1 or for Burial 2, since their location was between these burials and at the same elevation.

8. Ceramic Cluster (KJ70-9827); 101.84E/100.37N; 1825 AZEP.

The major part of this feature consists of 103 sherds (Verbena-Arenal-Aurora) densely concentrated in an area between 60-62 cm in diameter. Among the ceramic artifacts were a long, solid conical tripod leg, an incensario sherd, and black ware and white ware sherds. Other artifacts included four obsidian fragments and one lithic detritus fragment. This dense concentration of artifactual material was on top of and partly imbedded in a hard, light brown, pumice-clay surface, which covered the central pit (Feature 17) 30 cm to the west.

9. Ceramic Cluster (KJ70-9830); 100.80E/102.30N; 1802-1815 AZEP.

This feature consists of 76 sherds (Sacatepequez-Arenal) and a biconvex mano fragment concentrated in shallow pit about 13 cm deep, 25 cm in diameter. Most of the sherds appeared to be incensario fragments, and since fragments of burnt earth were found with the sherds, this feature might be the remains of a ritual observance, perhaps concenred with the rites for the dead. The feature's location was near the north end of the central pit (Feature 17), in dark brown soil surrounded by coarse arena. Because of the darken soil, the burning could have occurred where the feature was found, but it occurred only once or the fire was quite small, since none of the soil was sufficiently hardened as would be the case if the fire was quite intense or occurred repeatedly. It

appeared that the ceramic vessels were destroyed during or after use, and covered with soil.

10. Ceramic Cluster (KJ70-10193); 104.50E/100.22N; 1838 AZEP.

This feature consists of 65 sherds (Sacatepequez?-Arenal) concentrated in an oval area measuring 35 cm north-south and 20 cm west. Only the western portion of the feature was exposed; the eastern part was not excavated. This feature was found about 20 cm above some of the artifacts found with Burial 2. These sherds could be part of the ceramic refuse which covered Burial 2.

11. Ceramic Cluster (KJ70-11288, 11802); 99E/98-99N; 1791-1793 AZEP.

This concentration of artifacts, consisting mostly of 105 sherds (Verbena-Arenal, with some Sacatepequez and perhaps Aurora-Amatle 1), was scattered over a two square meter area. Among the ceramic fragments were sherds from necked jars, handled, low neck red jars, black-brown bowls, white ware vessels, and orange ware vessels. Other artifacts included an unclassifiable metate fragment, a large coarse-grained rubbing platform, and four fragments of lithic detritus. This feature was located in close proximity to Burial 3, which was about 50 cm to the west. It appears that these artifacts were deposited prior to Burial 3, which intruded through this feature during interment.

12. Ceramic Cluster (KJ70-9964); 103.10E/100.40N; 1819 AZEP.

A roughly circular concentration of 51 sherds (Arenal-Amatle 3) in an area 20-25 cm in diameter. These ceramic fragments were found 5 cm above artifacts near the legs of the skeleton in Burial 2. A relatively high number of sherds, some 500, were found in the 20 cm level (1816-1836 AZEP) just above the body. While most of the sherds were from the Verbena-Arenal phase, the presence of some Amatle 2-3 ceramics indicates some disturbance during the Late Classic period. This featureis probably part of the same sherd concentration which covered Burial 2.

13. Burnt Clay Structure; 100E/107N; 1844-1878 AZEP.

The remains of what was perhaps a terrace platform for the Late Classic structure constitute this architectural feature. Only a meter of this feature, which apparently ran east-west, was exposed during the excavation of the north trench. Among the materials recovered from this feature were 82 fragments of burnt clay (KJ70-11984, 12818, 13300), including 15 fragments with unpainted surfaces, and five fragments with impressions. Also recovered were four sherds and a thin stone slab which might have functioned as a laja (KJ70-12139, DOT 119). The terrace was originally between 35-40 cm high, covered with adobe. It is not apparent whether or note the platform surfaces were intentionally fired as a technique of increasing resistance to wear and erosion. It is very likely that these surfaces became burnt by the destruction of the structure above.

14. Burnt Clay Wall; 100.82E/97.54-78N; 1775-1794 AZEP.

This architectural feature consists of a burnt section of a vertical clay wall, measuring 23 cm in length and 19 cm in height. The exterior face of the wall was on the west side, and was fired to a depth of less than a centimeter. The wall was relatively flat, aligned approximately 22° east of north. This feature appeared to be part of a larger structure, a low platform about 20 cm high and at least 3.20 meters in length north-south. Only 68 cm of its width east-west was exposed by excavation. The structure was constructed of brown soil, covered with a floor consisting of an 8 cm thick layer of tan coarse arena and talpetate chunks. The section of burnt clay wall was the only part of the platform which was well preserved. The structure was built prior to the burials found to the north and west, probably during the Terminal Formative period. Not enough of the platform was excavated to determine its full size and function. It could have been an altar or a house platform.

15. Ceramic Cluster (KJ70-11810, 11857, 13409); 101.50E/105.95N; 1733-1749 AZEP.

Only partially excavated, this feature consists of a concentration of 226 sherds (Verbena through Amatle 1) in a semicircular area measuring 65 cm east-west by 126 cm north-soutoh. These sherds were found in a matrix of soft dark brown soil (Stratum 3b), just above the hard dark brown clay (Stratum 4) which constitutes the ancient topsoil. Along with the sherds were included a fragment of an incensario vessel (KJ70-13409), unidentifiable bone fragments (KJ70-12099, DOT 126), and a complete obsidian blade (KJ70-12009, DOT 142). This assemblage of material items is suggestive of a Terminal Formative burial, but the presence of Early and Middle Classic sherds implies some intrusion during the Classic period. It may be that this feature is part of Burial 6 which was disturbed and redeposited at a lower elevation by Middle Classic diggers.

16. Lithic Cluster (KJ70-11808, 11811, 11812, 11855, 11969); 100E/95-96N; 1839-1853 AZEP.

A concentration of 65 lithic tool fragments over a two square meter area characterized this feature. From this lithic cluster, the following fragments were found: 7 tabular manos (3 thick bi-plano, 1 thin bi-plano, 3 bi-convex), 1 pebble mano, 4 metates (1 open-ended simple slab, 3 unclassifiable), 1 rubbing platform, 9 utilized cobbles, 1 digging stick weight, 1 pumice fragment, 41 lithic detritus. Other material items included an adorno (KJ70-11969), unclassifiable bone fragments (KJ70-12093, DOT 135), a charcoal specimen (DOT 134) and two burnt clay lumps (KJ70-11855). The clay lumps are evidently the remains of the Late Classic structure or its terrace platform, for the burnt clay has unpainted surfaces or impressions. The 14 sherds (KJ70-11969) collected with the lithic fragments belong to the Amatle 2-3 phase of the Late Classic period. The appearance of this feature indicates that it was a refuse pile for broken lithic implements and debris, and that these items were dumped just beyond the south side of the terrace platform for the Late Classic structure. Evidently the residents of the Late Classic

structure participated in the manufacture or distribution process for lithic implements.

17. Central Pit (KJ70-9737, 9751, 9967); 100.30-101.50E/100.00-102.20N; 1751-1825 AZEP.

Occupying a central position in Mound A-VI-6 was a pit measuring roughly 120 cm east-west by 220 cm north-south, and 75 cm in depth. It had been dug into a dark brown soil (Stratum 3), and lined with four blocks of talpetate on the western edge. The entire pit was filled with coarse yellow arena, and covered with an 8 cm thick layer of hard pumice-clay. This architectural feature had an alignment along its major axis of approximately 22° east of north. Cultural materials were only found in the layer of pumice-clay; the coarse yellow arena fill was sterile. Among the cultural materials were 139 sherds (Sacatepequez-Arenal), five obsidian fragments, two fragments of lithic detritus, and a lump of burnt clay. A date of 56 B.C. $\pm$ 107 was determined by hydration analysis of one of the obsidian fragments (KJ70-9967, sample 7378). This feature had the appearance of a Terminal Formative tomb, except for the absence of a burial. The pit had been sealed by the pumice-clay layer during the Terminal Formative period, and had not been disturbed during later periods. It is possible that the pit was prepared for the burial of a particular individual, and had been filled with non-cohesive arena to reserve it for the time when the individual died. For some reason, however, the pit was never used for its intended purpose.

APPENDIX 4

LIST OF FIELD NUMBERS

DOT NO.	ACCESSION NUMBER	DESCRIPTION	PROVENIENCE	DATE
1	KJ70-7120, 7156	Large olla, containing 66 sherds (Verbena-Arenal) 1 figurine head, 3 obsidian fragments, 7 burnt clay lumps	100.00E/101.00N; 1817-1843 AZEP	6 July
2	KJ70-9492	Small greenstone object	102E/102N; 1898-1918 AZEP	16 July
3	KJ70-7537	Artifact cluster, consisting of 39 sherds (Verbena-Arenal), 1 obsidian blade fragment, half of a tabular mano	100E/100N; 1827 AZEP	8 July
4	KJ70-7577	Artifact cluster, consisting of 23 sherds (Verbena-Arenal), 1 non-granular abrading pebble, 1 detritus fragment	99E/100N; 1781 AZEP	8 July
5	KJ70-7258	Metate fragment (15x8x3 cm), with simple slab, open-ended, shallow trough	99.98E/101.97N; 1794-1809 AZEP	7 July
6	KJ70-10109	Charcoal specimen	101E/100N; 1878-1898 AZEP	16 July
7	KJ70-10046	(a) 1 obsidian flake, (b) 1 obsidian core fragment, (c) 1 obsidian point	101E/100N; 1878-1898 AZEP	16 July
8	KJ70-9496	Figurine head	101E/100N; 1858-1878 AZEP	16 July
9	KJ70-9608	Orange, hemispherical, tetrapod bowl	99.55E/101.87N; 1791-1796 AZEP	17 July
10	KJ70-9482	Black-brown, fine incised, cylindrical vase	99.55E/101.87N; 1791-1796 AZEP	17 July
11	KJ70-9458	Red mineral pigment	101E/100N; 1838-1858 AZEP	17 July
12	KJ70-9491	Female figurine	101E/100N; 1838-1858 AZEP	17 July
13	KJ70-9477	(a) 1 obsidian blade, top section, (b) 1 obsidian blade, bottom section, (c) 1 obsidian point	101E/100N; 1838-1858 AZEP	17 July
14	KJ70-9478	2 tabular mano fragments, 1 utilized cobble	101E/101N; 1858-1878 AZEP	16 July
15	KJ70-10024	1 obsidian point	100E/99N; 1878-1905 AZEP	20 July
16	KJ70-11518	Black-brown, fine incised fluted vessel	102.90E/101.59N; 1806-1814 AZEP	20 July
17	KJ70-11668	Deer antler	103.09E/101.85N; 1831 AZEP	20 July
18	KJ70-9832	Artifact cluster, consisting of 104 sherds (Verbena-Arenal, Amatle 1-2), 4 obsidian fragments	103.17E/102.13N; 1823-1844 AZEP	21 July

DOT NO.	ACCESSION NUMBER	DESCRIPTION	PROVENIENCE	DATE
19	KJ70-9750	14 sherds from a red ware vessel	103.30E/102.46N; 1823-1844 AZEP	21 July
20	KJ70-9747	1 angular hammerstone	103.41E/102.65N; 1823-1844 AZEP	21 July
21	KJ70-10020	Cylindrical ceramic bead	103.14E/102.73N; 1826 AZEP	21 July
22	KJ70-9457	Animal bone	100E/102N; 1847-1867 AZEP	17 July
23	KJ70-10026	Black-brown, fine incised sherd; red-on-white coarse incised sherd (Verbena-Arenal)	103E/102N; 1814-1832 AZEP	21 July
24	KJ70-10038	Spherical ceramic bead	101E/100N; 1838-1858 AZEP	21 July
25	KJ70-11520	Shallow flat bottom bowl	101.62E/100.60N; 1842-1847 AZEP	21 July
26	KJ70-10022	Spherical ceramic bead	103E/101N; 1794-1814 AZEP	21 July
27	KJ70-10043	10 incensario vessel sherds	103E/102N; 1814-1832 AZEP	21 July
28	KJ70-10042	3 sherds from a white flat bottom bowl (Verbena)	103E/102N; 1814-1832 AZEP	21 July
29	KJ70-10115	Red mineral pigment	102E/100N; 1818-1838 AZEP	21 July
30	KJ70-9495	Figurine head	101E/101N; 1878-1898 AZEP	16 July
31	KJ70-11521	Tripod bowl	103.22E/101.04N; 1791-1798 AZEP	22 July
32	KJ70-11996	Animal figurine	102.82E/101.12N; 1808 AZEP	22 July
33	KJ70-12100	Coarse brown goblet, containing soil sample	102.72E/101.33N; 1813 AZEP	22 July
34	KJ70-11991	Large, red, coarse incised sherd	102.55E/101.38N; 1798 AZEP	22 July
35	KJ70-12102	Red mineral pigment	103E/101N; 1794-1814 AZEP	22 July
36	KJ70-10025	Large bichrome sherd (Las Charcas-Sacatepequez)	103E/101N; 1794-1814 AZEP	22 July
37	KJ70-10030	Figurine head	101E/100N; 1838-1858 AZEP	22 July
38	KJ70-10028	Small, carved pumice artifact (pumice abrader?)	101E/100N; 1838-1858 AZEP	22 July
39		Charcoal specimen	102.77E/99.18N; 1821 AZEP	22 July
40	KJ70-10047	Well-shaped portable mortar	101.38E/99.12N; 1858 AZEP	22 July
41	KJ70-10027	Red chalcedony flake artifact	99E/99N; 1885-1905 AZEP	22 July
42	KJ70-10114	Purple mineral pigment	104.13E/100.29N; 1838 AZEP	23 July
43	KJ70-12008	4 sherds, coarse incised red ware	101E/100N; 1776-1825 AZEP	23 July
44	KJ70-10116	Mica flake	103E/99N; 1836-1856 AZEP	23 July
45	KJ70-10035	Figurine head	103E/99N; 1836-1856 AZEP	23 July
46	KJ70-10029	Animal figurine	103E/100N; 1816-1836 AZEP	23 July
47	KJ70-10032	Obsidian blade	103E/100N; 1816-1836 AZEP	23 July
48	KJ70-11519	Red-orange composite silhouette vessel	103E/99N; 1816-1836 AZEP	24 July
49	KJ70-10017	Effigy sherd, portraying a human face	103E/102N; 1794-1814 AZEP	24 July
50	KJ70-10039	Figurine head	103E/102N; 1774-1794 AZEP	24 July
51	KJ70-11526	Black-brown, fine incised effigy vase	103.23E/100.33N; 1802-1815 AZEP	24 July
52	KJ70-11522	Red, flat base bowl	103.22E/100.13N; 1798-1806 AZEP	24 July
53	KJ70-11524	Black-brown, fine incised cylindrical vase	103.22E/100.13N; 1798-1806 AZEP	24 July

DOT NO.	ACCESSION NUMBER	DESCRIPTION	PROVENIENCE	DATE
54	KJ70-11191	Simple slab metate (46x27x9 cm), with an open-ended shallow trough	103.66E/100.06N; 1814 AZEP	24 July
55	KJ70-10041	2 animal figurines	104.32E/101.12N; 1815 AZEP	20 July
56	KJ70-10045	Obsidian blade	101E/102N; 1838-1858 AZEP	20 July
57	KJ70-7778	Bone, in extremely poor condition	100.98E/105.60N; 1870-1891 AZEP	10 July
58	KJ70-10113	Charcoal specimen	104.06E/101.96N; 1815 AZEP	20 July
59	KJ70-11529	Deep red, flat base bowl	98.42E/99.15N; 1807-1817 AZEP	27 July
60	KJ70-13551	20 sherds from a mottled orange bowl	99.58E/102.10N; 1820 AZEP	29 July
61	KJ70-11220	Large rock (building material?)	103.95E/100.38N; 1804 AZEP	24 July
62	KJ70-11221	Large rock utilized as a rubbing platform	104.06E/100.24N; 1805 AZEP	24 July
63	KJ70-11219	Large rock (building material?)	104.40E/100.13N; 1815 AZEP	24 July
64	KJ70-11161	Artifact cluster, consisting of 63 sherds (including an incensario sherd; Verbena-Arenal), 4 obsidian fragments, 4 lithic detritus	103.80E/100.70N; 1812 AZEP	24 July
65	KJ70-11116	22 sherds of a red ware vessel, 2 obsidian fragments	104.16E/99.88N; 1805 AZEP	24 July
66	KJ70-11504	58 sherds from a ceramic plate or incensario cover, 1 fragment of lithic detritus	104.27E/101.10N; 1803 AZEP	24 July
67	KJ70-11109	40 sherds from a ceramic plate or incensario cover	104.48E/99.54N; 1814 AZEP	24 July
68	KJ70-11112	10 sherds of a large, shallow black-brown dish	103.92E/99.12N; 1810 AZEP	24 July
69	KJ70-11210,	Artifact cluster, consisting of 271 sherds	103.75E/99.25N; 1798-1810 AZEP	24 July
	12065	(Arenal), 1 figurine fragment, 4 obsidian fragments, 2 lithic detritus, 1 burnt clay lump	98E/103N; 1824-1873 AZEP	29 July
70	KJ70-12079	9 human dental crowns	98E/103N; 1824-1873 AZEP	29 July
71	KJ70-13605	Burnt adobe fragments, consisting of 43 burnt	98-99E/98N; 1864-1879 AZEP	29 July
	13633	clay lumps (including 25 fragments with unpainted		
	13635	surfaces, 2 with impressions), 1 sherd		
72	KJ70-10649	Ceramic clay ball	98E/102N; 1884-1924 AZEP	29 July
73	KJ70-12092	Bone fragment, unidentifiable	98.45E/102.92N; 1864 AZEP	29 July
74	KJ70-10665	Cylindrical ceramic bead	98E/98N; 1844-1864 AZEP	29 July
75	KJ70-10654	2 iron pyrite fragments	98E/98N; 1844-1864 AZEP	29 July
76	KJ70-10403	Charcoal specimen	98E/98N; 1839 AZEP	29 July
77	KJ70-10659	Artifact cluster, consisting of 26 sherds (Amatle 1-2), 1 fragment of lithic detritus	98E/98N; 1839 AZEP	29 July
78	KJ70-10833	Charcoal specimen	99.50E/103.85N; 1801 AZEP	30 July
79	KJ70-11528	Wide-mouth, round bottom jar	99.60E/103.85N; 1782-1801 AZEP	30 July

DOT NO.	ACCESSION NUMBER	DESCRIPTION	PROVENIENCE	DATE
80	KJ70-11527	Rectilinear, tetrapod effigy vessel	98.49E/98.31N; 1768-1791 AZEP	30 July
81	KJ70-10821	Obsidian blade (directly underneath DOT 80)	98.49E/98.31N; 1772 AZEP	31 July
82	KJ70-10825	Obsidian blade	98.88E.98.15N; 1769 AZEP	31 July
83	KJ70-10834	Charcoal specimen	99.02E/98.09N; 1769 AZEP	31 July
84	KJ70-10832	Wood fragments	98E/98N; 1767-1784 AZEP	31 July
85	KJ70-10826	3 small red, cylindrical ceramic beads	98E/99N; 1795-1815 AZEP	28 July
86	KJ70-10817	Tabular mano (19x9x4 cm)	98.58E/99.28N; 1806 AZEP	31 July
87	KJ70-10816	Rubbing platform (15x12x5-7 cm, 1456 gm)	98.74E/99.10N; 1816 AZEP	31 July
88	KJ70-10815	Tabular mano (14x8.5x4 cm)	99.89E/99.07N; 1811 AZEP	31 July
89	KJ70-10829	Unclassified, perforated ceramic artifact, doughnut-shape with bi-termianl protuberances (length 6 cm, width 5 cm, hole dia. 1.5 cm)	98.80E/99.05N; 1808 AZEP	31 July
90	KJ70-9724	2 fragments of lithic detritus	102.30E/100.25N; 1850 AZEP	21 July
91	KJ70-10838	Small pumicestone pebble	99E/103N; 1801 AZEP	30 July
92	KJ70-12081	Red mineral pigment	99E/104N; 1816-1836 AZEP	3 Aug.
93	KJ70-12091	Maize cob	99.90E/104.47N; 1816-1836 AZEP	3 Aug.
94		Charcoal specimen	99.45E/104.32N; 1816-1836 AZEP	3 Aug.
95	KJ70-12104	Red mineral pigment	99E/104N; 1796-1816 AZEP	3 Aug.
96	KJ70-12098	Mica flake	99E/104N; 1796-1816 AZEP	3 Aug.
97	KJ70-12086	Carbonized seed	99E/104N; 1796-1816 AZEP	3 Aug.
98	KJ70-12087	Large, white cylindrical ceramic bead	100E/104N; 1804-1824 AZEP	4 Aug.
99	KJ70-12096	Red mineral pigment	98E/98N; 1764-1784 AZEP	4 Aug.
100	KJ70-12015	Mica flake	100E/104N; 1804-1824 AZEP	4 Aug.
101	KJ70-11989	3 obsidian blades	98E/98N; 1764-1784 AZEP	4 Aug.
102		Charcoal specimen	103.75E/100.33N; 1784 AZEP	4 Aug.
103	KJ70-12080	Red and purple mineral pigment	100E/103N; 1804-1824 AZEP	4 Aug.
104	KJ70-11218	Large rock (building material?)	103.54E/102.65N; 1810 AZEP	4 Aug.
105	KJ70-11217	Tabular mano fragment	103.70E/100.29N; 1805 AZEP	4 Aug.
106	KJ70-12000	2 small lithic artifacts: (a) multifacet hammer-stone, (b) celt	100E/97N; 1840-1860 AZEP	5 Aug.
107	KJ70-13571	Artifact cluster, consisting of 37 sherds, 1 obsidian flake	100E/97N; 1840-1860 AZEP	5 Aug.
108	KJ70-12089	Maize cob	100E/105N; 1784-1804 AZEP	5 Aug.
109		Charcoal specimen	100E/97N; 1826 AZEP	5 Aug.
110	KJ70-12085	Carbonized seed	100E/105N; 1784-1804 AZEP	5 Aug.
111	KJ70-12090	Carbonized seed	100E/105N; 1784-1804 AZEP	5 Aug.
112	KJ70-12097	Mica flake	100E/105N; 1784-1804 AZEP	5 Aug.

DOT NO.	ACCESSION NUMBER	DESCRIPTION	PROVENIENCE	DATE
112	KJ70-12097	Mica flake	100E/105N; 1784-1804 AZEP	5 Aug.
113	KJ70-12083	(a) conic abrader, (b) bone bead	100E/105N; 1764-1784 AZEP	5 Aug.
114		Mica flake	100E/104N; 1764-1784 AZEP	5 Aug.
115	KJ70-12094	Mica flake	100E/97N; 1790-1800 AZEP	5 Aug.
116	KJ70-11525	Large, deep, flat base bowl	100E/105N; 1771-1781 AZEP	6 Aug.
117	KJ70-12103	Bone bead	100E/97N; 1750-1770 AZEP	6 Aug.
118		Bone fragment (unidentifiable)	100.82E/98.52N; 1767 AZEP	6 Aug.
119	KJ70-12139	Possible laja	100E/107N; 1844-1864 AZEP	6 Aug.
120	KJ70-12132	Tabular mano (23x10x8 cm)	99.75E/105.00N; 1825 AZEP	6 Aug.
121	KJ70-12138	Tabular mano fragment (8 cm wide, 4 cm thick)	100.30E/99.68N; 1809 AZEP	6 Aug.
122	KJ70-12095	Steatite artifact fragment	100E/107N; 1744-1764 AZEP	6 Aug.
123	KJ70-12133	Large rock (building material?)	100.85E/106.09N; 1777 AZEP	6 Aug.
124	KJ70-11447, 11482	Artifact cluster, consisting of 38 sherds (Verbena-Arenal), 2 obsidian blade fragments, 1 non-granular abrading pebble, 1 lithic detritus fragment, 3 burnt clay lumps	100E/105N; 1764-1784 AZEP	6 Aug.
125	KJ70-12134	4 obsidian blades, bone fragments (human)	98.30E/98.28N; 1752 AZEP	6 Aug.
126	KJ70-12099	Bone fragments (unidentifiable)	100E/104N; 1733-1749 AZEP	7 Aug.
127	KJ70-12084	Black, cylindrical lithic bead	100E/103N; 1784-1804 AZEP	7 Aug.
128	KJ70-12135	Large rock (building material)	100.39E/104.28N; 1805 AZEP	7 Aug.
129	KJ70-11803, 11804, 11805, 11893	Ceramic and other artifact debris with Burial 5, consisting of 734 sherds (Sacatepequez-Amatle 1), 1 figurine fragment, 1 unperforated ceramic disc, 6 obsidian fragments, 10 lithic detritus, 2 burnt clay lumps	100E/103-104N; 1794-1805 AZEP	7 Aug.
130	KJ70-11995	Unperforated, worked ceramic disc (9 cm dia.)	100.20E/104.06N; 1797 AZEP	7 Aug.
131	KJ70-12137	Large rock (building material?)	100.18E/103.95N; 1799 AZEP	7 Aug.
132	KJ70-12101	Small, cylindrical lithic bead	100E/103N; 1784-1804 AZEP	7 Aug.
133	KJ70-12115	Human long bone, accompanied by 20 sherds, 1 lithic detritus fragment	101.23E/107.65N; 1817 AZEP	7 Aug.
134		Charcoal specimen	100E/95E; 1839-1853 AZEP	7 Aug.
135	KJ70-12093	Bone fragments (unidentifiable)	100E/95E; 1839-1853 AZEP	7 Aug.
136	KJ70-12136	Large rock (building material?)	99.12E/99.32N; 1770 AZEP	8 Aug.
137	KJ70-11523	Small, hemispherical effigy cup	103E/99N; 1809 AZEP	8 Aug.
138	KJ70-12151	Large, flaring neck, handled jar	98.40E/99.65N; 1738-1767 AZEP	8 Aug.
139	KJ70-12002	Obsidian flake artifact	100E/103N; 1744-1784 AZEP	10 Aug.
140	KJ70-12082	Wood specimen	100E/103N; 1744-1784 AZEP	10 Aug.

DOT NO.	ACCESSION NUMBER	DESCRIPTION	PROVENIENCE	DATE
141	KJ70-12106	Maize cob	100E/103N; 1744-1784 AZEP	10 Aug.
142	KJ70-12009	Obsidian blade	100E/105N; 1733-1749 AZEP	7 Aug.
143	KJ70-10040	Handled cup candelero	103E/99N; 1796-1816 AZEP	27 July

APPENDIX 5

OBSIDIAN HYDRATION DATING

Twenty specimens of obsidian artifacts were selected from Mound A-VI-6 for chronometric dating by the technique of hydration analysis. The principle and process for this dating technique has been discussed in detail elsewhere (Michels and Bebrich 1971). The twenty obsidian specimens listed below were analyzed by Nancy Marshall, under the direction of Joseph Michels. The thickness of the hydration band is measured in terms of microns (μ). The age of the specimen has been determined by using the hydration rate for the Valley of Guatemala as described by Michels elsewhere in this volume. The date is

Table 3

Obsidian Hydration Dates

Sample Number	Accession Number	Associated Feature	Micron Value	Date	Ceramic Phase
7370	KJ70-9609	Burial 1	3.92	197 B.C. ± 111	Ver-Arl
7371	KJ70-12113	Burial 3	3.89	164 B.C. ± 110	Cha-Sac
7372	KJ70-13836	Burial 2	4.06	355 B.C. ± 115	
7373	KJ70-10821, DOT 81	Burial 3	3.34	397 A.D. ± 95	Sac-Amt 1
7374	KJ70-11445	DOT 31	3.84	110 B.C. ± 108	Ver-Amt 1
7375	KJ70-10046, DOT 7		2.37	1178 A.D. ± 67	Amt 2-3
7376	KJ70-10046, DOT 7c		3.02	684 A.D. ± 86	Amt 2-3
7377	KJ70-10046, DOT 7		2.72	927 A.D. ± 77	Amt 2-3
7378	KJ70-9967	Feature 17	3.79	56 B.C. ± 107	Sac-Arl
7448	KJ70-11989, DOT 101	Burial 3	3.74	3 B.C. ± 106	Sac-Amt 1
7449	KJ70-11893, DOT 129	Burial 5	2.13	1330 A.D. ± 60	Sac-Amt 1
7450	KJ70-13455	DOT 71	2.55	1053 A.D. ± 72	Ver-Arl
7451	KJ70-13455	DOT 71	3.49	252 A.D. ± 99	Ver-Arl
7452	KJ70-13455	DOT 71	2.38	1171 A.D. ± 67	Ver-Arl
7469	KJ70-13564	Burial 4	4.04	332 B.C. ± 114	Ver-Amt 1
7470	KJ70-11803, DOT 129	Burial 5	3.66	81 A.D. ± 104	Sac-Ver
7471	KJ70-11482, DOT 124	DOT 116	3.71	29 A.D. ± 105	Ver-Arl
7472	KJ70-10825, DOT 82	Burial 3	3.71	29 A.D. ± 105	Sac-Amt 1
7473	KJ70-13515	DOT 138	3.95	230 B.C. ± 112	Ver-Amt 1
7688	KJ70-8159	Feature 5	4.15	459 B.C. ± 117	Sac-Arl

NOTE: Dates are calculated on the rate of 7.03 μ^2/1000 years. Ceramic phase abbreviations are Cha = Las Charcas, Sac = Sacatepequez, Ver = Verbena, Arl = Arenal, Aur = Aurora, Amt = Amatle.

given in terms of the mean value for the year and the standard deviation from that value. Where possible the ceramic phase designations as provided by Ronald Wetherington are given for those specimens associated with ceramic lots. A graphic presentation of the data is provided in Figure 12.

The majority of obsidian hydration dates are consistent within themselves, with a clustering occurring in the Late and Terminal Formative periods and also in the Late Classic and Early Postclassic periods. A blatant exception to this pattern is sample 7449, whose date is inconsistent with its association with a supposed Terminal Formative burial, its stratigraphic position, and its ceramic association. A recheck was made of the specimen to see if some recording error had occurred, but the original date was only reaffirmed. No further explanation for this discrepancy can be offered at this time. Sample 7451 seems to present another discrepancy, for its date varies considerably from those of the other two samples (7450, 7452) which were drawn from the same artifact lot. However, the ceramic association with these samples tends to support an earlier date. The problem in this case is that (1) it is possible that no particularly diagnostic Classic sherds occurred in the artifact lot, as would be expected from its stratigraphic position (Level 2, 1844-1864 AZEP), or (2) this is an instance of mixed association of non-contemporaneous ceramic and obsidian artifacts, possibly caused by old ceramics being mixed with new obsidian during the Early Postclassic construction, or by the indiscriminate collection of previously segregated artifacts by the excavator.

With an appropriately large sample selected from unmixed artifact lots, obsidian hydration dating can provide a chronometric measure for the ceramic phases established for the Valley of Guatemala. From the twenty obsidian hydration samples listed above, only hypothetical chronological ranges can be proposed for two ceramic phases, Verbena-Arenal and Amatle 2-3. The two obsidian hydration samples (7370, 7471) associated with Verbena-Arenal ceramic lots suggest a range of about 200 B.C. to about 100 A.D. for the Terminal Formative component of Mound A-VI-6. Seven other obsidian hydration samples from this Terminal Formative component, while not associated with pure Verbena-Arenal phase sherds, fit comfortably within this range. It should be noted that the three radiocarbon dates (Y-391, Y-377, Y-382) obtained on materials from Mound E-III-3 also ranged in date from 100 B.C. to 100 A.D. (Deevey, Gralenski and Hoffern 1959; 1963). Similarly the three obsidian hydration samples (7375, 7376, 7377) associated with only Amatle 2-3 ceramics suggest a range for these phases between 700 and 1200 A.D. Further delineation of the ceramic chronology is not possible with just the twenty obsidian hydration samples listed above.

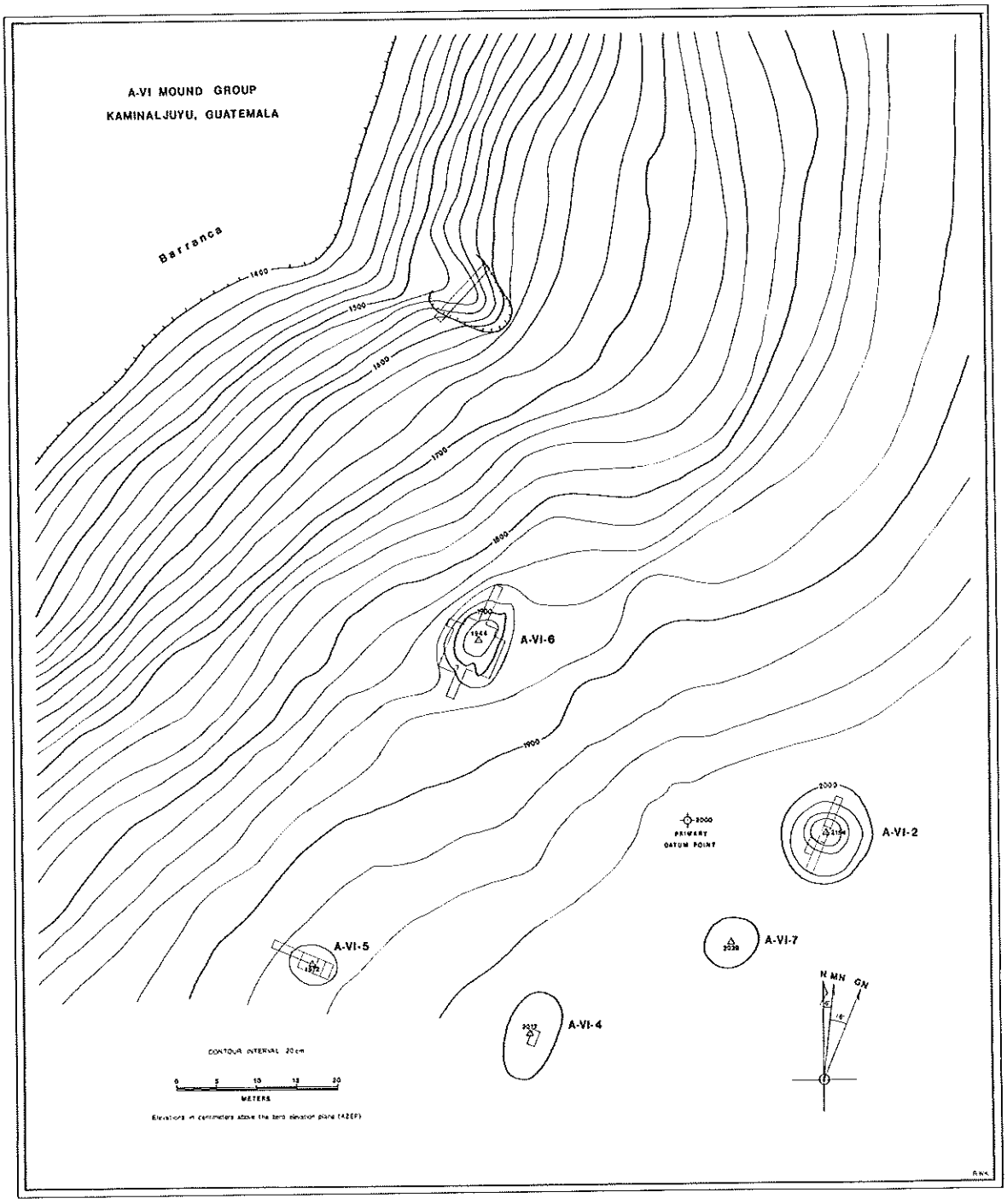


FIGURE 1: CONTOUR MAP OF THE A-VI MOUND GROUP

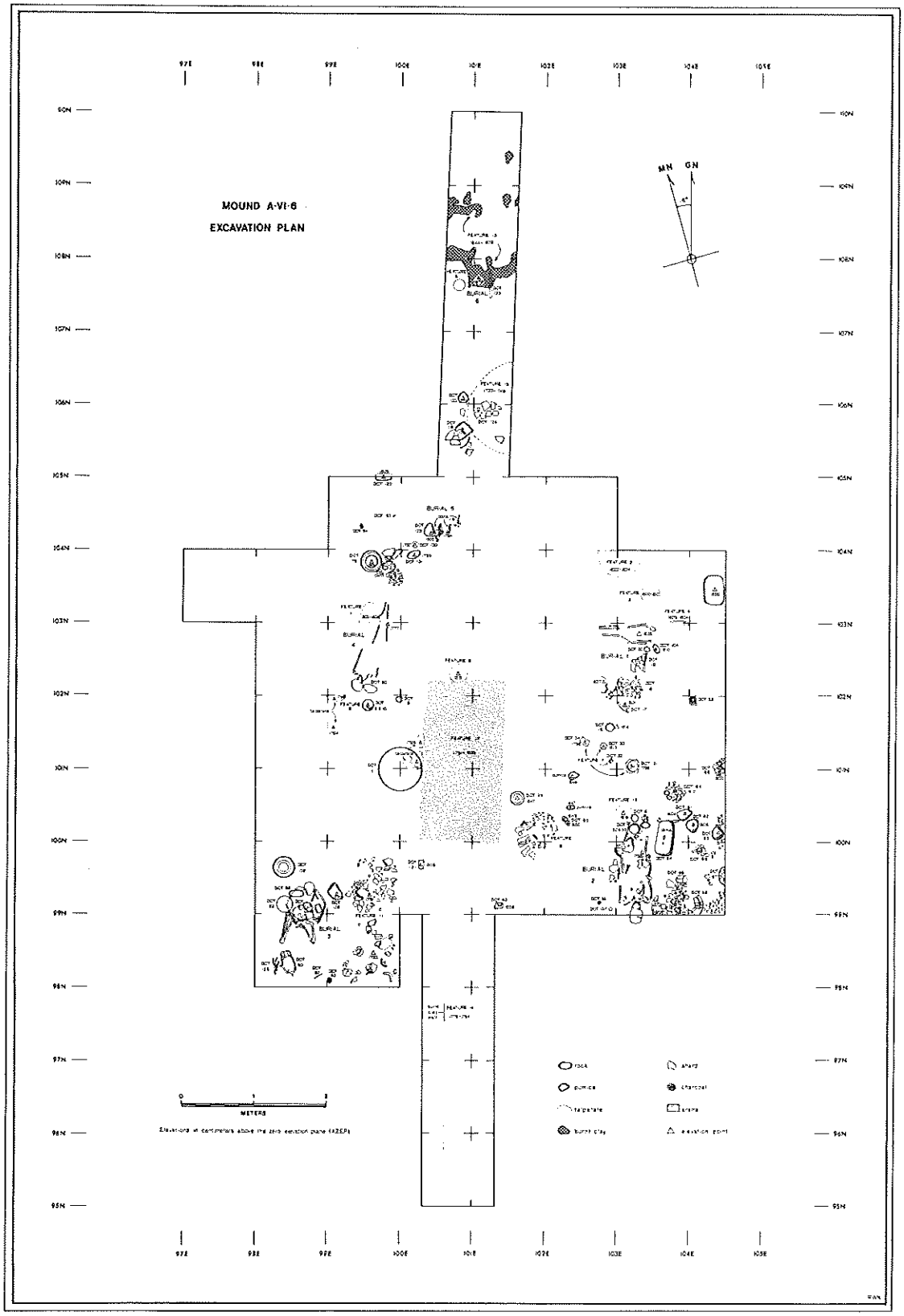


FIGURE 2: EXCAVATION PLAN OF MOUND A-VI-6

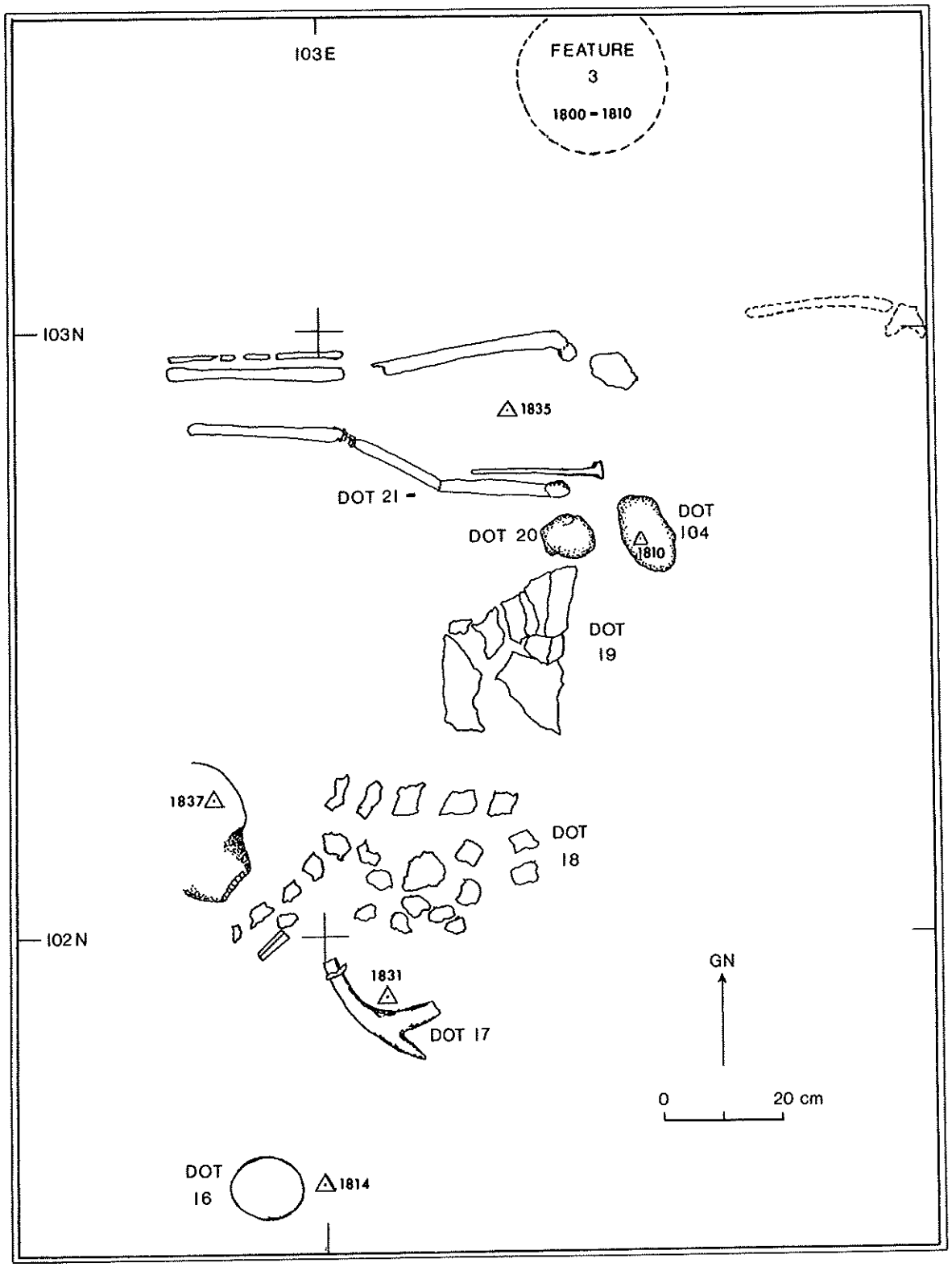


FIGURE 3: BURIAL 1, MOUND A-VI-6

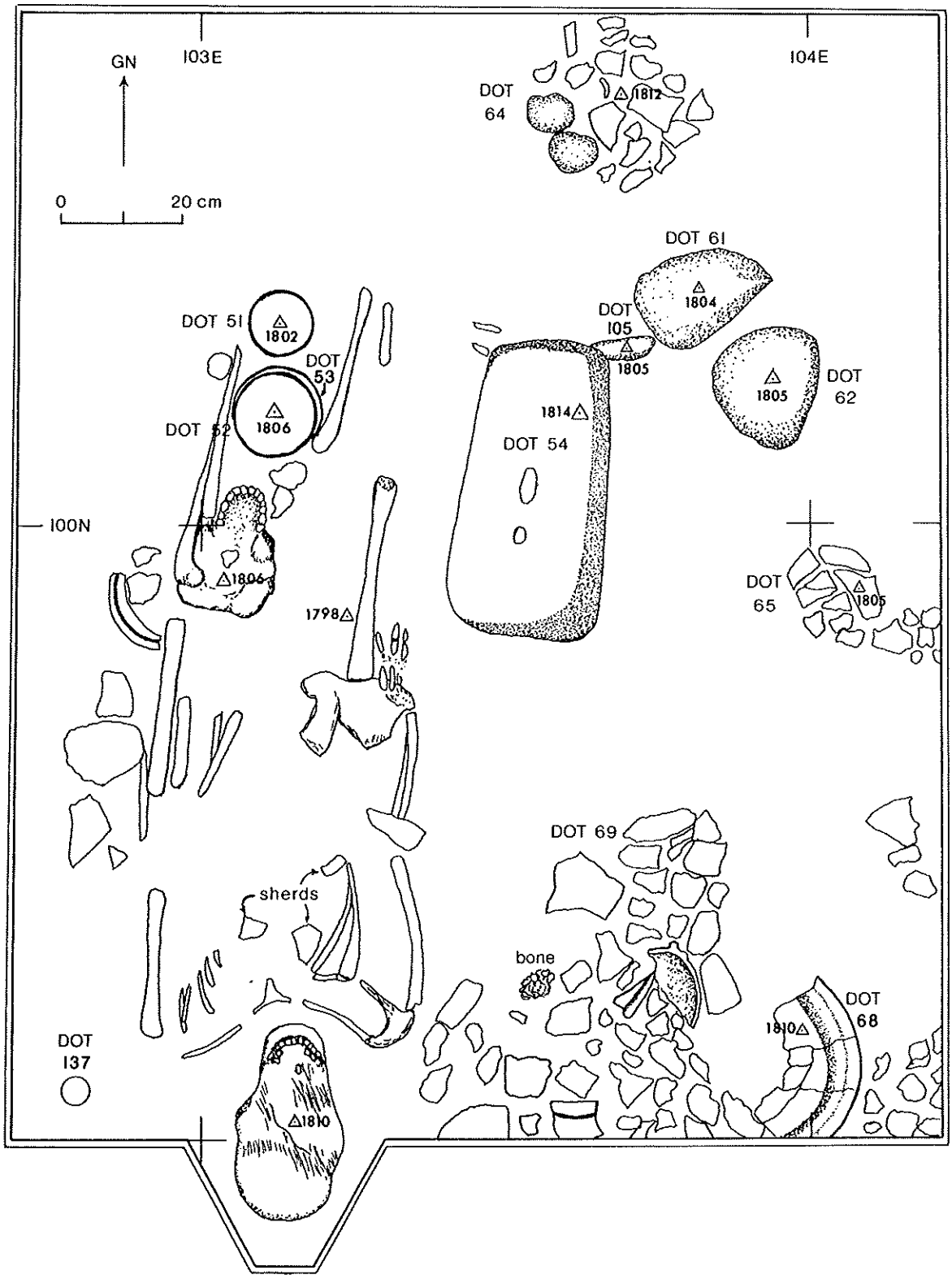


FIGURE 4: BURIAL 2, MOUND A-VI-6

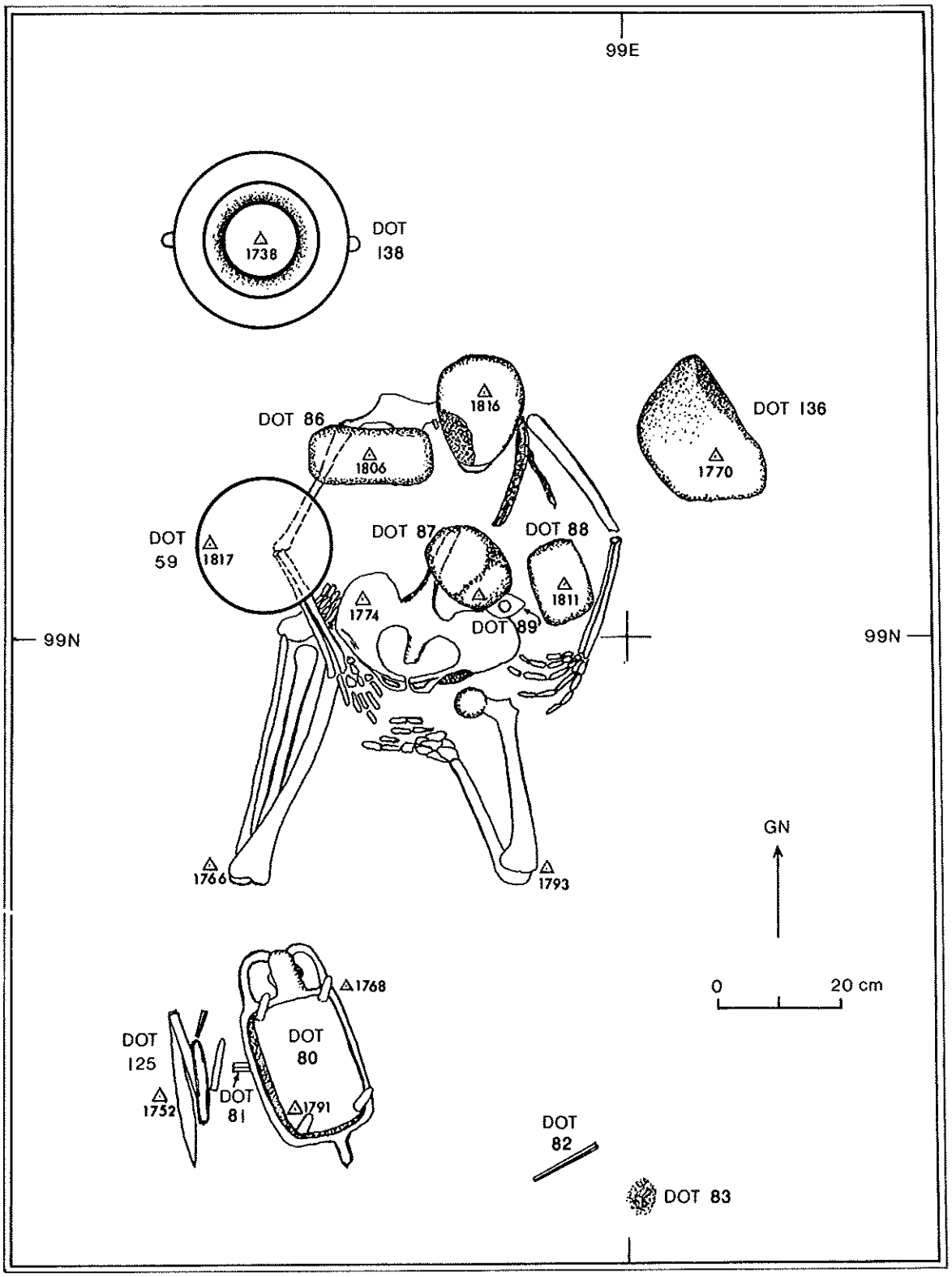


FIGURE 5: BURIAL 3, MOUND A-VI-6

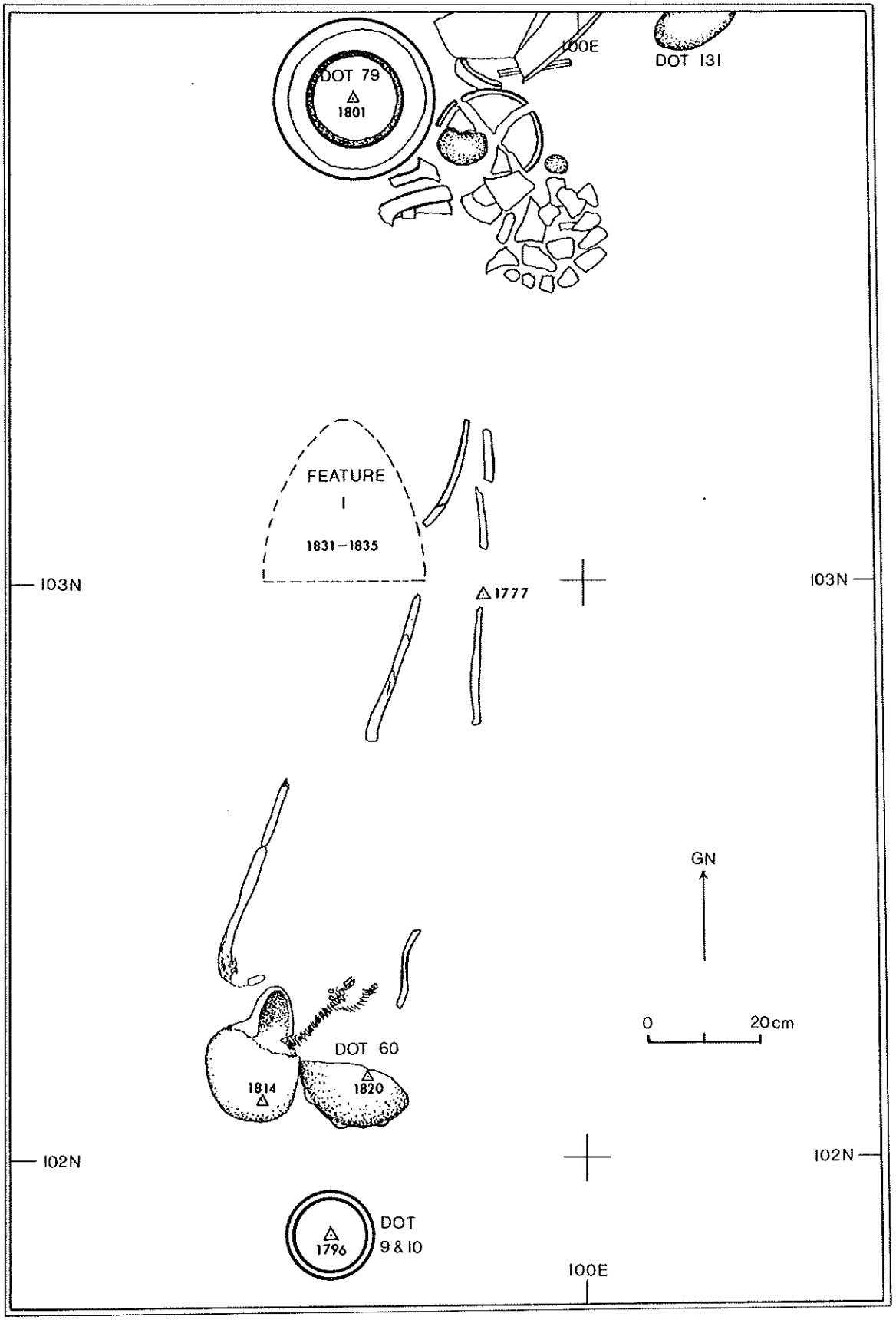
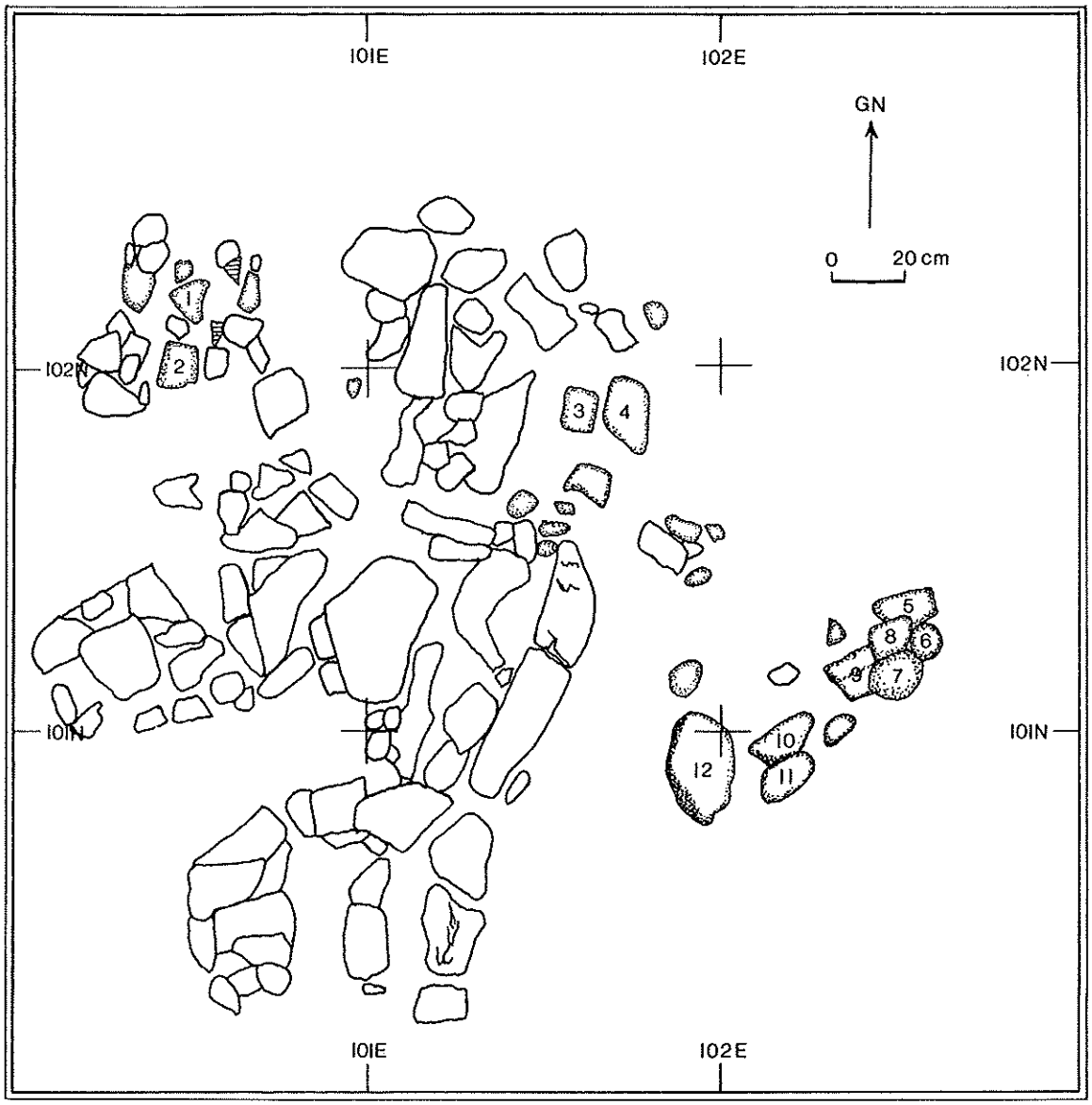


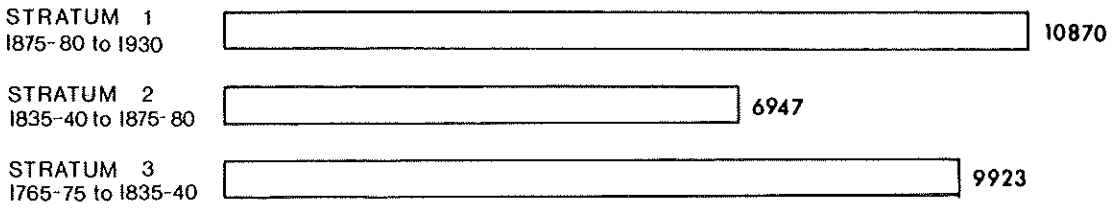
FIGURE 6: BURIAL 4, MOUND A-VI-6



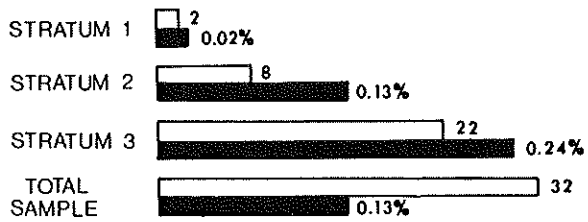
burnt clay sherd rock

1. mano fragment
2. mano fragment
3. metate fragment
4. metate fragment
5. metate fragment
6. round stone
7. hammerstone
8. metate fragment (?)
9. metate fragment (?)
10. large rock slab
11. large rock
12. large rock

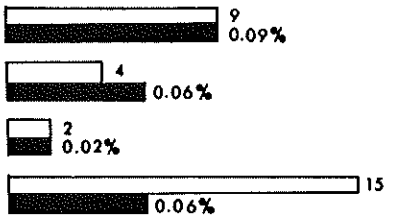
FIGURE 7: PLAN OF HOUSEHOLD DEBRIS



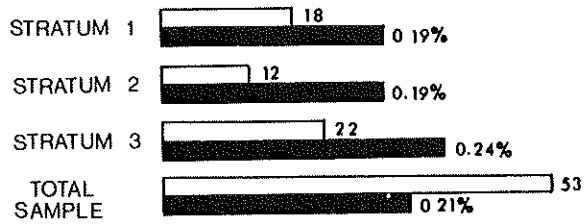
a. TOTAL ARTIFACT FREQUENCY BY CULTURAL STRATUM



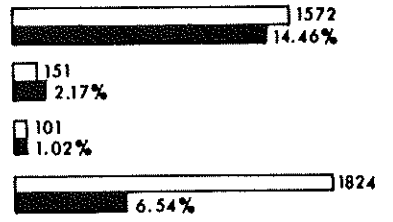
b. INCENSARIO SHERDS
(% relative to all ceramic artifacts)



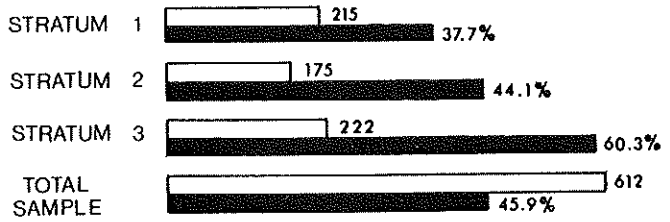
c. ADORNOS
(% relative to all ceramic artifacts)



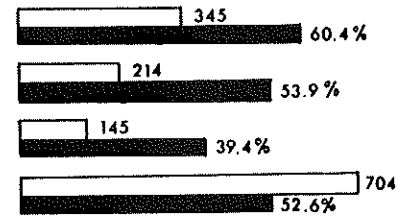
d. FIGURINES
(% relative to all ceramic artifacts)



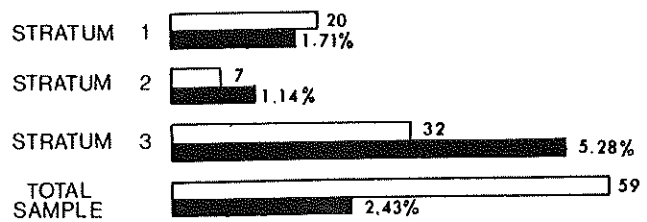
e. BURNT CLAY
(% relative to all artifacts)



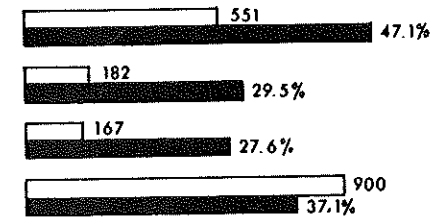
f. OBSIDIAN BLADES
(% relative to all obsidian artifacts)



g. OBSIDIAN FLAKES
(% relative to all obsidian artifacts)



h. PUMICE
(% relative to all lithic artifacts)



i. LITHIC DETRITUS
(% relative to all lithic artifacts)

FIGURE 8: ARTIFACT TYPE FREQUENCY AND DISTRIBUTION

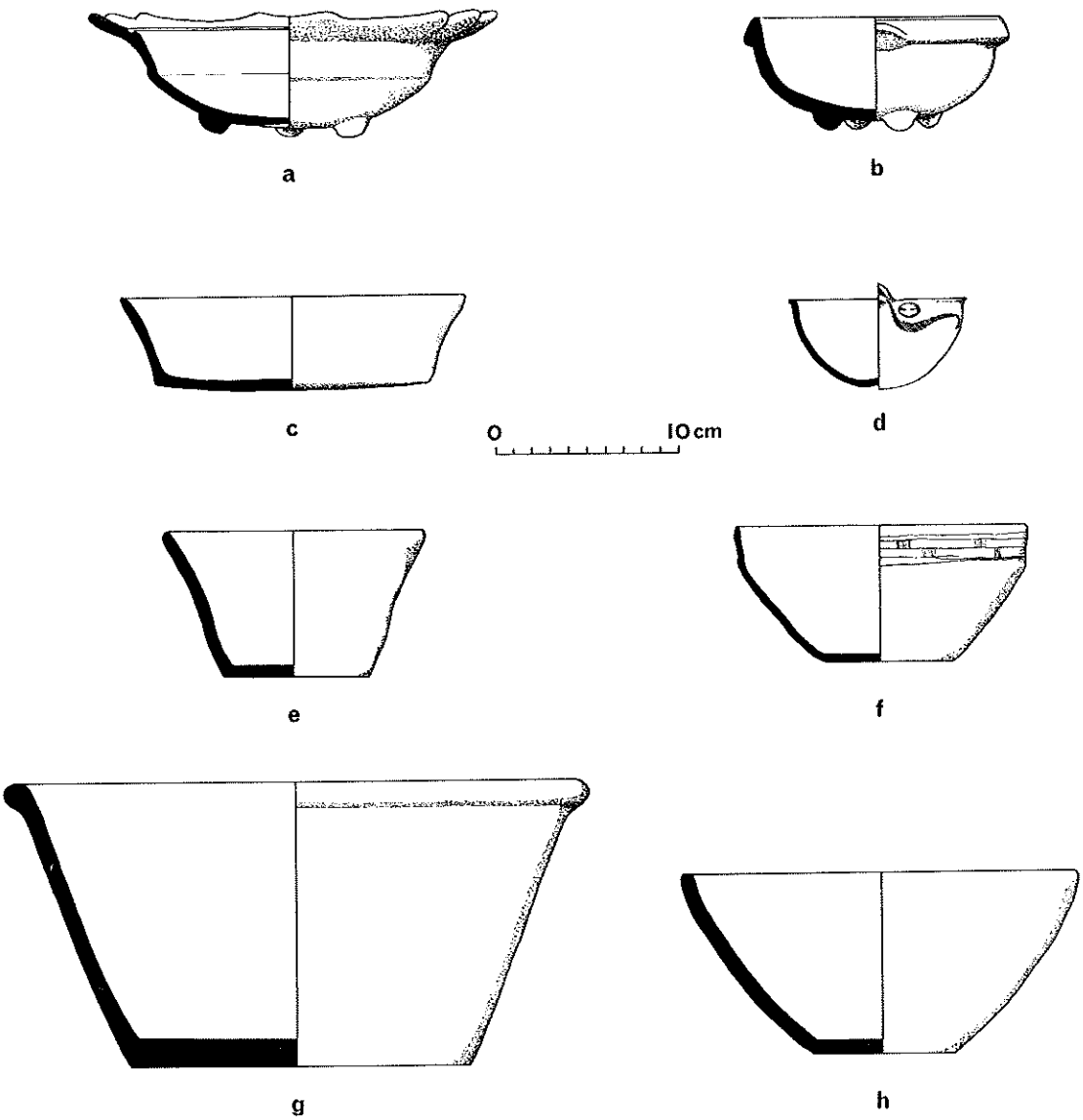


FIGURE 9: CERAMIC VESSELS - BOWLS

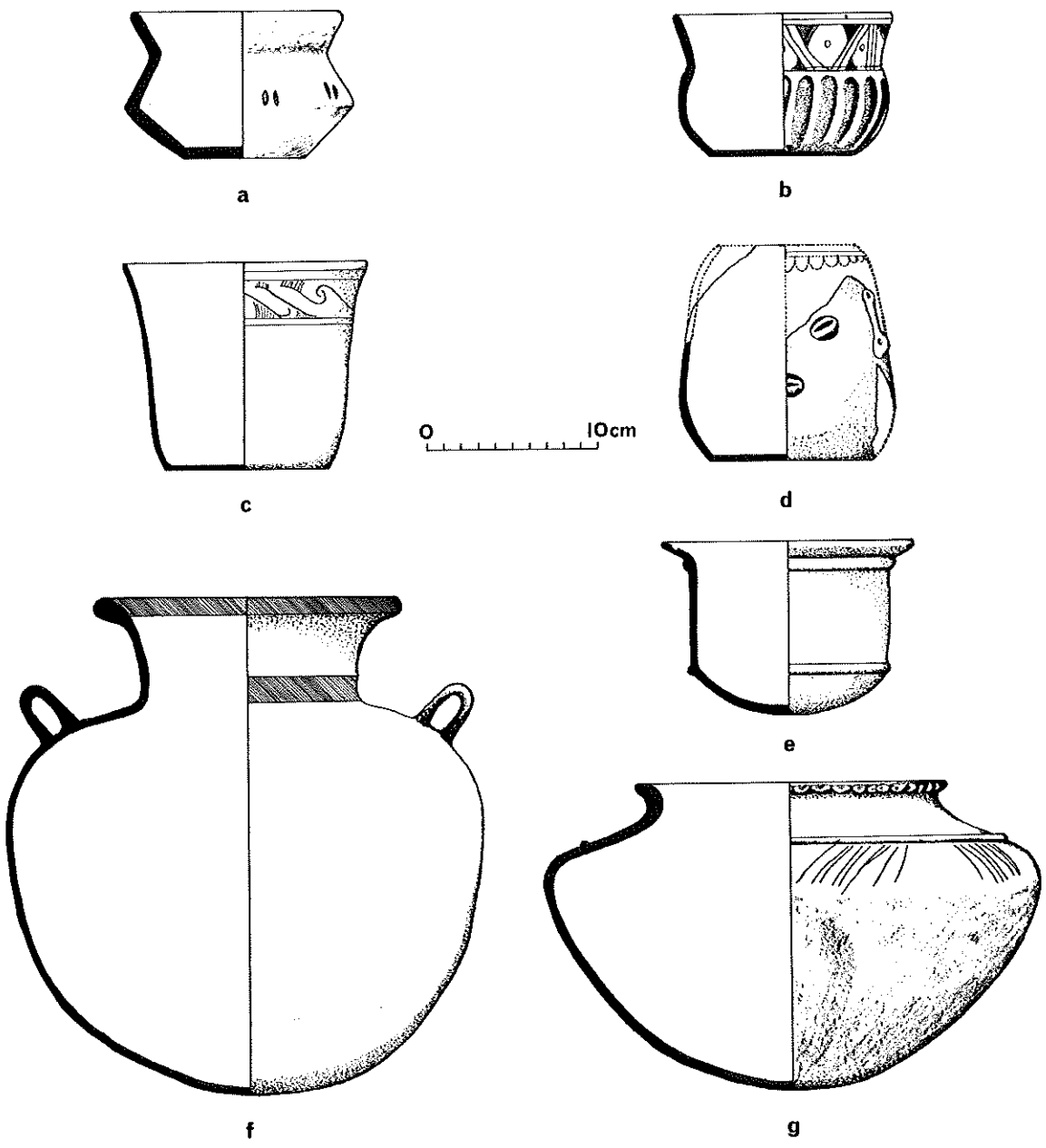


FIGURE 10: CERAMIC VESSELS - CYLINDRICAL AND CONSTRICTED VESSELS

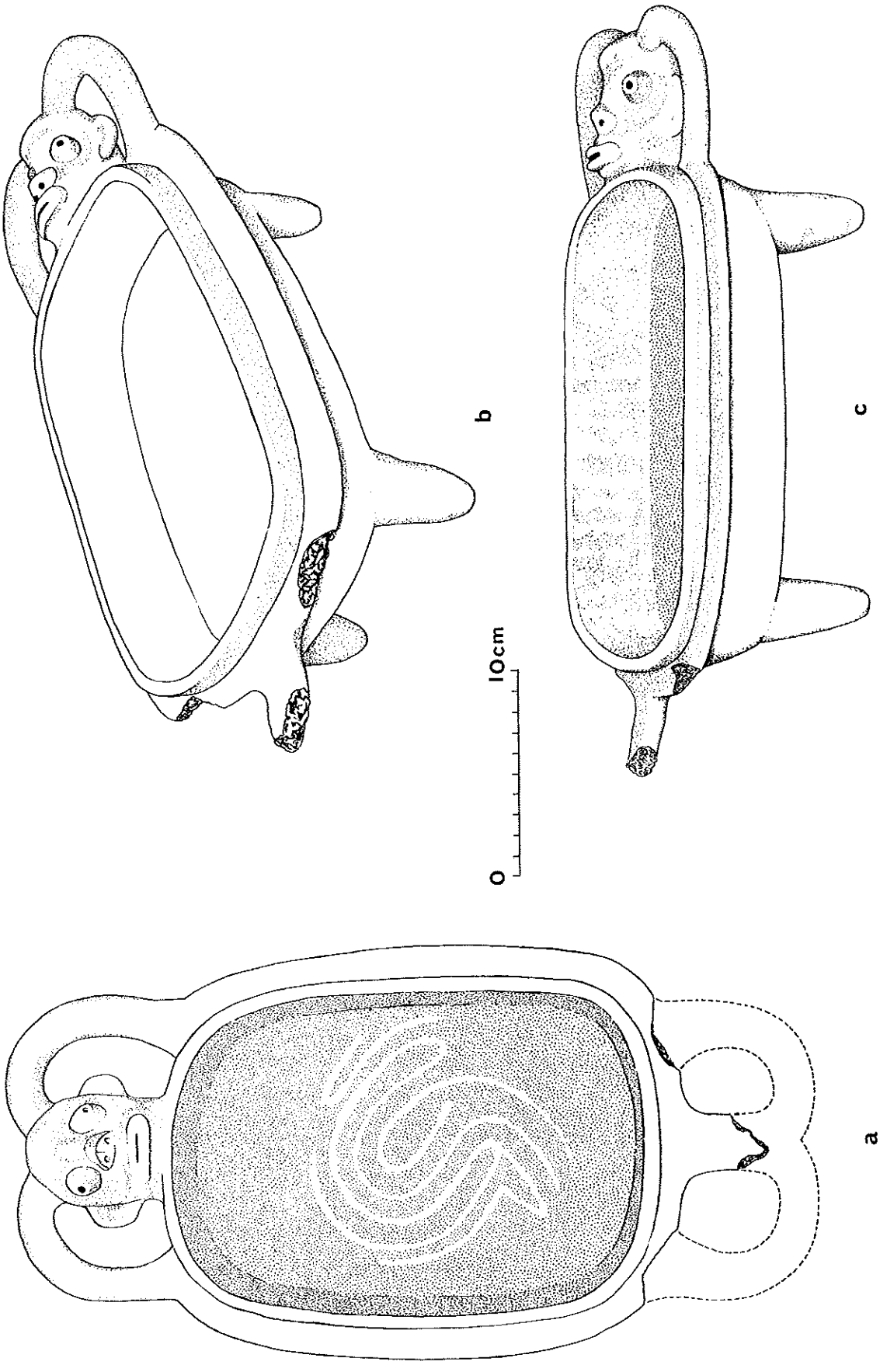


FIGURE 11: CERAMIC VESSELS - EFFIGY VESSELS

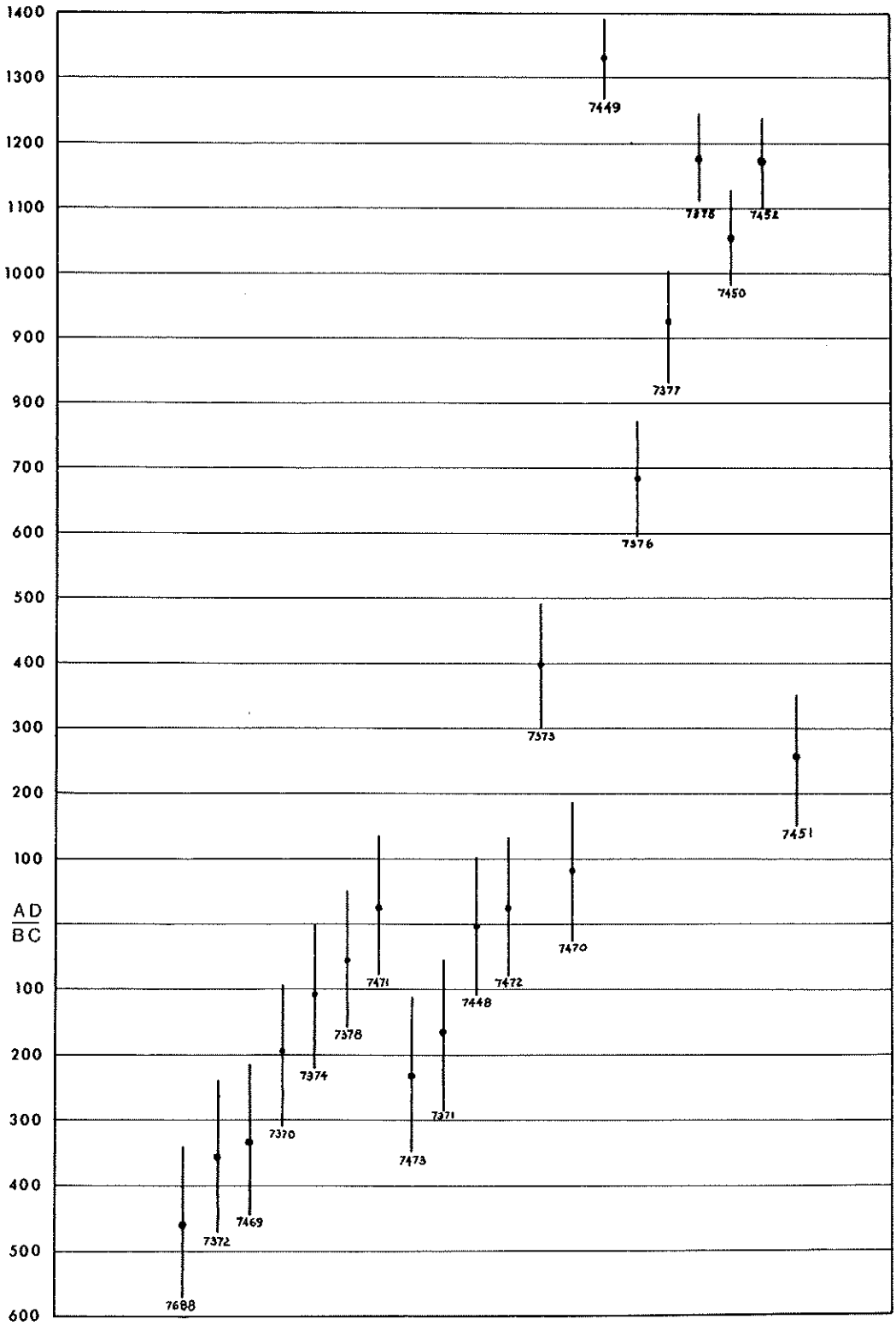


FIGURE 12: OBSIDIAN HYDRATION DATES

Stratum 1. Dark brown to black topsoil

Stratum 2.

a. Brown sandy clay with scattering of pumice particles mixed.

b. Brown sandy clay with moderate pumice particles mixed.

Stratum 3.

a. Dark brown soil

b. Soft, dark brown soil

c. Soft, gray soil

d. Loose, light brown sandy soil

e. Coarse yellowish brown arena and soil

f. Coarse yellow arena

g. Coarse tan arena with pumice

h. Hard, brown pumice-clay mixture

Stratum 4.

a. Hard dark brown clay

b. Hard reddish brown clay

Inclusions

Sherd

Pumice (P)

Talpetate (T)

Burnt Clay (C)

FIGURE 13: SOIL STRATIGRAPHY AT MOUND A-VI-6

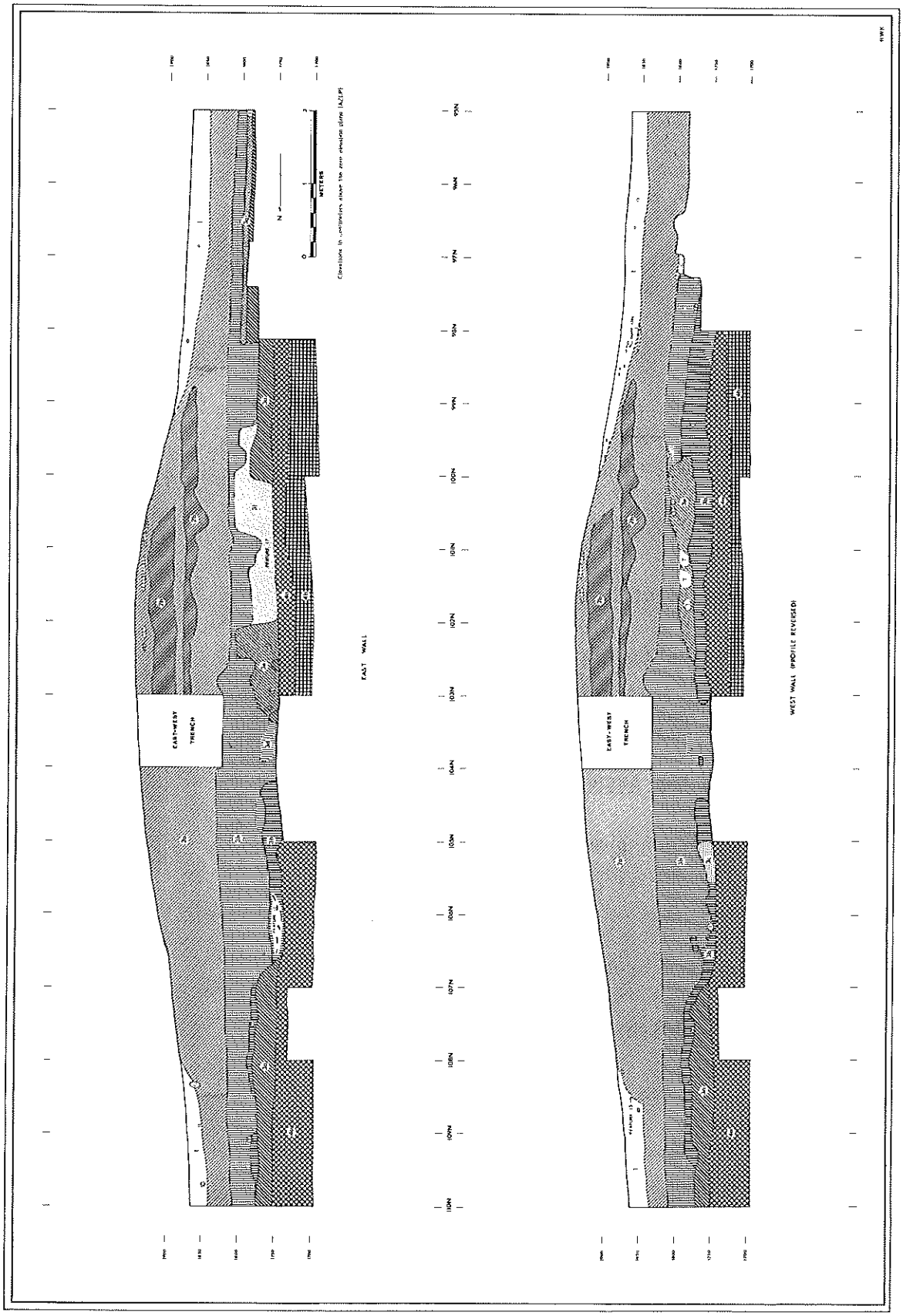


FIGURE 14: PROFILES OF NORTH-SOUTH TRENCH

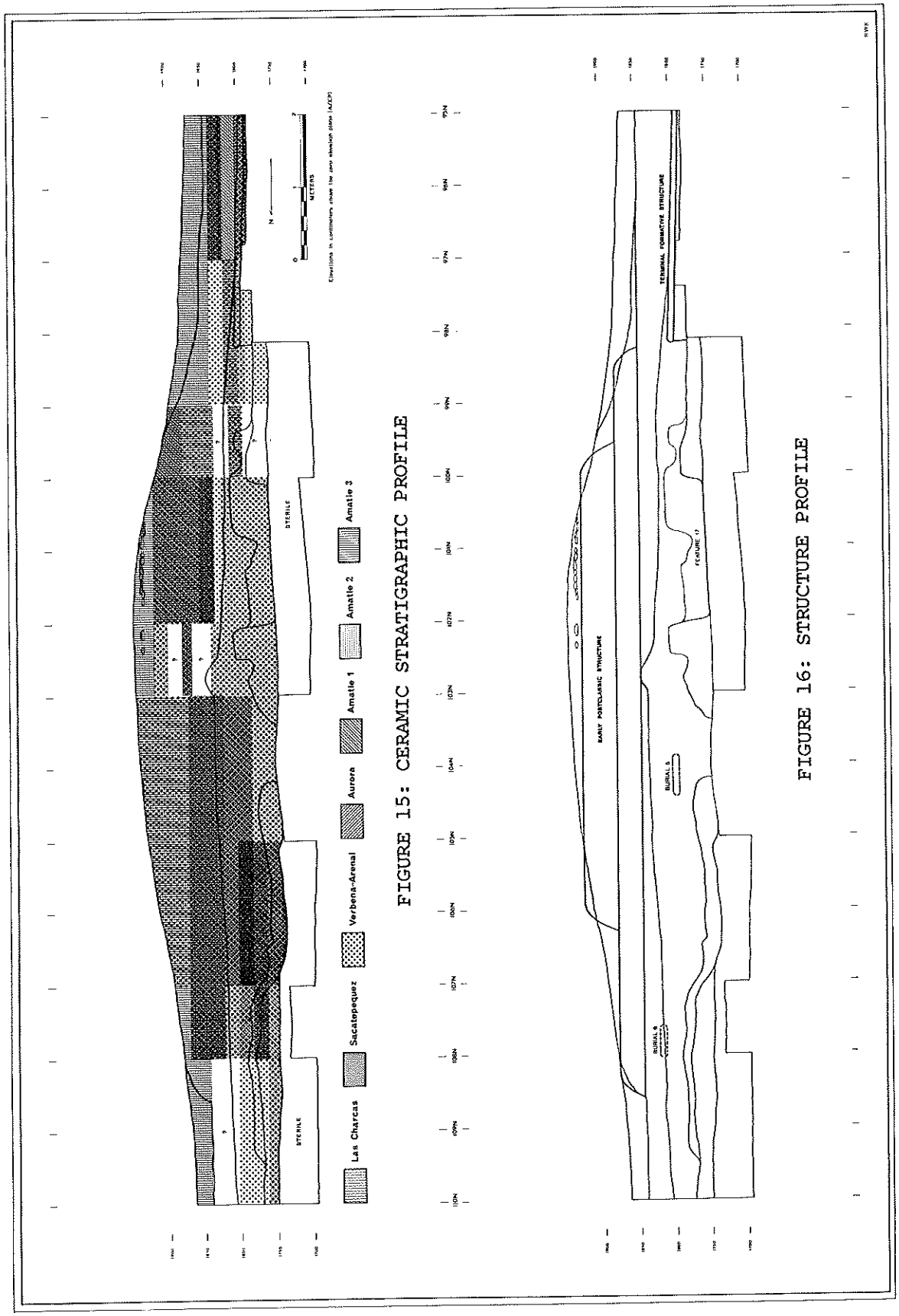
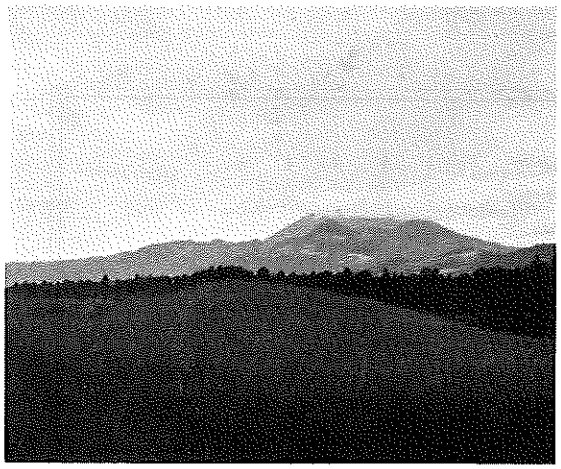


FIGURE 15: CERAMIC STRATIGRAPHIC PROFILE

FIGURE 16: STRUCTURE PROFILE



a. Mound A-VI-6, North Side

b. Burial 2, Mound A-VI-6

c. Burial 3, Mound A-VI-6

d. Burial 4, Mound A-VI-6

PLATE 1

THE B-III-5 MOUND GROUP: EARLY AND MIDDLE CLASSIC CIVIC ARCHITECTURE

by

Kenneth L. Brown

TABLE OF CONTENTS

	Page
INTRODUCTION	397
THE PROBLEM	398
METHODOLOGY: THE EXCAVATION	398
METHODOLOGY: DATA ANALYSIS	400
SITE DESCRIPTION	402
THE ARCHITECTURE	406
Mound B-III-2	407
Mound B-III-3	411
Mound B-III-4	416
Mound B-III-5: The Ball Court	417
Plaza 1	420
Summary: The Complex Through Time	421
DISCUSSION	423
Hypotheses Concerning the Origins of Ball Courts in the Highlands of Guatemala	424
Evidence Supporting the Early Classic Origin of Ball Courts in the Highlands of Guatemala	425
CONCLUSION	429
APPENDIX 1: Obsidian Hydration Dates	434
APPENDIX 2: Ceramic Phasing	438
APPENDIX 3: The Valley Ball Court Civic Centers	440
APPENDIX 4: Legend for Mound Profiles	442

LIST OF TABLES

Table		Page
1	Summary of Total Artifacts Recovered during Excavation	403

LIST OF FIGURES

Figure		Page
1	Contour Map of the B-III-5 Mound Group	445
2	Profile of the Wall of the Main (E-W) Trench through Mound B-III-3	446
3	Profile of the East Wall of the Main (N-S) Trench through Mound B-III-2	446
4	Profile, North Wall of the Main (E-W) Trench through the West Ball Court Wall	447
5	Profile, North Wall of the Main (E-W) Trench through the East Ball Court Wall	447
6	Tomb Containing Burial 1, Mound B-III-2b	448
7	Profile and Planview of Terraces, Mound B-III-3a	449
8	Cross-Section Reconstruction of the Terraces, Mound B-III-3a	450
9	Items on Floor of Mound B-III-3a	451
10	Superimposed Postholes and Floors, Mounds B-III-3a and B-III-3b	452
11	Planview of "Room", Mound B-III-3, South Side	453
12	Profile of "Room" Floor	453
13	Planview of Terraces, Mound B-III-4	453
14	Profile of Terraces, Mound B-III-4	453
15	B-III-5 Complex, Initial Phase of Construction	454
16	B-III-5 Complex, Second Phase of Construction	455
17	B-III-5 Complex, Final Phase of Construction	456
18	Orientation of Long Axis, Valley Ball Courts	457
19	Orientation of Long Axis, Early (Aurora) and Middle (Amatle 1) Classic Ball Courts in the Valley	458
20	Orientation of Long Axis, Late (Amatle 2) Classic Ball Courts in the Valley	459
21	Typical Mound Arrangement for the Terminal Formative Civic Center	460
22	Typical Mound Arrangement for the Early and Middle Classic Ball Court Civic Center	461
23	Typical Mound Arrangement for the Late Classic Ball Court Civic Center	461

LIST OF PLATES

Plate		Page
1a	View of Ball Court Playing Alley (Mound B-III-5), North End	462
1b	View of Ball Court (Mound B-III-5), West Side	462
1c	Ball Court Marker: Parrot Head with Horizontal Tendon (Mound B-III-5)	462
2a	Peten Polychrome Vessel (KJ70-7901, DOT 124) East Wall of Ball Court (Mound B-III-5)	463
2b	View of Mound B-III-2, North Side	463
2c	View of Mound B-III-3, North Side	463
2d	Feature 20, MoundB-III-3, Incensario and Rattle Balls on Top of Burnt Clay Floor	463

INTRODUCTION

The B-III-5 mound complex was excavated from June 26 to August 21, 1970, by the author with assistance from John Reynolds, under the direction of William T. Sanders and Joseph W. Michels, co-directors of the Kaminaljuyu Archaeological Project.

The decision to excavate this particular mound group was made after several factors were taken into consideration. Chief among these factors were: (1) the project's stated goals (see Sanders and Michels 1969: 2-4); (2) a group of Guatemalan businessmen had contracted to construct a supermarket over the site and were compelled to provide a majority of the work force necessary for the excavation. It was felt that to delay the excavation meant the complex would have been demolished with no archaeological work having been done on it; and (3) this was the last ball court at Kaminaljuyu (outside of Mounds C-II-4 and C-II-7 which are located within the Parque de Kaminaljuyu). Originally, there were twelve ball courts within the confines of Kaminaljuyu (A. L. Smith 1961; Shook and Smith 1942), only three of the others were excavated before they were destroyed (Shook and Smith 1942).

The B-III-5 complex--consisting of three mounds (one demolished to the modern ground level) and the ball court--was located approximately 750 meters southwest of the Parque de Kaminaljuyu. The mound group was situated on the western edge of a shallow depression thought by Shook to have been a lake during various stages in the history of occupation at Kaminaljuyu (Shook, personal communication). According to the Carnegie grid system the mounds of the complex were B-III-2, B-III-3, B-III-4, and both mounds forming the ball court were collectively designated B-III-5 (see Fig. 1 of Foreword).

The excavation consisted of intensive investigation of all three mounds; running a trench through the east-west axis of the ball court; and the placing of test trenches in the ball court walls, the playing field, and the plaza areas around the mounds. Approximately 150 excavation units were dug, nearly all to sterile, natural subsoil. Also, cuts into Mound B-III-2 and the east ball court wall, done during the construction of 4a Calle, were cleaned so that profiles could be drawn. A total of 133,317 artifacts were recovered during excavation.

It is the purpose of this report to describe the architectural features uncovered during the excavation, and is not intended to be a complete site report. Therefore, the artifacts uncovered will be mentioned only as they might be relevant to the question of the dating of the various constructional phases for each structure. An attempt will be made to reconstruct the architectural history of the entire complex.

Finally, an attempt will be made to integrate the data derived from several sources to form a coherent picture of Early and Middle Classic period architecture and settlement as demonstrated by the small ball court civic centers. That is, data was collected from: (1) surface surveys within the Valley of Guatemala (Shook 1952b; Davis 1968 and personal

communication); (2) surveys of other areas of the Highlands (Smith and Kidder 1943; Smith 1955); and (3) excavations carried out within the immediate environs of Kaminaljuyu relevant to the Classic (Shook 1952a; Webster, this volume; Cheek 1971).

THE PROBLEM

The B-III-5 mound complex was excavated so that we might gain a better understanding of Early and Middle Classic civic architecture and settlement pattern in and around Kaminaljuyu. Up to the time of the excavation no Early Classic civic centers had been investigated within the Valley of Guatemala and only a few Middle Classic sites (see reports by Webster, Ball and Reynolds elsewhere in this volume).

This report will analyze the data obtained from the B-III-5 mound complex excavation relating to architecture, and attempt to compare the results to A. Ledyard Smith's excavation of three ball courts in Kaminaljuyu, Shook's brief Cotio report, and with other, comparable sites within the Valley of Guatemala.

METHODOLOGY: THE EXCAVATION

Prior to the actual excavation of the complex, a surface survey was conducted. During this survey, a small ceramic collection was gathered and a sketch map made. The map was drawn for two reasons: (1) to gain a slightly more accurate conception of the size of and distance between the surface architecture than was afforded by the old Carnegie contour map and Espinoza's adaptation of it to the street map of the area, and (2) to plot in any artifact concentrations which occurred on, or could be observed from, the surface. From the map and the survey several problems became immediately apparent, and the actual excavation was organized to solve these problems, as well as the ones outlined previously. Some of these problems were: (1) had a low platform been built east of Mound B-III-3; (2) what function did B-III-2 have with the rest of the complex; (3) why did there appear to be no retaining wall which seems to be characteristic of Late Classic ball court centers in the Valley; (4) did the ball court have end walls; and (5) could anything be learned of Mound B-III-4 which is shown on both previous maps (Carnegie and Espinoza) but which was no longer visible above the ground surface. Once these, and other questions were formulated the actual excavation technique was worked out.

The day before excavation began, a grid system was layed over the complex. The northern base line paralleled 4a Calle, and was 20 cm south of the street's curb. From this base line grid north was determined to be 27° east of magnetic north. Before laying out the main trench, we determined that the basic excavation unit would be a 1 by 1 meter pit, which was to have a "flexible" orientation. That is, the long axis of the unit could be either

grid east-west or north-south depending upon what the situation called for as each pit was set up. It was further decided that the northwest corner of each pit would be the one from which the pit was designated. Thus, 22E/10N would mean that the northwest corner of that unit was 22 m east and 10 m north of the center point of the grid. No other excavation unit could be so designated.

In actual practice, the size of the excavation unit did vary depending upon the situation. For example, during the excavation south of Mound B-III-3 a very large trash pit was uncovered running along the eastern edge of two 1 by 2 meter pits. It was decided that the fastest way to excavate this dump was to dig a 2 by 2 meter unit along this eastern edge. That way we would avoid having to dig two 1 by 2 meter units, each in the usual 20 cm levels. Thus, while the size of each excavation unit was standard (with 95% of the units conforming to this size), it was not held to rigidly, and was dependent upon the situation as it was observed before the unit was staked out.

The main east-west trench was then set up. It was to be 1 m wide (north to south), and was to be taken down in 1 by 2 meter pits for a tighter horizontal control. This trench was set up so that its north wall was 20 m south of the northern base line of the grid. As can be seen from the contour map of the complex (see Fig. 7), this trench would pass through Mound B-III-3 just to the south of its center (and just north of two large tree trunks near its summit), as well as Plaza 1 and the ball court. This, it was hoped, would yield a long profile and enable us to determine how these three architectural features were integrated.

The northern wall of the main trench was then arbitrarily designated as being 0 north. This was done because it appeared to be a very easy way to organize the material once it was ready for analysis. That is, the main trench would then consist of all those units with __/0N as their designation. Further, all units north or south of the main trench could then be immediately differentiated from one another.

Grid center was placed along this trench in a position originally determined to be the point from which Mound B-III-2's main trench would start. (Though, once the road cut along Mound B-III-2's northern side was cleaned, it became obvious that this trench would have to be shifted nearly 2 meters to the east.) This point, then divided the site into four quadrants, which might further aid future analysis, and would keep unit designations from becoming confused.

To facilitate keeping elevations uniform and more efficient over the entire site, a vertical datum point was established. This was done by chipping a small hole into the top of a concrete manhole cover along the south side of 4a Calle. This point was then given an arbitrary designation of 20 m AZEP (Above a Zero Elevation Point). It was felt that no unit would go deeper than the zero elevation level, so that all elevations would be positive. This vertical designation system was chosen over the "cms BD" (centimeters below a vertical provenience datum point) because, for this type of excavation, it was deemed more efficient in facilitating the comparison of strata and feature levels within different units, for a fast glance at the respective elevations immediately yields comparative information.

The excavation was carried out in arbitrary 20 cm levels until natural, sterile soil was reached. Level one in each pit was used as a leveling device. That is, level measurements were taken from the highest corner of the unit. Therefore, level one, and, in a few cases, two and three, was not a uniform 20 cm below the ground surface throughout the pit, but, assuming the floor of the level was flat, all points along it were 20 cm below the unit's elevation point.

A system was employed which would record the provenience of special artifacts as they were uncovered during the excavation. In cases such as this, the artifact was given a special (DOT) number, and its exact horizontal and vertical provenience recorded in a special notebook. Then the artifact was placed into a bag by itself, its exact provenience recorded on the tag, and then sent into the laboratory to be catalogued. This system was also employed when proveniencing artifacts which were uncovered but not within previously designated excavation units. For example, artifacts recovered while clearing the burned adobe rubble from the summit of Mound B-III-3 were designated as DOT 27. This meant that they would be catalogued leaving the excavation unit blank, but, with the DOT number, thus, they would remain together with the provenience recorded. Individual radiocarbon and botanical samples were also given their own DOT number.

Before the actual excavation began the complex was given a number designation according to the grid system established by the Kaminaljuyu Project for both the site of Kaminaljuyu and the Valley of Guatemala (Sanders and Michels 1969: 7-11). The complex was given the number 46-22-229. This means that the site was within the boundaries of Kaminaljuyu, as the grid system was established such that all of Kaminaljuyu fell within Zone 46. Further, the 22 means that the complex was located very close to the center of the zone--though not necessarily near the center of Kaminaljuyu. The 229 sector designation was somewhat arbitrary since the complex passed through several sectors. However, Sector 229 was almost completely within the complex, more so than any of the others, so it was chosen. Using this zone-area-sector designation system, all materials from the complex could be easily and quickly separated from all other artifacts retrieved in the other excavations within Kaminaljuyu, as no other excavations could be so designated.

In an effort to determine the settlement pattern throughout the Kaminaljuyu archaeological zone, 1 by 2 meter test trenches were excavated. During the summer of 1970 several of these trenches were placed around the B-III-5 complex. The data recovered and noted by the various students involved with this project will be used in an attempt to determine the extent and density of the supporting population around the complex.

METHODOLOGY: DATA ANALYSIS

To facilitate the reconstruction of the various structures and construction phases which have taken place at the site, several types of analysis had to be done. The initial project was to trace all of the profiles compiled in the field so as to make one composite of each of the "main" trenches. To

avoid problems with matching soil zones (something which usually occurs when two or more people are doing the profiling), all profiles were gone over by this author before leaving the field. Thus, while the profiles may have been drawn by several different people, the definition of soil strata is uniform across the site, as they were defined by only one person.

Combining the above with the use of AZEP elevations all but eliminated another problem often faced when working with profiles drawn by different people at different times. This is the problem of differing elevations of strata between contiguous pits. When a profile was drawn, a secondary datum point was established in a corner of the wall to be profiled. From this point, usually established and marked with a nail, a string was stretched along the wall to the other corner, leveled with a line level, and attached to the wall. From this string the profile was drawn. Once the drawing was completed, the elevation of this secondary datum point was shot in relation to the primary vertical datum point. Whenever possible, a check for accuracy was made by refiguring the unit's initial elevation from the profile and rechecking to see that its elevation was what was originally determined for the unit. The difference was never greater than 2 cm and usually much less.

Therefore, in the construction of the composite profile drawings, very few serious problems were encountered, and those that were could be quickly cleared up. It was from these composite profiles, plus the measurements and notes taken while in the field, that mound and plaza reconstructions were made.

Unfortunately, the profiles of the various settlement pattern test trenches could not be treated in the same manner. There are several reasons for this: (1) the various students were quite variable in their abilities to distinguish soil changes; (2) the elevations of the test trenches were not recorded in relation to the mound complex's vertical datum; and (3) soil zones were not defined in a uniform manner as it was possible to do for the mound excavation, as I was unable to observe many of the trenches before they were back-filled. Thus, a direct comparison of strata was deemed impossible to do accurately, and the profiles were not used. Certain other types of data were used however.

During the winter, spring, and summer, of 1971, Dr. Ronald K. Wetherington and a small staff of students worked on the ceramic phasing for the entire Kaminaljuyu Project. It is upon this phasing that most of my site comparisons are based. The ceramics, along with what obsidian hydration dates that could be processed, were used to date all of the construction phases on the site. Once it was established what time periods the various constructional activities took place, scale drawings of the site during the latter part of that period were made. Further, the architecture of the site was compared with what is known from the various periods elsewhere within Kaminaljuyu and the Valley of Guatemala. The ceramic phases from the settlement pattern test trenches were used to give some idea of the settlement around the complex, and other Classic mound groupings, through time.

Obsidian hydration dates were run by Nancy Marshall, under the direction of Joseph W. Michels at the Obsidian Dating Laboratory, Department of Anthropology, The Pennsylvania State University. These dates were used to

substantiate and supplement the ceramic phasing. Appendix 1 is a listing of each obsidian date by number, the number referring only to the date's place on the chart which diagrams the date in order to show possible clusterings. Listed with the date is the micron value (from which the date was derived) and a brief statement as to what it was to have dated and where the date comes from.

Finally, other artifacts, such as whole vessels, are discussed only if they make some significant contribution to an understanding of the function of a particular structure, or toward establishing a structure's probable date of construction. Thus, specific artifacts are rarely mentioned within the body of the report. However, Table 1 provides a summary of total artifacts recovered during excavation.

All of the above data was collated and analyzed to see what information it might yield concerning such things as status differentiation, population settlement, and so forth, phase by phase, not only on the local (complex) level, but over Kaminaljuyu and the Valley of Guatemala as well. The results of this analysis are presented within the concluding section of the report.

SITE DESCRIPTION

The B-III-5 complex was located approximately 750 meters southwest of the main entrance to the Parque de Kaminaljuyu (see Fig. 1 of Foreword). Its physical boundaries at the time of excavation were determined by modern cultural activities rather than the activities of the people who built and occupied the site. That is, the complex was bounded on three sites (north, east, and south) by macadam roads and on the west side by a gasoline station. That these were not the original boundaries of occupation and construction at this site, as will be shown in more detail later, can be seen from the fact that the road (4a Calle) forming the northern boundary, cut through Mound B-III-2, both walls of the ball court, and destroyed Mound B-III-4 to modern ground level.

The complex originally consisted of three mounds and two "range" structures which formed the ball court. The tallest of these structures was Mound B-III-3 (Plate 2c). It stood approximately 2 1/2 m above the modern ground surface, though once the burned adobe debris had been cleared from the top of the mound the highest portion of the floor was only about 2 m above ground level. After the completion of the final construction phase, this mound was rectangular, approximately 17 meters long (north-south) by 12 1/2 meters wide. The accuracy of the east-west dimension is in doubt because of the more recent cutting along the west side of the mound, possibly for the adobe with which modern bricks are often made.

Mound B-III-2 (Plate 2b) was originally a rather large though low platform mound. At the time of excavation it stood only about 1 1/2 m above the modern ground surface along its eastern and southeastern sides. The dimensions were extremely hard to define because of both modern cultural activities (the road building and house construction) and the natural

Table 1

Summary of Total Artifacts Recovered during Excavation

Artifact Name	Material Code	Item	Sub-Item	Frequency
Rim sherds	1	1	0	13,216
Body sherds	1	2	0	103,184
Unclassified ceramic artifact	1	3	0	4
Burnt clay lumps	1	4	1	6,006
Burnt clay lumps	1	4	2	28
Burnt clay lumps	1	4	3	732
Burnt clay lumps	1	4	4	36
Burnt clay lumps	1	4	5	9
Clay figurines	1	5	0	319
Effigy sherds	1	6	0	37
Adornos	1	7	0	73
Effigy whistles	1	8	0	4
Clay beads	1	9	1	7
Clay beads	1	9	4	2
Clay stamp	1	10	1	9
Clay stamp	1	10	3	1
Rattle ball	1	11	0	17
Sherd disc	1	12	1	2
Sherd disc	1	12	2	12
Clay pendant	1	13	1	2
Clay pendant	1	13	2	1
Incensario	1	14	1	172
Incensario	1	14	2	32
Miniature vessel	1	15	0	1
Pottery vessel (whole)	1	16	0	40
Sherd abrader	1	17	0	2
Candelero	1	19	0	1
Candelero	1	19	1	4
Candelero	1	19	2	1
Candelero	1	19	3	8
Clay sculpture	1	20	1	2
Clay ear plug	1	21	0	6
Rim head vessel sherds	1	24	0	22
Obsidian blades	2	1	0	3,395
Obsidian flakes	2	2	0	3,591
Obsidian cores	2	3	0	30
Shaped obsidian artifacts	2	4	0	1
Stone building material	3	1	0	2
Unclassified stone artifacts	3	3	0	4
Mineral pigment	3	6	0	15
Quartz crystal	3	7	0	5
Green stone detritus	3	8	0	2
Soap stone detritus	3	9	0	9
Stone sculpture	3	10	0	4
Utilized stone cobble	3	11	0	19
Pumice	3	12	0	220

Table 1 (continued)

Artifact Name	Material Code	Item	Sub-Item	Frequency
Shaped mano	3	14	0	1
Shaped mano	3	14	1	4
Shaped mano	3	14	2	3
Shaped mano	3	14	4	1
Cylindrical mano	3	15	0	1
Pebble mano	3	16	0	2
Misc. non-artifact detritus	3	19	0	1,845
Hammer stone	3	20	2	1
Hammer stone	3	20	3	1
Abrading pebbles	3	21	1	1
Abrading pebbles	3	21	2	5
Abrading pebbles	3	21	3	26
Abrading pebbles	3	21	4	7
Shaped metate	3	23	0	2
Shaped metate	3	23	1	7
Shaped metate	3	23	2	1
Shaped metate	3	23	4	2
Shaped metate	3	23	7	4
Rubbing platform	3	24	1	1
Rubbing platform	3	24	2	1
Digging stick weight	3	27	0	1
Conical abrader	3	31	0	1
Lime stone	3	32	0	4
Thin stone slabs	3	35	0	3
Celt	3	36	0	4
Stone bead	3	37	1	1
Stone bead	3	37	2	1
Stone bead	3	37	4	1
Stone plug	3	38	0	1
Carved stone vessel	3	40	0	2
Basalt flake artifact	3	41	0	6
Chalcedony flake artifact	3	42	0	6
Stone figurine	3	50	0	1
Stone disc plaque	3	53	0	3
Radiocarbon sample	4	1	0	13
Radiocarbon sample	4	2	0	3
Unclassified bone	5	0	0	45
Bone bead	5	2	1	1
Human bone artifact	5	4	0	1
Human burial	5	5	0	3
Human cremation	5	7	0	2
Unmodified shell	6	1	0	1
Soil sample	7	1	2	3
Soil sample	7	1	3	2
Ecological specimen	9	1	0	3
			TOTAL COUNT	133,317

(Complete artifact code can be found in Table 1 of Foreword.)

slope of the land on this part of the site. As can be seen from the contour map (Fig. 1), it may be that the eastern side of the mound is the only one which has the original slope left. From surface appearances, and this proved to be the case upon excavation as well, the southern side shows considerable disturbance. The modern house and its associated out buildings were constructed on and around B-III-2 on this side, and it appears that they account for the lack of definition. Excavation demonstrated that B-III-2 was built into the slope of the land, to the point that it was almost a terrace rather than a mound (at least during the Middle Classic). Obviously the construction of 4a Calle destroyed a large section of this mound. However, the original contour map of Kaminaljuyu shows Mound B-III-2 to have been approximately 25 m on all sides and slightly over 2 m in height. At most, only 13 m of the north-south axis remained at the time of excavation. As will be demonstrated later, it would appear that this mound was never as large as the contour map suggests.

B-III-2 appears to have been "potted" and is the only one that was. A large depression was observed very close to what may have been the original center of the mound. I have no idea what was recovered--if anything--from that excavation, but had the pothunters moved southwest about 1 m, they would have come down on a tomb (Burial 1).

Concerning Mound B-III-4 only very little can be said. The construction of 4a Calle completely destroyed all but approximately 1 m along the southern edge of the mound. The old contour map shows this mound to have been nearly square, approximately 10 m on a side. It stood only about 1 to 1 1/2 m above modern ground surface at that time. Our excavation of this mound demonstrated that it was slightly over 7 meters in length along the southern side, though this may simply be the length of the stairway and not the mound itself. Further, the base of the mound was found to have been nearly 75 cm below the ground surface, giving the mound an overall height of approximately 2 to 2 1/2 meters.

The ball court was probably the most striking aspect of the complex (Plate 1a, 1c). This site was originally thought to have been built during the Late Classic. As Smith (1961) has pointed out, the typical ball court type constructed in the Valley of Guatemala during this period was the "palangana" type. Normally, these ball courts have all four closing walls of the same height, with no defined end-zones. However, this ball court did not appear to have had any end walls. If a north wall had existed, it was removed during the construction of 4a Calle. The south wall--again, if there had been one--may have been removed when an adobe brick house was built. However, there were no signs of its having existed on either the east or the west walls. A look at the Kaminaljuyu contour map shows the possible existence of a north wall, but not a south wall.

At the time of excavation, the east wall was almost 30 m in length and 5 to 6 m in width. The west wall was approximately 40 meters in length. Ten meters of which may have been added later, as a cut existed completely through the wall about 30 meters south of the 4a Calle road cut. Its width was 5 1/2 to 6 m. The west wall had the appearance of having been taller than the east wall, but this may be due to ground slumpage more than being an artifact of the original construction (T. Gray 1971). At any rate, the west wall was nearly 2 m in height, while the east wall was only about

1 1/2 m above the modern ground level of the playing field. The playing alley, before excavation, was between 10 and 12 m wide.

Plaza 1 was a rather irregular area defined by the west ball court wall and the three mounds. Its absolute boundaries were not discernible as it was not closed off by any type of retaining wall as is usual in the Late Classic civic centers (Borhegyi 1965). However, both possible northern and southern enclosures could have existed, but if they did they were destroyed by erosion (on the south side) and road construction (on the north). The Kaminaljuyu contour map gives no indication for there having been a retaining wall, though, since the contour interval is 1 m, such a wall might not have shown up. However, in areas of the site which did not seem to be overly disturbed, no retaining wall could be found. The lack of an enclosed plaza is interesting in light of the fact that this seems more typical of earlier complexes, at least in the Valley of Guatemala (Borhegyi 1965; Davis 1971).

Modern activities in the area, besides the construction of the roads and houses, had destroyed other sections of the site. The hardest hit were the ball court playing alley and Plaza 1 (see Fig. 1). Approximately half of the ball court alley had been removed down to and into the natural bedded arena which underlies this area of the complex. (This is represented by the shaded area on the contour map--Figure 1.) The major problem with using this area was the great amount of garbage (including a dead dog) which people in the neighborhood had thrown into the cut. But, while it was impossible (and undesirable) to excavate within this area, we were afforded a good view of the stratigraphy in that portion of the site.

Plaza 1 was both cut into and buried. That is, a large section along the outer edge of the west wall of the ball court had been cut away in much the same manner as the cut into the ball court's playing alley. This excavated area extended to the southern edge of the site--a distance of nearly 15 m. Further, a good deal of dirt seems to have been dumped into the plaza area, giving the impression of some type of structure. In fact, in the initial survey and mapping of the site, this area was thought to be the remains of a low platform or raised area within the plaza. Excavation revealed very disturbed earth down to just above the plaza surface--a depth of nearly 2 m. It was probably bulldozed onto the site during the construction of the roads to the north. Mound B-III-4 was probably destroyed at the same time, and may well have contributed to this overburden.

THE ARCHITECTURE

This section will discuss the architecture of the complex by individual mound through time. That is, by way of an example, Mound B-III-3 will be discussed as it looked during its various building phases. Finally, the section will conclude with a brief summary of the architecture and a description of what the site probably looked like through time. Where appropriate, reference will be made to the scale drawings found within this section of the report.

Mound B-III-2 (Plate 2b)

As has been stated, this may have been the largest of the mounds in the complex (excluding the ball court walls). This mound appears to have had two building stages, one very early in the Early Classic period and the other during the Middle Classic. Further, it does not seem to have been functional during the intervening years.

The profile of the road cut along the north side of the mound gave us our first indication of an internal structure to the mound. Stratum 11b on the profile appeared to be of the same dark brown puddled clay with crushed pumice inclusions as was found below it in Stratum 12, though with fewer inclusions and a more sandy, grainy, texture. However, 11b was visibly darker than the lower soil zones, and contained a great deal more organic remains, though the lower interface was not altogether clear in many places. This tends to give the impression that the upper face of this zone was very near the mound's original surface and, at one time, had had plants growing on it. The unevenness of Stratum 11b's upper surface argues for a fairly heavy, natural erosion, rather than its being the result of human activity (see Fig. 3). There would be no structural benefit, in this case, for such an irregular surface within the mound. This upper surface, on the north-south profile, for example, runs from an elevation of 19.58 to 19.34 AZEP in less than one meter lineally.

The ceramic phasing of Strata 11b and 12 generated only one rim sherd, out of 333 which could be typed (from a total of 683 rim sherds), that was considered diagnostic of the Aurora phase. The remainder of the sherds represented earlier phases (see Appendix 2). This would suggest an early Early Classic date for the deposition of these strata (Wetherington 1969).

A series of six obsidian hydration dates were processed from a randomly selected sample of the obsidian recovered from these strata. As can be seen in Appendix 1, these dates range from 565 $\pm$ 20 B.C. to A.D. 434 $\pm$ 93. However, two of these dates cluster between A.D. 341 to 417, while the remainder (excluding the two earliest) tend not to cluster at all. Combining this with the ceramic data (and the obsidian dates from these strata elsewhere on the complex), it would appear that these strata were deposited just after the beginning of the Early Classic.

There is, however, a question as to whether or not this represents a mound or whether it was merely a plaza area which was cut into the shape of a mound and built over several hundred years later (in this case, probably during the Middle Classic). Looking at the north-south profile (Fig. 3), it appears that this was a very low mound--possibly nothing more than a low lying house platform--during the early Early Classic. However, nothing remained of any refuse, terracing, or superstructure at the time of excavation.

A further problem, hinted at earlier, was that we were unable to determine where the ground surface was during this time period, at least not in direct contact with the mound, due to the house and road construction. However, using the data obtained from test pits placed in the main trench (east-west) southwest of the mound (within Plaza 2), strata containing ceramics

phased to the same time period occurs at a uniform elevation of approximately 18.40 AZEP. This is nearly 70 cm lower than the top of Stratum 11b in Mound B-III-2a at the time of excavation. Since this plaza strata is very flat and quite uniform in color and texture of its internal soil zones, it does not look to have been disturbed greatly from the time of occupation, and can probably be taken as very nearly the level of the soil surrounding Mound B-III-2a during the Early Classic (prior to A.D. 350), at least southwest of the mound. Further evidence for this being the case comes from the north-south profile itself. As can be seen in Figure 3, Stratum 11b runs gently downward, as one moves to the south, to an elevation of 18.59 AZEP at 4E/9N, which is 14 cm higher than the soil zone (11a) in OW/ON. (11a comprising most of the Early Classic strata within Plaza 2, as can be seen in Figure 3.) Seemingly undisturbed soil east of the house shows that Strata 11b and 12 tend to continue on into the soil zone 11a.

The evidence appears to argue for the hypothesis that there was a low platform mound approximately 10 m (east-west) by at least 10 m (though probably a little longer) north to south and some 75 cm in height. The mound being constructed just after the inception of the Aurora ceramic phase and, based upon other evidence to be presented later, prior to A.D. 350.

After the abandonment of Mound B-III-2a, probably before A.D. 400, it does not appear to have been reused until the late part of the Middle Classic. This is based upon the organic content of 11b and the lack of rebuilding or other artifactual evidence. However, there is definite evidence to demonstrate that the mound was rebuilt and used during the Middle Classic. The rebuilding activity consisted of the addition of Strata 16 and 17, using what remained of B-III-2a as a central core. Stratum 16 was a "blocky" mottled light brown sandy-clay with large (one to two inches in diameter) lumps of yellow-brown clay and talpetate. The interface with 11b was everywhere quite distinct. Stratum 17 consisted of large lenses of yellow sand-clay mixture which was extremely hard. The purpose of these lenses is not exactly clear, but they may have been an attempt to give additional support and cohesiveness to the structure. While Stratum 17 tended to be sterile, Stratum 16 yielded a fairly heavy amount of artifacts, some of which were rather large, indicating that this was a very poorly puddled clay. A majority of the sherds were Terminal Formative in date, while a few were as late as Middle Classic (two sherds out of 68 which were typed). Two obsidian hydration dates from this constructional fill cluster between A.D. 561 and A.D. 652. Thus, it would appear that this constructional unit was built very near the close of the Middle Classic--A.D. 700 (Parsons 1969; Sanders 1970).

No evidence for the prior existence of terracing or steps could be found in the profiles of this building phase; however, evidence did exist for there having been a superstructure. Almost immediately upon removing the overlying grass, large lumps of burned adobe were uncovered. Some of these fragments had post or stick impressions up to 10 cm in diameter. Directly beneath this rubble, which was the remains of a wattle and daub structure, was a rather cracked and broken burned adobe floor. This floor remained on only a small portion of the mound's summit due to the pot-hunting activity, erosion, and the road construction.

However, while little of the floor was found, three features of interest were uncovered in association with it. The first of these was a rather large, circular, clay-lined hole located very near the southern edge of the summit and very near the middle of the mound (east-west axis). This hole was very much like those found by Webster (elsewhere in this volume) in 1969 on Mound B-V-11, though this one was much smaller. It was 25 cm in diameter. The clay lining continued to a depth of 14 cm, but the hole could have been deeper since no fired clay-lined bottom was found. The hole was designated as Feature 28, and a small C-14 sample was taken from it. This "looked" very much like a posthole for several reasons, and was designated as such. Its size tends to argue for its not having served as a firepit (as Webster suggests his might have been) as it was simply too small and too deep. Another point is the feature's location. The floor only extended 3 cm to the south of the hole. There is the slight possibility that the floor could have eroded away, and may have originally extended farther to the south. However, the edge of the floor along this side was very uniform, and did not appear to have been badly eroded. Thus, if it were a firepit, it would have been dangerously close to the south wall of the structure. The clinching bit of evidence came when several large burned adobe fragments were found very close to this feature, each having the impression of a post which was from 19 to 23 cm in diameter. It would, therefore, appear that this was a posthole and the post it held was approximately 23 to 25 cm in diameter at its base.

The remaining two features probably belong together, these were: (1) a small, inverted, spiked incensario, and (2) a cluster of 13 ceramic "beads" and two small obsidian blades. Both of these features were situated on the floor less than 10 cm from one another, and approximately 1 meter northwest of the posthole (Plate 2d). The "beads" may have been the remains of a long destroyed rattle, as they were not perforated nor did they appear modified in any manner for suspension.

A second possible interpretation of this feature is that it represents the remains of a curing ceremony or a part of the paraphenalia for one. Michael Logan (1972) found, while working with present day native curers in Highland Guatemala, that the men he interviewed occasionally included as part of their "medicine bag" 13 "marbles" made--in some cases--of clay. The "marbles" were used in both the diagnosis of the disease and in predicting the future. Also included within the kit were several obsidian blades as well as, among other things, one or more rock crystals (Logan 1973). Two obsidian blades were found in direct association with the marbles, while two rock crystals were located in the wall rubble above the floor. Thus, it would appear that a rather close analogy might be drawn between modern native cures and the prehistoric activities manifest in the area; however, it would take more work in order to determine if this represents the storage of materials used by the occupant of the mound (thus, that the mound functioned as a residence and/or office), or whether this represents the remains of an activity conducted on the mound prior to its abandonment but which was not related to the "normal" function of the mound.

It would seem likely that the fire which appears to have destroyed this structure (as the entire soil matrix above the floor had a greasy feel and there were numerous small pieces of charcoal present) did so before the mound was abandoned, and, in fact, may have precipitated its abandonment.

No other evidence as to size, shape, or function of this mound could be found. There were no marks on the floor's edge, or on the floor itself, of other posts or walls. That walls and a roof existed can be seen from the numerous fragments of burned adobe which bear the impressions of small branches, but these will not yield much data on the size or shape of the structure. That this mound served a residential function--primarily--may be inferred (a priori) from its shape and height, but the presence of the incensario and the rattle beads, and the lack of any associated kitchen refuse, argue for a religious function. It remains a possibility that this was the place of residence for the chief and/or priest of the complex. Unfortunately, the data necessary for an accurate determination of the function of this mound was either removed or destroyed since the time the mound was abandoned.

Approximately 47 cm below the upper floor (burned adobe floor discussed above) in pits 4E/15-16N a second burned adobe floor was discovered. This was at first designated as floor 2, but was later defined as a cap over the tomb in which Burial 1 was uncovered. This burned cap was, on the average, 3 cm thick (floor 1 being only 2 cm at its thickest). Beneath this cap was a rectangular, with rounded corners, tomb oriented with its long axis north-south. It was 1.9 meters long by 0.9 meters wide (not including the ante-chamber). The walls of the tomb were made of burned adobe rising approximately 20 cm above the floor of the tomb. The elevation of the base of the tomb was 19.70 AZEP. Near the middle of the east wall, a "hallway" approximately 60 cm wide entered the tomb. The floor of this hallway was at an elevation of 19.85 AZEP, 15 cm above the base of the tomb. This hall then ran east from the tomb 60 cm to the base of a step which rose to an elevation of 19.98 AZEP. The burned adobe walls of the hall continued east for another 35 cm before both it and the floor terminated at a large "layer" of rock. This hallway had been capped by a burned adobe layer also (see Fig. 6).

The floor of the tomb appeared to have been lined with wood. Once the individual and the various grave offerings were placed on this flooring, the individual was set on fire. Upon excavation the bone was so badly burned that no orientation of the body, or bodies, could have been determined. However, some of the bone was recognizable enough to have been identified, and from this it was determined that while one of the occupants was human, the other may have been a small dog (Cheek 1970). The only grave offerings, aside from the dog, were two Amatle hardware vases, while probably whole when placed within the tomb, they were badly crushed at the time of excavation. These vases appear to have been placed into the tomb before it was set on fire because the contents of one, which was the bone of some type of animal, was as badly burned as that of the tomb's occupant(s).

Thus, we have two constructional and occupational stages for Mound B-III-2. The first of these, called B-III-2a, was constructed very early in the Early Classic (prior to A.D. 350). At that time the mound was a low platform which may have served as base for a house, the remains of which have eroded away. The second construction phase occurred during the late Middle Classic sometime between A.D. 561 and A.D. 652 (though probably late within this time span). At this time the mound was built into the natural slope of the land. It had a summit area which measured 10 m (north-south) by 8 m (east-west). B-III-2b was nearly 3 meters above the plaza surface east of the mound, but only about 1 meter high on the west side. Unfortunately, no

signs of a stairway or terracing could be found. This mound appears to have supported a small structure which may have served a religious or residential (or both) function.

Mound B-III-3

This mound appears to have undergone at least three stages of construction and use, though the first of these probably was not the construction of a mound. At an elevation of 1814 AZEP a very well preserved floor was unearthed. This floor was made of three layers of crushed and firmly packed talpetate with two layers of firmly packed yellowish arena interspersed between them, thus, giving a "layer cake" effect. This, according to Bebrich (1970), is a typical Terminal Formative floor. Below the floor (see Fig. 2) was a thin layer of dark brown sandy-clay (Stratum 11) which was directly on top of a layer of dark brown clay with numerous small pumice inclusions (Stratum 12). Stratum 12 was exactly like that which formed a majority of the fill of Mound B-III-2a.

As with Mound B-III-2a, Strata 11 and 12 contained a very small amount of Aurora phase ceramics. The remainder were types which occur earlier in the ceramic sequence. This, along with the evidence of the soils, demonstrates a contemporaneity with the construction of Mound B-III-2a. Thus, it would appear that this floor dated to the very early Early Classic, again, prior to A.D. 350.

Unlike B-III-2a, this floor did not appear to have been raised. In fact, it was lower than the upper surface of Stratum 11b in B-III-2a as well as Stratum 11a in the area of Plaza 2. Instead, it would appear, based upon the east-west profile through Mound B-III-3 (Fig. 2), that this represented what was left of a plaza surface which had been constructed at the same time as B-III-2a.

A question is raised by the presence of this floor. Why had it not eroded away before further building operations were begun over it as was the case with B-III-2a? The answer to this question appears to be that very soon after upkeep of this floor ceased, a small mound was constructed over it, sealing it, and thereby protecting it from erosion. In the construction of Mound B-III-3a, only a very small section of the floor was left intact, the remainder (at least on the eastern side of the mound) was dug through when Plaza 1 and the ball court were constructed.

B-III-3a was a small, terraced pyramid approximately 15 meters (north-south) by 10 meters at its base, and stood nearly 3 1/2 meters above the floor of Plaza 1. The construction of this mound appears to have been a rather laborious process. First, a layer of brown to dark brown sand to slightly clayey sand (Stratum 7) was placed over most of what remained of the floor. Then a layer of lighter brown clay (Stratum 8) was placed over the eastern section of the floor and most of Stratum 7. Finally, this unit was leveled with more of the same soil which comprised Stratum 7. For support, guarding against any slumpage, a burned adobe retaining wall and talpetate blocks were added. The talpetate ringed the mound, while the retaining wall appears to have been confined to the west and north sides of the mound. The

matrix in which the wall and blocks were set (Stratum 6) was an extremely hard, very well puddled brown to yellow-brown clay with some crushed pumice and talpetate inclusions. Covering all of this was a grayish-brown sandy clay which had a small amount of crushed pumice within it (Stratum 4). Finally, a unit of brown clay to very slightly sandy clay was placed over the entire mound (Stratum 3). This served as the final outer surface of the mound as far as could be determined during the excavation.

That B-III-3a was terraced could be seen in pits 20E/6-9N, in which five terraces surfaced with burned adobe were discovered, and two more were found in the east wall profile of 20E/6N (see Figs. 7 and 8). Terrace a, the lowest and which may represent a portion of the plaza surface rather than an actual terrace, was in very poor condition at the time of excavation, with only small, scattered portions of it remaining. Terrace b had a riser of approximately 22 cm and a tread of nearly 60 cm at its widest. The burned surfacing was in fairly good condition, though badly cracked, with a large number of very small pieces of charcoal adhering to the surface. Terrace c had a riser of 16 cm with a tread of approximately 30 cm. The surface of this terrace was nearly as well preserved as that of terrace b, and there were small, widely scattered flakes of charcoal adhering to it. Terrace d was all but missing, revealing the ring of talpetate mentioned earlier. However, a small portion of both the riser and the tread were present, with the riser being nearly 70 cm while the tread was 20 cm. Judging by the slope of the remaining terraces the riser for terrace d may have been at an angle of 20 to 22 degrees. Had it been perpendicular to the tread of terrace c the tread of d would have been almost 50 cm. Terrace d was probably broken off prior to or during the construction of B-III-3b. With terrace e the riser had a 16 to 18 degree angle and rose approximately 50 cm. It had the narrowest tread being only 6 to 8 cm. The riser surface was well preserved, but only a very small section of the tread was burned, and this was very badly cracked and broken. Terraces f and g, only the riser of g since the tread formed the mound's summit, were found only in the profile of the east wall of pits 20E/7-6N, and existed only as the interface between two soil zones (Strata 2 and 3). F appears to have had a riser of approximately 40 cm and a tread of 20 to 22 cm. G had a riser of nearly 50 cm. Both of these terraces had risers with an angle of 21 to 22 degrees.

It appears likely that the western side had seven terraces, the eastern half of the mound had one more which extended nearly four meters east from the base of B-III-3a, though only along the eastern side of the mound. This terrace or "apron" was half a meter above the plaza surface. The surface of the natural soil along the eastern half of the mound had been cut away during the construction of B-III-3a and Plaza 1. That is, the clay was removed, possibly for use in the construction of the mound itself, to a depth of nearly 1 meter below its level to the west of the mound. This drop was very sudden, so that the western half of pit 22E/9N reached natural soil within 30 cm of the ground surface, while in the eastern half it went down another 75 cm. This would have necessitated the apron (or another terrace at least) in order to have kept the terraces level east to west.

It is interesting that only in pits 20E/7-9N, and for a very short distance east into pits 22E/7-9N, did this terracing appear. In no other area (particularly in the main east-west trench through the mound) was this

feature observed. This, plus the extremely poor condition of the burned surfaces, and the high amount of small charcoal flakes adhering to the terrace surfaces, led to the hypothesis that this mound (B-III-3a) was originally terraced, but was not surfaced with burned adobe. Rather, the firing was accidental in nature, and happened very late in the use of B-III-3a. Substantial support for this hypothesis came from Feature 42 located in the western end of pit 24E/9N. Resting in a shallow depression in the natural arena was a very large concentration of burned adobe fragments and charcoal. An extremely large C-14 sample (which has just recently been submitted for analysis) was taken from the still identifiable remains of a log which was approximately 20 cm in diameter and 40 cm long. It, therefore, appears likely that the superstructure of B-III-3a burned and collapsed northward with a great deal of the burning material coming to rest upon the terracing of the mound, firing the clay surface. The burned rubble was either moved to be used as fill in the low area before B-III-3b was constructed, or, once it hit the ground it followed the slope of the soil coming to rest 2 to 3 meters east of where it fell. Of course, a combination of these processes might also have taken place.

Conclusive evidence for the existence of B-III-3a did not appear until late in the excavation, though signs of it were seen earlier. For example, the terracing did not seem to "fit" with the floor later designated as the floor of Mound B-III-3b, but to that time it was the only floor we had uncovered. However, the feeling that this lower floor and mound existed began when pit 22E/0N was being excavated. This pit was started because, while clearing the floor of B-III-3b in the area, the entire rim of a vessel could be seen where the floor had eroded away. Once cleared to a depth of nearly 30 cm a large number of whole and reconstructable vessels were recovered (see Fig. 9). This ceramic concentration included: (1) one whole brown-gray "water jar" with the handles broken off and placed inside; (2) a mud ware flat bottomed bowl which had been inverted over the water jar; (3) to the immediate west were three or four fully or partially reconstructable mud ware bowls--all of the handled variety; (4) along the north wall of the pit (less than one meter away) were four reconstructable polished black bowls; and (5) a small group of sherds which represented what was left of another mud ware bowl, also along the north wall. All of these vessels had the same elevation, and were sitting on a soil change, the interface of which was very flat.

Additional, and rather conclusive, proof came when the very large posthole associated with the floor of B-III-3b was cleaned in an attempt to find its depth. Approximately 28 cm below the floor a flat burned adobe floor-like feature was uncovered. In the southwest quadrant a lower, smaller posthold was uncovered (see Fig. 10). This lower posthole was 28 cm in diameter and at least 14 cm in depth. That it could not have been an extension of the larger posthole can be seen from both its smaller size and the fact that it is offset under the larger hole. Upon clearing further, a section of a badly preserved burned adobe floor approximately 1.9 meters by 1.8 meters was uncovered (see Fig. 10, the section of the lower floor which was uncovered is shaded). This floor was within 2 cm of the elevation of the soil change noted in 20E/0N, and "fit" with the terracing.

The dating of the construction of B-III-3a, taken by itself, is inconclusive. That is, the ceramic evidence suggests a date sometime during the Middle Classic--Amatle 1-Esperanza ceramic phase (Wetherington 1969; Parsons

1969), in that approximately 8% of the typed sherds could be phased to Aurora through Amatle 1, none are necessarily later. This, alone, would place the construction as post A.D. 500 (Sanders 1971). Of the four obsidian hydration dates listed within Appendix 1, only one of these dates falls near this time, the remainder are all much too early. However, based upon other evidence (best presented within the summary section of this chapter) the construction of B-III-3a probably dates to between A.D. 495 andA.D. 540.

The construction of Mound B-III-3b seems to have been a rather simple affair. A layer of brown clay (Stratum 2) was added over the entire pre-existing mound, bringing it to approximately 17 m by 12 1/2 m (east-west), at its base. This is an approximation because as observed within the north-south trench into the mound (20E/7-9N) the brown clay stratum was badly eroded and probably did not reflect the original mound surface. The southern edge of the mound was determined by the wall of Feature 12 (a possible room). Unfortunately no terracing could be recovered from this construction phase.

The wattle and daub superstructure appears to have burned and collapsed directly downward, as seen by the fact that 38 cm of burned adobe fragments and charcoal overlay the floor across nearly the entire summit of the mound. Directly beneath this rubble the floor was a very well preserved and well burned (though rather irregular) adobe 5 by 3 1/2 meters. Unfortunately this floor had no pottery or artifact concentrations of any type resting upon it. It is possible that the structure may have been cleaned before it was destroyed. However, two architectural features were associated with the floor.

The first of these was designated Feature 9, a very large adobe lined posthole. The dimensions were 47 cm by 53 cm by at least 15 cm. Though the depth could have extended to 28 cm the adobe lining was only found to a depth of 15 cm. The question can again be raised as to whether something as large as this might have functioned as a posthole. For this feature, two aspects of the walls would suggest a posthole. First, the walls were not exactly straight. That is, the upper 10 cm along the north wall sloped gradually to the south, while along the southern portion of the wall the upper 9 cm had a definite slope to the south as well. This gives the impression that at some time in the past something in the hole shifted its position and became tilted to the north, creating a slightly oval hole. Secondly, and more substantially, an area along the eastern section of the wall bore good impressions made by a very large piece of wood. The impression seemed to have been made by a piece of wood close to 44 cm in diameter.

The second architectural feature associated with the floor was what appeared to be a well fired adobe "step" located on the floor along the western edge. This step was approximately 75 by 50 cm, and was broken at both ends, so that at one time it was longer. The function of this step was almost impossible to determine from simply observing it. Its location on the floor might lead to the hypothesis that it served as the base for the wattle and daub superstructure. However, no signs of wattle work could be found on the step, nor did it seem to be attached to the floor. So, while the location is correct for a wall base, no signs of this having been the function could be observed. Thus, this hypothesis remains problematical until more Classic mound floors in the Valley of Guatemala can be excavated and it can be seen how often and in what location these "steps" occur.

One other architectural feature appeared to be associated with Mound B-III-3b; a room or very large terrace located on the southern side of the mound. This burned adobe floor was first discovered when a tree trunk was removed, and the wall of the hole was cleaned. Upon complete excavation it was found that the floor was a rather irregular (along the southern and western sides) surface nearly 5 1/2 meters long (east-west) by slightly over two meters at its widest (see Figs. 11 and 12). That it originally extended further to the south is probable but the very heavy erosion and the tree's root system had removed all traces of its existence outside of what was excavated. The northern wall of this "room" or terrace rose 20 cm above the floor before stopping. None of the adobe appeared to "corner" and run northward at the top of the wall, which might have given evidence of a higher terrace.

The question of the function of this feature was, and is, intriguing. At first it was designated as simply a wide terrace of Mound B-III-3b; however, in pit 24E/7S a possible step was uncovered. This step was half way between the apron surface and the floor of the feature. Thus, the hypothesis of a room rather than simply a terrace was proposed. However, this step may represent the remains of a still lower terrace that ran around the eastern side of the mound (as well as those portions of the north and south walls which are in the plaza) above the apron. Unfortunately, so little remained of the step that its function is still uncertain, and it could have functioned as both a step and a terrace.

How this rather complex feature came to be burned is another question. If a wattle and daub structure had been built over the upper terrace, when it was destroyed it might have caused the firing of the clay surfacing of both the terrace and the step. Evidence for this actually having occurred is poor, but some adobe was found which had impressions of small branches. Whether or not these were from the superstructure of B-III-3b could not be determined as their location--on the plaza surface to the east of the terraces--could have been caused by either of the proposed structures having been destroyed. Further, the burning of the terrace (room) surface could have been caused accidentally in much the same manner as the terraces of B-III-3a. However, none of the upper terraces (assuming their existence) were burned, which might suggest a more localized firing. That is, the destruction of a small structure associated with the lower terrace (the room) and not any of the higher ones. Artifacts on the room surface were rare, and there were no postholes or hearths associated with it. Thus, the question remains unanswered, but does appear to favor the hypothesis that a structure of some type, possibly a storage room, was built in this area, possibly under an already existing terrace.

The dating of Mound B-III-3b's construction, as well as that of the "room" to the south, is rather inconclusive if merely based upon the information from these structures themselves. Ceramics from the construction fill of B-III-3b contains a small percentage of Amatle 2 sherds. This would mean that the fill could not have been deposited prior to the Middle Classic (Wetherington 1969), which is generally accepted to have begun around A.D. 400 (Sanders 1970; Parsons 1969). Some of the ceramics known to have been resting on the floor of the "room" are also Amatle 2 in date.

Unfortunately, the two obsidian hydration dates from the debris above floor B-III-3b do not cluster enough to allow a decision on an absolute date. The situation in the "room" is even worse. As can be seen in Appendix 1, six dates were run, and they span from 286 ± 113 B.C. to A.D. 841 ± 80.

Based upon data taken from the site as a whole, however, it is probable that the construction of B-III-3b took place sometime between A.D. 660 to 719. The room was probably constructed at the same time. This estimate is based upon a summary of the dating data which is presented within the final section of this section.

Thus, it would appear that B-III-3 underwent three constructional and occupation phases. The first of these occurred during the early Early Classic, when a well prepared floor was layed down. This was probably a plaza surface rather than a mound, since it did not appear to have been raised above the surrounding ground surface. The second phase of activity was the construction of the mound itself. This was a rather small, terraced mound which supported a small wattle and daub structure. Based upon the ceramics present on the floor of this structure, it probably served a residential rather than ceremonial function. This mound was constructed during the Middle Classic, between A.D. 495 and 550. Finally, B-III-3b was built. This mound appears to have been a rather simple rebuilding of B-III-3a, and also supported a wattle and daub structure. At the same time--very near the end of the Middle Classic--a room, possibly for storage, was constructed south of the mound.

Mound B-III-4

As stated earlier, only a very small amount can be said relating to the size, shape, height, and function of Mound B-III-4. However, what little was uncovered shows a different method of construction for this mound, and this might relate to a slightly different function.

Figure 13 shows what remained of this mound at the time of our excavation. It appears, based upon size, that what was left of the mound were the lowest steps and the plaza surface as it articulated. These steps were surfaced with a very thick, well fired adobe (see Fig. 14), over a good portion of them, and ran for a distance of 7 meters (east-west). The posthole noted in Figure 14 would appear to post date theuse of the mound, since the cut into the burned clay was sharp and was not smoothed around the inside as with the postholes previously described. This firing appears to have been purposeful rather than accidental as was the case with B-III-3a. It seems, then, that a good deal of work went into the surfacing of this mound, more so than went into the other mounds.

That this extra work was related to the function of the mound is possible. A small midden area (Feature 14) was found to the west of this mound. While most of the material recovered was burned adobe, a great deal of charcoal (two C-14 samples were taken--one from the remains of a burned log), ceramics, and a cylindrical mano were recovered as well. This might indicate a residential function for the mound, possibly that of the chief. Though

because of the tremendous destruction, the evidence for any conclusive statements in this regard is lacking.

Unfortunately, nothing can be said concerning any internal structures in this mound. We appear to have uncovered the final construction phase, and, as Figure 14 demonstrates, we could not get far enough into the mound to determine whether there could have been any earlier construction phases or not. The profile of the soil above the burned clay surfacing shows a very rich, black loam, not a typical mound fill. Earlier construction seems probable, based upon the other mounds and the ball court, but is not proven.

One of the charcoal samples was submitted to Isotopes Inc. for radiocarbon dating. The specimen was catalogued as KJ70-9459 and received an Isotopes Lab Number of I-6246. The specimen came from Square 24E/9N, Level 4 (1969-1690 cm B.D.), Feature 11. Using a half-life of 5730 years and the MASCA Correction Table (Ralph 1971: Table 1.5), the sample dates somewhere between 641 A.D. and 827 A.D. This would suggest that the mound dates no earlier than the end of the Middle Classic period (700 A.D.).

Mound B-III-5: The Ball Court

In the following discussion of the architecture of the ball court, it will be treated as a functional unit. That is, the description will center on the ball court as a whole, rather than a discussion of each of the three aspects which combine to form it (the two walls and the playing alley).

Construction in the area of the ball court began with the laying down of a floor exactly like that found within B-III-3. As can be seen in the long east-west profile through the ball court (Figs. 4 and 5), both walls contain floors but at different elevations. In the west wall the elevation was 16.70 AZEP, while in the east wall it was at 15.12 AZEP. Both of these are below the elevation of the floor in B-III-3.

One of the more interesting aspects of this feature was the "wall" and superimposed floors seen in the east wall profile (Fig. 5). This low retaining wall may have served to keep "flood" waters from the lake which occupied the large depressed area east of the complex (Shook 1970). While the superimposed floors east of this retaining wall probably represent successive floors giving access to the lake.

Unfortunately, during the construction of the playing alley, as well as the lower portions of the walls, the floors were dug through. Thus, we are unable to say how they originally articulated. However, it does not appear that they were raised areas, and were probably not mounds. The fact that both floors lie directly on top of fill identical to that found in B-III-3 (Strata 11 and 12) might argue for their having been built contemporaneously with the B-III-3 floor and one another. All of this suggesting a rather extensive and elaborate plaza area, with possibly three terraces. The hypothesis that the plaza might have been terraced comes from the observation that all three floors are at a different elevation, and that the natural ground surface slopes greatly as one moves from west to east across the site. Therefore, when the plaza was constructed the farther east they

proceeded, the higher they would have had to build up beneath the floor to keep it level. At the end they would have been approximately 3 meters above the proposed surface of the lake. A downward sloping floor, that is, one which was not terraced and followed the slope of the land, might have been the case, but this would have greatly aided natural erosion and extensive yearly repairs would have been necessary. With a terraced plaza the repairs necessitated by erosion would have been lessened considerably.

Under this floor in the east ball court wall were several (three in the area excavated) small trash pits, one of which included Burial 2. This interment appears to have been the tightly flexed, primary burial of a young (probably adolescent) female (Weynes 1971). Weynes reports that no long bones were found with intact epiphyses, which might indicate an age prior to 16 or 17. Further, the lower second molars appeared to have erupted through the gums, though they showed no wear, according to Weynes (1971: 4). Therefore, age at death would appear to have been between 12 and 15 to 16. The orientation of the body was with the head to the south. The remains were, apparently, layed in the grave in such a manner that it was lying on the left side. The skull was not included with the rest of the bones, though the mandible was. The reason for this absence can only be conjectured at this time, but "free skulls" do appear in burials of other individuals at this period in time (see Kirsch, this volume) and the skull of this individual may have been so disposed of. No grave goods were found in association with this individual, except for the single clyindrical, ceramic bead found under the left scapula.

The ceramic phasing of both floors shows a very small percentage of Aurora phase material, and none from the later phases. This would suggest much the same date for construction as the floor in B-III-3 and Mound B-III-2a. The obsidian hydration dates support this date as well (these dates will be presented in more detail a little later in this section). Thus, a very early Early Classic date is postulated for the construction of this plaza.

Using the same logic, concerning the presence of these floors, as was used in connection with Mound B-III-3a, one would be forced to conclude that something was built over the floors not long after they stopped being repaired.

From the east-west profile, it appears that the ball court walls were built at this time. Construction appears to have followed steps very much similar to the construction of B-III-3a. First, a layer brown to dark brown sand to slightly clayey sand (Stratum 7) was deposited. This stratum is much thicker in the east wall because of the need to build up more than in the west wall. Thus, in the east wall this has the form of a thick central core covering most of the early floor, while in the west wall Stratum 7 is merely a thin strip covering the floor. For the west wall the second step was the deposition of Stratum 5. This is an amazingly hard light brown puddled clay with a small amount of crushed pumice and talpetate inclusions. Finally, Stratum 3, a unit of brown clay to slightly sandy clay, was used to cover was used to cover the entire exterior of the wall, exactly as was the case with B-III-3a. This brought the wall to a height of almost 3 meters above the playing surface.

For the east wall, on the other hand, the second step was the deposition of Stratum 3 along the east and west sides of the central core formed by Stratum 7 (and 7a). On top of this a small lens of very hard yellow-brown

pumacious clay was placed, probably for added support. Next, Stratum 5 was placed over the central portion of the wall. Finally, the wall was surfaced with the brown clay, Stratum 3, though at the time of excavation nothing remained of this stratum over the upper portion of the wall. Erosion and more recent human activity may account for its absence. Stratum 14 appeared to be composed of a dark brown sandy clay with a few pumice and talpetate inclusions. There seems to be the possibility that this was chiefly composed of a weathered Stratum 3, thus, giving support to the hypothesis that Stratum 3 was used to cover both walls as it had B-III-3a. After completion of the construction the wall would have been brought to a height of nearly 3 meters above the playing surface.

Both walls may have had a bench extending into the ball court. Though erosion has made this difficult to distinguish from the profiles in both cases, the east wall profile gives the best indication that one existed. Stratum 3 extended westward for, approximately, 1 1/2 meters, and its surface is fairly level, before it drops rather sharply to what was probably the surface of the playing alley. This bench does not appear to have been covered by any of the wall's fill, nor does it give the appearance of being a secondary deposit. Thus, it, in all probability, served as a bench. A similar bench must have existed along the west wall as can be seen by the cut into the arena, but the very heavy erosion of Stratum 3b makes this extremely difficult to observe. Unfortunately, the bench does not appear any more clearly in the profile of the west wall. However, based upon other findings (Smith 1961), if the east wall had a bench, then it is extremely probable that the west wall had one also.

The dating of the initial construction of these walls was made difficult by an unforeseen problem with the excavation technique: the west wall was divided almost in half by pits. This made it impossible to secure a sample of ceramics and obsidian which was contained solely within the early fill. Thus, both the ceramics and the obsidian are inconclusive for this early stage of the west wall. The east wall is, fortunately, a different matter.

The ceramic evidence comes from two sources within the east wall: (1) the fill; and (2) a ceremonial "cache" placed into the wall sometime after construction. The fill contained only a very small percentage of sherds (3.3%) which were phased Aurora-Amatle 1, but none that were definitely later. This, taken by itself, would suggest a date shortly after the beginning of the Middle Classic. The ceramic cache gives further evidence in this regard.

This feature (32), located in pits 64E/0-1S, was intruded into the ball court wall (see Fig. 5). Contained within this concentration were several whole and reconstructable vessels: (1) a small polished black ware vase or goblet tentatively classified as Aurora (Wetherington 1971); (2) a complete, though broken, vessel which was identified as Tzakol Peten Polychrome (Plate 2a), a basal-flange bowl which dates to the Early Classic (Coe 1966); (3) several large sherds identified as Esperanza Flesh Color (Lischke 1970), an Early Classic ware from Kaminaljuyu; and (4) a whole red ware vessel (Cinnamon Ware) which dates as Aurora-Amatle 1. In fact, all of the ceramics, for which type information is available, from this cache date to the Aurora-Amatle 1 at Kaminaljuyu or the Early Classic from other areas.

The obsidian hydration dates for this construction fill are, to a small degree, ambiguous. While there is a very nice clustering of three dates between A.D. 101 and 183, this would be too early for the ceramics, and earlier than the dating of the floor upon which the fill is resting. This leaves one date (A.D. 453 $\pm$ 93) which would seem to fit with the ceramic data. However, as will be shown later, when this date is combined with data from the rest of the complex, it gives a very reliable date.

Somewhat later the ball court walls were resurfaced and slightly enlarged. This construction consisted of first placing a yellow arena "cap" over the summit of the existing walls (Stratum 17). This was probably done after trimming the already existing walls slightly, as can be seen from the lack of Stratum 3 over Stratum 5 in either of the walls. Finally, everything was covered with a layer of light brown, "blocky" sandy clay with large lumps of tan clay and talpetate (Stratum 16). This constructional unit is identical to the latest construction phase of B-III-2, and may have been added during the renovation of the mound and the plaza. Erosion and more modern human activities have completely removed Stratum 16 from the east wall.

As far as benches are concerned, it appears likely that there was a reuse of the earlier ones. In fact, there does not appear to have been even a resurfacing of these early benches.

Sometime, probably late in this construction phase, a cannibalized burial was placed in a shallow depression in the upper portion of the bench of the east wall. The victim appeared, from the very large size and massiveness of the bones, particularly the mandible, to have been an adult male. Because of the central location of this burial (number 3, found in pit 64E/7N) along the east wall, it was felt that it may have dedicated the placement of the central marker. While Shook's photograph of one of the markers (Plate 1b) from this court suggests such center markers might have been present, we were unable to locate any during the course of the excavation.

This construction brought the west wall to a height in excess of 3 m above the playing alley. The height of the east wall is uncertain due to the erosion and cutting, but it was probably very nearly the same as the western wall.

The ceramic data from both walls demonstrates that construction occurred sometime after the beginning of the manufacture of Amatle Hardware, as there is a small percentage of this ware within the constructional fill.

Four obsidian hydration dates from the west ball court wall, which probably came from this constructional fill, cluster very nicely between A.D. 660 and 719. Thus, lending support to the idea that this construction took place during the very late portion of the Middle Classic.

Plaza 1

This plaza was first constructed when B-III-3a and the ball court were built. In fact, some of the fill used in the construction of the mound and walls may have come from this area of the complex. As has already been

demonstrated, the natural clay was stripped off, leaving the surface of the plaza almost 1 meter below the level of the natural soils found west of B-III-3.

The plaza forms a rather blocky "L-shape" running from the west ball court wall to Mound B-III-3 as its narrowest east-west dimension, and from the wall to the eastern edge of B-III-2 as its widest (though this may not have occurred until late in the architectural history of the complex). North to south the plaza runs from someplace near the north side of B-III-4 to an undetermined point south. Erosion and human activities made it impossible to determine exactly where it ended on both the north and south.

The plaza appears to have had two levels, at least during the later phase of occupation. That is, the natural soil level rises abruptly nearly 70 cm on a line running north to south just east of the mid-axis of B-III-3. From this line the soil runs very slightly up hill to B-III-2. It seems probable that this work was done when Mound B-III-2 was brought back into use during the Middle Classic. The level of the natural clay at the eastern edge of Mound B-III-2b is still 20 cm below the natural clay level south of the mound, and, presumably, outside of the plaza.

What type of surfacing the plaza had during its period of use could not definitely be determined, though it may have had a thin clay plaster. Evidence for this plaster, at least just prior to the abandonment of the complex, comes from Feature 31, which was located in pits 36-38E/0N. Within this feature were at least five reconstructable vessels, all of which were sitting on a surface approximately 4 cm above the natural sand. The feature was widely scattered, and no signs of a pit were observed in the profile, so unless the original surface was above the vessels and has eroded away, they were sitting on the plaza floor.

Summary: The Complex Through Time

Based upon similarity of soils, constructional techniques, ceramics, and obsidian hydration dates, this section will reconstruct what the site looked like through time. On the basis of the obsidian dates the periods of building activity will be correlated with the Christian calendar. The reconstruction drawings are diagrams of the complex at the end of each constructional period. No attempt has been made to determine the order in which each structure was built.

The first architectural phase saw the construction of B-III-2a and a three, or more, tiered plaza which ran east to the shore of the lake (Fig. 15). The plaza, and possibly B-III-2a, was surfaced with a well prepared "layer cake" floor made of three layers of crushed talpetate interspersed with two layers of an arena-clay mixture. The fill of B-III-2a and that found below the plaza floor in B-III-3 and the ball court walls, appeared--from field identification--to have been very nearly the same (Gray 1970).

The dating of this construction phase, based upon the similarity in soil type and construction technique, comes from both the ceramics and obsidian hydration dates. The ceramics contained predominantly Verbena-

Arenal or earlier. Only 0.68% could be phased to the Aurora or Early Classic. When the fill is broken down by area, the percentage of Aurora sherds appears to be rather constant--with the exception of B-III-2a--which would further suggest contemporaneous construction. The evidence from the obsidian dates from this fill shows a series of six dates--out of 13 (only one of which was "too late")--that place this construction between A.D. 265 and 340 (see Appendix 1). Therefore, it appears that this construction phase took place during the Early Classic period.

The second phase of building activity saw the construction of B-III-3a, Plaza 1, the ball court, and, possibly, B-III-4 (see Fig. 16). B-III-3a measured approximately 15 by 10 meters at the base and was 3 meters high. The mound had seven terraces and a rather wide apron extending eastward into Plaza 1. The ball court was nearly 24 meters wide (east-west) by at least 31 meters long. The playing alley was, however, only 8 by 31. The walls stood nearly 3 meters off the playing surface. As with the earlier construction, the building technique and the fill types used were nearly identical for each of the ball court walls and B-III-3a. The differences in technique are probably related to function (support for B-III-3a, thus the need for more support to guard against slumpage) and elevation (the east wall of the ball court had to have an extra meter of fill in order to bring it up to the same elevation above the playing alley as the west wall).

In dating this construction phase, based initially upon fill and technique similarities, not only the ceramics and obsidian from the fill, but ceramics from two concentrations as well, were used. The fill ceramics (only from B-III-3a and the east ball court wall) show a very even, though small, amount of material which is diagnostic Amatle 1. Both ceramic concentrations (Features 4 and 32), especially Feature 32, yield trypes which are characteristic of Amatle 1 or Aurora at Kaminaljuyu, or Early Classic Tzakol in the Peten. More obsidian hydration dates are necessary before an absolute date can be assigned with a high reliability. However, three obsidian dates show a clustering between A.D. 408 and 436. It is possible that, since two of these dates are considerably later in time, that this date should be pushed back closer to A.D. 500, though the ceramics might argue for the proposed early date since it is a mixed sample.

Finally, the third phase saw the construction of B-III-2b, B-III-3b, a refinishing of the ball court, a slight altering of Plaza 1, and very likely B-III-4 (see Fig. 17). Mound B-III-2b and the ball court walls had exactly the same type of material used in their refinishing--a blocky yellow-brown sandy clay with yellow pumaceous sand lenses, possibly to aid in support or to protect against slippage. B-III-3b was constructed of a slightly more brown clay, and may have been done at a slightly different time. Plaza 1 was enlarged so as to include Mound B-III-2b into the complex.

The dating of this final construction activity would be at the end of the Middle Classic. The ceramic evidence shows a small percentage (slightly over 8.3%) of the sherds typed are diagnostic of Amatle 1-2, particularly Amatle 2. The obsidian hydration dates would tend to bear out this dating. That is, a series of seven dates cluster between A.D. 660 and 719 and the single radiocarbon date from B-III-4 would seem to lend some additional support.

DISCUSSION

The site appears to have undergone three overall constructional phases. The first of these consisted of the construction of a three, and possibly more, tiered plaza surfaced with a well prepared arena mixed with clay/crushed talpetate floor and a low platform mound (B-III-2a). This plaza was found in three places over the site, and in all cases the fill below it was very nearly identical, thus showing a certain amount of contemporaneity of construction. The ceramic data shows predominantly Verbena-Arenal, or earlier, types and a very few Aurora diagnostics. From a series of six obsidian hydration dates, the construction took place during the period A.D. 265 to 340. This, then, would suggest that the constructional activity dates (using generally accepted terminology) to the Early Classic period.

The second period of constructional activity saw the building of Mound B-III-3a, the ball court, Plaza 1, and possibly, the Mound B-III-4. Constructional fill and technique within B-III-3a and the ball court walls would suggest a certain amount of contemporaneity. The ceramic analysis of this fill demonstrated that 9.5% of the typed rim sherds were diagnostic Aurora, Esperanza-Amatle 1, or both. Two ceramic concentrations yielded very much similar results. In fact, one of these concentrations, the ceramic cache in the east ball court wall, allowed a cross dating to be made with the Maya Lowlands of the Peten. The ceramic data permits the tentative assignment of this building phase to the Early Classic through the early Middle Classic (Wetherington 1969). However, three obsidian hydration dates from the fill deposited during construction yield a clustering between A.D. 408 and 436. Thus, not only providing support to the ceramic data, but allowing the use of actual years, something which will be very useful in comparing the various statements concerning the earliest date for the construction of ball courts.

At this point, the settlement pattern data becomes important. On the basis of a preliminary analysis of settlement test trench data, both Aurora and Esperanza-Amatle 1 phase occupation was found to surround the complex, though it may have been that only the latter phase occupation was found to surround the complex, though it may have been that only the latter phase occupation was definitely centered on the complex, the former very probably was also. The ceramic data would tend to suggest an evolution in the settlement pattern, rather than a sharp break between occupations. Thus, raising the hypothesis that the Esperanza-Amatle 1 people were an outgrowth of the Aurora people living around and using the site.

The final phase of construction saw the refinishing of the ball court, a slight altering of Plaza 1, and the building of B-III-2b, B-III-3b, and B-III-4. Initially, this was defined as a constructional phase because the technique and fill types are nearly identical for all of the mounds, with the exception of B-III-3b. The ceramics show that this building phase took place during a period of ceramic change. Sherds from the mound fill revealed that 8.3% were diagnostic Amatle 1-2. Tomb 1 contained two Amatle Hardware vessels as offerings. A series of seven obsidian hydration dates cluster between A.D. 660 to 719. Parsons (1969) defines the Middle Classic as running from A.D. 400 to 700. Accepting this chronological position, the obsidian dates demonstrate the late Middle Classic date for this building phase.

Hypotheses Concerning the Origins of Ball Courts in the Highlands of Guatemala

Within the rather small literature on ball courts and sites containing ball courts, at least two general hypotheses concerning when they were first constructed in the Highlands have been advanced: (1) hypothesizing their Late Classic origin, and (2) hypothesizing their origin as Early Classic.

The first hypothesis has been brought forth by A. Ledyard Smith (1961 and 1965), and quoted by numerous authors including Clune (1964) and Coe (1965), among others. Smith believes that "with the exception of two early ball courts at Copan which Stromsvik places in the Early Classic period (1952), I know of no structural ball courts before the Late Classic period (Smith 1961: 120). He reiterates this hypothesis in another article when he states that "there is no evidence of ball courts having been built before the Late Classic period, ..." (Smith 1965: 89). Smith's "evidence" for this hypothesis is based upon the data collected by two archaeological field techniques: (1) surface surveys conducted by himself (1955), with Kidder (1952), and by Shook (1952b); and (2) test excavations conducted during both surface surveys and supervised by him (1942) at Kaminaljuyu, and by Shook (1952a) of the Cotio site in the Valley of Guatemala. It is the collation of all of this data that makes Smith feel certain that ball courts did not occur prior to the Late Classic in the Highlands, though more recently he does admit that Early Classic sherds have been found on several ball court sites. These he explains are not conclusive evidence of earlier construction and that all of the other evidence still points to the Late Classic origin (1970).

The second hypothesis (that for the Early Classic origins) was proposed by Borhegyi (1965: 21) when he stated "although more common during the Late Classic times (A.D. 700-1000), ball courts make their first appearance in the Early Classic period." However, he seems to hint at their greater antiquity in the Highlands as early as 1960 when he stated that "in the Highlands of Guatemala and southern Mexico we find another type of ball court during the Classic period (A.D. 300 to 1000)..." (Borhegyi 1960: 58). The evidence used by Borhegyi to support this hypothesis comes from two sources. The first of these stems from his 1958 re-excavation of C-II-7 at Kaminaljuyu. During this excavation he discovered that the architectural technique used as characteristic of the Early Classic. His second source for evidence comes, apparently, from his analysis of the data presented by Smith in the report on Smith's survey of four departments within the Highlands of Guatemala (1955). Here he notes that 13 of Smith's sites were phased as having sizable Early Classic occupations. "About" eight of these sites had ball courts of the open ended variety which Borhegyi considered typical of the Early Classic. It was to this second line of evidence that Smith directed his comments about Early Classic sherds: even though present at sites with ball courts they did not constitute conclusive proof of Early Classic court construction.

It goes almost without saying that the B-III-5 ball court would support Borhegyi's hypothesis. The question becomes: what other evidence might exist which would further support the hypothesis, or are B-III-5 and C-II-7 (both located within Kaminaljuyu) the only two early courts?

Evidence Supporting the Early Classic Origin of Ball Courts in the Highlands of Guatemala

In general, the information dealt with in this section can be divided into two broad categories, these might be termed: (1) those sources available to and used by Borhegyi (before 1969), and (2) those sources which stem from the analysis of information gained during the data collection phase of the current Kaminaljuyu Archaeological Project (primarily after 1969). Within the first category would be placed the investigations cited in the preceding section, by Smith, Kidder, and Shook, as well as Borhegyi. The second category would include the data from the B-III-5 excavation, Davis' survey of a large portion of the Valley of Guatemala, plus Cardenas' and Cheek's (1971) excavations in the Palangana section of Kaminaljuyu. The first set of materials has been in the literature for a long time, while the second group has still to be presented in full.

As noted above, Borhegyi states that Smith's survey of Central Guatemala revealed 13 sites having substantial Early Classic occupation, eight of which had open ended ball courts. Borhegyi cites this as one of his main sources of evidence that ball courts originated during the Early Classic of the Highlands. However, as reported in the literature (Smith 1955) these sites do not appear to be as conclusive proof as Borhegyi seems to believe. Of the sample of 13 sites, four can be eliminated as not having a ball court. Of the remaining nine sites, only three (Calchitan Valley, Rio Blanco and Chicol) appear to lend solid support to Borhegyi's hypothesis, the remaining sites have rather extensive later (Late Classic through Protohistoric) occupations, making an accurate determination as to the correct phase of construction of the ball court impossible without excavation specifically designed to solve this problem. However, even the presence of only three ball courts serves to nullify Smith's hypothesis.

Chalchitan, as reported by Smith (1955: 11-15), is "quite extensive, consisting of 40 odd mounds, mostly associated with two plazas and a ball court group" (Smith 1955: 11). In actual fact, there were two ball court groups (according to Smith's map of the site), one of which was excavated because "...it was an interesting unit and was in a fairly good state of preservation..." (Smith 1955: 11-12). This court, designated as Structures 23 and 24, had a trench dug across the center of the playing alley. This court appears to have undergone two construction phases. Based upon an analysis of the pottery from below the floor of the latest construction, this building activity occurred during the Late Classic. However, the ceramics taken from below the earlier floor were all Early Classic. Thus, Smith concludes that "the ceramic evidence definitely places the late court in the Late Classic period. The early court may have been either" (Smith 1955: 12). It would seem that the lack of any Late Classic materials might suggest an Early Classic construction, but no firm conclusions can be made without further excavation which would tie the early court in with other structures on the site. However, it appears that the data, in its reported state, would allow one to hypothesize the Early Classic construction, or at least it does not contradict such a hypothesis in any convincing manner.

The Rio Blanco complex provides even more conclusive evidence as to the Early Classic origin of ball courts in the Highlands of Guatemala. Rio

Blanco, located in the Department of Quiche, is a small site consisting of only eight mounds, five of which are arranged in a ball court group. The ball court is of the open ended variety (Smith 1961, 1965). According to Smith (1955: 25) "a good sample of pottery shows occupation in the late pre-Classic and Early Classic periods with a possible reoccupation in Protohistoric times." Thus, it would appear that the ball court was constructed prior to the Late Classic, unless it was constructed during the "possible" Protohistoric occupation (which would not seem to be a safe assumption to make).

Chicol, located in the Department of Huehuetenango, is thought by Borhegyi (1965a: 66) to have been typical of Early Classic sites. It consisted of 14 mounds arranged into two groups, with one small outlying mound. The ball court is in the western group of mounds, and is of the open ended variety. Smith states that a "good" collection of pottery was taken from the surface of this site. The sherds were phased and they demonstrated "...that the site was occupied during the Early Classic and probably Late Classic times" (Smith 1955: 8). This would suggest the ball court may have been constructed during the Early Classic, but it would appear that Borhegyi may have been a bit premature in assigning this site, from the data presented by Smith, to be typical of the Early Classic centers.

In an early attempt to determine the function of mounds which had an "elongated rectangular form" (Shook and Smith 1943: 265), Smith supervised the excavation of three ball courts within Kaminaljuyu. Two of these courts are located within the Palangana section of the site, and have been designated as C-II-4 and C-II-7; the third was located near mounds A and B and was designated F-V-1 (this ball court center has since been completely destroyed). There may be a question as to whether or not these are the correct mound designations, since Smith reported these excavations before the Carnegie grid was applied to the site, but according to Shook (personal communication) these are the correct listings. Unfortunately, only very little has ever been published on the artifactual materials recovered during this series of excavations, so that no comments can be made in this regard. However, Smith does discuss, though only briefly, the architecture associated with and found beneath the ball courts.

Two of the courts (C-II-4 and F-V-1) were found to have been built over structures which had piedrin surfaces, while with C-II-7 it was observed that "the upper part of the wall and face of the mound proved to be terraced and to bear a piedrin coating" (Shook and Smith 1943: 266). This would suggest that C-II-4 and F-V-1 were both constructed later than C-II-7, if it can be demonstrated that the architectural technique of finishing a mound with piedrin has a limited temporal distribution.

Charles Cheek (1971) has found that the use of piedrin surfacing was limited to the Middle Classic period. This conclusion is based upon his (and Sean Cardenas') excavations within the Monument Plaza section of the Palangana at Kaminaljuyu. This chronological positioning is based upon ceramic analysis and obsidian hydration dates. Therefore, it would appear that C-II-7 was constructed during the Middle Classic, and according to Borhegyi (1965a) the piedrin surfacing may have been the second construction of the ball court. Borhegyi notes that in 1958 he encountered blocks of pumice set in adobe, presumably below the piedrin (though no mention is made

of any piedrin surface). According to the excavation of D-III-13 (Berlin 1952) this constructional technique is typical of the Early Classic, Aurora phase. Thus, it is possible that C-II-7 was originally built during Aurora times.

A fairly large amount of data supporting Borhegyi's hypothesis is now beginning to appear from the analysis of information gathered during three seasons of survey in the Valley of Guatemala. Shook (1952b) reports 29 ball court sites (some have more than one ball court) within the Department of Guatemala. Davis' re-survey of the Valley has brought this number to more than 45, thus, more than 65 ball courts may actually have existed within the Valley, since Davis was unable to survey all of it. Of these 45 sites, adequate ceramic samples for phasing were collected on 38 of them. Four of the complexes had questionable ball courts; two were not used in the following analysis, while the other two were because Davis "felt" they had the remains of a ball court. Further, one site, Cerritos (71-30-141), originally mapped by Shook (1952b), was used even though no ball court was left when Davis surveyed it. There was a good enough correlation between the Shook and Davis maps for the remainder of the site to suggest that the ball court had been present and in the position drawn by Shook. (More data on this and the other sites can be found in Appendix 3.)

From this sample of 36 ball court sites, 12 were phased (by Wetherington and/or this author) as having substantial occupations during the Early and/or Middle Classic. Six of these sites were phased as having predominantly or solely Aurora, Amatle 1, or both as their major occupation: (1) Lo de Reyes 1 (22-14-044) was phased Amatle 1 predominantly; (2) La Communidad (45-34-171) and Cerritos (71-30-141) were Aurora; and (3) Villa Neuva (71-34-166), Barcena (71-10-247), and Azacualpilla (24-22-010) were predominantly Aurora and Amatle 1. All of these were definitely ball court sites, thus indicating that by the end of the Middle Classic at least eight ball courts (including B-III-5 and C-II-7) were found within the Valley of Guatemala.

Twenty-two of the ball court sites from the Valley have been phased as almost solely Amatle 2--both in occupation and construction. Each of these complexes appears to have had other periods of occupation, both earlier and later, but according to Shook, Wetherington, and/or this author the most dominant phase was Amatle 2. (See Appendix 3 for the complete listing of these sites by name and number.)

Unfortunately, no excavation was done on these Valley sites, with the exception of Cotio, and the above statements are based almost solely upon surface survey. However, it was noted on the Carnegie contour map of Kaminaljuyu prepared by Shook and T. R. Johnson (as adapted by Sanders and Michels 1971), that the long axis of the ball courts were oriented, generally, in two directions: (1) approximately north to south (C-II-7, B-III-5, D-IV-6, and the court near C-III-2), or (2) east to west (C-II-4, F-V-1, B-IV-2, and E-V-2). Because of the interesting possibility that this orientational difference might be correlated with the time of construction, these results were matched with the Valley survey material. The results of plotting all long axis orientations from the Valley sites can be seen in Figure 18 (only the Valley sites have been plotted on this figure). As can be seen, there is no "set" orientation, although two clusters do appear, and,

interestingly, the results are very much like that for the courts at Kaminaljuyu, though there is a bit more variation. On the surface this would appear to support Smith's belief that there was no pattern to the orientation of ball courts (Smith 1961). However, when the orientation was plotted according to construction phase, a definite pattern appeared.

Figure 19 shows the orientation of the Aurora-Amatle 1 ball courts as being, primarily, north to south--as was the case at Kaminaljuyu. All of these courts are between 23 degrees East and 34 degrees West of Magnetic North. B-III-5 is approximately 26 degrees East of Magnetic North, while C-II-7 appears to be very nearly the same or slightly more northerly. Unfortunately, no data exists to date the time of construction of D-IV-6 and the ball court near C-III-2, both are oriented east of north so it would be helpful in substantiating this hypothesis. The plotting in Figure 19 was originally set up on the basis of six sites mentioned earlier as having been constructed during Aurora-Amatle 1 times. The other six sites displayed a large percentage of Early and Middle Classic sherds, and the orientation of the ball court was such as to suggest an early construction. This, however, would have to be more conclusively determined through extensive excavation.

Figure 20 diagrams the orientation of those sites phased as solely or predominantly, by a large percentage, Amatle 2 by Wetherington, or "Late Classic Amatle" by Shook (1952b). Shook's analysis was used when either a site he recorded was not found by Davis (Cotio) or on those sites where Wetherington was unable to phase the ceramic material collected by Davis (Cristina). There appears to be a poor "fit" because three of the sites overlap the cluster formed by the Aurora-Amatle 1 ball courts. However, there is a certain amount of question with regards to two of these sites; the ceramic phasing of one, Santa Clara, and the very small size of the ball court on the second (Rastro I). The third, San Jose V, is very definitely an Amatle 2-3 site. The majority of the Amatle 2 ball courts cluster between 43 degrees north and 45 degrees south of east. This fits very well with the data from Kaminaljuyu, where both C-II-4 and F-V-1 are oriented slightly south of east and well into this cluster, as do the other east-west oriented ball courts for which there is as yet no conclusive ceramic data as to when they were constructed.

In order to test the significance of these distributions a t-test for the difference of means was run. To determine the average (mean) value for the two distributions, each angle of orientation was determined in relation to the number of degrees from Magnetic North. All readings were taken from north of the east-west line. The orientations east of north were written as positive, while those west of north were negative. For example: site 85-01-292 had an angle of 23 degrees east of north, when the mean for the Aurora-Amatle 1 ball courts was determined, it received a value of +23. From this it was determined that the mean for the Aurora-Amatle 1 ball courts was +3.46, while for the Amatle 2 courts this value was -42.69. The difference in the means was determined to be significant at the .002 level of confidence ($t = 3.48$; $df = 33$). This would suggest that the difference in orientation, as presented here, was not a product of chance. It would tend to support the hypothesis that Early and Middle Classic ball courts were oriented north to south, while the later courts were east to west.

Unfortunately, the ball courts from Smith's survey do not appear to have this same chronologically related orientation. This might be the result of a lack of data, since only 66 sites were found, 39 of which had one or more ball courts, in the four departments, an area roughly 250 by 100 kilometers (25,000 square kilometers). If the area is at all comparable to the Valley of Guatemale, several hundred more sites are still to be found. Thus, not until a larger sample of sites is gathered can this orientation hypothesis be adequately tested outside of the Valley of Guatemala.

A second hypothesis that might be tested is that the very extensive external cultural influences exerted on the Valley of Guatemala, particularly from Teotihuacan and the Central Mayan Lowlands, may have influenced the early orientation of the ball courts. In this context, it might be noted that, prior to now, the earliest ball courts were found at Copan. Here Stromsvik (1952) notes that three ball courts were found at Copan, all of which were constructed during the Early Classic. All three courts are oriented north to south. Blom (1932), Borhegyi (1960), and Stern (1952) hypothesize that the ball game had its origins in the lowland tropical rain forests where rubber trees grow wild. Exactly when ball games were invented is not known, but Borhegyi (1960: 57) notes that figurines resembling ball players were found at Tlatilco in the Highlands of Mexico and dated to approximately 1500 B.C. However, no ball courts have yet been found in the Highlands of Mexico that date this early. In fact, no courts have been located at Teotihuacan, the largest of the Classic centers in Mesoamerica. Thus, it is suggested that the idea for both the ball game and court diffused from the Lowlands, possibly from the Mayan area. Since the earliest lowland courts are oriented north to south, and the game has been connected with religious and political ceremonies, it is possible that certain religious (and political) concepts were also diffused to the Highlands. If religious ideas were connected and diffused with the idea for constructing courts, then these ideas may have changed over time, possibly correlated with a loosening of relationships with the lowlands, because there was this perceptible change in the orientation of the ball court during the Late Classic. Archaeologically, very little has been found from outside the Valley of Guatemala during the Late Classic, while for at least 200 years prior to this time external influences are very evident.

CONCLUSIONS

1. From the assembled data it can be concluded that the ball court made its appearance in the Highlands of Guatemala at some time during the Early Classic (Aurora phase) or very early in the Middle Classic (Esperanza-Amatle 1 phase). Chronometrically, this would be between A.D. 300 and 500.

2. The long axis of early ball courts was oriented no more than 35 degrees East or West of Magetic North, while those constructed during the Late Classic (Amatle 2 phase) were oriented nearly east to west. It is as yet uncertain as to why this shift occurred when it did, but one possibility is that there was a change in some of the religious beliefs associated with

the ball game. Borhegyi notes a return of certain religious symbols (ie., mushroom stones) which might suggest this possibility has some basis in fact.

3. There appears to be greater continuity in settlement patterns than has heretofore been thought to exist within the Valley of Guatemala. It appears that the excavation of the B-III-5 complex, which has led to other research, may have filled a "gap" in our knowledge of the culture history in the Highlands of Guatemala in general, and the Valley of Guatemala in particular. Prior to this excavation and the resulting research, the pervasive feeling among archaeologists was that the knowledge of Early Classic settlement was "meagre" (Shook and Proskouriakoff 1956; Smith 1965). The excavation of the B-III-5 complex provided the "first" look at one type of Early Classic settlement. The correlation between the orientation of the long axis of the ball court and the time of construction has provided supportive data which would suggest that the B-III-5 complex was typical of Early Classic mound groups within the Valley of Guatemala. This, in turn, allows the construction of a model for Early and, to a lesser extent, Middle Classic civic center arrangements, and the demonstration that, even though outside influences were very pervasive in the Valley, elite residence centers continued along an evolutionary development from the Terminal Formative to the Late Classic.

Bebrich (1969) provisionally defined the typical settlement type for the Terminal Formative at Kaminaljuyu (see Fig. 21) as follows: (a) a compact structurally amorphous group of two to five mounds of varying size; (b) a densely occupied settlement core, with density dropping off as one moves out from the center; (c) a surface area of four to six hectares; and (d) they are spatially isolated (ie., they generally do not overlap) (Bebrich 1969: 9). During this period of time, the major difference between mound groups comes from the size of the mounds and their number, rather than from the complexity of the arrangement.

Eucaliptus (Shook and Proskouriakoff 1956; Smith 1965) has been used as the type site for Late Classic ball court civic centers. Borhegyi (1965a: 31) typifies Late Classic centers as being radically different from the pre-Classic centers, and consisting of "low and elongated platform mounds (which) were arranged around tightly enclosed plazas and rectangular ball courts, the latter usually walled on all four sides." The most common type of mound complex at this time was the small civic center, very much like Eucaliptus (see Fig. 23); however, larger sites seem to have been constructed as well. There appears to have been four of these large centers in the Valley of Guatemala north of Lake Amatitlan (Taltic, San Antonio Frutal, Solano, and the Palangana section of Kaminaljuyu). Three of these sites (Solano being the exception) have the small ball court-civic centers in close association with the acropolis, or administrative section.

During the Early Classic the building of low elongated mounds arranged around small plazas appears to have begun. These small civic centers may be defined as consisting of: (a) A compact, tight, very ordered arrangement of mounds, usually numbering only two or three, forming a small plaza. One mound was clearly taller than the other(s), but all were considerably reduced from the size of Terminal Formative mounds. However, functionally these mounds may have been merely small replicas of their Terminal Formative

predecessors. (b) Ball courts, possibly of the open ended variety, were associated with many of these sites, and, where associated, were oriented a few degrees east or west of magnetic north. (c) Settlements appear to have exhibited both occupational zoning and discreteness (Bebrich 1969: 9). At the moment the data does not permit an accurate statement as to the overall surface area of these settlements but they tend to be larger than those of the Terminal Formative (see Fig. 22).

It does not appear that Middle Classic centers were very different, at least as far as the small civic centers are concerned, although they may have been more enclosed. The problem here being the typical Mesoamerican pattern of building over earlier structures. Thus, since most of the data on Middle Classic civic centers comes from surface survey rather than excavation, it is hard to accurately judge what was constructed during any given time period when several phases of occupation and construction are rperesented.

It can be seen that the small ball court civic center is not "radically" different from the Terminal Formative centers. Rather, they appear to be evolved from this Formative settlement type. The major settlement difference, then, is the development of the large acropolis type of site.

4. Sometime late in the Aurora or early in the Esperanza-Amatle 1 phase, Kaminaljuyu moved to a more complex level of sociopolitical organization, as reflected in the types of sites constructed. Based upon the evidence available today there was only one settlement type constructed during the Terminal Formative--that defined by Bebrich (1969). However, possibly by the end of the Aurora phase, and definitely before the end of Esperanza-Amatle 1 times the construction of large "public" centers, ie., the Palangana section of Kaminaljuyu, as well as the smaller elite residential ball court civic centers was taking place. Because of the apparent functional difference between the mounds, as well as the number of mounds and their arrangement, it is possible that slightly different, but overlapping, activities took place at the acropolic centers as opposed to the small civic centers. Based upon the fact that both types of centers are built near one another they probably drew from the same, nearby, population base for the economic, labor, and political support. Therefore, it would seem likely that a higher level of organization was required to coordinate the activities necessary to support the various types of centers.

APPENDICES

APPENDIX 1

OBSIDIAN HYDRATION DATES

The samples used for dating purposes came from a random selection of individual specimens within specifically chosen obsidian lots. All lots were requested by this author in order that certain questions might be answered. To facilitate the formulation of questions and the decision as to which obsidian lots would best answer the questions, both the various profiles made during the excavation and the artifact catalogue were employed. As was usually the case, even the lots could be randomly selected, since several lots, which could all snwer the question "equally well," were submitted, one or more was then selected for dating.

As can be seen, not all the results were used in the determination of chronometric dates for the various constructional phases found at the complex. Certain dates were determined, on the basis of other evidence, to have been either too early or too late. The majority of these "incorrect" dates were too early. Since most of the dated samples came from mound fill which contained large percentages of other artifacts (ceramics) which are though to be earlier, this is not a great problem. It is postulated that the fill that was used came from previously occupied areas of Kaminaljuyu and the artifacts were not cleaned out before use (as mound fill). However, the later dates present a slightly different problem.

Five dates of the "too late" variety occurred. There appear to be at least four possible reasons for discounting these dates at present: (1) burning; (2) post-cultural or post-use chipping; (3) contamination of the stratum by later peoples with the resultant intrusion of later obsidian artifacts; and (4) contamination caused by the mixing of artifactual material from higher stratigraphic levels during excavation (a major problem in every excavation). Due to the extreme "lateness" of the dates, two samples definitely belong in category 3. However, the correct classification for the remaining three dates has, as yet, not been determined, and awaits an anlaysis of the artifacts themselves.

Each date was run in the Obsidian Dating Laboratory associated with the Department of Anthropology, The Pennsylvania State University, by Nancy Marshall, under the direction of Joseph W. Michels. For each date, the following information is provided: (1) the artifact number assigned each specimen by Marshall; (2) the number of the date as it appears on the chart included within this chapter; (3) the construction phase the sample was selected to date; (4) the micron value determined; and (5) the correlated date based upon the 7.03 $\mu^2/1000$ years hydration rate. Finally, after the dates for each construction phase, structure (the room south of Mound B-III-3), or occupation phase, a brief summary comment will be made describing the cluster of dates and its archaeological interpretation.

Artifact Number	Chart Number	Construction Phase	Micron Value	Correlated Date
7630	1	B-III-5F	3.24	A.D. 490 ± 92
7589	2	B-III-2a	3.30	A.D. 434 ± 93
7575	3	B-III-3F	3.38	A.D. 359 ± 96
7638	4	B-III-2a	3.42	A.D. 320 ± 97
7357	5	B-III-5F	3.45	A.D. 291 ± 97
7576	6	B-III-3F	3.46	A.D. 282 ± 98
7356	7	B-III-3F	3.48	A.D. 262 ± 98
7358	8	B-III-5F	3.50	A.D. 242 ± 99
7639	9	B-III-2a	3.61	A.D. 132 ± 102
7354	10	B-III-5F	3.72	A.D. 18 ± 105
7635	11	B-III-5F	3.79	B.C. 56 ± 107
7588	12	B-III-2a	3.83	B.C. 99 ± 108
7355	13	B-III-3F	3.90	B.C. 175 ± 110
7353	14	B-III-5F	4.10	B.C. 401 ± 116
7363	15	B-III-2a	4.16	B.C. 471 ± 117
7364	16	B-III-2a	4.24	B.C. 565 ± 120

Dates 3 through 8 cluster between A.D. 263-331. Therefore the construction of Mound B-III-2a and the associated plaza (as seen in Figure 15) took place sometime within that time span. Further, it is likely that the Aurora ceramic phase began during this time as well.

7630	17	B-III-3a	3.23	A.D. 499 ± 91
7362	18	B-III-5a	3.28	A.D. 453 ± 93
7139	19	B-III-3a	3.40	A.D. 340 ± 96
7587	20	B-III-5a	3.42	A.D. 320 ± 97
7631	21	B-III-3a	3.44	A.D. 301 ± 97
7579	22	B-III-5a	3.56	A.D. 183 ± 101
7586	23	B-III-5a	3.56	A.D. 183 ± 101
7577	24	B-III-5a	3.59	A.D. 152 ± 101
7361	25	B-III-5a	3.64	A.D. 101 ± 103
7351	26	B-III-5a	3.76	B.C. 24 ± 106
7585	27	B-III-5a	3.81	B.C. 77 ± 108
7352	28	B-III-5a	3.95	B.C. 230 ± 112
7584	29	B-III-5a	4.06	B.C. 355 ± 115

Note: Two dates have not been listed because both were felt, on the basis of all of the data from the complex, to be too late, and were probably intrusions, these are: (1) #7578--A.D. 145 ± 55 and (2) #7140--A.D. 1185 ± 67.

These dates demonstrate that the ball court and Mound B-III-3a were constructed between A.D. 408-436. However, this is based upon only four dates (17 through 20) and the constructional activity may have been earlier, since most of the dates are earlier than this time span. A few more dates would probably clear this problem up very quickly.

Artifact Number	Chart Number	Construction Phase	Micron Value	Correlated Date
7347	30	B-III-3b	2.83	A.D. 841 ± 80
7582	31	B-III-5b	2.94	A.D. 751 ± 83
7636	32	B-III-5b	2.96	A.D. 734 ± 84
7350	33	B-III-5b	3.03	A.D. 675 ± 86
7365	34	B-III-2b	3.04	A.D. 667 ± 86
7348	35	B-III-3b	3.05	A.D. 658 ± 86
7583	36	B-III-5b	3.08	A.D. 632 ± 87
7366	37	B-III-2b	3.15	A.D. 571 ± 89
7637	38	B-III-5b	3.79	B.C. 56 ± 107
7349	39	B-III-5b	3.88	B.C. 153 ± 110

This set of dates yields the best clustering of obsidian dates from the site. Six dates (30-35) show a range from A.D. 668 to A.D. 719. A possible problem here is that a majority of the dates come from the west ball court wall, but the cluster still is formed by samples from three different places over the complex, which have been independently demonstrated to have been constructed approximately contemporaneously. Therefore, it would appear to be an accurate temporal span.

7580	40	Room	2.83	A.D. 841 ± 80
7632	41	Room	3.03	A.D. 675 ± 86
7581	42	Room	3.34	A.D. 397 ± 95
7633	43	Room	3.73	A.D. 8 ± 106
7360	44	Room	3.93	B.C. 208 ± 111
7359	45	Room	4.00	B.C. 286 ± 113

These attempt to date the room south of Mound B-III-3. Unfortunately, there is no clear pattern so no date can be given for the construction of this feature.

Artifact Number	Chart Number	Settlement Phase	Micron Value	Correlated Date
7724	46	Aur-Am 1	2.79	A.D. 872 ± 79
7725	47	Aur-Am 1	2.83	A.D. 841 ± 80
7715	48	Aurora	2.95	A.D. 743 ± 83
7709	49	Amatle 1	3.08	A.D. 632 ± 87
7732	50	Aurora	3.31	A.D. 425 ± 94
7731	51	Aurora	3.32	A.D. 416 ± 94
7705	52	Aurora	3.51	A.D. 233 ± 99
7710	53	Amatle 1	3.53	A.D. 213 ± 100
7703	54	Aurora	3.54	A.D. 203 ± 100
7704	55	Aurora	3.56	A.D. 183 ± 101
7711	56	Aurora	3.56	A.D. 183 ± 101
7712	57	Aurora	3.58	A.D. 163 ± 101
7714	58	Aurora	3.58	A.D. 163 ± 101
7645	59	Aurora	3.63	A.D. 112 ± 103
7709	60	Amatle 1	3.91	B.C. 185 ± 111
7733	61	Aurora	3.95	B.C. 230 ± 112

There are several clusterings of dates within this group of samples; however, none of these seem correct in light of the ceramic associations. The main problem here would appear to be the lack of a sufficiently detailed ceramic analysis. Levels were recorded as if they were "pure" ceramicly (only the one phase was found within that level), this appears not to have been the case.

APPENDIX 2

CERAMIC PHASING

This appendix is not meant to present all of the ceramic data derived from the excavation of the B-III-5 complex. Instead, it will present data which was thought to bear most directly upon the relative dating of each construction phase discussed within the body of the report. This has been accomplished, primarily, through the use of the following chart, which presents: (1) the diagnostic ceramic phase (if one exists) for each of the ceramic types found by Wetherington or his staff. The + means that the type also occurred earlier than the diagnostic phase, while the - means it occurred after the diagnostic phase; (2) the type number designated by Wetherington, a description of each may be found in the "Provisional Taxonomic Key: Kaminaljuyu Ceramics" (Wetherington 1971); and (3) the construction phase, divided into individual structures, from which the ceramic data was derived.

The numbers in the columns to the right of the ceramic types represent the number of sherds of that type, or types, found within the appropriate structure. Certain types present have been dropped because no phase information was available (types 112-14 among others). Further, as regards individual types within the large groupings, for the purpose of this report it was deemed sufficient to note the presence of the larger group and its chronological position rather than each separate type, because, in general, the correct chronological position of the individual type is as yet uncertain.

Diagnostic Phase	Type Number	Constr. Phase 1			Constr. Phase 2		Constr. Phase 3		
		B-III-2a	B-III-3F	B-III-5F	B-III-3a	B-III-5a	B-III-2b	B-III-3b	B-III-5b
Las Char -	260-69	3							
Las Char -	140	1							
	130-32					1			
	380	3							
Sacatep	170-71	4		1			1		
Sacatep	199						1		
Sacatep	202	1	1		1				
	080	11				1			
	120	16			2	1		1	
	050			1					
Verbena -	090	5			2	9	4		
	060	11	1	3		1			
	178-80	2		2	1	2			
	302-09	29	2	2	5	7	7		1
	154-69	28		11	7	10	2		1
	280-98	35	8	5	13	10	7	2	1
	320-29	11	3	4	2	1	1		
	310-19	7		4	3	2	3		
	270	66	6	5	25	24	9	2	3
Arenal +	420-38	2	4	2	5	4	1	2	1
Arenal +	061	1	2						
Aurora +	272		1	1		2			
Aur-Am 1 -	230	1			2				
Aur-Am 1 -	412-15			3	7	8	1	8	1
Am 1-2 +	181-84			1	2	2			
Am 1-2	346			2*	2	2	1		1
Amatle 2	188-90					1[1]			
Amatle 2	340-45			1*		3[1]		1	1

[1]These sherds were very near the top of the east wall in pit 66E/0N where modern cutting has been especially heavy. It is probable that they were introduced into the lower strata.

*These sherds were sealed below the early floor in the west ball court wall. They probably were introduced through the rodent activity seen in the wall profile (Fig. 13).

APPENDIX 3

THE VALLEY BALL COURT CIVIC CENTERS

The Early to Middle Classic Ball Court Sites: (N-S)

	Site Name	Kaminaljuyu Project Grid Number
1	Lo de Reyes I	22-14-044
2	Azacualpilla	24-22-010
3	Pelikan	33-43-139
4	La Comunidad	45-34-171
5	Florencia	56-43-326
6	Barcenas IV	70-14-296
7	Barcena	71-10-247
8	Cerritos	71-30-141
9	Santa Clara VI	71-30-158
10	Villa Neuva	71-34-166
11	Petapa I	85-01-292
12	Taltic IV	85-11-223
13	C-II-7	46-23-041
14	B-III-5	46-22-250
15	C-III-12 (?)	----
16	D-IV-6 (?)	46-33-041

The Late Classic Ball Court Sites: (E-W)

17	Rincon III	19-44-290
18	Rastro I	27-43-398
19	Cristina	33-24-212
20	Guacamaya I	33-41-118
21	La Cruz	34-40-108
22	Lavarreda	35-41-118
23	Sanja	45-03-389
24	Aycinena	46-00-210
25	Betania	46-04-303
26	Primavera	56-33-386
27	Pompeya	68-42-100
28	Falda	70-34-292
29	San Jose VI	71-01-366
30	San Jose V	71-12-116
31	San Jose III	71-13-361
32	Santa Catalina	71-14-391
33	Santa Clara IX	71-31-312
34	Eucaliptus	71-40-033
35	Santa Clara V	71-41-048
36	Villa Nueva VI	71-44-324
37	Petapa V	85-01-370

	Site Name	Kaminaljuyu Project Grid Number
38	Taltic III	85-11-285
39	Taltic II	85-11-301
40	Cotio	----
41	C-II-4	46-23-000
42	B-IV-2	46-32-053
43	F-V-1	46-34-221

APPENDIX 4

LEGEND FOR MOUND PROFILES

List of soil strata by number.

1: Black to gray-black top soil; contained a larger amount of organic material.

2: Brown to light brown clay; very few, small talpetate inclusions.

3: Dark brown caly to very slightly sandy clay; no inclusions.

3a: Dark brown sandy clay; no inclusions.

3b: Dark brown sand to clayey sand, heavily mottled with coarse yellow arena.

4: Light gray-brown sandy clay; crushed pumice inclusions.

5: Yellow to yellow-brown clay; extremely hard and cohesive.

6: Dark brown clay; crushed pumice and talpetate inclusions; extremely hard and cohesive.

7: Brown to dark brown slightly clayey sand; no inclusions.

7a: Brown sand; very loose.

8: Light brown to brown clay to slightly sandy clay; small amount of crushed pumice inclusions.

9: Yellow-brown pumaceous clay.

10: Dark brown clay; talpetate flake inclusions; very hard and cohesive.

11: Chocolate-brown clay; no inclusions.

11a: Chocolate brown sandy clay; no inclusions.

11b: Chocolate-brown to dark brown sandy clay; no inclusions; high concentration of organic materials within the unit.

12: Chocolate-brown clay; large amount of crushed pumice and talpetate inclusions.

13: Brown to gray-brown sand; mottled; large amount of modern cultural materials.

14: Dark black humus; high concentration of organic materials.

15: Dark reddish-brown humus; lower concentration of organic material than within Stratum 14; high concentration of burned adobe lumps which gives the zone its reddish hue.

16: Yellow to yellow-brown mottled, blocky clay; no inclusions.

17: Coarse yellow sand mixed with a small amount of clay; very hard; no inclusions.

18: Yellow to yellow-brown sandy clay; very much like Stratum 16. This is probably a rodent hole.

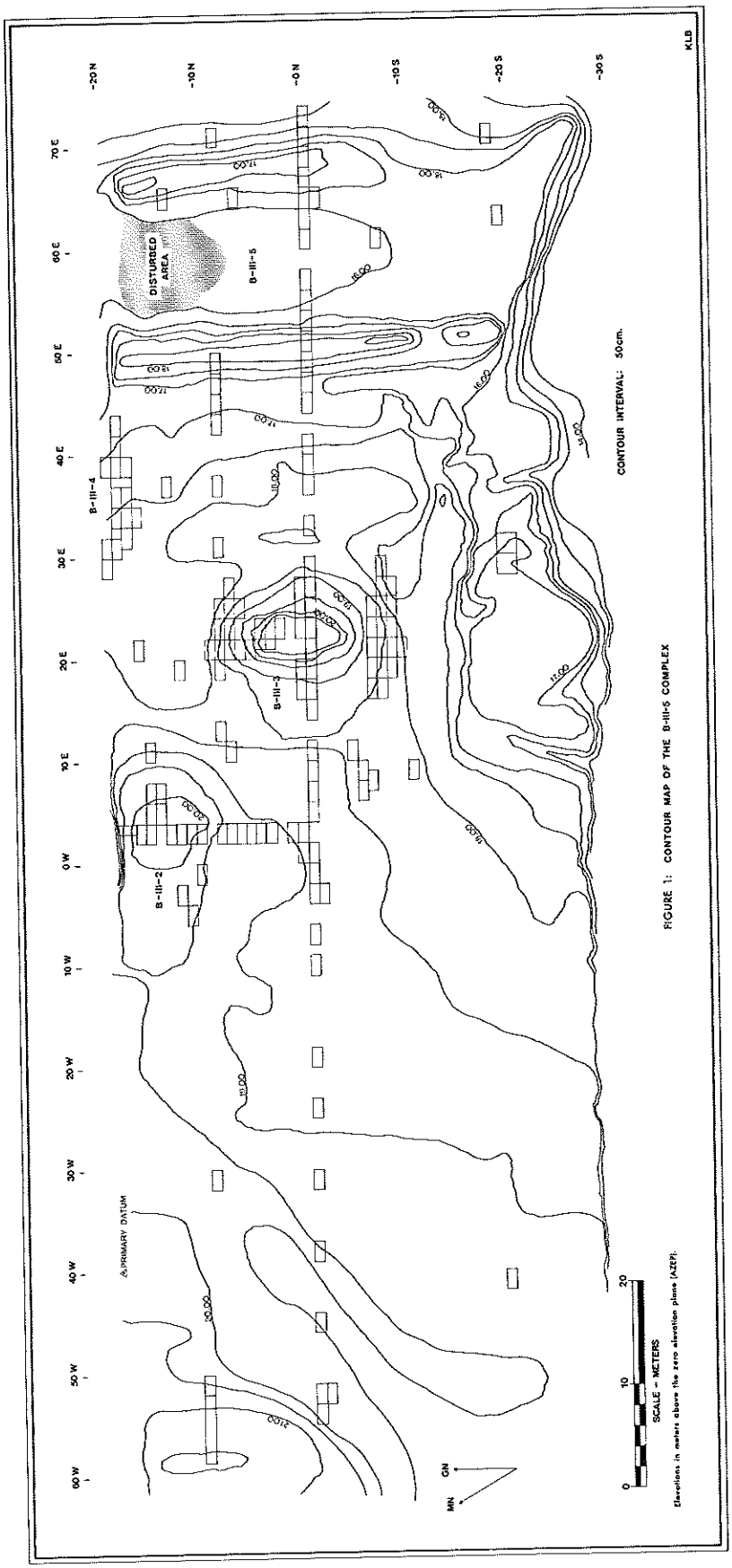


FIGURE 1: CONTOUR MAP OF THE B-III-5 COMPLEX

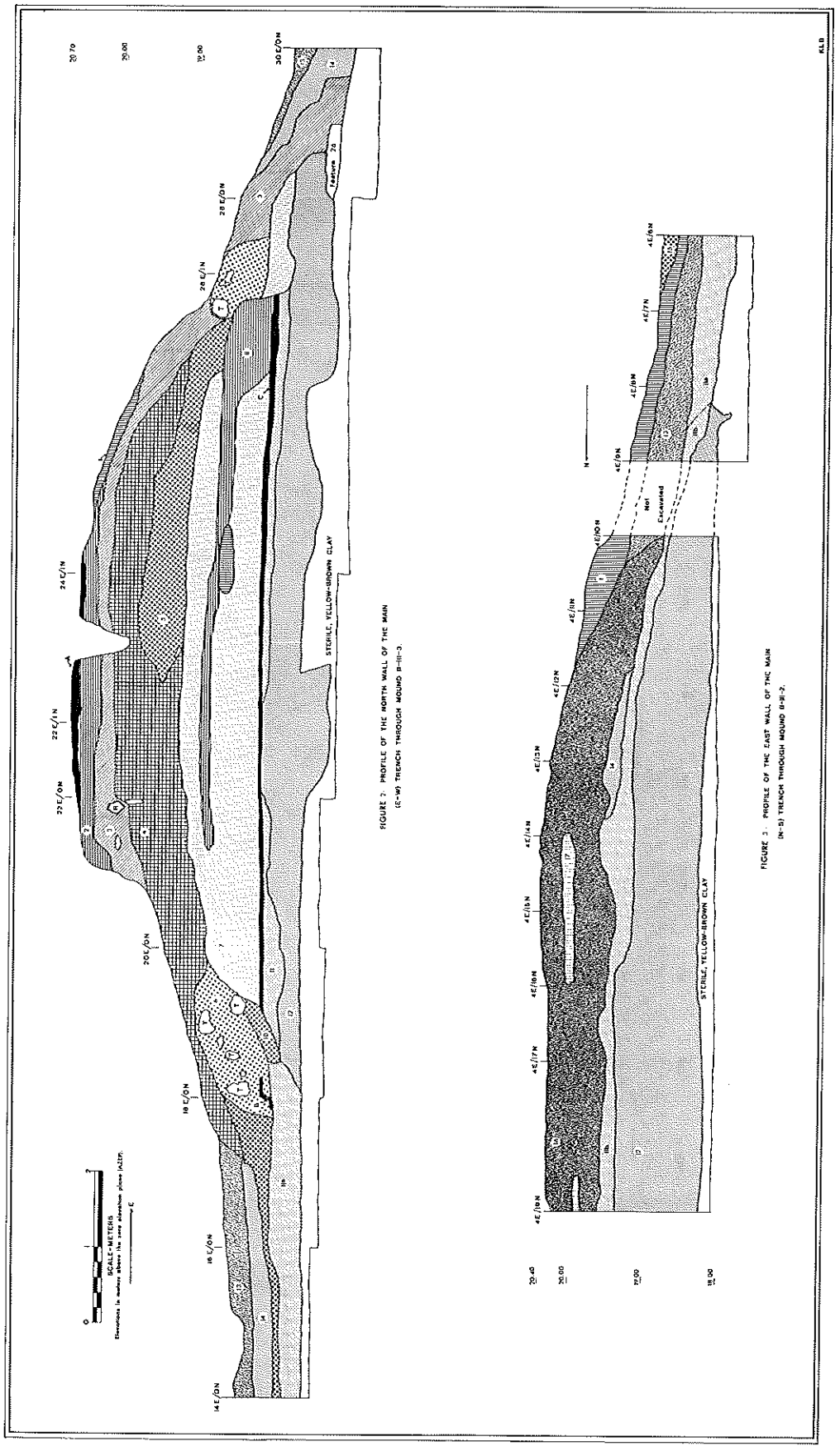


FIGURE 2: PROFILE OF THE NORTH WALL OF THE MAIN (C-W) TRENCH THROUGH MOUND 8-III-3.

FIGURE 3: PROFILE OF THE EAST WALL OF THE MAIN (N-S) TRENCH THROUGH MOUND 8-III-2.

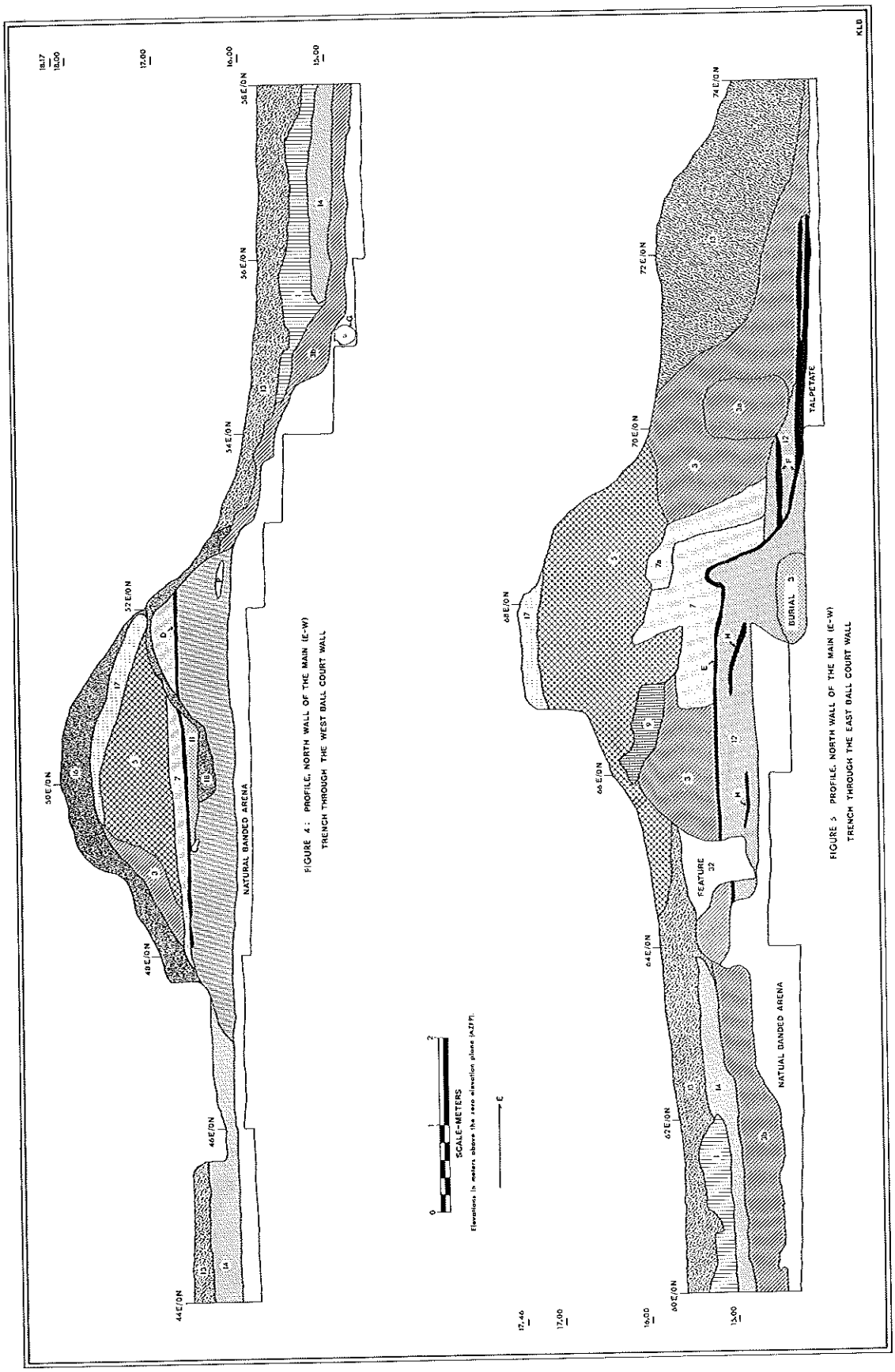


FIGURE 4: PROFILE, NORTH WALL OF THE MAIN (E-W) TRENCH THROUGH THE WEST BALL COURT WALL

FIGURE 5 PROFILE, NORTH WALL OF THE MAIN (E-W) TRENCH THROUGH THE EAST BALL COURT WALL

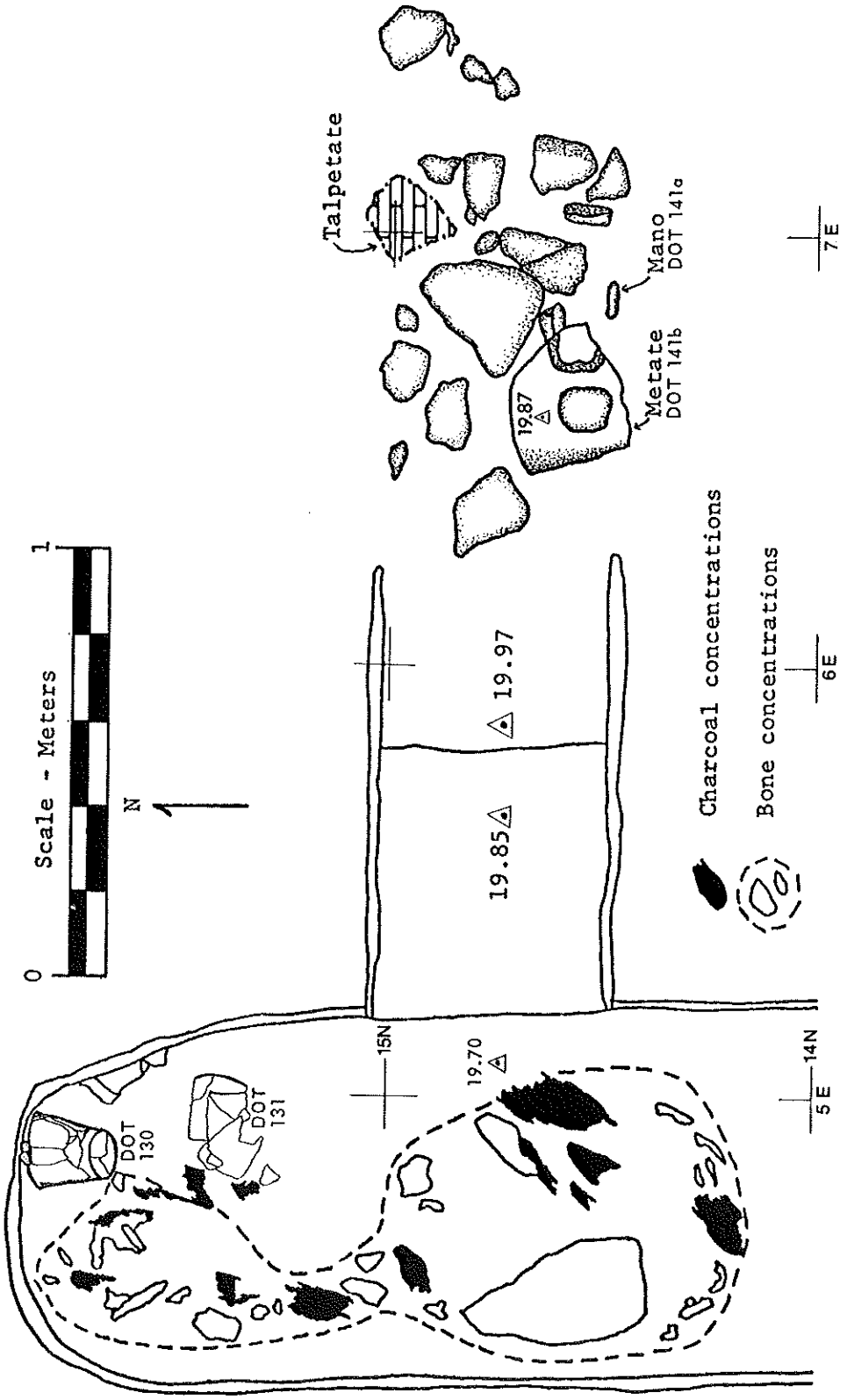


FIGURE 6: TOMB CONTAINING BURIAL 1, MOUND B-III-2b

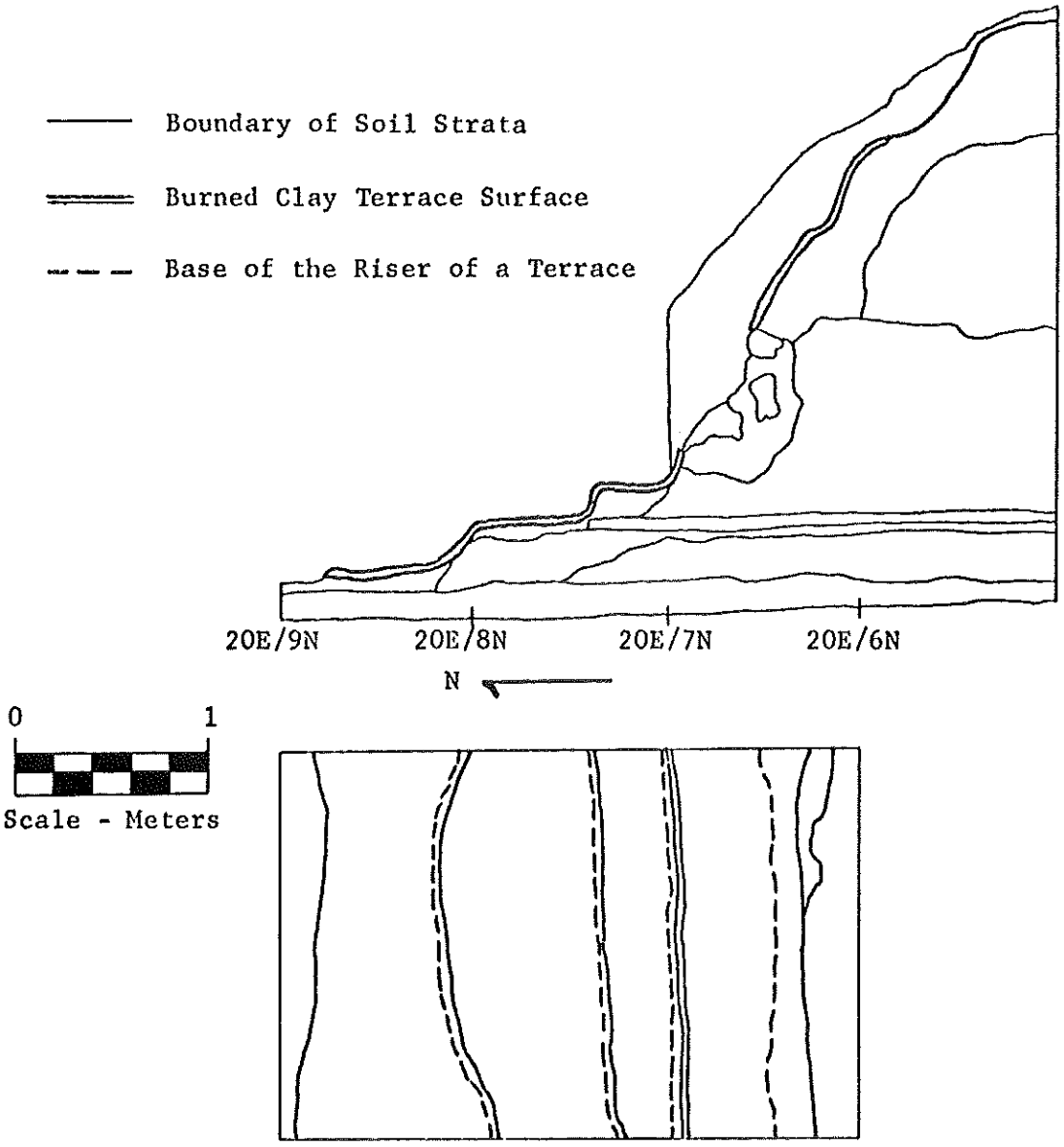


FIGURE 7: PROFILE AND PLANVIEW OF TERRACES, MOUND B-III-3a

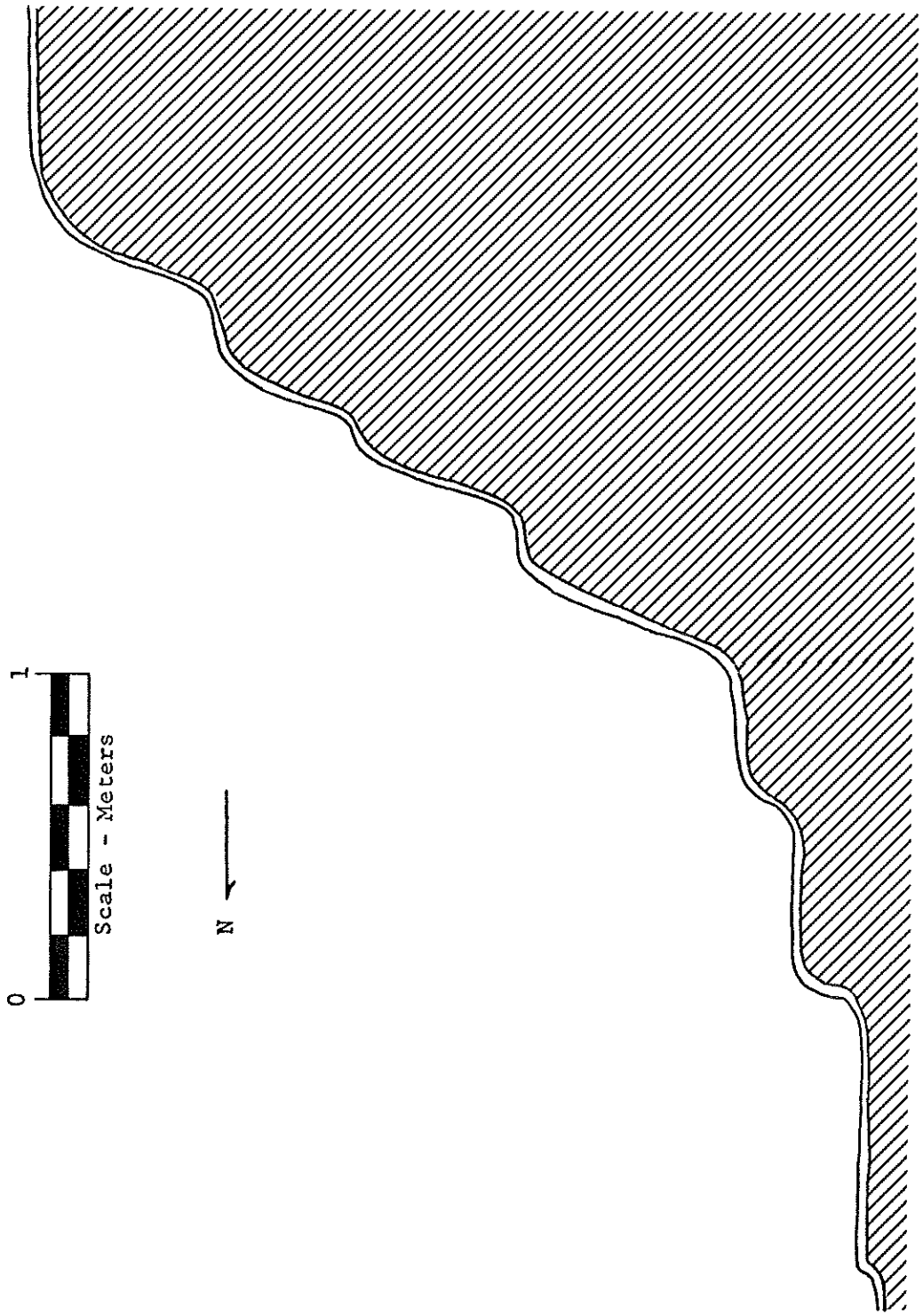


FIGURE 8: CROSS-SECTION RECONSTRUCTION OF THE TERRACES, MOUND B-III-3a

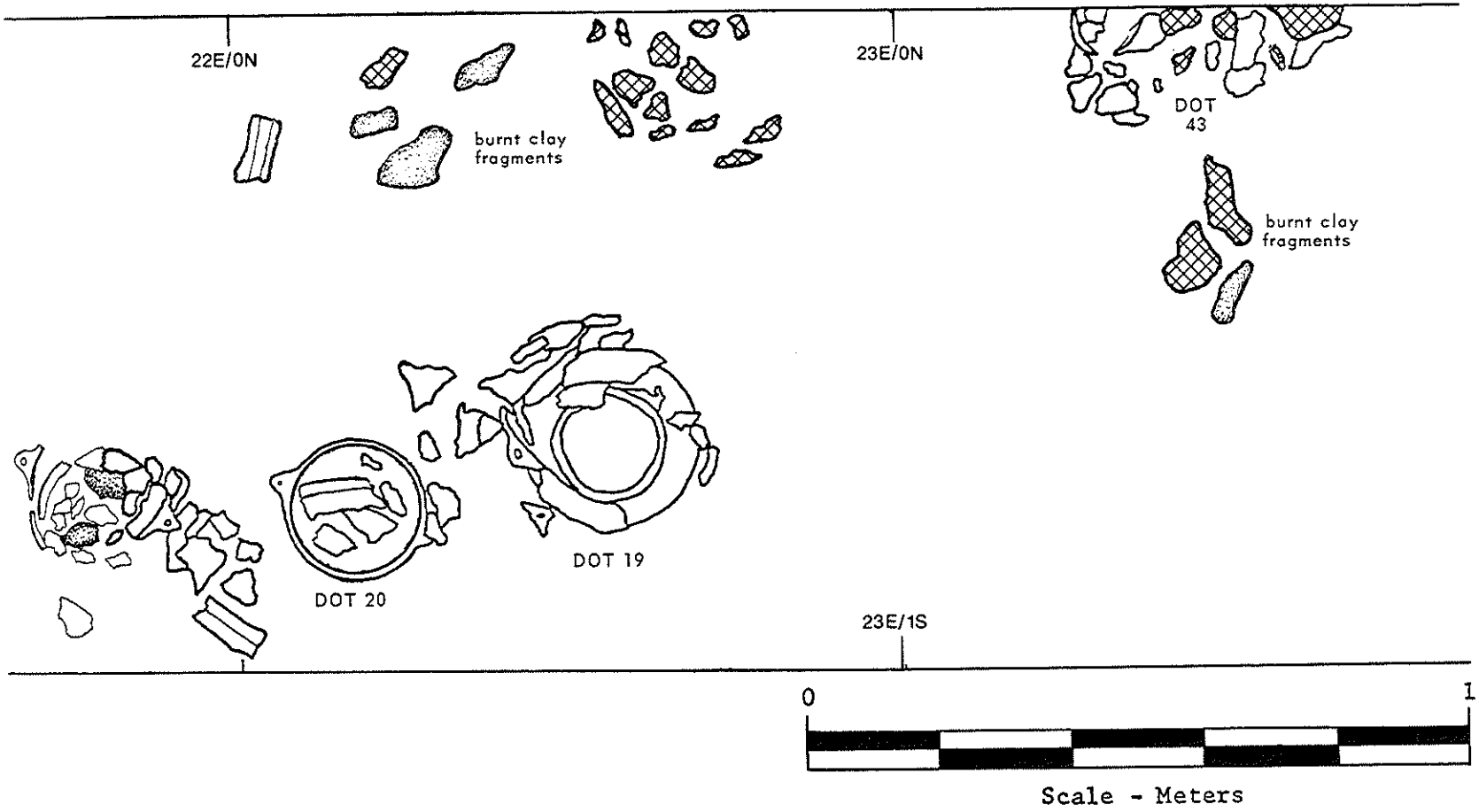


FIGURE 9: ITEMS ON FLOOR OF MOUND B-III-3a

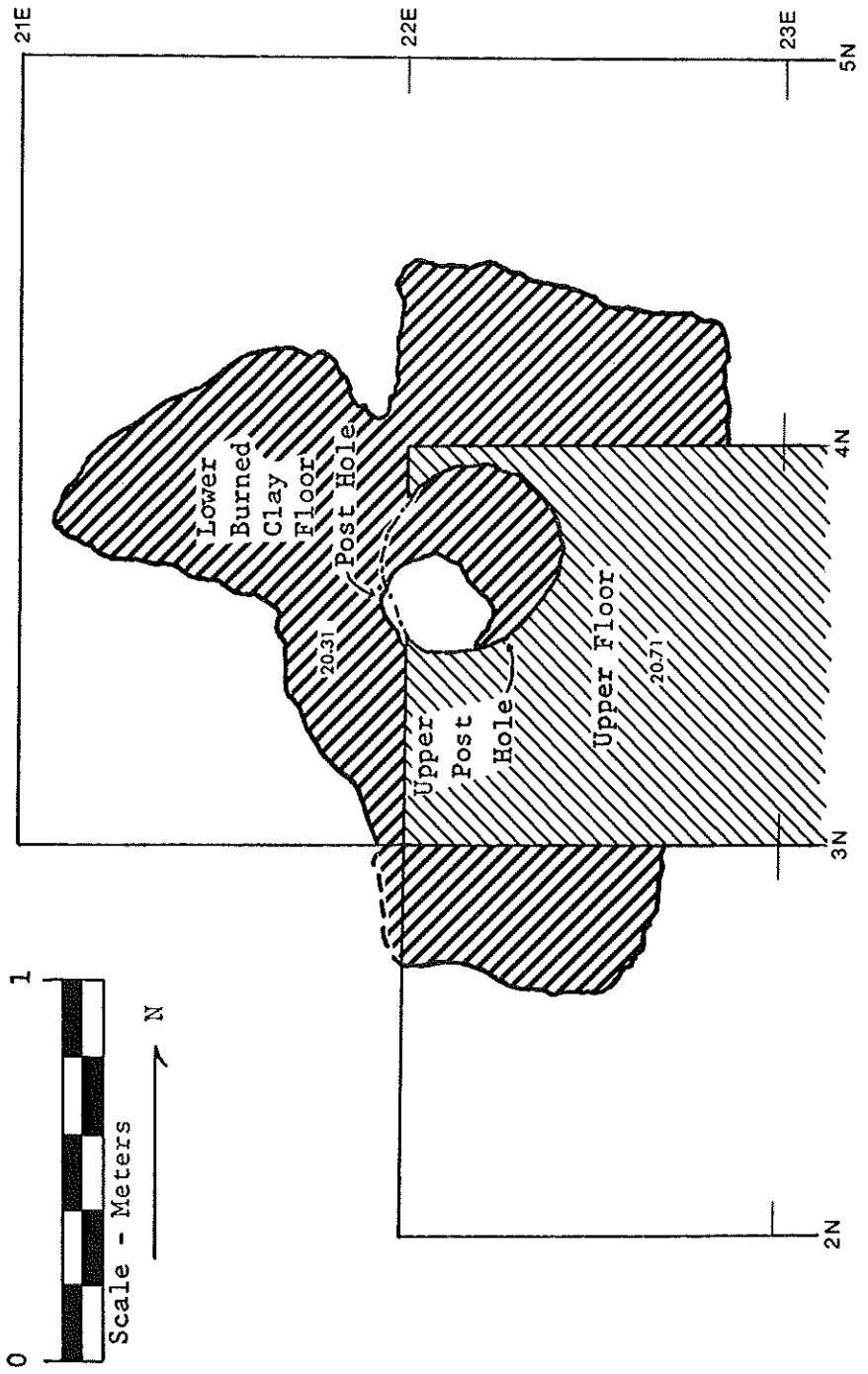


FIGURE 10: SUPERIMPOSED POST HOLES AND FLOORS, MOUNDS B-III-3a (heavy line) and B-III-3b (medium line)

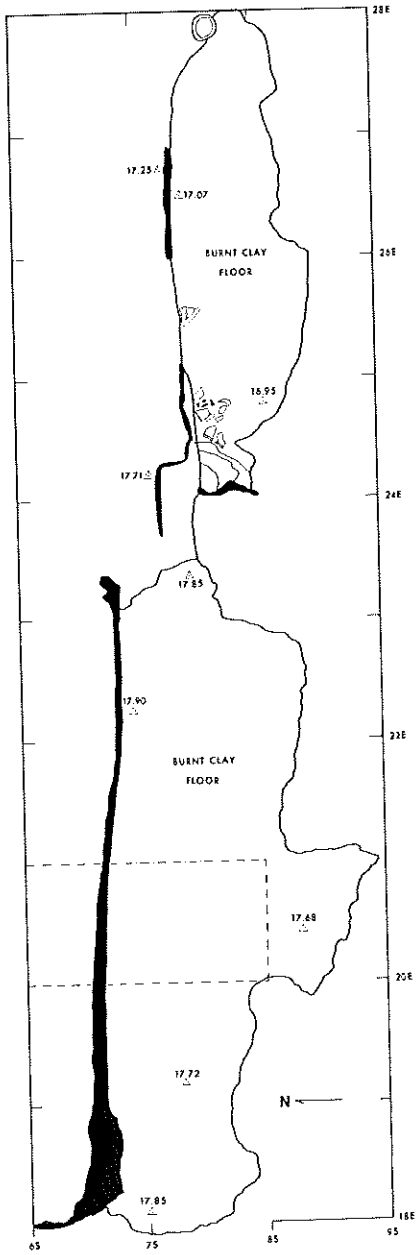


FIGURE 11: PLANVIEW OF "ROOM", MOUND B-III-3, SOUTH SIDE

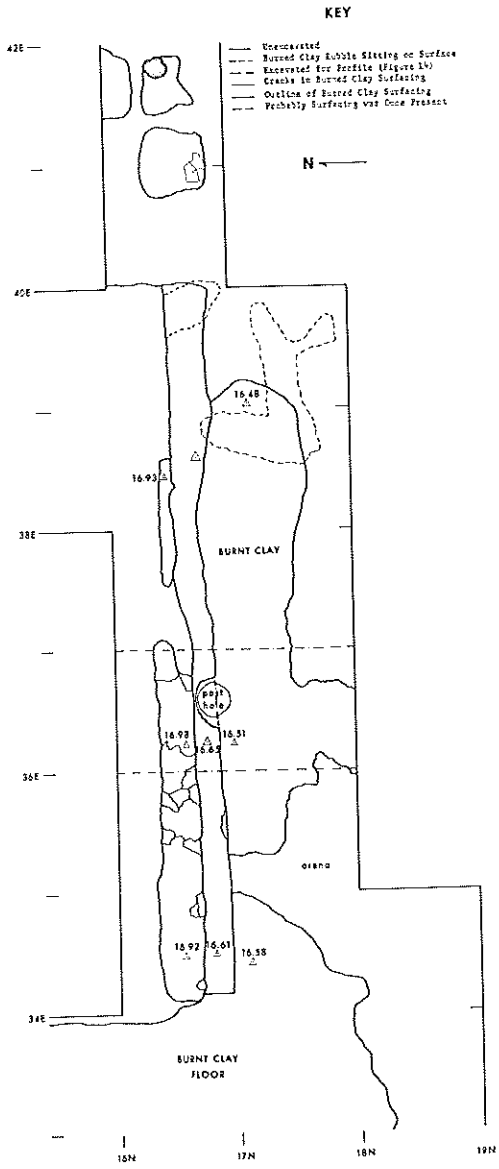


FIGURE 13: PLANVIEW OF TERRACES, MOUND B-III-4

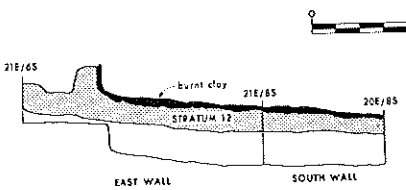


FIGURE 12: PROFILE OF "ROOM" FLOOR

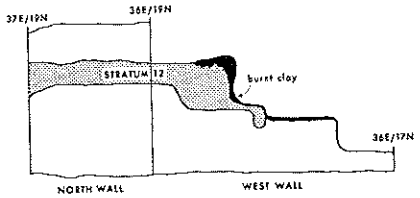


FIGURE 14: PROFILE OF TERRACES, MOUND B-III-4

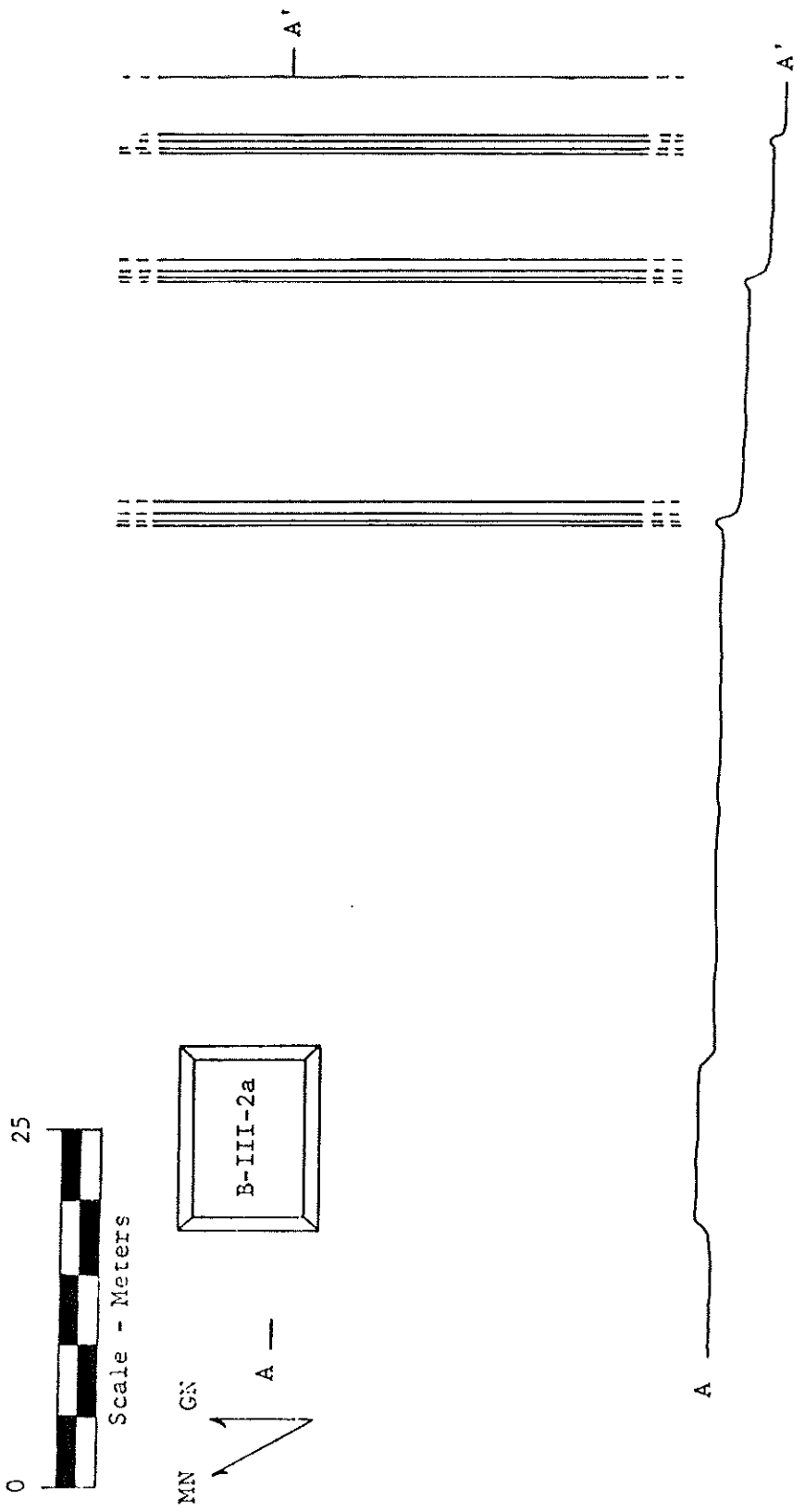


FIGURE 15: B-III-5 MOUND GROUP, INITIAL PHASE OF CONSTRUCTION

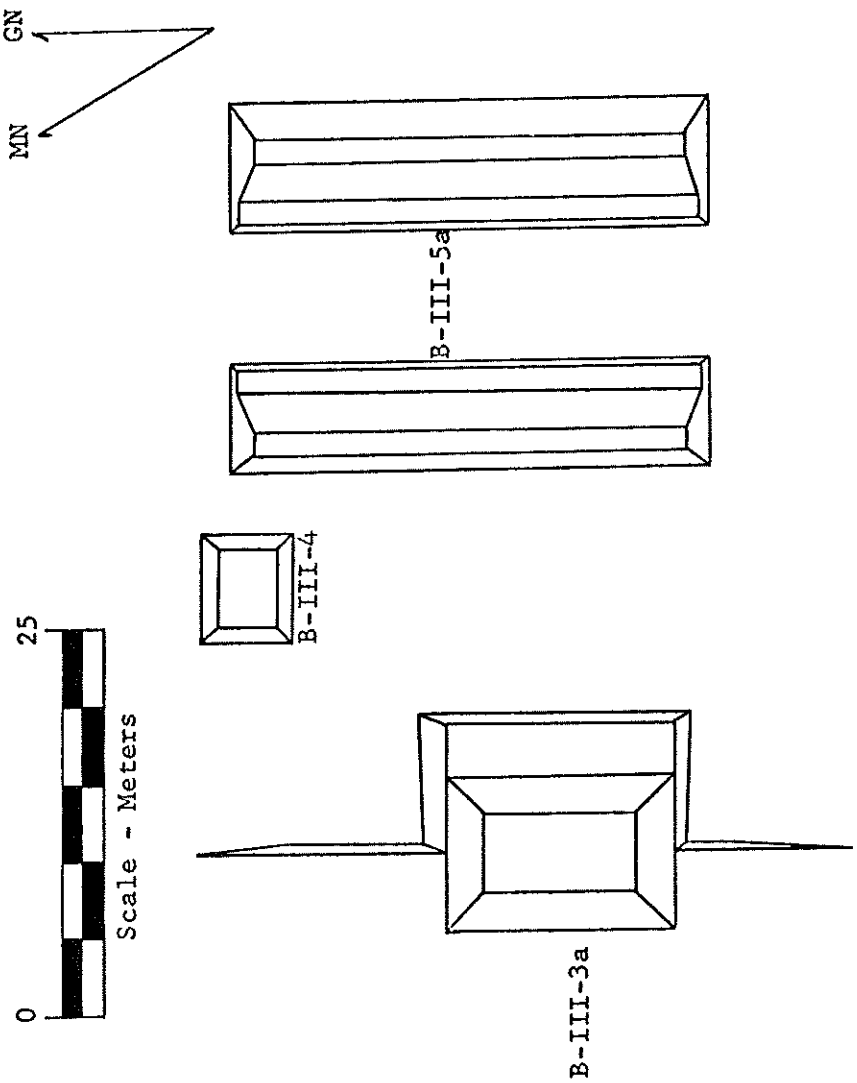


FIGURE 16: B-III-5 MOUND GROUP, SECOND PHASE OF CONSTRUCTION

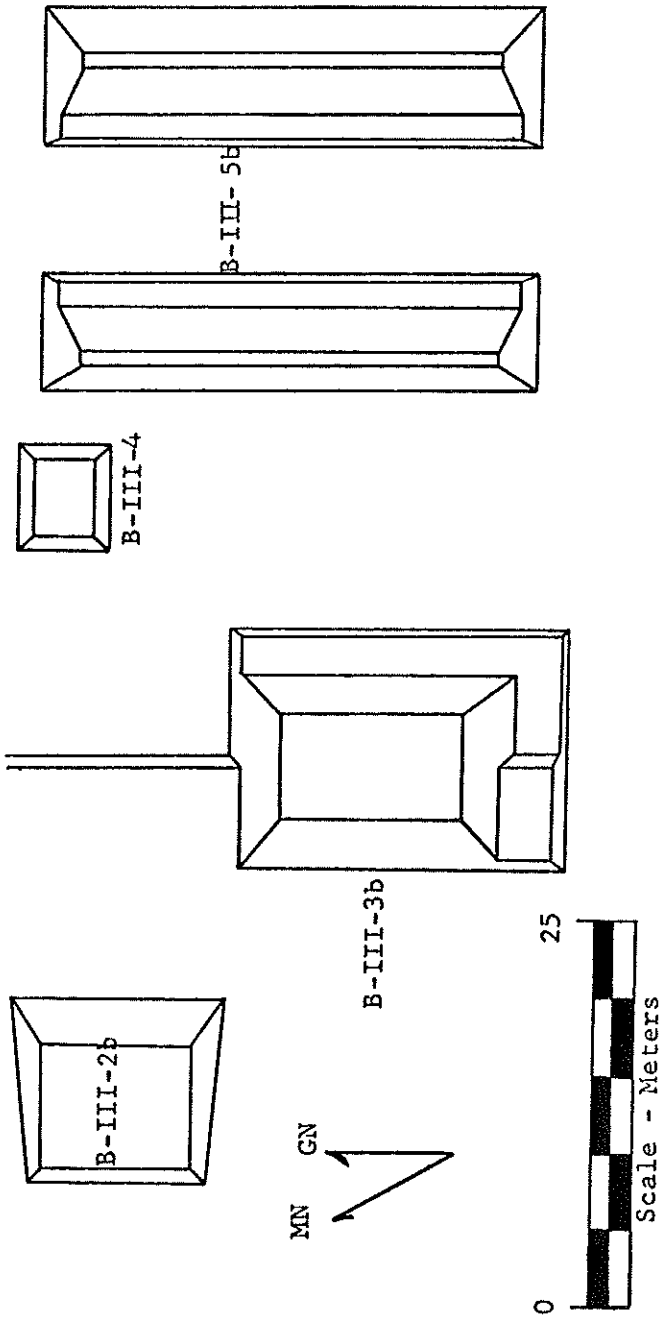


FIGURE 17: B-III-5 MOUND GROUP, FINAL PHASE OF CONSTRUCTION

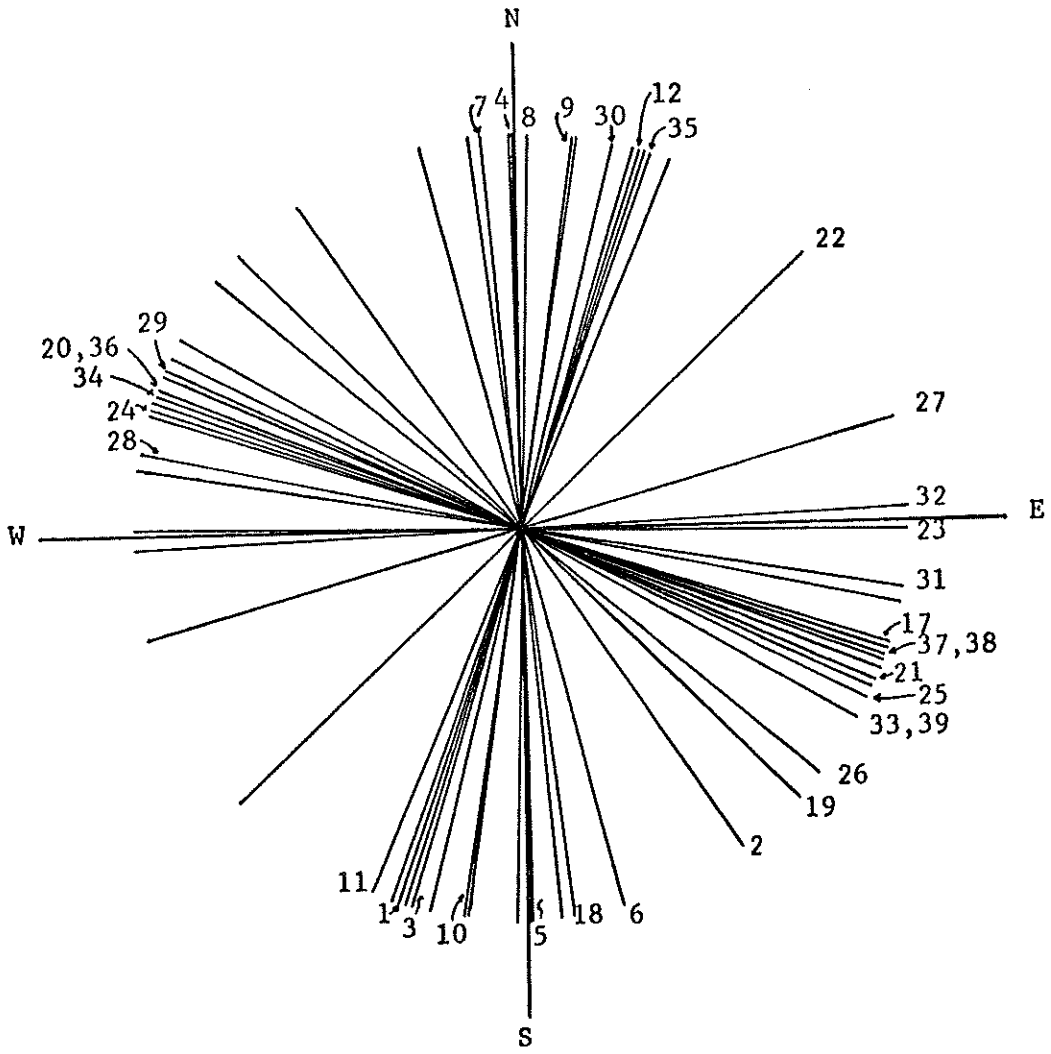


FIGURE 18: ORIENTATION OF LONG AXIS, VALLEY BALL COURTS

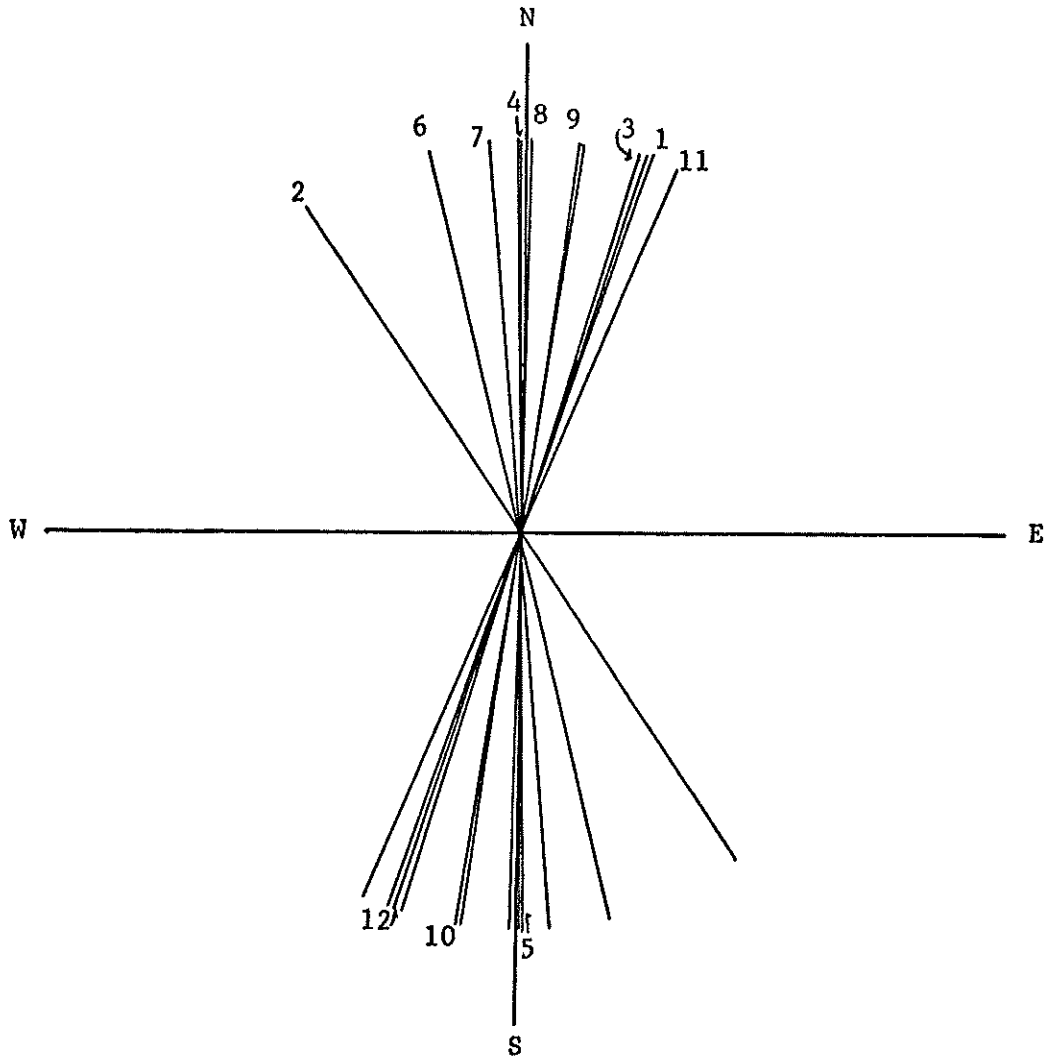


FIGURE 19: ORIENTATION OF LONG AXIS, EARLY (AURORA), AND MIDDLE (AMATLE 1) CLASSIC BALL COURTS IN THE VALLEY

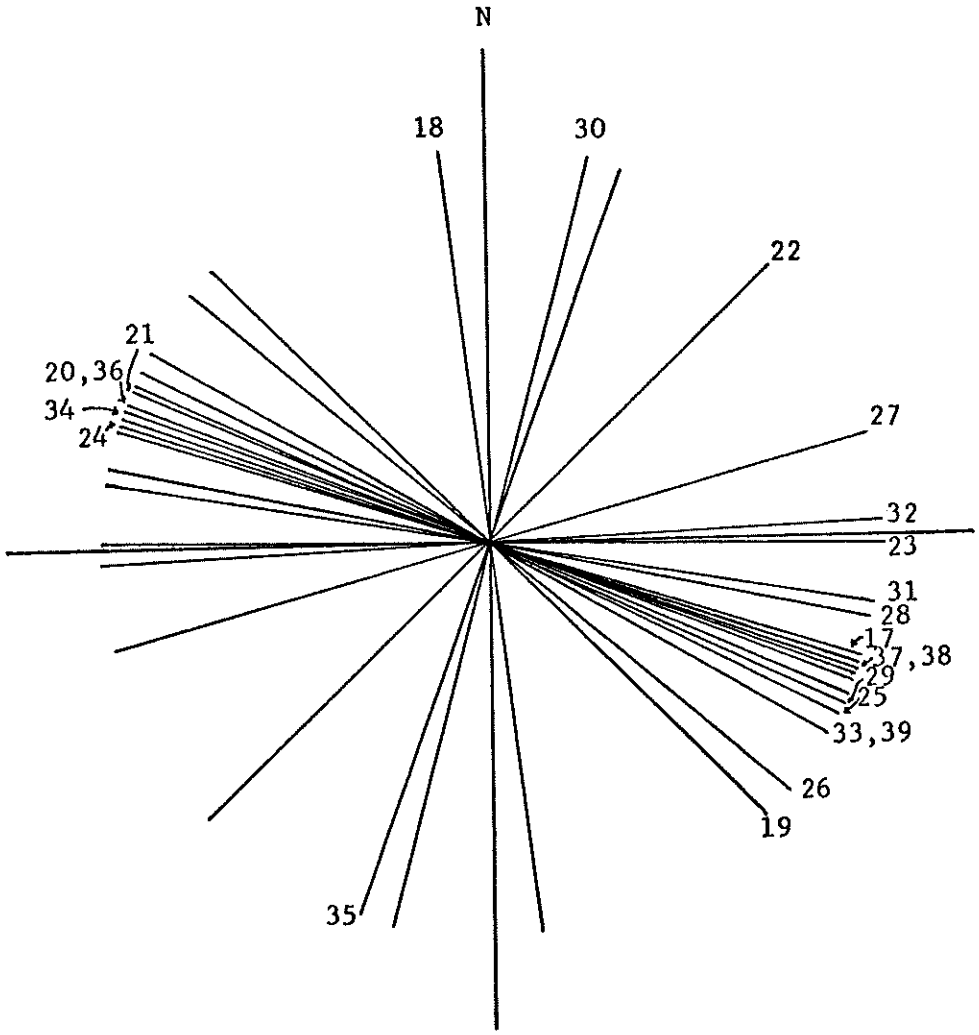


FIGURE 20: ORIENTATION OF LONG AXIS, LATE (AMATLE 2)
CLASSIC BALL COURTS IN THE VALLEY

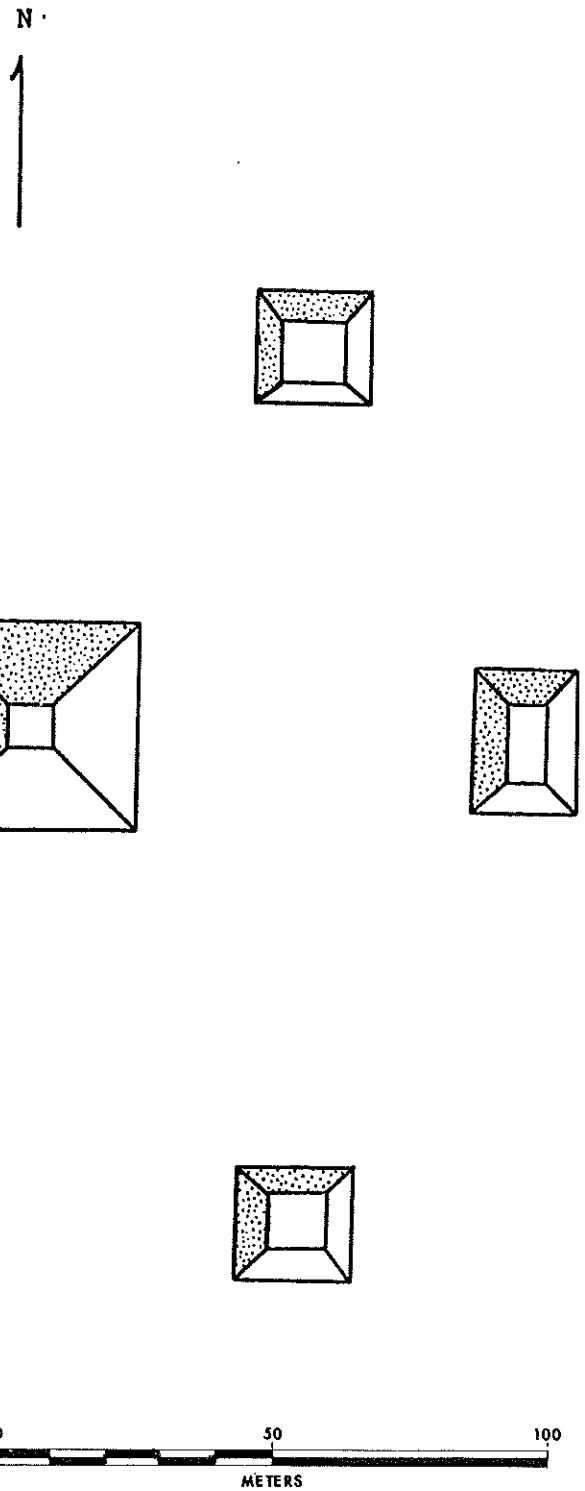


FIGURE 21: TYPICAL MOUND ARRANGEMENT FOR THE TERMINAL FORMATIVE CIVIC CENTER (AFTER BEBRICH 1969)

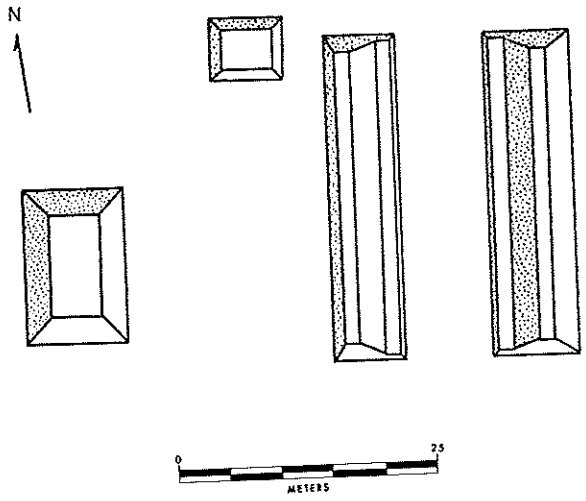


FIGURE 22: TYPICAL MOUND ARRANGEMENT FOR THE EARLY AND MIDDLE CLASSIC BALL COURT CIVIC CENTER

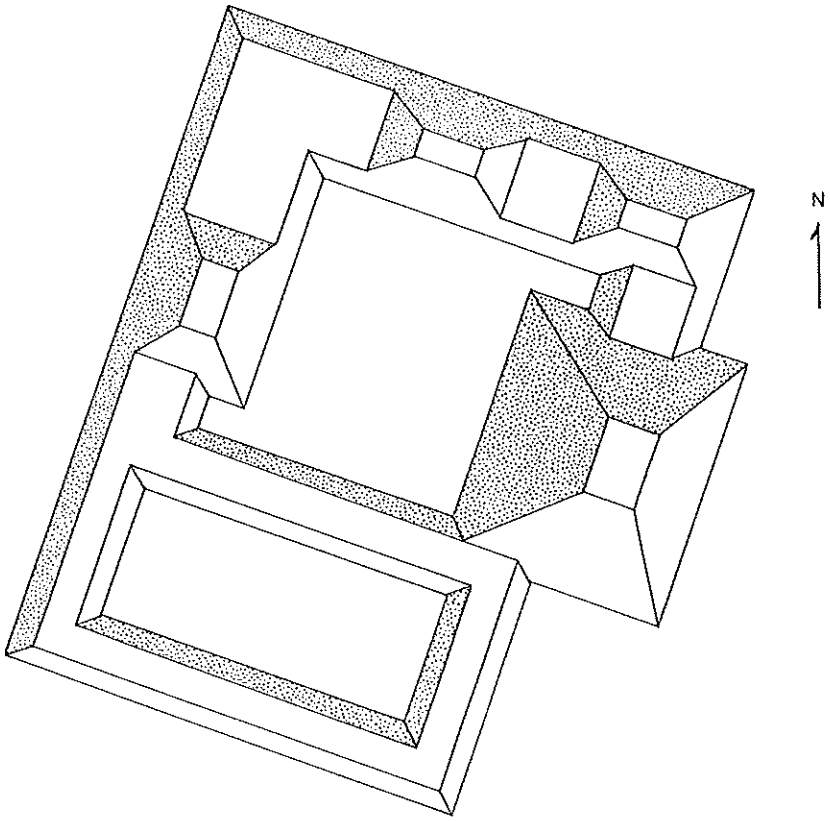
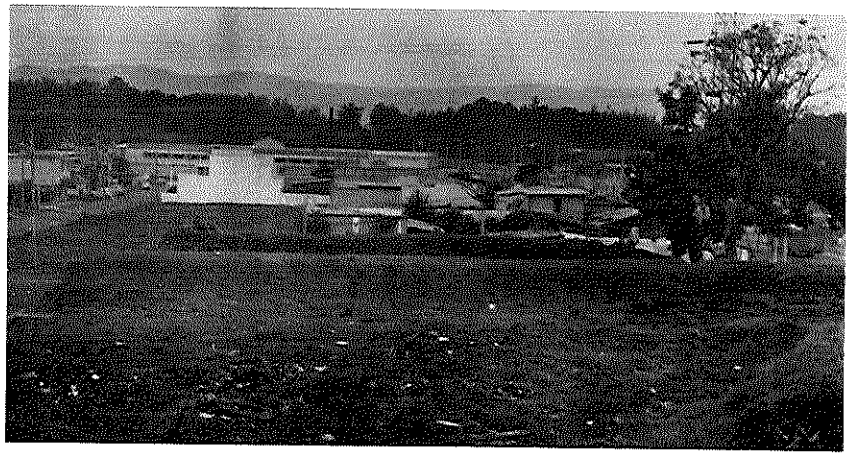


FIGURE 23: TYPICAL MOUND ARRANGEMENT FOR THE LATE CLASSIC BALL COURT CENTER (AFTER SHOOK AND PROSKOURIAKOFF 1956)

a. Mound B-III-5, North End of Playing Alley



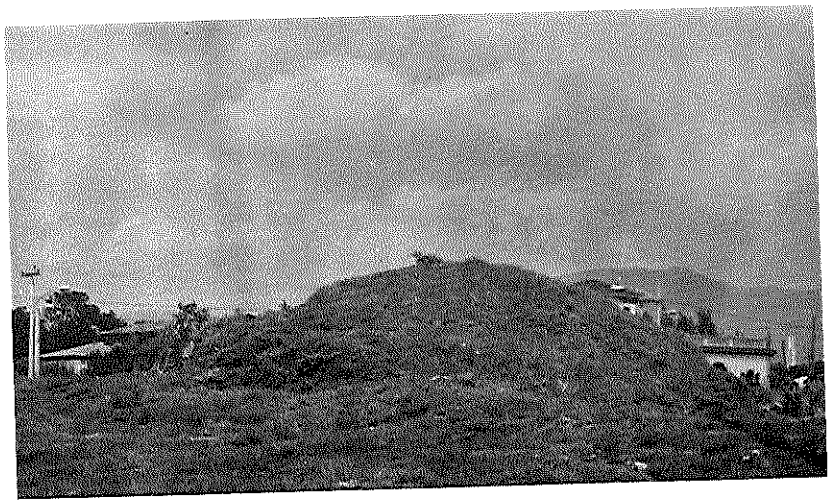
b. Mound B-III-5, West Side

c. Parrot Head Sculpture (Monument 32)
(Photo courtesy of Peabody Museum, Harvard)

PLATE 1

a. Peten Polychrome Bowl (KJ70-7901, DOT 124) Feature 32, Mound B-III-3

b. Mound B-III-2, North Side



c. Mound B-III-3, North Side

d. Feature 20, Mound B-III-3

PLATE 2

ARTIFACT SUMMARIES FOR

KAMINALJUYU MOUND EXCAVATIONS

by

Joseph W. Michels

LIST OF TABLES

Table		Page
1	Mound B-II-1: Total Artifacts Recovered During Excavation . .	470
2	Mound B-II-2: Total Artifacts Recovered During Excavation . .	472
3	Mound B-III-1: Total Artifacts Recovered During Excavation . .	473
4	Mound B-IV-1: Total Artifacts Recovered During Excavation . .	475
5	Mound B-V-2: Total Artifacts Recovered During Excavation . . .	477
6	Mound C-V-12: Total Artifacts Recovered During Excavation . .	478
7	Mound D-III-1: Total Artifacts Recovered During Excavation	480
8	Mound F-VI-3 (INCAP): Total Artifacts Recovered During Excavation	481

INTRODUCTION

The Instituto de Antropologia e Historia, Guatemala requested that the Kaminaljuyu Project Field Laboratory process a number of artifact collections relating to previously excavated mounds at Kaminaljuyu. The mounds were dug by various individuals affiliated with the Instituto. For one reason or another the excavated collections had not been subjected to laboratory processing and were being stored in the Guatemala Museum of Anthropology in their original field packings.

We were happy to oblige the Instituto since our laboratory was geared up to processing such large quantities of specimens that the extra load was hardly felt. Even more important, however, we were pleased that in so doing we would make these collections fully comparable from an analytic standpoint with collections excavated by the project. In this category are the museum collections from Mounds B-IV-1, C-V-12, D-III-1, and F-VI-3.

In addition we have supplied artifact summaries for three mounds excavated by the Kaminaljuyu Project and published in the first report (Occasional Paper in Anthropology, No. 2: 1969). The excavation reports went to press before the artifact summaries were available. They are printed here and serve as supplements to the individual chapters in the above-mentioned volume. In this category are the artifact collections from Mounds B-II-1, B-III-1, and B-V-2.

Finally, there is an artifact summary for one mound excavated by the Kaminaljuyu Project but still unpublished--Mound B-II-2. The excavation report will be included in the volume on the Kaminaljuyu Mound Survey to be published at a future date. The artifact summary is included here since B-II-2 forms part of the B-III-1 mound group which is currently serving as an example of a Terminal Formative elite residential and civic complex in various discussions concerning changing settlement patterns at Kaminaljuyu, in this volume and elsewhere.

The artifact summaries provide information on the frequency distribution of artifacts within the 160 taxonomic categories recognized for purposes of preliminary analysis. For more information on the classification scheme the reader should refer to the Foreword of this volume.

Table 1

Mound B-II-1: Total Artifacts Recovered During Excavation*

Artifact Name	Material Code	Item	Sub-Item	Frequency
Rim sherd	1	1	0	7,131
Body sherd	1	2	0	57,596
Unclassified clay artifact	1	3	0	40
Burnt clay lumps	1	4	0	1,925
Burnt clay lumps	1	4	1	567
Clay figurine	1	5	0	84
Effigy sherd	1	6	0	27
Adorno	1	7	0	108
Clay bead	1	9	0	3
Clay stamp	1	10	1	1
Clay stamp	1	10	3	1
Sherd disc	1	12	2	4
Sherd disc	1	12	1	1
Incensario	1	14	0	8
Pottery vessel (whole)	1	16	0	6
Sherd abrader	1	17	0	41
Obsidian blade	2	1	0	1,820
Obsidian flake	2	2	0	997
Obsidian core	2	3	0	11
Shaped obsidian artifact	2	4	0	8
Obsidian pebble	2	5	0	1
Stone building material	3	1	0	542
Unclass. chipped stone artifact	3	2	0	2
Unclass. ground stone artifact	3	3	0	117
Mica	3	4	0	26
Mineral pigment	3	6	0	2
Quartz crystal	3	7	0	2
Green Stone detritus	3	8	0	7
Soap stone	3	9	0	2
Utilized stone cobble	3	11	0	143
Pumice	3	12	0	129
Shaped mano	3	14	1	2
Shaped mano	3	14	2	3
Shaped mano	3	14	4	5
Cylindrical mano	3	15	0	4
Pebble mano	3	16	0	5
Non-artifact detritus	3	19	0	554
Hammer stone	3	20	1	7
Hammer stone	3	20	2	2
Hammer stone	3	20	3	1
Hammer stone	3	20	4	1
Hammer stone	3	20	5	1
Abrading pebble	3	21	1	14

Table 1 (continued)

Artifact Name	Material Code	Item	Sub-Item	Frequency
Abrading pebble	3	21	2	31
Abrading pebble	3	21	3	69
Abrading pebble	3	21	4	6
Polishing pebble	3	22	1	32
Shaped metate	3	23	0	1
Shaped metate	3	23	1	13
Shaped metate	3	23	2	2
Shaped metate	3	23	6	1
Shaped metate	3	23	7	1
Rubbing platform	3	24	1	27
Rubbing platform	3	27	2	2
Stone mortar	3	25	3	1
Thin stone slab	3	35	0	12
Celt	3	36	0	5
Basalt flake artifact	3	41	0	8
Chalcedony flake artifact	3	42	0	3
Steatite tab	3	44	0	1
Radiocarbon sample	4	1	0	66
Radiocarbon sample	4	2	0	1
Unclassified bone	5	0	0	17
Animal bone	5	1	0	6
Animal bone	5	1	1	1
Human bone	5	3	0	3
Unmodified shell	6	1	0	3
Soil sample	7	1	0	109
Ecological specimen	9	1	0	1
Ecological specimen	9	2	0	2
Unidentified object	11	0	0	1
Adobe flooring	12	0	0	4
Adobe flooring	12	1	0	9
			TOTAL COUNT	72,389

*Excavated by the Kaminaljuyu Project (Austin 1969).
(Complete artifact code can be found in Table 1 of Foreword.)

Table 2

Mound B-II-2: Total Artifacts Recovered During Excavation*

Artifact Name	Material Code	Item	Sub-Item	Frequency
Rim sherd	1	1	0	895
Body sherd	1	2	0	7,434
Unclassified clay artifact	1	3	0	12
Burnt clay lumps	1	4	0	510
Clay figurine	1	5	0	3
Effigy sherd	1	6	0	1
Adorno	1	7	0	5
Sherd disc	1	12	0	1
Incensario	1	14	0	3
Candelero	1	19	0	1
Obsidian blade	2	1	0	268
Obsidian flake	2	2	0	120
Obsidian core	2	3	0	3
Stone building material	3	1	0	190
Unclass. chipped stone artifact	3	2	0	2
Unclass. ground stone artifact	3	3	0	44
Grooved stone weight	3	5	0	7
Mineral pigment	3	6	0	7
Quartz crystal	3	7	0	3
Green stone detritus	3	8	0	5
Soap stone	3	9	0	1
Utilized stone cobble	3	11	0	3
Pumice	3	12	0	27
Pyrite	3	13	0	9
Shaped mano	3	14	2	1
Hammer stone	3	20	1	5
Hammer stone	3	20	3	1
Abrading pebble	3	21	2	1
Abrading pebble	3	21	3	1
Polishing pebble	3	22	1	2
Shaped metate	3	23	1	1
Rubbing platform	3	24	1	1
Rubbing platform	3	24	2	1
Chalcedony flake artifact	3	42	0	2
Radiocarbon sample	4	1	0	12
Unclassified bone	5	0	0	2
Animal bone	5	2	0	1
Soil sample	7	1	0	5
			TOTAL COUNT	9,590

*Excavated by the Kaminaljuyu Project.
(Complete artifact code can be found in Table 1 of Foreword.)

Table 3

Mound B-III-1: Total Artifacts Recovered During Excavation*

Artifact Name	Material Code	Item	Sub-Item	Frequency
Rim sherd	1	1	0	8,825
Body sherd	1	2	0	49,754
Burnt clay lumps	1	4	0	2,434
Burnt clay lumps	1	4	1	586
Burnt clay lumps	1	4	2	1
Burnt clay lumps	1	4	3	45
Clay figurine	1	5	0	124
Effigy sherd	1	6	0	22
Adorno	1	7	0	46
Effigy whistle	1	8	0	2
Clay bead	1	9	1	4
Clay bead	1	9	2	1
Clay stamp	1	10	0	1
Rattle ball	1	11	0	1
Sherd disc	1	12	2	1
Clay pendant	1	13	0	3
Incensario	1	14	0	32
Incensario	1	14	1	17
Miniature vessel	1	15	0	2
Pottery vessel (whole)	1	16	0	1
Sherd abrader	1	17	0	2
Obsidian blade	2	1	0	2,654
Obsidian flake	2	2	0	1,188
Obsidian core	2	3	0	32
Shaped obsidian artifact	2	4	0	1
Water-worn obsidian pebble	2	5	0	3
Stone building material	3	1	0	974
Mica	3	4	0	28
Mineral pigment	3	6	0	15
Quartz crystal	3	7	0	4
Green stone detritus	3	8	0	113
Soap stone detritus	3	9	0	5
Stone sculpture	3	10	0	1
Utilized stone cobble	3	11	0	124
Pumice	3	12	0	598
Pyrite	3	13	0	13
Shaped mano	3	14	2	7
Shaped mano	3	14	4	2
Cylindrical mano	3	15	0	1
Pebble mano	3	16	0	7
Fine-grained mano	3	17	0	1
Non-artifact detritus	3	19	0	297
Hammer stone	3	20	1	21

Table 3 (continued)

Artifact Name	Material Code	Item	Sub-Item	Frequency
Hammer stone	3	20	2	1
Hammer stone	3	20	3	1
Hammer stone	3	20	4	2
Hammer stone	3	20	5	6
Abrading pebble	3	21	1	11
Abrading pebble	3	21	2	60
Abrading pebble	3	21	3	60
Abrading pebble	3	21	4	13
Polishing pebble	3	22	0	19
Polishing pebble	3	22	1	18
Shaped metate	3	23	0	2
Shaped metate	3	23	1	9
Shaped metate	3	23	2	4
Shaped metate	3	23	3	1
Rubbing platform	3	24	1	7
Rubbing platform	3	24	2	8
Rubbing platform	3	24	3	2
Stone mortar	3	25	2	1
Ground stone vessel	3	33	0	4
Thin stone slab	3	35	0	2
Celt	3	36	0	2
Stone bead	3	37	0	2
Stone bead	3	37	1	3
Stone bead	3	37	2	1
Stone pendant	3	39	0	1
Basalt flake artifact	3	41	0	3
Chalcedony flake artifact	3	42	0	9
Shaft smoother	3	43	0	2
Steatite tab	3	44	0	2
Radiocarbon sample	4	1	0	40
Radiocarbon sample	4	2	0	1
Unclassified bone	5	0	0	19
Animal bone	5	1	0	20
Animal bone	5	1	1	1
Animal bone	5	1	2	9
Animal bone	5	1	3	1
Bone artifact	5	2	0	1
Human bone	5	3	0	4
Soil sample	7	1	0	10
Ash	8	1	0	2
Ecological specimen	9	1	0	1
			TOTAL COUNT	68,357

*Excavated by the Kaminaljuyu Project (Bebrich 1969).
(Complete artifact code can be found in Table 1 of Foreword.)

Table 4

Mound B-IV-1: Total Artifacts Recovered during Excavation*

Artifact Name	Material Code	Item	Sub-Item	Frequency
Rim sherd	1	1	0	2,022
Body sherd	1	2	0	4,956
Unclassified clay artifact	1	3	0	1
Burnt clay lumps	1	4	1	54
Burnt clay lumps	1	4	3	2
Clay figurine	1	5	0	100
Effigy sherd	1	6	0	2
Adorno	1	7	0	10
Clay bead	1	9	1	1
Clay rattle ball	1	11	0	1
Sherd disc	1	12	1	1
Clay pendant	1	13	1	1
Clay pendant	1	13	2	4
Incensario	1	14	1	127
Miniature clay vessel	1	15	0	4
Pottery vessel (whole)	1	16	0	1
Candelero	1	19	3	1
Rim head vessel sherd	1	24	0	1
Obsidian blade	2	1	0	98
Obsidian flake	2	2	0	193
Obsidian core	2	3	0	9
Shaped obsidian artifact	2	4	0	1
Stone building material	3	1	0	9
Mica	3	4	0	1
Green stone detritus	3	8	0	1
Stone sculpture	3	10	0	1
Utilized stone cobble	3	11	0	3
Pumice	3	12	0	3
Shaped mano	3	14	4	1
Non-artifact detritus	3	19	0	87
Hammer stone	3	20	1	1
Abrading pebble	3	21	2	2
Abrading pebble	3	21	3	3
Abrading pebble	3	21	4	2
Shaped metate	3	23	0	1
Shaped metate	3	23	1	1
Conical abrader	3	31	0	1
Lime stone	3	32	0	2
Celt	3	36	0	1
Basalt flake artifact	3	41	0	4
Chalcedony flake artifact	3	42	0	1
Steatite tab	3	44	0	1
Unclassified bone	5	0	0	1
			TOTAL COUNT	7,717

*Excavated by Gustavo Espinoza.
(Complete artifact code can be found in Table 1 of Foreword.)

Table 5

Mound B-V-2: Total Artifacts Recovered During Excavation*

Artifact Name	Material Code	Item	Sub-Item	Frequency
Rim sherd	1	1	0	1,383
Body sherd	1	2	0	16,812
Unclassified ceramic artifact	1	3	0	5
Burnt clay lumps	1	4	0	153
Burnt clay lumps	1	4	1	1,793
Burnt clay lumps	1	4	2	4
Burnt clay lumps	1	4	3	13
Clay figurine	1	5	0	8
Effigy sherd	1	6	0	6
Adorno	1	7	0	17
Clay bead	1	9	2	2
Incensario	1	14	0	1
Incensario	1	14	1	1
Pottery vessel (whole)	1	16	0	3
Obsidian blade	2	1	0	344
Obsidian flake	2	2	0	576
Obsidian core	2	3	0	6
Shaped obsidian artifact	2	4	0	1
Water-worn obsidian pebble	2	5	0	1
Stone building material	3	1	0	213
Unclassified stone artifact	3	2	0	2
Unclassified stone artifacts	3	3	0	23
Mica	3	4	0	11
Grooved stone weight	3	5	0	1
Soap stone detritus	3	9	0	2
Utilized stone cobble	3	11	0	30
Pumice	3	12	0	1,561
Shaped mano	3	14	1	2
Shaped mano	3	14	2	1
Misc. non-artifact detritus	3	19	0	453
Hammer stone	3	20	2	1
Hammer stone	3	20	3	1
Hammer stone	3	20	4	1
Abrading pebble	3	21	1	1
Abrading pebble	3	21	2	4
Abrading pebble	3	21	3	8
Polishing pebble	3	22	1	3
Shaped metate	3	23	0	1
Rubbing platform	3	24	2	2
Thin stone slab	3	35	0	1
Radiocarbon sample	4	1	0	7
Unclassified bone	5	0	0	22
Animal bone	5	1	0	36

Table 5 (continued)

Artifact Name	Material Code	Item	Sub-Item	Frequency
Animal bone	5	1	2	12
Unmodified shell	6	1	0	19
Soil sample	7	1	0	8
Unidentified object	11	1	0	1
			TOTAL COUNT	23,556

*Excavated by the Kaminaljuyu Project (Cardenas 1969).
(Complete artifact code can be found in Table 1 of Foreword.)

Table 6

Mound C-V-12: Total Artifacts Recovered during Excavation*

Artifact Name	Material Code	Item	Sub-Item	Frequency
Rim sherd	1	1	0	3,905
Body sherd	1	2	0	16,484
Unclassified clay artifact	1	3	0	2
Burnt clay lumps	1	4	1	429
Burnt clay lumps	1	4	3	14
Burnt clay lumps	1	4	4	2
Burnt clay lumps	1	4	5	3
Clay figurine	1	5	0	147
Effigy sherd	1	6	0	13
Adorno	1	7	0	15
Effigy whistle	1	8	0	1
Clay bead	1	9	1	1
Clay rattle ball	1	11	0	1
Sherd disc	1	12	1	2
Sherd disc	1	12	2	11
Clay pendant	1	13	2	8
Incensario	1	14	1	150
Miniature clay vessel	1	15	0	7
Pottery vessel (whole)	1	16	0	33
Sherd abrader	1	17	0	1
Clay spindle whorl	1	18	0	1
Candelero	1	19	0	2
Clay sculpture	1	20	1	3
Clay finger ring	1	22	0	1
Obsidian blade	2	1	0	332
Obsidian flake	2	2	0	564
Obsidian core	2	3	0	26
Shaped obsidian artifact	2	4	0	2
Obsidian quarry nodules	2	6	0	2
Mica	3	4	0	4
Mineral pigment	3	6	0	2
Green stone detritus	3	8	0	1
Soap stone	3	9	0	3
Stone sculpture	3	10	0	4
Utilized stone cobble	3	11	0	10
Pumice	3	12	0	10
Shaped mano	3	14	0	2
Shaped mano	3	14	1	1
Shaped mano	3	14	2	2
Pebble mano	3	16	0	1
Non-artifact detritus	3	19	0	220
Hammer stone	3	20	0	1
Hammer stone	3	20	2	1
Abrading pebble	3	21	2	4

Table 6 (continued)

Artifact Name	Material Code	Item	Sub-Item	Frequency
Abrading pebble	3	21	3	4
Abrading pebble	3	21	4	1
Shaped metate	3	23	1	1
Rubbing platform	3	24	2	1
Stone pestle	3	26	1	1
Stone hoe	3	28	0	1
Conical abrader	3	31	0	2
Lime stone	3	32	0	2
Thin stone slab	3	35	0	1
Carved stone vessel	3	40	0	3
Basalt flake artifact	3	41	0	1
Chalcedony flake artifact	3	42	0	5
Unclassified bone	5	0	0	9
Human burial	5	5	0	2
			TOTAL COUNT	22,462

*Excavated by Gustavo Espinoza.
(Complete artifact code can be found in Table 1 of Foreword.)

Table 7

Mound D-III-1: Total Artifacts Recovered During Excavation*

Artifact Name	Material Code	Item	Sub-Item	Frequency
Rim sherds	1	1	0	194
Body sherds	1	2	0	515
Burnt clay lumps	1	4	1	6
Burnt clay lumps	1	4	3	3
Effigy sherd	1	6	0	1
Clay pendant	1	13	1	1
Incensario	1	14	1	10
Candelero	1	19	2	1
Obsidian blade	2	1	0	7
Obsidian flake	2	2	0	7
Misc. non-artifact detritus	3	19	0	2
			TOTAL COUNT	747

*Excavated by Susan Miles and Gustavo Espinoza.
(Complete artifact code can be found in Table 1 of Foreword.)

Table 8

Mound F-VI-3 (INCAP): Total Artifacts
Recovered During Excavation*

Artifact Name	Material Code	Item	Sub-Item	Frequency
Rim sherd	1	1	0	2,765
Body sherd	1	2	0	12,533
Burnt clay lumps	1	4	1	78
Burnt clay lumps	1	4	3	22
Burnt clay lumps	1	4	4	2
Burnt clay lumps	1	4	5	2
Clay figurine	1	5	0	75
Effigy sherd	1	6	0	11
Adorno	1	7	0	22
Effigy whistle	1	8	0	6
Clay rattle ball	1	11	0	1
Incensario	1	14	1	102
Miniature clay vessel	1	15	0	1
Pottery vessel (whole)	1	16	0	14
Clay spindle whorl	1	18	0	1
Candelero	1	19	0	1
Candelero	1	19	1	1
Clay ear plug	1	21	0	2
Rim head vessel sherd	1	24	0	1
Obsidian blade	2	1	0	190
Obsidian flake	2	2	0	334
Obsidian core	2	3	0	4
Shaped obsidian artifact	2	4	0	5
Stone building material	3	1	0	1
Mineral pigment	3	6	0	1
Stone sculpture	3	10	0	1
Utilized stone cobble	3	11	0	1
Pumice	3	12	0	9
Shaped mano	3	14	0	3
Shaped mano	3	14	1	2
Shaped mano	3	14	2	10
Shaped mano	3	14	4	2
Non-artifact detritus	3	19	0	97
Hammer stone	3	20	1	1
Abrading pebble	3	21	3	4
Abrading pebble	3	21	4	1
Shaped metate	3	23	1	7
Digging stick weight	3	27	0	5
Stone club	3	29	3	2
Stone club	3	29	1	2
Conical abrader	3	31	0	1
Lime stone	3	32	0	1
Stone anvil	3	34	0	1

Table 8 (continued)

Artifact Name	Material Code	Item	Sub-Item	Frequency
Stone anvil	3	34	2	1
Celt	3	36	0	4
Stone bead	3	37	0	1
Basalt flake artifact	3	41	0	1
Mushroom stone	3	51	0	1
Unclassified bone	5	0	0	4
Soil sample	7	1	1	1
Ecological specimen	9	5	0	1
			TOTAL COUNT	16,339

*Excavated by the Instituto de Antropologia e Historia, Guatemala.
(Complete artifact code can be found in Table 1 of Foreword.)

ANNOTATED BIBLIOGRAPHY

FOR

KAMINALJUYU AND THE VALLEY OF GUATEMALA

by

Richard W. Kirsch

INTRODUCTION

This annotated bibliography represents research data compiled as part of The Pennsylvania State University Kaminaljuyu Project through 1973 and is presented here as a research tool for investigators interested in this area of highland Guatemala. Although most of the 165 entries pertain to archaeological data, many other entries contain data on ecology and ethnology of the Valley of Guatemala. This compilation is based on the work of many authors, including the efforts of Robert Wauchope, Michael Coe, Arden King, and others who have contributed to the Handbook of Latin American Studies. Acknowledgment is gratefully made for their invaluable assistance.

Materials included in this bibliography are published monographs, reports and articles, unpublished theses and dissertations on deposit at academic institutions, and papers presented at meetings of professional associations. It should be noted that citations are presented in alphabetical order according to author. A topical index of references is provided at the end of the bibliography.

ADAMS, Richard Newbold (1924-)
1957 Cultural surveys of Panama, Nicaragua, Guatemala, El Salvador, Honduras. Pan American Sanitary Bureau, Scientific Publication 33, Washington. 669p., maps, tables.

A basic ethnological compendium, including general descriptions of the rural cultures of Central America, as well as brief descriptions of the communities visited during the survey. Included is ethnographic data on San Miguel Petapa in the Valley of Guatemala (p. 398). The Guatemalan section republished in Spanish as Enuesta sobre la cultura de los ladinos en Guatemala, Ministerio de Educaccion Publica, Seminario de Integración Social Guatemala, Publication No. 2, 1964.

ARNOLD, Dean Edward (1942-)
1971 Intercommunity ceramic differences among the central Pokomam of Guatemala. Paper presented at the 70th annual meeting of the American Anthropological Association, New York.

Discussion of the intercommunity differences among the contemporary ceramics made in the Pokom speaking communities of Mixco, Sacoj, Chinautla, Sacojito, and Durazno, in the Valley of Guatemala. Some of these differences are explained on an ecological basis, and suggests some implications for the study of ancient ceramic craft specialization. Pottery making communities tend to be located in marginal agricultural areas which have clay resources.

ATWOOD, Rollin Salisbury (1903-)
See ATWOOD and ATWOOD, 1932

ATWOOD, Wallace Walter (1872-1949), and ATWOOD, Rollin Salisbury (1903-)
1932 Geographical research in Guatemala. Carnegie Institution of Washington, Year Book, 31: 101-107.

Definition of physiographic regions and description of geomorphology of the central highlands of Guatemala, with special attention to the study of Lake Atitlan and vicinity. F. W. McBryde participated in making an intensive study of Solola in conjunction with the geographical study of the Lake Atitlan region.

AUSTIN, Donald Mac (1944-), with LOTHSON, Gordon
1969 Mound B-II-1 excavation. In SANDERS, William T., and MICHELS, Joseph W., The Pennsylvania State University Kaminaljuyu Project: 1968 Season, Part One - The Excavations. Occasional Papers in Anthropology, No. 2, The Pennsylvania State University, Department of Anthropology. University Park.

Excavation methodology and description of an elite residential platform, associated with Mound B-III-1, dating to the Miraflores (Verbena-Arenal) phase of the Terminal Formative period.

BALL, Joseph W.
1973 The B-V-8 mound group: a later Formative and Middle Classic elite residence complex. In MICHELS, Joseph W., and SANDERS, William T., The Pennsylvania State University Kaminaljuyu Project: 1969, 1970 Seasons, Part One - Mound Excavations. Occasional Papers in Anthropology, No. 9, The Pennsylvania State University, Department of Anthropology. University Park.

Methodology and description of the excavation of Mounds B-V-8, B-V-14, B-V-15 provides first description of a Late Formative elite residence at Kaminaljuyu in addition to discussion of the subsequent Middle Classic elite residence complex built there.

BATRES JÁUREGUI, Antonio (1847-1929)
1926 Una cuidad arcaica sepultada en el Valle de Guatemala. Anales de la Sociedad de Geografía e Historia de Guatemala, 3(2): 176-190 [2 photos].

Presents the hypothesis that Kaminaljuyu was founded by the Olmec, the predecessors of the Maya and the Quiché, and that the site was buried by eruptions from an ancient volcano located at Lake Amatitlan some two thousand years ago, in a manner similar to Pompeii. A rather literary presentation.

BEBRICH, Carl Alan (1942-)
1969a Mound B-III-1 excavation. In SANDERS, William T., and MICHELS, Joseph W., The Pennsylvania State University Kaminaljuyu Project: 1968 Season, Part One - The Excavations. Occasional Papers in Anthropology, No. 2, The Pennsylvania State University, Department of Anthropology. University Park.

Excavation methodology and description of a multi-terraced temple platform, perhaps of a mortuary temple, dating to the Verbena phase. One burial of a child, perhaps dedicatory, is reported.

1969b Kaminaljuyu during the Terminal Formative period. Paper presented at the 68th annual meeting of the American Anthropological Association, New Orleans.

Discussion of the Miraflores settlement pattern at Kaminaljuyu, consisting of possibly 14 ward-size units, and the relation of this pattern to Service's concept of the chiefdom. Social distinctions based on the comparison of Mounds B-III-1 and E-III-3 are discussed.

BEBRICH, Carl Alan (1942-), and WYNN, Jack Thomas (1940-)

1971 Late Formative mound structures at Kaminaljuyu, Guatemala. Paper presented at the 36th annual meeting of the Society for American Archaeology, Norman, Oklahoma.

Discussion of the construction, chronology, and possible functions of banded-fill mound structures at Kaminaljuyu. This type of structure is associated with the Las Majadas, Providencia, and Early Verbena phases of the Late Formative. A distinction is made between low-lying and high conical structures, with the latter probably serving as mortuary tumuli and the focus for periodic communal observances, perhaps related to ancestor veneration.

1973 Mound B-V-6: a Late Formative ceremonial structure. In MICHELS, Joseph W., and SANDERS, William T. The Pennsylvania State University Kaminaljuyu Project: 1969, 1970 Seasons, Part One - Mound Excavations. Occasional Papers in Anthropology, No. 9, The Pennsylvania State University, Department of Anthropology. University Park.

Methodology and description of the excavation of Mound B-V-6 in which a thorough discussion of Late Formative mound construction techniques is offered.

BERLIN, Heinrich

1952 Excavaciones en Kaminal Juyú: Montículo D-III-13. Antropología e Historia de Guatemala, 4(1): 3-18 [7 drawings, 11 photos], Guatemala.

Description of the excavation of Mound D-III-13 at Kaminaljuyu. Four superimposed temple platform structures were identified and two burials were encounted. The ceramics proved to be from an Early Classic phase prior to Esperanza, and is defined here as Aurora.

BORHEGYI, Stephan Francis de (1921-1969)

1950a Tlaloc effigy jar from the Guatemala National Museum. Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology, 4(96): 55-59 [1 plate].

Description and archaeological significance of an anthropomorphic jar believed to have come from Kaminaljuyu. Discussion includes a comparison with specimens from Tomb II of Mound A (F-VI-1) and from Teotihuacan and Monte Alban.

1950b Rim-head vessels and cone-shaped effigy prongs of the Pre-Classic period at Kaminaljuyu, Guatemala. Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology, 4(97): 60-80 [8 plates].

Discussion on typology and function of certain ceramic forms dating to the Miraflores (Providencia, Verbena, Arenal) phase at Kaminaljuyu. Description of three types of rim-head vessels, and their relation to the cone-shaped effigy prongs found on three-pronged "incensarios," which should more properly be designated as incensario vessel supports, according to their function. A chronological chart of ceremonial vessels from Kaminaljuyu is included.

1950c A group of jointed figurines in the Guatemala National Museum. Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology, 4(100): 93-99 [3 plates].

Description, comparative data, and discussion of Preclassic doll-like jointed figurines from Kaminaljuyu and Tazumal. The two Kaminaljuyu specimens are yellowish white slipped, female figurine torsos, dating to the Terminal Formative period, Miraflores phase. In comparison with the Classic Mexican jointed figurines, these specimens are mechanically more complex.

1951a A study of three-pronged incense burners from Guatemala and adjacent areas. Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology, 4(101): 100-124 [1 chart, 6 plates].

Comparative study and chronology of eight specimens of this ceramic vessel form, including four from Kaminaljuyu. Though similar in characteristics, these vessels date from the Terminal Formative to the Late Classic periods, suggesting a single ceremonial cult which persists over a long time.

1951b "Loop-nose" incense burners in the Guatemala National Museum. Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology, 4(103): 143-158 [4 plates].

Description and classification of a distinctive type of ceremonial vessel, probably dating to the Middle Classic period. Discussion is based on a sample of 14 vessels, of which seven are from Kaminaljuyu. Comparative analysis suggests a possible stylistic sequence.

1951c Further notes on three-pronged incense burners and rim-head vessels in Guatemala. Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology, 4(105): 162-176 [1 chart, 3 plates].

The frequency of all known three-pronged incensarios, scored incensario covers, and rim-head vessels is listed by departments of Guatemala, site, and time period. These ceremonial vessels appear related to a rain and fertility cult, originating in the Formative period, and centering at Kaminaljuyu. The subsequent absence of these forms in the Middle Classic period is related to Teotihuacan influence. A "renaissance" of these forms occurs during the Late Classic at sites other than Kaminaljuyu. Included are descriptions of five additional incensarios, a chronological chart, and a distributional map.

1954 Jointed figurines in Mesoamerica and their cultural implications. Southwestern Journal of Anthropology, 10(3): 268-277 [1 map, 6 drawings], Albuquerque.

Distribution of two types of jointed figurines, located in central Guatemalan highlands-western Salvador and Central Mexico-Veracruz. Such jointed-arm, pregnant female figurines found at Kaminaljuyu date to the Providencia phase of the Late Formative period. They may have been used as minikins by diviners in fertility rituals or childbirth, perhaps with ventriloquism. Also published in Spanish in Antropología e Historia de Guatemala, 6(2): 3-9.

1955 Pottery mask tradition in Mesoamerica. Southwestern Journal of Anthropology, 11(3): 205-213 [1 mpa, 3 drawings], Albuquerque.

Geographical and chronological distribution of ceramic masks and their probable uses. Description of a micaceous, reddish-brown ware ceramic mask from Las Charcas, 2 km south of Kaminaljuyu, is given. Modern ceramic masks are presently made at Santa Cruz Chinautla, where they are used by dancers during festivals.

1956a The development of folk and complex cultures in the southern Maya area. American Antiquity, 21(4): 343-356 [1 map, 1 hcart], Salt Lake City.

Review of the historical sequence of cultural development in the Guatemalan highlands and Pacific coast. Distinction is made between folk or rural culture, which tends to persist through time, and complex or urban culture, which is more elaborated and frequently changes. Also published in Spanish in Ciencias Sociales, 5(26): 50-63.

1956b El incensario de "tres asas" de Kaminal Juyú, Guatemala. Antropología e Historia de Guatemala, 8(2): 3-7 [1 drawing].

Description of a three-handled incensario from Kaminaljuyu, dating from the Verbena phase of the Terminal Formative period. Vessel was excavated in the area between Mounds E-III-6 and E-IV-1 by Luis Mayorga, Instituto de Antropología e Historia.

1956c Settlement patterns in the Guatemalan highlands: past and present. In WILLEY, Gordon R., Prehistoric Settlement Patterns in the New World. Viking Fund Publication in Anthropology, No. 23, pp. 101-106.

Present-day settlement patterns in the Guatemalan highlands are typed and defined as (1) dispersed villages, (2) compound villages, and (3) concourse center. These settlement pattern types appear to have originated in prehispanic times, for modern settlements are frequently correlated with prehispanic settlements of a similar type. Similar factors (not yet identified) determining settlement patterns have operated in both the past and present.

1956d The 1956 summer excavations in Guatemala. Oklahoma Anthropological Society Newsletter, 5(3): 8-10, Norman.

Brief report of excavations at Kaminaljuyu, including Mound C-II-4, Mound D-IV-2, Las Charcas pits.

1956e Summer excavations in Guatemala. Archaeology, 9(4): 286-287 [2 photos].

Brief report of excavations at Kaminaljuyu, including Mound C-II-4, Mound D-IV-,2 Las Charcas pits.

1957a "Mushroom stones" of Middle America: a geographically and chronologically arranged distribution chart. In WASSON, Valentina P., and WASSON, R. Gordon, Mushrooms, Russia and History. Pantheon Books, New York, Vol. 2, pp. 275-281, and appendix.

1957b Un raro cascabel de barro del período primitivo Pre-Clásico en Guatemala. Antropología e Historia de Guatemala, 9(1): 9, 11 [1 drawing].

Description of two clay rattles found at Kaminaljuyu and dating from the Las Charcas or Providencia period.

1958a Aqualung archaeology. Natural History, 67(3): 121-125 [15 photos], American Museum of Natural History, New York.

Recovery of ceremonial ceramic vessels from Lake Amatitlan, dating from the Late Formative through the Late Classic periods.

1958b Hallazagos arqueológicos en aguas del lago de Amatitlan. Antropología e Historia de Guatemala, 10(1): 3-12 [5 photos].

Underwater archaeology applied to Lake Amatitlan has resulted in the recovery of over 400 artifact specimens. Discussion on the sites of Contreras (100 BC-200 AD), Mejicanos (300-600 AD), and Amatitlan (600-900 AD), which span the Preclassic and Classic periods.

1959a Underwater archaeology in Guatemala. Proceedings of the 33rd International Congress of Americanists, 2: 229-240 [2 photos, 1 map].

Method and results of archaeological research at Lake Amatitlan. Many complete ceremonial vessels were recovered and correlated with nearby dry-land sites, thus dating from the Late Formative through the Late Classic periods. The Early Classic Lavaderos site has Cotzumalhuapa style sculpture, implying Pipil migration into the area at this time.

1959b Underwater archaeology in the Maya highlands. Scientific American, 200(3): 100-113 [6 photos, 5 mpas].

Recovery of ceremonial vessels from Lake Amatitlan and results of archaeological investigations in the vicinity. Underwater deposits are correlated with nearby lake-shore sites of Amatitlan, Contreras, Contreras Alto-Los Jicaques (Tzacualpal?), and Mejicanos. Dating of materials range from the Late Formative through the Late Classic periods.

1961a Miniature mushroom stones from Guatemala. American Antiquity, 26(4): 498-502 [2 photos, 1 chart, 1 table], Salt Lake City.

Analysis of a cache of nine miniature mushroom stones found with nine miniature manos and metates at the Verbena cemetery at Kaminaljuyu. These artifacts date to the Verbena phase of the Terminal Formative period, and possibly were used in the ceremonial preparation and consumption of sacred hallucinatory mushrooms. A typology of mushroom stones, related to chronology and distribution, is given.

1961b Steps in present-day pottery making in Chinautla, Guatemala. Katunob Newsletter-Bulletin, 2(1): 56-57, Southern State College, Magnolia, Arkansas.

Brief outline of pottery making process in a Pokom community 12 km northeast of Guatemala City. Topics discussed include pottery preparation, modeling and shaping, decoration, firing, and marketing. Some reference to Pokom terminology.

1961c Underwater archaeological studies in Lake Amatitlan, highland Guatemala. American Philosophical Society Year Book, 1960: 547-551, Philadelphia.

Summary of the January 1960 fieldwork at archaeological sites in and around Lake Amatitlan, as well as information from Lake Flores (Peten Itza), Lake Ixpaco, Lake Guija, Lake Atescatempa, and Lake Atitlan.

1963 Pre-Columbian pottery mushrooms from Mesoamerica. American Antiquity, 28(3): 328-338 [19 photos, 1 map], Salt Lake City.

Distributional analysis of the ceramic counterparts of the mushroom stones, which have been found in Veracruz, Tabasco, Chiapas, Peten, Cotzumalhuapa area, and El Salvador. Temporal distribution of this

artifact type is in the Late and Terminal Formative periods. A possible function of these ceramic mushrooms is use in a postulated hallucinogenic mushroom cult.

1965a Archaeological synthesis of the Guatemalan highlands. In WILLEY, Gordon R., Archaeology of Southern Mesoamerica (Handbook of Middle American Indians, Volume 2). University of Texas Press, Austin. pp. 3-58 [7 maps, 1 table].

A broad overview of cultural development in the Guatemalan highlands, arranged chronologically by periods. Topics include subsistence, settlement patterns and architecture, arts and crafts, inferences on the social and religious structure, foreign influences and migration patterns.

1965b Settlement patterns of the Guatemalan highlands. In WILLEY, Gordon R., Archaeology of Southern Mesoamerica (Handbook of Middle American Indians, Volume 2). University of Texas Press, Austin. pp. 59-75 [7 maps, site plans, sketches].

Discusses chronologically site features and inferences, restating his concept of urbanism, and constructing a settlement pattern typology.

1965c Some unusual Mesoamerican portable stone sculptures in the Museum fur Volkerkunde, Berlin. Baessler-Archiv, 13(1): 171-206 (illus., plates], Berlin.

Detailed description and comparative and interpretive comments on portable stone sculptures, some of which are from the Lake Amatitlan area. Two categories of sculpture are discussed: those forms which are related to the ball game, such as yokes, thin heads, handstones, tenoned heads, and markers; and those forms which are related to the mushroom cult, such as the mushroom stones.

1966 Shell offerings and the use of shell motifs at Lake Amatitlán, Guatemala, and Teotihuacan, Mexico. Proceedings of the 36th International Congress of Americanists, 1: 355-371 [1 table, 3 maps, 32 illus.], Seville.

Discussion of a dated (650 AD ± 130) shell offering found with an Esperanza cylinder tripod near Mound 5, Mejicanos site, and shell adornos on ceramic artifacts from the Lavaderos site. Comparison of these finds from the Lake Amatitlan area with shell motifs from Teotihuacan. Inferences on the ritual use of shell and the possibility of trade in highly valued Spondylus princeps shells from the Pacific coast.

1968 Una fecha de C-14 para la influencia Teotihuacana en Guatemala. Estudios de Cultura Maya, 6: 221-224 [2 photos], Universidad Nacional Autónoma de México, Mexico.

A radiocarbon date of 650 AD ± 130 is associated with an Esperanza fleshware cylinder tripod vessel found at the Mejicanos site (Site C) on the south shore of Lake Amatitlan.

1969 Stone, bone and shell objects from Lake Amatitlan, Guatemala. Baessler-Archiv, 17(2): 265-302 [1 table, 3 maps, 43 photos], Berlin.

An inventory of 48 lithic, bone, shell, and mineral specimens recovered from sites in and around Lake Amatitlan. Detailed descriptions, photographs, and comparative and interpretive comments are included. Includes not only specimens collected during 1954-69, but also some of those collected by Walter Lehman (1909) and Marshall Saville (1917). Discusses evidence of Teotihuacan influence, the ball game and sacrifices to water deities, and prehispanic shell diving.

BORHEGYI, Stephan Francis de (1921-1969), and METCALF, George
1967 Un hacha tallada poco frecunte de Kaminaljuyú. Antropología e Historia de Guatemala, 19(2): 15-19 [2 photos, 1 drawing].

Description of a unique carved stone celt from Kaminaljuyu, possibly dating from the Late Formative period. The celt was recovered during the excavations at Finca Miraflores by Manuel Gamio in 1926. Now in the collection of the United States National Museum (No. 332-368).

BORHEGYI, Stephan Francis de (1921-1969), and PARSONS, Lee Allen (1932-)
1963 Pares de vasijas gemelas policromadas con figuras pintadas del area maya. Estudios de Cultura Maya, 3: 107-112 [3 plates], Universidad Nacional Autónoma de México, Mexico.

Duplicate pairs of Peten Polychrome vessels with painted figures have been found in tombs at Uxmal, Copan, Guaytan, Baking Pot, Zaculeu, and Kaminaljuyu, suggesting a specific mortuary function. Six nearly identical polychrome (red and black on orange) ring-stand bowls with basal flanges and the same design painted inside, were found in Tombs A-III (12, 14), A-VI (15, 22, 23), B-I (33) at Kaminaljyyu (P. 110). Also published in Antropología e Historia de Guatemala, 16(1): 13-22.

BORHEGYI, Stephan Francis de (1921-1969), and SCRIMSHAW, Nevin Stewart
1957 Evidence for pre-Columbian goiter in Guatemala. American Antiquity, 23(2): 174-176 [1 photo], Salt Lake City.

Goiter is depicted in a Las Charcas phase clay effigy whistle from Finca Copalche, Valley of Guatemala and a Miraflores phase figurine fragment from La Zarca, Platanar, near Ocós, Department of San Marcos. The incidence rate for endemic goiter in southern Guatemala varies from 21% to 68%, one of the highest in the world. Marine foods might have reduced this incidence in prehispanic times. Also published in Spanish in Antropología e Historia de Guatemala, 13(2): 21-26.

BRINE, Lindesay (1834-1904)

1894 Travels amongst American Indians, their ancient earthworks and temples; including a journey in Guatemala, Mexico and Yucatan, and a visit to the ruins of Patinamit, Utatlan, Palenque and Uxmal. Sampson Low, Marston and Company, Ltd., London. xxvi+429p., illus. (incl. plans), plates, maps.

Mentions a brief survey made of mounds near Mixco, which probably represents Kaminaljuyu (p. 189-190). The settlement area seems to form an extensive and irregular parallelogram 1200 yards long and 500 yards wide; some of the mounds exceed 45 feet (14 m) in height. A sketch accompanies the description.

BROWN, Kenneth Leland (1947-)

1972a The B-III-5 complex, Kaminaljuyu, Guatemala: new interpretations on architecture and settlement pattern during the Classic period. Master's thesis, Department of Anthropology, The Pennsylvania State University, University Park. vii+140 p., 26 fig., 3 charts, 9 plates, biblio: 136-140.

Report of excavations at a small civic center consisting of three platform mounds (B-III-2, B-III-3, B-III-4) and a ball court (B-III-5). Chronology for the complex ranges from the Early Classic period (300 AD) to the beginning of the Late Classic period (700 AD). Also discussed is the residential settlement in the vicinity of the complex during this game time period, and evidence is presented demonstrating that ball court construction in the Valley of Guatemala began in the Early Classic period, and that Early and Middle Classic ball courts differ from Late Classic ball courts in the orientation of their long axes.

1972b Ball court construction: its relationship to Classic settlement pattern and Teotihuacan influence in the Valley of Guatemala. Paper presented at the 37th annual meeting of the Society for American Archaeology, Miami.

Differences in construction technique and orientation distinguish Early and Middle Classic ball courts from Late Classic ball courts at Kaminaljuyu and the Valley of Guatemala. Discussion based on recent excavations of a ball court at Kaminaljuyu (Mound B-III-5), comparisons with three ball courts excavated by A. L. Smith (C-II-4, C-II-7, F-V-1), and survey data from 36 ball court sites in the valley. From this evidence, a model of Teotihuacan influence is proposed.

1973 The B-III-5 mound group: Early and Middle Classic civic architecture. In MICHELS, Joseph W., and SANDERS, William T., The Pennsylvania State University Kaminaljuyu Project: 1969, 1970 Seasons, Part One - Mound Excavations. Occasional Papers in Anthropology, No. 9, The Pennsylvania State University, Department of Anthropology. University Park.

Methodology and description of the excavation of Mounds B-III-3, B-III-4 and B-III-5, in which elaborate architectural complexes were revealed that dated to the Early and Middle Classic periods. Special attention

is paid to the ball court structure, and a comparative analysis of Early vs. Late Classic ball courts at Kaminaljuyu is provided.

BRYAN, Kirk (1888-1950)
1945 Soils and climatic chronology in Guatemala. Carnegie Institution of Washington, Year Book 44: 168-170.

Brief study on the sequence of volcanic deposition in the Valley of Guatemala. A typical geological soil profile is given, with a discussion on the derivation of components in the natural strata. Some paleoclimatic inferences are given.

CARDENAS, Donal Seán (1946-), with AUSTIN, Donald Mac (1944-)
1969 Mound B-V-2 excavation. In SANDERS, William T., AND MICHELS, Joseph W., The Pennsylvania State University Kaminaljuyu Project: 1968 Season, Part One - The Excavations. Occasional Papers in Anthropology, No. 2, The Pennsylvania State University, Department of Anthropology. University Park.

Methodology and description of the excavation of Mound B-V-2, in which two Majadas-Providencia structures were identified.

CARDENAS, Donal Seán (1946-)
1969 Kaminaljuyu during the Late Classic period. Paper presented at the 68th annual meeting of the American Anthropological Association, New Orleans.

Discussion of settlement pattern changes and possible political realignments as suggested by evidence of population decline and reduced construction activity at Kaminaljuyu, while the population of the Valley of Guatemala reached its maximum extent and there were a number of large centers during this period. Reeaxmines the relationship between the Amatle, Pamplona, and Esperanza ceramic complexes in light of recent dating techniques.

See REYNOLDS and CARDENAS, 1973

CEREZO DARDON, Hugo
1949 Kaminaljuyu. Ministerio de Educación Pública, Guatemala, Instituto de Antropología e Historia, Seccíon de Docencia y Divulgacion, Folleto No. 2 [8p., illus., map].

Brief information on temples, tombs and ball courts at Kaminaljuyu during the Miraflores, Esperanza and Amatle-Pamplona phases. Designed for secondary students.

CHEEK, Charles Dale
1971a Excavations at the Palangana, Kaminaljuyu, Guatemala, Guatemala. Doctoral dissertation, Department of Anthropology, University of Arizona, Tucson. x+250p., 52 illus., biblio: 244-250.

Report of excavations at Mound C-II-14 and adjoining West and East Plazas, descriptive sequence of construction and utilization of the complex from the Terminal Formative through the Late Classic periods and discussion of the architectural resemblances between Teotihuacan and Kaminaljuyu. The hypothesis is proposed that initial Teotihuacan influence at Kaminaljuyu is the result of trade contacts and acceptance of traits by the local elite for reasons of prestige; later influence results from actual political control of Kaminaljuyu by Teotihuacan.

1971b Excavations at the Palangana, Kaminaljuyu, Guatemala. Paper presented at the 36th annual meeting of the Society for American Archaeology, Norman, Oklahoma.

Comparison of construction techniques and architectural features of structures built during the Middle Classic period, both at Teotihuacan and Kaminaljuyu. Data based on structures recently excavated in the plaza between Mounds C-II-12 and C-II-14 at Kaminaljuyu.

CHINCHILLA AGUILAR, Ernesto

1961 Historia y tradiciones de la ciudad de Amatitlán. Ministerio de Educación Pública, Guatemala. 261p., illus., bilbio.

Series of brief chapters offering vignettes of colonial and 19th century history of Amatitlan, located 25 km southwest of Guatemala City. Impressionistic, but with some useful political and economic data.

COE, Michael Douglas (1929-)

1960 A fluted point from highland Guatemala. American Antiquity, 25(3): 412-413 [2 photos, 1 drawing], Salt Lake City.

Description of a fluted obsidian projectile point, resembling the Eastern Clovis type, which was found at San Rafael, 18 km west of Guatemala City.

COE, Michael Douglas (1929-), and FLANNERY, Kent Vaughn (1934-)

1964 The pre-Columbian obsidian industry of El Chayal, Guatemala. American Antiquity, 30(1): 43-49 [1 map, 2 drawings], Salt Lake City.

Report on El Chayal, an extensive obsidian workshop site located in an area of major obsidian deposits 25 km northeast of Guatemala City, and dating from about 5000 to 1500 BC. Conclusions are based on surface collections of large quantities of such distinctive forms as elongated unifacial flakes, stemmed projectile points, leaf-shaped bifacial knives, discoidal scrapers, as well as the absence of ceramics. These artifacts are related to others from Honduras, Guatemala, and Mexico.

CRANE, H. R., and GRIFFIN, James B.

1964 University of Michigan radiocarbon dates IX. Radiocarbon, 6: 15-16.

Lists a radiocarbon date of 330 BC $\pm$ 130 for the Las Charcas excavations by S. F. Borhegyi in 1956.

1966 University of Michigan radiocarbon dates XI. Radiocarbon, 8: 282.

Lists a radiocarbon date of 650 AD ± 130 associated with an Esperanza fleshware cylinder tripod vessel found at the Mejicanos site on the south shore of Lake Amatitlan by S. F. Borhegyi.

DAVIS, Michael Kincaid (1939-)
1969 The history of settlement pattern in the Valley of Guatemala. Paper presented at the 68th annual meeting of the American Anthropological Association, New Orleans.

Preliminary interpretation based on two seasons of archaeological survey in the Valley of Guatemala, in which about 100 additional sites have been discovered since E. M. Shook's survey (1952a). Indicates that the valley population was becoming more nucleated during the Terminal Formative and Early-Middle Classic period and more dispersed during the Late Classic. Presents civic center models for the Late Formative, Terminal Formative, and Late Classic periods.

DEEVEY, Edward Smith Jr. (1914-)
1955 Limnological studies in Guatemala and El Salvador. International Vereinigung fur theoretische und angewandte Limnologie, Verhandlungen, 12: 278-283 [1 graph], Stuttgart.

Brief report on limnological studies, mostly based on Lake Amatitlan and Lake Guija, but with some references to Lake Atitlan. Lake Amatitlan is fairly saline, with most fauna between 15 and 18 meters depth; standing crop biomass was measured at 39 kg fresh weight per hectare. Short discussion followed the description.

See TSUKADA and DEEVEY, 1967

DEEVEY, Edward S., GRALENSKI, L. J., and HOFFREN, Väinö
1959 Yale natural radiocarbon measurements IV. Radiocarbon Supplement, American Journal of Science, 1: 162-164.

Lists radiocarbon dates for specimens from Kaminaljuyu submitted by the Carnegie Institution of Washington. Samples are associated with Las Charcas, Arevalo, Majadas, Providencia, Sacatepequez, Verbena, Santa Clara, and Aurora phases, dating between 380 BC ± 50 and 400 AD ± 70.

DEGER, Erwin Conradin (-1941)
1932 Las cenizas y arenas volcánicas de Guatemala y El Salvador en relación con su rol en la formacion del suelo agrícola. Tipografía Amos & Anderson, suc., Guatemala. 23 p. [2 photos, 12 tables].

Mineralogical analysis of igneous rocks, granular pumice (arena), and volcanic ash from the volcanos of Acatenango, Santa Maria, Izalco, and Fuego in southern Guatemala and El Salvador. In general, the soils formed from these volcanic materials are relatively rich in potash (K_2O), but are low in lime (CaO) because of leaching during the rainy season, and tend to be slightly acidic.

1939 Album petrografico de la America central, part I: la zona de Amatitlan. Instituto Quimico-Agricola Nacional, Guatemala. 79p. [10 tables, 15 photos, 14 microphotos, 1 map (color)].

Petrographic analysis of geological formations in the vicinity of Lake Amatitlan. Study includes description of properties, chemical and mineralogical composition, and practical application of such lithic types as hypersthenic andesite, pyroxene andesite, trachytoid andesite, hypersthene lava andesite, trachybasaltic andesite, plagioclasic basalt, biotic granite, and pumice stone, which are found in the area.

DEUTSCH, Warren Neal (1947-)

1972 Identification of potting communities from highland Guatemala through use of neutron activation. Master's thesis, Department of Anthropology, The Pennsylvania State University, University Park. v+51p., 6 fig., biblio: 49-51.

Report on an experiment to identify modern pottery-making communities in the Valley of Guatemala (Chinautla, Sacojito, Mixco, Sacoj, and Durazno) through the neutron activation of their clays, tempering materials, and wares. Results demonstrated statistically similar trace element configuration for clays from the same source. These results have implications for identification of ancient pottery-making communities.

EASBY, Dudley Tate, Jr. (1905-)

See EASBY and EASBY, 1953

EASBY, Elizabeth Kennedy (1925-), and EASBY, Dudley Tate, Jr. (1905-)

1953 Apuntes sobre la técnica de taller jade en Mesoamérica. Anales del Instituto de Arte Americano e Investigaciones Estéticas (Universidad de Buenos Aires), 6: 11-38 [13 fig.].

Brief description of jades from Kaminaljuyu and other Maya sites, from Oaxaca, the Valley of Mexico, and La Venta. Data from Kaminaljuyu are based on KIDDER, JENNINGS and SHOOK 1946: 104-124, fig. 143-153.

ESCOBAR MOSCOSO, Gabriel (1921-)

1969 Preliminary report of the ethnographic survey for the Kaminaljuyu Project. Paper presented at the 68th annual meeting of the American Anthropological Association, New Orleans.

Ethnographic data on contemporary settlement patterns, domestic architecture, agricultural activities, traditional craft specialization and trade networks from the Valley of Guatemala were collected in conjunction with the archaeological research of the Kaminaljuyu Project. Observations were made on 40 communities and intensive study on six (Palin, Concepcion Pinula, Agua Salobrega, etc.). Special emphasis on indigenous patterns which resemble prehispanic counterparts and might aid in interpreting archaeological data.

ESPINOZA AGUILAR, Gustavo
1967 Escavaciones en Kaminal-juyú. Antropología e Historia de Guatemala, 19(1): 128-129 [1 photo].

Brief report of the excavation of Mound B-IV-1, a structure containing Middle and Late Formative ceramic vessels and several burials.

FELDMAN, Lawrence Herbert (1942-)
1970 A Pokom state: excavation, survey and discussion of protohistoric sites in the north of the Valley of Guatemala. Paper presented at the 35th annual meeting of the Society for American Archaeology, Mexico.

A reconstruction, based on archaeological and ethnohistorical data, of the political domain of Chinautla prior to the Spanish Conquest. Features such as burials, ball courts, mound complexes are related to Pokom terms in colonial dictionaries and early Spanish descriptions.

1971 A tumpline economy: production and distribution systems of early Central-East Guatemala. Doctoral dissertation, Department of Anthropology, The Pennsylvania State University, University Park. viii+284p., 29 tables, 13 maps, 1 drawing, biblio: 258-284.

Discussion and analysis of Late Postclassic and Colonial economic organization and evolution in Central-East Guatemalan highlands, including the Valley of Guatemala. Includes a summary of political and religious structure, historical development, distribution systems, food production, manufacturing, trade of high-value goods.

FLANNERY, Kent Vaughn (1934-)
See COE and FLANNERY, 1964

FOSHAG, William Frederick (1894-1956)
1957 Mineralogical studies on Guatemalan jade. Smithsonian Institution, Miscellaneous Collections, 135(5): 1-60 [1 map, 5 tables, 4 plates].

Brief history of the use of jade in Mesoamerica, its nomenclature (both mineralogical and Nahuatl), technological analyses and description of jade from Kaminaljuyu, Nebag, San Agustin Acasaguastlan, and Uaxactun. Prehispanic use of other minerals and lapidary techniques are also included. Also published in Spanish in Antropología e Historia de Guatemala, 6(1): 3-47.

FUENTES Y GUZMAN, Francisco Antonio de (1643?-1699)
1932-33 Recordación florida, discourso historical; y demonstración natural, material, militar y política del reyno de Guatemala. . . . Biblioteca Goathemala, Guatemala.

Historical account of Guatemala, written in 1690. Includes references to cúes (mounds) in the Valley of Mixco and the plain of La Culebra (Tomo II, p. 41, 54-55); the Pokom state of Petapa (bk. 6: 80-82, 270; bk. 8: 464-470); burial and investiture of the lord of Petapa (Tomo I; 265-267); and other ethnohistoric data.

1969, 1972 Recordación florida: discourso historical, natural, material, militar y político del reino de Goathemala. . . .In Obras históricas de Francisco Antonio de Fuentes y Guzmán (Biblioteca de autores españoles, tomo 230: 53-417, tomo 251: 1-350), Ediciones Atlas, Madrid.

GAGE, Thomas (1603-1653)

1969 Travels in the New World, ed. by J. Eric S. Thompson. University of Oklahoma Press, Norman. iii+379p, ill part, maps.

A recent edition of A new survey of the West Indias, first published in 1648. Contains references, based on Gage's travels in Guatemala, of Mixco (p. 200), Pinula (p. 201), Petapa (p. 201), and Amatitlan (p. 204), in the Valley of Mixco (Guatemala). Data on population size, products and their distribution, and agriculture.

GAMIO, Manuel (1883-1960)

1926-27 Cultural evolution in Guatemala and its geographic and historic handicaps. Art and Archaeology, 22: 202-221; 23: 16-32, 70-78, 92, 129-133 [3 maps, 54 photos, 18 drawings, 4 tables], Washington.

Seismic activity is the major geological factor influencing cultural development in the Guatemalan highlands. Cultural evolution in this area is examined for the pre-hispanic, colonial, and modern periods. Artifacts from Salcajá and Kaminaljuyu, as well as the results of stratigraphic excavations at the Finca Miraflores (Kaminaljuyu), are presented.

GOUBAUD CARRERA, Antonio (1902-1951)

1948 Chinautla, síntesis socio-economica de una communidad indígena Guatemalteca. Instituto Indigenista Nacional, Publicacones especiales, No. 4. x+57p., fold map, fold chart.

Provides a summary of economic and social activities in Chinautla, a Pokom community 12 km northeast of Guatemala City. Includes data on population, agriculture, male and female crafts, clay mining and prices for clay, selection of clay for certain vessels, socio-political and religious structure, health conditions, supernatural beliefs, individual life cycle.

GRAJEDA MENA, Guillermo

1964 Kaminaljuyú y su pequeña escultura comparada con la del Peten. Antropología e Historia de Guatemala, 16(1): 51-56.

Summary of archaeological explorations at the site of Kaminaljuyu and a comparison of ceramic figurines from the site with those from the Peten, arranged chronologically by correlated ceramic phases.

GRALENSKI, L. J.

See DEEVEY, GRALENSKI, and HOFFREN, 1959

GRIFFIN, James B.
See CRANE and GRIFFIN, 1964
CRANE and GRIFFIN, 1966

HEATH-JONES
1959 Definition of an ancestral Maya civilization in Miraflores phase: Kaminaljuyu. Paper presented at the 24th annual meeting of the Society for American Archaeology, Salt Lake City.

Evidence of glyphs corresponding to the lowland Maya and carved on Stela 10 at Kaminaljuyu during the Miraflores (Verbena) phase implys the presence of Maya civilization at this highland site during the Terminal Formative period. This is the earliest hieroglyphic text presently known in Mesoamerica.

1970 Identification of an ancestral Maya calendar in the Southern Maya area in Miraflores phase on Monument 10, Kaminaljuyu. Paper presented at the 35th annual meeting of the Society for American Archaeology, Mexico.

Month glyphs identified as ancestral to the Maya calendar inscriptions of the Classic period in the lowlands was found carved on Stela 10 at Kaminaljuyu in a Miraflores (Verbena) context. This is the earliest calendric text yet discovered in Mesoamerica.

HOFFREN, Väinö
See DEEVEY, GRALENSKI, and HOFFREN, 1959

HURTADO DE MENDOZA, Luis (1940-)
1973 Neutron activation analysis of obsidian artifacts from Kaminaljuyu, Guatemala; archaeological application and prospects. Master's research paper, Department of Anthropology, The Pennsylvania State University, University Park. 56p, 7 tables, 3 fig., biblio: 49-56.

Presents results of experiments to determine the degree of homogeneity or heterogeneity in the composition of obsidian artifacts from Kaminaljuyu. Problems investigated and discussed are: (1) the affects of chemical composition on the hydration rate of obsidian; (2) the effects of alien political control on the local exploitation and distribution of obsidian; and (3) the relation of trace element composition of obsidian to its visual appearance, and which types of obsidian are selected for certain artifacts. Results show that about 95% of obsidian analyzed came from the four or five extrusions of El Chayal and 4% from Ixtepeque.

IMPARCIAL
1960a En Kaminal Juyú sale otra revelación asombrosa anillo de piedra que sería para juego de pelota. El Imparcial, 39th year, No. 12706, 6 Aug 1960, p. 1 col 4-7, p. 2 col 6-8 [2 photos], Guatemala.

Brief report on the discovery of a silhouette relief sculpture (Silhouette 2) at Kaminaljuyu. The sculpture, described as a stone ring on top of a long base and crowned by an inverted hollow triangle, was found standing vertically, at a depth of 2 m, in a tomb lined with 11 poligonal stone columns, similar to tombs at La Venta. The stone ring sculpture is compared with objects called trachtemalacatl found at Tecpan, Guerrero, Mexico (HENDRICHS 1939, El Mexico Antiguo, 4: 387-392).

1960b Kaminal Juyú: más valiosos hallazgos. El Imparcial, 39th year, No. 12797, 24 Nov 1960, p. 1 col 1, p. 2 col 6-7 [2 photos], Guatemala.

Brief report on the discovery at Kaminaljuyu of a rectangular structure (9.56 m N-S by 10.20 m E-W) formed by rows of large stone slabs, located in flat terrain 100 meters east of the Palangana on the road to Bethania, and of three stone sculptures (a female figure 1.25 m high, a ball court marker with a mask, and the base of a stone column) which were found together in the west sector of the site. Gustavo Espinoza and Franz Termer state that the sculptures show many Olmecoid characteristics.

1963 Hallazgo arqueologico peligra en Kaminal Juyú. El Imparcial, 42nd year, No. 13638, 3 Sept 1963, p. 1f, Guatemala.

Brief report on a terraced temple platform discovered during excavations of Mound D-III-1. A toad figure was destroyed by children, and a plea is made to protect the site of Kaminaljuyu from further destruction.

JENNINGS, Jesse David (1909-)

1943 The site of Kaminal Juyu and its contribution to solution of certain problems of Central American prehistory. Doctoral dissertation, Department of Anthropology, University of Chicago. iii+119 p., 26 plates, biblio: 82-85.

Description of the site of Kaminaljuyu, excavation of Mounds A (F-VI-1) and B (F-VI-2), analysis of the mortuary offerings from six of the tombs, and the relation between Kaminaljuyu and Teotihuacan as reflected in the Esperanza ceramic complex.

See KIDDER and JENNINGS, 1937
KIDDER, JENNINGS and SHOOK, 1946

KIDDER, Alfred Vincent (1885-1963)

1945 Excavations at Kaminaljuyu, Guatemala. American Antiquity, 11(2): 65-75 [32 photos, 5 drawings], Salt Lake City.

Summary of the excavations of Mounds A (F-VI-1) and B (F-VI-2), Middle Classic temple structures built during the Esperanza phase.

1948 Kaminaljuyu, Guatemala: addenda and corrigenda. Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology, 3(89): 224-232.

Important supplement to KIDDER, JENNINGS and SHOOK 1946 report of excavations at Kaminaljuyu. Contains a preliminary account of the rich Miraflores phase discoveries and the earlier Las Charcas phase. Closes the supposed hiatus between Esperanza and Amatle-Pamplona by assigning the later to the Late Classic period. Further discussion of the correlation problem.

1949-50 Certain archaeological specimens from Guatemala. Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology, 4(92): 9-27; 4(95): 46-54 [11 plates].

Descriptive notes on miscellaneous artifacts in private and museum collections that were not previously reported. Artifacts are from various highland Guatemalan sites, including 21 objects from Kaminaljuyu. These are a pyrite-incrusted plaque (Fig. 1a), perforated lithic ornaments (Fig. 2), moldmade adornos (Fig. 6f-h), a hollow figurine (Fig. 7a), jointed figurine arms (Fig. 53, 1a), and a ceramic box (Fig. 3g).

1961 Archaeological investigations at Kaminaljuyu, Guatemala. Proceedings of the American Philosophical Society, 105(6): 559-570 [1 map], Philadelphia.

Summary of the Carnegie Institution of Washington's archaeological research at Kaminaljuyu, with emphasis on the development of the local ceramic sequence.

1965 Preclassic pottery figurines of the Guatemalan highlands. In WILLEY, Gordon R., Archaeology of Southern Mesoamerica (Handbook of Middle American Indians, Volume 2), University of Texas Press, Austin. pp. 146-155 [8 fig.].

Description of Formative period ceramic figurines and their characteristics, mostly based on specimens from Kaminaljuyu. An outline of Preclassic figurine traits by phase, written by Robert L. Rands, is given as an appendix.

See SHOOK and KIDDER, 1952

KIDDER, Alfred Vincent (1885-1963), and JENNINGS, Jesse David (1909-)
1937 Guatemala highlands. Carnegie Institution of Washington, Year Book, 36: 143-144

Report of excavations on Mounds A (F-VI-1) and B (F-VI-2) at Kaminaljuyu.

KIDDER, Alfred Vincent (1885-1963), JENNINGS, Jesse David (1909-), and SHOOK, Edwin Martin (1922-)

1946 Excavations at Kaminaljuyu, Guatemala. Carnegie Institution of Washington, Publication 561. x+284p., 2 maps, 3 tables, 102 fig., 207 photos and drawings (part color), biblio: 279-284.

Description and analysis of the excavations of Mounds A (F-VI-1) and B (F-VI-2) at Kaminaljuyu. Six superimposed temple platform structures and associated tombs were uncovered in each of these mounds. The ceramics from the tombs, consisting significantly of cylindrical tripod vessels, are here defined as Esperanza, and date to the Middle Classic period. Architecture and artifacts indicate Teotihuacan influence during this period.

KIDDER, Alfred Vincent (1885-1963), and RICKETSON, Oliver Garrison, Jr. (1894-1952)

1935 Finca Miraflores. Carnegie Institution of Washington, Year Book, 34: 121.

Brief report of the Carnegie Institution's initial survey of the site of Kaminaljuyu.

1936 Kaminaljuyu. Carnegie Institution of Washington, Year Book, 35: 130-131.

Brief report of the initial season of excavation on Mound A (F-VI-1) at Kaminaljuyu.

KIDDER, Alfred Vincent (1885-1963), and SHEPARD, Anna Osler (1903-)

1944 Stucco decoration of early Guatemala pottery. Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology, 2(35): 23-30 [1 plate].

Descriptive notes on polychrome stucco decoration on pottery from Kaminaljuyu, dating to the Late or Terminal Formative Period. Fragments of four stucco decorated vessels were recovered during stratigraphic excavations at Finca Miraflores by R. E. Smith in 1938. Technique of stucco application is described in detail.

KIDDER, Alfred Vincent (1885-1963), and SHOOK, Edwin Martin (1922-)

1946 "Rim-head" vessels from Kaminaljuyu, Guatemala. Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology, 3(69): 54-58 [2 plates].

Description of a type of ceremonial vessel which is shown to belong to the Miraflores phase. Stratigraphic excavations at Finca Miraflores by R. E. Smith in 1938 demonstrate a Formative context for these vessels. Some Olmec characteristics are suggested. The existent collection of rim-head vessels from Kaminaljuyu is illustrated.

1961 A possibly unique type of Formative figure from Guatemala. In LOTHROP, Samuel K., ed., Essays in Pre-Columbian Art and Archaeology. Harvard University Press, Cambridge. pp. 176-181 [3 photos].

Brief discussion of heavy-eyed figurines from Kaminaljuyu.

KIRSCH, Richard William (1943-)

1972 Excavations at Kaminaljuyu: Mound A-VI-6. Master's thesis, Department of Anthropology, The Pennsylvania State University, University Park. vii+175p., 17 fig., 3 tables, 13 plates, biblio: 142-148.

Report of excavations at a small mound having two distinct temporal and functional components: a Terminal Formative period (180 BC-35 AD) cemetary, with remains of six successive burials; and an Early Postclassic period (1050-1200 AD) residential structure. Also discussed are mortuary practices at Kaminaljuyu during the Terminal Formative period and the Early Postclassic residential settlement of the A-VI mound group.

1973a Mound A-VI-6: a Terminal Formative burial site and early Postclassic house platform. In MICHELS, Joseph W., and SANDERS, William T., The Pennsylvania State University Kaminaljuyu Project: 1969, 1970 Seasons, Part One - Mound Excavations. Occasional Papers in Anthropology, No. 9, The Pennsylvania State University, Department of Anthropology. University Park.

Methodology and description of the excavation of Mound A-VI-6. In addition to analyzing the remains of five Terminal Formative burials, the author provides a general discussion of Formative burial patterns at Kaminaljuyu. An Early Postclassic house was later built on A-VI-6; this is discussed in the context of other Early Postclassic settlement units in the immediate area.

1973b An annotated bibliography of the Archaeology of Kaminaljuyu. In MICHELS, Joseph W., and SANDERS, William T., The Pennsylvania State University Kaminaljuyu Project: 1969, 1970 Seasons, Part One - Mound Excavations. Occasional Papers in Anthropology, No. 9, The Pennsylvania State University, Department of Anthropology. University Park.

A complete bibliography containing 165 entries has been compiled that comprises all available studies on Kaminaljuyu and the Valley of Guatemala up through 1973. Each entry comes with a brief description of its contents. A topical index is also supplied.

1973c Mortuary practices at Kaminaljuyu, Guatemala: indications of social change and cultural interactions. Paper presented at the 24th annual meeting of the Pennsylvania Sociological Society, University Park, Pennsylvania, November 19.

Preliminary observations based on 110 burials from Kaminaljuyu; principally within the time range of Late Formative through Middle Classic (500 BC-700 AD). Analysis focuses upon such burial data as position and orientation of the body, type and quantity of mortuary offerings, and association with monumental architecture.

LIBBY, Willard Frank (1908-)
1954 Chicago radiocarbon dates V. Science, 120: 746.

Three radiocarbon dates from Mounds C-III-6 and E-III-3, representing the Majadas and Miraflores (Verbena) phases of the Late and Terminal Formative periods at Kaminaljuyu. Dates range from 1192 BC ± 240, 1020 BC ± 200 to 540 BC ± 300, and since they are based on the early solid carbon method, are not completely reliable.

LISCHKA, Joseph James
1972 A formal-functional analysis of ceramic distribution at Kaminaljuyu, Guatemala. Doctoral dissertation, Department of Anthropology, University of Arizona, Tucson. xiv+199p., 15 fig., 24 tables, biblio: 191-199.

Analysis is based on 28 selected Amatle 2 phase vessel forms from seven Late Classic period excavations, representing both mound structures and occupation surfaces. The statistical technique of key-cluster analysis is used to generate four factors representing at least six sets of vessel-using functions. The nature of these activity sets were inferred from the vessel forms in the statistical cluster and other associated artifacts and architectual details from the excavations.

LOTHROP, Samuel Kirkland (1892-1965)
1926 Stone sculptures from Finca Arevalo, Guatemala. Museum of the American Indian, Heye Foundation, Indian Notes, 3: 147-171 [2 maps, 14 photos, 6 drawings], New York.

Description and discussion of 18 large stone sculptures from Kaminaljuyu. Seven of these sculptures were located in the vicinity of Mounds C-II-12, C-II-13, and C-II-14, designated as the 'Acropolis' of the site.

LOWY, Bernard (1916-)
1971 New records of mushroom stones from Guatemala. Mycologia, 63(5): 983-993 [10 photos], Lancaster.

Ten mushroom stones from highland Guatemala are described for the first time. Included are a tripod mushroom stone excavated from Mound F-VI-3, Kaminaljuyu, by Ismael Tercero in 1968 (Fig. 1), and another tripod with a geometrical design was collected from San José V (71-12-116) in 1970 (Fig. 2). Discusses various functional interpretations of these objects, as representations of hallucinogenic fungi used in religious ceremonies, as boundry markers used during field surveys, and as seats symbolically associated with high status offices.

MATA AMADO, Guillermo
1964 Apuntes arqueologicos sobre el Lago de Amatitlan. Antropologíe e Historia de Guatemala, 16(1): 63-77 [4 photos & drawings, 1 map (fold)].

Summary of archaeological research at eight sites at Lake Amatitlan, their possible relation with nearby sites surveyed by E. M. Shook (1952a), and the description of a carved stone yoke and a carved bone from the Mejicanos site. Also published in Revista Universidad de San Carlos, 59: 33-43 (1963).

MAUDSLAY, Alfred Percival (1850-1931)
1889-1902 Archaeology. In GODMAN, F. Ducane, and SALVINE, Osbert, ed., Biologia Centrali-Americana, R. H. Porter and Dulau Co., London. 4 vol. in 1, illus. atlas, 392 plates, maps.

This classic work includes a brief mention of the site of Kaminaljuyu (volume 2, pages 38-39) including a map of the site and photographs of the mounds and two stone sculptures (plates LXXIV, LXXV).

MEEK, Seth Eugene (1859-1914)
1908 The zoölogy of Lakes Amatitlan and Atitlan, Guatemala, with special reference to ichthyology. Field Museum of Natural History, Publication 127, Zoological Series, 7(6): 159-206 [2 maps, 17 photos], Chicago.

Description of the physical, floral, and faunal characteristics of these two highland Guatemalan lakes. Fishing resources are not very extensive; seven species of fish inhabit Lake Amatitlan, of which only three, the pescadito (Poecilia sphenops), the pepesca (Astyanax micropthalmus), and the mojarra (Cichlasomas guttulatum), are regularly collected by native fishermen. Also reported are zoöplankton, sponges, leeches, snails, crustaceans, amphibians, reptiles, and water fowl.

METCALF, George
See BORHEGYI and METCALF, 1967

MICHELS, Joseph William (1936-)
1969a Application of computer technology to data processing and analysis at Kaminaljuyu. Paper presented at the 68th annual meeting of the American Anthropological Association, New Orleans.

Methodology concerning the use of the IBM 360 computer for data recording, storage, retrieval and analysis in The Pennsylvania State University Kaminaljuyu Project. To date, data on about two million artifacts have been recorded, which can be used as input in distributional analysis (using Symap program), factor analysis in identifying functional groupings, and taxonomic analysis in refining ceramic typology.

1969b Patterns of settlement in and around Kaminaljuyu, highland Guatemala. Paper presented at the 134th annual meeting of the American Association for the Advancement of Science, Boston.

Summary of changing settlement patterns at Kaminaljuyu and the Valley of Guatemala, as related to time periods from the Middle Formative through the Late Postclassic. Since swidden farming appears equally successful in all areas of the valley, changing concentrations of settlements should be interpreted from a sociopolitical viewpoint rather than an ecological one. Based on interpretations presented in BEBRICH 1969b, CARDENAS 1969b, and DAVIS 1969.

1973a Dating Methods in Archaeology. Seminar Press, New York. xiv+ 230 p., illus.

In chapter six (pp. 99-109, Tables 5, 6, Fig. 29) Michels illustrates artifact cross-dating with ceramic materials from Kaminaljuyu. He reviews and illustrates with tables and figures the provisional ceramic taxonomy and phase identifications that have resulted from preliminary analyses of excavated sherd material conducted under the supervision of Ronald K. Wetherington.

1973b Radiocarbon and obsidian dating: a chronometric framework for Kaminaljuyu. In MICHELS, Joseph W., and SANDERS, William T., The Pennsylvania State University Kaminaljuyu Project: 1969, 1970 Seasons, Part One - Mound Excavations. Occasional Papers in Anthropology, No. 9, The Pennsylvania State University, Department of Anthropology. University Park.

Report on the calculation of an obsidian hydration rate for Kaminaljuyu by means of correlated radiocarbon dates and a summary of obsidian composition control through neutron activation analysis.

1973c Artifact summaries for Kaminaljuyu mound excavations. In MICHELS, Joseph W., and SANDERS, William T., The Pennsylvania State University Kaminaljuyu Project: 1969, 1970 Seasons, Part One - Mound Excavations. Occasional Papers in Anthropology, No. 9, The Pennsylvania State University, Department of Anthropology. University Park.

Newly available artifact summaries for previously published or still unpublished mound excavations.

See SANDERS and MICHELS, 1969

MICHELS, Joseph William (1939-), and SANDERS, William Timothy (1926-)
1973 The Pennsylvania State University Kaminaljuyu Project: 1969, 1970 Seasons, Part One - Mound Excavations. Occasional Papers in Anthropology, No. 9, The Pennsylvania State University, Department of Anthropology. University Park.

Reports on radiocarbon and obsidian dating, and on the excavation of Mounds B-V-4, B-V-6, B-V-8, B-V-9, B-V-10, B-V-11, B-V-14, B-V-15, A-VI-6, B-III-3, B-III-4, B-III-5. Also an annotated bibliography of archaeological research at Kaminaljuyu up through 1973.

MILES, Suzanna Whitelaw (1922-1966)

1957a The sixteenth-century Pokom-Maya: a documentary analysis of social structure and archaeological setting. Transactions of the American Philosophical Society, 47 (Pt. 4): 731-781 [3 maps, 14 tables, biblio: 779-781], Philadelphia.

Ethnographic reconstruction, based on historical documents and archaeological evidence, of the language group which inhabited the Valley of Guatemala at the Spanish Conquest. Includes linguistic relationships, historical traditions, religion, kinship and social structure, settlement patterns, population, political organization.

1957b Maya settlement patterns: a problem for ethnology and archaeology. Southwestern Journal of Anthropology, 13(3): 239-248, Albuquerque.

Comparison of lowland Maya archaeological evidence with 16th century highland Pokom settlement patterns. A similar type pattern, the extended boundry town, is found in both areas and times, suggesting long durability and great flexibility of this settlement type. Ethnographic functions of civic center structures in Guatemalan highlands is given (p. 242).

1958 An urban type: extended boundry towns. Southwestern Journal of Anthropology, 14(4): 339-351 [3 drawings], Albuqueruqe.

Discussion and comparison of an extremely dispersed type of settlement pattern which is found among both the Classic Maya and the Classic Greeks. Both civilizations were urban, but not in the sense of compact and concentrated aggregates of people. The extended local planning of components but no over-all plan, a civic center inhabited mostly by political and religious officials and artisans, while many others reside outside. Sequel to MILES 1957b.

1963 Informe sobre Kaminal-Juyú, rendido al Instituto de Antropologíe e Historia, por la arqueologa Susan Miles. Antropología e Historia de Guatemala, 15(1): 35-38 [2 photos].

Recommendation for the preservation of a portion of the site of Kaminaljuyu as a park, accompanied with a list of mounds which should be preserved. Photos of unfired clay figures from Mound D-III-1 included.

1965a Sculpture of the Guatemala-Chiapas highlands and Pacific slopes, and associated hieroglyphs. In WILLEY, Gordon R., Archaeology of Southern Mesoamerica (Handbook of Middle American Indians, Volume 2), University of Texas Press, Austin. pp. 237-275 [1 map, 9 drawings, 8 photos, 2 tables].

Description and discussion of large stone sculptures, chronologically arranged. Specimens are from several sites (Izapa, Cotzumalhuapa, Monte Alto, Abaj Takalik) as well as 39 from Kaminaljuyu. Most comprehensive study to date.

1965b Summary of preconquest ethnology of the Guatemala-Chipas highlands and Pacific slopes. In WILLEY, Gordon R., Archaeology of Southern Mesoamerican (Handbook of Middle American Indians, Volume 2), University of Texas Press, Austin. pp. 276-287 [1 map, 1 table].

Ethnological summary of the Late Postclassic period, based on documentary and archaeological evidence. Discusses linguistic areas, settlement pattern, economic activity, trade relations, kinship systems, political organization, and religion. Derived from MILES 1957a to a large extent.

PARSONS, Lee Allen (1932-)

1963 A doughnut-shaped vessel from Kaminaljuyu, with a distributional analysis of this unusual form. American Antiquity, 28(3): 386-389 [1 photo, 1 chart], Salt Lake City.

Description of a tubular, ring-shaped, stuccoed red ware vessel from Kaminaljuyu, dating to the Miraflores (Verbena) phase. A distributional study of this unique form indicates the usefulness of the horizontal variety of doughnut vessels as a Terminal Formative horizon marker. A suggested origin of this form is Peru, from which it spread northward by maritime trade.

See BORHYEGI and PARSONS, 1963

PROSKOURIAKOFF, Tatiana (1909-)

See SHOOK and PROSKOURIAKOFF, 1956

RANDS, Robert Lawrence (1922-)

1965 Classic and Postclassic pottery figurines of the Guatemalan highlands. In WILLEY, Gordon R., Archaeology of Southern Mesoamerica (Handbook of Middle American Indians, Volume 2), University of Texas Press, Austin. pp. 156-162 [11 fig.].

Description and discussion of highland Guatemalan ceramic figurines, including two specimens from Kaminaljuyu.

RANDS, Robert Lawrence (1922-), and SMITH, Robert Eliot (1899-)

1965 Pottery of the Guatemalan highlands. In WILLEY, Gordon R., Archaeology of Southern Mesoamerica (Handbook of Middle American Indians, Volume 2), University of Texas Press, Austin. pp. 95-145 [2 maps, 7 tables, 13 illus.].

Description and analysis of ceramic vessels from various sites (Zacleu, Zacualpa, Salcajá, etc.), related mostly to the Kaminaljuyu ceramic sequence. Ceramic characteristics are discussed by time periods and ceramic phases.

REINA, Rubén Elias (1924-)

1957 Chinautla, a Guatemalan Indian community: a field study in the relationship of community culture and national change. Doctoral dissertation, Department of Sociology and Anthropology, University of North Carolina, Chapel Hill.

Study of a Pokom speaking community and the extent to which changes at the national level are related to changes in the community socio-cultural system. Paradoxically, the community tends to persist in its traditional cultural patterns despite nearby urban influences. Ethnographic data on traditional occupations, beliefs, and life cycle.

1960 Chinautla, a Guatemalan Indian community: a study in the relationship of community culture and national change. Community Culture and National Change, Tulane University, Middle American Research Institute, Publication 24(2): 55-130.

Study of a Pokom speaking community 12 km northeast of Guatemala City, focusing on the relation between the community and the larger national scene. The systematic reactions of various groups within the community to internal and external pressures are examined and analyzed.

1966 The law of the saints: a Pokomam pueblo and its community culture. Bobbs-Merrill Co., Inc., Indianapolis and New York. xx+338 p., 3 maps, 2 charts (1 fold), 2 tables, 18 photos, 4 appx., biblio: 325-328, index.

Ethnography based on the author's longitudinal study (since 1953) of Chinautla, a community 12 km northeast of Guatemala City. Discussion includes municipio settlement pattern and relations, history, differentiation of Indians, Ladinos, and Mengalas, occupations, local-national interaction, the cofradia, life cycle, and world view.

1969 Eastern Guatemalan highlands: the Pokomames and Chorti. In VOGT, Evon Z., Ethnology, Part One (Handbook of Middle American Indians, Volume 7), University of Texas Press, Austin. pp. 101-132 [5 maps, 5 photos, 1 drawing, 4 tables].

Reviews geography, cultural and linguistic distribution, history, subsistence, settlement patterns, technology, economy, social organization, political and ceremonial organization, religion and world view, life cycle and annual cycle. Data based on REINA 1960, 1966, and WISDOM 1940.

REYNOLDS (John Kenneth (1946-)

1971 Residential architecture at Kaminaljuyu: a Formative and Classic center in highland Guatemala. Master's thesis, Department of Anthropology, The Pennsylvania State University, University Park. vii+130p., 18 tables, 10 fig., biblio: 128-130.

Discussion and analysis of residential architecture at Kaminaljuyu during the Formative and Classic periods. Data based on extensive excavations of test pits and of the B-V-8 and B-V-9/10/11 complexes. Emphasis on construction materials and techniques, relation between housing and status, and the temporal stability for each of these aspects.

REYNOLDS, John Kenneth (1946-), and CARDENAS, Donal Sean (1946-)
1973 Mound B-V-4: a Late Formative ceremonial structure and Middle Classic residence complex. In MICHELS, Joseph W., and SANDERS, William T., The Pennsylvania State University Kaminaljuyu Project: 1969, 1970 Seasons, Part One - Mound Excavations. Occasional Papers in Anthropology, No. 9, The Pennsylvania State University, Department of Anthropology. University Park.

Methodology and description of the excavation of Mound B-V-4. Comparisons are made with Mound B-V-2. Reuse of mound for residential construction during the Middle Classic period is analyzed.

RICHARDSON, Francis Boott (1913-)
1940 Non-Maya monumental sculpture of Central America. In HAY, Clarence L., et al, The Maya and their Neighbors. D. Appleton-Century Co., Inc., New York and London. pp. 395-416 [9 drawings].

Large stone sculpture is used to define the geographical limits of culture areas and clarify chronology in Central America. The crude boulder sculptures at Kaminaljuyu represent a wide-spread pre-Maya culture (p. 399). Cultural affiliations at this site tend to be with the north and west rather than the south and east.

RICKETSON, Oliver Garrison, Jr. (1894-1952)
See KIDDER and RICKETSON, 1935
KIDDER and RICKETSON, 1936

RILEY, Robert Alsop (1944-)
1971 How socio-cultural variables affect food composition: the Guatemalan case. Paper presented at the 70th annual meeting of the American Anthropological Association, New York. [8 tables].

Study relating dietary variability to socio-economic levels in two communities, Barcenas and San Miguel Petapa, in the Valley of Guatemala. Mean daily caloric and nutrient intake of 52 families are correlated with house types and with occupation and land tenure. Intercommunity variation is also indicated by a higher average intake for Petapa (a cabecera) than for Barcenas (an aldea), though Petapa is the smaller community. Other factors of community variation are considered.

SANDERS, William Timothy (1926-)
1969 The Kaminaljuyu Project: an overview. Paper presented at the 68th annual meeting of the American Anthropological Association, New Orleans.

Outline of the research goals of The Pennsylvania State University Kaminaljuyu Project in salvaging data from this major Mesoamerican center. Summary of previous research at the site and tentative conclusions from ongoing research is given.

1970 The highlands of Guatemala and ecological theory. Paper presented at the Columbia University Seminar on Ecological Systems and Cultural Evolution, 9 November 1970.

Descriptive discussion of the cultural history of the Valley of Guatemala from earliest continual habitation until the Spanish Conquest. Focus is upon reconstructing the changes in population, land use, settlement pattern, social organization, political control which occur during this period of time. These changes are discussed in relation to such ecological factors as soil characteristics, locality near a passage of a trade route, and presence of a major obsidian source.

1972 Chiefdom to state: political evolution at Kaminaljuyu, Guatemala. Paper presented at the International Colloquium on the Reconstruction of Complex Societies, Massachusetts Institute of Technology, Cambridge, 29-30 April 1972.

Discussion based on chronological sequence of culture change in the Valley of Guatemala from the Middle Formative period (800-500 BC) through the Late Classic period (700-1000 AD). Using E. R. Service's classification, various features of the chiefdom and the state are related to such evidence as community and zonal settlement patterns, civic and residential architecture, burials, and craft specialization. Evidence from Kaminaljuyu indicates a chiefdom existed during the Late Formative period (500-100 BC), becomes increasingly complex during the Terminal Formative period (100 BC-300 AD), with a state level of political organization evident during the Middle Classic period (500-700 AD).

See MICHELS and SANDERS, 1973

SANDERS, William Timothy (1926-), with HIRNING, Robert
1969 The settlement pattern test trenches. In SANDERS, William T., and MICHELS, Joseph W., The Pennsylvania State University Kaminaljuyu Project: 1968 Season, Part One - The Excavations. Occasional Papers in Anthropology, No. 2, The Pennsylvania State University, Department of Anthropology. University Park.

Description and discussion on the excavation of 34 test pits near Mound B-I-1, Mound B-III-1, the Palangana, and the northwest quadrant of the site of Kaminaljuyu. Tentative conclusions on the settlement patterns related to time period and socio-political implications are presented.

SANDERS, William Timothy (1926-), and MICHELS, Joseph William (1936-)
1969 The Pennsylvania State University Kaminaljuyu Project: 1968 Season, Part One - The Excavations. Occasional Papers in Anthropology, No. 2, The Pennsylvania State University, Department of Anthropology. University Park.

Methodology and report on excavations of Mounds B-V-2, B-III-1, B-II-1, and of 34 test pits.

SAVILLE, Marshall Howard (1867-1935)
1930 Toltec or Teotihuacan types of artifacts in Guatemala. Museum of the American Indian, Heye Foundation, Indian Notes, 7: 195-206 [3 photos], New York.

Teotihuacan or Mexican influence is inferred from three artifacts (a two-hole candelero, a handled candelero, a rosette adorno) locally made in Central Guatemala and found near the site of Kaminaljuyu.

SCHRIMSHAW, Nevin Stewart (1918-)
See BORHEYGI and SCRIMSHAW, 1957

SHEPARD, Anna Osler (1908-)
See KIDDER and SHEPARD, 1944

SHOOK, Edwin Martin (1922-)
1948-49 Guatemala highlands. Carnegie Institution of Washington, Year Book, 47: 214-217, 48: 219-221.

Brief report on the excavation of Mound E-III-3 at Kaminaljuyu.

1950-51 Guatemala. Carnegie Institution of Washington, Year Book, 49: 197-198; 50: 240-241.

Brief report on the excavation of Mounds E-II-3, E-III-1, D-III-10, D-III-13, C-III-6, C-III-10 at Kaminaljuyu. These structures date to the Arevalo, Majadas, Providencia, and Aurora phases of the Middle and Late Formative and Early Classic periods.

1951 The present status of research on the preclassic horizons in Guatemala. In TAX, Sol, The Civilizations of Ancient America (Proceedings of the 29th International Congress of Americanists, Volume 1), University of Chicago Press, Chicago. pp. 93-100 [2 plates].

Concise outline of early cultures in Guatemala, with particular reference to the Las Charcas, Sacatepequez, Miraflores (Providencia, Verbena, Arenal, Santa Clara) phases. Advances the hypothesis that sedentary settlements based on agriculture began first in the coastal lowlands of Mesoamerica, then spread into the highlands, creating symbiotic trade relations. Preclassic cultures collapsed under pressures from Mexico.

1952a Lugares arqueológicos del altiplano meridional central de Guatemala. Antropología e Historia de Guatemala 4(2): 3-40 [fold-out map].

Results of an archaeological survey of the southern central Guatemalan highlands, containing brief description and chronological placement of over 100 sites in the departments of Guatemala, Sacatepequez, and Chimaltenango. A chronology based on the Kaminaljuyu ceramic sequence is presented. Also published in Arqueologia Guatemalteca, 2: 65-130 (1957).

1952b The ruins of Cotio, department of Guatemala, Guatemala. Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology, 4(107): 181-188 [3 plates].

Description of a Late Classic site 13 km west of Guatemala City, near Kaminaljuyu. The site contains two mound structures, a ball court, and a grave with Amatle phase mortuary vessels. A site plan and illustration of Amatle phase vessels are included.

1971 Inventory of some Pre-Classic traits in the highlands and Pacific Guatemala and adjacent areas. In HEIZER, Robert F., and GRAHAM, John A. (ed.), Observations on the emergence of civilization in Mesoamerica. University of California, Contributions of the Archaeological Research Facility, 11: 70-77. Berkeley.

Discussion of settlement characteristics, architecture and sculpture of the Formative period. References to Monte Alto and Kaminaljuyu.

See KIDDER, JENNINGS, and SHOOK, 1946
KIDDER and SHOOK, 1946
KIDDER and SHOOK, 1961

SHOOK, Edwin Martin (1922-), and KIDDER, Alfred Vincent (1885-1963)
1952 Mound E-III-3, Kaminaljuyu, Guatemala. Carnegie Institution of Washington, Contributions to American Anthropology and History (Publication 596), 11(53): 33-127 [25 plates, 55 illus., biblio: 127].

Description and analysis of the excavation of Mound E-III-3, the highest structure (20 m) at Kaminaljuyu. At least seven superimposed altar or temple platforms are distinguished, along with two rich tombs containing some 500 vessels, dating to the Miraflores (Verbena) phase of the Terminal Formative period.

SHOOK, Edwin Martin (1922-), and PROSKOURIAKOFF, Tatiana (1909-)
1956 Settlement patterns in Meso-America and the sequence in the Guatemalan highlands. In WILLEY, Gordon R., Prehistoric Settlement Patterns in the New World. Viking Fund Publication in Anthropology, No. 23, pp. 93-100 [3 maps, 3 site plans].

Discussion of three successive settlement patterns in the Valley of Guatemala: Late Preclassic (Formative) - linear arrangements of structures (Santa Izabel); Classic - enclosed plazas with adjoining ball courts (Eucaliptus); Postclassic - fortified hilltop sites (Chinautla). Based on SHOOK 1952a.

SHOOK, Edwin Martin (1922-), and SMITH, Augustus Ledyard (1901-)
1942 Guatemala: Kaminaljuyu. Carnegie Institution of Washington, Year Book 41: 263-267.

Report on the excavations of Mound B (F-VI-2), which proved to be a series of Esperanza phase temple platforms and tombs, and of three ball courts (C-II-4, C-II-7, F-V-1) at Kaminaljuyu.

SMITH, Augustus Ledyard (1901-)

1961 Types of ball courts in the highlands of Guatemala. In LOTHROP, Samuel K., et al, Essays in Pre-Columbian Art and Archaeology, Harvard University Press, Cambridge. pp. 100-125, 9 illus., 1 table, notes: 488-489, biblio: 457-458.

Typology and discussion of highland Guatemalan ball courts, with a table of various sites with ball courts.

1965 Architecture of the Guatemalan highlands. In WILLEY, Gordon R., Archaeology of Southern Mesoamerica (Handbook of Middle American Indians, Volume 2), University of Texas Press, Austin. pp. 76-94 [15 illus.].

Discussion, by time periods, of architectural assemblages, construction materials, decorative elements, and types of structures. Structure typology includes temples, long buildings, altar platforms, altar shrines, ball courts, and tombs. Much of the data are from Kaminaljuyu, as well as Zaculeu, Nebaj, Zacualpa, Mixco Viejo, and A. L. Smith's archaeological reconnaissance in central Guatemala.

See SHOOK and SMITH, 1942

SMITH, Robert Eliot (1899-)

1949 Cerámica elaborada sin torno, Chinautla, Guatemala. Antropología e Historia de Guatemala, 1(2): 58-61 [4 plates].

Descriptive data on pottery making techniques at Chinautla, a Pokom community 12 km northeast of Guatemala City. The technique of constructing vessels without the use of the wheel is compared with similar ones in five communities in the United States (San Ildefonso, New Mexico), Mexico (Coyotepec, Oaxaca; Becal, Campeche; Ticul, Yucatan), and El Salvador (Guatajiagua). Steps in the process are illustrated with 16 photographs.

See RANDS and SMITH, 1965

STENHOLM, Nancy Ann

1973 Identification of house structures in Mayan archaeology: a case study at Kaminaljuyu. Doctoral dissertation, Department of Anthropology, University of Washington, Seattle. 366p.

A model of what constitutes a house is presented, based on data from contemporary houses and archaeological structures believed to be houses. Included are a list of the qualitative and quantitative criteria, and the necessary and sufficient conditions for identifying excavated structures as houses. The model was applied to a Terminal Formative structure (B-V-2) at Kaminaljuyu for determination of function.

STEWART, Thomas Dale (1901-)

1949 Notas sobre esqueletos humanos prehistóricos hallados en Guatemala. Antropología e Historia de Guatemala, 1(1): 23-34 [3 tables, 1 photo].

Osteological study of human skeletons from San Agustin Acasaguastlan in the central Montagua Valley, Mound B (Tombs B-I, B-V, Pit Burial B) at Kaminaljuyu in the Valley of Guatemala, and Zaculeu near Huehuetenango. Factors considered were normal cranial forms, types of cranial deformations, dental mutilations, reconstructed stature, and bone pathology.

TSUKADA, Matsuo, and DEEVEY, Edward S., Jr.
1967 Pollen analysis from four lakes in the southern Maya area of Guatemala and El Salvador. In CUSHING, E. J., and WRIGHT, H. E., ed., Quaternary Paleoecology (Proceedings of the 7th Congress of the International Association for Quaternary Research, Volume 7), Yale University Press, New Haven. pp. 303-331 [6 charts, 4 photos, 1 map].

Pollen diagrams from Lake Izabal, Lake Guija, Lake Cuscachapa, and Lake Amatitlan indicate that agricultural activity was most prominent during the Classic period, diminishing during the Postclassic and colonial periods, and that swidden farming does not appear responsible for vegetational changes. Lake Amatitlan sediments date back to about 1000 BC.

VILLACORTA, Carlos Augusto
1927 Vestigios de un edificio arcaico. Anales de la Sociedad de Geografia e Historia de Guatemala, 4(1): 51-64 [11 photos, 1 plan, 1 map].

Report on the excavation of Mound D-III-6 ("Quita Sombrero") at Finca La Providencia (Kaminaljuyu). The structure is a terraced temple platform, from which Monuments 16, 17, 18 are reported to have been found (MILES 1965a: 257). The ceramics have subsequently been dated to the Arenal phase of the Terminal Formative period. Six ceramic fragments are pictured. Also included is a summary of WILLIAMSON 1877.

1931 Esculturas en piedra de origen maya-tolteca. Revista del Museo Nacional de Guatemala, 1: 8-14 [13 photos].

Description of 16 large stone sculptures from the site of Kaminaljuyu. Similar to LOTHROP 1926.

1932a Sitio arqueológico de origen maya-tolteca, entre Guatemala y Mixco, su exploración y ultimos piezas del tipo arcaico allí encontradas que ya figuran en la colection del Museu de Guatemala. Revista del Museo Nacional de Guatemala, 2: 22-32 [12 photos].

Summary of archaeological explorations at the site of Kaminaljuyu and description of seven more stone sculptures from that site and a mushroom stone from Cerro Alux, Mixco. Results of some excavations into Mound C-II-12 are presented. Also published in Anales de la Sociedad de Geografia e Historia de Guatemala, 9(1): 110-120.

1932b Nuevas piezas que enriquecen el Salón Arqueológico del Museo Nacional. Anales de la Sociedad de Geografia e Historia de Guatemala, 9(1): 110-120 [12 photos, 1 table].

Summary of archaeological explorations at the site of Kaminaljuyu and description of seven more stone sculptures from that site and a mushroom stone from Cerro Alux, Mixco. Results of some excavations into Mound C-II-12 are presented. Sequel to J. A. VILLACORTA 1927. Also published in Revista del Museo Nacional, 2: 22-32.

1939 Altar E de Kaminal Juyú; el original se encuentra en el Museo Arqueológico de la Ciudad de Guatemala. (Monumentos Arqueológicos de Guatemala, No. 1.) Tipografía Cordon, Guatemala. 8 p., 1 photo, 2 maps.

Brief description of Altar E (Altar 1) from Kaminaljuyu, and dates to about 500 AD. Text is in Spanish, English, French, German, and Italian. Description is similar to that given in VILLACORTA and VILLACORTA 1930: 47-48.

See VILLACORTA and VILLACORTA, 1930

VILLACORTA CALDERÓN, José Antonio (1879-1964)

1926 Monografía del departmento de Guatemala. Tipografía Nacional, Guatemala. xii+378p., 152 illus., 6 maps (fold-color).

Study of the political unit which includes the Valley of Guatemala. Topics included are typography, hydrography, precipitation, vegetation, fauna, parks and public institutions in Guatemala City, summary of each municipio (area, population, products, festivals, etc.), archaeology (chapter 41: 367-378).

1927 Arqueológia guatemalteca: region de los cúes entre Guatemala y Mixco. Anales de la Sociedad de Geografia e Historia de Guatemala, 3(4): 376-392 [2 maps, 20 photos].

Description of the site of Kaminaljuyu, including historical accounts, and of 18 large stone sculptures from the site, with photographs of 16 of them. Similar to LOTHROP 1926.

1955 Una página del Teo-Amoxtli en un bajo relieve de Kaminaljuyú. Revista Universidad de San Carlos, 35: 135-154, Guatemala.

After recounting the Toltec migration legends and outlining the Popol Vuh, the scene carved on the recently discovered Stela 10 is related to the story of Hunaphu and Xbalanque slaying the Lords of Xibalba to avenge the death of their fathers, as presented in the Popol Vuh (RECINOS 1950: 160). The date of 179 AD is given for the stela, which may have been an altar.

VILLACORTA CALDERÓN, José Antonio (1879-1964), and VILLACORTA, Carlos Augustus
1930 Region de los cúes entre Guatemala y Mixco. In Arqueología Guatemalteca. Tipografía Nacional, Guatemala. Chap. II, pp. 33-64, 3 maps, 31 photos, 1 plan.

Description of the site of Kaminaljuyu, data on 18 large stone sculptures from the site, and report on the excavation of Mound D-III-6. Republication of J. A. VILLACORTA 1927 and C. A. VILLACORTA 1927.

WAUCHOPE, Robert (1909-)
1970 Protohistoric pottery of the Guatemalan highlands. In BULLARD, William R. (ed.), Monographs and Papers in Maya Archaeology. Harvard University, Peabody Museum of Archaeology and Ethnology, Papers, 61: 89-243. Cambridge.

Descriptions of vessels and fragments from various archaeological sites, including Azacualpilla, Chinautla, Kaminaljuyu, and other sites in the Valley of Guatemala (p. 210-219). Nine figures showing vessel forms and design motifs are included.

WEBSTER, David Lee (1943-)
1973 The B-V-11 mound group: a Middle Classic elite residence compound. In MICHELS, Joseph W., and SANDERS, William T., The Pennsylvania State University Kaminaljuyu Project: 1969, 1970 Seasons, Part One - Mound Excavations. Occasional Papers in Anthropology, No. 9, The Pennsylvania State University, Department of Anthropology. University Park.

Methodology and description of the excavation of Mounds B-V-9, B-V-10, B-V-11, which revealed a surprisingly intact Middle Classic elite residence compound.

WETHERINGTON, Ronald Knox (1935-)
1969 The ceramic sequence at Kaminaljuyu. Paper presented at the 68th annual meeting of the American Anthropological Association, New Orleans.

Presentation of the tentative ceramic sequence as developed from the 1968 and 1969 seasons of The Pennsylvania State University Kaminaljuyu Project. Chronological period relation and diagnostic characteristics for each ceramic phase is discussed and illustrated. Varies from earlier sequences in SHOOK 1952a and BORHEGYI 1965a.

WILLIAMS, Howel (1898-)
1960 Volcanic history of the Guatemala highlands. University of California Publications in Geological Science, 38(1): 1-86 [8 maps (2 fold), 13 plates].

Geological study of the Guatemalan highlands, with emphasis on Tertiary deposits and Quaternary volcanic formations. Includes a petrographic study in the Valley of Guatemala (p. 22) and deposit formations in the Guatemalan City graben (p. 63-65). The most recent pumice deposits are at least 2340 years old, pre-dating the earliest culture at Kaminaljuyu.

WILLIAMSON, George McWillie (1829-)
1877 Antiquities in Guatemala. Smithsonian Institution, Annual Report 1876: 418-421 [1 map].

Report of three sites in the Valley of Guatemala, the largest of which (No. 3) has been identified as the sites of Naranjo and Pelikan by E. M. Shook (1952a: 22).

WOODBURY, Richard Benjamin (1917-)
1965 Artifacts of the Guatemalan highlands. In WILLEY, Gordon R., Archaeology of Southern Mesoamerica (Handbook of Middle American Indians, Volume 2), University of Texas Press, Austin. pp. 163-179 [17 fig.].

Discussion of nonceramic artifacts, including lithics (celts, bark beaters, "doughnut stones," hammerstones, manos and metates, stone vessels, mushroom stones, obsidian blades and points, pyrite mosaic plaques), metals (gold, copper, tumbaga), bone, shell, cloth, basketry, and stuccoed objects. Several references to Kaminaljuyu and Zaculeu.

WYNN, Jack Thomas (1940-)
See BEBRICH and WYNN, 1971, 1973

Bibliographic Index for Kaminaljuyu and the Valley of Guatemala

Altars -- See Architecture, Sculpture
Architecture
  Austin with Lothson 1969
  Ball 1973
  Bebrich 1969a
  Bebrich and Wynn 1971, 1973
  Berlin 1952
  Brown 1972a
  Cardenas with Austin 1969
  Cheek 1971a, 1971b
  Imparcial 1960b
  Kidder, Jennings and Shook 1946
  Kirsch 1973a
  Reynolds 1971
  Reynolds and Cardenas 1973
  Shook 1971
  Shook and Kidder 1952
  Smith, A.L. 1965
  Villacorta, C.A. 1927
  Webster 1973
  See also Ball Courts, Settlement Pattern
Artifacts
  Borhegyi 1969
  Kidder 1949-50
  Michels 1973c
  Saville 1930
  Woodbury 1965
  See also Ceramic Artifacts, Jade, Lithic Artifacts, Mushroom Artifacts, Sculpture
Axe, Stone -- See Lithic Artifacts
Ball Courts
  Brown 1972a, 1972b, 1973
  Borhegyi 1956d, 1956e
  Shook 1952a, 1952b
  Shook and Smith 1942
  Smith, A.L. 1961
Bone Artifacts - See Artifacts
Burials
  Bebrich 1969a
  Berlin 1952
  Borhegyi 1956d, 1956e
  Espinoza 1967
  Jennings 1943
  Kidder 1948
  Kidder, Jennings and Shook 1946
  Kirsch 1972, 1973a, 1973c
  Shook 1948-49, 1950-51, 1952b
Burials (Con't)
  Shook and Kidder 1952
  Stewart 1949
  See also Mortuary Customs, Osteological Studies
Calendrics
  Heath-Jones 1970
  Miles 1957
  See also Sculpture
Candelero -- See Ceramic Artifacts
Ceramic Artifacts
  Borhegyi 1955, 1957b, 1963
  Michels 1973c
  Saville 1930
  See also Figurines, Pottery
Ceramic Sequence
  Borhegyi 1965a
  Kidder 1948, 1965
  Michels 1973a
  Rands and Smith 1965
  Shook 1952a
  Wetherington 1969
Chronology -- See Ceramic Sequence, Radiocarbon Dating, Obsidian Dating
Climate -- See Environment
Commerce -- See Economy
Computer Application -- See Methodology
Construction Techniques -- See Architecture
Crafts -- See Economy, Ethnographic Studies, Pottery Techniques (Modern)
Distribution System -- See Economy
Disease and Treatment
  Borhegyi and Scrimshaw 1957
Doughnut-Shaped Vessels -- See Pottery
Ecology -- See Environment, Settlement Pattern
Economy
  Feldman 1971
  Chinchilla 1961
  Miles 1957a, 1965b
  Reina 1960, 1966, 1969
  See also Ethnographic Studies
Effigy Vessels -- See Pottery

Environment
Atwood and Atwood 1932
Bryan 1945
Deevey 1955
Deger 1932, 1939
Meek 1908
Tsukada and Deevey 1967
Villacorta, J.A. 1926
Williams 1960
Ethnographic Studies
Adams 1957
Escobar 1969
Goubaud Carrera 1948
Reina 1957, 1960, 1966, 1969
Riley 1971
See also Pottery Techniques (Modern)
Ethnohistoric Data
Chinchilla 1961
Feldman 1970, 1971
Fuentes y Guzmán 1932-33, 1969, 1972
Gage 1969
Miles 1957a, 1957b, 1958, 1965b
Excavations
Berlin 1952
Borhegyi 1956d, 1956e
Brown 1972a
Cheek 1971a
Espinoza 1967
Gamio 1926-27
Imparcial 1960a, 1960b
Kidder 1945, 1948, 1961
Kidder, Jennings and Shook 1946
Kirsch 1972
Michels and Sanders 1973
Sanders and Michels 1969
Shook 1950-51, 1952b
Shook and Kidder 1952
Shook and Smith 1942
Villacorta, C.A. 1927
Figurines
Borhegyi 1950c, 1954
Borhegyi and Scrimshaw 1957
Gamio 1926-27
Grajeda Mena 1964
Kidder 1949-50, 1965
Kidder and Shook 1961
Rands 1965
Villacortá and Villacorta 1930
Geology -- See Environment
Hieroglyphs -- See Calendrics, Sculpture
Historical References to Sites
Batres Jáuregui 1926
Brine 1894
Fuentes y Guzmán 1932-33, 1969, 72
Grajeda Mena 1964
Maudslay 1889-1902
Williamson 1877
House Platforms -- See Architecture, Residential Structures
Incensarios, Incensence Burners -- See Pottery
Interpretation -- See Synthesis and Interpretation
Interregional Influences
Borhegyi 1965a, 1966, 1968, 1969
Brown 1972b
Cheek 1971a, 1971b
Jennings 1943
Kidder, Jennings, and Shook 1946
Miles 1965a
Saville 1930
Jade
Easby and Easby 1953
Foshag 1957
Kidder, Jennings and Shook 1946
Kinship -- See Ethnographic Studies, Ethnohistoric Data
Language -- See Ethnographic Studies, Ethnohistoric Data
Lithic Artifacts
Borhegyi 1957a, 1961, 1969
Borhegyi and Metcalf 1967
Coe 1960
Coe and Flannery 1964
Hurtado 1973
Mata Amado 1964
Michels 1973c
Woodbury 1965
See also Jade, Mushroom Artifacts, Sculpture
Masks, Clay -- See Ceramic Artifacts
Methodology
Borhegyi 1959a
Kidder, Jennings and Shook 1946
Michels 1969a, 1969b
Michels and Sanders 1973
Sanders and Michels 1969
Shook and Kidder 1952
Mortuary Customs
Fuentes y Guzmán 1932-33, 1969, 72
Feldman 1970
Miles 1957a
See also Burials

Mushroom Artifacts
Borhegyi 1957a, 1961a, 1963, 1969
Lowy 1971
Neutron Activation Analysis
Deutsch 1972
Hurtado 1973
Obsidian -- See Lithic Artifacts
Obsidian Dating
Michels 1973b
Osteology
Stewart 1949
Paleoclimatology -- See Environment
Palynology -- See Environment
Pedestal Sculpture -- See Sculpture
Population Estimates
Borhegyi 1965a
Miles 1957a
Villacorta, J.A. 1926
Pottery
Berlin 1952
Borhegyi 1950a, 1950b, 1951a, 1951b, 1951c, 1956b, 1958a, 1958b, 1959b
Borhegyi and Parsons 1963
Kidder, Jennings and Shook 1946
Kidder and Shepard 1944
Kidder and Shook 1946
Lischka 1972
Michels 1973a
Parsons 1963
Rands and Smith 1965
Shook 1951, 1952b
Shook and Kidder 1952
Wauchope 1970
Wetherington 1969
See also Ceramic Artifacts
Pottery Techniques (Modern)
Arnold 1971
Borhegyi 1961b
Deutsch 1972
Smith, R.E. 1949
Production System -- See Economy
Radiocarbon Dating
Borhegyi 1968
Crane and Griffin 1964, 1966
Deevey, Gralenski and Hoffren 1959
Libby 1954
Michels 1973b
Rattles, Clay -- See Ceramic Artifacts
Religion -- See Ethnographic Studies, Ethnohistoric Data
Residential Structures
Kirsch 1972
Michels and Sanders 1973
Residential Structures (Con't)
Reynolds 1971
Sanders and Michels 1969
Stenholm 1973
See also Architecture
Rim-Head Vessels -- See Pottery
Sculpture
Borhegyi 1965c
Heath-Jones 1959, 1970
Imparcial 1960a, 1960b
Lothrop 1926
Miles 1965a
Richardson 1940
Shook 1971
Villacorta, C.A. 1931, 1932a, 1932b, 1939
Villacorta, J.A. 1927, 1955
Settlement Pattern
Bebrich 1969b
Borhegyi 1956c, 1965b
Brown 1972a, 1972b
Cardenas 1969
Davis 1969
Michels 1969b
Miles 1957a, 1957b, 1958, 1965b
Reina 1966, 1969
Sanders with Hirning 1969
Shook 1971
Shook and Proskouriakoff 1956
Shell Artifacts -- See Artifacts
Silhouette Sculpture -- See Sculpture
Skeletons -- See Burials, Osteology
Socio-Political Organization -- See Ethnographic Studies, Ethnohistoric Data, Synthesis and Interpretation
Soils -- See Environment
Stela -- See Sculpture
Stone Artifacts -- See Lithic Artifacts, Sculpture
Synthesis and Interpretation
Batres Jáuregui 1926
Borhegyi 1956a, 1965a
Gamio 1926-27
Heath-Jones 1959, 1970
Jennings 1943
Kidder 1948, 1961
Kidder, Jennings and Shook 1946
Michels 1969b
Sanders 1972
Shook 1951
Shook and Kidder 1952
Temple Structures -- See Architecture

Trade -- See Economy
Valley Sites
  Borhegyi 1958, 1959a, 1959b, 1961c, 1968, 1969
  Brown 1972b
  Coe and Flannery 1964
  Davis 1969
  Feldman 1970
  Mato Amado 1964
  Shook 1952a, 1952b
  Williamson 1877
Zoology -- See Environment

REFERENCES CITED

Austin, D. M. 1969 (with G. Lothson) Mound B-II-1 excavation. In The Pennsylvania State University Kaminaljuyu Project: 1968 Season, Part One - The Excavations. W. T. Sanders and J. W. Michels (eds.). Occasional Papers in Anthropology, No. 2, The Pennsylvania State University, Department of Anthropology, University Park.

Ball, J. W. 1973 The B-V-8 mound Group: A later Formative and Middle Classic elite residence complex. In The Pennsylvania State University Kaminaljuyu Project: 1969, 1970 Seasons, Part One - Mound Excavations. J. W. Michels and W. T. Sanders (eds.). Occasional Papers in Anthropology, No. 9, The Pennsylvania State University, Department of Anthropology, University Park.

Bebrich, C. A. 1969 Mound B-III-1 excavation. In The Pennsylvania State University Kaminaljuyu Project: 1968 Season, Part One - The Excavations. W. T. Sanders and J. W. Michels (eds.). Occasional Papers in Anthropology, No. 2, The Pennsylvania State University, Department of Anthropology, University Park.

Berlin, H. 1952 Excavaciones en Kaminal Juyú: Montículo D-III-13. Antropología e Historia de Guatemala, 4(1): 3-18.

Blom, Frans. 1932 The Maya ball-game Pok-ta-pok. Middle American Research Series, Publication Number 4: 485-530.

Borhegyi, S. F. de 1956 Settlement patterns in the Guatemalan highlands: Past and present. In Prehistoric Settlement Patterns in the New World. G. R. Willey (ed.). Viking Fund Publications in Anthropology, No. 23, pp. 101-106.

Borhegyi, S. F. de 1960 America's ballgame. Natural History, 69(1): 48-59.

Bryan, Kirk 1945 Soils and climatic chronology in Guatemala. Carnegie Institution of Washington, Year Book 44: 168-170.

Cardenas, D. S. 1969 Kaminaljuyu during the Late Classic period. Paper presented at the 68th annual meeting of the American Anthropological Association, New Orleans.

Cheek, C. D. 1971 Excavations at the Palangana, Kaminaljuyu, Guatemala, Guatemala. Doctoral dissertation, Department of Anthropology, University of Arizona, Tucson.

Clune, F. J. 1963 A functional and historical analysis of the ball game of Mesoamerica. Doctoral dissertation, Department of Anthropology, University of California, Los Angeles.

Coe, Michael D. 1966 The Maya. Praeger, New York.

Davis, M. K. 1969 The history of settlement pattern in the Valley of Guatemala. Paper presented at the 68th annual meeting of the American Anthropological Association, New Orleans.

Deevey, E. S., L. J. Gralenski and V. Hoffren 1959 Yale natural radiocarbon measurements. IV. Radiocarbon supplement. American Journal of Science, 1: 162-164.

Espinoza, G. 1967 Excavaciones en Kaminal-juyú. Antropología e Historia de Guatemala, 19(1): 128-129.

Friedman, I. and R. L. Smith 1960 A new dating method using obsidian. Part I. The development of the technique. American Antiquity, 25(4): 476-522.

Friedman, I., R. L. Smith and W. D. Long 1966 The hydration of natural glass and the formation of perlite. Bulletin of the Geological Society of America, 77: 323-330.

Gamio, M. 1926-27 Cultural evolution in Guatemala and its geographic and historic handicaps. Art and Archaeology, 22: 202-221; 23: 16-32, 70-78, 92, 129-133.

Gordus, A. A., W. C. Fink, M. E. Hill, J. C. Purdy and T. R. Wilcox 1967 Identification of the geologic origins of archaeological artifacts: An automated method of Na and Mn neutron activation analysis. Archaeometry, 10: 87-96.

Gray, T. 1971 Personal communication.

Johnson, L. 1969 Obsidian hydration rate for the Klamath Basin of California and Oregon. Science, 165: 1354-1356.

Kidder, A. V. 1945 Excavations at Kaminaljuyu, Guatemala. American Antiquity, 11(2): 65-76.

Kidder, A. V. 1948 Kaminaljuyu, Guatemala: Addenda and corrigenda. Carnegie Institution of Washington, Notes on Middle American Archaeology and Ethnology, 3(89): 224-232.

Kidder, A. V. 1965 Preclassic pottery figurines of the Guatemalan highlands. In Archaeology of Southern Mesoamerica (Handbook of Middle American Indians, Vol. 2). G. R. Willey (ed.). University of Texas Press, Austin.

Kidder, A. V., J. D. Jennings and E. M. Shook 1946 Excavations at Kaminaljuyu, Guatemala. Carnegie Institution of Washington, Publication 561.

Linne, Sigvald 1942 Mexican highland cultures; archaeological researches at Teotihuacan, Calpulalpan and Chalchicomula in 1934-35. The Ethnographical Museum of Sweden, Publication 7, Stockholm.

Lischka, J. J. 1972. A formal-functional analysis of ceramic distribution at Kaminaljuyu, Guatemala. Doctoral dissertation, Department of Anthropology, University of Arizona, Tucson.

Logan, M. H. 1972 Personal communication.

Logan, M. H. 1973 Personal communication.

Lothrop, S. K. 1927 Pottery types and their sequence in El Salvador. Museum of the American Indian, Heye Foundation, Indian Notes and Monographs, 1(4): 165-220.

Lothrop, S. K. 1933 Atitlan: An archaeological study of ancient remains on the borders of Lake Atitlan, Guatemala. Carnegie Institution of Washington, Publication 444.

Michels, J. W. 1969 Patterns of settlement in and around Kaminaljuyu, highland Guatemala. Paper presented at the 134th annual meeting of the American Association for the Advancement of Science, Boston.

Michels, J. W. and C. A. Bebrich 1971 Obsidian hydration dating. In Dating Techniques for the Archaeologist. H. N. Michael and E. K. Ralph (eds.). MIT Press, Cambridge and London. pp. 164-221.

Orrego Corzo, Miguel 1968 Unpublished notes on excavations at Mound B-III-1, on deposit at the Kaminaljuyu Project files. Department of Anthropology, The Pennsylvania State University, University Park.

Parsons, L. A. 1969 Bilbao, Guatemala: An archaeological study of the Pacific coast Cotzumalhuapa region, Volume 2. Publications in Anthropology, No. 12, Milwaukee Public Museum.

Pearson, Karl 1899 Mathematical contributions to the theory of evolution; on the reconstruction of stature of prehistoric races. Philosophical Transactions of the Royal Society, London, Series A, 193: 170-244.

Ralph, E. K. 1971 Carbon-14 dating. In Dating Techniques for the Archaeologist. H. N. Michael and E. K. Ralph (eds.). MIT Press, Cambridge.

Rands, R. L. 1965 Classic and Postclassic pottery figurines of the Guatemalan highlands. In Archaeology of Southern Mesoamerica (Handbook of Middle American Indians, Volume 2). G. R. Willey (ed.). University of Texas Press, Austin. pp. 156-162.

Rice, Donald. 1972 Neutron activation analysis of Kaminaljuyu and El Chayal obsidian. Unpublished manuscript, The Pennsylvania State University.

Sanders, W. T. 1970 The highlands of Guatemala and ecological theory. Paper presented at the Columbia University Seminar on Ecological Systems and Cultural Evolution, 9 November 1970.

Sanders, W. T. and J. W. Michels 1969 The Pennsylvania State University Kaminaljuyu Project: 1968 Season, Part One - The Excavations. Occasional Papers in Anthropology, No. 2, The Pennsylvania State University, Department of Anthropology, University Park.

Sanders, W. T. and B. J. Price 1968 Mesoamerica: The Evolution of a Civilization. Random House, New York.

Shook, E. M. 1950-51 Guatemala. Carnegie Institution of Washington, Year Book, 49: 197-198; 50: 240-241.

Shook, E. M. 1951 The present status of research on the preclassic horizons in Guatemala. In The Civilizations of Ancient America (Proceedings of the 29th International Congress of Americanists, Volume 1). Sol Tax (ed.). University of Chicago Press, Chicago. pp. 93-100.

Shook, E. M. 1952 Lugares arqueológicos del altiplano merididonal central de Guatemala. Antropología e Historia de Guatemala 4(2): 3-40.

Shook, E. M. and A. V. Kidder 1952 Mound E-III-3, Kaminaljuyu, Guatemala. Carnegie Institution of Washington, Contributions to American Anthropology and History (Publication 596), 11(53): 33-127.

Shook, E. M. and T. Proskouriakoff 1956 Settlement patterns in Meso-America and the sequence in the Guatemalan highlands. In Prehistoric Settlement Patterns in the New World. G. R. Willey (ed.). Viking Fund Publication in Anthropology, No. 23, pp. 93-100.

Smith, A. L. 1955 Archaeological reconnaissance in central Guatemala. Carnegie Institution of Washington, Publication 608.

Smith, A. L. 1961 Types of ball courts in the highlands of Guatemala. In Essays in Pre-Columbian Art and Archaeology. S. K. Lothrop, et al. (eds.). Harvard University Press, Cambridge. pp. 100-125.

Smith, A. L. 1965 Architecture of the Guatemalan highlands. In Archaeology of Southern Mesoamerica (Handbook of Middle American Indians, Volume 2). G. R. Willey (ed.). University of Texas Press, Austin. pp. 76-94.

Smith, A. L. and A. V. Kidder 1943 Explorations in the Motogua Valley, Guatemala. Carnegie Institution of Washington, Contributions to American Anthropology and History, Publication 546.

Standley, P. C. and J. A. Steyermark 1952 Flora of Guatemala. Part III. Chicago Natural History Museum, Fieldiana: Botany, Volume 25.

Stern, Theodore 1950 The rubber ball games of the Americas. American Ethnological Society, Monograph Number XVII.

Stromsvik, G. 1952 The ball courts at Copan. In Contributions to American Anthropology and History, Number 55. Carnegie Institution of Washington, Publication 596.

Trotter, M. and G. C. Gleser 1952 Estimation of stature from long-bones of American Whites and Negroes. American Journal of Physical Anthropology, 10: 463-514.

Ucko, P. J. 1970 Ethnography and archaeological interpretation of funerary remains. World Archaeology, 1(2): 262-280.

Wauchope, Robert 1938 Modern Maya houses: A study of their archaeological significance. Carnegie Institution of Washington, Publication Number 502.

Wetherington, R. K. 1969 The ceramic sequence at Kaminaljuyu. Paper presented at the 68th annual meeting of the American Anthropological Association, New Orleans.

Wetherington, R. K. 1971 Personal communication.

Wolfman, Daniel 1972 Personal communication.