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THE ARCHAEOLOGICAL SEQUENCE FROM SIPOLITE, OAXACA, MEXICO

By Donald Leslie Brockington

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CHAPTER I

INTRODUCTION

Problem

During February and March, 1962, excavations were conducted at Sipolite, near Puerto Angel, Oaxaca, Mexico. The purpose of the excavation was to establish a cultural sequence and to study its interconnections with other parts of Mesoamerica and to investigate possible relationships with Central and South America. A second purpose was to acquire a ceramic collection to be used in developing statistical techniques of description and analysis.

The original project design was based upon results of a 1956 archaeological survey by Gabriel DeCicco and the author.[1] Surface and purchase collections from Sipolite indicated a long occupancy of the site and the presence of several Mesoamerican ceramic traditions. Preclassic, Classic and Postclassic remains similar to those of Monte Albán, Veracruz, the Valley of Mexico, the Mixteca and western Mexico were noted.[2] Luciano Cruz Ensaldo, owner of part of the site, reported finding artifacts from several meters below the surface while well digging. It seemed that abundant materials representing widespread archaeological cultures and a long time span should be found in deep midden deposits.

Further, Eduardo Noguera had visited Puerto Angel in December, 1955, and was told of other nearby sites. Puerto Angel, about three

kilometers east of Sipolite, seemed a likely focal point for pre-hispanic sea travel for, while it is small, it is one of the few ports on the west coast of Mexico. Sites near the port might be expected to yield evidences of sea travel and perhaps parallel the finds from nearby Sipolite. In addition, further knowledge of the culture history of the Oaxacan coast would be valuable. It is practically unexplored archaeologically in spite of the fact that often postulated contacts between western Mexico and Central America and possibly South America most likely would have been along this coastline.

A large sample of complex remains was desired for purposes of testing, developing, and applying statistical techniques to ceramic description and analysis. Sipolite or a similar site could reasonably be expected to yield such a collection. The ceramic materials were to have been stored for collateral studies but, in conformance with the requirements of Mexican laws, are being returned to Mexico.

In accordance with our original plan, the author and an assistant, Mr. William Hurley, would survey the Puerto Angel vicinity to determine the nature of those sites reported by Noguera and any others that might exist. A field decision would be made selecting one for excavation. Efforts were to be concentrated at one site but others could be tested if such were deemed advisable. All excavations were for recovering midden remains since investigation of architecture is time consuming, expensive, and seldom yields primary deposits. The work permit granted by the Instituto Nacional de Antropologia e Historia only authorized stratigraphic investigations.

The research design was followed, as is described below in more detail. Survey indicated Sipolite as the best choice for excavation since other sites were very modest in size, content, and temporal span. Excavations began at Sipolite.

First efforts were in that portion of the site where the owner had dug wells, since deposit depth was there a known fact. Four pits revealed that soils and remains had washed from surrounding slopes adding to depth; much accumulation was not by primary deposition. A few sherds of Preclassic through Postclassic periods were found. Pits on flanking ridges encountered bedrock near the surface. Two pits in the western part of the site revealed the sought depth of midden accumulation and temporal span. Six additional pits there yielded thousands of sherds and small remains. Part of the project aims and requirements was achieved. However, the represented traditions were not entirely those expected. Field and preliminary study showed some to be very similar to those in the Monte Alban sequence, at least for the Preclassic period. Mixtec related objects were found only on the surface.[3] Strong similarities were noted to remains from Veracruz, Puebla, and Morelos and weaker associations with the Valley of Mexico were suggested. Also, considerable similarities with Yucatan, Campeche, Tabasco, highland Chiapas, and the Pacific coast of Guatemala were noted, none of which had been anticipated. But the native tradition of Sipolite dominated and its outstanding characteristic appeared to be its lack of change over a long period. The study of cultural conservativeness became the main concern of the project. None of the original purposes was abandoned, but the

emphasis shifted. External sequences have been correlated to the Sipolite sequence and hence to each other. The collection is stored at the University of Wisconsin for ancillary and subsidiary study purposes.

Attribute analysis and statistical techniques are used. Such are excellent methods for studying remains that reveal but slight changes. Also, the considerable complexity of the ceramics is further justification for use of statistical techniques, as has been pointed out over twenty years ago by Anna Shepard.

> "...Their [statistics] most important advantage is perhaps that they enable us to summarize and compare far more data than can possibly be carried in mind without averaging results, thus they are a substitute for experimental methods in fields where experiment cannot be applied...If we compare the information gained by statistical studies with that obtained by study of the relatively few data which can be evaluated by inspection, the statistical method is unquestionably far more fruitful..."[4]

A study of the long persistence of an early tradition - a study of cultural stability - is of more than local interest. The fact of survivals, either of elements or complexes, is well known archaeologically and ethnographically but Mesoamerican archaeologists have not dealt much with them. Fairly uniform cultural change as reflected by ceramic traditions has been generally assumed for much of Mesoamerica. A more sophisticated statement which recognizes variation has been made by Gordon Willey and Philip Phillips.

> "Surely, one of the reasons that Classic cultures could be developed in Middle America was that there was a multiplicity of regional traditional antecedents. The intertwining of the many varied strands of the Formative produced the Classic....This does not mean that the Middle American Classic was characterized by a single, homogeneous culture or civilization. Regionalism persisted, but it was a regionalism in which the various Classic

cultures had assimilated enough from each other so that all drew upon a common fund of great depth and richness."[5]

Since most excavation has been in or near great centers, change usually has been found but finding such is not remarkable since we can reasonably assume that it was in the great centers that the majority of innovations occurred, fashions set, and from there the prestigeful customs disseminated. However, not all great centers show constant and rapid change for all their histories, as Ignacio Bernal has pointed out for the Valley of Oaxaca during the late Classic and Postclassic periods.[6] Likewise, certain centers such as Xochicalco and El Tajín usually are regarded as having continued with the Classic tradition into Postclassic times but the extent of survivals has never been made clear. By and large one finds much agreement at a given moment through Mesoamerica, at least for the great centers. By a curious and unwarranted extension that agreement is taken to include ceramic traditions. One portion of Mesoamerica, western Mexico, is thought to have clung to a basically Preclassic ceramic tradition until the appearance of traits supposedly diagnostic of the Postclassic. Lengthy survivals of Preclassic ceramic traditions have been noted for central and coastal Chiapas[7] and highland Guatemala.[8] In spite of the many notable exceptions uniform ceramic change is still generally accepted, as witnessed by correlation charts with lines crossing from one side to the other bringing stylistic periods into chronological and developmental agreement. In the light of so many exceptions, one wonders why the assumption prevails?

Size is an important factor for a village does not possess complexities and elaborations equivalent to those of a great center;

obviously the composition of finds in each will be different. Distinctions between hamlet and urban center are easily discernible but gradations between may not be. Small villages, using only the size factor, cannot be expected to have participated equally with large centers in drawing "...upon a common fund of great depth or richness."

The problem is not only a more purely archaeological one but has considerable importance for interpretations of Mesoamerican culture history. When phases are equated as being synchronous because of possessing similar traits and the equation is extended to include other phases, errors may be compounded but rendered acceptable by circular reasoning. By accepting this reasoning the application of, for example, a culture area or co-tradition concept may become more reasonable but at the expense of not recognizing and properly evaluating the local and regional variation that may have existed. This is not intended to assert that the application of co-tradition or culture area concepts to Mesoamerica is incorrect but only to suggest that the definitions are currently inadequate.

Survivals of attributes or combinations of attributes have been regarded as anachronisms, incongruous with their surroundings at a given point in time. The assumption of incongruity does not always appear justifiable. New finds from remote areas cannot be automatically related to the rapidly changing great centers, and especially so when the new finds are from small villages.

But how can survivals be detected? How can we distinguish between very slow change and the slight differences that are to be expected between two areas at a single point in time? Remoteness

may be as adequate an explanation of variation as temporal difference but remoteness is not only a matter of distance. Cultural isolation, rough terrain, political or linguistic boundaries, and many other factors may function, as has been discussed at length by highly qualified archaeologists in 1955.[9] The many factors listed by that seminar seldom can be learned from excavation, even under optimum conditions. More often an archaeologist has a sizable collection of non-perishable artifacts from a site and their locations, his personal knowledge of other artifacts and sites, and the literature of his area and anthropology. Clues to relevant environmental forces may be gained by consulting general works by specialists from other disciplines. When faced with the problem of discussing relationships between two or more assemblages the archaeologist deals with both time and space. It is from this level of study that theory should be derived. However, often theoretically based conclusions serve as a crutch for sustaining postulated interrelationships.

When discussing relationships between two or more assemblages, time and space frames of reference are used, as is illustrated below in Diagram 1. The horizontal axis represents distance or space, the vertical axis time, and the diagonal axes the combination of these, the time-space dimension. Seldom can one discuss a purely spatial problem but two very similar assemblages are assumed to be temporally equivalent. Except for purely local circumstances one seldom deals with a temporal relationship that excludes space or, in other words, dissimilar remains in one site or in the immediate area are, if there is no positional evidence to the contrary, considered dissimilar in

time. In the majority of cases both time and space must be discussed. Choosing between the two or giving greater weight to one depends upon the evidence and the subjective choice of the archaeologist. Techniques for assigning absolute dates have aided in controlling the time variable but such are not always applicable. The comparative method is basic to archaeology. To return to the problem: how do we

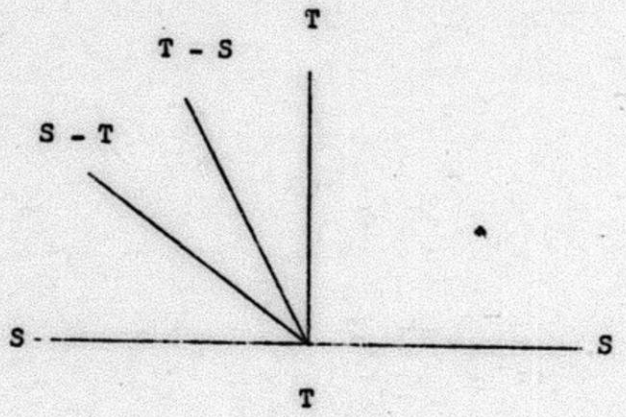


Diagram 1

study similar assemblages that are from different points in time? If it can be demonstrated that a tradition survived for a long time with rather few changes, the matter of comparability becomes a real concern.

An example of results that can come from not recognizing survivals is shown in a recent paper by Robert Rands wherein he noted reappearance of early attributes and attribute combinations in a later period at Palenque.[10] After considering but dismissing survivals as improbable, he advanced a theory of re-invention of early attributes. His rejection of survivals was consistent with the knowledge of that time. However, there is a strong possibility that the specific attributes in question and their combinations did survive at Sipolite and

very likely were transmitted to Tabasco, the region near Palenque. The theoretical discussion seems reasonable except that our new materials make his illustrations less usable.

The demonstration of survival of attributes, individual and in clusters, is a major purpose of this study. Documentation and discussion are given in Chapter IV. A tentative ceramic typology is proposed and correlations with external sequences attempted in the last part of Chapter IV. Methodology, described in Chapter III, is given some emphasis, not only for accomplishing stated purposes, but to suggest new ways and to apply suggestions for deriving more and better inferences from archaeological remains.

The nature of similarities between Sipolite and elsewhere is discussed and suggestions offered as to how trait transmission may have occurred are found in Chapter VII as conclusions. The discussion and conclusions are based upon the assumption that the site stratigraphy is essentially undisturbed and that the ceramic tradition was indeed extremely conservative.

It may be difficult to determine when a ceramic tradition is conservative for the apparent homogeneity could result from one short period when a thick layer was deposited and later covered by and slightly mixed with a later occupation's remains. A conservative tradition, by definition, exhibits no or but slight change. The demonstration of such slight change necessitates employment of sensitive tools, here narrowly defined attributes. Grossly defined groupings would obscure minor variations that represent slow trends. A

traditional approach well might ignore the essential fact of slight variation.

Multiple lines of evidence are presented. Body sherds are given statistical treatment in Chapter IV. Supports, handles, figurines, and other minor ceramic objects are classified or described in Chapter V and lithic remains in Chapter VI.

Regardless of techniques employed or materials used, the conclusions are consistent. When conclusions reached with one artifact class agree with those indicated by another, the sequence is further verified and maximum credibility attained. Archaeological conclusions are combined with the background information given in Chapter II to form a tentative reconstruction of the culture history of Sipolite and the coast of Oaxaca.

There is no evidence of contacts with or influences from outside Mesoamerica. The effigy lugs which seemed to suggest a South American connection are explained in Chapter V as a local tradition.

The earliest known human occupation of the coast was during the middle or late Preclassic. While the ceramics are most similar to those of Monte Alban I/II, they are distinct and suggest participation in a general southern Mesoamerican tradition. Monte Alban similarities decline at the beginning of the Classic and there are greater associations with more southerly regions, especially Tabasco, until direct and strong relationships are seen with the late Classic Maya culture. It is suggested that a fusion of Maya and Zapotec traditions occurred on the Oaxacan coast and that Maya traits obvious farther

north, such as at Xochicalco, passed along the coast. The historical Mixtec domination followed the Maya influences.

ENDNOTES

[1]Gabriel DeCicco y Donald Brockington, Reconocimiento Arqueológico en el Suroeste de Oaxaca, Informes Núm. 6 de la Dirección de Monumentos Prehispánicos, Tradución por Eduardo Noguera (México: Instituto Nacional de Antropología e Historia, 1956), pp. 89-102; Donald L. Brockington, "A brief report on an archaeological survey of the Oaxacan Coast," Mesoamerican Notes, No. 5 (México: Mexico City College, 1957), pp. 98-104.

[2]The terms "Preclassic," "Classic," and "Postclassic" have been used with various meanings. I intend them to be indicators of general chronological divisions. "Preclassic" indicates the early ceramic cultures of Mesoamerica until the time of Christ, "Classic" refers to the time span from the time of Christ until approximately 900 A.D., and "Postclassic" extends from the Classic until the Spanish conquest. Each term may be divided into early, middle or late segments.

[3]H. B. Nicholson has made strong objection to application of the linguistic title "Mixtec" to archaeological remains in "The use of the term 'Mixtec' in Mesoamerican archaeology," American Antiquity, Vol. XXVI, No. 3 (January, 1961), 431-433. One agrees with Nicholson that artifacts cannot speak and, more important, there is abundant evidence that non-Mixtec speakers produced artifacts of the "Mixtec" style. There is no alternative term, except for the awkward "Mixteca-Puebla" proposed by George Vaillant. I shall use the term "Mixtec," following the examples of Alfonso Caso, Ignacio Bernal and John Paddock, the leaders in Oaxacan archaeology. Paddock recently has proposed the term "Ñuñi," Mixtec for the dry northeastern Oaxaca region that presumably was the center of major development of the style.

[4]Anna O. Shepard, Rio Grande Glaze Paint Ware, Contributions to American Anthropology and History, No. 39, Carnegie Institution of Washington Publication 528 (Washington, D. C.: U. S. Government Printing Office, 1942), p. 239.

[5]Gordon Willey and Philip Phillips, Method and Theory in American Archaeology (Chicago: University of Chicago Press, 1962), p. 151.

[6]Ignacio Bernal, "Monte Albán and the Zapotecs," Boletín del Centro de Estudios Oaxaqueños, Núm. 1 (Oaxaca: Mexico City College, 1958), pp. 7-9.

[7]Donald L. Brockington, "A prolongation of the Preclassic period indicated by the ceramics of Santa Rosa, Chiapas," Los Mayas del Sur y sus Relaciones con los Nahuas Meridionales (México: Sociedad Mexicana de Antropologia, 1961), pp. 90-92. Gareth Lowe in a personal communication to the author has indicated that BYU-New World Archaeological Foundation excavations at Izapa, Chiapas, reveals a regional survival of ceramics very similar to Chiapa IV and V (450 B.C.-100 B.C.) until the middle Classic. Stephan Borhegyi has noted a similar long survival of Preclassic traditions in highland Guatemala and discusses such in a forthcoming article in the Handbook of Middle American Indians.

[8]Robert Wauchope, Excavations at Zacualpa, Guatemala, Middle American Research Institute Publication 14 (New Orleans: The Tulane University, 1948), p. 29.

[9]Emil Haury, Chairman, "An archaeological approach to the study of cultural stability," Seminars in Archaeology: 1955, Robert Wauchope, editor. Memoirs of the Society for American Archaeology, No. 11 (October, 1956), pp. 31-57.

[10]Robert L. Rands, "Elaboration and invention in ceramic traditions," American Antiquity, Vol. XXVI, No. 3 (January, 1961), 331-340.

CHAPTER II

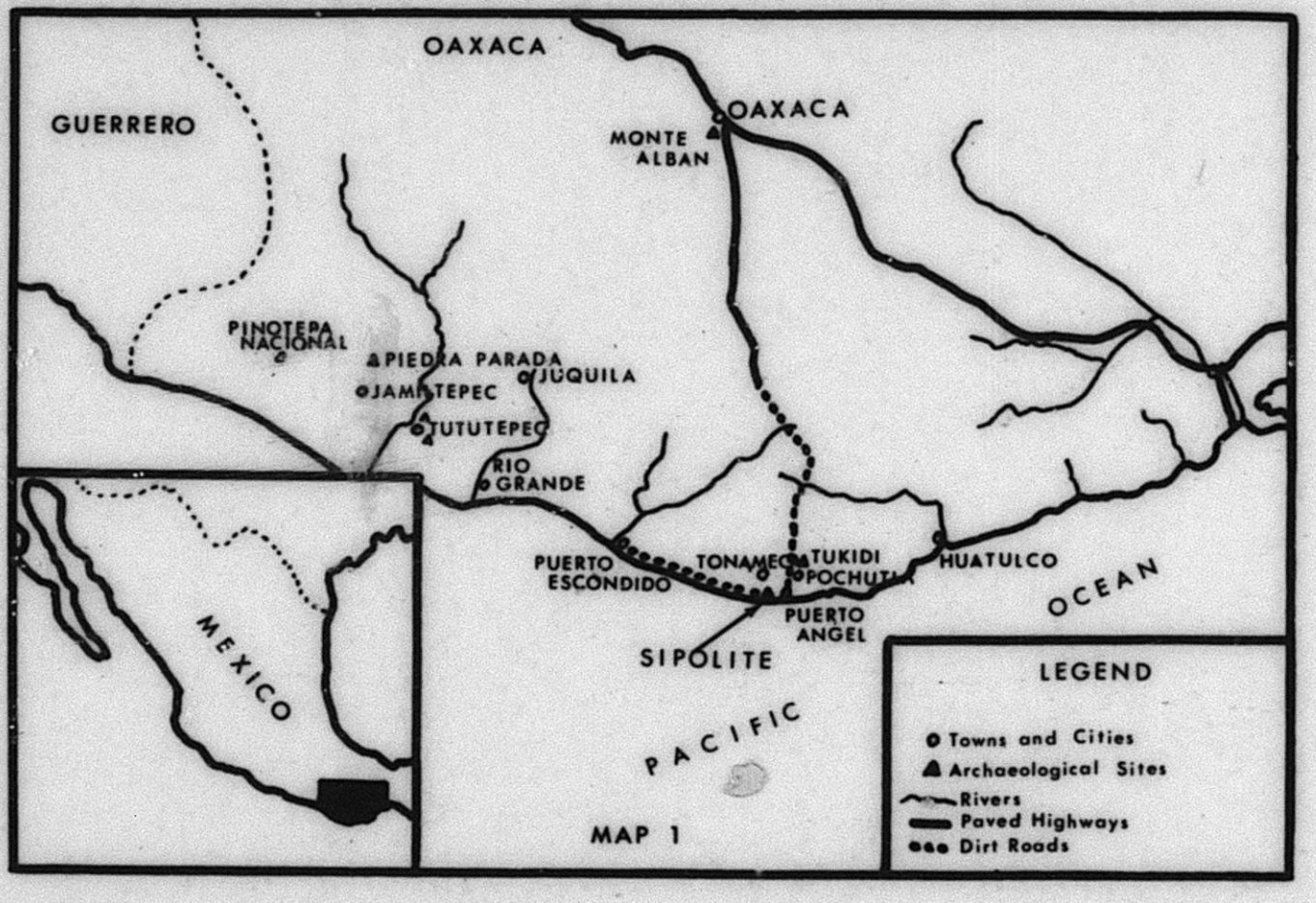
THE BACKGROUND AND EXCAVATIONS

Description of the Region

The coast of Oaxaca is a segment from a narrow band of fairly uniform conditions stretching twelve hundred kilometers along the Pacific coast of Mexico from Bahia de Banderas in the northwest to below the Isthmus of Tehuantepec in the southeast (see Map 1). In Oaxaca the band varies from fifty to five kilometers wide and is about twenty-five kilometers wide at Puerto Angel. It is very hilly to the southeast and becomes more open and level to the northwest. The coastal plain was formed by erosion after the raising of the Sierra Madre del Sur in the late Mesozoic and early Cenozoic. The plain has been sinking slowly since the late Cenozoic.[1] The soil apparently is a crumbly red lateritic soil, deep and uniform, and made of siliceous clays that become yellowish with depth and are formed by decomposition of bedrock.[2]

Recently published summaries of the geography of Middle America do not add much to the above and, in fact, are somewhat at variance with it.[3] The conflict seems to be due to a lack of specific facts. L. C. Stuart points out that "...Biologically this is one of the least known of the Mexican biotic regions..."[4] Our ignorance seems to extend to other fields although the extreme variability of the region may be cause for much apparent confusion.

MAP I


OAXACA
GUERRERO
OAXACA
MONTE ALBAN
PINOTEPA NACIONAL
PIEDRA PARADA
JAMILTEPEC
JUQUILA
TUTUTEPEC
RIO GRANDE
PUERTO ESCONDIDO
TONAMECA
TUKIDI
POCHUTLA
HUATULCO
OCEAN
PUERTO ANGEL
SIPOLITE
PACIFIC
MEXICO
LEGEND
Towns and Cities
Archaeological Sites
Rivers
Paved Highways
Dirt Roads

MAP 1

The only reported volcanic activity on the coast of Oaxaca has been near Puerto Angel with the Volcán de Pochutla erupting in 1870 and a submarine volcano erupting in 1803 and 1875.[5] Earthquakes are common and often severe. A triangle having Puerto Angel, Oaxaca City, and Acapulco as its apices would enclose the area of epicenters for over half of all earthquakes that occur in Mexico. The region of greatest earthquake activity is between Pochutla and Juquila.[6]

The climate for the entire coastal plain is Awg in the Koeppen system of classification with the temperature during all months being over 18° C. and with over 750 mm. of rainfall occurring from May through September with dry winters.[7] A good impression of climate for the Puerto Angel region can be gotten from the tables presented by M. T. de la Peña and reproduced below in Table I. We may note that the rainfall is extremely variable from year to year, from 590 to 1,260 mm. during the years quoted, and that the number of days with rainfall is small. Rain falls heavily on a few days during five or six months of the year. Temperatures, however, are constant with practically no monthly variation. A low of 18° C., a high of 45° C., and an average of 30° C. describes almost any month. Rainfall up the coast is somewhat higher and towards Tehuantepec it is about like Puerto Angel, until the area just south of La Ventosa where exceedingly arid conditions prevail. The coast is cut by seven rivers that flow the year around and several smaller rivers that fill to modest proportions during the wet season. The shoreline is broken and rough consisting of a few beaches, a good deal of mangrove swamp, and cliffs with offshore reefs. There are no good harbors and only three small

Puerto Angel (1931 - 1940)

	Jan	Feb	Mar	Apr	May	Jun	
Rain (in mm.)	1	8	0	0	104	207	
No. of rainy days	0	0	0	0	2	9	
	Jul	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
Rain (in mm.)	157	206	452	118	7	8	1,268
No. of rainy days	9	8	11	4	0	0	43

Puerto Angel (1945 - 1948)

	Jan	Feb	Mar	Apr	May	Jun	
Rain (in mm.)	0	0	0	0	78	112	
No. of rainy days	0	0	0	0	4	5	
Temperature (C.)	30	30	30	31	32	30	
	Jul	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
Rain (in mm.)	99	37	206	65	0	0	597
No. of rainy days	3	3	7	2	0	0	24
Temperature (C.)	31	30	30	30	29	29	30

TABLE 1. - Rainfall and temperatures for Puerto Angel, Oaxaca[8]

but poor ones, Huatulco, Puerto Angel, and Puerto Escondido, excepting Salina Cruz near Tehuantepec.

The flora is varied. Behind the mangrove growth along much of the coast and below the coniferous forest in the mountains are savannah conditions and thorn bushes. A Mexican botanist describes the coast thusly:

> "...but actually it is very rich in vegetal species, primarily in the barrancas, without doubt because of their proximity to the sea, and this has been observed already by...Prof. Alfonso Herrera, Sr., who feels that the vegetation of this zone is much more exhuberant and varied than that on the east coast.
>
> "Fine woods and trees of great height are abundant as are leguminous thorn-bushes and shrubs. There also are various forms of cacti, but there is only one arbolescent fern, and orchids are scarce..."[9]

The fauna include skunk, gopher, squirrel, field rat, hare, jabali, hawk, comecacao, chachalaca, quail, bunting, sparrow, and greenfinch, according to one authority,[10] and we can add the iguana, a small deer, armadillo, the jaguar, and parrots which are present at least in the Puerto Angel area. Sea fauna are exceptionally rich with the western Pacific game and commercial fish being present as well as shrimp, lobster, and shell fish near the site.

Stuart notes that the region has great faunal diversity, probably a result of the variations in climate, vegetation, and relief.[11] Robert West suggests that the diversity may have made the coast exceptionally desirable for primitive peoples.[12]

In summary, the Puerto Angel region is part of the coastal plain of Oaxaca. The plain is very hilly, covered with thorny bush growth for the most part, cut into segments by rivers and has mountains separating it from the interior. Rainfall is heavy but the

climate dry; temperatures consistently are high. Flora and fauna are varied. In short, geographical isolation with quite varied regional resources appears to be the main theme.

Historical Background

There are no prehispanic or early colonial records available for the Sipolite-Puerto Angel region. The Relaciones Geográficas of 1580 written in reply to a questionnaire circulated throughout the Spanish colonies contain descriptions of the geography, history, economics, agriculture, customs and inhabitants of Tonameca, Pochutla, Huatulco, and Port of Huatulco, the towns nearest Puerto Angel and Sipolite.[13] In each Relación mention is made of Puerto Angel but never of Sipolite. The account of Pedro de Alvarado's conquest of Tututepec written in 1522 by Hernando Cortes is the earliest reference to the coast of Oaxaca.[14] There are brief descriptions in the Suma de Visitas from the mid-sixteenth century.[15]

The paucity of early documents might lead one to the conclusion that the coast of Oaxaca was not important before or after the arrival of the Spaniards. Such a conclusion would be partly wrong. The coast from Guerrero to Tehuantepec and inland for varying distances was under the control of the lord of Tututepec at the time of the Conquest and never was conquered by the Aztecs.[16] Tututepec warred against Mitla,[17] Miahuatlan,[18] Tehuantepec,[19] Putla,[20] and Nochixtlan[21] and sent troops as far afield as Coixtlahuaca to aid that city in its struggle with the Aztecs.[22] The lord of Tututepec apparently exercised unusually close control over his vassal towns.[23] Barbara Dahlgren in her study of Mixtec ethnohistory makes repeated references

to Tututepec having been the most powerful, richest, and most warlike of all the Mixtec city-states.[24] In spite of the power of Tututepec, we have few records or descriptions of its realm. It is possible that such early records do not exist or, more likely, do exist but have not received the attention of scholars.[25] It is also possible that the importance of the coast of Oaxaca diminished during the first colonial years.

We have no evidence to indicate that the immediate region of Puerto Angel was important or especially noteworthy during the last centuries of Indian control or during Colonial or early Independence times. Since Puerto Angel and presumably Sipolite were included in the area of Pochutla in the Relación of 1580, it is not unlikely that they also were before the Conquest. A summary of the contents of the Relación de Pochutla probably is a reasonably fair description of any inhabitants of the Puerto Angel region. If we can so assume, the people were descendents of Chichimecs and spoke a Nahuatl dialect. They were subject to Tututepec paying a tribute of gold dust, jewels, copper, feathers, clothes and servants. Cotton was grown and fish were taken locally to trade for tribute items, although some gold was found in gullies. Town officials, judges, and tax collectors were appointed by the lords of Tututepec.

Preferred agricultural lands were the naturally damp or seasonally flooded areas near the ocean. Crops included corn, beans, squash, chile, chia, sweet potatoes, and cotton. Local fruits included several varieties of zapotes, avocadoes, and native plums. Wild animals included jaguars, mountain lions, wild pigs, deer,

iguanas, doves, quail, chachalacas, and other small animals. Most were hunted and eaten, especially deer and iguanas. Fish were taken from the lagoons and estuaries near the ocean. Salt was purchased or made from sea water in jars and a salt substitute of sea water mixed with marsh mud was used.

Clothes consisted of a mantle, breechclout and sandals. Hair was worn long as a protection against the sun. Houses were small, low, roofed with straw and without doors.

The men warred under the command of the lords of Tututepec and used clubs with inserted obsidian blades, bows and arrows, shields, and wore quilted cotton garments as armor.

The people usually were healthy but consulted medical practitioners when sick and used medicines made from herbs and trees. The local deity was Yzpapalotl (Itzpapalotl? - Obsidian Butterfly). Worship included burning copal, pine sticks, and making offerings of birds, animals, and human blood and hearts. Sacrificial victims were eaten.[26]

While the foregoing summary is sketchy, it is all we have. In general, we can see a culture quite similar to the basic Mesoamerican pattern, but with local variations. Nothing in other sources or modern customs refutes the summary; to the contrary, the summary not only is supported by other Relaciones and evidence but makes good sense in the light of archaeological facts. Boas studied the Pochutla dialect and considered it an "1" variety of Nahuatl.[27] Fernández, Swadesh, and Weitlaner, using lexicostatistical estimates, suggest that Pochuteca separated from Valley of Mexico Nahuatl a minimum of

fourteen centuries ago.[28] The Pochuteca linguistic island stands in contrast with the Chontal and Huave speakers to the east, the Zapotecs to the north and east, and the Mixtecs to the west. If we accept the judgment of Fernandez, Swadesh, and Weitlaner, the Mixtecs entered the area only six hundred years ago.[29]

Ixtlilxochitl writing in the sixteenth century said that a group of Chichimecs left the Valley of Mexico in the fourth century after Christ, traveled to the coast of Jalisco, and sailed southward to Huatulco. There they landed, settled in various towns, and eventually traveled across the Isthmus of Tehuantepec to the Gulf Coast.[30] They established a dynasty in Tututepec.[31] The close correspondence between the lexicostatistical estimates and legendary dates presented by Ixtlilxochitl tend to support each other. Also, the claims of the lords of Tututepec to be descendants of Toltecs adds further support. There remains the problem of explaining the fact that Mixtec was the language of Tututepec when Alverado arrived in 1522, as it is today. The example of submergence of the Toltec language in Yucatan may provide a somewhat analogous situation where a dominant minority was inundated linguistically. An alternative would be that the Mixtec newcomers pretended descent from Chichimec Toltecs in an attempt to validate their claims to power. Such was not unknown in Mesoamerica.

Other small linguistic groups on the coast include the Chatino and Trique. The Chatino are linguistically related to the Zapotecs having diverged between eighteen and twenty centuries ago.[32] The Trique on the Oaxaca-Guerrero border are more distantly related to the Mixtecs.[33]

After 1522 the history of the Puerto Angel region would seem to be one of decline until the last thirty years. According to the Relación de Pochutla, that town and its sub-units had a population of 8,000 at the time of the Conquest but had been reduced to twenty Indians (males, heads of families probably) in 1580.[34] The Visita of the mid-sixteenth century credits the town of Pochutla with twenty-five males.[35] All of the Relaciones for the area mention sickness as the cause for decline in population but the Relación del Puerto de Guatulco describes the plagues and their results in fascinating detail left below in the original:

> "...Antiguamente biuyan sanos y rrezios y llegauan a muy bieyos y despues que vinyeron los spanoles dende a dos anos, comenco a auer enffermedad de que vinyeron a morir muchos, y esta enffermedad que les dio fueron camaras de sangre, de que murian cada dia cinquenta e sesenta personas en este pueblo; y pasada esta enffermedad, les dio otra en otra temporada les acudio otra enffermedad de sarna e ynchazones de fuego que les salia, de que asi mysmi murieron gran suma de gentes; y vino a quedar muy despoblado e con pocos yndios este pueblo, y cada dia a ydo dismynuyendose, tanto, que ya no ay veinte yndios en la cabecera y doscientos en todo el pueblo y sus sujetos; y vna de las causas que dan para que en las dichas enffermedades muriesen tanto es no auer tenydo quien los curase, porque, aunque antiguamente solia auer enffermedades, no morian porque tenian medicos que los curavan con yerbas y plantas que conozian."[36]

It is obvious that disease greatly reduced the population.[37] The condition of the coast was indicated when Viceroy Martín Enriques, writing in 1579 to the Viceroy of Peru after Francis Drake's raid on Huatulco in that year, noted:

> "On the entire coast of this New Spain the corsairs cannot do any harm that will amount to much, because it is almost uninhabited by Spaniards as well as Indians. Where there are Indians, there are few and they live in straw huts. There are a few Spanish settlements inland and the

> trade from these ports to Nicaragua and Panama consists of some native wearing apparel, beans and things of little importance..."[38]

The impression is that the coastal areas such as Puerto Angel were sparsely inhabited and economically unimportant. While Huatulco itself was the major port for trade between New Spain and Peru during the period from 1540 to 1560, by 1570 Acapulco had taken over the function of handling legitimate trade.[39] Drake's raid in 1579 and the burning of Huatulco by Thomas Cavendish in 1587 hastened its decline and in 1616 the Spaniards destroyed the port of Huatulco by order of the Viceroy.[40] The activities of pirates prevented development of an already depressed area which apparently was kept underdeveloped in order to hinder further piratical incursions, as has been suggested by Peter Gerhard.[41] Concerning Puerto Angel specifically, the same author noted: "Puerto de los Angeles, or Puerto Angel, just west of Guatulco, was not used by the Spaniards to any extent, but it was occasionally called at by pirates."[42] The Relación de Pochutla describes Puerto Angel in some detail and notes specifically that it was undesirable and not used by the Spaniards.[43] The Relación de Tonameca mentions lack of fresh water as making it undesirable.[44]

By the late eighteenth century the Indian population of the Pochutla district had increased to 1,040 and cotton and cochineal were being exported to Oaxaca.[45]

During later Colonial days we have no note of Puerto Angel but during the turbulent days of Benito Juárez, the coast became a staging area for armies about to march on Oaxaca City and a refuge area for

unsuccessful commanders. Felix Diaz, younger brother of the future dictator, was trapped and killed while trying to flee by ship from Puerto Angel. By 1883 a customs station had been established and a mule road from Oaxaca completed. Yellow fever was found in nearby Tonameca.[46] A railroad from Oaxaca to Tehuantepec by way of Pochutla and Huatulco was planned and at least partially surveyed but abandoned during Porfirio Diaz's administration.[47] In 1930 when Aldous Huxley entered Mexico through Puerto Angel it was being used by shipping. Huxley's description of Puerto Angel with four huts and two houses and the poor mule road to Miahuatlan shows the conditions of thirty years ago, but he noted that coffee plantations were reviving the area even then.[48] In 1960 a concrete quay for loading coffee onto lighters to take out to freighters anchored at the harbor mouth was completed. The sporadic but very profitable stevedoring and success of a local fishing cooperative together with bettered communication with inland Oaxaca have brought about an increase to over seven hundred inhabitants. The anti-malaria campaign has made the region more healthy although malaria is still common today.[49] Construction of a road along the coast from Acapulco, Guerrero to Salina Cruz on the Isthmus of Tehuantepec is progressing rapidly. With branches running into the highlands from Pinotepa Nacional and Tututepec, the new road system should destroy the isolation of the last four centuries.

Previous Archaeological Work

The archaeology of coastal Oaxaca, excluding the Isthmus of Tehuantepec region, is poorly known because so little work has been done there. Bernard Bevin,[50] Heinrich Berlin,[51] Román Piña Chan,[52]

and some representatives of Time Magazine[53] have made trips through the region and have noted ruins, monuments, and remains. El Atlas Arqueológico de la República Mexicana summarizes the few sites known until about 1950.[54]

Gabriel DeCicco and the author made a brief survey of the western portion of the coast and the Pochutla-Puerto Angel part in 1956.[55] We returned to one site, Piedra Parada Jamiltepec, to undertake testing excavations, the only archaeological digging done until the present work.[56]

Román Piña Chan summarized our scanty knowledge of the archaeology of the coast in a paper presented in 1957.[57]

Very little previous archaeological work has been done in the Puerto Angel region. Dr. Eduardo Noguera and Sr. Lorenzo Gamio visited Puerto Angel in 1955 and collected a few ceramic figurines. DeCicco and the author visited Sipolite, collected sherds from the surface and purchased a small collection of ceramic objects.[58] Students from the Escuela Nacional de Antropología e Historia visited the region a few years ago. An American "potted" the west ridge a couple of years ago finding several rude tecomate vessels. Visitors from Puerto Angel and tourists have collected ceramic objects and there are several small private collections in Puerto Angel. Two aviform effigy lugs from "near Puerto Angel" are in the Museo Frizzell de Arte Zapoteca in Mitla.

Local residents are aware of archaeological remains. Many know of a site about twelve kilometers to the west and of two or three hilltop sites fifteen or twenty kilometers to the east. The hilltop sites

are surrounded by stone walls or "corrales," possibly defensive works. During our survey in 1962 we talked to many local people from town and country and visited every suggested location. The extremely poor remains found at most sites suggests that the occurrence of even a few sherds at a place have been noted.

The Atlas Arqueologico de la Republica Mexicana records no remains from the Puerto Angel region.

The reconnaissance by DeCicco and the author in 1956 located three sites in this region, Sipolite (misspelled Sipilote) and two others near Pochutla. The airport site just south of Pochutla had modern remains over indigenous ones. The scanty ancient artifacts were probably all Postclassic and similar to Mixtec remains. The other site, Tukidi, to the north of Pochutla revealed grey wares similar to those of Monte Albán II as well as plain versions of the aviform effigy lugs found at Sipolite.[59]

Obviously, our knowledge of the archaeology of the region is very scanty. While it is not likely that we have missed any extensive ruins in the immediate vicinity of Puerto Angel, there is no reason to suppose that such do not exist fairly nearby. This investigation must be regarded as a pioneer effort in an essentially unknown portion of Mesoamerica.

Survey and Its Results

Survey of the Puerto Angel region began on February 13, 1962, when Mr. William Hurley, field assistant, and I visited Sipolite. The following day after securing a guide we began visiting places that had been recognized by local people as archaeological sites and also those

suggested by Dr. Noguera. All within two hours walk of Puerto Angel were visited. When a pattern of site locations became apparent, we directed the search towards certain likely places. The survey was guided by previous knowledge, direct inquiry, and searching for favorable locations for living.

Local people recognize sites by the presence of pottery fragments and, for some distant sites, by masonry remains. Inquiry about sites continued even after excavations had begun but we never were informed of any other than those we had visited.

The reader may find the location information somewhat vague. In the absence of accurate maps a more precise description would be a delusion. There are no outstanding peaks or geographical features to serve as reference points and so the town of Puerto Angel has been used. Anyone wishing to visit the sites should have little difficulty since most geographical features, often individual hills, are named and known to local inhabitants, especially farmers.

Anclero is located one kilometer due north of Puerto Angel. Most of the site is on land used as milpa by Sr. Felipe Garcia of Puerto Angel. Six or seven stone outlines, probably remains of houses, and several lines of stones, remains of possible retaining walls, were noted. Inspection of the site indicated a shallow deposit of cultural debris concentrated on one side of a slight basin. The basin deepens downhill to become a ravine. Three house outlines were found along the ravine over a hundred meters from the main concentration.

Occasional sherds, mostly plain body sherds, were found as well as two fragments of celts, three manos, one mold-made figurine head, several solid aviform effigy handles, and a hollow mold-made monkey effigy support. Sr. Garcia gave us four mold-made figurine heads he claimed to have found on the site.

A short occupancy appears indicated for Anclero. The site was given low priority for excavation although, other than Sipolite, it is the largest site in the region and could be of interest as an example of a small late period site. It appears to be Late Classic and/or Early Postclassic in temporal placement.

Sr. Garcia was not only friendly and helpful in regard to the ruins but gave other information that proved to be of value for understanding sites and their location in the region. When we expressed some surprise at the milpa being surrounded by a barbed wire fence he pointed out that the location was particularly favorable since it is damper than the surrounding dry hills. By fencing the plot, always using it in some manner, and paying a small rental to the town, he kept control over it. It seems probable that the same factors that made the land valuable to Sr. Garcia also made it valuable for ancient settlement. We may note that surface finds of artifacts taper off as one goes further down the ravine into drier conditions.

In response to questions about a small hut at one side of the milpa, Sr. Garcia said it was for the person guarding the crop from animals. For two months before harvest a guardian remains in the milpa day and night with food and water being brought out to him from the village. He pointed out sherds from a modern vessel he had

dropped while guarding the milpa the previous year. Similar minor domestic tragedies while living at the milpa may account for our finds at other sites, as will be noted below, if the same customs prevailed in ancient times.

Marco de Luna is an abandoned milpa on and between two hills slightly over a kilometer northwest of Puerto Angel. Twenty plain rough body sherds were found on and near the top of one hill. No other evidence of human occupancy was noted. As a point of some possible botanical interest, several cotton plants were seen on the site although our guide assured us that the plant is not grown today and has never been grown in the vicinity, to his knowledge.[60]

Zapotal is a milpa belonging to our guide, Apolinar Sequiero, and his father. It is about three hundred meters towards Puerto Angel from Marco de Luna. Ten sherds, seven from a vessel broken the previous year, were found on top of a hill. The other sherds appear to be plain coarse reddish-brown paste body sherds.

In spite of the name no zapote trees grow in the vicinity and Apolinar knew of none that had grown there.

Cacahuite is a milpa on a hill about one and a half kilometers east of Puerto Angel. The hill ends with a cliff that drops into the ocean. Fifteen sherds were found on top of the hill with one bearing an incised line and all others being plain. Four of the sherds are of grey paste and all are identical to those from Sipolite. The site name also is applied to a neighboring hill where sherds have been found when the land was cleared but we were unable to find any remains in the undergrowth.

Agüete is located at the mouth of a small canyon where it enters the sea just west of where the Cacahuite hills begin.[61] Agüete is the only naturally verdurous place near Puerto Angel, other than Sipolite. A series of wells provide water for a few fruit trees and tomato plants. The owner supposedly keeps a few goats which feed upon the grasses that grow there.

Cultural remains consisting of several hundred plain body sherds were found but only over a small area about fifteen meters back from the sea. All of the sherds are very rough. While the site appears to be relatively favorable for human use and occupancy, no other remains were noted. Examination of the walls of the wells revealed no subsurface cultural remains. The concentration, location, and nature of sherds suggest that perhaps salt was prepared from sea water at this place. The reader's attention is directed to the Relación del Puerto de Guatulco where such a custom is mentioned.[62]

Two other locations where sherds reputedly have been found were visited but after scrambling through thorn bushes and scraping aside leaves for several hours we were unable to discover any indication of human occupation. Both locations were on hilltops and our guide said that both were the same as Marco de Luna and Cacahuite.

Except for Anclero and Sipolite all sites appear relatively unimportant. Sipolite almost certainly is the largest site in the region and has the longest time span. Anclero, the second largest site, is located in a position recognized even today as being exceptionally favorable. Agüete may have been a salt production site. All

other sites are extremely small and possibly represent remains of field guardian stations.

Sipolite clearly was indicated as the most favorable place for excavation.

Site Description

Sipolite (alternative spelling, Zipolite) is a dispersed settlement located from three to four kilometers west of Puerto Angel, Oaxaca.[63] Behind Sipolite beach which runs east and west for over a kilometer, hills rise abruptly leaving a fairly level plain from one to three hundred meters wide. Three seasonal streams flow from the hills to the ocean. Along the stream beds are narrow plains, the largest of which projects back into the hills for less than a kilometer before being reduced to a ravine. Immediately behind the beach are several small ponds of brackish water. Some of these ponds are seasonal survivals that were small lagoons thirty years ago when the largest stream flowed the year around. Shrimp were taken in the lagoons.

A dirt road passes along the narrow plain carrying truck traffic between Puerto Angel and Puerto Escondido to the northwest. During March, 1962, two or three trucks daily used the road, most evidently carrying supplies to crews working on the projected coastal road near Puerto Escondido.

Sipolite is dry having flowing water only during the rainy season. Water is secured from shallow wells dug in damp places or stream beds for the rest of the year. Two deep wells supply most of the water used in Puerto Angel through a system of pumping stations,

reservoirs, and pipes. In spite of the rather elaborate system and the full-time attendance of an engineer, the water supply in Puerto Angel is barely sufficient for present needs.

Along the coastal band are some fifteen houses of wattle and daub or simple pole walls and thatch roofs. Until 1955, only one family lived at Sipolite in recent years. They tended a coconut palm grove owned by a customs official in Puerto Angel. Except for this grove and another planted on the archaeological site in 1955 by Don Luciano, agricultural activities are pretty much limited to milpas with corn and beans planted on the seaward slopes and along the narrow valleys. Other than an occasional banana plant, a few chickens, and several head of cattle and swine, no other production is evident. The impression is one of precarious poverty. One of our workers lived at Sipolite, having come there three years earlier. A visit to his house revealed a small milpa with remains of corn, beans, and squash and an unsuccessful attempt to grow coconut palms.

To the east of the site is a small brickyard where most of the fired brick used in Puerto Angel is made. The yard is a family enterprise employing five or six men and boys. Their constant labor and activity is remarkable for Sipolite and their relative prosperity is shown by the three cows, numerous chickens, turkeys, and pigs seen around their house.

On Sipolite beach is a wooden cross sunk in a block of cement with a remada over it. On the Day of the Cross several dozen people came from Puerto Angel with a priest to bless the cross. At the western end of the beach is an isolated rock pillar projecting perhaps

fifty feet above sea level. A large opening has eroded through the pillar. The Zapotec-speaking inhabitants of San Agustín Loxicha thirty-five kilometers inland make annual pilgrimages to such a rock on the seashore, but I do not know whether it is this one.[64] My informants knew of no such visits and I saw no surface remains that would indicate any unusual activity. Several hundred meters out to sea is another tall rock covered with white bird guano. Hydrographic Office Sailing Directions call attention to Piedra Blanca as a navigational aid.[65]

The sea snail Purpura which yields a fluid used to dye thread a beautiful purple is found in great numbers on rocks at Sipolite. Since Purpura is the outstanding actual or potential local resource, a brief discussion of it and its use at Sipolite is appropriate. According to local informants, Mixtecs from Pinotepa (Nacional?) come at the end of the dry season to pick the snails from rocks during low tide, gently squeeze them to extract the fluid, and then replace the snail to recuperate and be "milked" again. The cotton threads dipped in the yellowish fluid turn a brilliant purple and are hung to dry on racks before being taken back to the village for weaving into cloth.[66] Mixtecs from Mechuacan between Jamiltepec and Pinotepa Nacional are known to use these purple threads for weaving bridal costumes and for making purple borders for skirts.[67] The same practice has been described fifty years ago among the Huave to the east.[68] In Nicaragua during the early seventeenth century the cloth was considered to be extremely valuable.[69] S. K. Lothrop has suggested that part of the prehispanic wealth of the Nicoya Peninsula

was based upon exploitation of the Purpura dyes.[70] Zelia Nuttall has pointed out that the Purpura dyes were almost surely used by the Mixtecs before the Conquest, both for clothes and as a pigment for paints.[71] If the local source of Purpura was being exploited while the archaeological site of Sipolite was occupied, it may explain the finding of fine objects in what must have been an otherwise undistinguished small village. However, there is absolutely no evidence that Purpura was being exploited before modern times at Sipolite. Indeed, we cannot infer from the modern usage and the fact of the presence of Purpura today that it was exploited at any previous time. We need only note that the occurrence of Purpura from Lower California to Chile along the Pacific coastline is rather common, more so than one might suspect from reading accounts of its usage.[72]

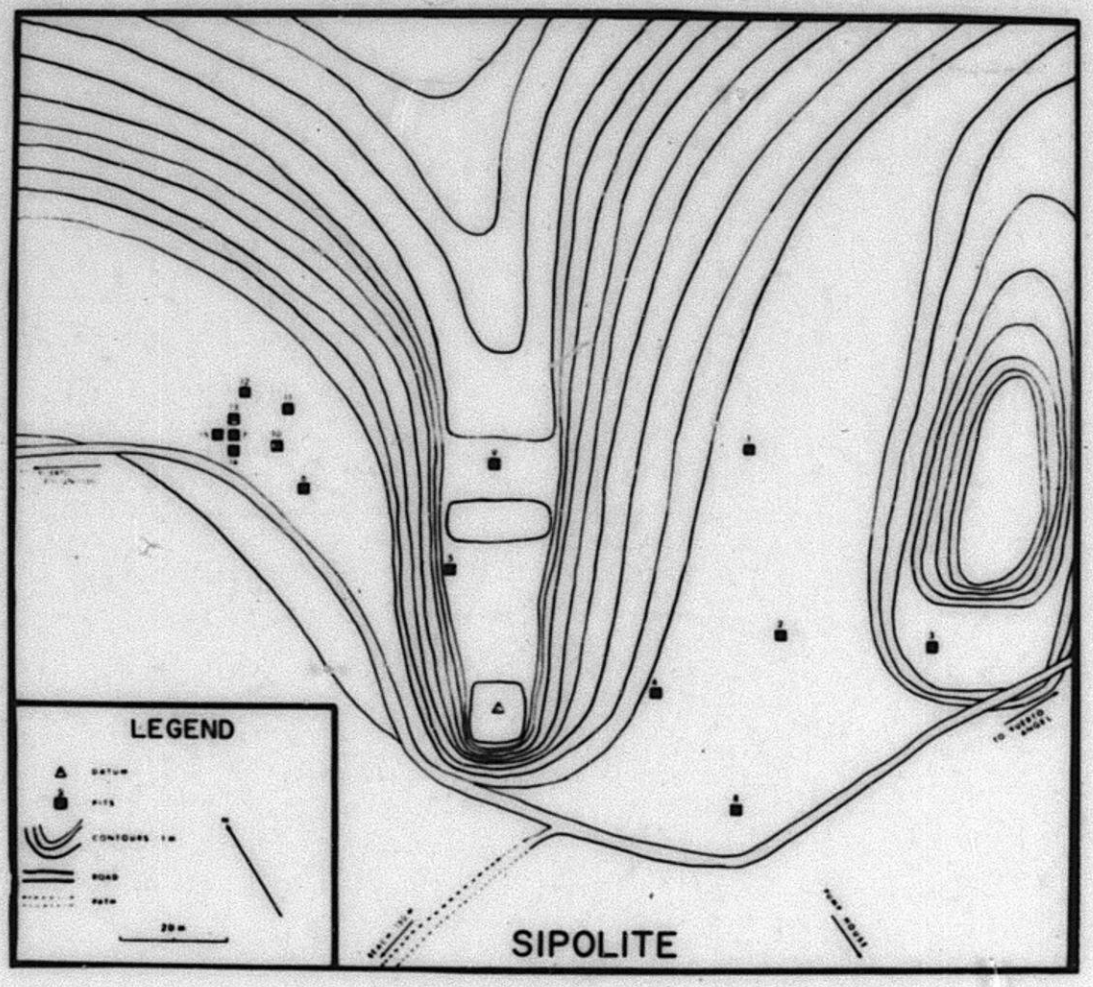
At Sipolite the archaeological remains apparently are concentrated at the eastern end of the beach but occasional remains are found scattered on the seaward slopes and narrow plains for the full length of the beach. Inspection of the sides of the hills revealed a few fragments of manos and metates and an occasional plain sherd, but nothing more. Frequent stone outcrops suggested that there is little depth of cultural remains. The two narrow valleys going back inland along streams appear more favorable for occupation. Examination of the stream beds and banks and the valley surfaces did yield an occasional plain coarse reddish-brown utilitarian ware sherd. No concentration of sherds, no house outlines, nor any mounds were seen and our informants could not tell us of any, other than those at the east end of the beach.

The area of concentration begins on the land belonging to Don Luciano Cruz Ensaldo and extends about four hundred meters down to the beach itself. Map 2 is a sketch of the main features to be seen. We may call attention to the two ridges running roughly parallel with one flat area between them and another to the west. The ridges, each about twelve meters high, end abruptly on a flat floodplain which slopes gradually down to the beach. The dirt road from Puerto Angel skirts the end of the ridges and then proceeds westward along the base of the hills. The road, lined by barbed wire fences, marks the southern boundary of Don Luciano's land.

On top of the east ridge is a pole and thatch house. The west ridge is occasionally planted in corn. Between the two ridges is a coconut palm grove planted in 1955 by Don Luciano. At the north end of the palm grove he has planted chile, tomatoes, papaya, and chirimoya, all of which must be watered by hand during the dry part of the year. During the period of maximum dryness, even the palms must be watered. At the south end of the palm grove is a stand of banana plants.

To the west of the west ridge is a fairly flat clearing used occasionally for corn. This portion of the site is much drier than the palm grove, the soil is harder, and cultural remains, as we shall see, much more plentiful. The western boundary of Don Luciano's land apparently coincides well with the ancient limit of the settlement for in the thorn thicket outside the fence outcrops of rock suggest that the cultural deposit is thin. An examination of the roadbed revealed very few sherds beyond the fenceline.

MAP 2



Immediately to the south of the flat clearing is a small vale in the crotch formed by the dirt road and a lane leading down to the beach. Examination of the lane and road revealed many sherds and two house outlines which suggest that the vale would be worth excavating, but the present occupant was reluctant to grant permission.

Directly across from Don Luciano's palm grove is the main well and pumping station for the Puerto Angel water system.

Excavation Procedures and Description

Since our purpose was to recover cultural remains representing a long temporal span in a stratified sequence, the first problem was to locate a satisfactory area within the known site. Surface finds did not suggest one portion to be preferred over any other but since cultural remains had been found over 2.5 meters deep during well digging in the coconut grove between the two ridges, we began there. Pits had to be located in the small open spaces as far as possible from trees so as to not injure their root systems; tree locations largely determined pit locations.

A wooden stake to be used as an arbitrary bench mark was driven into the earth near the center of the low platform at the south end of the west ridge. A base line was run 30 degrees east of north, an orientation that closely corresponded to the long axis of the ridge, and was extended southward at 210 degrees. Any point north of the arbitrary bench mark was indicated by a "plus" and any to the south by a "minus." A point to the east of the base line was indicated by "R" for "right" while "L" for "left" indicated that the point was west of the base line. A point on the site could be

located in relation to the arbitrary bench mark by sighting from that point at a right angle to the base line with a Brunton pocket transit, measuring the distance with a tape measure, and then finding the distance from the base line point back to the arbitrary bench mark. For example, the stake at the southeast corner of Pit #1 was forty-seven meters east of the base line and forty-eight meters north of the arbitrary bench mark. The stake's location therefore was +48R47. All distance measurement units are meters.

The location of the arbitrary bench mark had been chosen because from there one has maximum view of the site and also of the flat area south of Don Luciano's land towards the ocean where excavations had been contemplated. Since most of our work was immediately east or west of the base line and below the ridge, we seldom could see the base line. Auxiliary base lines were established east and west of the ridge and further location measurements were taken from them in order to avoid undue errors.

Distance and elevation readings were taken from the base line to the outstanding local features and sketch maps have been prepared from them. The Map 2 description of placement of excavations is fairly accurate while terrain and cultural features are approximations. The reader can get a reasonably good impression of the general conditions existing in the vicinity of the excavations but time and equipment did not permit the making of more accurate maps.

Two pit locations in the coconut palm grove were chosen and staked out with each pit being two meters on a side, as were all of our pits. The southeast stake, as with all pits, served as the

reference stake. After a leveled string was placed around the stakes outlining the squares, excavation began. All vertical excavation units here and elsewhere were .25 meter units.

Workers were secured in Puerto Angel and Sipolite. Five were hired initially and their numbers augmented to a maximum of sixteen. Some were efficient and careful while others were less satisfactory. All were inexperienced in archaeological work and required close supervision. Mr. Hurley and I had to move from pit to pit assisting, observing, directing, examining recovered objects, preparing labels, taking notes, and consulting with each other.

Local workers are accustomed to using a steel bar for digging. Picks are not available in Puerto Angel or Pochutla. Workers were grouped in twos or threes, one with a bar and another with a shovel. While one broke away the exceedingly hard soil, the other watched to recover materials. The preferred system was to excavate a trench perhaps eight or ten centimeters deep along one side of the pit and then to gradually advance across the pit breaking off the face of the trench wall or bank. Loose dirt and clods were shoveled out of the pit with the bar man watching while the shovel man worked. All workers used hard wooden sticks to break up dirt clods. Hurley and I joined to help search when not otherwise occupied. All earth was examined by at least two persons, usually by three.

Hurley and I occasionally troweled through backdirt to see that all cultural materials were being removed. Judging from our searches, it is estimated that over ninety-eight percent of all

objects over one centimeter in size were recovered although even very small objects were found.

Work methods together with the very hard soil caused many sherds to be broken. Some were deliberately broken by workers hoping to find gold inside. The collection has few complete hollow supports for this reason although the form is common. One vessel was removed by a worker who hoped to find legendary wealth. Another worker pulled sherds from a pit wall and mixed them with deeper materials. The pit was excluded from the stratigraphic study and the worker fired. By the time the important stratipits were being dug, we had learned which workers were capable and dependable and so were able to entrust the more delicate and responsible tasks to them, leaving the less sensitive jobs to the others. A mutual trust had been established and less deliberate breakage occurred.

At the end of each day the bags from uncompleted levels were tied closed and stored in a small hut in the palm grove. Bags from completed levels were labeled, tied closed, and carried back to Puerto Angel and stored in Hurley's quarters. Some sherds were washed and marked for provenience during evenings and on Sundays.

Except for some large manos and metates, all materials were taken to Puerto Angel and shipped to Oaxaca and later to the University of Wisconsin where they are now located. Two broken vessels from Offering #2, Pit #10 were left in the Museo Regional del Estado de Oaxaca upon request of Sr. Lorenzo Gamio. All such objects were measured and photographed.

Pit #1 (+48R47) located near the north end of the palm grove was abandoned after twelve levels had been removed to a depth of 3.0 meters. Water was entering too rapidly and there was danger of the pit walls collapsing.

From six to fifty sherds were found in each level, a yield that was low compared with later pits. No vertical concentration was noted. Sherds from all levels were water-worn and eroded. This together with the stratification of silt and sand indicated that many of the sherds had been washed in from other places of primary deposition. The pit was rejected from the stratigraphy analysis.

Pit #2 (+13R53) near the center of the palm grove was terminated at 2.75 meters when water was entering too rapidly, although sherds were being found at that depth. The pit was excluded from the stratigraphy study because a worker mixed sherds from Level 4 with others of Level 9. Further, we learned that Don Luciano probably had planted a coconut palm seedling in the pit location and so the upper meter of the pit may have been disturbed.

Below the possibly disturbed portion of the pit we found two halves of two bowls in Level 10. One fragment has an incised "comb" design on the base interior; the other fragment has a painted red rim and red spots within a scratched line on the exterior wall.

Pit #3 (+11R81) was located on the south end of the east ridge on a flat area which appeared to be an addition to the ridge. Sherds and small objects were found to a depth of 1.25 meters when bedrock was reached and the pit terminated.

PLATE I



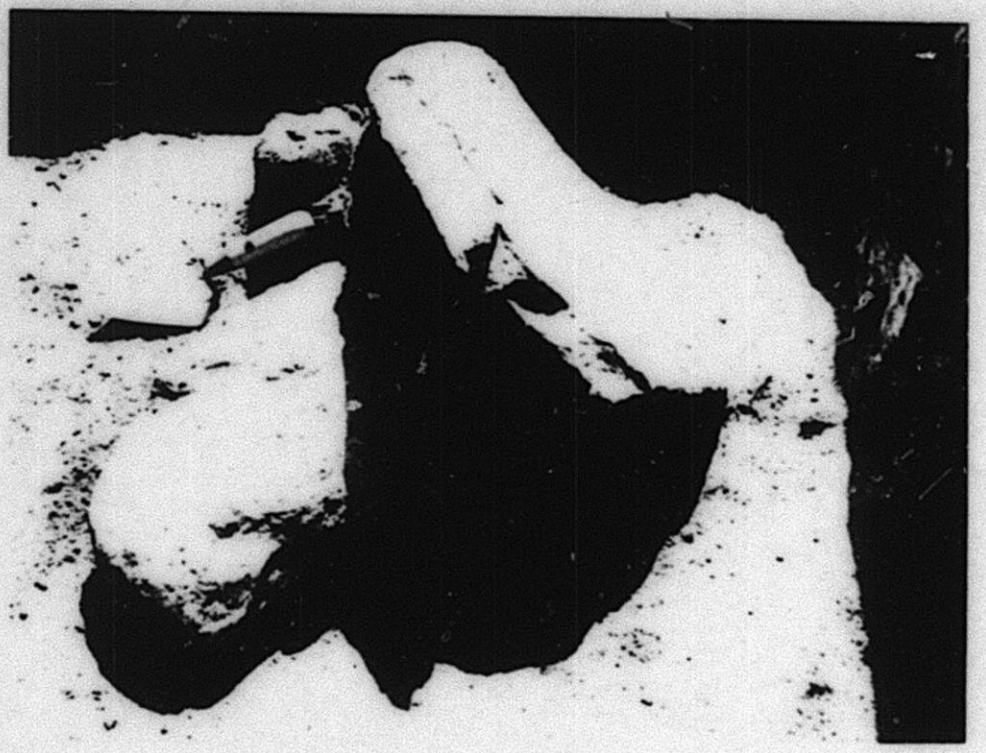
PIT 1, NORTH WALL

Burial #1 was found in the northeast wall of the pit which was extended to expose the entire burial. Above the burial was a rock slab and a metate. A third rock, also a metate, was found near the center of the pit but was removed by workers before a precise location could be noted. I have the impression that the burial was placed in a hole dug down to bedrock. The body must have had its head tilted with the face downwards and the legs drawn up into a foetal position. The arms may have been drawn up between the legs aand chest. Dirt and the two slabs of rock appear to have been thrown into the pit with the second falling slightly westward of the corpse. More earth was tossed in and a third slab or metate thrown on but again falling westward even beyond the second. See Plates II and III for photographs of the burial and positions of the stone slabs.

Burial #1 was in very poor condition but seems to have been a young adult male, although accompanied by two metates which are normally considered to be female tools. Gender is suggested by the mastoid process which was large and long, the presence of a slight but definite mental depression, and medium heavy brow ridges. If the remains are of a female, we would conclude that the women were extremely rugged, a possibility that is not without some support. An early adult age is suggested by the fact that the maxillary and mandibular third molars had not erupted. Also, the distal epipheseal union of a femur appeared complete indicating an age over nineteen years.

In spite of the apparent youth of the individual, all erupted teeth were heavily eroded with little occlusial surface left on the

PLATE II



BURIAL 1 WITH METATE AND ROCK SLAB COVER

PLATE III



BURIAL 1

premolars. The only noted pathology was a large maxillary abcess above the left incisors. The distal left maxillary incisor was heavily shoveled and other incisors probably were but they crumbled before accurate observation could be made.

The pelvis, feet, and hand bones were missing, but it is not possible to say whether mutilation or decay was responsible.

The placing of the burial surely disturbed the area of Pit #3 and this with the shallow deposit caused it to be rejected from the stratigraphy study.

Pit #4 (+2R30) was located in the palm grove at the eastern side of the west ridge. Bedrock was struck in Level 11 along the west or ridge side of the pit but sand and clay continued downwards in the eastern half. The pit terminated at 3.0 meters because of water entering but sherds were encountered for the full depth. The sub-surface stratification followed the angle of the ridge side and many of the finds probably had washed down from the ridge. For this reason the pit was excluded from the stratigraphy study.

Pit #5 (+2L8) was on the west ridge. Bedrock was found between .25 and .50 meters. The thin deposit suggests that the ridge may have been eroded or cleaned off, the latter suggested by the indications of terraces and the visible platform construction.

In Level 2 we found a large piece of baked brick. One side is smoothed and bears traces of red pigment while the other side is rough. Two opposite edges have rounded edges reminiscent of a vessel lip. The fragment is approximately .09 meters thick, .18 meters long, and .18 meters wide. Apparently it is made of local paste. The

PLATE IV



TWO VIEWS OF FIRED EARTHEN FRAGMENT

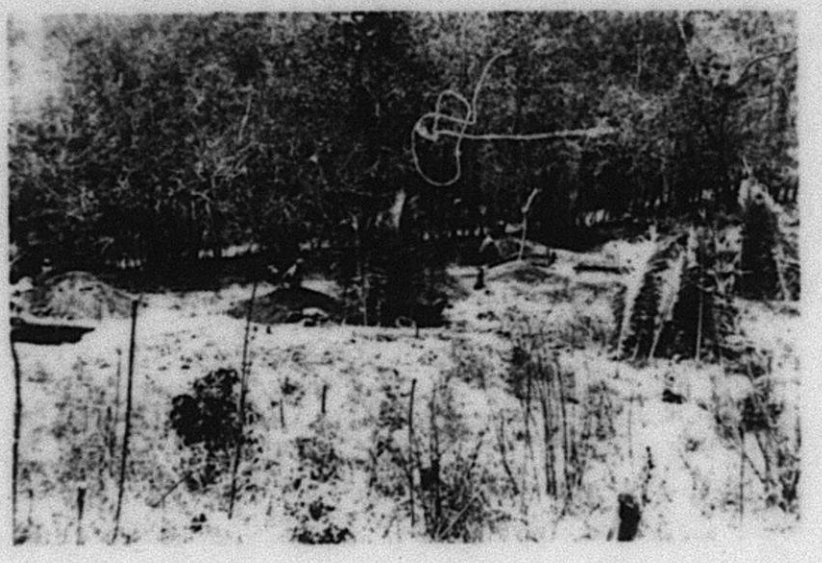
shallow depth of the find does not preclude its being modern although all of our workers rejected that possibility on the grounds that it was unlike any brick they knew. We suggest it may be an architectural fragment, a piece of fired clay or earthen construction. See Plate IV for a photograph of the object.

Pit #6 (+40L35) was located in the open area west of the west ridge in the vicinity where Pits 7, 10, 11, 12, 13, 14, and 15 were dug later. It was completed to a depth of 2.5 meters. The water table was not reached in the western part of the site and the soil was extremely dry and hard. Sherds were found throughout the pit but only in the very top of Level 10. The cessation of sherds coincided with the appearance of a coarse brown sand that in this area marked the termination of cultural materials. A small test pit dug along one side of the pit bottom found that the sand continued downwards for at least another .25 meters without cultural remains being present.

Pit #7 (+50L48) continued to a depth of 2.50 meters with no remains being found in Level 10. In Pit 7 we first detected definite changes indicating Classic materials in upper levels and undoubted early or Preclassic remains in lower levels. A Preclassic ceramic figurine head was found in Level 8 along with sherds extremely similar to those assigned to the earliest period of Monte Alban.

Pit 7 yielded the sought-for sequence and in considerable quantities, and for these reasons Pits 13, 14, and 15 were located around it.

PLATE V



WESTERN PART OF SITE DURING EXCAVATIONS

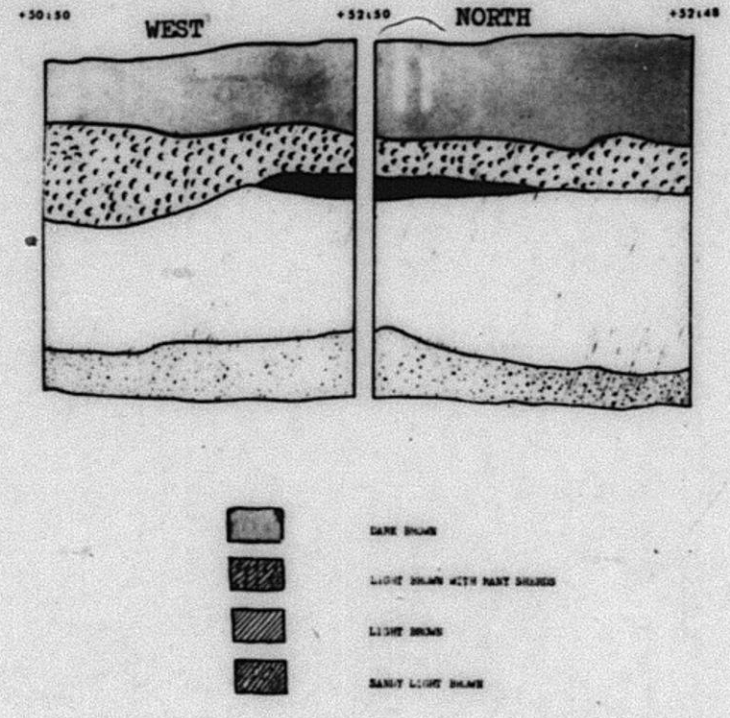
Profile drawings of the stratification revealed in the north and east walls of Pit 7 are given in Plate VI. Since the stratification of all stratipits is practically identical, no other drawings are presented; they would be repetitious. Field notes contain drawings of all pits.

Pit #8 (-20R45) was at the south end of the palm grove near the road. It continued to a depth of 2.25 meters although no artifact was found in Levels 7 or 9 and but one sherd in Level 8. In fact, very few sherds were found in this pit. The soil was very sandy with little loam. The familiar red sand that elsewhere marked the halt of cultural materials here had begun as high as Level 7. Water began entering the pit in Level 8.

Don Luciano had found several spindle whorls -- lost before we could examine them -- near where Pit 8 was dug. We hoped to recover Postclassic remains but were not successful and the poor yield suggests that this portion of the site was not intensively occupied.

Pit #9 (+45) was located on the reference line which here ran near the edge of the west ridge top. By digging near the edge it was hoped that architectural features might be avoided. The western edge of the pit included a wall of irregular stones which were removed by an inexperienced worker before a close examination could be made. Further, two complete or nearly complete vessels were behind the wall and revealed by its removal. Remaining impressions permitted observations of the former positions. One vessel -- see Plate VII -- is a rude, wide-mouthed convex bowl 10 cms. high and with 17.5 cms.

PLATE VI



PROFILES OF NORTH AND WEST WALLS OF PIT 7

diameter across the orifice with wall varying from 7 to 8 mm. thick. The temper is medium with pebble inclusions. The base is flat with a vague pedestal, similar to Basal Angle Form 77. It is unslipped and has a smoothed interior and exterior. A wide and shallow groove circles the exterior about 1.5 cms. below the rim.

The second vessel -- see Plate VIII -- is a very slightly concave cylindrical vase 21 cms. high, walls 2 to 3 mm. thick, polished, and with a white slip covering interior and exterior. The orifice is 10.8 cms. in diameter and the base 10.3 cms. across. The rim is painted red for approximately 3.5 cms. inside and slightly overlapping onto the exterior. The entire exterior is covered with an orange slip over the white. On the exterior orange slip is a design in black, probably made by a negative or resist technique. The design is uncertain and much eroded but apparently consists of rectangles and lines perhaps setting off or outlining orange rectangles. The paste is light reddish-brown with fine quartzite inclusions.

Fragments of a barrel-shaped vase with thin walls covered inside and out with a thick, soft white slip very similar to two vessels found in Offering #2, Pit 10, was found with the others in Pit 9.

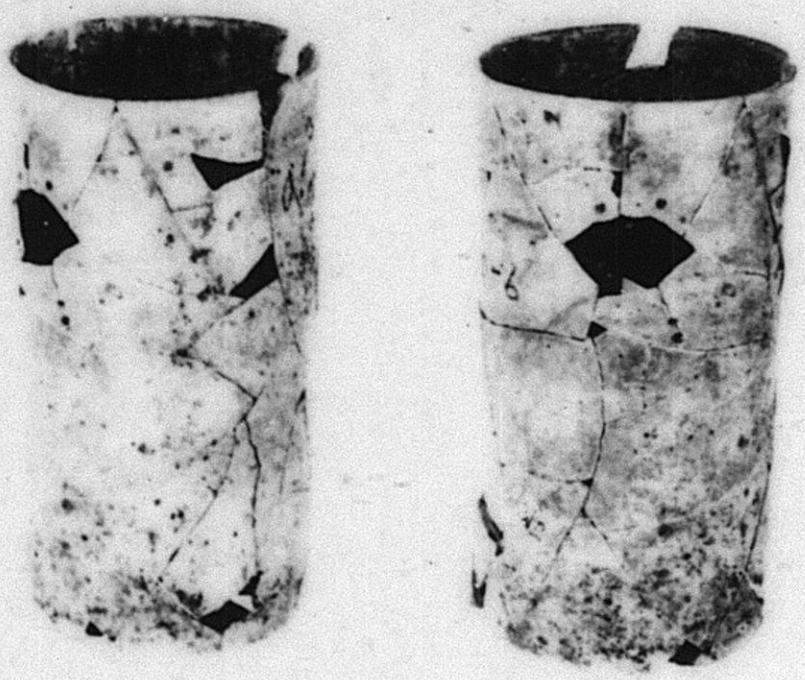
Preclassic-style sherds were found in Level 3, indicating that the ridge probably had been a habitation location during the early occupation of the site. The fact may be of additional importance since it may explain our finding early materials in upper levels of Pit 4 and elsewhere in the palm grove. The early materials could have washed down from the west ridge.

PLATE VII



REDDISH-BROWN BOWL FROM PIT 9

PLATE VIII



TWO VIEWS OF POLYCHROME VASE FROM PIT 9

Pit #10 (+48L40), slightly north of Pit 6, terminated with Level 9 with remains being found only in the upper part of that level. A wall consisting of a single course of stone was found crossing the northwestern corner of the pit. Another wall was found paralleling the first out approximately 1.12 meters to the southeast and about .20 meters deeper. The impression is one of the outside of a stepped platform. Stones of the upper wall have regular faces on their southeast faces as does the lower course. Both are oriented three degrees south of east or pointing ninety-three degrees off north and so the structure, if it was regular and square, must have been oriented with its sides facing three degrees off the cardinal points. The near correspondence to cardinal point orientation does not seem especially significant; many buildings in Mesoamerica, especially those not in the Valley of Mexico or Veracruz, are oriented towards the cardinal points.

The stone blocks vary in size and are irregular in form but tend to be rectangular on their faces. The blocks vary from .16 to .41 meters long and from .10 to .30 meters high. They seem to have been roughly formed but not polished. There is no evidence of a trench having been dug to receive them and it is assumed therefore that they were placed on the surface of the ground. See Plates IX and X for photographs of the walls.

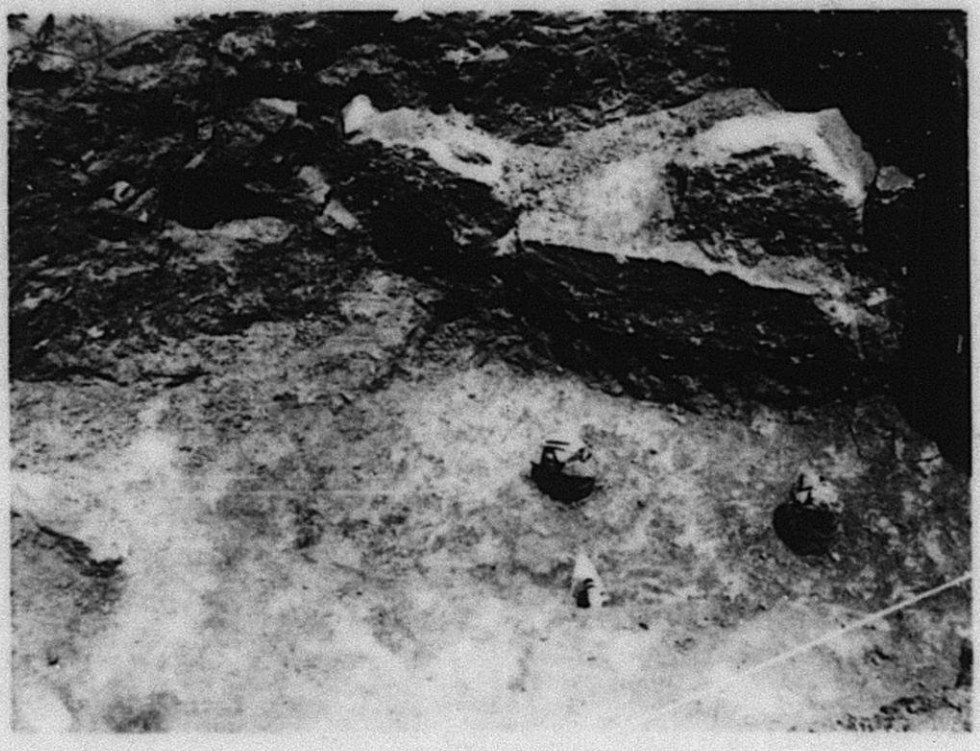
Two black-slipped cylindrical vases were found .30 meters southeast of the upper wall in Pit 10. The more westerly one is .21 cms. high with an orifice measuring 9.5 cms. across, walls 1.5 to 2.5 mm. thick, and measuring 11.5 cms. across at the maximum diameter of

PLATE IX



PIT 10, UPPER AND LOWER WALLS

PLATE X

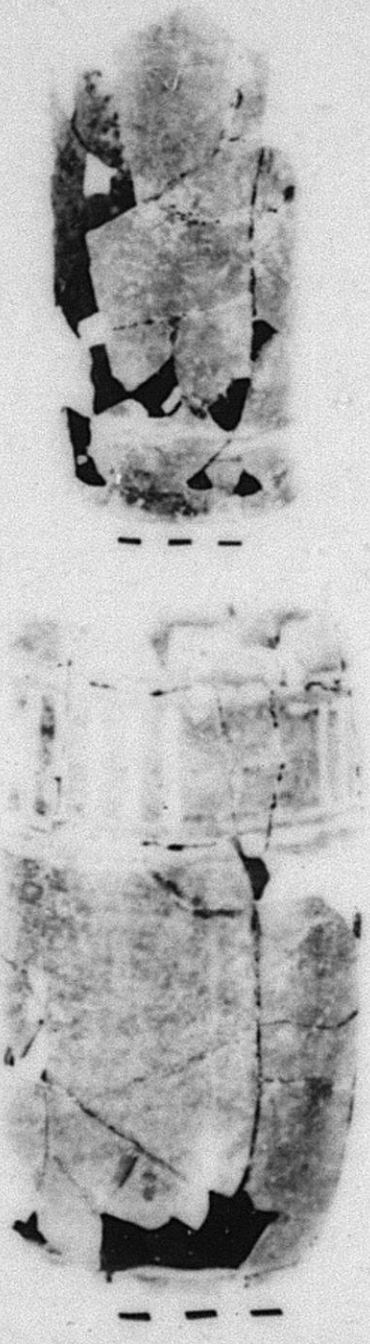


PIT 10, UPPER WALL WITH OFFERING 1

the barreled middle. It is slipped black on the interior and exterior and polished. Paste is dark grey with fine quartzite inclusions. The vessel has horizontal grooves 1.5 and 6 cms. below the rim with a slightly raised molding running through each groove. Between the two horizontal grooves are four groups of five vertical grooves. The second vessel also has two bands of molding, one at the base and the other some five centimeters higher but with the upper portion of the vessel being slipped but otherwise plain. It is 21 cms. high and 11 cms. across the orifice and base. The walls are very slightly concave and 3 mm. thick. Both vessels were shattered by earth pressure and further smashed by blows from shovels and steel bars. The vessel bases were at depths of 1.14 and 1.17 m. respectively and so appear to be related to the upper wall and have been termed "offerings." See Plates X and XI for views of the vessels.

Offering 2 of Pit 10 was found in the southeast corner of the pit. One cylindrical vase was placed inside another and both were covered by a down-facing basal ridge bowl. The interior vase is 20 cms. high, has an orifice 7.3 cms. across and slightly constricted, and a base measuring 10.1 cms. across. It has two horizontal bands of molding, one which appears to splay out at the vessel base and the other about one third up the vessel. The exterior vase is more barreled and measures 18.8 cms. high, 11.9 cms. across the orifice and 13.1 cms. across the base. Each vessel has walls about 3 mm. thick. The interior vase bears traces of light brown slip on the interior and orange on the exterior, while the other vessel seems to have been covered with a cream slip interior and exterior.

PLATE XI



TWO BLACK-SLIPPED VASES FROM OFFERING 1, PIT 10

The bowl corresponds to Concave Bowl Form 84 with slightly concave walls about 5 cms. high and 3 mm. thick. It is covered with a thick very dark grey, almost black, slip and polished. The paste is grey with no visible temper. The rim diameter measures 23 cms.

See Plate XII for a photograph of the vessels in place and Plate XIII for drawings of the two vases.

The top of Offering 2 was 1.17 meters below the surface and seems to be associated more with the second or lower wall than the higher one.

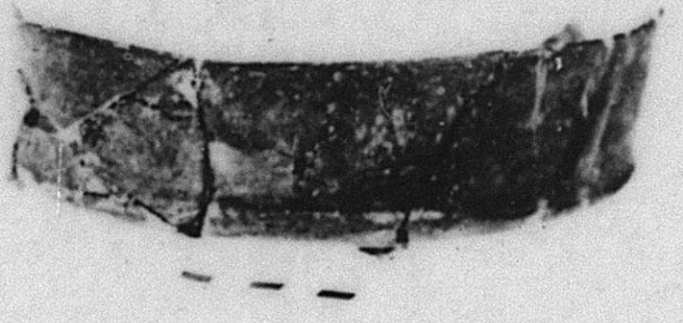
Pieces of a charred material, evidently copal or tree resin, were found in Level 8 of the pit and were submitted along with a carbon sample from Pit 14, Level 8, for age determination. The results were unsatisfactory.[73]

Pit #11 (+55L38) which terminated with Level 8 was somewhat shallow for this portion of the site and cultural remains were found only in the upper portion of the lowest level. Further, the last level had encountered the coarse brown sand that indicated the cessation of cultural materials in this part of the site. We may note that Pit 11 was the most northeasterly of the pits dug west of the west ridge and, being peripheral, may be expected to be somewhat different.

A line of stones, probably a wall or house outline, was encountered in Level 3 at a depth of .67 meters.[74] The wall faces southeast and is oriented three degrees south of east.

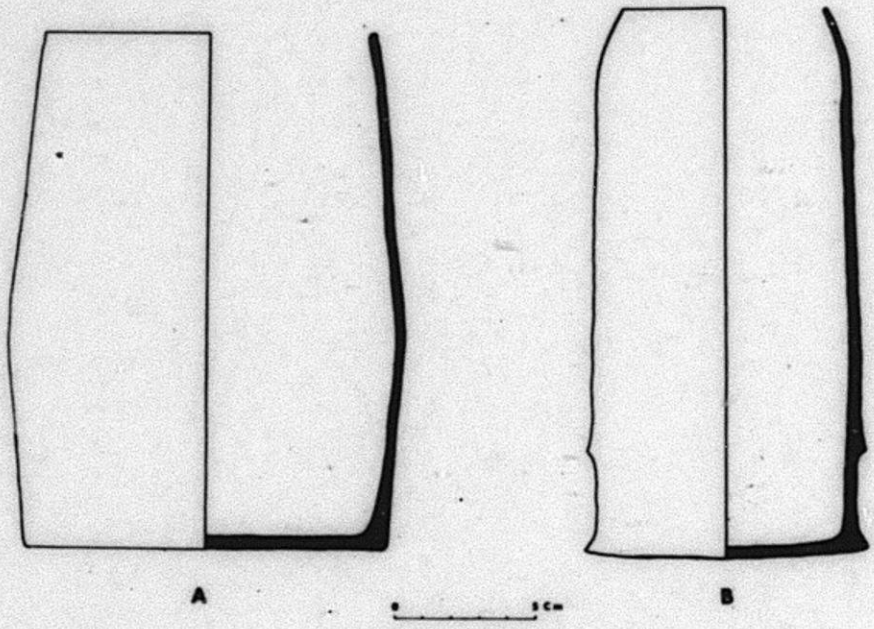
A nearly complete rude reddish-brown wide-mouthed tecomate was found in the west wall of the pit behind the stone wall. The

PLATE XII



BLACK-SLIPPED BOWL FROM OFFERING 2, PIT 10

PLATE XIII



TWO VASES FROM OFFERING 2, PIT 10

vessel base was .83 meters below the surface, indicating its rim was below the wall base and so presumably could represent an offering. The vessel is 13.5 cms. high, approximately 18 cms. across the widest part of the body, and has an orifice that constricts to 13.5 cms. The base is flat and the walls are 6 mm. thick. The paste is reddish-brown with coarse quartzite inclusions and occasional pebbles. It is smoothed in and out but neither slipped nor decorated. It is similar to one found in Pit 9. See Plate XIV for photographs of the vessel and wall.

A sherd from a mold-made vessel was found in Level 4 and is identical with a larger one found in Pit 15. Both could have been produced from the same mold or be from the same vessel. The Pit 11 sherd was cleaned by a worker without my having been notified and the detail has been altered slightly by his carelessness.

Pit #12 (+58L46), dug to a depth of 2.25 meters, was the most productive with perhaps five thousand sherds being found in Level 4 and nearly three thousand in Levels 3 and 5 each, an extraordinary concentration. A similar pattern of sherd concentration in Levels 3, 4 and 5 was noted for all pits in this area, especially Pits 7 and 12 through 15, the most westerly pits.

A line of stones in the form of a rectangle was found at depths ranging from .43 to .80 meters with depths more or less corresponding with modern surface contours. The orientations were three degrees in excess of the cardinal points. If it is a house, it would have been very shallow, approximately 1.25 meters deep. The length

PLATE XIV





PIT 11 -- UPPER, OFFERING 1;
LOWER, STONE WALL WITH OFFERING IN PLACE

is not known since the northeast end is not within the pit. See Plate XV for an illustration of the alignments.

Pit #13 (+53L48) was first of three pits dug bordering Pit 7. Like the others, it was one meter from Pit 7, in this case a meter to the north. It was continued to a depth of 2.25 meters.

A heavy sherd concentration was noted in Levels 3 and 4 and scattered portions of several vessels were found.

Pit #14 (+47L48) was a meter south of Pit 7 and continued downwards for nine levels to a depth of 2.25 meters. A line of stones at a depth of .77 meters, again oriented three degrees south of east, was seen in Level 4.

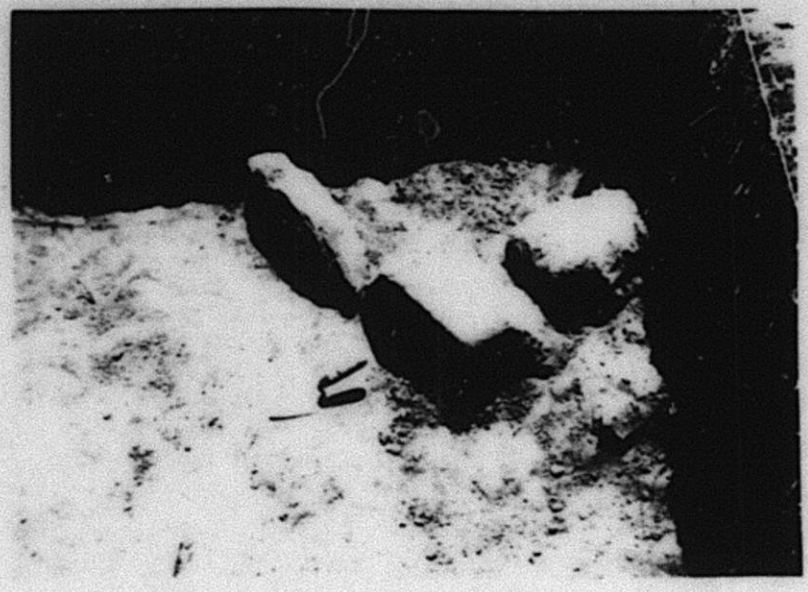
A soil sample was taken from the center of each level and placed in a cloth bag, a procedure admittedly not completely correct since dust from one bag could filter into another. However, a portion of each sample was left in separate glass vials at the University of Wisconsin for study.

Charcoal, evidently from wood, found in Level 8 has been submitted for age determination as mentioned above.

Pit #15 (+50L51), the last pit started on the site, was terminated with Level 9 at a depth of 2.25 meters. A test hole was dug .10 meters deeper to verify the cessation of cultural materials.

The most notable find from Pit 15 was of a mold-made sherd from Level 3. The sherd, evidently from a convex bowl, has a reprs-sentation of a human head wearing a headpiece with speech scroll before the lips emerging from the jaws of a serpent or Cipactli monster. The monster has a flowing headdress, perhaps with feathers,

PLATE XV



PIT 12 -- STONE WALLS

and circular earplug. There appear to be other figures represented but unfortunately sufficient is not present for distinguishing other elements. The paste is light brown with very fine quartzite inclusions and is unslipped and unpainted at present. It is illustrated and discussed in Chapter IV.

A cache of approximately seventy-five round, unmarred, unworked river pebbles was found in Level 4. No pit outline was noted and nothing could be associated with the find.[75]

These fifteen pits constituted the extent of excavations performed at Sipolite. The area was surveyed for characteristics, a sketch map made, but the fifteen pits yielded the great bulk of data for the site.

Sample Characteristics

Approximately sixty-five thousand sherds weighing nearly three thousand pounds were found in the fifteen pits, a respectable sample at least in numbers. Because of the inexperienced workers, tools used, and the hard soil, many of the sherds were broken. During the preliminary study and initial sorting in the laboratory fragments of a larger sherd were glued together if break marks were recent. Further, if sherds obviously were from the same vessel, they were treated as a single sherd, a somewhat doubtful procedure. The sherds most often detected as being from a single vessel are decorated sherds, especially those which are unique in some respect. If such are treated as separate sherds or examples, the count of our unique cases increases and an important point obscured. If we treat several sherds obviously from a single vessel as a single sherd, the unique

sherds remain unique. Plain sherds are more likely to be ignored or missed unless a break mark is recent and so more pieces of single vessels are considered discrete fragments. The alternative to committing one error while trying to rectify another appears to be to commit two errors.

Assuming for the moment that the finds reflect changing forms, styles, and techniques, it remains to be demonstrated that the sequence represents the actual course of past events and not a disturbed stratification. All pits that obviously were disturbed or where deposition was known or strongly suspected of being secondary were rejected from the stratigraphy study. Pits 6, 7, 10, 11, 12, 13, 14, and 15 met the requirements and will be referred to subsequently as stratipits to distinguish them from unacceptable pits. Pits 10, 11, 12, and 14 had sub-surface constructions but the constructions were in Level 5 and above, mostly in Levels 3 and 4. I have included these four pits since preliminary analysis revealed the sequences within each to be the same as that in the apparently undisturbed stratipits. All stratipits are approximately of the same depth, eight or nine levels of .25 meters each. Level 9 produced few finds and has been grouped with Level 8 in the stratigraphy study.

The ceramic collection consists mostly of sherds; there are few complete vessels and not many sherds that represent complete profiles from lip to base. This study must be a sherd study and is more limited than a study based on complete vessels.

Most of the sherds are eroded and disintegrating and have been softened so that they will scratch with talc or the fingernail. Many

have lost original surface finish and decoration. Rainfall, temperatures, and soil acids in the tropics combine to alter sherds and make study more difficult for the archaeologist.[76] Although a particular slip may be badly disintegrated, a trace usually remains and I have therefore judged each sherd as it now appears.

Most sherds are from monochrome utilitarian household vessels. The plain body sherds have not been included in the stratigraphy study but all rim and base sherds, all decorated (with more than slip) sherds, and all appendages, such as handles, supports, and adornments, have been included in the study.[77] Further discussion of each form class is presented below.

ENDNOTES

[1]Jorge L. Tamayo, Geografía General de México, Tomo I (México, 1949), 423.

[2]Ibid., II, 486-487.

[3]Handbook of Middle American Indians, Robert C. West, editor, Vol. I (Austin: University of Texas Press, 1964). The three articles that are especially useful for our purposes are: Manuel Maldonado-Koerell, "Geohistory and paleogeography of Middle America," 3-32; Robert C. West, "Surface configuration and associated geology of Middle America," 33-83; and, L. C. Stuart, "Fauna of Middle America," 316-362.

[4]Stuart, op. cit., 353-354.

[5]Tamayo, op. cit., I, 252-253.

[6]Ibid., 286.

[7]Ibid., II, 56-57.

[8]M. T. de la Peña, Problemas Sociales y Económicas de las Mixtecas, Memorias del Instituto Nacional Indigenista, Vol. II, Núm. 1 (México, 1950), 17.

[9]C. Conzatti, Las Regiones Botánico-geográficas del Estado de Oaxaca, IV Congreso Botánico Internacional (Oaxaca, 1926), p. 14. This and all subsequent translations from Spanish into English are mine.

[10]Jorge L. Tamayo, Geografía Moderna de México, Segunda Edición (México, 1955), p. 196.

[11]Stuart, op. cit., 354.

[12]West, op. cit., 65.

[13]Most coastal towns referred to here and in the following text are located on Map 1.

[14]Hernando Cortes, Five Letters: 1519-1526 (Third Letter), J. B. Morris, Translator (New York, 1929), pp. 235-237.

[15]Francisco del Paso y Troncoso, Suma de Visitas, Papeles de Nueva España, Segunda serie, Tomo I (Madrid, 1905), pp. 186, 288 and 315.

[16]Robert Barlow, "Extent of the empire of the Culhua Mexica," Ibero-Americana, Vol. XXVIII (Berkeley: University of California Press, 1949), 106.

[17]Francisco del Paso y Troncoso, Relaciones Geográficas de la Diocesis de Oaxaca, Papeles de Nueva España, Segunda serie, Tomo IV (Madrid, 1905), 149. All further references to the Relaciones Geograficas will be cited in the following form: Relación de Mitla, 149, and so forth.

[18]Relación de Pochutla, 238.

[19]Relación del Puerto de Guatulco, 244.

[20]Alfonso Caso, "Las relaciones de Ixtlahuaca, Tehuantepec, Coatzacoalco, Cozuatepec, Peñoles e Iztepec," Revista Mexicana de Estudios Históricos, Tomo II, Núm. 5 (1928), 158.

[21]Relación de Mitlatongo, 77.

[22]Fray Juan de Torquemada, Monarquia Indiana, Tercera edición, Tomo I (México: Salvador Hayhoe, 1943), 207-208.

[23]Barbara Dahlgren de Jordan, La Mixteca (México: Imprenta Universitaria, 1954), pp. 168-169.

[24]Ibid., pp. 177, 187, 189 and 225 for specific statements.

[25]There are indications of considerable unstudied documentary data concerning the coast of Oaxaca, especially the kingdom of Tututepec. Heinrich Berlin in his Fragmentos Desconocidos del Codice de Yanhuitlán (México: Antigua Libreria Robredo de Jose Purrua e Hijos, 1947) mentions available but unstudied documents. Herbert Harvey recently has informed me of considerable numbers of colonial period documents dealing with the region in the national archives of Mexico.

[26]Relación de Pochutla, 238-240.

[27]Franz Boas, "El dialecto Mexicano de Pochutla, Oaxaca," International Journal of American Linguistics, Vol. I, No. 1 (July, 1917), 9-44.

[28]Maria Teresa Fernández de Miranda, Mauricio Swadesh y Roberto J. Weitlaner, "El panorama etno-linguístico de Oaxaca y el Istmo," Revista Mexicana de Estudios Antropológicos, Tomo XVI (México, 1960), 142.

[29]Ibid., 143.

[30]Don Fernando de Alva Ixtlilxochitl, Obras Históricas, Tomo I (México: Alfredo Chavero, 1952), 38-39.

[31]Ibid., 39 and 89.

[32]Fernández de Miranda, Swadesh y Weitlaner, op. cit., 143.

[33]Ibid., 145.

[34]Relación de Pochutla, 239.

[35]Paso y Troncoso, Suma de Visitas..., 186.

[36]Relación del Puerto de Guatulco, 249-250.

[37]The author of the Relaciones from the Pochutla region several times mentions that the plagues that reduced local populations were especially severe because there were no native medical practitioners to aid the stricken. Since religious and medical activities often were invested in the same person in Mesoamerican society and since the Spaniards discouraged or actively suppressed the native religion, they may have unwittingly removed the specialists who could have mitigated the effects of the plagues.

[38]Martín Enríquez, "Letter to the Viceroy of Peru," in New Light on Drake, Zelia Nuttall, editor, Second series, Vol. XXXIV (Cambridge: The Hakluyt Society, 1914), 245.

[39]Woodrow Borah, "Early colonial trade navigation between Mexico and Peru," Ibero-Americana, Vol. XXXVIII (Berkeley: University of California Press, 1954), 117.

[40]Peter Gerhard, Pirates on the West Coast of New Spain, 1575-1742 (Glendale: Arthur H. Clark Co., 1959), p. 35.

[41]Ibid., pp. 95 and 242.

[42]Ibid., p. 36.

[43]Relación de Pochutla, 242.

[44]Relación de Tonameca, 247.

[45]Relaciones Topográficas de Pueblos de México, Vol. I, MS 2449 (cf. Paz, Catálogo, #465), Biblioteca Nacional, Madrid (1789), pp. 1-2

[46]Manuel Martínez Gracida, Colección de 'Cuadros Sinópticos' de los Pueblos, Haciendas y Ranchos del Estado Libre y Soberano de Oaxaca (Oaxaca, 1883), p. 476 and passim. This work has no pagination other than that added by Jorge Fernando Iturribarría, the present State Librarian.

[47]Jorge Fernando Iturribarría, Oaxaca en la Historia (México, 1955), p. 243.

[48]Aldous Huxley, Beyond the Mexique Bay (London: Chatto and Windus, 1949), pp. 227-228.

[49]The limited success of the anti-malaria campaign may be a major reason for population increases along the Oaxacan coast. I have the impression that many areas formerly abandoned were also malaria infested and that with the partial eradication of malaria, these areas are being reoccupied.

[50]Bernard Bevan, "Travels with a donkey in Mexico," The National Geographic Magazine, LXVI, No. 6 (1934), 757-788.

[51]Berlin, Fragmentos Deconocidos..., pp. 13-14.

[52]Román Piña Chán, "Hallazgos arquelógicos en tierras de Oaxaca," Tlatoani, Num. 8-9 (México, 1954), pp. 31-33.

[53]Time Magazine, Latin American edition (March 8, 1954), p. 43.

[54]El Atlas Arqueológico de la República Mexicana, Instituto Panamericano de Geografia e Historia Publicacion Núm. 41 (México, 1939).

[55]DeCicco y Brockington, op. cit.; Brockington, "A brief report...," pp. 98-104.

[56]Donald Leslie Brockington, "Piedra Parada: a comparative study of a site in Jamiltepec, Oaxaca," (unpublished M. A. thesis, Department of Anthropology, Mexico City College, 1957).

[57]Román Piña Chán, "Algunos sitios arqueológicos de Oaxaca y Guerrero," Revista Mexicana de Estudios Anthropologicos, Tomo XVI (México, 1960), pp. 65-76.

[58]DeCicco y Brockington, op. cit., pp. 89-102.

[59]Ibid., pp. 71-78 and 103-110.

[60]Note the Eighteenth century reference given above to cotton being grown in the Pochutla district.

[61]Agüete apparently is a corruption of the Spanish aguita (a little mist or spray), perhaps in reference to the spray of the nearby sea.

[62]Relación del Puerto de Guatulco, 238.

[63]Origin of the name Sipolite is uncertain but it may be a corruption of the Nahuatl sipolitlan or zipotli which could translate as "bumpy place" or "place of continuous bumps (hills?)," an accurate description of local topography. Arthur J. O. Anderson

informs me that such a reconstruction is not unreasonable. See Francisco J. Santamaría, Diccionario de Mejicanismos (Mexico: Editoral Porrua, S. A., 1959), p. 975.

[64]Verbal communication from an informant to the author in San Agustin Loxicha, March, 1956. It appears to be coincidence that Sipolite beach is the scene of several events of religious nature. The cross, the Purpura gathering, and possible importance of the "window rock" have no apparent common interrelationship, other than location.

[65]West Coasts of Mexico and Central America, U. S. Navy Hydrographic Office Bulletin 26 (Washington, D. C.: U. S. Government Printing Office, 1951), p. 164. The Bulletin presents a detailed description of the coast of Oaxaca and major offshore features.

[66]For a detailed description of the dyeing process as performed today, see Peter Gerhard, "Emperors' dye of the Mixtecs," Natural History, Vol. LXIII, No. 1 (January, 1964), 26-31.

[67]Personal communication from Gabriel DeCicco to the author, Mexico City, September, 1955.

[68]Zelia Nuttall, "A curious survival in Mexico of the use of the Purpura shell-fish for dyeing," Putnam Anniversary Volume, Anthropological Essays (New York, 1909), pp. 368-371.

[69]Thomas Gage, A New Survey of the West Indies, Third edition (London, 1677), p. 437 and passim.

[70]Samuel K. Lothrop, Pottery of Costa Rica and Nicaragua, Vol. I (New York: Museum of the American Indian, Heye Foundation, 1926), 91.

[71]Nuttall, op. cit., pp. 380-381.

[72]A. Myra Keen, Sea Shells of Tropical West America (Palo Alto: Stanford University Press, 1958), pp. 376-377.

[73]This sample and that from Pit 14 were submitted to the University of Wisconsin Radiocarbon Laboratory. Both were from Level 8 of their pits and should be of similar age. The archaeological contents of each pit were practically identical for Level 8. Both dates should have been around 600 B.C., ±200 years. The carbonized wood from Pit 14 (WIS-40) yielded a date of 370 ± 60 B.P., or 1580 A.D. while that from Pit 12 (WIS-41) gave 3750 ± 100 or 1800 B.C. The radiocarbon readings are not acceptable. See Margaret M. Bender, Reid A. Bryson and David A. Baerreis, "University of Wisconsin Radiocarbon Dates I," Radiocarbon, Vol. 7 (1965), 403.

[74]I suggest these stones served as "splash defences." The common occurrences of single lines of stones are usually referred to

as merely "house outlines," a practice that seems excessively vague. I know of no use of stone outlines for pole and thatch houses but such stones would protect adobe or wattle and daub houses from being eroded by rain water splashing after falling from even that did not project far beyond the walls.

[75]Mr. Masakazu Yoshizaki tells me that the Japanese in Hokkaido formerly gathered stones of approximately the same size as these, mixed bits of putrid meat among them, and enclosed all in a net which was lowered into water where shrimp lived. The shrimp entered the net searching for the meat between the stones and could not escape quickly as the net was raised. I do not intend to suggest that the stones from Pit 15 are remains of a shrimp trap, even though shrimp were taken at Sipolite until recently, but only that unmarred stones may have been quite useful in sometimes unexpected ways.

[76]For a discussion of the same problem for another part of Mesoamerica, see Philip Drucker, Ceramic Sequences at Tres Zapotes, Veracruz, Mexico, Bureau of American Ethnology Bulletin 140 (Washington, D. C.: U. S. Government Printing Office, 1943), p. 34.

[77]Rim sherds, basal angle sherds, handles, supports and decorated sherds include slightly over 5,000 fragments or about ten percent of the estimated total collection. I have the impression that a similar selection from other Mesoamerican Preclassic sites would include about the same percentage of a total collection.

CHAPTER III

METHODOLOGY

Descriptive and Analytical Procedures

Field observation and preliminary study indicated that several pits were not acceptable. Some were very shallow and others were dug in areas where debris had been redeposited by natural agency. Eight pits seemed acceptable and these are termed "stratipits."

In Wisconsin each bag was opened and its contents carefully examined. If the bag was from a proposed stratipit, all rim, basal angle, and decorated sherds were separated out as were all figurines, handles, and supports. Objects broken in transit or excavation were repaired when possible. Location marks were checked for clarity and accuracy.

Preliminary study in Oaxaca had given knowledge of gross characteristics and their changes through various levels. Since future analysis was to be oriented in terms of preliminary conclusions, a quick test of stratigraphic validity, suspected external relationships, and possible temporal assignments was desirable. Handles, supports, and figurines were used for immediate study since they were few in numbers and often are highly diagnostic for temporal placement and cultural association indication.

Since no group was very numerous, a typological approach seemed preferable to any statistical manipulation. Slightly different

procedures were used for each artifact group. Vessel supports were divided into form groups on a large table with vertical chalk lines separating each prospective group. After a classification based on morphological characteristics had been completed, horizontal lines representing the nine stratigraphic levels were drawn across the table and each support placed in its appropriate level of the form type. A stratigraphic sequence of support forms did exist with migration or mixture between levels not being common.

Handles were studied somewhat differently. Early study had indicated a small number of variations and combinations. Effigy lug handles were long or short, plain or decorated, and solid or pierced. When decorated, it was by punching or gouging. With the noted variations in mind, another table was chalked off with vertical and horizontal lines dividing the surface into cells for all possible form and attribute combinations and levels. After the matrix was prepared handles were placed in their appropriate cell. With only slight refinement the classification appeared satisfactory. The sequence indicated a constant, orderly change through successive levels which further substantiated opinion that the stratigraphy was intact.

Figurine fragments were classified by a third system wherein horizontal lines were drawn on a table top to represent levels. Figurines from stratipits were placed in their appropriate places and sorted into morphological types proceeding from the basis of location. This method is ill-advised because of possibly prejudicing the

classifier. It has the advantage of being rapid, especially when the collection is small and heterogeneous.

The three procedures varied slightly. Supports were classified purely on the basis of sorting into form categories and refined by considering some vertical differences. Handles were classified by listing observed characteristics and then considering all possible combinations. Figurines were placed in relative vertical positions and then classified into form groups. In each case definite vertical progression of changing forms and attributes was noted. Migration, upwards and downwards, appeared slight. Handle form changes indicated continuous elaboration without interruption, suggesting constant site occupation by one group and a single tradition, at least for that one ceramic feature. Figurines and supports indicated diverse external associations with the suspected regions and roughly the expected chronological span and sequence. Local persistence was indicated by each artifact group.

Charts were prepared for each artifact group and the objects were stored. Eight months later they were laid out, reclassified without consulting charts or notes, and results compared. The same classification resulted with only slight revision. First conclusions were reiterated.

Rim, basal angle, and decorated sherds had been separated from plain body sherds with the latter being returned to bags and stored. The sherds used in the study number 5,131 or approximately ten percent of those from stratipits. In all, some 65,000 sherds were recovered from all pits and surface collections.

Use of basal angle and rim sherds introduced no apparent bias into the statistical study, with two exceptions. We will note later that few bases from the numerous tecomate and olla[1] forms were recovered. Ollas and tecomates apparently had round or globular bodies and round bases. There is no true basal angle and it has not been possible to distinguish between basal and body sherds since few are large enough to be identified.

A second bias was in the use of decorated sherds not attached to rims or basal angles. Certain form, paste, or slip groups are more often decorated than others and so a definite bias was introduced. However, fewer than fifty sherds are involved, less than one percent of those used in the study. The bias is not severe and the gain from having additional examples of decorated sherds probably more than compensates for it.

Sherds were sorted into gross categories of major form variations. They include basal angle, tecomate, olla, everted rims, concave walled bowls, and convex walled bowls. Other groupings were attempted but abandoned during the study. Had all sherds been included in a single form category, the resulting complexity would have been cumbersome. However, the distinctions between major form variations are sometimes difficult to perceive. Tecomates and ollas differ in that the former has no neck and the latter does. Presence or absence of a neck involves function since a vessel with a neck is more efficient for pouring liquids. For present purposes of description and analysis it is irrelevant whether or not liquids actually were poured from the vessels; only the fact of form need be considered.

Application of the distinctive criterion would seem simple but is not. Tecomates blend morphologically with ollas. Some tecomates have thickened or reinforced rims, others have rims that turn upwards slightly, and others have a neck or low ridge a centimeter or two high. The majority can easily be distinguished from olla sherds but there are dubious examples. In this particular case the rule applied was that the vessel was judged a tecomate if the neck was shorter than the thickness of the vessel wall just below the neck root. The distinction between tecomate and convex walled bowl is likewise not always clear. A wide mouthed tecomate is practically identical with a sharply incurved convex bowl. Such judgments were made more difficult since sherds were used, not complete or nearly complete vessel. In a general sense the gross form categories are valid groupings but they are primarily intended to be devices for simplifying description and codification.

Most sherds were not large enough to permit reliable judgment of body form, especially for ollas and tecomates, so rim and lip variations make up most of the finer divisions within gross form categories. Using the tecomate form group as an example of procedure, twenty-eight variations were noted with each being considered an "attribute." Each attribute is defined in precise terms, either written and/or by illustration with a catalog of attributes being presented in Chapter IV.

Each attribution has variation within it since two sherds or vessels are seldom exactly alike. In one sense each attribute is a small form type but definitions are often exceedingly fine. Each

attribute usually includes less than a dozen members. A finer grouping would create excessive complexities.

There are fourteen attribute classes: pit, level, paste color, thickness, temper, hardness, core characteristics, orifice diameter, surface treatment, base form, slip, rim form (with five categories), decoration, and appendage associations. The attributes found within each class are listed in the Code Catalog in Chapter IV. Attributes were defined during preliminary study and some were added while sherds were being examined. Each attribute was given a code number within its class. Since the coded descriptions were to be punched into standard International Business Machine (IBM) cards, columns of the cards had to be divided into groups or "fields" containing sufficient digits to accommodate the anticipated number of attributes for each class. When proposed groupings were completed, examination of sherds began. Each was examined, location and physical characteristics were expressed in terms of the established code system, and the appropriate codings were entered on work sheets. Each line on a work sheet represented a single sherd and would yield a single IBM card. All cells in each line had to be filled. If, for instance, a sherd was not decorated, the three cells of the field were filled with zeros.

Work sheets were given to a hired operator who produced with an IBM 24 or 26 Card Punch one card for each sherd. All cards were verified on an IBM 56 Card Verifier. In addition, the author made spot checks, more to allay his suspicions than in the hope of detecting all errors. When the sherd description was at last complete and

all cards had been punched and verified, the entire set of cards, called the "data deck," was reproduced with an IBM 519 Document-Originating Machine. One data deck was stored to prevent loss of laboriously gained descriptive material. Later the data deck was recorded on magnetic tape by a Computer Data Corporation (CDC) 1604 satellite.

At this stage the sherds had been ordered into what Albert Spaulding has called Classification of Type 1 by which "...The collection can be characterized by tallying each appearance of every attribute considered..."[2] In explanation he points out that "Classification of Type 1 results in a number of classes having no relationship to one another except that imposed by the nature of the attribute systems..."[3] It constitutes a kind of description which by itself is not useful to the archaeologist. To advance to higher levels of ordering, what Spaulding refers to as attribute combinations and attribute clustering, mechanical sorters, computers, and statistical techniques have been used.

A frequency distribution program was designed by Robert Schacht for use with the CDC 1604. All attribute frequencies were tabulated on the machine yield or "output," first by levels within individual stratipits and then by levels with all stratipits consolidated. Patterns of occurrence were easily discernible by visual inspection of the frequency distribution output. The program has been preserved by the author and can be used to duplicate the output if such should prove desirable. The gained distribution is but a detailed version of a common feature of archaeological studies. It is especially

useful for suggesting possible fruitful directions of thought and investigation.

Before describing the specific statistical techniques used, the nature of the collection should be reviewed. Eight of the fifteen pits were accepted as being probably satisfactory. All eight stratipits have at least eight levels of equal size and several stratipits have a ninth level. From 5,000 to 20 sherds were found in each level of each stratipit. Since approximately ninety percent were excluded because of being plain body sherds, from 500 to 2 sherds represented each level of each stratipit. Level 9 was poorly represented so all sherds from it were consolidated with Level 8 remains to make constant the number of levels and to avoid having very poorly represented levels. It should be noted that when sherds were found in Level 9, they occurred only in the upper portions.

All statistical techniques used in this study assume that the sample was randomly selected. "...In essence, a fully random sample of sufficient size would be representative. By random would be meant not only the potential that each individual would be equally likely to be represented, but that each combination of individuals could be chosen..."[4] While sociologists, psychologists, and others have evolved elaborate standards and methods for selecting random and representative samples, the problem is somewhat different for archaeologists, a fact that evidently is not always appreciated.

Sampling problems have been discussed recently by J. A. Brown and L. G. Freeman, Jr.,[5] and by S. Rootenberg.[6] Brown and Freeman found that results of a UNIVAC ceramic analysis were skewed because

of differential distribution, possibly caused by differential uses of the ceramics from one part of the site and another. While such differences may result in an erroneous diachronic interpretation, to ignore synchronic intra-site variations is to lose clues as to social organization, specialized functions and activities, and so forth. The justification for grouping or separating cultural samples for different parts of a site should be based on as many lines of evidence as possible and certainly not upon statistical results alone.

Rootenberg proposed a methodology for selecting a representative sample by defining site limits, computing its cubic content, and applying rigid mathematical techniques for selecting excavation clusters. His proposal may be correct for ideal circumstances but is not always practicable. Further, I am not convinced that such procedure is satisfactory for all archaeological purposes.

A slightly different objection was raised when, after presenting a paper demonstrating how statistical techniques can be applied to archaeological data, Spaulding was criticized because he could not prove his archaeological materials had been randomly selected.[7] During the discussion examples were presented of one archaeologist or another not selecting materials randomly but giving preference to fist axes over flake tools or polychrome sherds over plain sherds. It was not pointed out that if the cited collections had been studied by subjective methods, the same criticisms would have been equally applicable. The cited examples reflect poor archaeological field techniques and do not constitute criticism of anything else.

Obviously, every collection must be as complete as possible in order to be properly analyzed by any method.

Competent archaeologists reject from stratigraphic studies materials found under questionable conditions. If an intrusive pit or gopher hole is detected, few would assume the stratification to be undisturbed. If a study is to be based upon stratigraphy, such an area is rejected in favor of one where there is no evidence of disturbance. There are techniques for detecting mixture but statistical techniques have the advantage of not only making comparisons but of expressing with a specific level of confidence whether or not there has been mixture.

The problem of determining whether an assemblage is actually representative of a site or area or culture is more archaeological than statistical. Obviously, an archaeologist can only study what he has and from such he makes inferences about the site. His inferences are usually extended to the surrounding region, a practice rendered acceptable by virtue of being accepted. Probably few archaeologists are completely free of concern about having found a truly representative sample at their sites. At least implicit in most studies is a statement to the effect that "If we consider our finds representative of the site and the site representative of the region, then we can conclude..." The fifteen pits of Sipolite yielded approximately 65,000 sherds, a sample that usually would be accepted as at least fairly representative of the site. Even with 150 pits and 650,000 sherds it would not be absolutely certain that the sample would be representative or random. This study is therefore

open to no more criticism on the question of whether the collection is random or representative than would be any study involving fifteen pits and 65,000 sherds. That level of criticism is accepted, but with the conventional qualifier, "If we accept our finds as representative of the site, then we can conclude..."

Each statistical technique has certain underlying logical assumptions which must be satisfied if the technique is to be properly applied. One of these is that certain types of measurements can or cannot be handled by each technique. Many workers alter or distort their data to be able to apply more powerful statistical techniques and such practice is not always reprehensible.[8] We have chosen to be conservative in determination of types of measurement as well as in selecting the specific techniques to be applied to the data. More adventuresome and probably more informative techniques do exist. Assumptions always must be made and any work may be questioned by attacking the assumptions, even if they are generally acceptable. It is felt that progress in developing and applying statistical techniques generally acceptable to archaeologists is necessary before we venture into more esoteric and debatable procedures.

The four types of measurement are nominal, ordinal, interval, and ratio scales. Nominal measurement is use of a number to represent a class or category. Ordinal measurement is gotten by rank ordering with the smallest or largest first. The interval scale of measurement uses equal units of measurement as does the ratio scale which has a beginning point of absolute zero.

Another view of data is to consider them either continuous or discontinuous. Nominal data are discontinuous while the others are continuous, unless forced into the discontinuous category. Spaulding, and many others, points out that "...in an ultimate sense, the distinction between qualitative [discontinuous] and quantitative [continuous] attributes tends to break down because any real measuring instrument must be divided into discrete steps, however small they may be..."[9] We need not concern ourselves with such a philosophical point.

The attribute classes of Thickness and Orifice Diameter are of ratio scale; Level, Hardness, and Core Characteristics are of ordinal scale; and Pit, Paste Color, Temper, Surface Treatment, Slip, Base Form, Rim Form (with five categories), Decoration, and Appendage Association are all of nominal scale. Since Hardness is not a sensitive class (most sherds test within three Moh scale grades) and Core Characteristics can have but four grades without extreme subjectivity or time consuming measurement that probably would be nearly useless, we are left with two usable ratio and one ordinal scale classes; the remainder are nominal scale classes. Parametric statistics, the most powerful and familiar to research workers, cannot be applied to nominal data, only to interval or ratio scale data. It is therefore necessary to use nonparametric statistics for the most part although parametric statistics will be used for at least one operation.

Statistical operations should be oriented towards specific purposes. It is possible to prepare a computer program to note

intensity of occurrence of each attribute within each class in combination with every other attribute of all other classes, as James Deetz has done for a ceramic collection from South Dakota.[10] Such a program would not be desirable for the Sipolite collection which is larger and far more complex than Deetz's. Instead, four major problems have been selected and techniques suitable for each are used. The selected problems do not pretend to exhaust all possibilities.

By using a system of attribute notation for description an enormous number of problems can be investigated. Such detailed analytical approaches have been difficult in the past, although typological studies have implicitly or explicitly considered attributes. Typologists note attributes, weigh their occurrences, patterns and proportions, and define types. Characteristics are averaged. The advent of electronic sorters and computers which can efficiently record, store, sort, extract, and correlate fantastic quantities of information make detailed studies more possible. The result has been a gain in precision and in range of study possibilities.

Deetz considered his use of attribute analysis and statistics "...an attempt to treat ceramic typology in a more detailed manner in order to advance in the direction of greater depth and detail of interpretation..."[11] We concur with his aims but add to them the desire to demonstrate and use new methodology for better attacking standard archaeological problems and yet preserve the descriptive data in a form which can be used by other persons for any purpose they may wish. For example, when a collection is presented as a series of types the data are "frozen" into one form which precludes

re-examination or reclassification. By use of attribute description and IBM cards the data deck can easily and inexpensively be reproduced upon request. Another investigator is therefore free to test, reclassify, or to study any problem that may interest him; the data are not "frozen."

The four problems investigated here are: 1) justification for consolidating all stratipits into a single study unit; 2) demonstration of vertical change; 3) extraction of modes and types; and, 4) description of variation within a type through time.

Problem I

Some statistical procedures function with greater probability when units considered are more equal in size. Low frequencies can be adjusted for in X^2 tests by applying Yates' correction or Fisher's exact method,[12] but such computations can become very laborious. It is therefore desirable to consolidate all stratipits into a single unit to increase sample size of lower levels and attribute or groupings of low frequency.

In archaeological terms, if it can be demonstrated that Level 6, for example, from all stratipits contain the same materials in the same proportions, then Level 6 can be regarded as a single assemblage and so treated. In statistical terms, if it can be demonstrated that Level 6 from all stratipits contains the same materials in the same proportions, then Level 6 everywhere represents a sample from the same population and can legitimately be grouped into a single sample for further treatment.

It should be noted that inspection of distribution tables indicates that a given level of all stratipits represents essentially the same cultural assemblage.

While any grouping could be used, general form-paste or form-slip categories tentatively called "wares" are used, all tecomate forms of reddish-brown paste are considered a ware, Reddish-brown Tecomate. Others are Reddish-brown Convex Bowl, Grey Tecomate, Grey Concave Bowl, Black-slipped Concave Bowl, and Cream Concave Bowl. Inspection of distribution tables shows the first four wares extending through all levels while the last two are confined to upper levels.

The data deck was searched using an IBM 83 Sorter and all cards representing the five wares were selected. A series of Chi-square (X^2) tests considering Reddish-brown Tecomates and all other sherds occurring by levels were performed using an electric desk calculator. The series, including a check, required about seven hours but a more experienced operator could work more rapidly. Chi-square is a useful test since it can be used for non-parametric as well as parametric data and for any order of data. Its interpretation is fairly clear and because of being so popular enjoys widespread understanding. Chi-square tests the hypothesis of no difference, the hypothesis that a frequency of occurrence does not differ from what could be expected if only chance were operating. The null hypothesis is rejected on a specific level of confidence. The investigator is left free to operate on any level of confidence he may wish. Rejection of a null hypothesis usually serves as justification for the investigator using

its alternative but the alternative itself cannot be proved by a X^2 test.

For our problem the null hypothesis is that the horizontal distribution of Reddish-brown Tecomate sherds for a given level of all eight stratipits does not differ from what would be expected by chance. We will operate on the 90% level of probability or 10% level of significance. If the null hypothesis is rejected at that level, explanation will be necessary. It is anticipated that the null hypothesis will not be rejected.

In the preliminary operation the null hypothesis could be rejected at the 10% to 20% level of confidence. However, it was felt that the rude test of one stratipit level did not invalidate the procedure. Further tests followed. A X^2 program for the CDC 1604 computer was prepared to perform desired tests for all wares used in both Problems I and II, as is discussed below.[13] The programs were expansions of the basic X^2 operation which needs no further explanation here. A detailed discussion is given in Appendix C. Interpretation of results is done by entering a table of X^2 values at the proper degrees of freedom.

The distribution and frequencies of Reddish-brown Tecomate sherds were organized into Table 1, for all stratipits and levels. Frequencies of Level 6 examples were extracted and formed into a two by eight cell table, Table 2, together with total sherd occurrences. The expanded formula was then applied to the data in the two by eight table. The formula is:

$$X^2 = \frac{\left[N_1 - N_2 \frac{NS_1}{NS_2}\right]^2}{N_2 \frac{NS_1}{NS_2}} + \frac{\left[N_2 - N_1 \frac{NS_2}{NS_1}\right]^2}{N_1 \frac{NS_2}{NS_1}},$$

where N_1 equals the observed frequency of the Reddish-brown Tecomates in a given cell. For testing Level 6, Pit 1, it would be 12. N_2 equals the frequency of all wares for that same cell or 132. NS_1 equals the frequency of that ware for all of that level, minus the cell being considered, 41 - 12 or 29. NS_2 equals the frequency of sherds in that level, minus the cell being considered, 631 - 132 or 499.

Substituting into the formula we have:

$$X^2 = \frac{\left[12 - 132 \frac{29}{499}\right]^2}{132 \frac{29}{499}} + \frac{\left[132 - 12 \frac{499}{29}\right]^2}{12 \frac{499}{29}}$$

$$X^2 = \frac{(12 - 2.44)^2}{2.44} + \frac{(132 - 206.52)^2}{206.52}$$

$$X^2 = \frac{91.39}{2.44} + \frac{5,563.23}{206.52}$$

$$X^2 = 37.4 + 26.5 = 63.9$$

With the X^2 value of 63.9 we enter the table of values with the appropriate degrees of freedom which are calculated by multiplying the number of rows in the cell table minus one by the number of columns minus one or (2 - 1)(8 - 1) equaling 7. With seven degrees of freedom a X^2 value of 63.9 exceeds the .0001 level of probability and the null hypothesis is therefore rejected. The occurrences of Reddish-brown Tecomate sherds in Level 6, Stratipit 1, is beyond

Level	Stratipits								Total
	1	2	3	4	5	6	7	8	
1	0	1	1	2	1	1	1	3	10
2	2	8	1	2	6	5	10	8	42
3	2	10	6	4	18	20	26	15	101
4	3	11	7	15	32	19	6	12	105
5	13	10	6	5	18	8	2	5	67
6	12	2	10	1	3	4	6	3	41
7	1	6	8	1	0	3	7	6	32
8	1	2	2	0	0	0	1	2	8
Total	34	50	41	30	78	60	59	54	406

TABLE 1. - Distribution of Reddish-brown Tecomate sherds

	Stratipits								Total
	1	2	3	4	5	6	7	8	
RBr Tecomate	12	2	10	1	3	4	6	3	41
All Sherds	132	65	99	57	32	91	97	58	631

TABLE 2. - Level 6 distribution of Reddish-brown Tecomate sherds and all sherds

reasonable doubt not due to chance. To fully answer the null hypothesis posed by Problem I we must consider the entire occurrence of sherds in Level 6 of all stratipits and then in all levels of all stratipits. A further expansion of the formula used above enables

us to consider the entire level, pit by pit. The formula is:

$$X^2 = \sum_{i=1}^{k} \frac{\dfrac{(N_i - NS_i)(RT - N_i)}{(RTS - NS_i)^2}}{\dfrac{NS_i (RT - N_i)}{RTS - NS_i}} .$$

The data deck was fed into the CDC 1604 computer which required about twenty minutes. Computation time for the program including a revision of the same process and data for Problem II required approximately one minute, twenty seconds, including the printing out of answers.

Results are given and discussed in Chapter IV, as are the results of other problems and operations. In short, it was demonstrated that the null hypothesis could not reasonably be rejected, that the distribution of Reddish-brown Tecomates and other wares throughout Level 6 was most likely due to chance. The same conclusions were reached for other levels. It was therefore assumed that consolidation of all stratipits into a single unit was not incorrect.

Distribution tables for all six wares as well as all sherds are given in Appendix A.

Problem II

It is possible that the site has been churned and mixed so that the same wares are found evenly distributed through all levels. If so, Level 6 of all stratipits would have similar content but would not stand apart from Levels 5 and 7. Problem I therefore is not completely answered until similar patterns of vertical change have

been demonstrated for all stratipits. Further, while study of supports, handles, and figurines has indicated vertical change, the fact has not been shown for the far more numerous vessel sherds.

Procedures used to demonstrate vertical change are nearly duplicates of those used for Problem I. The same ware groupings, distribution tables, and X^2 formulae are used. In effect what has been done is to turn Problem I on edge. Instead of a null hypothesis of horizontal random distribution, we test a hypothesis that the vertical distribution of Reddish-brown Tecomate sherds (and the other wares too) does not differ from what would be expected by chance. Rejection of the null hypothesis permits using the alternative.

It is not necessary to reject the null hypothesis for all wares. Rejection for two wares should constitute adequate demonstration of vertical change since differential mixing of sherds would have been most unlikely. Inspection of distribution frequencies indicates that certain wares did enjoy continuous popularity. One interpretation of failure to reject the null hypothesis for these wares would be to accept them as survivals.[14] Another interpretation would be to accept as more likely a suggestion of one continuous site occupation by a group with a conservative ceramic tradition. Such interpretations are more archaeological in nature but would be supported logically by quantified statistical evidence.

Results are given in Chapter IV. Anticipated vertical change was shown for four wares while two occurred in frequencies best explained by chance. Further discussion is provided in Chapter IV.

Problem III

This problem has two parts, the definition of modes and ceramic types and charting their occurrences in the sequence. Modes are defined in the sense proposed by Irving Rouse; they are historically significant attributes.[15] They are detected by noting their existence during a short time span or segment of a stratigraphic column. Certain distinctive attributes are also treated as modes although they may not be limited to short spans. Ultimately, a mode is defined on the basis of demonstrated or suggested utility. The arrangement of modes into a sequence produces a seriational chart. Since the seriation of Sipolite modes is based upon stratigraphic evidence, it approaches John Rowe's ideal situation:

> "If the investigator has the time and the choice, he can profitably combine the methods of excavating a stratified site, making a stratigraphic analysis of the materials found, and then doing a parallel seriational analysis of the same materials. Since the limitations of the two methods are different, each provides a check on the other. If the results agree, a maximum credibility has been attained."[16]

Mode analysis and seriation have three particular purposes in this study. First, if vertical change can be illustrated for specific features, the sequence validity is thereby supported. Second, it aids the eventual definition of valid criteria for inter-site and inter-regional comparisons. Third, survivals of specific features support a theory of a conservative ceramic tradition. It might be added that mode analysis also supports the definition of cultural phases within the site.

Modes have been detected by inspection of the frequency tables produced by the computer, as discussed above. A summary and discussion of modes will be found in Chapter IV.

Several techniques have been used elsewhere for defining types. Here types as such are not defined but general groupings based on morphological similarities and called series are presented. For example, the tecomate rim forms are divided into seven series with each series containing those members that share form characteristics. It has not been possible to give great consideration to factors such as paste, temper and so forth; the variation within even a narrowly defined form group is too wide, as is discussed in Chapter IV. Many of the series show considerable homogeneity of not only vessel rim form but other factors and therefore eventually may prove to be acceptable types. However, rather than clutter the archaeological literature with types and type-names of uncertain validity, the series are named with general form designations and numbers.

The series may be used for making inter-site comparisons, as is usually done with formal types. The series tend to change through time, as has been said of types. As James Ford has pointed out, the attributes that cluster to form types will tend to slowly alter with time;[17] types tend to "decay," and so will a series. A type extending over a long period may come increasingly to deviate from the original definition and to continue forcing examples into the definition may become misleading. The "type-variety" concept is a partial answer to such a problem.[18] Robert Lowie has raised a similar problem in a

different context but points out that the amount of deviation from a definition has its importance gauged by the intentions of the observer.[19] This intensity of disagreement for types or for series may be crucial in a study of cultural conservativeness. However, use of statistical techniques enables one to quantify the degree of agreement or disagreement for any given moment, as has been done in Problem IV.

Initial attempts to extract series on the bases of paste differences and, in a second attempt, slip differences were not successful. A third attempt using form similarities was successful. All IBM cards were consolidated into a single deck, sorted into form series, and then each form series was sorted to find frequencies of pastes, slips, surface finishes, orifice diameters, tempers and decoration attributes. Each series is defined and described in Chapter IV.

Problem IV

It was anticipated that attributes comprising a series would vary through time in regard to their degree of association with that series. Further, each attribute system may vary independently of others. The degrees of cohesiveness and variation provide quantified evidence for rate and kind of culture change.

The varying degrees of association by levels for three attribute classes - temper, hardness and decoration - are calculated for three ceramic form series. An Index of Dissimilarity (ID) is used.

The ID, a measure of differentiation that has great potential for archaeological applications, was brought to the author's

attention by Sanford Labovitz. It can be used for any data of any order that can be reduced to percentages. The interpretation is perfectly clear. Paraphrasing Labovitz's explanation,[19] the ID is defined as the percentage or number of individuals of one subclass that would have to change their location in order to have a distribution identical with the remainder of the class. From another viewpoint, the ID measures how dissimilar is the occurrence of one segment from the total population.

The formula for ID is:

$$\frac{S\ (S|X - Y|/2)\ (N_x)}{N}\ 100,,$$

where, in the archaeological example discussed below, X is the percent of sherds possessing one of a class of attributes in a given stratipit level; Y is the percent of sherds possessing all other attributes of that class for the same level; N_x is the total number of sherds having the attribute of X; and N is the total number of sherds comprising the attribute class. The formula $S|X - Y|/2$ yields a separate ID for each attribute, if more than one level is being tested. To calculate the ID for all attributes of the class, multiply the separate ID's by N_x, sum the products, divide by N, and multiply by 100.

The procedure is illustrated in Table 3 using hypothetical data. Sipolite Coarse Ware, a ceramic type having four temper varieties, occurs in three levels. Each temper occurs in differing percentages in each level. We wish to measure the amount of differential

Levels	(Col. 1) Temper 1	(Col. 2) X	(Col. 3) Y	(Col. 4) Tempers 2, 3, & 4
3	60	43.80%	24.54%	40
4	40	29.19	36.81	60
5	37	27.01	38.65	63
	137	100.00%	100.00%	163

$S|X - Y|/2 = 38.52/2 = 19.26$ $\quad (S|X - Y|/2)\,N_x = 19.26\,(137) = 26.39$

	Temper 2			Tempers 1, 3, & 4
3	23	32.39%	33.62%	77
4	23	32.39	33.62	77
5	25	35.21	32.75	75
	71	99.99%	99.99%	229

$S|X - Y|/2 = 4.92/2 = 2.46$ $\quad (S|X - Y|/2)\,N_x = 2.46\,(71) = 1.75$

	Temper 3			Tempers 1, 2, & 4
3	14	33.33%	33.33%	86
4	16	38.09	32.56	84
5	12	28.57	34.11	88
	42	99.99%	100.00%	258

$S|X - Y|/2 = 11.07/2 = 5.535$ $\quad (S|X - Y|/2)\,N_x = 5.535\,(42) = 2.33$

	Temper 4			Tempers 1, 2, & 3
3	3	6.00%	38.80%	97
4	21	42.00	31.60	79
5	26	52.00	29.60	74
	50	100.00%	100.00%	250

$S|X - Y|/2 = 65.60/2 = 32.80$ $\quad (S|X - Y|/2)\,N_x = 32.80\,(50) = 16.40$

$SN_x = N = 300$

$$ID = \frac{S\left[(S|X - Y|/2)\right](N_x)}{N}\,100$$

$$ID = \frac{46.87}{300}\,100$$

$ID = 15.63\%$

TABLE 3. - Illustration of the computation of the Index of Dissimilarity for a hypothetical type, Sipolite Coarse Ware

distribution for the four tempers combined and for each temper independently. The second purpose is satisfied in the process of answering the first.

The steps involved are:

1. Using those IBM cards representing all of Sipolite Coarse Ware, separate them into four groups, one for each temper.

2. For each temper group, note the number found in each of the three levels and present the number in the appropriate section under Column 1. For example, there are 60 sherds with Temper 1 in Level 3, 40 in Level 4, and 37 in Level 5. A total of 137 sherds of Sipolite Coarse Ware contain Temper 1.

3. Change the numbers to percentages and enter such in Column 2 or X. The 60 sherds of Temper 1, Level 3, make up 43.80% of 137.

4. Opposite each entry in Column 1, enter the remaining number of sherds with Tempers 2, 3, and 4 in Column 4. In the last cited case, 40 would be entered for Column 4.

5. Total Column 4 getting 163 and then compute the percentages for each entry and enter such under Column 3, or Y.

6. Subtract X and Y values, Columns 2 and 3, ignoring signs.

7. Divide the sum of differences by 2 to obtain $S|X - Y|/2$. With this answer we have measured the differentiation by levels for Temper 1. To measure total differentiation for all tempers, continue below.

8. Multiply $S|X - Y|/2$ by N_x.

9. Proceed in the same way for each temper and then sum the values obtained for each in Step 8, $S\ (S|X - Y|/2)\ (N_x)$.

10. Divide the value obtained in Step 9 by the total number of sherds being considered, N.

11. Multiply the resulting value by 100 to obtain a percentage value for the total ID.

The ID computation is somewhat laborious but is quite simple and, as mentioned before, interpretation is perfectly clear. The result at each stage is a straightforward measure of differentiation. A problem can be expanded to include more variables but the individual contribution to the final measure can be readily detected.

Three series are subjected to ID measurement for three attribute classes. Results are presented and discussed in Chapter IV. Tables with illustrations of procedures and raw data are given in Appendix B.

ENDNOTES

[1]The terms "olla" and "tecomate" are in general use in Mesoamerican archaeology and I will use them here. "Tecomate" is taken from a Nahuatl term for gourd, since the vessel resembles a hollow gourd with a circular opening cut into it. "Olla" is a Spanish term for jar. An olla has a neck while the tecomate does not; both have globular or ovoid bodies and presumably were used for storage and cooking.

[2]Albert C. Spaulding, "The dimensions of archaeology," in Essays in the Science of Culture, G. E. Dole and R. L. Carneiro, editors (New York: Thomas Y. Crowell Company, 1960), p. 442.

[3]Ibid.

[4]Edgar F. Borgatta, "Some comments on methodological developments in the last quarter-century," The Sociological Quarterly, Vol. IV, No. 4 (October, 1962), 298.

[5]J. A. Brown and L. G. Freeman, Jr., "A Univac analysis of sherd frequencies from Carter Ranch pueblo, eastern Arizona," American Antiquity, Vol. XXX, No. 2 (October, 1964), 162-167.

[6]S. Rootenberg, "Archaeological field sampling," American Antiquity, Vol. XXX, No. 2 (October, 1964), 181-188.

[7]Albert C. Spaulding, "Statistical description and comparison of artifact assemblages," The Application of Quantitative Methods in Archaeology, R. F. Heizer, editor, Viking Fund Publications in Anthropology, No. 28 (New York, 1960). See comments on pages 86-89.

[8]Borgatta, op. cit., 297.

[9]Spaulding, "The dimensions...," p. 440.

[10]James J. F. Deetz, "An archaeological approach to kinship change in eighteenth century Arikara culture," (Ph.D. dissertation presented to the Department of Anthropology, Harvard University, 1960). A slightly altered version of Deetz's dissertation has been published but does not contain the discussion of methodology given in the earlier work. See James Deetz, The Dynamics of Stylistic Changes in Arikara Ceramics, Illinois Studies in Anthropology, No. 4 (Urbana: University of Illinois Press, 1965).

[11]Deetz, "An archaeological approach...," p. 1.

[12]There are many presentations and discussions of the two corrections. I have used a standard textbook, N. M. Downie and R. W. Heath, Basic Statistical Method (New York: Harper and Brothers, 1959), pp. 150-151.

[13]The formulae and programs used with the CDC 1604 were prepared by Robert Schacht and approved by qualified persons at the University of Wisconsin Numerical Analysis Laboratory. The programs presently are in the possession of the author. See Appendix C for Schacht's discussion of the program and reasons for using 62 degrees of freedom in interpreting results.

[14]If the X^2 value is exceedingly low, we could suggest that the occurrences of Reddish-brown Tecomates were proportionate to the total amount of pottery made and discarded, thereby gaining insight into population increase or fluctuations, concentration of settlement or pottery-making habits.

[15]Irving Rouse, Prehistory in Haiti: A Study in Method, Yale University Publications in Anthropology, No. 21 (New Haven: Yale University Press, 1939), pp. 11-12.

[16]John Howland Rowe, "Stratigraphy and seriation," American Antiquity, Vol. XXVI, No. 3 (January, 1961), 330.

[17]James A. Ford, "The type concept revisited," American Anthropologist, n.s., Vol. LVI, No. 1 (February, 1954), pp. 51-52.

[18]Robert E. Smith, Gordon R. Willey and James C. Gifford, "The type-variety concept as a basis for the analysis of Maya pottery," American Antiquity, Vol. XXV, No. 3 (January, 1960), 330-340.

[19]Robert H. Lowie, The History of Ethnological Theory (New York: Holt, Rinehart and Winston, 1937), p. 253.

[20]Sanford I. Labovitz, "Technology and division of labor," (Unpublished Ph.D. dissertation presented to the Graduate School, University of Texas, 1963), pp. 86-90. Labovitz cites Otis D. Duncan and Beverly Duncan, "Residential distribution and occupational stratification," in Cities and Society, P. K. Hatt and A. J. Reiss, Jr., editors (Glencoe, 1957), pp. 283-296, as a published application of the ID. I find his discussion more clear and enlightening.

CHAPTER IV

CERAMIC DESCRIPTION AND ANALYSIS

Code Catalog

The purpose of the code system is to reduce observed and measured attributes to numbers for easier reference and handling, specifically for entering on IBM cards. The choice and definition of attributes are essentially subjective but all attributes have been defined in specific terms. In this study the definitions are narrow, for use of more general attributes would lessen the sensitivity of the study. Even so, there is a range of variation within each attribute and fitting variations into definitions constitutes a kind of classification. Further atomization of attributes would be undesirable because of the accompanying increase in complexity.

The code was designed to be punched into standard IBM cards having eighty columns each with ten rows of digits, 0 through 9. The columns, only thirty-seven of which were used, were organized into "fields," each of which contains the code designations for all attributes of a single group. For example, Field 2 includes only Column 2 and is devoted to stratipit levels. Levels are represented by Numbers 1 through 9 respectively with 0 not being used. A group possessing fourteen attributes requires a two column field, one for each digit. In such case, Attribute 6 is indicated by 06 since all

columns must be punched. A group with over ninety-nine attributes needs a three column field in which Attribute 6 is indicated as 006.

Most groupings are self-explanatory being simply pit, level, temper, etc., but rim forms are divided into several categories to avoid having too many members within any one, as was discussed in Chapter III. Groupings are given below in order of appearance on the IBM cards. Fields are defined and descriptions of attributes are provided. Rim forms are described by means of profile drawings with other description being given when such seems necessary.

Stratipit - Field 1 (Column 1)

Surface collections are indicated by 0. Stratipits 6, 7, 10, 11, 12, 13, 14, and 15 are represented by Numbers 1 through 8 respectively.

Level - Field 2 (Column 2)

Levels 1 through 9 are represented by Numbers 1 through 9 respectively.

Paste Color - Field 3 (Columns 3 and 4)

Fourteen paste colors are noted but there is considerable variation within each. Approximate definitions of the modal color are given using the Ridgway system.[1] Common color terms are used in this study to avoid giving a false sense of precision of definition. Code numbers, common names, and abbreviations used are presented below in Table 4 with their corresponding Ridgway names and hue/tone designations.

Code Number	Common Name	Abbreviation	Ridgway Code	
			Name	Hue and Tone
01	Reddish-Brown	RBr	Vinaceous-Rufous	7'i
02	Brick	Brick	Dragon's blood Red	5'i
03	Orange	O	Ochraceous-Salmon	13'b
04	Cream	Cr	Pale Ochraceous-Salmon	13'f
05	Tan	Tan	Tilleul-Buff	17'''f
06	Light Brown	lBr	Vinaceous-Buff	17'''d
07	Brown	Br	Army Brown	13'''i
08	Dark Brown	dBr	Dark Vinaceous Brown	5'''k
09	Light Grey	lGr	Cinereous	45'''''d
10	Grey	Gr	Deep Plumbeous	49'''''-
11	Dark Grey	dGr	Blackish-Plumbeous	49'''''k
12	Black	Bl	Black	--------
13	Whitish Grey	WGr	Pearl Gray	35'''''f
14	Light Reddish-Brown	lRBr	Flesh Color	7'd

TABLE 4. - Paste color code and designations

Thickness - Field 4 (Columns 5 and 6)

Sherd thickness was measured to the nearest millimeter and given as such. Rim sherds were measured below the lip where no thickening or thinning was noted. Measurements were averaged for irregular sherds.

Temper, Size and Kind - Field 5 (Columns 7 and 8)

It is not certain whether temper was deliberately added or occurred as natural inclusions in the pastes. Microscopic examination shows some particles with sharp edges and others slightly rounded. In general, the finer tempers seem more rounded. There is

reason to conclude that all or almost all inclusions are natural. Paste sources have not been positively identified but at least the coarse reddish-brown and brown pottery could have been made with earth found at the site. Such earth has quartzite particles of varying sizes and often with fairly sharp margins. Temper size in a sherd may ee quite variable with fine and very large particles occurring together. It is possible that local pastes were used and perhaps pounded, thereby crushing some inclusions but not all. Such conjecture is supported by the observation that the pastes do not seem to have been carefully washed or prepared. Many holes, apparently left as organic particles such as twigs, leaves, organic trash, etc., burned away, are found in Sipolite pottery, especially in the coarse wares. The fine paste wares seem to have been made from poorly prepared sedimentary clays and only occasionally contain quartzite particles which, with few exceptions, are uniform in size and fine. Other substances, except for a few sherds containing sand, are not found in Sipolite pottery. The majority of evidence suggests that aplastic materials were not deliberately added to pastes. Further evidence and more expert opinion is needed.

Sand, noted by its regular size and rounded margins, has been graded into three sizes with diameters of each being: coarse, 1 to 2 mm.; medium, 1 to .05 mm.; and fine, less than .05 mm. Distinctions were made by estimation while viewing with a ten power hand lens, as with grading of quartzite temper.

Size of quartzite particles has been divided into five grades: pebble, greater than 5 mm. (some are as much as 15 mm. while 10 mm.

particles are not at all uncommon); coarse, 5 to 2.5 mm.; medium, 2.5 to 1 mm.; fine, 1 to .05 mm.; and very fine, less than .05 mm.

Twenty-nine temper variations were listed originally but in final analysis not all were found. Preliminary inspection showed volcanic ash used as temper and two code numbers were reserved for it. Later microscopic examination revealed the particles to be quartzite or whitish quartz, not volcanic ash. Likewise, it was suspected that sherd temper would be found, but it was not. The code system therefore has unused categories.

Three substances called X, Y, and Z were examined by a geologist who suggested them to be decayed minerals of natural occurrence in the pastes. They appear to be non-significant but their presence is given.

Table 5 lists the code numbers for each temper material and its size variations.

Hardness - Field 6 (Column 9)

A simple five grade scale was devised for measuring pottery hardness using talc, fingernail, copper penny, and a steel knife blade. Each sherd was scratched with equal pressure being applied and temper protrusions were avoided. Most sherds were of the first three grades. It is felt that the slight variations in hardness are of little diagnostic value. Code numbers, the grade scale, and Moh scale equivalents are presented in Table 6.

Core Oxidation - Field 7 (Column 10)

A simple observation of firing completeness was made by noting the amount of oxidized cross-section core of sherds. A five grade

Code Number	Temper Material and Size
00	Not used
01	Quartzite, fine
02	Quartzite, medium
03	Quartzite, coarse
04	Quartzite, fine with pebbles
05	Quartzite, medium with pebbles
06	Quartzite, coarse with pebbles
07	Quartzite, fine with pebbles and organic holes
08	Quartzite, medium with pebbles and organic holes
09	Quartzite, coarse with pebbles and organic holes
10	Quartzite, fine with organic holes
11	Quartzite, medium with organic holes
12	Quartzite, coarse with organic holes
13	Quartzite, coarse with Red "Y" mineral
14	Quartzite, very fine with organic holes and Red "Y" mineral
15	Not used
16	Sand, fine
17	Sand, medium
18	Sand, coarse
19	No visible temper
20	No visible temper, organic holes
21	Sherd temper (not used)
22	Volcanic ash, fine (not used)
23	Volcanic ash, medium (not used)
24	Quartzite, very fine with organic holes
25	Quartzite, very fine with pebbles
26	Quartzite, very fine
27	Yellow "X" mineral, no other visible temper
28	Red "Y" mineral, no other visible temper
29	Grey "Z" mineral, no other visible temper

TABLE 5. - Kind and size of temper with code designations

scale was used with Numbers 1 through 5 noting as follows: unoxidized, over two-thirds unoxidized, between one- and two-thirds unoxidized, less than one-third unoxidized, and completely oxidized. Grading was by inspection and estimation.

Code Number	Grade Scale Test	Moh Scale
0	Not used	
1	Scratch with talc	- 1
2	Scratch with fingernail	1 to 2.5
3	Scratch with penny	2.5 to 3.5
4	Scratch with steel	3.5 to 5.5
5	Will not scratch with steel	5.5 +

TABLE 6. - Hardness test and code designations

Orifice Radius - Field 8 (Columns 11 and 12)

Orifice radius was measured by fitting the outside lip of rim sherds to successive concentric rings of measured radii. The rings were one centimeter apart and readings were given according to the nearest centimeter. A sherd of 16 cms. radius (32 cms. diameter) was given as 16 in the code system. Measurements sometimes were inaccurate because of small sherd size or irregularities.

Surface Treatment - Field 9 (Columns 13 and 14)

This category does not include slipping, painting, or incising but only the polishing, smoothing, or roughening that is evident. Inferences as to treatment techniques are based on observations by Anna Shepard.[2] Smoothed surfaces seem to have resulted from wiping, perhaps with the hand, leaving even, smooth surfaces with very fine ridges or lines caused by dragging of temper particles. Polishing seems to have been done when the paste was fairly hard since troughs left by a tool are seldom apparent. When noted their occurrence is expressed in the code system. The nature of polishing tools is unknown. Rough surfaces seem to have been produced by scraping with

a hard tool when the paste was plastic. Dragging temper bits often have left deep gouges or scorings. At other times the paste must have been in a leather hard stage for the temper bits have pulled out without dragging.

Roughened surfaces differ from rough surfaces in that they seem to have been deliberately produced. Many sherds, especially on their exterior surfaces, are very rough and may have long gouges running horizontally or vertically as though they had been heavily scraped with a hard lunate tool before the paste was leather hard. The result is not pleasing for the surfaces are very rough and uneven and pitted where temper particles were dragged or knocked out.

Two varieties of raking have been noted. The first, brush raking, seems to have been done by pulling a handful of coarse grass or twigs across a leather hard surface causing series of more or less parallel striations to occur in overlapping groups. Most run horizontally on vessel exteriors. The second variety, raking, seems to have been produced by dragging fine grass stems across a more plastic surface. The results are more regular and shallow than brush raking.

A few sherds have "pock-marked" surfaces suggesting that a temper with a radically different shrinkage rate was used.[3] No such temper was found in the sherd body so the condition may have been produced by pecking at a leather hard surface with a rough or pointed tool.

Table 7 presents code numbers and varieties of surface treatment.

Code Number	Surface Treatment	
	Interior	Exterior
01	smooth	smooth
02	smooth	smooth
03	smooth	polished
04	smooth	polished, with visible troughs
05	polished	smooth
06	polished	polished
07	smooth	rough
08	smooth	roughened
09	smooth	raked
10	polished	rough
11	polished	roughened
12	polished	raked
13	smooth	brush raked
14	rough	rough
15	rough	roughened
16	rough	polished
17	roughened	smooth
18	pock-marked	polished
19	rough	smooth
20	raked	rough
21	raked	roughened
22	roughened	roughened

TABLE 7. - Surface treatment and code designations

Slip and Area Painting - Field 10 (Columns 15 and 16)

Often it is difficult to distinguish between a slip or wash and area painting when dealing with sherds. A wash, a thin solution of liquid clay, is only quantitatively different from a slip which is thicker. A slip or wash usually covers the entire vessel, but not always. Area painting, on the other hand, may be applied to an unslipped vessel or to a slipped surface. Painting on an unslipped surface may give results resembling a slip or wash, depending upon the pigment thickness, while paint on a slipped surface resembles

double-slipping. Because of the difficulty in distinguishing between the various techniques, all have been included here under a single field in the code system. Other decorated sherds have been described in Field 18, Decoration.

Some sherds are covered with a slip of one color on their interiors and another color on the exteriors. The variations usually are of similar colors and may be because of differences in temperatures or oxygen availability during firing. Orange or grey spots on white-slipped sherds appear to be firing clouds. Therefore, when a sherd is white on one surface and orange or grey on the other, it may be the result of firing differences. No further technical explanation is offered at this time but rather each sherd is described as it is.

Not all sherds are slipped. Many probably never were slipped while others have lost their slips by erosion. Obviously eroded sherds are included under Attribute 10 while unslipped and intact sherds are described under Attribute 01.

Abbreviations are used for color designations with RBr indicating reddish-brown, Br for brown, Bl for black, Gr for grey, O for orange, Cr for cream, and l and d for light and dark variations respectively.

Table 8 presents code numbers and varieties of slips and area painting.

Basal Angle Forms - Field 11 (Columns 17 and 18)

Basal angle sherds without attached rims are included in the form section of the code catalog. The division into individual

Code Number	Color	Description	Location
01	none		
02	RBr	thin	exterior
03	RBr	thin	interior
04	Bl	thin	exterior
05	RBr	thin	interior and exterior
06	lBr	thin	interior
07	RBr	medium,	interior and exterior
08	RBr	medium	exterior
09	Gr	medium	interior
10	eroded, not possible to determine if slipped		
11	lBr	medium	interior and exterior
12	Gr	medium	interior and exterior
13	dBr	medium	interior and exterior
14	Deep Red	medium	exterior
15	dGr	medium	interior
16	Dirty White	medium	interior with
	Gr	medium	exterior
17	Br	medium	interior with
	Rust Red	medium	exterior
18	Bl	medium	interior
19	dBr	medium	interior
20	lRBr	wash	interior and exterior
21	Dirty White	medium	interior and exterior
22	Br	medium	interior and exterior
23	O	medium	interior and exterior
24	dBr	medium	interior with
25	CrWhite	thick	interior with
	O	medium on	
	White	medium	exterior
26	Br	medium	interior
27	dBr	medium	exterior
28	Dirty White	medium	interior with
	Dirty White	medium and	
	Red	medium	exterior
29	Bl	medium	interior and exterior
30	Br	medium	interior and exterior
31	Red	medium	interior with
	Red	medium on	
	White	medium	exterior
32	lGr	medium	interior
33	Buff	thick	interior and exterior

TABLE 8. - Slip and area painting with code designations

Code Number	Color	Description	Location
34	O	thin	interior with
	1Br	thin	exterior
35	1Gr	medium	interior and exterior
36	Cr	medium	exterior
37	Bl	medium	exterior
38	dBr	medium on	
	Dirty White	medium	interior with
	Dirty White	medium	exterior
39	1Br	thin	exterior
40	Bl Graphite	thin	interior
41	O	medium on	
	White	medium	interior
42	Cr	medium	interior and exterior
43	Cr	medium	interior with
	Red	medium	exterior
44	Bl	medium	interior with
	Dirty White	medium and	
	Red	medium	exterior
45	Cr	medium	interior
46	Bl	thick	interior and exterior
47	Bl	thin	interior and exterior
48	Bl	medium	interior and exterior on base with
	White	medium	interior and exterior on vessel walls
49	Red	medium	interior and exterior
50	White	medium	interior with
	Bl	medium	exterior
51	1Gr	medium	exterior
52	Br	medium	exterior
53	painted design in and/or out, see Decoration Code, Field 18		
54	Deep Red	medium	interior
55	Red	medium on	
	Cr	medium	interior and exterior
56	O	medium	exterior
57	Cr	medium with	
	O firing clouds		interior with
	O	medium	exterior
58	O	medium interior	

TABLE 8-Continued. - Slip and area painting with code designations

Code Number	Color	Description	Location
59	White	medium	interior with
	Red	medium on	
	White	medium	exterior
60	O	medium on	
	White	medium	interior with
	White	medium	exterior
61	Dirty White	medium	interior
62	Br	medium	beginning 1 cm. interior rim, plain below, and
	Br	medium	exterior
63	White	medium	interior with
	O	medium on	
	White	medium	exterior
64	Rust Red	medium	interior with
	Br	medium	exterior
65	Bl	thin	interior with
	lBr	medium	exterior
66	Bl	medium and	
	Red	medium on	
	White	medium	interior
67	Bl Graphite	thin	interior and rim
68	Dirty White	medium	exterior
69	CrWhite	thick	exterior
70	Bl	medium	interior with
	Red	medium	exterior
71	White	medium	interior and exterior
72	O	medium	interior with
	Dirty White	thin on	
	O	medium	exterior
73	O	medium	interior with
	White	medium	exterior
74	CrWhite	thick	2 to 3 cms. inside rim and covering exterior
75	Cr	medium	interior and rim
76	Red	medium on	
	White	medium	interior with
	White	medium	exterior
77	Red	medium	interior with
	Cr	medium	exterior

TABLE 8-Contimued. - Slip and area painting with code designations

attributes considers mainly two sets of factors, the wall angle and form and the basal angle and form. Variations in concave and convex walls, flat and curved bases, and special features such as indented bases are noted as the specific attributes.

Plates XVI through XXI illustrate Basal Angle Form profiles. Additional examples are given on some rim form plates. Provenience data for all illustrated profiles is given in Appendix D. Plates may carry more than one illustration of a form attribute in which event not only is the attribute code number given but also letters for labeling the variations. The same method of presentation is used for illustrating, labeling, and describing rim form profiles and decorative elements.

All drawings in the code catalog are of approximately two-thirds true size.

Tecomate Rim Form - Field 12 (Columns 19 and 20)

Variations in tecomate rim forms are presented in Plates XXII through XXIV. As noted above, tecomate forms have been distinguished from olla forms by their lack of a neck or the presence of a neck that is shorter than the thickness of the vessel wall just below the neck-body angle.

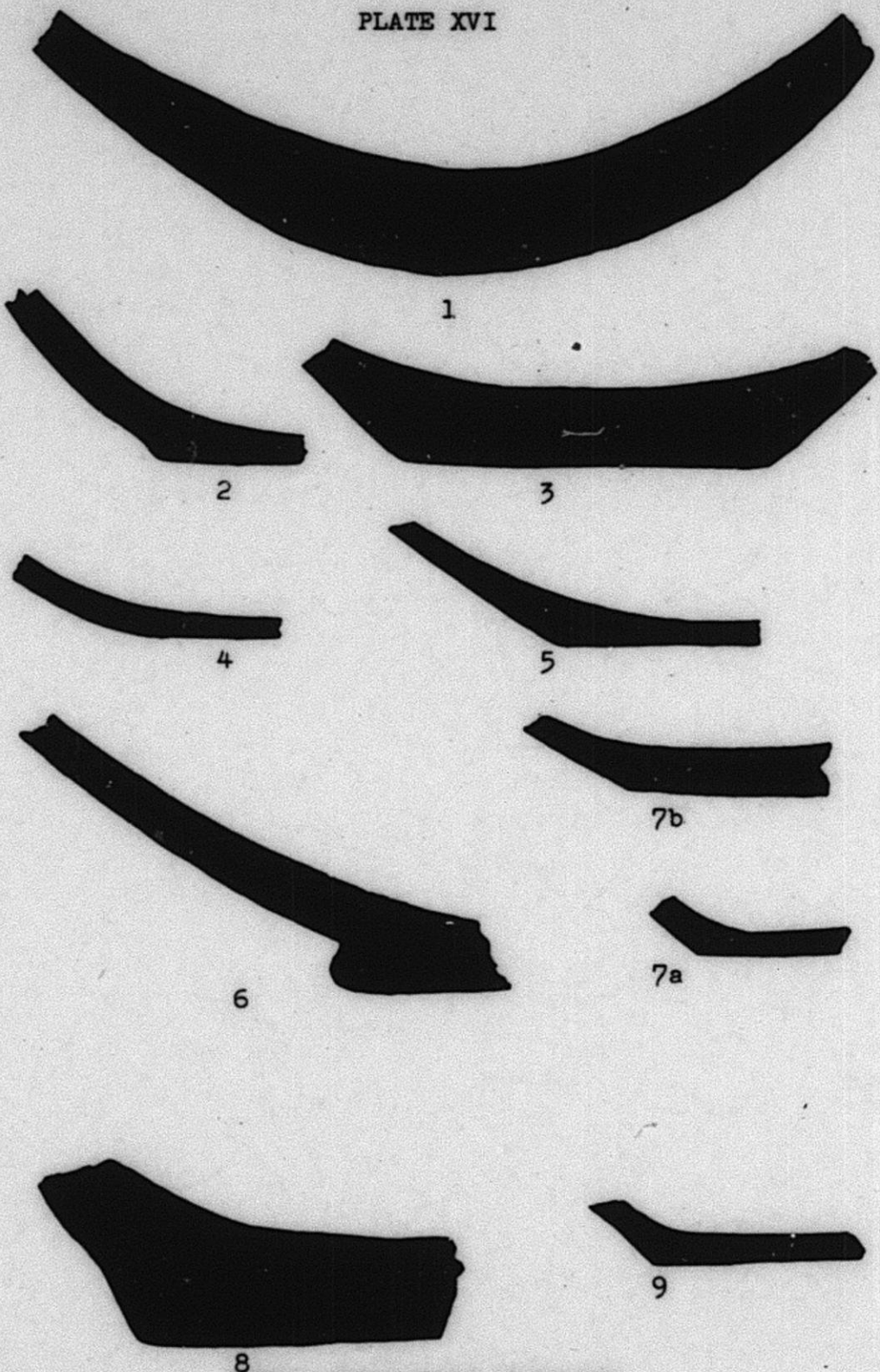
Olla Rim Form - Field 13 (Columns 21 and 22)

Olla rim form variations are presented in Plates XXV and XXVI.

Convex Bowl Rim Form - Field 14 (Columns 23, 24, and 25)

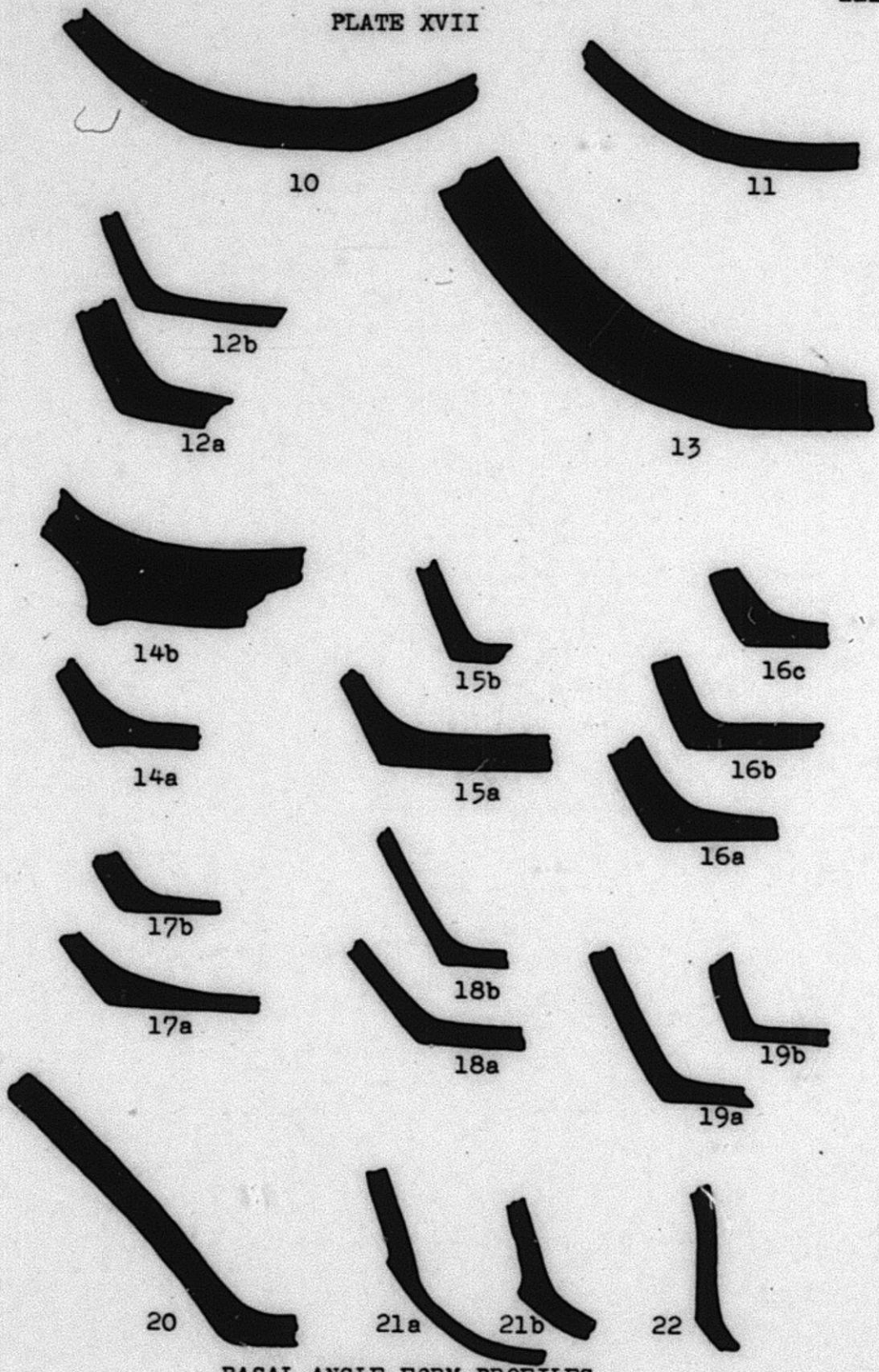
Bowl forms have been divided into two major variations, convex and concave, based on the external wall profiles. The division and variations describe only the rim portions of the vessels since the

PLATE XVI



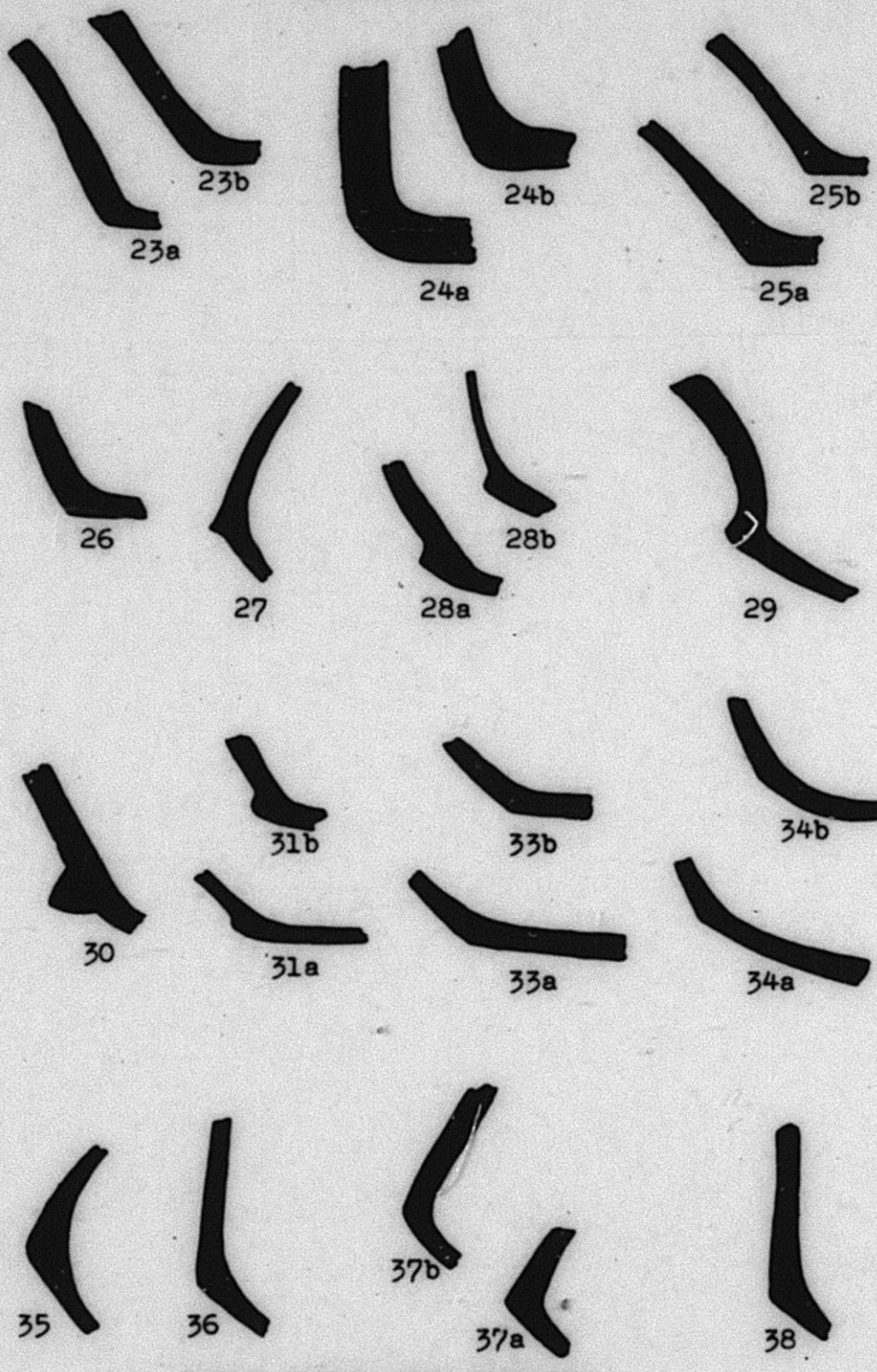
BASAL ANGLE FORM PROFILES

PLATE XVII



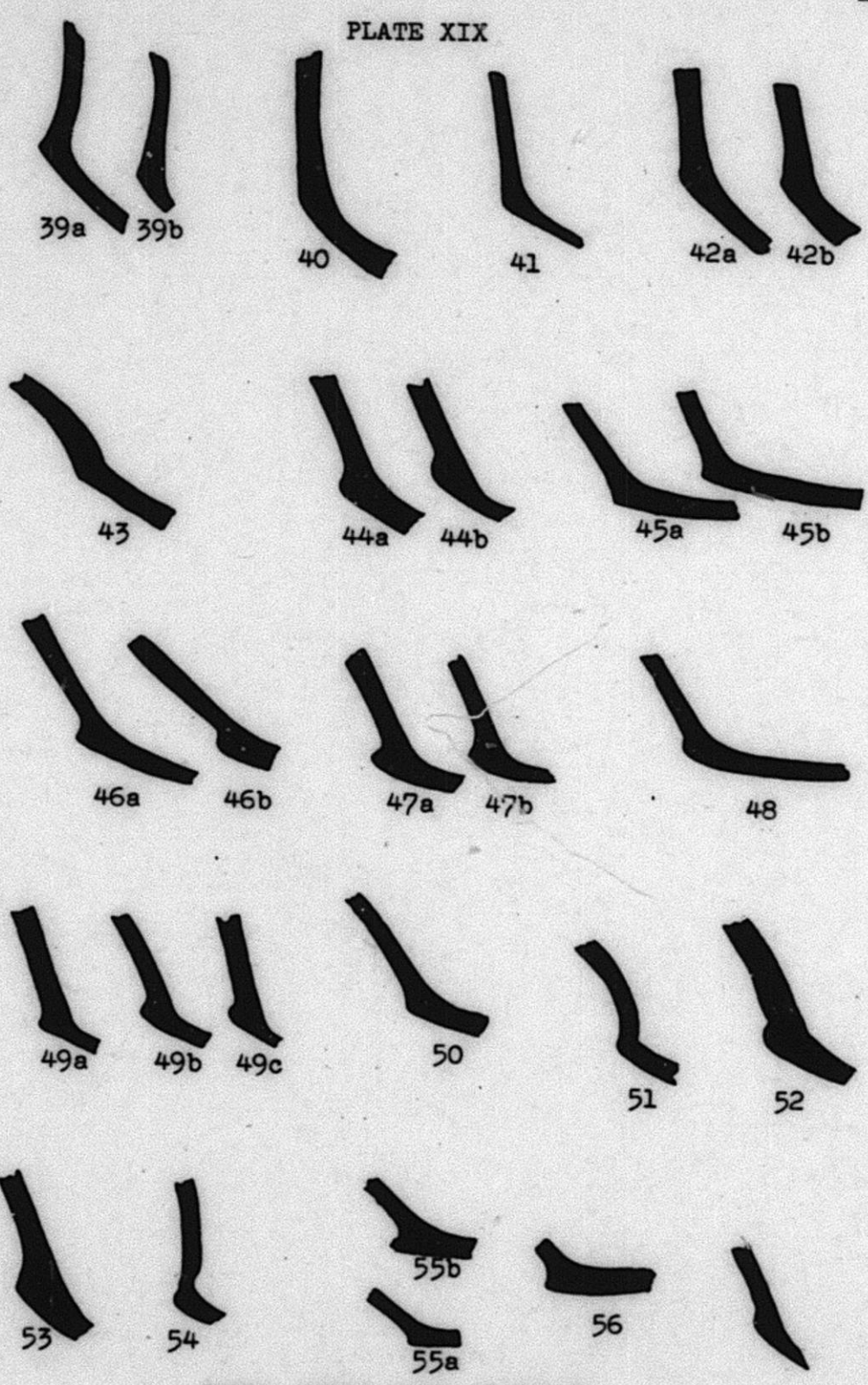
BASAL ANGLE FORM PROFILES

PLATE XVIII



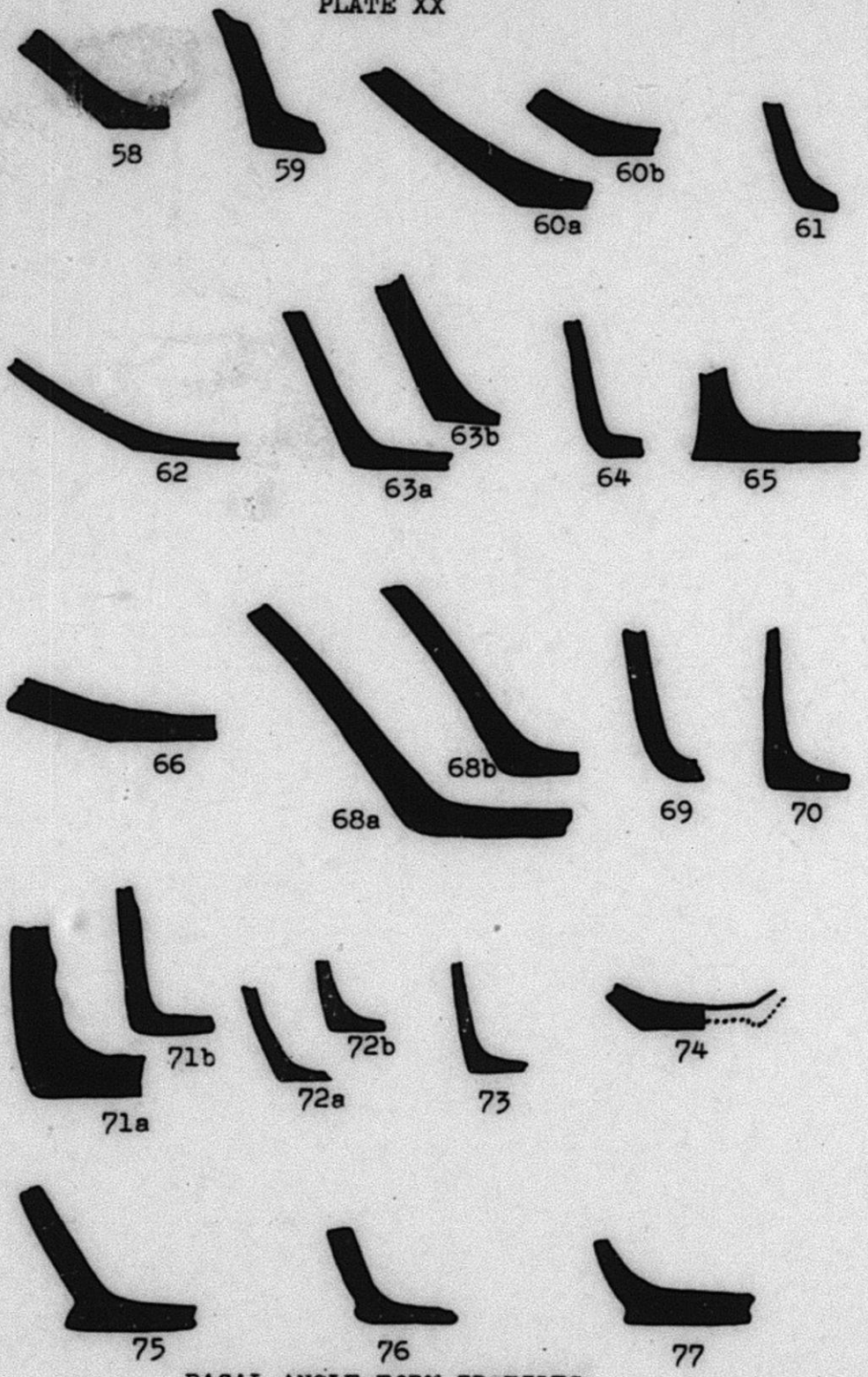
BASAL ANGLE FORM PROFILES

PLATE XIX



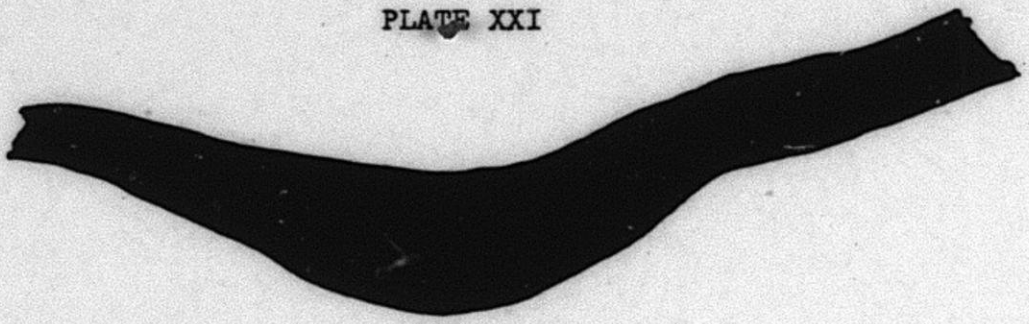
BASAL ANGLE FORM PROFILES

PLATE XX

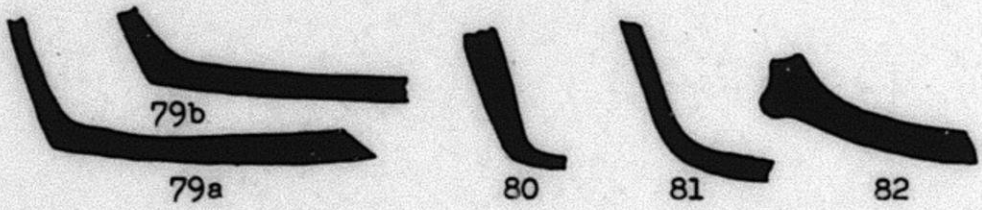


BASAL ANGLE FORM PROFILES

PLATE XXI



78



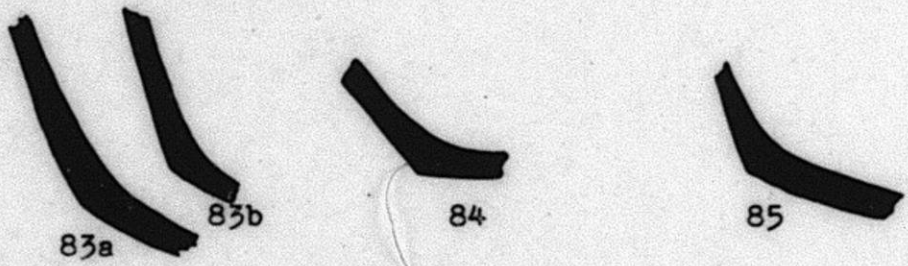
79b

79a

80

81

82



83a

83b

84

85



86a

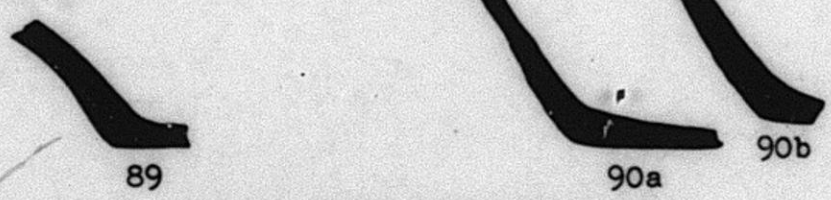
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87a

87b

88a

88b



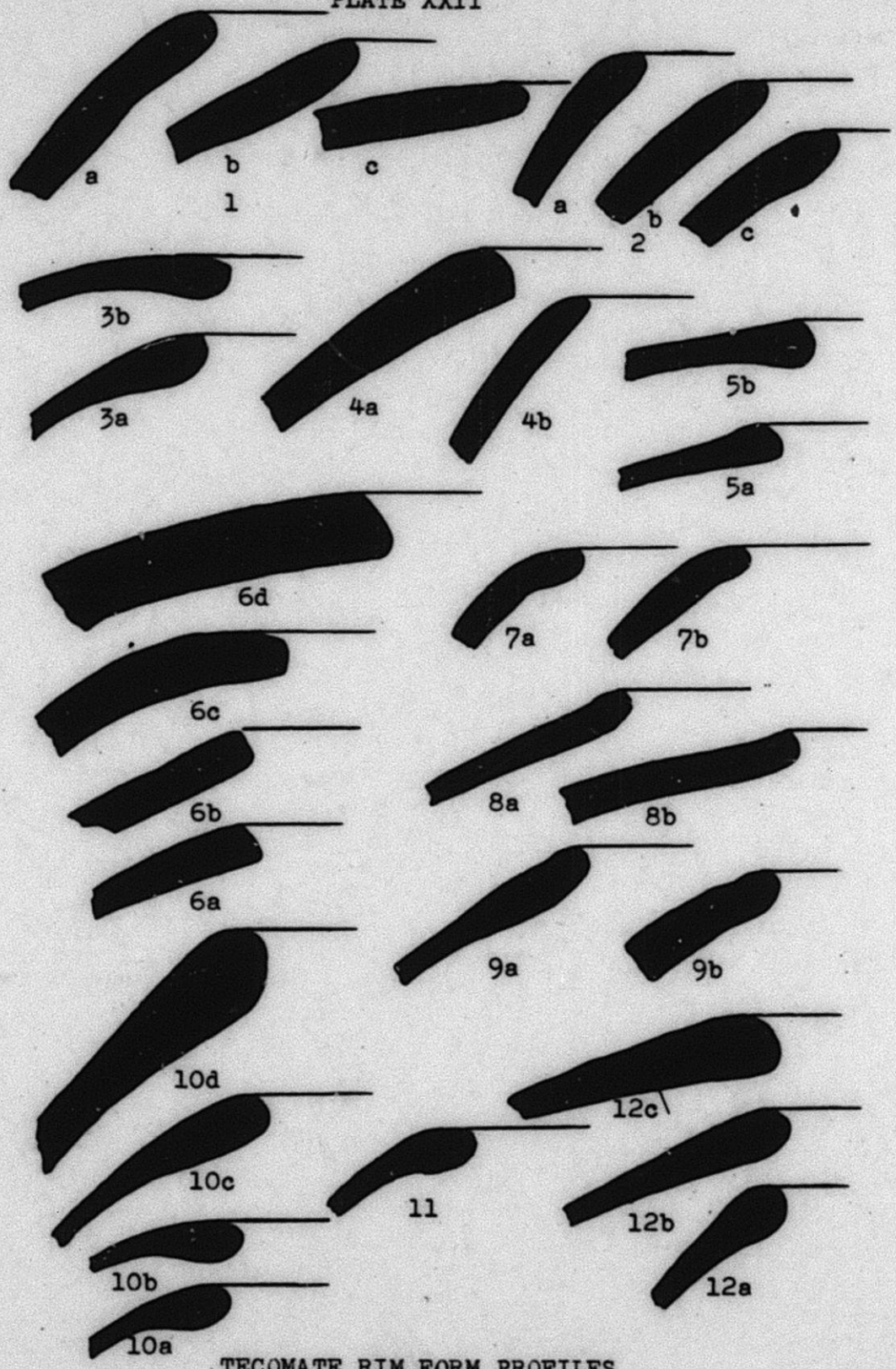
89

90a

90b

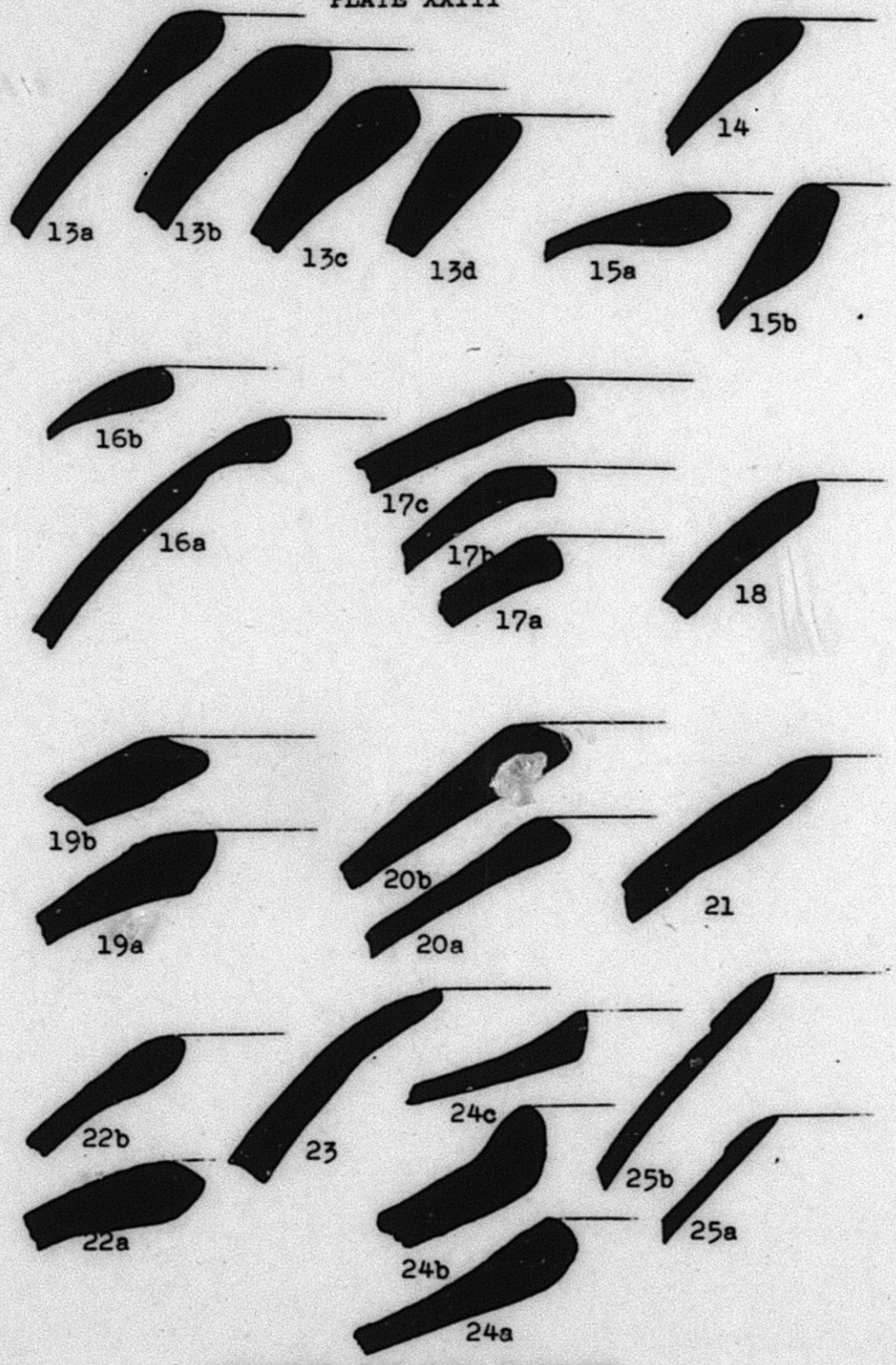
BASAL ANGLE FORM PROFILES

PLATE XXII



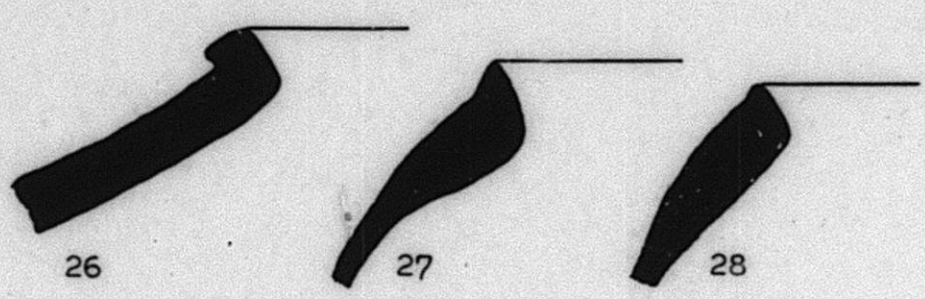
TECOMATE RIM FORM PROFILES

PLATE XXIII



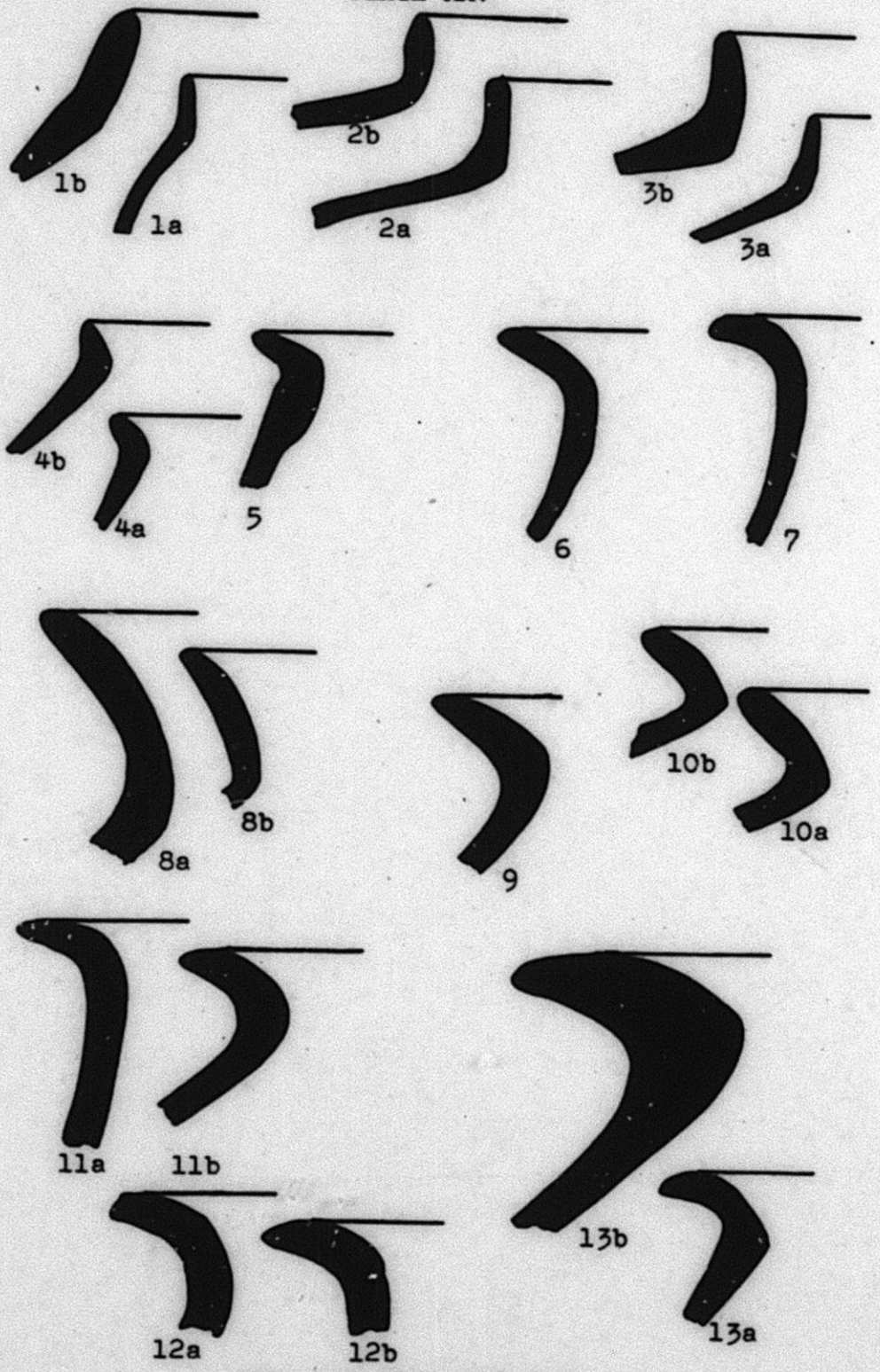
TECOMATE RIM FORM PROFILES

PLATE XXIV



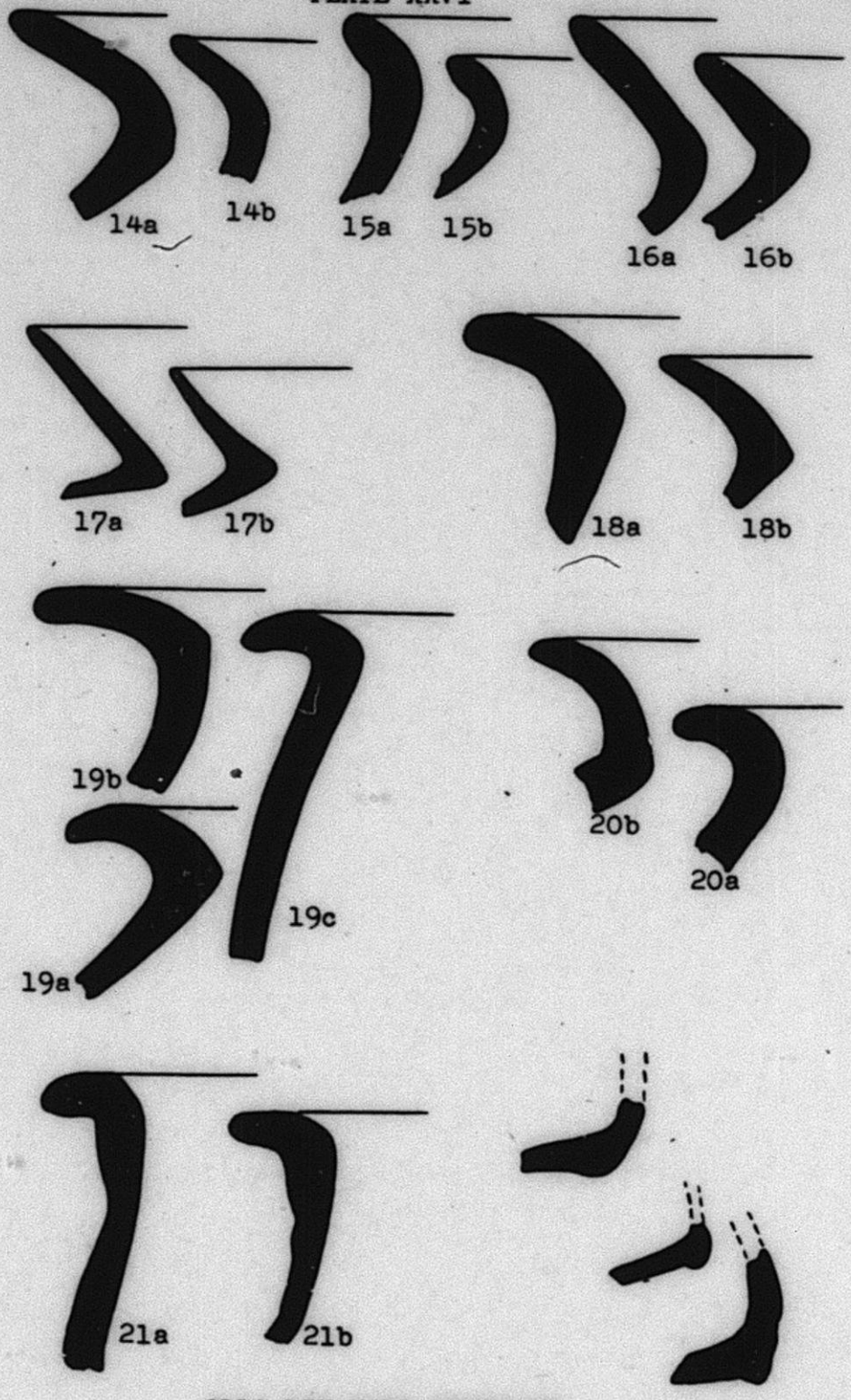
TECOMATE RIM FORM PROFILES

PLATE XXV



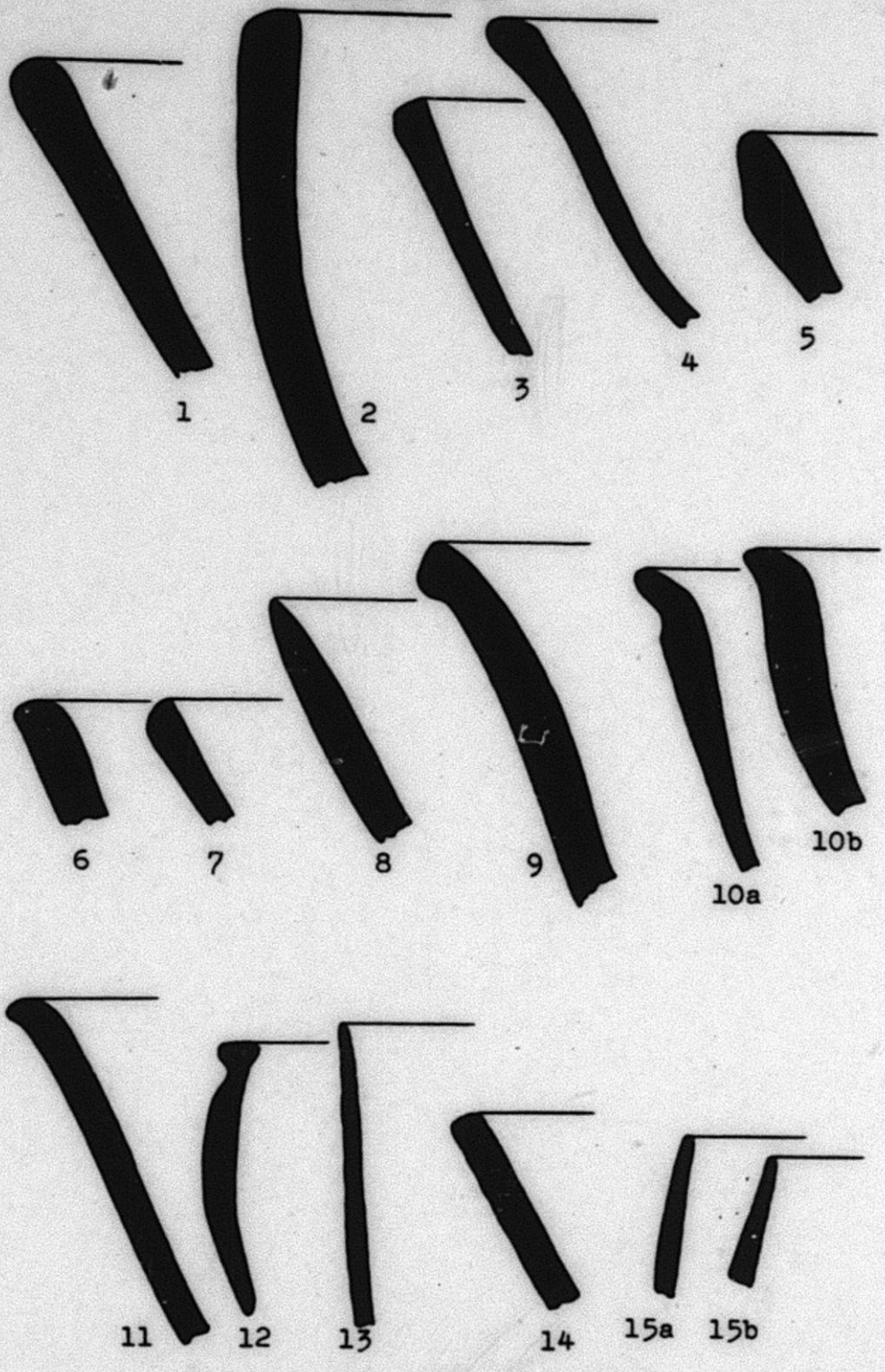
OLLA RIM FORM PROFILES

PLATE XXVI



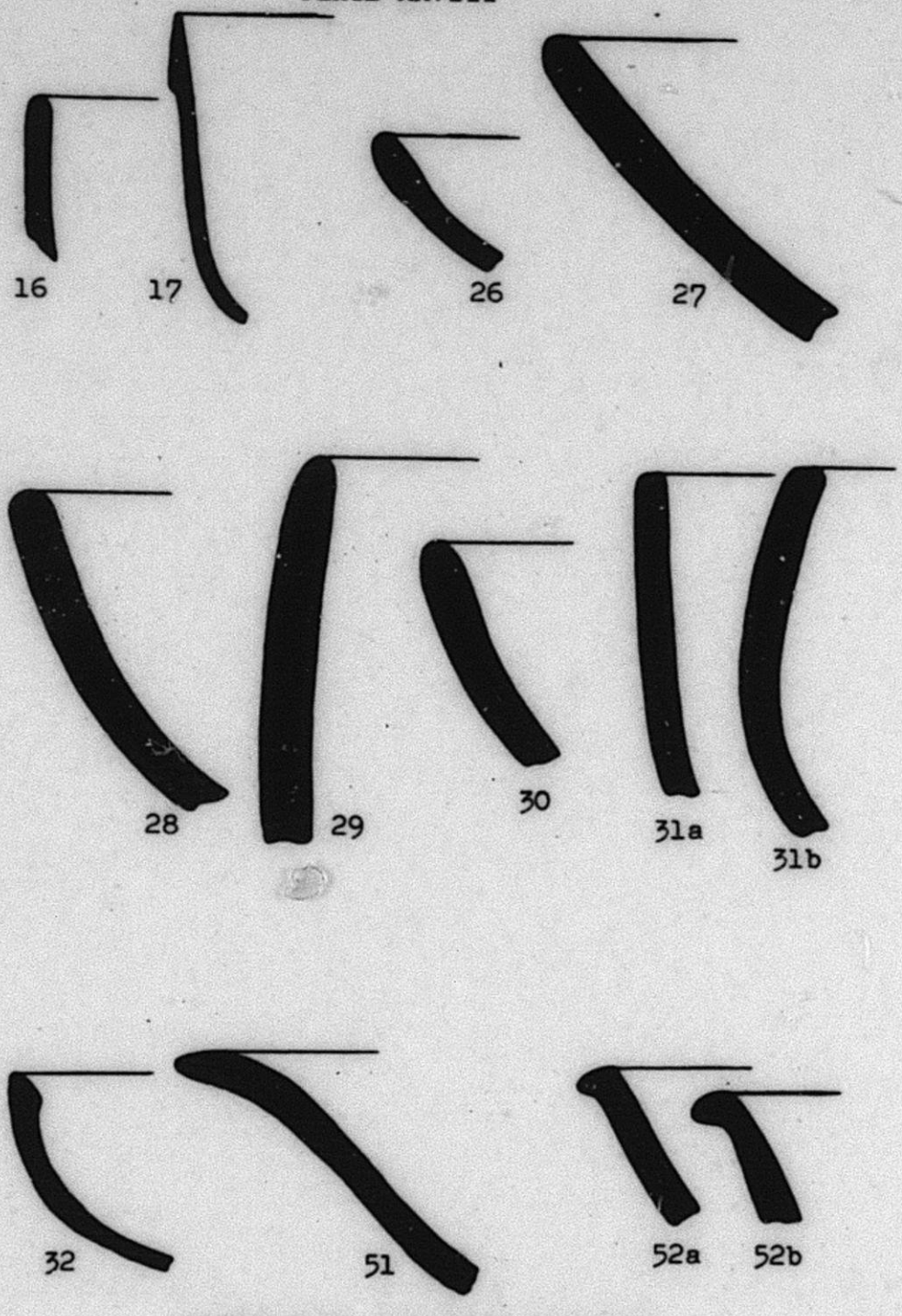
OLLA RIM FORM PROFILES

PLATE XXVII



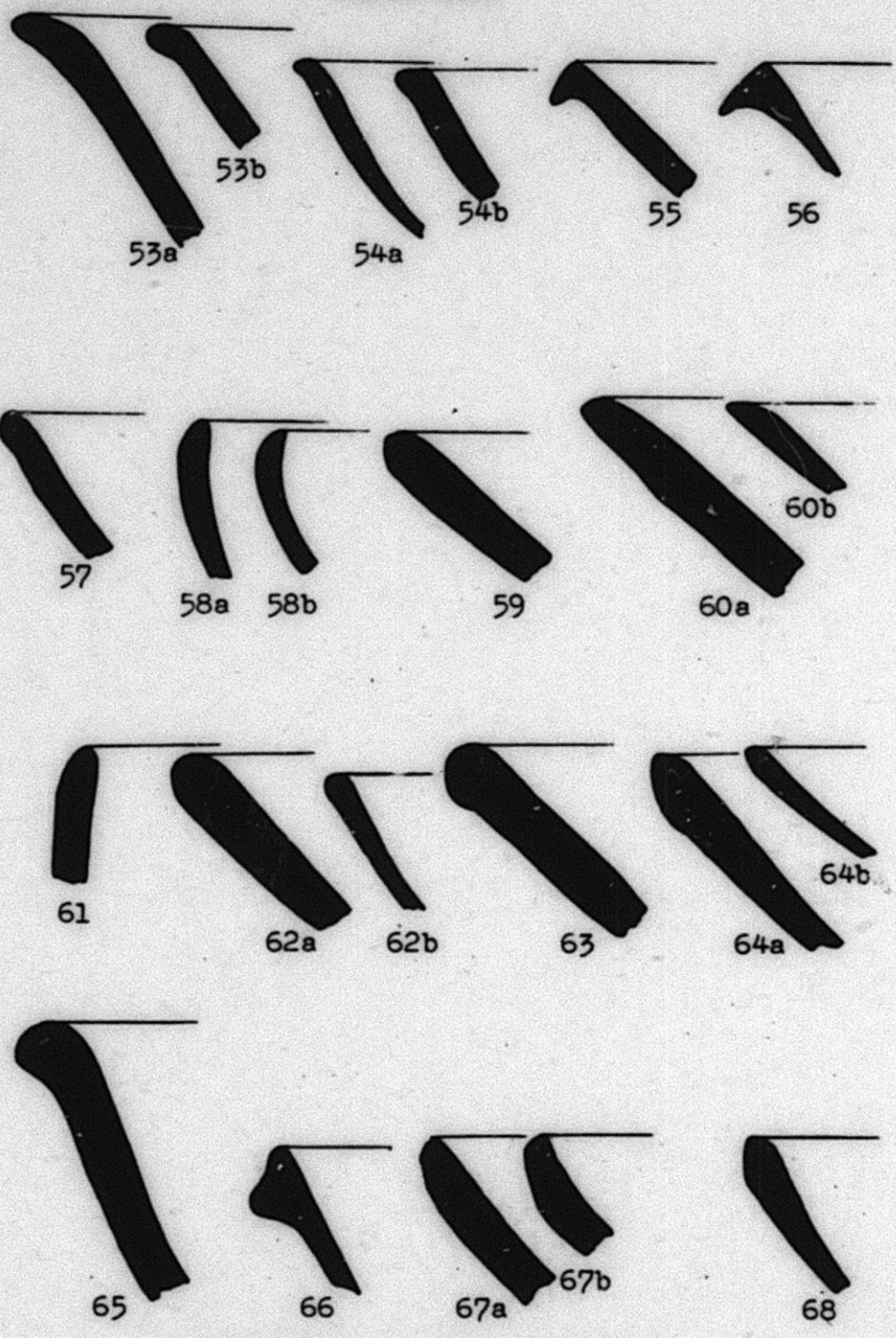
CONVEX BOWL RIM FORM PROFILES

PLATE XXVIII



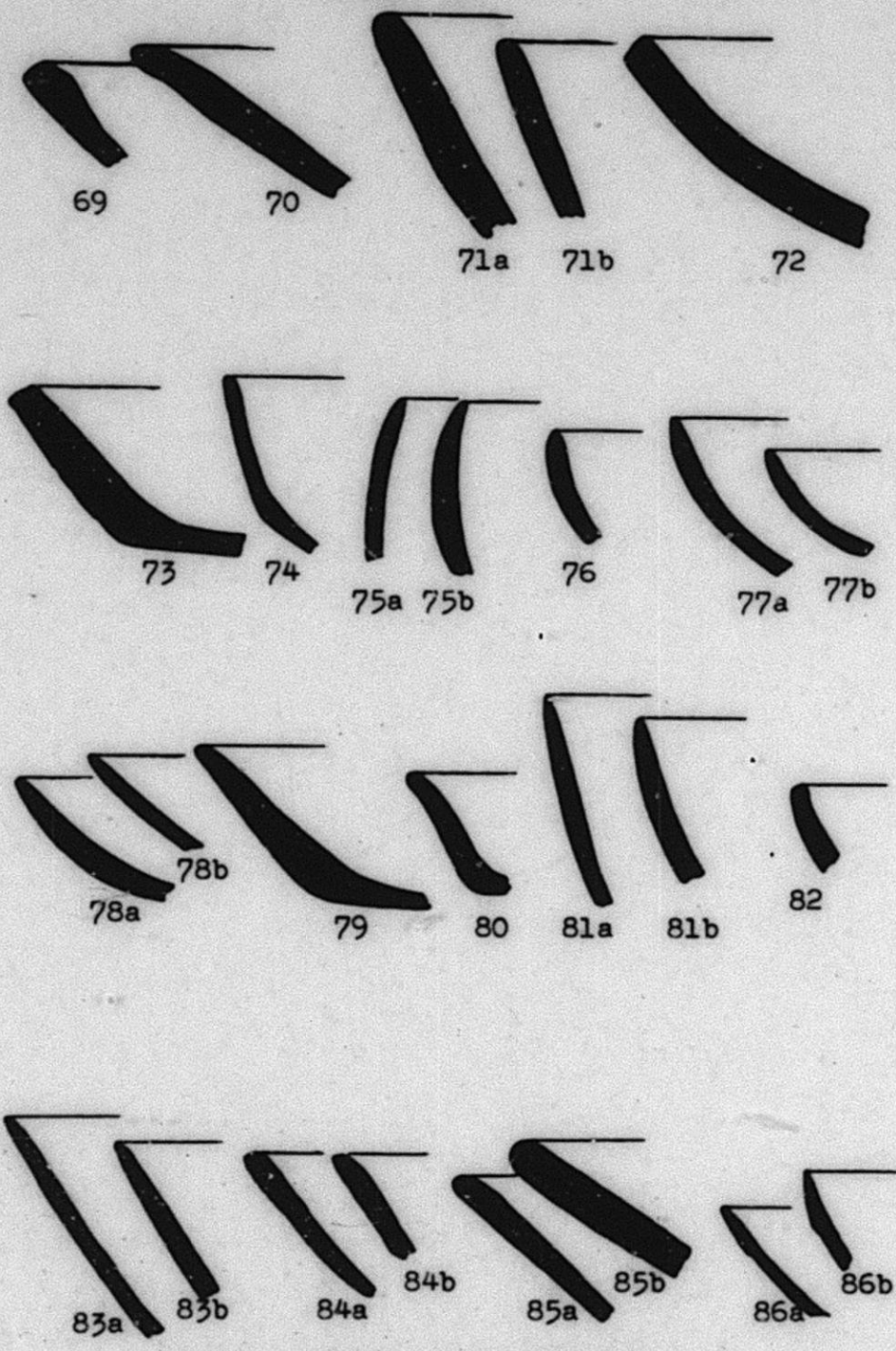
CONVEX BOWL RIM FORM PROFILES

PLATE XXIX



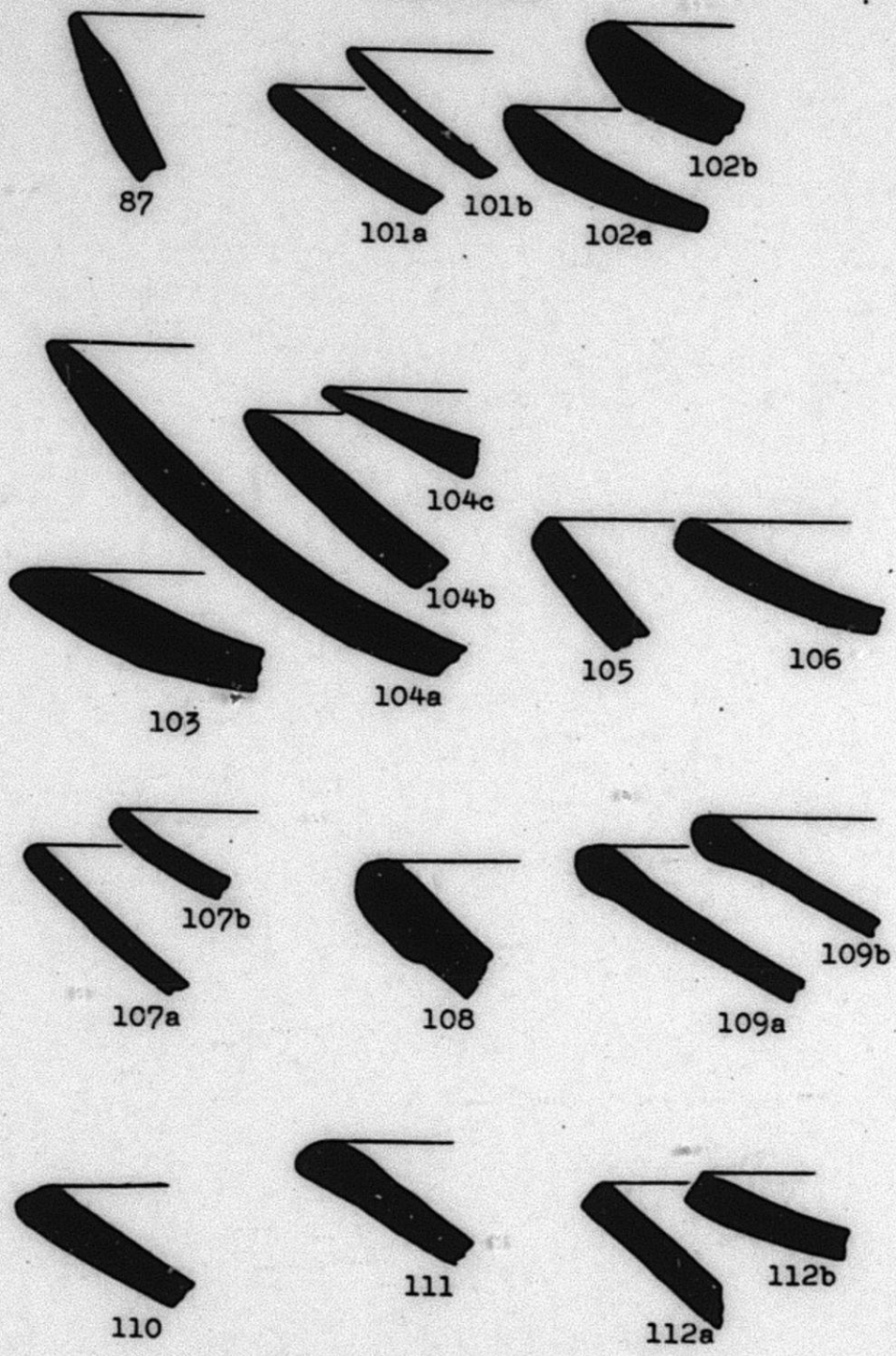
CONVEX BOWL RIM FORM PROFILES

PLATE XXX



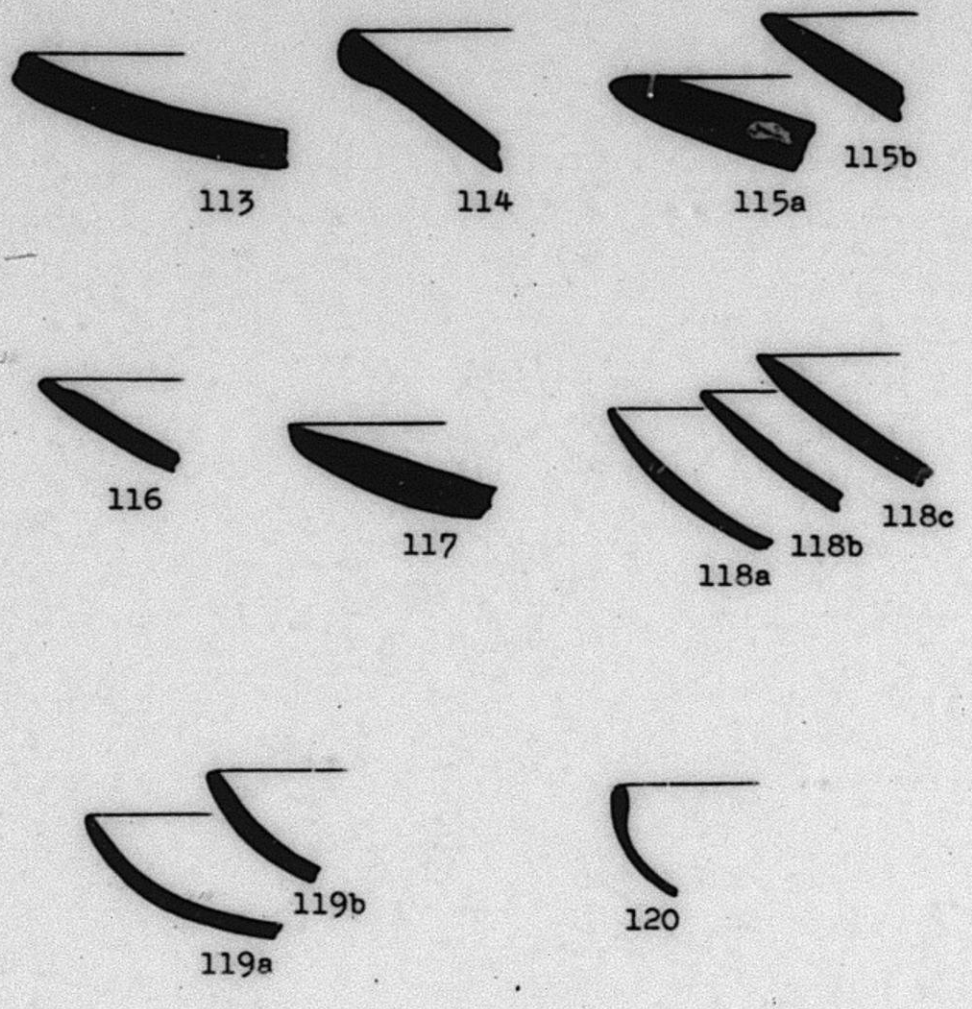
CONVEX BOWL RIM FORM PROFILES

PLATE XXXI



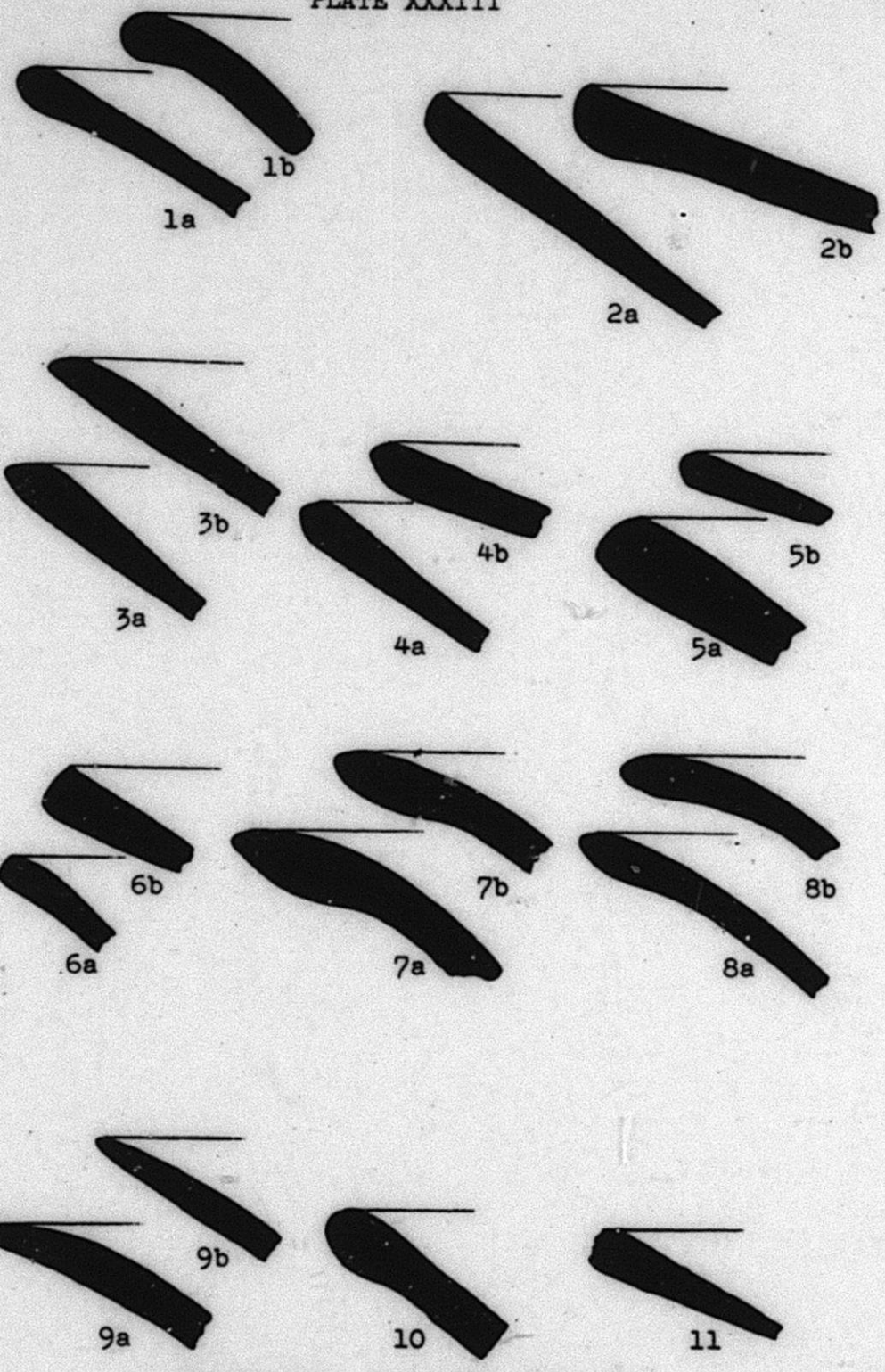
CONVEX BOWL RIM FORM PROFILES

PLATE XXXII



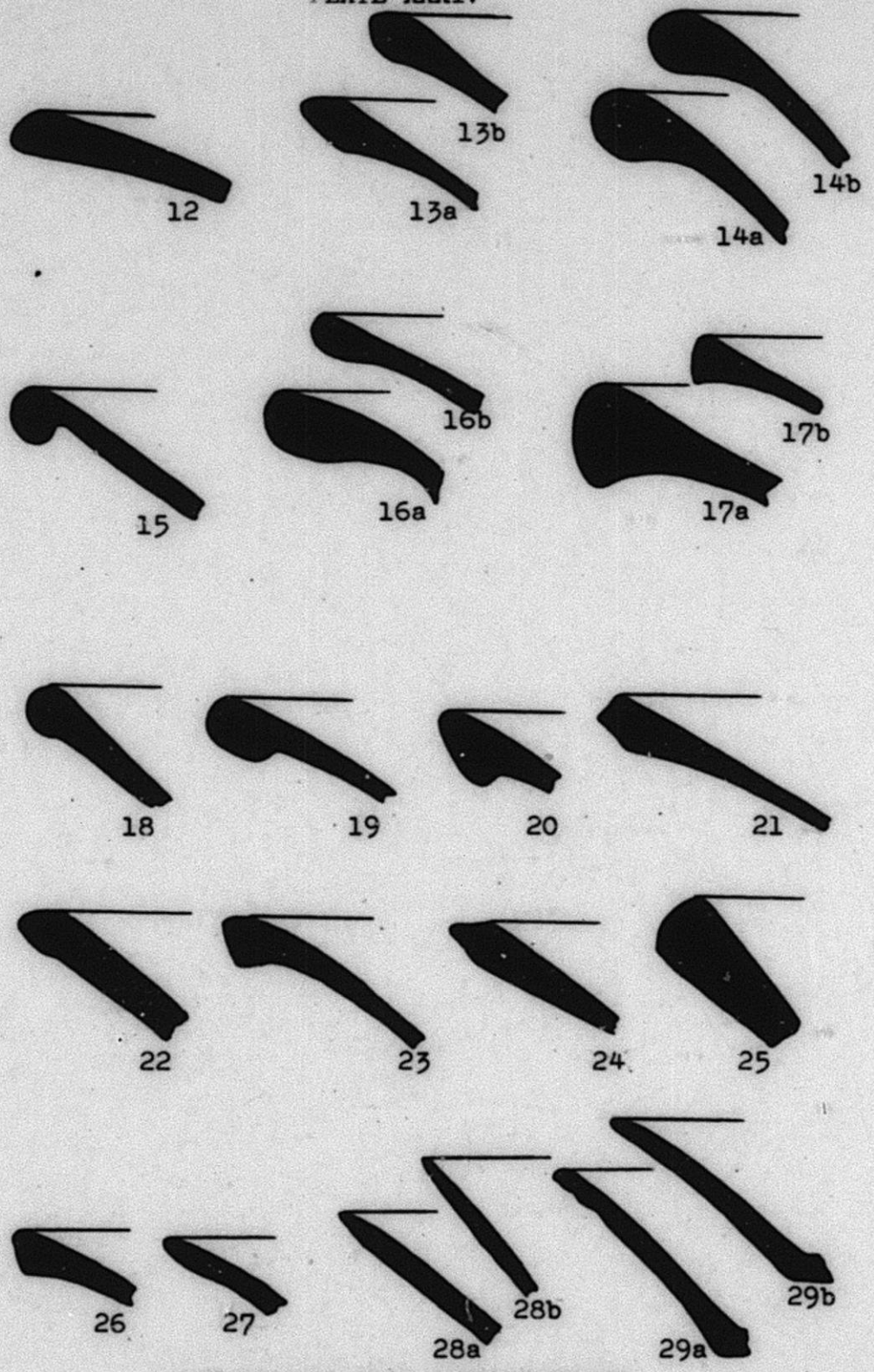
CONVEX BOWL RIM FORM PROFILES

PLATE XXXIII



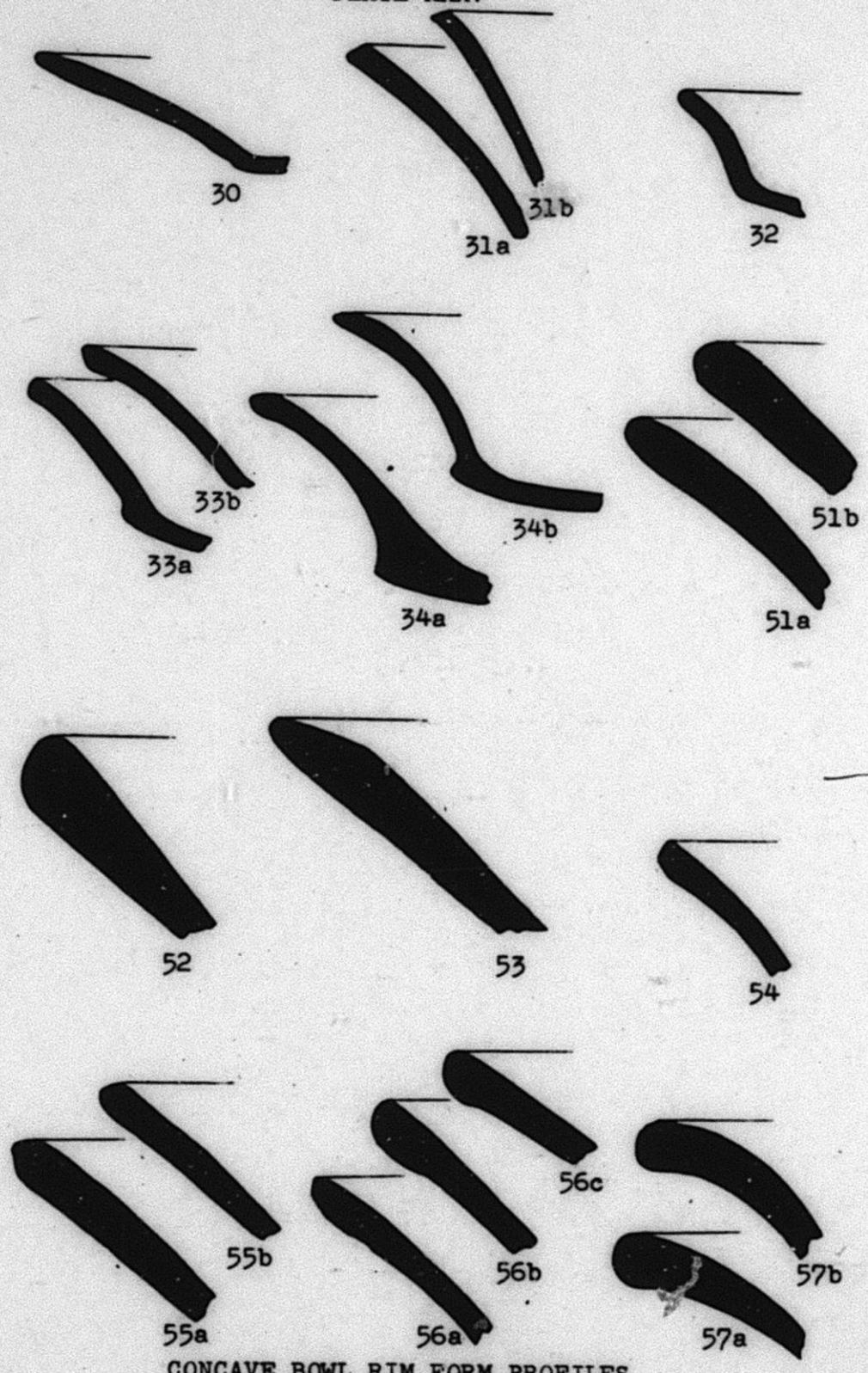
CONCAVE BOWL RIM FORM PROFILES

PLATE XXXIV



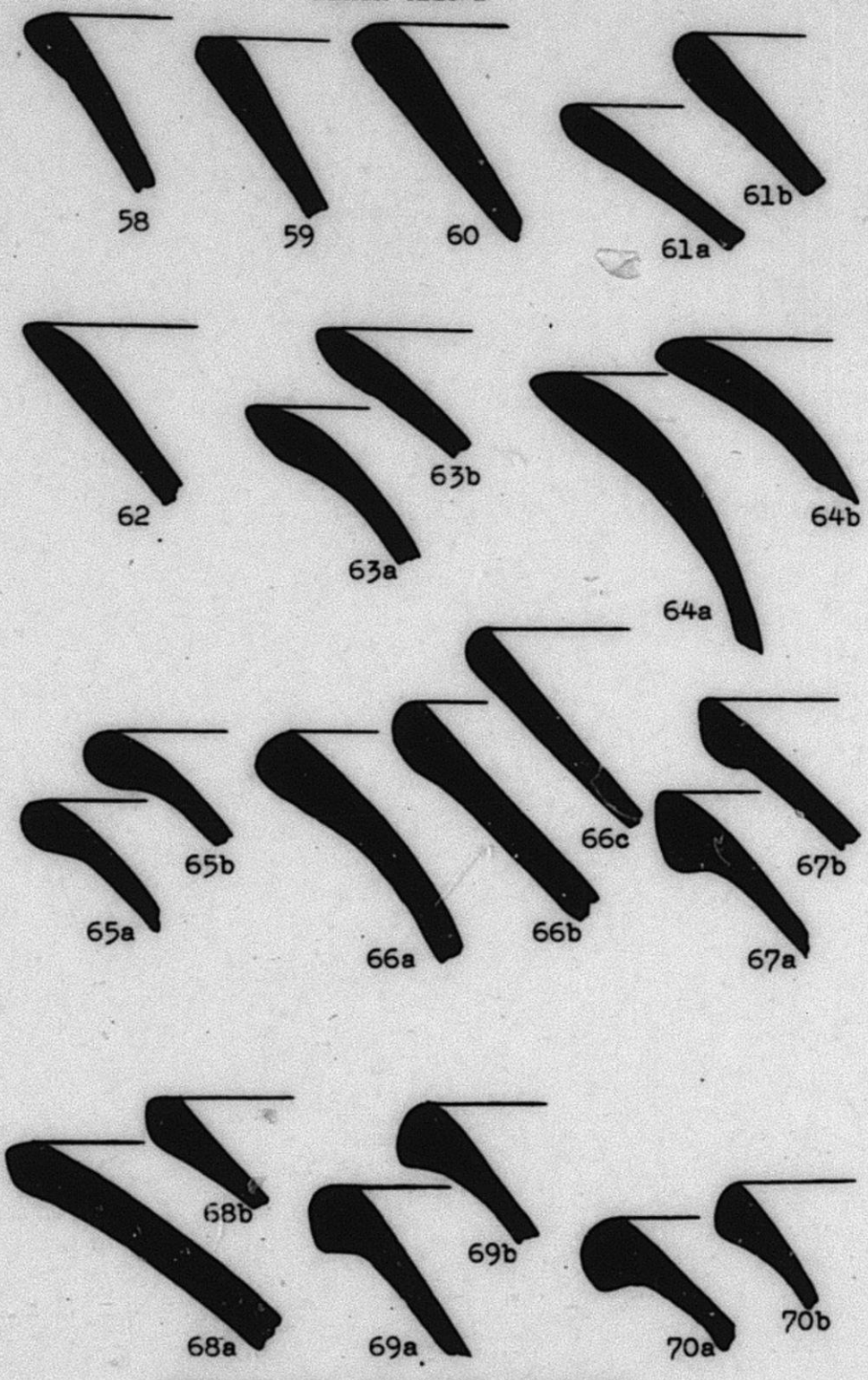
CONCAVE BOWL RIM FORM PROFILES

PLATE XXXV



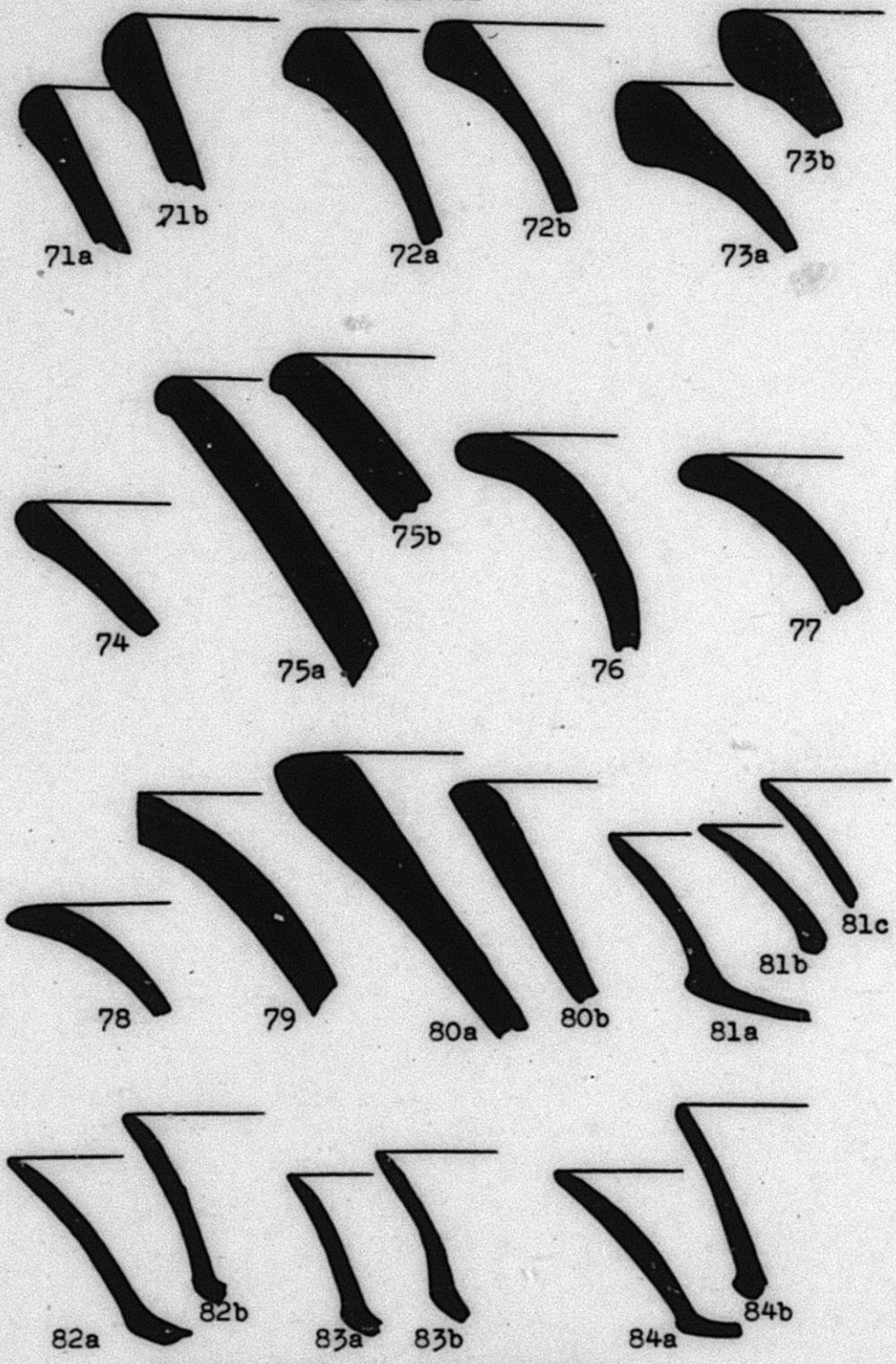
CONCAVE BOWL RIM FORM PROFILES

PLATE XXXVI



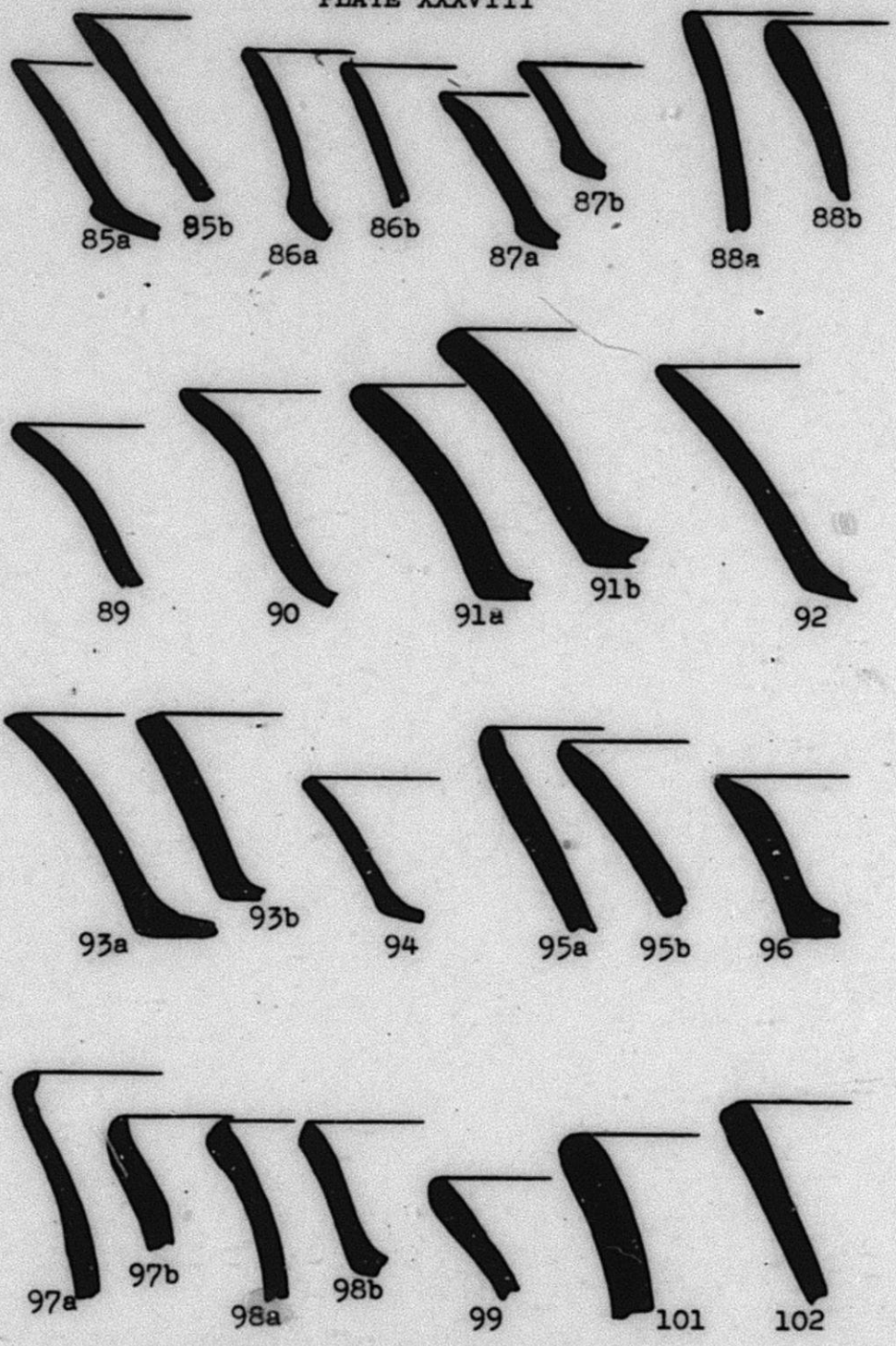
CONCAVE BOWL RIM FORM PROFILES

PLATE XXXVII



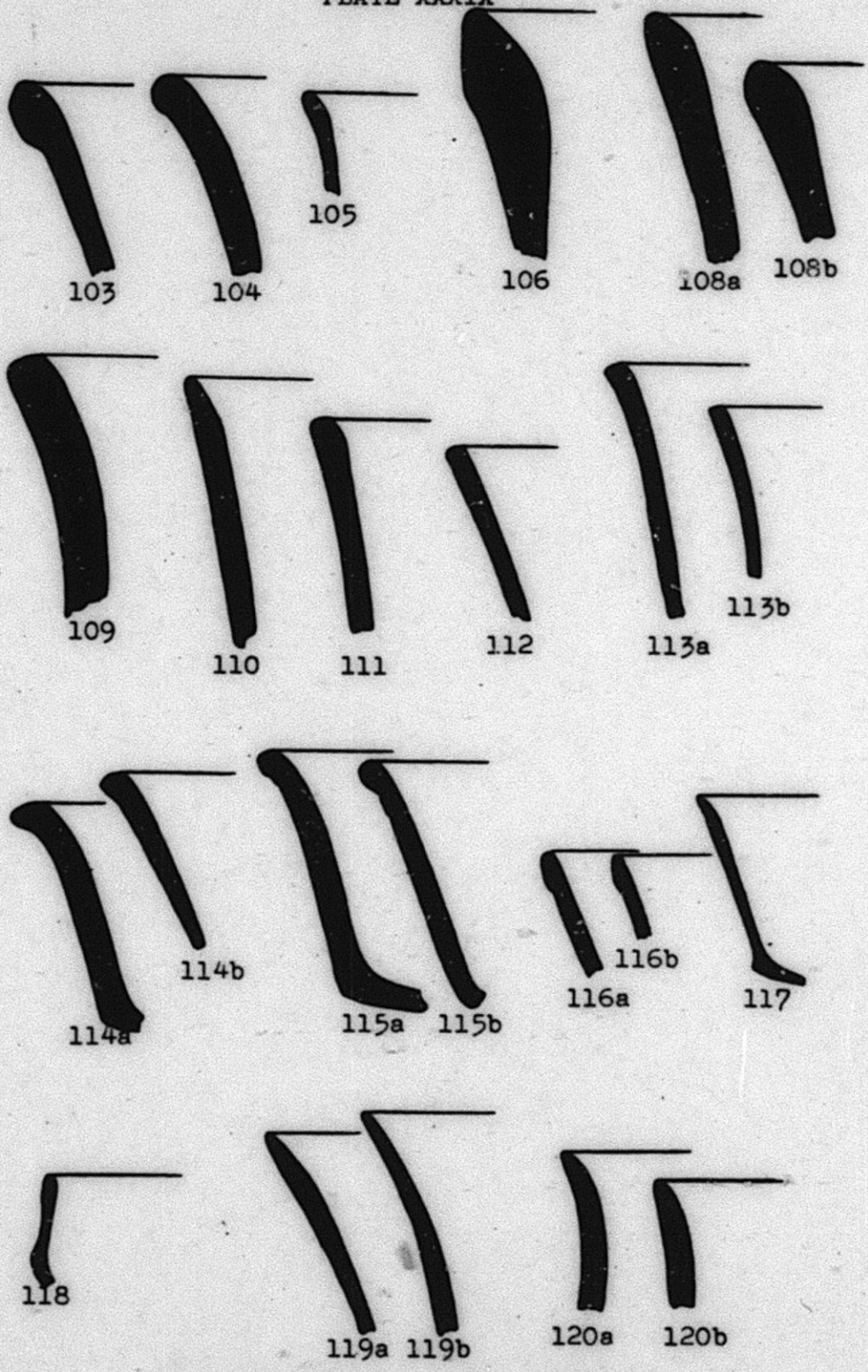
CONCAVE BOWL RIM FORM PROFILES

PLATE XXXVIII



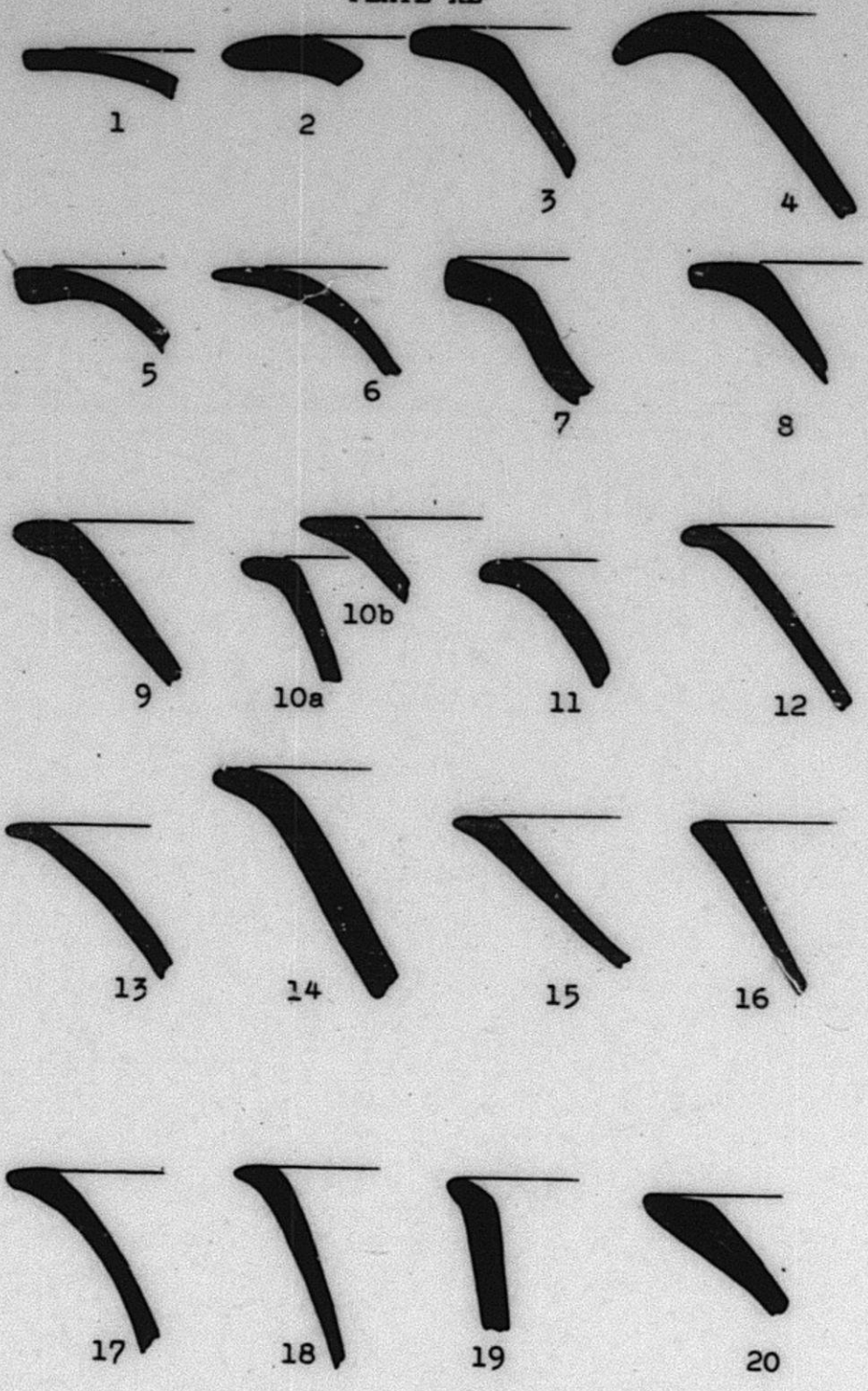
CONCAVE BOWL RIM FORM PROFILES

PLATE XXXIX



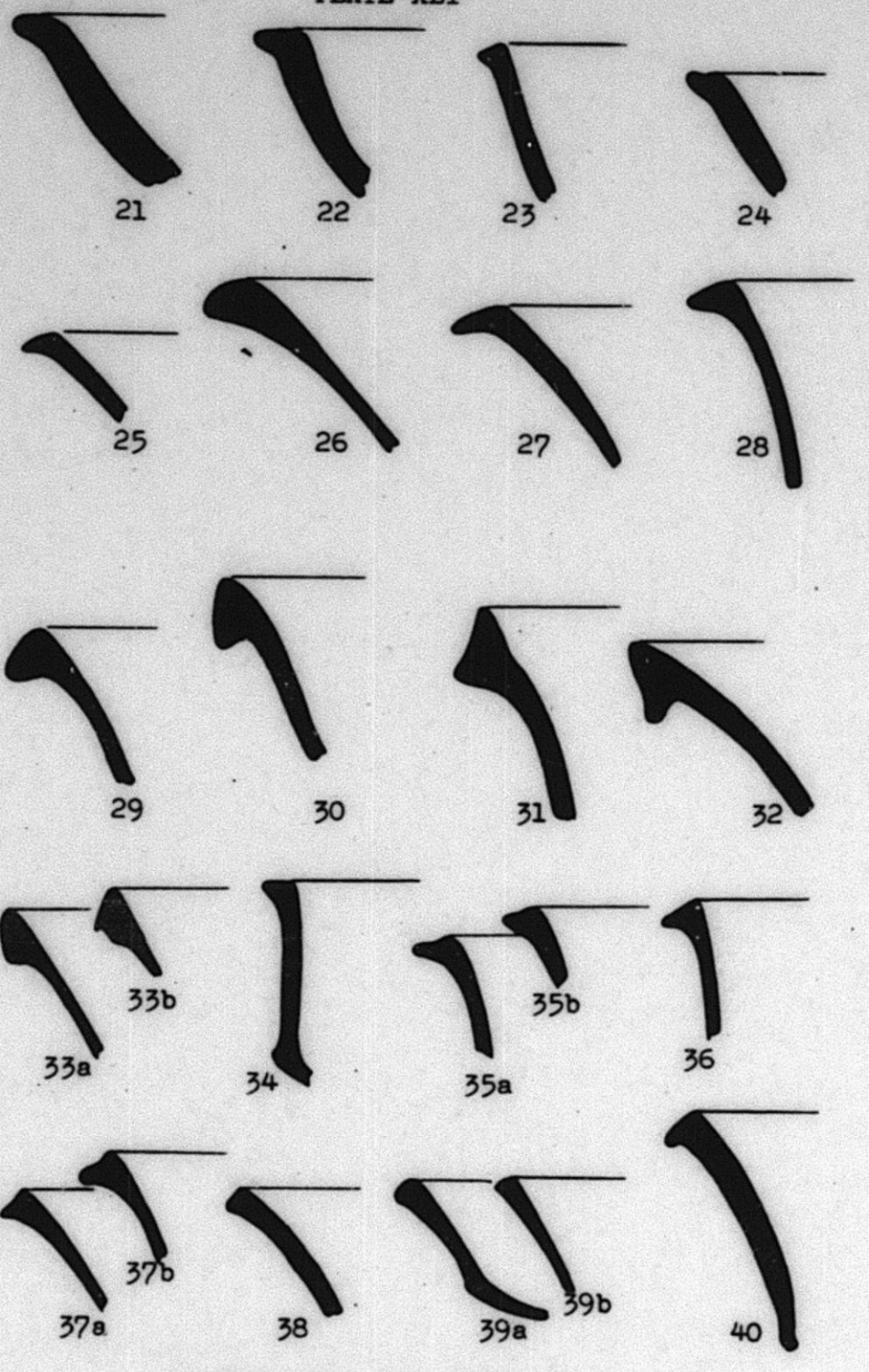
CONCAVE BOWL RIM FORM PROFILES

PLATE XL



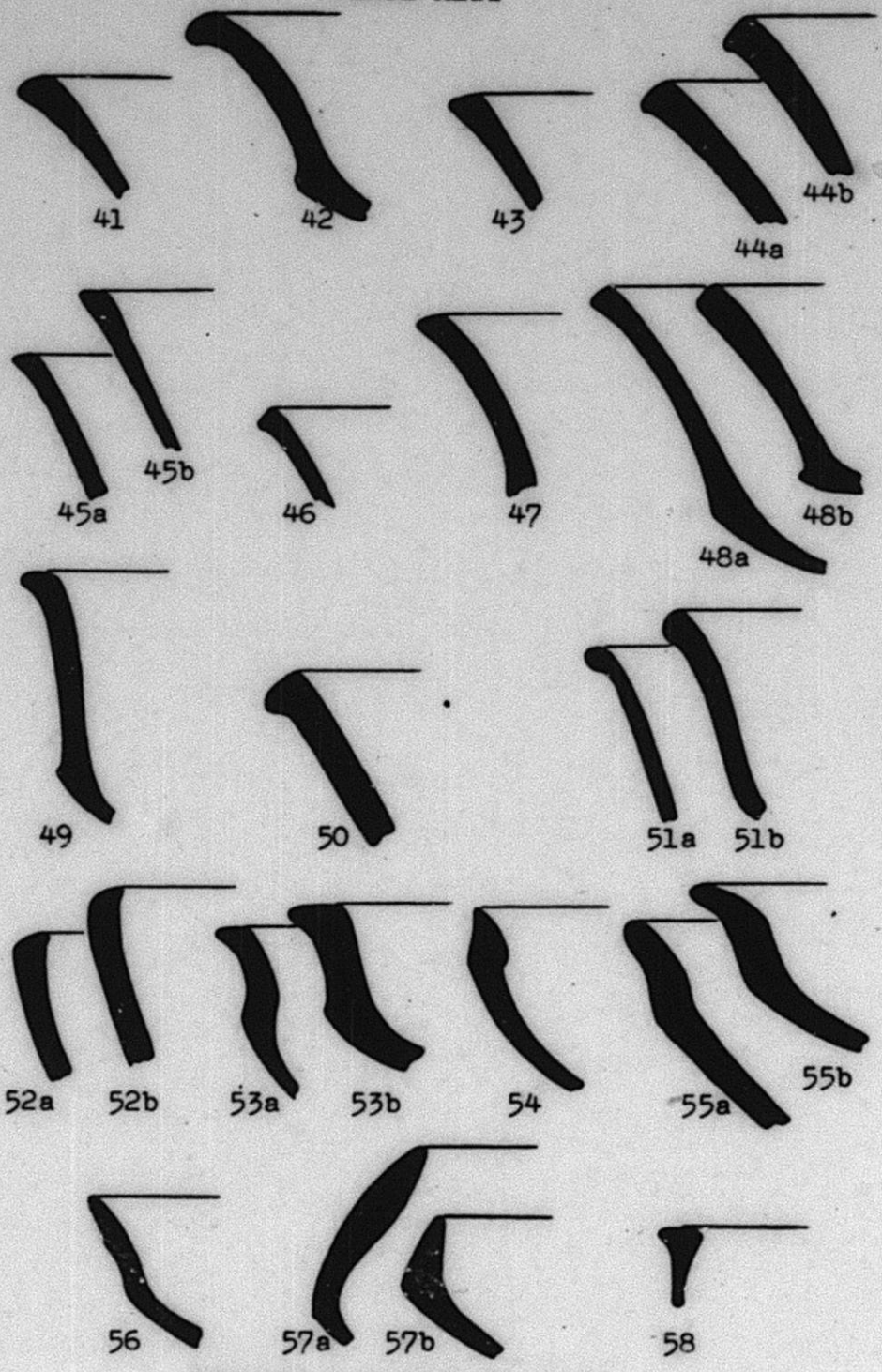
EVERTED RIM FORM PROFILES

PLATE XLI



EVERTED RIM FORM PROFILES

PLATE XLII



EVERTED RIM FORM PROFILES

complete wall profiles are seldom present. The convex bowls probably were spheroidal with unconstricted orifices. The form category has been organized into high, medium, and low profiles. Most examples of everted rims are included in Field 16.

Convex bowl rim forms are given in Plates XXVII through XXXII.

Concave Bowl Rim Form - Field 15 (Columns 26, 27, and 28)

The concave bowls are unrestricted and vary from a low out-flaring wall bowl to tall hyperboloid forms. Variations are grouped into high, medium, and low examples. Most everted rim forms are included in Field 16.

Concave bowl rim forms are given in Plates XXXIII through XXXIX.

Everted Rim Form - Field 16 (Columns 29 and 30)

Variations in everted rim forms apparently are of diagnostic value for much of southern Mesoamerica. The Sipolite everted rims therefore were placed in a separate form category in an endeavor to better test such a hypothesis. As is discussed below, everted rims do not seem to appear until relatively late times at Sipolite and the variations found in Chiapas and Guatemala, especially during the late Preclassic and early Classic, are missing from the Sipolite sequence. The separation of the everted rim forms was not entirely successful.

The rim width, degree of eversion, and vessel wall profile characteristics have served as the bases for defining attributes within the category.

Plates XL through XLII illustrate everted rim form attributes. Plate XLII has three profiles originally intended for Field 17.

Field 17 (Columns 31 and 32)

Field 17, intended for use in describing rim forms for unusual or compound silhouette vessels, was used for studying cord- or twine-marked sherds. A few dozen coarse temper sherds, mostly of reddish-brown paste, seemed to bear cord impressions. It was suspected that the vessels had been cord-marked and that subsequent smoothing or polishing had removed most traces of the markings. A similar technique has been noted on the Pacific coast of Guatemala.[4] Careful study of the Sipolite examples led to the conclusion that the impressions were not results of cord-marking but of the removal and/or dragging of coarse inclusion grains. Field 17 should be disregarded.

Decoration - Field 18 (Columns 33, 34, and 35)

Decoration of Sipolite ceramics is described on the bases of design variations and their placement on the vessel and the methods of decoration. So much as is possible terminology follows that used by Robert Smith.[5] The catalog presents written descriptions as well as drawings or photographs when such seem advisable. Unless otherwise stated, all decoration is on the exteriors of vessel walls. Also, all fillet decorations are found around the exterior bases of vessel walls, unless specified otherwise.

It is quite likely that some listed attributes are but minor variants of others, as is discussed in that section dealing with modes. Also, it is probable that single vessels carried several

attributes listed here as discrete units since more complicated designs contain combinations that elsewhere may appear alone. Therefore, each design combination is considered a distinctive attribute.

001 - Finger-punched fillet around the basal angle of a vessel

002 - Painted red band above base with white area above it

003 - Two incised parallel lines around base

004 - Single painted red band around base

005 - Finger-punched fillet with a painted red band above it

006 - Incised "cursive" wavy line enclosed within two parallel incised lines around base (see Plate XLVI, 116 for example)

007 - Two parallel groove incised lines around base with red paint between lines

008 - Series of three to five light polish parallel lines on base interior going outwards to wall

009 - Painted dark brown line around base

010 - Two parallel polished lines circling base of interior wall

011 - Series of two to five incised lines descending to base (Plate XLIII)

012 - Two incised lines around base with painted red and graphite bands (Plate XLIII)

013 - Band of red paint around base and outer margins of base

014 - Series of converging incised lines swooping towards wall on interior base (Plate XLIII)

015 - Three parallel and evenly spaced ("comb-incised") incised lines around interior wall base (Plate LII)

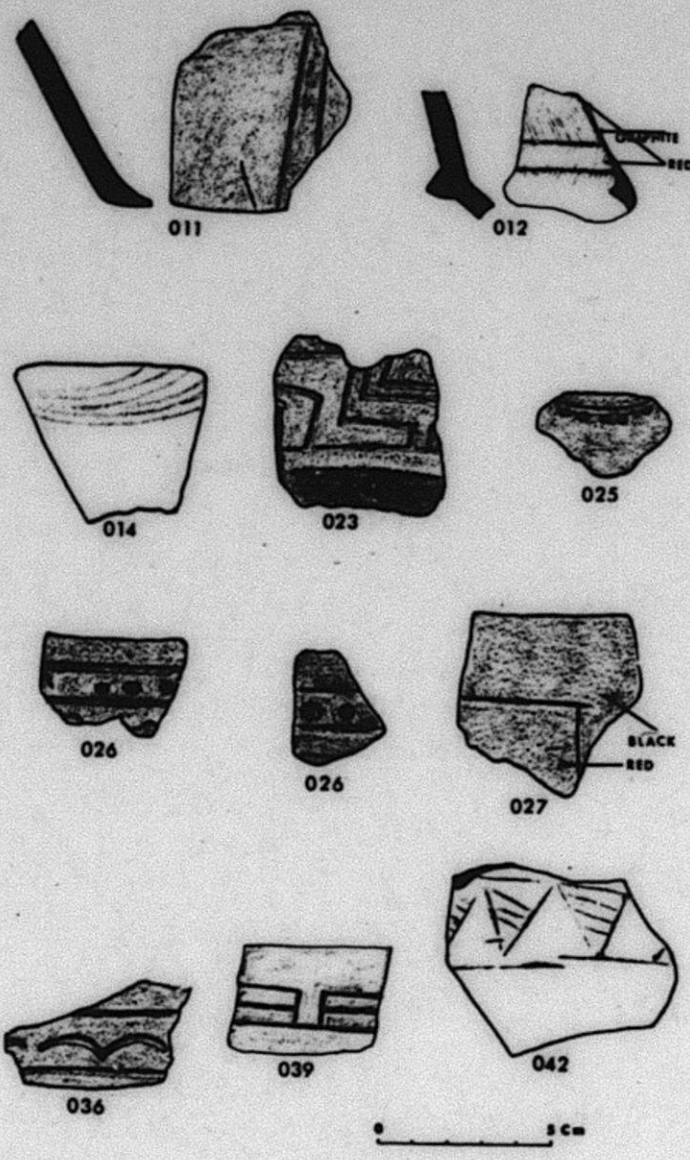
016 - Two comb-incised lines around interior wall base

017 - One incised line around base

018 - One incised line around base with painted red band above line

019 - Stick-notched fillet (evidently made by vertically impressing the fillet with a sharp cornered instrument)

PLATE XLIII



DECORATION ATTRIBUTES 011 THROUGH 042

020 - Finger-punched fillet with incised line above it

021 - Two or three painted black lines above finger-punched fillet

022 - Finger-punched fillet with finger-punched fillet going vertically up wall (Plate XLVI, 120)

023 - Incised multiple step on wall (Plate XLIII)

024 - Incised cross-hatching, design unknown

025 - Horizontal line of bosses (Plate XLIII)

026 - Two parallel incised lines with gouged dots between them (Plate XLII)

027 - Incised lines separating painted red and black areas (Plate XLIII)

028 - One line incised around rim

029 - One groove incised line around rim

030 - Two lines incised around rim

031 - Two or three fine lines comb-incised on vessel rim

032 - Finger gouging across vessel rim

033 - Red painted rim

034 - Red painted rim with red band of less than one centimeter around inside lip

035 - One line incised around inside rim

036 - Incised cursive wavy line enclosed within two incised lines around rim (Plate XLIII)

037 - Small horizontal appliqued tab on vessel rim with punctated dots on upper surface of tab

038 - Red paint on rim and red dots enclosed within incised lines

039 - Incised rectangular design (Plate XLIII)

040 - Graphite painted band two centimeters wide around interior rim

041 - Incised cursive wavy line between parallel lines of uncertain location

042 - Downward pointing sloppily incised triangles filled with horizontal hatching (Plate XLIII)

043 - Same as 042 but with incision being neat and precise (Plate XLIV)

044 - Incised horizontal chevrons (Plate XLIV)

045 - Sloppily incised lines with sherd surface pecked with sharp instrument (Plate XLIV)

046 - Three parallel incised lines around rim

047 - Painted red hematite band three centimeters wide around rim

048 - Upwards pointing sloppily incised triangles with horizontal hatching around rim in band (Plate XLIV)

049 - Same as 048 but with incision being neat and precise (Plate XLIV)

050 - Red painted design, size and form uncertain

051 - Upwards pointing truncated triangle filled with horisontal wavy lines (Plate XLIV)

052 - Incised cursive wavy line within parallel lines around base and with wavy polished lines on interior of base

053 - Incised line design (Plate XLIV)

054 - Painted red hematite band two centimeters wide inside and outside rim

055 - Red hematite spots on orange slip or paint in band around rim

056 - Incised line with gouged tics (Plate XLIV)

057 - Series of incised vertical lines within horizontal lines around rim (Plate XLIV)

058 - Deep bosses two centimeters across punched from exterior to interior (Plate XLIV)

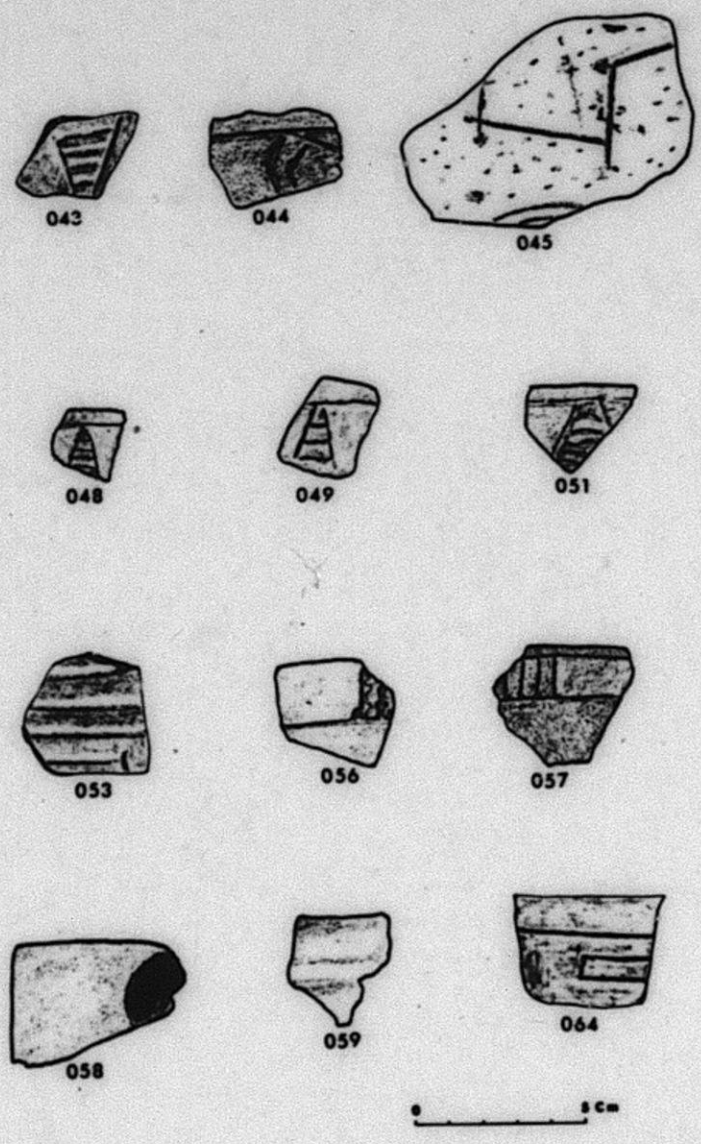
059 - Horizontal molding circling vessel near rim (Plate XLIV)

060 - Painted black band two centimeters wide around interior rim

061 - Painted white rim

062 - Three incised parallel lines around outside rim, red paint on rim and covering exterior wall

PLATE XLIV



DECORATION ATTRIBUTES 043 THROUGH 064

063 - One groove incised line around inside rim

064 - Incised rectangular design (Plate XLIV)

065 - Two parallel incised lines around rim with red paint below first line to base

066 - Finger-punched rim

067 - Incised meander around rim (Plate XLV)

068 - Two parallel incised lines around rim with red paint below second line to base

069 - Incised design with tics off the lines (Plate XLV)

070 - Incised diagonal parallel and horizontal lines (Plate XLV)

071 - Two incised parallel lines around rim with red paint covering all of exterior

072 - One incised line around rim and red paint on rim

073 - Two incised parallel lines around rim and finger-punched fillet around base

074 - Two incised parallel lines around rim and red paint on rim

075 - Two incised parallel lines around rim and red paint covering outside and rim

076 - Two incised parallel lines around rim with red paint on rim and below second line to base

077 - Two incised parallel lines around rim with red paint between lines

078 - Two incised parallel lines around rim with red paint above second line to rim

079 - Incised rectangular design (Plate XLV)

080 - Incised rectangular design around rim (Plate XLV)

081 - Gouged design in panel (Plate XLV)

082 - Incised angle of two parallel lines (Plate XLV)

083 - Sloppily incised right-pointing triangles in vertical band (Plate XLV)

084 - Incised design (fragment of S-curve?) (Plate XLV)

085 - Sloppily incised down-pointing truncated triangles horizontally hatched and in series around rim

086 - Two incised curving lines with red paint covering vessel exterior (see Plate XLV, 096 for similar design)

087 - Two parallel groove incised lines around inside rim

088 - Notched rim

089 - One incised line around rim with red paint below it

090 - Painted graphite and deep red design (the design apparently consists of graphite rectangles, perhaps forming a meander, with red paint above and below)

091 - Graphite paint, with design and association unknown

092 - Groove incised panel and design (Plate XLV)

093 - Incised and punctated panel and design (Plate XLV)

094 - Down-pointing painted red chevron

095 - Down-pointing painted red chevron with red band around wall base

096 - Incised design separating red and graphite paint (Plate XLV)

097 - Groove incised repeated design (Plate XLV)

098 - Sloppily incised S-design in double rows (Plate XLV)

099 - Small appliqued horizontal tab on exterior rim

100 - Irregular zigzag incised vertical lines (Plate XLVI)

101 - Small horizontal protuberances from slightly everted rim (Plate XLVI)

102 - Red paint covering interior surface

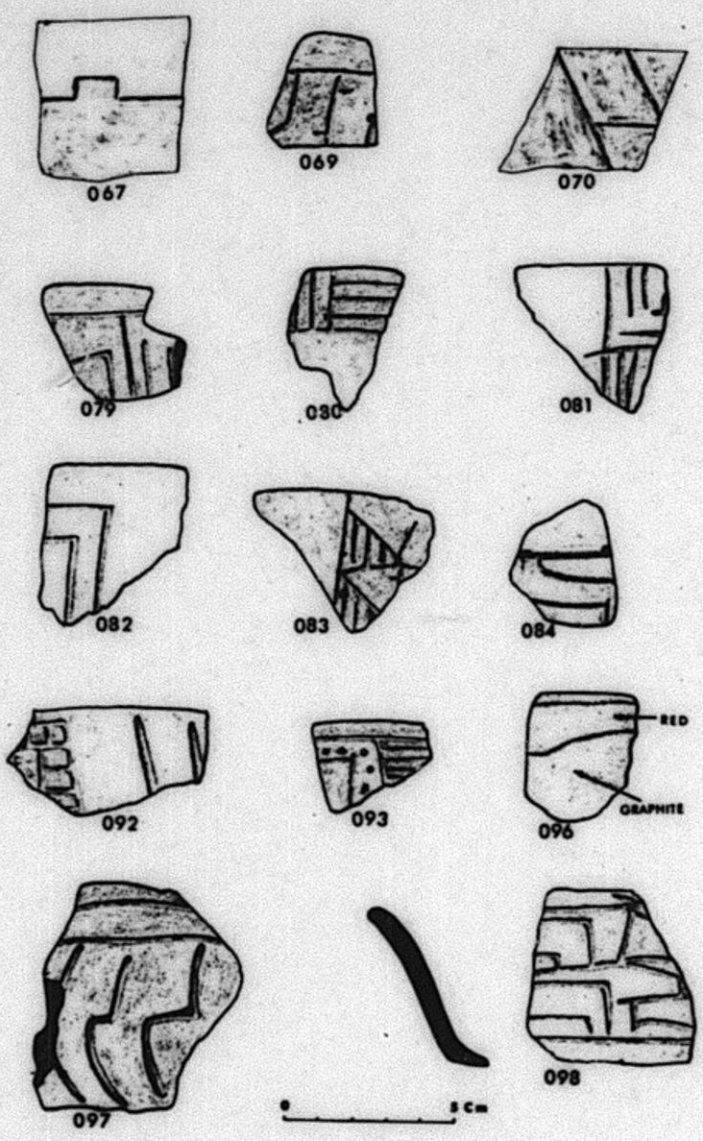
103 - Graphite paint on rim and red band around rim

104 - Single fine incised line on rim with red paint on rim

105 - Red paint covering rim and exterior wall

106 - Regular incised vertical zigzag lines with red paint covering exterior (Plate XLVI)

PLATE XLV



DECORATION ATTRIBUTES 069 THROUGH 098

107 - Incised design (Plate XLVI)

108 - Incised design (meander?) with enclosure filled with red paint (Plate XLVI)

109 - Red painted design consisting of band around base and long rectangles rising from line

110 - Deep vertical gadooning from base and up vessel wall for unknown distance (Plate XLVII)

111 - Polished wavy lines on interior base (Plate XLVI)

112 - Narrow excised design at base, exterior covered with red paint (Plate XLVI)

113 - Group of incised lines going out to wall on base interior

114 - Three comb-incised lines around inside base of wall and swooping out to wall base

115 - Three comb-incised lines around inside base and in straight and wavy patterns on base interior (Plate XLVII)

116 - Incised cursive design around base with incised design above (double terrace pattern?) (Plate XLVI)

117 - Identical with 107

118 - Regular incised vertical zigzag lines (Plate XLVI)

119 - Three parallel lines around rim with small gouges between them (Plate XLVII)

120 - Incised cursive and parallel lines with long, narrow gouges between them and vertical finger-punched fillet going down wall to base (Plate XLVI)

121 - Wide excised grooves around rim (Plate XLVI)

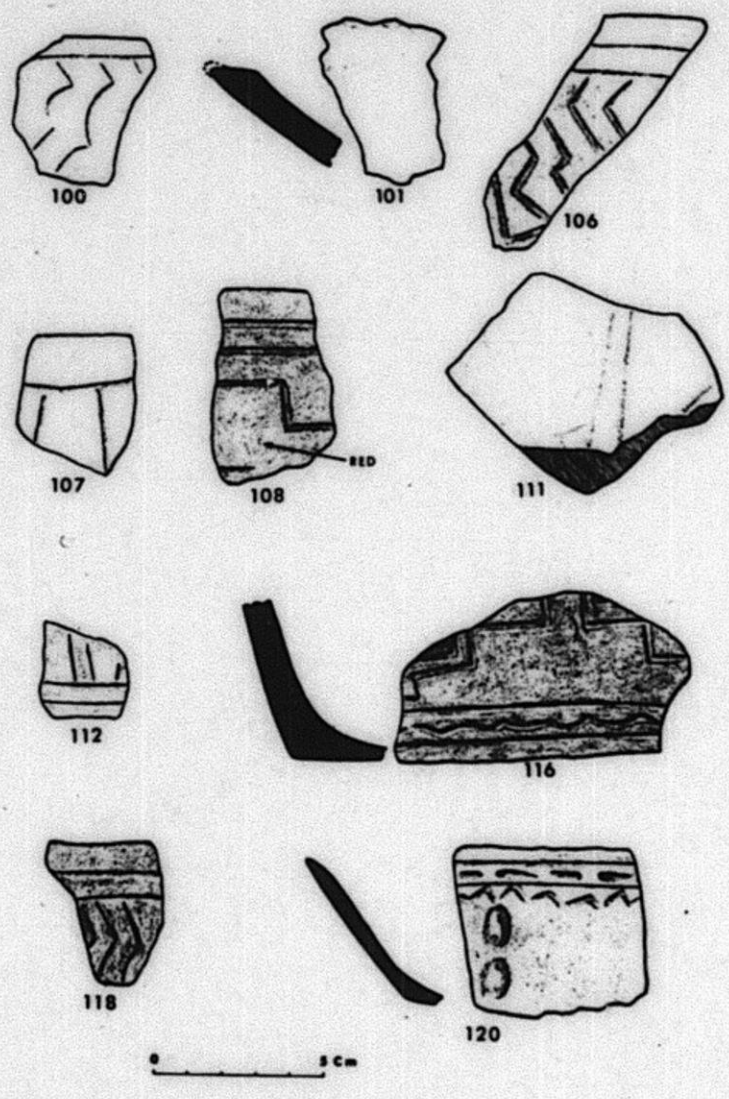
122 - Two or three comb-incised lines on base interior, design uncertain

123 - Plano-relief carving, often with incised lines (all examples apparently are of the Fine Orange series, most likely Z Fine Orange, as is discussed below) (Plates XLVII and XLIX)

124 - Plain rocker stamping (Plate XLVII)

125 - Incised multiple step (Plate XLIX)

PLATE XLVI



DECORATION ATTRIBUTES 100 THROUGH 120

126 - Incised cursive wavy lines between parallel line, location uncertain, with vertical finger-punched fillet (Plate XLIX)

127 - Series of groove incised parallel lines slanting downwards from horizontal line (Plate XLVII)

128 - Excised glyphic element, probably modeled-carved with area between excisions having been modeled. This attribute should be combined with Attributes 132 and 139. (Plate XLVII)

129 - Mold-made design; anthropomorphic figure in serpent's mouth (Plates XLVII and XLVIII)

130 - Incised cross-hatched panel at base (Plate XLIX)

131 - Groove incised cross design within a square (Plate XLVII)

132 - Same as Attribute 128 (Plate L)

133 - Same as Attributes 128, 132, and 139 but with the excised portions filled with red paint (Plate L)

134 - Rectangular pattern of faint polish lines on exterior wall (Plate XLIX)

135 - Portion of appliqued figure on vessel exterior (Plate XLIX)

136 - Series of incised lines originating near rim and going down wall (Plate XLIX)

137 - Horizontal band of interlocking incised triangles with diagonal hatching and with red paint between the triangles (Plate LI)

138 - Incised design with punctated areas (Plate LI)

139 - Same as Attributes 128 and 132 (Plate L)

140 - Complicated pattern of faint polish lines on base interior (Plate LI)

141 - Sloppily incised hatched triangle, location and orientation unknown

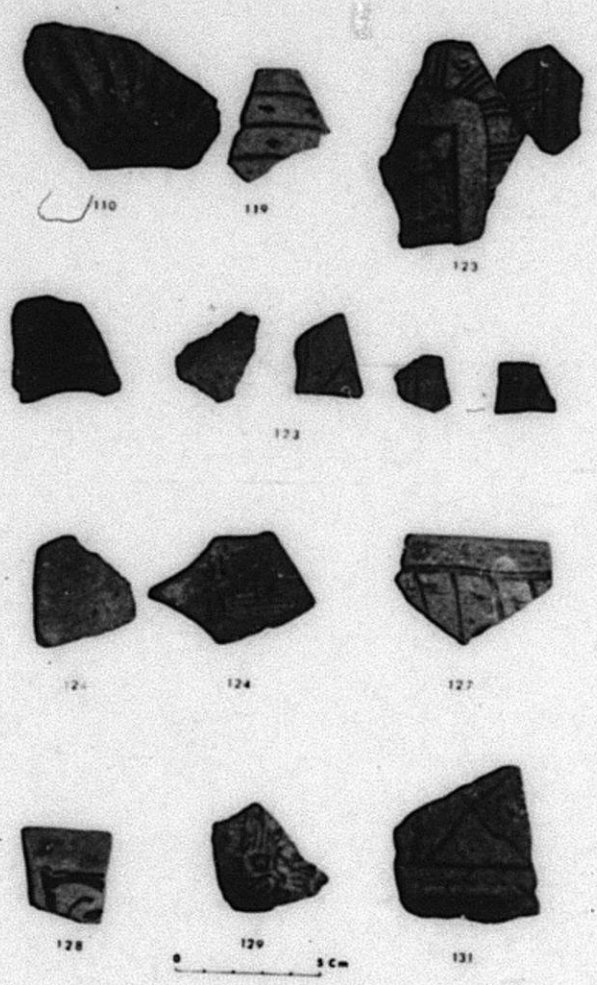
142 - Same as Attribute 141, but precise and neat

143 - Incised triangle design filled with punctated dots (Plate LI)

144 - Series of incised zigzag vertical lines in band around rim (Plate LI)

145 - Wide excised lines filled with red paint; design unknown

PLATE XLVII



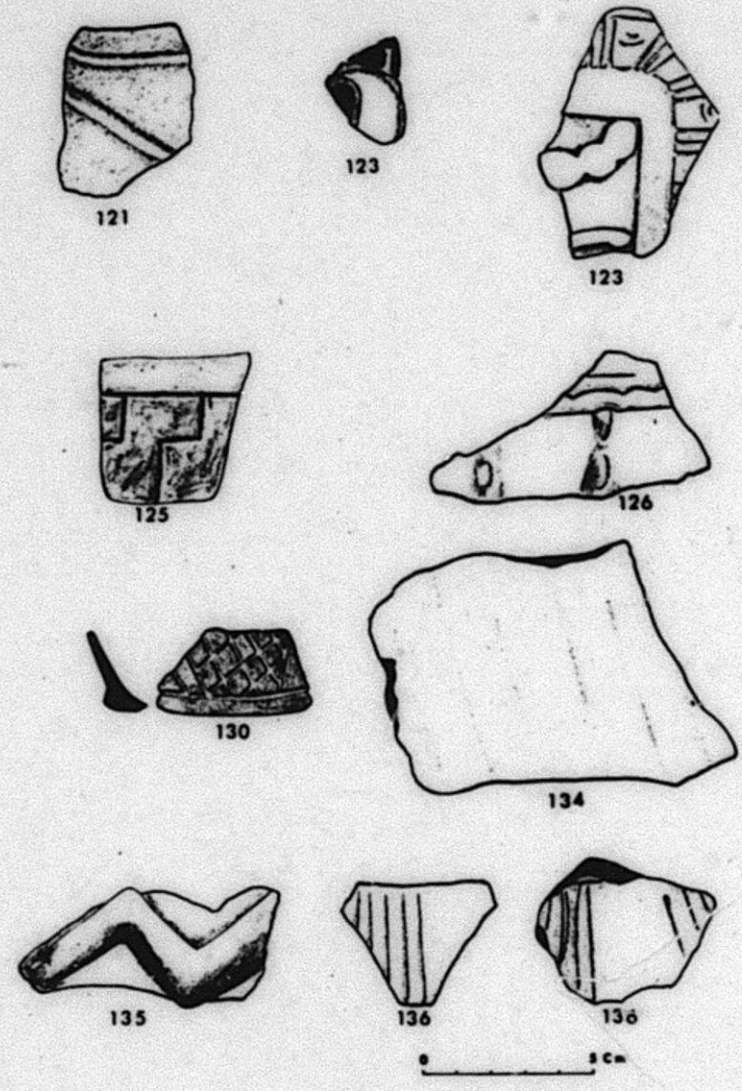
DECORATION ATTRIBUTES 110 THROUGH 131

PLATE XLVIII



MOLD-MADE SHERD -- DECORATION ATTRIBUTE 129

PLATE XLIX



DECORATION ATTRIBUTES 121 THROUGH 136

PLATE L



DECORATION ATTRIBUTES 132 THROUGH 139

146 - Band of incised reverse curve designs (Plate LI)

147 - Panels of five vertical grooves (Plate LIII)

148 - Same as Attribute 059

149 - not used

150 - Irregular pattern of incised zigzag lines in series

Appendage Association - Field 19 (Columns 36 and 37)

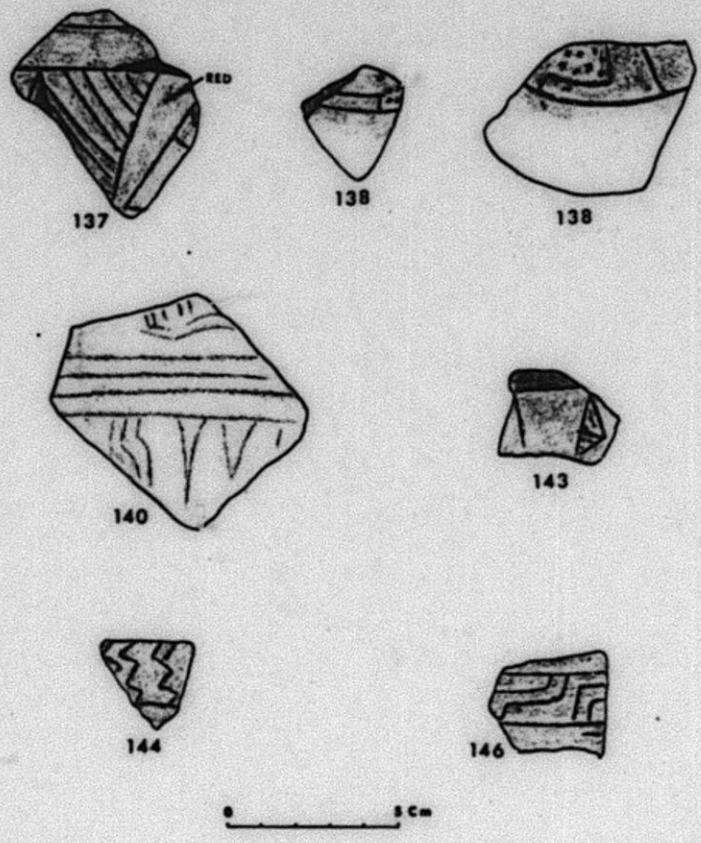
A few support and handle appendages were found attached to rim sherds from stratipits. It was hoped that reconstruction of vessel forms and combinations could be made by sorting the IBM cards for Field 19 notations and then studying rim profiles given on the same cards. The attempt was not successful since the associations were so rare.

Table 9 gives the attribute numbers and appendage varieties.

Attribute	Appendage Variation
01	Support, solid slab (variety unknown)
02	Support, hollow (variety unknown)
03	Support, hollow, swollen mammiform
04	Handle, solid nubbin
05	Support, solid peg
06	Support, solid nubbin
07	Support, hollow, slitted conical
08	Support, hollow, slitted ball

TABLE 9. - Appendage association attributes and code designations

PLATE LI



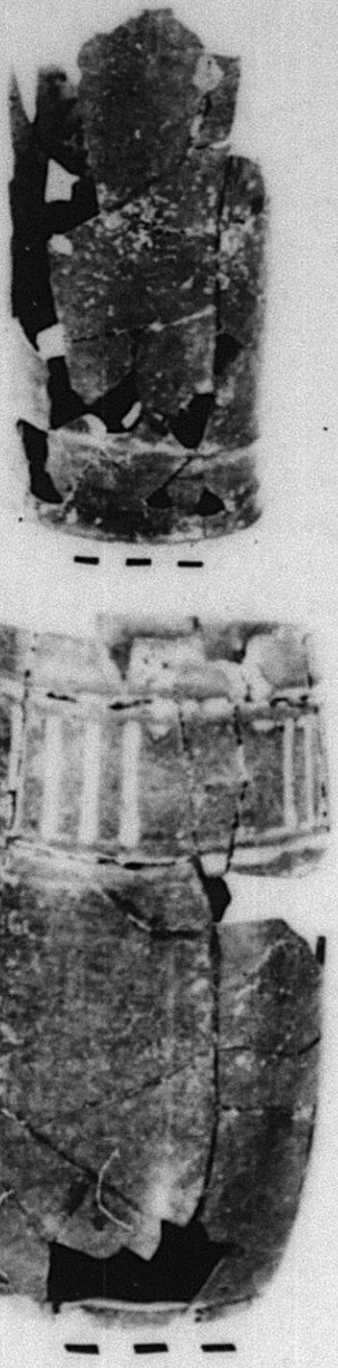
DECORATION ATTRIBUTES 137 THROUGH 146

PLATE LII



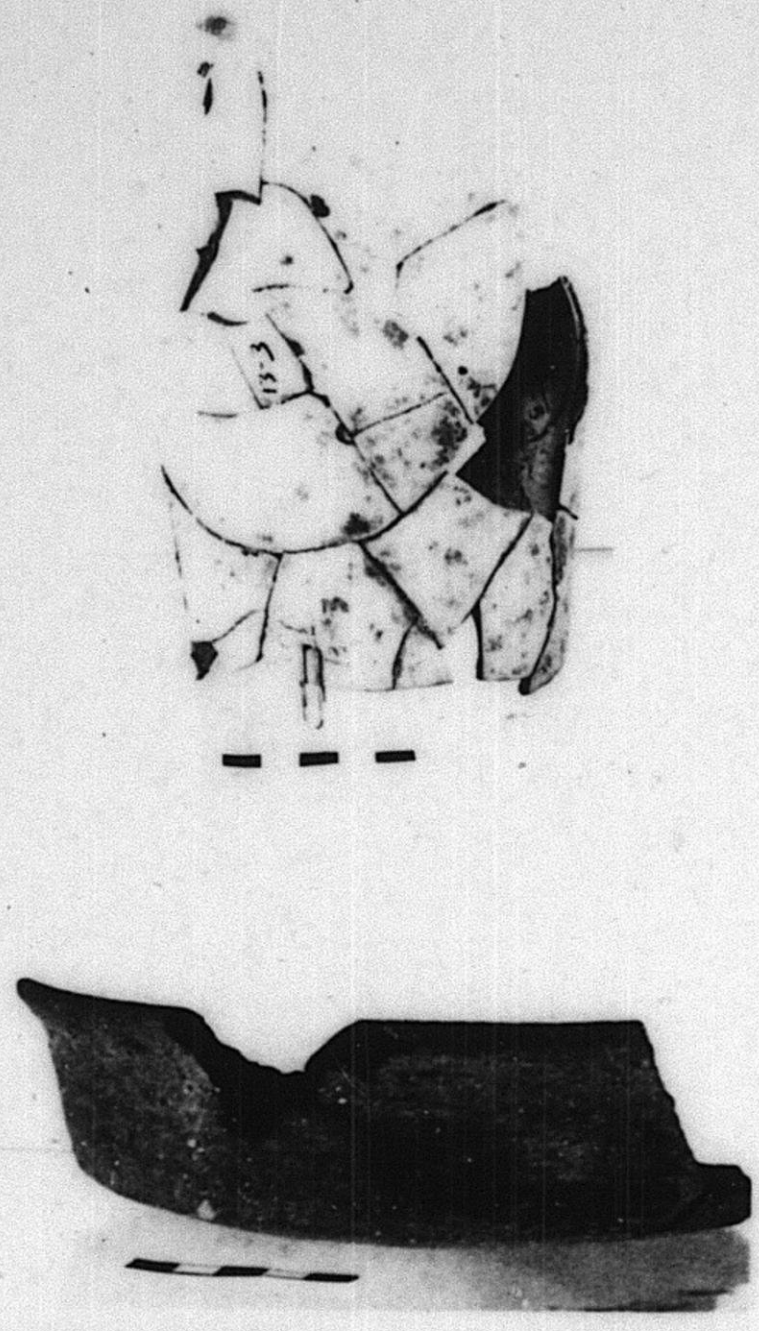
INTERIOR OF COMB-INCISED BOWL FROM PIT 2, LEVEL 10

PLATE LIII



TWO BLACK-SLIPPED VASES FROM OFFERING 1, PIT 10

PLATE LIV



UPPER -- VASE FRAGMENT FROM PIT 13, LEVEL 3;
LOWER -- SHERD FROM PIT 2, LEVEL 10

Problem I

As defined in Chapter III, Problem I is to demonstrate that variations in distributions of six tentative ware groupings between the same level of all stratipits are most likely due to chance. The null hypothesis is that there is no difference in distribution between stratipits for a given level.

Results of the chi-square program are given in Table 10 and summarized with levels of probability in Table 12. As can be seen in Table 12, the chi-square values are exceedingly low. The null hypothesis cannot be rejected. Having such slight variation can best be explained as a function of chance with the probability of such explanation being greater than 99.5% for each group. The conclusion is overwhelmingly in favor of grouping all stratipits into a single unit.

Problem II

The second problem is to eliminate the possibility that the results of Problem I may have been due to an even churning of the site which could produce a uniform distribution. If vertical change can be shown, then the homogeneity of Problem I results was between the same levels of all stratipits and not for all levels of all stratipits. The null hypothesis of no difference should be rejected.

Results of the chi-square program are given in Table 11 and with the Table 12 summary and levels of probability. There is less than .1% probability that the vertical distributions of Ware Groups 2, 3, 4, and 5 can be explained by chance. The null hypothesis is

Ware Groupings	Levels								Total
	1	2	3	4	5	6	7	8	
1	.124	3.012	.743	2.333	.098	5.827	6.578	.247	18.962
2	.179	.042	2.113	1.725	.581	2.072	.054	2.075	8.841
3	.547	3.244	.957	3.504	1.903	3.553	6.475	.163	20.347
4	.147	5.345	6.924	.284	4.374	.028	4.270	1.696	23.068
5	.017	.768	4.371	1.232	7.881	3.203	.005	.000	17.477
6	.568	.773	14.720	.902	3.079	2.149	1.396	.554	24.141

TABLE 10. - Chi-square values for ware groupings with all pits combined for each level, Problem I

Ware Groupings	Pits								Total
	6	7	10	11	12	13	14	15	
1	1.047	3.695	.909	1.429	.618	1.147	.187	.262	9.294
2	44.576	1.020	24.642	42.119	.217	1.471	19.748	125.455	259.303
3	9.009	1.055	26.581	25.229	.238	8.517	10.199	148.920	229.747
4	1.464	1.079	7.553	3.944	4.384	.897	10.606	89.263	119.181
5	48.972	3.344	20.754	13.882	4.844	.012	19.942	101.120	212.870
6	.479	5.588	1.933	3.868	.378	.337	1.843	10.787	25.213

TABLE 11. - Chi-square values for ware groupings with all levels combined for each stratipit, Problem II

Ware Groupings and Numbers	Problem I		Problem II	
	Chi-square Value	Probability of Occurring by Chance (d.f. = 62)	Chi-square Value	Probability of Occurring by Chance (d.f. = 62)
1 Grey Tecomate	18.962	.995	9.294	.995
2 RBr Tecomate	8.841	.995	259.302	.001
3 RBr Convex Bowl	20.347	.995	229.747	.001
4 Bl-slipped Concave Bowl	23.068	.995	119.181	.001
5 Grey Concave Bowl	17.477	995	212.870	.001
6 Cr-slipped Concave Bowl	24.141	.995	25.213	.995

TABLE 12. - Summary of chi-square results for Problems I and II

rejected for those groups and vertical change demonstrated beyond reasonable doubt.

Ware Groups 1 and 6 have very low chi-square values and their distributions may be interpreted as the result of chance at a probability level in excess of 99.5%. The null hypothesis cannot be rejected. The wild discrepancy between conclusions for Ware Groups 2, 3, 4, and 5 and 1 and 6 must be explained.

Ware Group 6 (Cream-slipped Concave Bowls), with a total of seventeen cases, is found in Level 1, one example; Level 2, three examples; Level 3, eleven examples; and Level 4, two examples. Conventional archaeological analysis would regard the limited distribution and concentration in Level 3 as highly significant and indicative of a short-lived and distinctive ceramic grouping. But the chi-square test indicates that the occurrence is best explained as a result of chance with a very high level of probability, over 99.5%. In this case the chi-square results are rejected. They conflict with common sense. The rejection can be justified not only on the basis of logic but because of the nature of the chi-square test which considers sample size as one factor. In a population of 5,130 individuals any distribution of seventeen cases, other than very tight clustering, will give low values to be explained as chance. The chi-square value for Ware Group 6 does not jeopardize conclusions reached for Problem II but it should serve as a warning against blindly and naively accepting statistical "proofs."

Ware Group 1 (Grey Tecomate) chi-square values cannot be so easily explained. There are a total of eighty-seven cases and

inspection of the distribution table shows a fairly even vertical and horizontal distribution. The value may be explained as due to chance with a confidence level in excess of 99.5%. We suggest that the group is too inclusive or that it persisted throughout the occupation of the site and thus account for the results. But since the findings are completely opposite to those arrived at for the other ware groups, the null hypothesis for the problem as a whole still is rejected.

The conclusions for Problems I and II were as anticipated and the consolidation of all stratipits into a single stratigraphic column for further analysis by levels is considered acceptable.

Problem III

Mode definitions, the first part of Problem III, depend upon two factors, distinctive features and historical significance. If an attribute obviously is different from others, it may be considered a mode but the demonstration of historical significance can be more difficult. Significance is admitted when utility for either delineating cultural periods or for showing cultural continuity is demonstrated. The test is in the application.

Below are discussions of each attribute class or "field" with proposed modes given in tables. Complete stratigraphic distributions for all attributes are given below.

Paste

Little variation can be noted for pastes. There are slight changes in percentages of occurrences. The most important are increases in frequencies of Tan and Light Brown pastes from lower to

upper levels and a decrease in Brown and Light Grey pastes. See Table 13.

Paste variations do not seem useful as modes.

Sherd Thickness

Sherd thicknesses change little from level to level. It may be that thin sherds, those less than five millimeters, become more frequent in upper levels. See Table 14. The few very thick sherds from middle levels may be a sampling bias since those levels yielded the greatest numbers of sherds and therefore have greater probability of extremes.

No useful modes are noted.

Temper

Examination of Table 15 shows that there is no great change in kind or size of temper. A better demonstration of the lack of

Attribute	Color	Level							
		1	2	3	4	5	6	7	8
01	RBr	27.59	32.72	30.56	27.38	25.18	25.19	21.51	22.75
02	Brick	2.76	3.09	2.34	1.10	1.60	1.10	1.89	.59
03	O	.68			.17	.10	.15	.23	
04	Gr		.18	.81	.68	.64	.31		.59
05	Tan	6.20	5.81	6.22	6.65	6.21	1.90	2.60	3.59
06	lBr	15.86	11.09	11.81	11.00	9.64	10.14	8.98	8.38
07	Br	13.10	15.45	19.11	17.40	16.50	14.89	17.02	22.75
08	dBr	4.82	5.09	5.04	5.54	6.96	7.13	5.91	4.19
09	lGr	11.03	8.36	8.74	12.96	12.21	14.73	18.43	18.56
10	Gr	13.79	10.36	9.73	10.66	13.39	17.11	16.07	14.37
11	dGr	2.06	2.72	1.44	1.19	3.00	3.01	3.54	1.79
12	Bl	.68	.18			.32	.15		.59
13	WGr	.68	.36	.18	.76	.64	1.42	1.65	.59
14	lRBr	.69	4.54	3.96	4.35	3.53	2.69	2.12	2.39

TABLE 13. - Stratigraphic occurrences of pastes

Thickness in mm.	Level							
	1	2	3	4	5	6	7	8
1	.68			.08				
2	2.75	2.36	1.80	1.27	1.39	.63	.23	.59
3	15.17	9.63	8.11	7.25	9.11	4.27	2.12	2.99
4	16.55	18.36	20.64	18.48	16.93	15.21	11.58	5.98
5	19.31	20.72	22.99	24.91	24.22	26.62	24.11	18.56
6	13.10	12.36	12.44	17.06	17.36	22.34	18.67	20.95
7	11.03	13.09	11.72	9.55	11.03	13.15	16.31	23.95
8	7.58	7.45	9.10	8.61	7.60	6.65	12.05	11.97
9	5.51	5.09	5.41	5.37	3.42	3.64	5.20	8.38
10	4.82	4.00	3.15	4.18	4.18	3.32	4.49	3.59
11	1.37	2.72	2.34	1.45	1.71	2.21	2.12	1.19
12	.68	2.00	.81	.85	1.71	.79	.94	1.19
13	.68	1.09	.54	.25	.64	.31	.94	
14	.68	.36	.09	.42		.47	.23	.59
15		.54	.18		.10	.15		
16		.18	.18	.08	.10		.47	
17			.18			.15	.23	
18		.	.27	.08			.23	
19					.10			
20								
21				.08	.10			
22								
23					.10			
24								
25					.10			

TABLE 14. - Stratigraphic occurrences of sherd thicknesses

change can be seen in Table 16 which presents results of a frequency program prepared by Ardyce Holmberg, a student at San Diego State College. Holmberg's program notes the percentage of each temper size grouping for grey paste sherds for all levels. The size groups are coarse, medium, fine, no visible temper, and others. The variations from level to level and throughout all levels are but slight.

Attribute	Level							
	1	2	3	4	5	6	7	8
1	10.34	7.45	8.11	5.03	5.46	7.44	9.45	5.38
2	18.62	16.36	17.04	17.57	14.57	15.05	13.94	13.17
3	12.41	19.81	18.66	14.67	13.18	16.32	19.62	18.56
4	.68	.54	.45	.51	1.17	.15	.70	.59
5	2.75	2.90	2.70	2.90	3.00	1.58	1.41	2.99
6	5.51	7.09	6.40	7.25	8.14	7.29	6.14	8.38
7					.10			
8						.15		.59
9		.18	.18	.08	.32	.15	.23	
10	5.51	4.90	4.41	3.66	3.75	5.07	4.25	5.98
11		.36	.45	.51	.53	.15	.47	1.79
12		.18	.27	.34	.21	.47	.23	
13					.10			
14	3.44	1.63	1.26	2.47	1.07	.95	.47	2.99
15								
16				.25				
17								
18								
19	10.34	8.90	8.65	7.08	9.64	7.13	5.67	4.19
20	15.17	17.63	18.21	23.03	23.04	19.01	18.43	18.56
21								
22								
23								
24	10.34	8.54	8.74	11.86	10.61	11.88	12.52	10.77
25	.68		.27		.10	.31		
26	3.44	2.18	2.70	2.13	3.85	4.12	4.49	4.79
27		.36	.27	.25	.21	1.58	.94	
28	.68	.54	.99	.17	.75	.79		.59
29		.36	.18	.17	.10	.31	.94	.59

TABLE 15. - Stratigraphic occurrences of tempers

Hardness

Approximately one-third of the Sipolite sherds were scratched by a talc fragment and so are less than 1 on the Moh hardness scale. The percentage of such sherds increases slightly in upper levels and there is a corresponding decrease in sherds testing between 2.5 and 3.5. The tendency may be explained as a result of soil conditions.

Temper	Level							
	1	2	3	4	5	6	7	8
Coarse		.84	1.80	.34		.45	3.10	1.72
Medium			.90	1.71	2.24	1.81	3.10	1.72
Fine	20.51	14.40	14.93	8.90	11.23	13.63	16.14	14.79
None	71.79	76.27	74.20	80.47	81.27	77.27	72.04	75.86
Other	7.70	8.49	8.17	8.57	5.26	6.84	5.62	6.91

TABLE 16. - Stratigraphic occurrences of temper sizes for grey pastes

Sherd hardness does not seem useful as a mode. Table 17 presents stratigraphic changes.

Attribute	Moh Scale	Level							
		1	2	3	4	5	6	7	8
1	-1	40.00	35.09	35.97	42.15	38.04	35.97	32.86	31.13
2	1-2.5	47.58	55.27	49.95	44.11	43.51	48.33	44.44	43.71
3	2.5-3.5	12.41	9.63	14.06	13.73	18.43	15.68	22.45	25.14
4	3.5-5.5								
5	5.5+								

TABLE 17. - Stratigraphic occurrences of sherd hardness

Core Oxidation

There appears to be a shift towards more completely oxidized cores although the characteristic is not useful as a mode. See Table 18. Also, note that while the sherds are more completely fired in upper levels, the hardness rating has declined.

Attribute	Level							
	1	2	3	4	5	6	7	8
1	.68	.72	.36	.42	.64	.63	.70	.59
2	6.20	7.45	7.57	5.71	6.32	7.92	7.32	5.98
3	11.72	15.27	16.14	15.87	15.75	10.30	14.42	14.37
4	6.20	8.72	11.54	10.58	9.43	7.44	9.92	13.17
5	75.17	67.81	64.38	67.40	67.84	73.69	67.61	65.86

TABLE 18. - Stratigraphic occurrences of changes in core oxidation

Orifice Radii

Orifice radii do not change much throughout the Sipolite occupation. Several changes may be noted. For example, a radius measurement of 12 centimeters decreases constantly towards higher levels but a measurement of 14 centimeters increases. There seems to be no larger pattern to the changes. The trait is useless by itself as a mode. See Table 19.

Surface Treatment

As can be seen in Table 20, changes in surface treatment are complex. Some trends are clear while others are not. The most obvious trends include an increase in smoothing interiors and exteriors (Attribute 02) in upper levels, a decrease in polishing the interior and exterior (Attribute 06), and a decrease in smoothed interiors with polished exteriors (Attribute 03). There is a tendency for exteriors to become rough or roughened more often in upper levels (Attributes 07, 08, and 14).

Orifice Radii in cms.	Level							
	1	2	3	4	5	6	7	8
1				.10				
2		.42	.10	.30	.13	.18		
3	1.58	.63	.21	.40	.65	.36		
4	1.58	1.68	.74	.40	1.04	.55	1.12	
5	.79	1.47	1.81	1.01	1.56	1.47	1.12	2.85
6	3.96	1.89	2.13	2.34	2.48	3.69	3.10	1.42
7	3.96	2.32	3.51	3.36	4.57	5.17	5.36	2.14
8	7.93	8.01	4.58	5.70	4.18	4.62	6.77	6.42
9	6.34	6.75	7.03	6.21	6.40	6.65	5.93	5.00
10	5.55	8.22	10.12	10.19	7.84	9.42	9.88	9.28
11	7.93	8.22	8.52	9.07	10.45	11.09	5.64	6.42
12	3.96	6.54	8.42	9.37	10.06	10.53	9.32	13.57
13	7.93	8.43	10.44	9.17	8.88	8.68	9.03	8.57
14	10.31	6.11	7.78	7.13	6.27	7.76	6.77	4.28
15	4.76	6.96	5.75	5.70	5.22	5.54	6.77	5.71
16	6.34	4.64	4.69	4.17	6.92	3.14	6.77	5.71
17	4.76	4.00	4.47	4.17	4.83	3.14	3.95	7.14
18	1.58	3.16	3.51	3.87	3.00	2.58	3.95	5.00
19	1.58	2.32	2.45	2.54	2.22	2.77	1.97	5.71
20	1.58	2.10	3.19	2.65	2.35	3.88	3.67	1.42
21	3.17	2.74	2.13	2.34	2.22	3.51	1.41	2.14
22	4.76	1.89	1.49	2.14	2.74	1.47	1.69	1.42
23	4.76	3.58	2.02	1.42	.91	.73	1.69	1.42
24	.79	3.16	1.91	2.54	1.96	.73	1.12	3.57
25	2.38	1.68	.74	1.83	1.04	.92	1.12	
26		1.89	.85	1.12	.65	.55	1.12	
27	.79	.84	1.06	.20	1.17		.56	.71
28	.79	.21	.21	.20	.13	.36		
29								
30				.10		.36		

TABLE 19. - Stratigraphic occurrences of orifice radii measurements

There are other characteristics that deserve comment. Note that raked interiors (Attributes 20 and 21) are found in Levels 2 through 7. If they are considered to be from grinding bowls or molcajetes, then molcajetes are quite early at Sipolite. The problem cannot be resolved at this time without complete examples.

Attribute	Level							
	1	2	3	4	5	6	7	8
01								
02	48.96	45.81	32.37	29.86	27.33	32.48	36.87	34.73
03		.36	.90	.93	1.71	3.16	4.72	4.19
04								
05	4.13	4.54	8.29	8.10	8.89	7.44	6.61	4.79
06	24.13	25.27	33.00	38.13	40.83	38.66	35.93	44.31
07	5.51	9.81	9.37	6.39	7.18	5.07	4.25	3.59
08	8.27	5.81	6.67	7.93	5.35	4.27	2.12	1.79
09			.18	.51				
10		1.45	2.16	1.70	1.82	2.06	1.18	1.19
11	.68	.72	1.71	1.19	1.82	1.58	1.89	.59
12				.17	.10			
13				.08			.23	
14	6.89	3.45	2.43	2.38	1.07	1.42	1.65	1.79
15	.68	.72	1.08	.68	.96	.31	.70	
16				.17	.42		.70	
17			.18		.10	.31		
18	.68		.09					
19		1.63	.54	.68	.75	1.42	.94	2.99
20			.54	.25	.42	.63	.47	
21		.36	.36	.76	1.07	1.10	1.65	
22			.09		.10			

TABLE 20. - Stratigraphic occurrences of surface treatment techniques

A recent article by Charles Brush on "Pox Pottery" draws attention to Attribute 16 and, to a lesser extent, Attributes 17 and 19. Brush describes Pox Pottery from the earliest ceramic levels at Zanja and Puerto Marquez, Guerrero that apparently is identical with the earliest ceramics found near Tehuacan, Puebla. He writes:

> "The diagnostic feature of Pox Pottery is the rough and pitted appearance of the inside or concave surface of the sherd...The pitting was undoubtedly produced by brushing or wiping the interior of the vessel after the clay had dried sufficiently to have lost most of its plasticity. This caused the irregularly sized particles to be dragged along and away from the clay, leaving

> numerous deep gouges and crater-like indentations. This crude interior contrasts with the well-smoothed, occasionally red-slipped exterior or convex surface of these fragments. Pox pottery is quite friable, and the generally small sizes of the sherds make shape determination difficult...the forms were either sharply incurving neckless pots or vessels with high straight necks..."[6]

The description given of how rough or roughened surfaces may have been produced on Sipolite pottery closely matches Brush's description.

Brush suggests that Pox Pottery is a possible horizon marker for the change from nomadic to sedentary ways of life.[7] He is confusing ceramic and non-ceramic with sedentary and nomadic ways of life. Regardless, the occurrences of sherds with rough interiors and polished exteriors (Attribute 16) in Levels 4, 5, and 7 and the similar examples with roughened interiors and smoothed exteriors (Attribute 17) and rough interiors and smoothed exteriors (Attribute 19) in Levels 3, 5, and 6 and 2 through 8 respectively may indicate that the custom endured a long time, certainly into the late Classic or early Postclassic period. Such similarities over a three thousand year span would make Pox Pottery unsatisfactory as a horizon marker. The Sipolite sherds are hard and not friable and this attribute may distinguish Pox Pottery. Better data concerning vessel form may also refine the description to produce a true horizon marker.

It should be noted that Sipolite, like the Guerrero sites, is located beside a lagoon, a fact that supports other suggestions made by Brush.

Surface treatment attributes do not appear sufficiently distinctive nor limited in occurrence to be useful as modes.

Slip and Area Painting

Approximately half of the Sipolite sherds are slipped with the two lowest and two highest levels having the greatest percentage of unslipped examples, as is shown by Attribute 01 in Table 21. In spite of the many slip attribute categories, few modes can be defined. When a slip is distinctive and of limited distribution, it usually is of low frequency. The homogeneity is striking.

Several attributes show percentage changes, as with Attribute 11 (Light Brown, medium, on interior and exterior) and Attribute 30 (Brown, medium, on interior and exterior) both of which occur in high frequency in Level 8 and experience similar declines in successively higher levels. Attribute 39 (Light Brown, thin, on exterior) follows the same pattern. It might be concluded that brown slip was popular but lost favor but we cannot use brown slips as modes.

Attribute 67 (Black Graphite, thin, on rim and interior) is found only in Level 8 and should be considered a mode. Use of graphite also is discussed in the section dealing with decoration and is found only in Levels 7 and 8 with a single example in Level 6 and an aberrant example in Level 4. The mode is an indicator of the earliest Sipolite period.

A general mode is characterized by bichrome and polychrome painting, double slipping, or painting with one color on a slip of another. It is found in Levels 1 through 5, if we exclude bichrome combinations that have black as one color. The mode frequency is extremely low constituting .68%, .72%, 1.26%, 2.06%, and 1.24% of Levels 1 through 5 respectively and including Attributes 16, 17, 24,

Attribute	Level							
	1	2	3	4	5	6	7	8
01	60.00	53.09	41.11	42.40	44.05	49.44	59.33	55.08
02		1.81	1.08	1.27	2.10	1.58	.94	1.19
03	2.22	8.00	6.40	7.67	5.57	6.65	1.89	2.39
04		.36	1.35	1.02	1.07	.15	.23	
05	4.82	6.90	7.03	6.31	7.07	7.44	5.43	7.18
06	1.37	.90	2.43	2.64	2.89	3.01	3.30	1.79
07		1.09	1.35	1.45	1.28	1.58	1.41	.59
08			.18	.17		.31	.23	
09		.36	.72	1.53	1.60	.79	.47	
10	13.79	7.63	6.94	7.25	6.96	6.49	5.91	2.99
11	.68	.54	2.07	2.64	3.00	3.96	7.32	10.17
12		1.09	3.42	4.26	2.78	2.85	.94	1.19
13	.68	1.63	1.35	1.79	1.50	1.42	.32	.59
14	.68	.18	.72	.59	1.17	1.10	.70	1.79
15			.27	.25	.10			
16				.25				
17		.18	.18	.51	.21			
18		.18	.18	.76	.42	.15	.23	
19		.36	1.26	.68	.21	.31		.59
20				.08			.23	
21		.90	.27	.42	.64	.15		
22			.27	.08	.10	.15		.59
23	.68	1.45	1.35	1.53	.53	.95	.23	
24		.18		.08				
25					.42			
26	1.37	2.18	1.35	.76	1.71	.63	1.41	1.19
27	.68	.18	.18	.42	.42	.31	.47	.59
28			.18	.08				
29	3.44	1.81	4.68	2.47	2.67	.31		
30	.68	2.18	3.06	1.62	2.78	3.32	3.54	7.18
31				.08				
32		.18	.45	.17	.42		.47	
33				.17	.21		.23	
34			.09	.08				
35	2.75	.18	2.25	3.07	3.32	2.37	1.41	.59
36	.68	.54	.18	.08	.10			.59
37	.68	.18	.18	.17	.21		.23	
38		.18		.25				
39		.18	.18	.08	.32	1.42	1.41	1.19
40								
41					.10			

TABLE 21. - Stratigraphic occurrences of slip and area painting attributes

Attribute	Level							
	1	2	3	4	5	6	7	8
42	.68	.72	1.71	.76	.53	.31		
43					.10			
44				.08	.10			
45			.36	.25	.10			
46					.10			
47	.68	2.00	1.80	1.02	.42	1.10		
48			.18					
49			.36	.08	.42	.15		.59
50			.09					
51		.18	.18	.42	.32	.15	.23	.59
52		.36	.27	.25	.32	.47	.94	
53			.09					
54			.09	.08		.15		
55		.18						
56				.08		.15		
57					.10			
58			.09		.10	.15		
59	.68		.36	.17	.21			
60				.08				
61	.68	.18						
62				.08				
63			.09	.08				
64				.08				
65				.08		.15		
66							.47	
67								1.19
68		.18	.18	.17	.21			
69	.68			.08				
70						.15		
71				.25	.42			
72			.09					
73				.08				
74	.68	.72	1.17	.34	.21			
75					.10			
76				.08				
77			.09					

TABLE 21-Continued. - Stratigraphic occurrences of slip and area painting attributes

25, 28, 31, 34, 38, 41, 43, 44, 53, 55, 57, 59, 60, 62, 63, 64, 72, 73, 76 and 77.

The Sipolite ceramic tradition is almost entirely a monochrome one.

Basal Angle Form

Several basal angle forms probably are modes. Below is a description of each and the attributes included within each mode. Table 23 gives the distributions for all basal angle attributes and Table 22 summarizes mode distributions.

1. A distinctive feature is a slight ridge at the basal break of strongly outflaring slightly concave or convex wall. The base is deeply convex and the vessel form may be regarded as a shallow Z-angle bowl. Attributes 43, 52, 53, and 57 are included within the mode.

2. The distinctive feature is a pronounced ridge at the basal break of nearly erect walls that may be straight, slightly concave or slightly convex. The vessel form may be regarded as a medium to sharply Z-angle bowl. The mode includes Attributes 21, 28, 29, 31, 44 through 52, and 55.

3. A low pedestal base, sometimes constricted at the wall bottom, accompanying an open convex bowl is found in Levels 2, 3, and 4. The mode includes Attributes 2, 6, and 8.

4. A similar but distinct mode is defined on the basis of a slight depression around the circumference of the pedestal which gives it an appearance somewhat like a ring base support. The mode includes Attribute 14 and is found in Level 3.

5. Attribute 90 with a flat base, rounded basal angle, and divergent walls that are convex at the base and then flare outwards becoming convex is found in Levels 3, 4, and 5. The base-wall form combination define the mode.

6. A more general mode is characterized by a flat base and convex but extremely divergent walls. It occurs in Levels 2 through 5 and includes Attributes 4, 11, 62, and 66 and perhaps 13 and 60.

7. A specific mode, the concave or "dimpled" base, including only Attribute 74, is found in Level 5.

8. A low pedestal base, sometimes constricted at the wall bottom, accompanying a vessel with nearly erect but slightly convex walls is found in Levels 6 and 7. The mode is distinguished from Number 3 described above by the wall orientation. The Attributes include 75, 76, and 77.

9. A mode indicative of early levels is formed by a flat base, sharp or fairly sharp basal angle, and slightly concave walls that diverge at approximately an angle of 45 degrees. It includes Attribute 88 and perhaps 89.

10. A basal ridge approaching proportions of a true flange is distinctive in form and accompanying decoration, Decoration Attribute 012. Although there is but a single example, Attribute 30, from Level 7 it is proposed as a mode.

11. Another unique example is Attribute 54 from Level 8. The vessel wall is slightly concave but erect with a low basal ridge and convex base. The interior basal angle is grooved, perhaps the result of a finger being run around the interior.

Attribute	Level							
	1	2	3	4	5	6	7	8
00	86.20	86.00	83.76	83.36	82.52	85.10	82.74	86.22
01		1.29	.55	1.02	1.22	1.06		
02			.55	.51				
03		2.59	.55	1.53		2.12		8.69
04				.51	1.22			
05			.55					
06		1.29	.55					
07	5.00	1.29		2.05	4.29	5.31	6.84	
08				.51				
09	5.00	1.29	.55	.51				
10				.51	.61		1.36	
11			1.11					
12		1.29		1.53	2.45		1.36	
13			.55					
14			1.66					
15	5.00		.55	2.56	4.29	5.31	4.10	
16				1.53	.61	1.06	2.73	
17				1.53	1.22	1.06		
18	10.00	5.19	5.00	4.61	6.74	5.31	2.73	4.34
19	15.00	9.09	5.55	6.66	6.74	10.63	5.47	
20		1.29		1.53		1.06		
21		1.29	1.66	1.02	2.45			
22			.55	1.02	1.22			
23			1.66	.51	2.45	6.38	13.69	4.34
24			.55	1.02	.61	2.12	2.73	
25		2.59	1.66	5.64	4.29	5.31		4.34
26		1.29		5.12	3.68	1.06	4.10	4.34
27		1.29	2.77	1.02	1.22		1.36	
28		1.29	3.33	5.12	3.06	1.06		
29			.55	1.53	1.22			
30							1.36	
31		1.29	.55	2.56	.61			
32		1.29	.55	.51				
33		1.29	.55	.51	1.22		1.36	
34			1.66	.51	1.84	1.06	1.36	4.34
35	5.00		1.66	.51	.61	3.19	8.21	13.04
36		3.89	5.55	2.05	2.45	2.12	4.10	4.34
37		3.89	.55	1.53	1.22	4.25	5.47	8.69
38	5.00		1.66	.51	1.84	4.25	1.31	
39	5.00	5.19	4.44	3.58	.61	1.06	1.36	
40		1.29	.55	1.02	.61	1.06		
41			1.11	3.58	3.06			
42	5.00	2.59	1.11	1.02	.61	1.06		
43		2.59						
44		1.29		1.02	.61			
45		2.59	5.00	3.07	1.84			

TABLE 23. - Stratigraphic occurrences of Basal Angle Forms

Attribute	Level							
	1	2	3	4	5	6	7	8
46	5.00	2.59	7.22	1.02	1.22			
47	5.00	1.29	1.11	1.02	1.22			
48	5.00	3.89	5.00	2.05	1.22			
49			1.66	2.05	1.22			
50	5.00	1.29	1.66	1.53	.61			
51		2.59	1.11	1.53	.61			
52			1.11					
53	5.00	2.59	1.11	.51				
54								4.34
55	5.00	6.49	5.55	1.02	1.84			
56			.55	1.02	1.22		1.36	4.34
57		1.11						
58	5.00		1.66	.51	1.22		1.36	
59		2.59	1.11	1.53	3.06	3.19	2.73	4.34
60		1.29	1.66	1.02		2.12		
61			.55	.51		1.06	4.10	4.34
62				.51				
63		2.59	.55	2.56	2.45	4.25		
64				.51		1.06	1.36	4.34
65			.55			1.06		
66		1.29	.55		.61			
67								
68			2.22	1.53	.61	1.06	1.36	
69			.55	.51		2.12	1.36	
70	5.00	1.29	.55	1.02	2.45	1.06		
71			1.11	.51	.61	1.06		
72		1.29	1.11	.51	1.22	1.06		
73			.55	.51	.61	1.06	2.73	
74					1.84			
75						1.06		
76						1.06		
77							1.36	
78								
79		2.59		1.02	1.22	3.19	1.36	4.34
80					.61	1.06		
81								
82				.51				
83		1.29	.55	.51				
84		1.29	.55	1.02	.61			
85				.51	2.45	1.06		
86			.55				1.36	8.69
87		1.29	1.11	1.02	.61	1.06	1.36	
88		1.29			1.22	3.19	4.10	8.69
89		1.29	1.11		1.22	1.06	2.73	
90			.55	.51	1.22			

TABLE 23-Continued. - Stratigraphic occurrences of Basal Angle Forms

12. It is difficult to distinguish between a high shoulder and outflaring wall that abruptly turns inwards. All have been included as Basal Angle attributes. Variations appear in every level. Similar examples have been grouped into three general categories - Attributes 27, 35, 36, and 37; 22, 38, 39, 40, 41, and 42; and 83 and 85 - with their distributions being given in Table 20. The duration of the characteristic is considered as possibly indicative of a long tradition. However, uncertainty as to total vessel form prevents confident definition as a mode.

Tecomate Rim Form

Tecomate rim forms do not appear especially useful as modes. Certain changes can be seen and several modes are proposed. The simple, evenly rounded rims increase in percentage from lower to upper levels although tecomates as a form decrease.

A faint groove around the inside or outside rim is found on Attributes 7, 8, and 9 occurring in Levels 1 through 5 but concentrated in Levels 3 through 5. It may be considered a mode.

The distinct and specific Attribute 25 is found in Levels 1 through 6. Note a similar distribution for the same low raised tapered band around the outside rims of convex bowls (Convex Bowl Attributes 17 and 86). The tapered band is considered a mode.

Attribute 27 with its slightly raised exterior lip and faint groove around the lip base is found in Levels 2 and 3 while Attribute 28 with a lower lip is found in Levels 4 and 5. The two attributes may be variations on a single mode.

Attribute 26 with its distinctive raised and square rim is found only in Level 3 and satisfies requirements for a mode.

Table 24 presents the distribution of tecomate rim form attributes.

Attribute	Level							
	1	2	3	4	5	6	7	8
00	86.20	83.45	80.52	82.08	81.24	78.28	73.04	75.44
01	35.00	26.37	22.22	15.71	14.28	12.40	15.78	12,19
02	5.00	1.09	3.24	3.33	2.85	5.83	5.26	7.31
03		7.69	8.79	6.66	11.42	8.02	7.01	7.31
04	5.00	7.69	6.01	5.23	6.28	7.29	6.14	7.31
05		6.59	2.31	1.90	3.42	1.45	7.01	
06	10.00	13.18	13.42	16.66	10.85	2.91	7.01	14.63
07			.46	.95	1.14			
08	5.00		2.31	2.85	2.28			
09		1.09	.46	.47				
10		2.19	6.48	9.52	9.14	5.83	2.63	4.87
11			1.38	.95		.72	5.26	7.31
12	5.00	10.98	5.09	6.19	2.28	4.37	1.75	
13		2.19	3.70	2.38	8.00	8.75	12.28	7.31
14		1.09	1.38	.47	.57	.72		
15				.47	1.71	4.37	1.75	
16	10.00	2.19	2.77	4.28	1.71	.72	.87	
17			3.24	3.80	2.85	2.18	.87	4.87
18		1.09	.46	.47			.87	2.43
19				.95	.57		.87	4.87
20			2.31	3.33	1.71	5.83	4.38	2.43
21	10.00	3.29	3.24	3.33	9.71	13.86	12.28	7.31
22			1.38	1.42	2.28	5.10	4.38	9.75
23	5.00	5.49	3.70	1.90	2.28	.72		
24	5.00	5.49	3.24	3.80	1.71	6.56	3.50	
25	5.00	1.09	1.85	1.90	2.28	2.18		
26			.46					
27		1.09	.46					
28				.95	.57			

TABLE 24. - Stratigraphic occurrences of Tecomate Rim Forms

Olla Rim Forms

Olla rim forms are not useful as modes, although certain tendencies are apparent. Ollas increase slightly in percentage from lower to higher levels as tecomates decrease. Compare Attributes 00 (Other Forms) of Tables 24 and 25.

Attribute	Level							
	1	2	3	4	5	6	7	8
00	91.72	91.09	93.68	97.01	97.32	97.14	97.63	98.80
01	16.66	12.24	2.85			5.55		
02		2.04	5.71	14.28	8.00	5.55	20.00	50.00
03			1.42	5.71	4.00	5.55	20.00	
04	8.33	8.16	4.28		4.00	16.66		
05		8.16	4.28	8.57	4.00	5.55		
06	25.00	8.16	7.14	11.42	24.00	11.11	10.00	
07	16.66	16.32	10.00	11.42	24.00		10.00	
08		2.04	1.42					
09		10.20	4.28	2.85				
10			7.14					
11		6.12	1.42	5.71				
12			2.85					
13		2.04	4.28	2.85				
14		4.08	5.71					
15			4.28		4.00			
16		2.04	7.14	8.57	4.00			
17	8.33	8.16	4.28	2.85				
18		6.12	5.71	2.85	8.00			
19		2.04	11.42		8.00	11.11		
20	8.33	2.04		2.85		11.11	10.00	
21	8.33		2.85	17.14	8.00	22.22	20.00	
22	8.33		1.42	2.85		5.55	10.00	50.00

TABLE 25. - Stratigraphic occurrences of Olla Rim Forms

Attribute 17, which is quite distinctive with its sharply divergent and thinned rim, is found in Levels 1 through 4 and may be considered a mode.

The most marked change is with a combination of body form and rim divergence. Judging from the small portions of body sections adhering to rims, it would appear that the longer, more ovoid bodies decline as globular bodies become more common in higher levels. Simultaneously, rims become more divergent. Compare distributions of Attributes 4, 5, 6, 7, 19, and 21 with Attributes 8, 9, 10, 11, 12, 13, and 17.

The slight changes in tecomate and olla forms deserve comment. One concern of this study is cultural conservatism as reflected in ceramics. Olla and tecomate forms usually are considered common household vessels and it is for such that we can reasonably expect the least change if a site was continuously occupied by bearers of a single tradition. The lack of great change in ollas and tecomates at Sipolite supports the thesis of continuity and conservatism.

Convex Bowl Rim Forms

Most of the Convex Bowl Rim Forms are either not distinctive or not limited in their occurrences but some do satisfy requirements for mode definitions. Table 26 gives distributions for all attributes. Modes are described below.

1. Attributes 17 and 86 with the low raised and tapered band around the outside of rims occur in Levels 1 through 5. The same essential feature was discussed with Tecomate Rim Forms.

2. A sharply tapered or nearly pointed rim on medium outflaring and slightly convex walls (Attribute 83) is found in Levels 1 through 5.

3. A somewhat similar mode, comprising Attributes 13 and 15 and found in Levels 1 through 6, is an evenly tapered rim on an erect barreled vessel or one which is slightly constricted at the rim. In either case the vessel seems to have been tall with slightly convex walls.

4. Several of the convex and concave rim forms could have been from griddles or comals which are generally considered to have been Classic and later in Mesoamerica. The form distributions for Sipolite are from Levels 1 through 7. Attributes 102 and 114 are from such low and very open vessels and have externally bolstered rims and slightly convex walls. See the discussion of similar forms among concave rims.

5. Attribute 52 with its small everted rim and slightly convex wall inclined outwards at about 45 degrees is found in Levels 2, 3, and 4.

6. Attributes 10 and 12 have a wide finger groove around the outside below the rim and each are from tall slightly convex bowls. The distribution is in Levels 2 through 5.

7. Attribute 58 is found in Levels 2 through 7 but is of much higher frequency in lower levels, especially Levels 6 and 7. The attribute has a rim curved inwards which is beveled on the exterior and pointed on the interior to form a "beak," and pertains to a medium open convex-walled vessel. It is proposed as a mode because of its unusual form and apparent concentration in lower levels.

8. Attribute 14, a tall very slightly convex-walled vessel with a flat and squared rim, is found only in Levels 6 and 7.

Attribute	Level							
	1	2	3	4	5	6	7	8
000	76.55	80.00	82.68	81.91	83.92	81.14	79.66	79.04
001		.94	.52	.94	.66			
002	2.94	.94	1.04	.94		.84		
003	2.94	1.88	1.04	1.41	.66			
004			.52					
005			1.56	.47				
006	2.94		1.04					
007		.94				1.68		2.85
008				.47				
009		.94			1.33			5.71
010		.94	.52	1.88	.66			
011		1.88	1.04	.94	.66			
012		1.88	.52	.94	.66			
013		.94	1.56	1.41	1.33	1.68		2.85
014						.84	1.16	
015	2.94	1.88	1.56	2.83	1.33	.84		
016						.84	2.32	2.85
017	8.82	2.83	1.04		4.66			
026		.94				.84		
027		2.83	2.08	1.88	1.33			
028			2.08	1.88		.84		
029			.52	.47	1.33			
030	5.88	2.83	1.56	2.35	2.00	1.68	1.16	2.85
031	2.94	2.83	6.77	6.60	1.33	1.68	1.16	
032			2.08	.47	.66			
051			.52	.94	.66	.84		
052		1.88	1.56	1.41				
053		.94	.52	.94	2.66	.84		
054	2.94		1.04	.47	1.33	.84		2.85
055		.94		.47				
056			.52					
057	2.94	.94		.47	.66	2.52	3.48	
058		.94	.52	3.30	3.33	8.40	6.97	
059		.94		.47	1.33	3.36	2.32	2.85
060				.94	4.00	3.36		
061		.94	1.04			4.20	6.97	14.28
062		2.83	1.56	.94	1.33	2.52	1.16	
063		.94	.52	.47	1.33	2.52		
064		2.83	1.56	.94	.66			
065		2.83		1.88				
066			.52				1.16	

TABLE 26. - Stratigraphic occurrences of Convex Bowl Rim Forms

Attribute	Level							
	1	2	3	4	5	6	7	8
067	2.94	.94	3.64	2.35	1.33			2.85
068		1.88	3.12	1.41		.84		
069			.52	.47	.66			
070		4.71	2.08	.47		.84		
071		4.71	4.68	3.77	3.33	2.52		
072	8.82	1.88	1.56	2.35	2.00		1.16	2.85
073							2.32	5.71
074		.94	.52	.47	2.00	.84		
075		1.88	2.60	2.35	2.00	.84	1.16	
076		.94		1.41	3.33	2.52	3.48	
077	5.88	2.83	3.12	2.35	4.00	.84	1.16	
078		1.88	1.56	2.35	.66	.84	1.16	2.85
079				.47	.66	6.72	5.81	5.71
080	2.94		.52	.47		1.68	1.16	2.85
081			1.04	3.30	2.66	4.20	2.32	2.85
082				.47	.66			
083	2.94	3.77	3.64	3.30	4.66	.84		
084	2.94	1.88	1.56	.94	1.33			
085		3.77	3.64	3.30	.66	1.68	2.32	2.85
086	2.94		1.04	.94	1.33			
087			.52			2.52	3.48	2.85
101	11.76	8.49	5.72	4.24	5.33	5.88	3.48	
102	2.94	2.83	1.04	2.83	3.33	1.68		
103			.52	.47	.66	.84	1.16	
104	5.88	3.77	3.64	3.77	5.33	.84	2.32	
105	5.88	1.88	3.12	3.30	2.00	3.36	6.97	2.85
106			3.12	.47	.66	.84	1.16	2.85
107	5.88	4.71	4.68	2.83	2.66	1.68	3.48	5.71
108				.47			1.16	
109			.52	.94	2.00			
110					.66			
111			1.04					
112			1.04	1.41	.66	2.52	1.16	
113						.84	1.16	
114			1.04	.94	.66	.84	2.32	
115				1.88	4.66	4.20	6.97	2.85
116						.84	1.16	2.85
117					.66	.84	5.81	8.57
118	2.94	3.77	1.56	3.30	3.33	3.36	5.81	
119			.52	.47		1.68	1.16	
120						.84	1.16	

TABLE 26-Continued. - Stratigraphic occurrences of Convex Bowl Rim Forms

9. Attribute 113, a low very open convex bowl with a groove on a squared rim, is found in Levels 6 and 7.

10. Attributes 87, 116, and 117 are all low convex bowls with their interior lips thinned, as though a finger has been run around them. The mode is found in Levels 6, 7, and 8 with a solitary example in Level 3.

11. Attribute 79 is an open bowl with low outflaring and slightly convex walls thickened at the base and thinned towards the rim. It is found only in Levels 6 through 8.

Tall convex bowls seem to be found predominantly in upper levels but the tendency cannot be considered a mode.

Concave Bowl Rim Forms

Many of the Concave Bowl Rim Forms are quite distinctive but few enjoy a limited distribution. However, several show high percentages in certain levels and so are listed below and defined as modes. Table 27 summarizes stratigraphic occurrences of modes and Table 28 gives occurrences for all attributes.

1. The rim of a medium open bowl with slightly concave walls may be evenly rounded, slightly pointed, or with beveled interior lip but never a beveled exterior lip. The form is associated with a basal ridge of Z angle profile with a convex base such as was discussed with Basal Angle forms. The mode includes Attributes 82 through 86 and is found in Levels 1 through 5 with one example in Level 6.

2. A similar mode, including Attributes 33 and 34, has the same description except that the walls are more deeply concave. It is found in Levels 1 through 5.

3. A nearly erect, slightly concave thin-walled form with a barely thickened rim that is flattened with a ridge round the inside and/or outside lip is found in Levels 1 through 7. It includes Attributes, 111, 112, and 113.

4. Attributes 114 and 115 represent slightly outflaring and concave walls with a rolled rim. It is found in Levels 2 through 7.

5. Attribute 30 is a very low vessel with concave and widely flaring walls, probably a plate. It is found in Levels 2 through 6.

6. Attribute 118 is either a high shouldered or basal angle vessel with a wide groove, probably made by running a finger horizontally around the exterior, above the shoulder. It is found in Levels 2 and 3.

7. This mode may be a variant of the first two suggested. It has a thin, erect, and nearly straight wall with the interior lip beveled and the exterior lip pointed. It is associated with a basal ridge and is found in Levels 3 and 4. It includes Attribute 117.

8. A form represented by Attributes 21 and 24 is nearly flat with an evenly thickened rim that is beveled on the interior and exterior lips. It is found in Levels 3, 4, and 5.

9. A form with nearly erect walls with a bolstered rim beveled on the interior rim is found in Levels 2 through 6 but is concentrated in Levels 4 through 6. It includes Attributes 106 and 108.

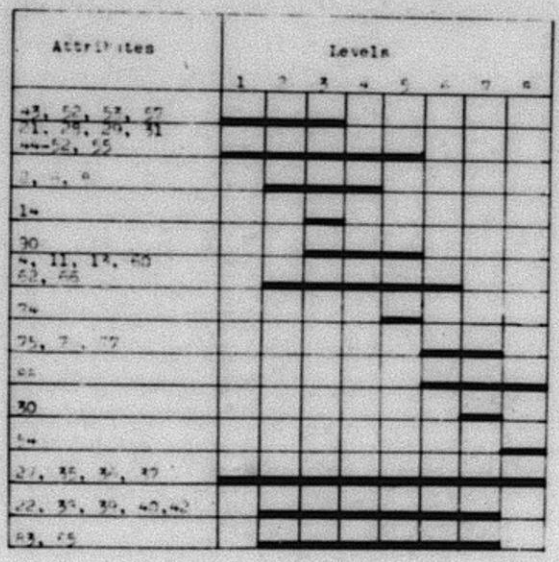


TABLE 22. - Summary of Nasal Angle Form Node Distributions

Attributes	Levels 1	2	3	4	5	6	7	8
82-86								
33, 34								
112, 111, 113								
114, 115								
30								
118								
117								
21, 24								
106, 108								
95, 96								
90								
97, 98								
91, 92, 94								
93								
14, 16, 17								
69-73								

TABLE 27. - Summary of the stratigraphic occurrences of Concave Bowl Rim Form nodes

10. Attributes 95 and 96 with a "finger-thinned" interior lip on a wall that flares outwards at about 45 degrees are found in Levels 3 through 8 and concentrated in Levels 5 through 8.

11. Attribute 90 describes a form with a wall that flares outwards at about 45 degrees, first rising as a convex profile and then curving outwards becoming concave. It is found in Levels 3 through 8 but is in highest percentage in Levels 5 through 8. Note the similarity to Attribute 90 in the Basal Angle forms.

12. A rim with the exterior lip beveled and the interior lip pointed or beaked on an evenly concave wall is found in Levels 3 through 8 but in greatest percentages in Levels 5 through 8. It includes Attributes 97 and 98.

13. Attributes 92 and 94 are evenly rounded rims on concave walls that flare outwards at about 45 degrees. They are found in Levels 5 through 8 with two examples from Level 4.

14. This mode is similar to the last but differs in having a flattened rim with sharp interior and exterior lips. It includes Attribute 93 and is found in Levels 6 through 8.

15. A sizable collection of heavily bolstered rim sherds from low, widely divergent, concave-walled vessels may represent fragments of griddles or comals. The form may have distinctive variations but their stratigraphic positions range from Levels 1 through 8. Attributes 14, 16, 17, and 69 through 73 may be grouped within this durable mode. A similar form was discussed with Convex Bowl rim forms.

Attribute	Level							
	1	2	3	4	5	6	7	8
000	72.41	72.18	71.41	69.28	69.02	66.71	77.06	70.65
001		3.26	2.20	1.94	2.07	.95	1.03	2.04
002		1.96		1.66	.34	1.90	1.03	4.08
003			.31	.27	.69	.95	1.03	
004			.31	.55	.34		4.12	
005	2.50	1.30	.31	.83	1.03	.95		2.04
006		1.30	.31	.55	.69	.95	2.06	2.04
007			.94	1.11	.69		1.03	
008			2.52	1.38	1.38	1.90		2.04
009	5.00		1.89	1.11	1.03			
010		.65				.47	1.03	
011			.31	.55	.69	.95		
012			.63	.27				
013	2.50	2.61	1.26	2.50	1.03	1.42	1.03	
014	5.00	1.30	4.10	4.44	2.07	2.38	1.03	
015		2.61	1.26	.83	1.73	.95		
016			1.26	.83		1.90	4.12	
017		1.30	1.26	1.38	2.07	2.38	3.09	6.12
018					.34			
019	2.50		.31	1.38	.34	.47	1.03	
020	2.50					.47		
021			.63	.55	.69			
022				.27				
023			.94					
024				.83	.34			
025				.27				2.04
026		1.30						
027		.65	1.26					
028			.94		1.38	.47		
029		.65	.63	1.38		.47		
030		.65	1.87	1.66	.34	.47		
031	5.00	1.30	1.57	3.88	2.76	1.90		
032			.94	1.94				
033	7.50	8.49	3.15	1.66	.34			
034			.63		1.03			
051	2.50	3.26	2.20	1.66	2.42	.95	2.06	4.08
052		1.30						
053	2.50	1.30	.63	1.66	2.42	1.42	1.03	
054				.55		.95		2.04
055				.27	.34	.47	2.06	
056		1.30	2.20		2.42	2.85	6.18	2.04
057		1.96	1.26	1.66	2.07	1.42	1.03	

TABLE 28. - Stratigraphic occurrences of Concave Bowl Rim Forms

Attribute	Level							
	1	2	3	4	5	6	7	8
058			.63	1.11	.69	.95		
059	2.50			.55			1.03	
060		1.30	1.26	.55	.69	.95		
061			.31	.27	.34	2.85	1.03	
062			.94	1.38	1.73	1.90	4.12	
063		.65	.63	.55	1.38	.47	2.06	
064		.65	.94	1.66	2.42	1.42		
065	2.50	1.30	2.52	3.33	1.03	2.38		
066		1.30	.31	.83	.69	.47	1.03	
067	2.50		.94	.55	.69	.47		2.04
068			.31	.27	.34	.95		2.04
069	2.50	1.30	1.89	1.11	1.38	.47	1.03	4.08
070			.94	.55		.47		2.04
071		.65	.94	1.11	.34	.95	3.09	3.04
072			.63	.55	.34	.95		
073			.31	.27	1.38	2.85	3.09	4.08
074					.34			
075	2.50		.31	.83	1.03'			
076			.31	.27			1.03	
077			.63	.27				
078				.27	.34		1.03	
079		.65						
080	2.50	3.26	3.15	1.38	1.73	.47	2.06	2.04
081	2.50	3.92	2.20	1.66	2.42	.95	1.03	2.04
082		4.57	2.52	1.66	.34			
083	5.00	3.26	4.10	1.94	.69	.47		
084		1.30	1.26	.55	.34			
085	2.50	5.22	3.47	2.50				
086	15.00	5.88	4.41	3.33	.69		1.03	
087	10.00	1.96	1.89	.27				
088		.65	2.20	3.05	.34			
089		1.30	3.15	2.22	2.07			
090			.31	.27	2.76	5.71	6.18	2.04
091					3.11	3.80	2.06	10.20
092				.27	2.42	4.76	10.30	8.16
093						.95	1.03	4.08
094				.27	1.38		1.03	2.04
095			.31	.83	1.38	1.42	1.03	4.08
096			.31	.83	2.76	4.76	1.03	2.04
097			.31	.27	.34	.95		2.04
098				.55	1.03	4.28	4.12	10.20
099				.27	2.07	3.33	3.09	4.08

TABLE 28-Continued. - Stratigraphic occurrences of Concave Bowl Rim Forms

Attribute	Level							
	1	2	3	4	5	6	7	8
100								
101	2.50	1.30		.27	1.03	.47	1.03	
102				.27	.34		1.03	
103				.27	.34			
104			.94	.27				
105				.27				
106					.34			
107								
108		.65		1.11	.34	.95		
109		1.96		.55	1.38	.47		
110			.31		.34	.47		
111			.31	.55	.34	.47		2.04
112	5.00	2.61	3.15	4.16	4.49	3.33	1.03	
113		5.22	2.52	6.38	5.53	3.80	2.06	
114		3.26	3.47	2.22	5.88	3.80	4.12	
115		.65	.94	.55	.69	.47	1.03	
116			.63		.34			
117			.63	.27				
118		.65	.31					
119	2.50	3.26	1.57	3.33	2.76	2.85	2.06	
120		1.96	2.52	.87	1.38	2.38	1.03	

TABLE 28-Continued. - Stratigraphic occurrences of Concave Bowl Rim Forms

Everted Rim Forms

An outstanding feature of the Everted Rim Forms is their occurrences in upper levels and relative absence, except in simple varieties, in lower levels. This distribution is in sharp contrast with the elaborate everted rim traditions of Guatemala, highland Chiapas, southern Veracruz, and, to a lesser extent, Monte Alban.

Several forms are satisfactory for definition as modes and are described below. Table 29 gives distributions for all attributes.

Two attributes of the Convex Bowl Rim Form category are included here since they have everted rims and should not have been presented earlier.

1. Attribute 53 with its flat and slightly everted rim on a round-bottomed compound silhouette bowl with a high basal angle with the walls barely concave and rising nearly straight is found in Levels 2 and 3.

2. Attribute 50 and Convex Bowl Firm Form Attribute 55 are down-angled everted rims of nubbin proportions on an open, slightly convex bowl found in Levels 2 through 4.

3. Attribute 54 is similar to Attribute 53 but here has a pointed rim with an interior bolster. It is in greatest percentages in Levels 2 and 3 but occurs in Level 4.

4. A small, flat everted rim, Attribute 22, on a medium convex bowl is present in Levels 1 through 4.

5. Attribute 42 with a slightly down-angled everted rim with outer rim rounded and on a wide outflaring concave bowl with a shallow Z angle profile and low basal ridge is found in Levels 2 through 5.

6. Attribute 55 also is similar to Attribute 53 but here the upper wall flares more outwards. It occurs in Levels 1 through 5 but is concentrated in Levels 2 and 3.

7. A small down-angled everted rim with a groove on the rim and accompanying a medium to open concave bowl occurs in Levels 1 through 5. It includes Attributes 35, 36, and 37.

8. A small, thin, down-angled everted rim - Attributes 25, 27, and 28 - is associated with low to medium concave bowls in Levels 1 through 5.

9. A morphological sequence of Attributes 30 to 33 beginning with a simple form and ending with a complex form in a continuous series is found in Levels 2 through 4 with one example in Level 6. The attributes appear stratigraphically ordered as they would be in the sequence. The form is characterized by a heavy everted rim that angles downwards and sometimes points back at the vessel base. The vessel form seems to be a medium to widely divergent concave wall bowl. In earlier occurrences the rim seems to have been applied as a separate strip while later the vessel rim has been bent over and formed.

10. A bolstered rim everted, but never level, and with a definite ridge around the interior is found in Levels 5 through 8 with one example in Level 3. The vessel form is an open bowl with concave walls. The mode is represented by Attribute 20.

11. Attribute 14 with a small, externally tapered everted rim inclined slightly upwards is found on a medium convex bowl in Levels 7 and 8.

12. A compound silhouette vessel, Attribute 57, is found in Levels 4 through 8 but in highest percentage in Levels 6 through 8. The vessel had a high shoulder with a short wall above the shoulder. It is similar to Basal Angle Forms 37 and 35 and has the same stratigraphic distribution in Levels 4 through 8 and high percentage in Levels 6 through 8.

Attribute	Level							
	1	2	3	4	5	6	7	8
00	86.20	86.35	87.01	86.00	86.49	91.12	89.59	92.21
01		1.33		1.21				
02	5.00	1.33	2.77			1.78		
03			.69	.60			2.27	
04				.60				
05			.69					
06				.60		3.57	2.27	
07	5.00			1.21		3.57		7.69
08			1.38	1.21	.79			
09		1.33	1.38	.60	1.58	1.78		
10	5.00	2.66	.69	2.43	2.38	1.78	4.54	
11			.69	.60	1.58	5.35	2.27	7.69
12	5.00	2.66	4.86	3.04	7.93	10.71	6.81	
13			2.08	3.65	3.96	1.78	11.36	
14							4.54	7.69
15			2.08	1.21	1.58	1.78	6.81	
16	10.00	1.33	3.47	3.04	1.58	7.14	4.54	
17	10.00	2.66	5.55	5.48	2.38	3.57		
18		4.00	3.47	7.31	6.34			
19	5.00	1.33	.69	3.04	.79	5.35	2.27	7.69
20			.69		1.58	8.92	6.81	53.84
21		2.66		1.82	2.38	3.57	6.81	
22	5.00	1.33	1.38	.60				
23	5.00	5.33	2.08	1.21		1.78		
24		1.33	.69	.60	.79		2.27	
25		1.33	.69	1.21	.79			
26		2.66		1.21	3.96	1.78		
27			2.08	1.21	.79			
28		4.00	1.38	2.43	3.96			
29	5.00	6.66	7.63	.60	2.38			
30		1.33	1.38	1.21	.79			
31		1.33	.69	2.43	.79		2.27	
32			.69	.60				
33		8.00	2.08					
34				1.21				
35				1.21				
36	5.00	1.33	.69	3.65	2.38			
37				.60	.79			
38	10.00	4.00	3.47	3.04	3.96			
39	5.00	2.66	4.86	4.26	4.76	3.57		
40				3.65	3.17			
41		1.33	1.38	4.87	3.17	5.35	2.27	

TABLE 29. - Stratigraphic occurrences of Everted Rim Forms

Attribute	Level							
	1	2	3	4	5	6	7	8
42		2.66	2.77	3.04	3.17			
43	10.00	1.33	1.38		.79			
44		1.33	4.86	3.04	2.38			
45		4.00	3.47	1.82	5.55	3.57	6.81	
46		4.00	2.08	2.43	4.76	1.78		
47			5.55	1.82	3.96	5.35	4.54	
48				5.48	3.17	1.78		
49	5.00	2.66	3.47	1.83	.79	1.78		
50		1.33	.69					
51		1.33	3.47	3.65	2.38	3.57	2.27	
52			.69		3.17	1.78	2.27	
53		1.33	.69					
54		5.33	3.47	1.21				
55	5.00	10.66	4.16	.60	.79			
56			.69					
57				.60	2.38	7.14	15.90	15.38
58				.60				
59					.79			

TABLE 29-Continued. - Stratigraphic occurrences of Everted Rim Forms

Decoration

Decoration modes may be designs, design elements, techniques, materials, or a combination of these. The use of graphite is considered a mode, as is discussed below, while a certain combination of graphite, a band of red paint and parallel incised lines is another mode. Were the collection larger, it should be possible to treat each element, technique and material as a separate attribute but the small number of decorated sherds from Sipolite does not now permit this. The code catalog can be rearranged making new attributes for future studies, if such should be needed.

Modes given below emphasize stratigraphic distinctions while specific but long-lasting attributes have been somewhat neglected with a few exceptions. Table 30 summarizes mode distributions while Table 31 gives attribute distributions.

1. Stick-notched fillet, Attribute 019, is present in Levels 2 and 3 only.

2. The plano-relief carving on Fine Orange ware sherds, Attribute 123, is found in Levels 2 and 3 with one sherd from Level 4. The larger sherds more closely resemble descriptions of the Z variety than the X, as is discussed in the comparative section of the study.

3. Cross-hatching, always by incision, is part of Attributes 024 and 130 from Levels 2, 3, and 4.

4. Punctation is part of Attributes 037, 093, 138, and 143 in Levels 2, 3, and 4.

5. Filling of excised portions of excised glyphic elements with red paint, Attribute 133, is present in Level 3.

6. Attribute 129 describes the two unique sherds from mold-made vessels, probably convex bowls. The small sherd illustrated in Plate XLVII is from Pit 12, Level 3, and is a duplicate of the larger sherd from Pit 15, Level 4, illustrated in Plate XLVIII. Both probably were made with the same mold. The larger sherd depicts a human head wearing a conical cap with a speech scroll near the mouth. The head is in the jaws of an "earth monster" or Cipactli creature which wears an ear plug and flowing feather headdress. It is discussed at greater length in the comparative section.

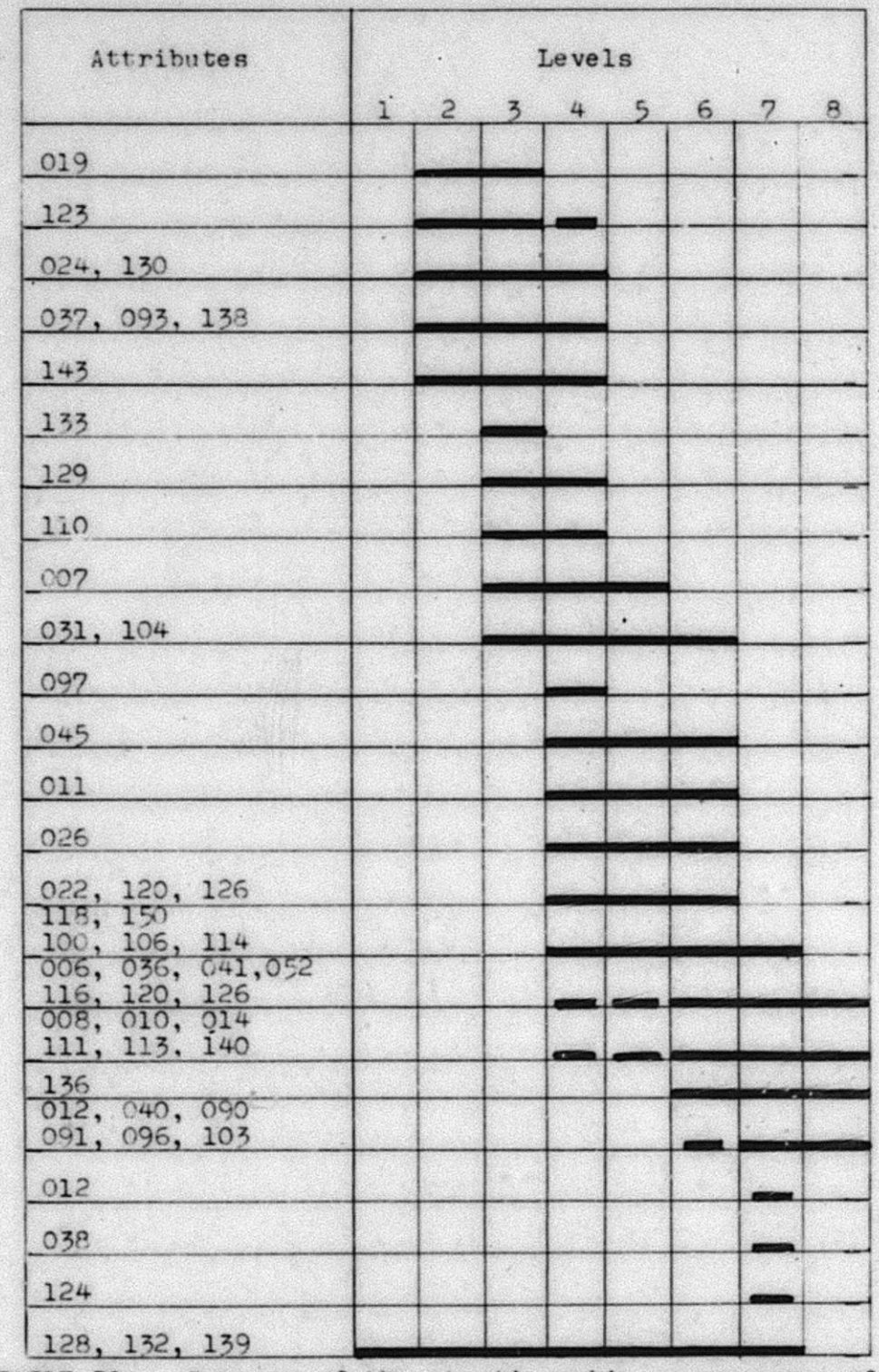


TABLE 30. - Summary of the stratigraphic occurrences of Decoration modes

7. Vertical gadooning, Attribute 110, is present in Levels 3 and 4.

8. Attribute 007 describes two parallel incised lines around the base of a vessel wall with red paint between the lines. It is in Levels 3 through 5.

9. Attribute 031 and 104 describes a combination of red paint and fine incised lines on top of vessel rims. The lines are considered a mode and are found in Levels 3 through 6.

10. Attribute 097, a groove incised repeated design, is only in Level 4.

11. Pecking with a sharp instrument, Attribute 045, is found in Levels 4, 5, and 6. It differs from punctation in that here the clay surface is not only penetrated but bits were ripped away as the instrument was removed.

12. Groups of three to five incised lines vertically descending to the vessel base, Attribute 011, are found on sherds from Levels 4, 5, and 6.

13. Attribute 026, two parallel horizontal incised lines with gouged dots between the lines, are found in Levels 4, 5, and 6.

14. Vertical finger-punched fillet, often accompanying one variety or another of the incised cursive wavy line design but here considered as an independent aspect, occurs in Levels 4, 5, and 6 in Attributes 022, 120, and 126. The cursive line design has a wider distribution, as is discussed below as Mode 17.

15. Series of vertical zigzag lines are in Levels 4 through 7 included within Attributes 100, 106, 114, 118, and 150. Some groups

may be precise and neat while others are sloppy and irregular. The distinctions are not stratigraphically different.

16. Series of two or three comb-incised lines on and/or around interior bases are found in Levels 3 through 8 with but one case each in Levels 3 and 4. Comb-incising on interior bases reaches its maximum after the similar custom of polishing or single line incising. Attributes 015, 016, 114, 115, and 122 include comb-incising on interior bases.

17. The incised cursive wavy line design, usually enclosed by two horizontal parallel incised lines, is most common in Levels 6, 7, and 8 but continues with much diminished frequencies until one example is found in Level 3. The mode includes Attributes 006, 036, 041, 052, 116, 120, and 126.

18. Attributes 008, 010, 014, 111, 113, 140, polish or individually incised lines on and/or around interior bases, are most frequent in Levels 7 and 8 but continue upwards with a single case in Level 4.

19. Series of four or five vertical straight lines originating near a rim and traveling down the wall for an unknown distance are found in Levels 6, 7, and 8. Attribute 136 describes the mode.

20. The use of graphite paint is confined to Levels 7 and 8 with one example in Level 6 and an aberrant one in Level 4. The graphite often occurs in conjunction with red paint. The mode is included in Attributes 012, 040, 090, 091, 096, and 103.

21. Attribute 012 occurs on Basal Angle Form Attribute 30 and there is but one example. The combination of a graphite band enclosed

by red bands above and below with two parallel incised lines, one in the red paint band and the other in the graphite, is unique for Sipolite. It was found in Level 7.

22. Part of Attribute 038 is the incising of a line around a red spot on the vessel exterior. It is found in Level 7. Half of a vessel bearing the same attribute was found in Pit 2, Level 10, along with the section illustrated in Plate LII which has the comb-incised lines on the base interior. Pit 2 was rejected from the stratigraphy study because a worker had mixed finds in higher levels but Level 10 was not disturbed. The association of red spots within lines and comb-incision is probably correct and, in fact, agrees with the stratipit evidence.

23. Two examples of plain rocker stamping were found in Level 7 of different stratipits. It is Attribute 124.

24. Fragments of what is or appears to be excised glyphic elements, Attributes 128, 132, and 139, were found in Levels 1 through 7. The small pieces may be deceiving and some may depict decorative elements, not glyphs.

After two unsuccessful attempts to form type groupings by sorting cards into paste categories, then into surface treatment sub-categories, and dividing further into slip variations, it was realized that there is greater variation within Sipolite ceramics than was anticipated. In the second attempt cards were sorted first into slip categories and then by rim forms.

To demonstrate the problem and illustrate the variation three rim form attributes sharing the same distinctive feature and

Attribute	Level							
	1	2	3	4	5	6	7	8
000	88.96	89.27	83.40	79.69	79.95	77.81	80.37	86.82
001		1.69	1.63	2.10	2.67		1.20	
002					.53			
003			.54	.42			2.40	
004	12.50	5.08	11.41	9.24	2.67	5.00	8.43	4.54
005	6.25		2.71	3.36	1.60	2.85		
006				.84		.71	2.40	
007			.54	.42	.53			
008					.53	.71	3.61	9.09
009			.54		.53			
010				.42	1.60		2.40	4.54
011				.42	1.06	.71		
012							1.20	
013							1.20	
014						.71		4.54
015				.84		.71	1.20	
016							2.40	
017	6.25				.53	2.14	1.20	
018			.54				1.20	
019		1.69	1.08					
020				.42				
021					.53			
022				.42	.53			
023		1.69						
024		1.69						
025		1.69	.54				1.20	
026				.42	.53	1.42		
027			1.63		1.06			
028	18.75	10.16	5.43	8.82	5.34	14.28	8.43	4.54
029		3.38		1.68	.53	.71	1.20	
030	31.25	23.72	16.30	16.80	18.18	12.14	6.02	
031			.54	.84	.53	2.14		
032				.42				
033		8.47	12.51	16.38	23.52	7.85	2.40	4.54
034						1.42	3.61	
035		1.69	.54			2.14		
036				.42				
037				.42				
038							1.20	
039				.42				
040							1.20	

TABLE 31. - Stratigraphic occurrences of Decoration attributes

Attribute	Level							
	1	2	3	4	5	6	7	8
041			.54	.42	.53	.71	1.20	
042		1.69	1.63		.53	1.42	2.40	
043				.42	.53	1.42		
044						.71		
045				.42	1.06	.71		
046		1.69		.42				
047		1.69		.42	.53	.71		
048	6.25				1.06			
049				.42	.53			
050		1.69	9.78	3.36	2.13	3.57	1.20	
051							1.20	
052								4.54
053			.54					
054					.53			
055					.53			
056						.71		
057			.54					
058				.42				
059	6.25					2.14		
060			1.08	1.26	.53	1.42	1.20	
061						.71		
062						.71		
063			1.08	.84	2.67	1.42		4.54
064		1.69		.42	1.06			
065			.54					
066			.54					
067			.54			.71		
068		1.69	1.08	2.10	3.74	2.85		
069			.54					
070			.54					
071		1.69	2.17	2.94	3.74	2.14	2.40	
072			1.63	.42	1.60			
073			.54	.42	1.06	.71		
074			.54	1.26	.53	.71		
075			.54		.53	2.14		
076						.71		
077				.42		1.42		
078						.71		
079			.54	.84				
080							2.40	

TABLE 31-Continued. - Stratigraphic occurrences of Decoration attributes

Attribute	Level							
	1	2	3	4	5	6	7	8
081					.53			
082				.84	.53	.71		
083				.42				
084		1.69						
085		1.69	.54					
086			.54	.42	1.06			
087					.53	1.42	1.20	
088				.42	.53	.71		4.54
089						.71		
090							1.20	9.09
091							1.20	
092				.42				
093		1.69						
094			1.63	.42				
095			.54					
096				.42				
097				.42				
098		3.38		.42				
099					.53		1.20	
100							3.61	
101				.42	.53		1.20	
102								4.54
103						.71		
104				2.10	.53			
105			1.63					
106				.42				
107			.54					
108				.42				
109			.54					
110			.54	.42				
111								4.54
112				.42		.71		
113							1.20	
114			.54	.42			7.22	4.54
115							1.20	
116				.42	1.06	.71	1.20	4.54
117			.54	.42				
118				.42		.71	1.20	
119				.42	1.06			
120					.53	.71		

TABLE 31-Continued. - Stratigraphic occurrences of Decoration attributes

Attribute	Level							
	1	2	3	4	5	6	7	8
121			.54					
122			.54		.53	.71		
123		6.77	4.89	.42				
124							2.40	
125			.54					
126						.71		
127						.71		
128				.42				
129			.54	.42				
130		3.38	.54	.42				
131		1.69						
132				1.26	1.06	1.42	3.61	
133			.54					
134				.42				
135			.54					
136						.71	2.40	4.54
137		1.69	.54					
138			.54					
139	6.25			1.26	1.60			
140						1.42	1.20	18.18
141		1.69	.54		.53			
142	6.25		.54	.84	1.06			
143		1.69						
144					.53			
145				.42			1.20	
146				.42	.53			
147								
148				.42				
149								
150						.71		

TABLE 31-Continued. - Stratigraphic occurrences of Decoration attributes

stratigraphic distribution were chosen and grouped together. Tecomate Rim Form 25 and Convex Bowl Rim Forms 17 and 86, all from Levels 1 through 5 with three tecomate rims from Level 6, have a low raised band around the rim and taper to a point at the rim. The attribute is not found on any other vessel rims. One might well expect such a

specific mode to have a narrow range of pastes or slips or at least show a regular pattern within the stratigraphic sequence. Tables 32 and 33 give stratigraphic occurrences of paste and slip variations respectively. Paste differences appear randomly distributed. There may be a tendency to have used red slip or paint (Attributes 05, 14, 17, 24, 49, and 56) in lower levels but otherwise the variation is considerable.

Level	Paste Attributes								
	01	05	06	07	08	09	10	11	14
1					1	1	1	2	
2		2					1		
3	1		1		1		2	1	1
4		1				4	1		
5	1	3	1	1		2	1	2	
6	1					1	1		
7									
8									

TABLE 32. - Stratigraphic distribution of paste attributes for Tecomate Attribute 25 and Convex Bowl Attributes 17 and 86

Paste, temper and surface treatment differences do not seem useful for dividing Sipolite ceramics into meaningful categories. Vessel form would appear most diagnostic. Therefore, the primary division is on the basis of form and form groupings are described for their slip, paste, surface finish, temper, rim radius and decoration attributes.

Level	Slip Attributes									
	01	10	05	11	14	17	21	24	49	56
1	4	1								
2		1					1	1		
3	5	2		1						
4	3	2			1					
5	4	2	1		1	1			2	
6	1	1								1
7										
8										

TABLE 33. - Stratigraphic distribution of slip attributes for Tecomate Attribute 25 and Convex Bowl Attributes 17 and 86

It is not felt that the form groupings should be regarded as wares, types or varieties since each of these terms carries a sense of precision of classification that cannot now be given to Sipolite groupings. Rather, the groupings are called series, a term which for Mesoamerican archaeology does not carry a recognized level of denotation. Webster's Third New International Dictionary defines series as:

> "...1: a group of usually three or more things or events standing or succeeding in order and having a like relationship to each other...6a: a group of specimens or types progressively differing from each other in some morphological or physiological attribute..."[8]

Each major form group is divided into series. For instance, tecomates are divided into seven series and numbered 1 through 7. Each series is briefly described as to form and the tecomate rim form attributes included in it are given. The description of the series then follows. The form attributes included within the series will, of

course, vary somewhat from the series description. In one sense the description is the ideal with the form attributes being variations from the ideal. Such variation validates use of the term series.

Some series are rather narrowly defined while others are fairly general; some have many members while others have few. Definitions are based on two factors, distinctiveness and numbers. One series may have very few members but be quite distinctive. Form attributes that are extremely distinctive must be placed in separate groupings. On the other hand, unless each grouping or series has sufficient members, we have returned to description of attributes. The intention is to define groupings that are potential types and/or varieties. Whether or not the groupings are successful must await the test of further study.

The number of members within each series is given following the series title.

Sipolite Tecomate Series: Series 1: (462)

Form: Tecomate with simple, unbolstered, unelaborated rim which is evenly rounded (Attributes 1, 2, 4, 6, 7, 8, 9, 16, and 17)

Slip: Unslipped, 45%; reddish-brown, 30%; brown, 20%; others, 5%

Paste: Reddish-brown, 50%; brown, 35%; others, 15%

Finish: Smoothed, 55%; polished, 10%; polished interior and rude exterior, 12%; rude interior and exterior, 10%; others, 13%

Temper: Fine and none visible, 15%; medium, 35%; coarse, 50%

Rim Radius: Range from 3 to 20 cms. with 10.9 cms. average

Decoration: Very rare with one example each of Attributes 28, 36, and 50

Occurrence: Levels 1 through 8 with 14, 46, 113, 110, 76, 43, 41, and 19 examples respectively for the levels.

Comment: This tecomate series follows the occurrence pattern for all sherds for each level. The lack of change in relative popularity is noteworthy for while tecomates elsewhere declined in popularity during the late Preclassic, no such decline occurred at Sipolite.

. Tecomate Series 2: (229)

Form: Tecomate with rounded bolstered rim (Attributes 3, 5, 10, and 12)

Slip: Unslipped, 44%; reddish-brown, 25%; browns, 15%; others, 10%

Paste: Reddish-brown, 45%; browns, 35%; greys, 15%; others, 5%

Finish: Smoothed, 60%; polished, 17%; rude interior and exteriors, 4%; others, 19%

Temper: Fine or none visible, 5%; medium, 50%; coarse, 45%

Rim Radius: Range from 4 to 27 cms. with 12.5 cms. average

Decoration: Attributes 28 and 110 having five and four examples each and Attributes 26, 27, 29, 30, 42, 47, and 120 with one each

Occurrence: Levels 1 through 8 with 1, 26, 50, 52, 46, 27, 21 and 6 examples

Tecomate Series 3: (119)

Form: Tecomate with bolstered rim flattened around the external rim (Attributes 11, 13, 14, 15, and 20)

Slip: Unslipped, 26%; reddish-brown, 26%; browns, 36%; reds, 4%; orange, 4%; others, 4%

Paste: Reddish-brown, 40%; browns, 48%; light reddish-brown, 7%; others, 5%

Finish: Smoothed, 50%; polished, 12%; smoothed and polished, 12%; rough or roughened (rude), 15%; others, 11%

Temper: Fine, 5%; medium, 45%; coarse, 50%

Rim Radius: Range from 3 to 30 cms. with 14.5 cms. average

Decoration: One example of Attribute 50

Occurrence: Levels 2 through 8 with 2, 19, 16, 21, 28, 26, and 7 examples

Tecomate Series 4: (47)

Form: Tecomate with pointed rim (Attributes 21, 22, and 23)

Slip: Unslipped, 36%; reddish-brown, 30%; browns, 20%; others, 14%

Paste: Reddish-brown, 53%; browns, 40%; others, 7%

Finish: Smoothed, 60%; polished, 10%; rude interior and exterior, 25%; others, 5%

Temper: Fine, 5%; medium, 30%; coarse, 65%

Rim Radius: Range from 4 to 25 cms. with 14 cms. average

Decoration: One example of Attribute 27

Occurrence: Levels 1 through 8 with 1, 5, 9, 7, 8, 5, and 4 examples

Tecomate Series 5: (83)

Form: Tecomate with rim beveled on interior and/or exterior (Attributes 18 and 19)

Slip: Unslipped, 57%; reddish-brown, 15%; brown, 12%; grey, 8%; others, 8%

Paste: Reddish-brown, 27%; browns, 35%; greys, 30%; others, 8%

Finish: Smoothed, 50%; polished, 40%; rude, 10%

Temper: Fine and none visible, 49%; medium, 16%; coarse, 35%

Rim Radius: Range from 4 to 27 cms. with 12.5 average

Decoration: Four examples for Attribute 28 and two each for Attributes 30 and 80 with one each for Attributes 49, 50, 117, and 121

Occurrence: Levels 1 through 8 with 2, 4, 8, 10, 18, 19, 16, and 6 examples

Tecomate Series 6: (43)

Form: Tecomate with raised external lip (Attributes 24, 26, 27, and 28)

Slip: Unslipped, 57%; reddish-brown, 25%; others, 17%

Paste: Reddish-brown, 37%; browns, 33%; greys, 20%; others, 10%

Finish: Smoothed, 51%; polished, 12%; smoothed and polished, 20%; rude, 18%

Temper: Fine or none visible, 47%; medium, 10%; coarse, 43%

Rim Radius: Range from 4 to 24 cms. with 12 cms. average

Decoration: One example each for Attributes 26, 28, 41, and 119

Occurrence: Levels 1 through 7 with 1, 6, 9, 10, 4, 9, and 4 examples

Sipolite olla forms have been divided into two large groups, those with ovoid bodies and those with globular bodies. Each group has been sub-divided into series.

Sipolite Olla Series: Series 1: (11)

Form: Ovoid body with short, erect and straight neck (Attribute 1)

Slip: Unslipped, 73%; reddish-brown, 27%

Paste: Reddish-brown, 55%; browns, 36%; others, 9%

Finish: Smoothed, 73%; smoothed and polished, 27%

Temper: Fine, 27%; medium, 37%; coarse, 36%

Rim Radius: Range from 5 to 23 cms. with 9.6 cms. average

Decoration: None

Occurrence: Levels 1, 2, 3, and 6 with 1, 6, 2, and 1 examples respectively

Comment: Apparently the series is an indicator of Late Sipolite although the form is sometimes considered typical of the Rmmlas Preclassic.

Olla Series 2: (77)

Form: Ovoid body with outwardly everted rim that is never horizontal (Attributes 4, 5, 6, and 7)

Slip: Unslipped, 61%; reddish-brown, 20%; with grey, brown and red slips rare

Paste: Reddish-brown, 21%; browns, 47%; greys, 25%; others, 7%

Finish: Smoothed, 60%; smoothed interior and rude exterior, 25%; rude, 8%; others, 7%

Temper: Fine and none visible, 20%; medium, 33%; coarse, 47%

Rim Radius: Range from 3 to 22 cms. with 8.4 cms. average

Decoration: Two examples of Attribute 25 and one each for Attributes 11 and 24

Occurrence: Levels 1 through 7 with 6, 34, 19, 11; 14, 6, and 2 examples

Olla Series 3: (38)

Form: Ovoid body with widely divergent neck and rim (Attributes 11, 12, 19, and 21)

Slip: Unslipped, 74%; reddish-brown, 16%; others, 10%

Paste: Reddish-brown, 42%; browns, 38%; greys, 18%; others, 2%

Finish: Smoothed, 45%; smoothed and polished, 16%; rude, 39%

Temper: Fine and none visible, 29%; medium, 29%; coarse, 62%

Rim Radius: Range from 2 to 16 cms. with 7.9 cms. average

Decoration: None

Occurrence: Levels 1 through 7 with 1, 4, 13, 8, 4, 6, and 2 examples

Olla Series 4: (23)

Form: Globular body with short, straight, vertical neck (Attributes 2 and 3)

Slip: Unslipped, 76%; browns, 12%; greys, 12%

Paste: Reddish-brown, 26%; browns, 38%; greys, 30%; others, 12%

Finish: Smoothed, 65%; polished, 26%; polished interior and rude exterior, 9%

Temper: Fine and none visible, 52%; medium, 40%; coarse, 8%

Rim Radius: Range from 2 to 23 cms. with 9.6 cms. average

Decoration: Two examples of Attribute 29 and one of Attribute 25

Occurrence: Levels 2 through 8 with 1, 5, 7, 3, 2, 4, and 1 examples

Olla Series 5: (57)

Form: Globular body with curved and divergent necks and rims (Attributes 8, 9, 10, 13, 14, 15, 16, and 20)

Slip: Unslipped, 56%; reddish-brown, 38%; others, 6%

Paste: Reddish-brown, 53%; browns, 28%; greys, 10%; others, 9%

Finish: Smoothed, 49%; smoothed interior and rough exterior, 39%; others, 12%

Temper: Fine, 12%; medium, 16%; coarse, 72%

Rim Radius: Range from 2 to 22 cms. with 11 cms. average

Decoration: None

Occurrence: Levels 1 through 7 with 1, 14, 28, 7, 4, 2, and 1 examples

Olla Series 6: (9)

Form: Globular body with straight, tapered neck diverging outwards at a 45° angle (Attribute 17)

Slip: Unslipped, 33%; greys, 22%; cream or dirty white, 44%

Paste: Reddish-brown, 66%; and grey, brick, and light reddish-brown

Finish: Smoothed, 55%; polished and smoothed, 22%; polished interior with rude exterior, 22%

Temper: Fine, 33%; medium, 33%; coarse, 33%

Rim Radius: Range from 2 to 16 cms. with 6 cms. average

Decoration: None

Occurrence: Levels 1 through 4 with 1, 4, 3, and 1 examples

Comment: Late Sipolite indicator

Olla Series 7: (6)

Form: Fragments of a body-neck union with bulge at interior angle suggesting a tall, narrow neck that did not permit smoothing the angle, as might occur with a bottle form (Attribute 22)

Slip: Unslipped, 50%; reddish-brown, light brown, and white

Paste: Brown, 50%; grey, 33%; reddish-brown, 16%

Finish: Smoothed, 66%; smoothed and polished, 33%

Temper: Fine, 66%; medium, 16%; coarse, 16%

Rim Radius: Range 4 to 5 cms. with 4.6 cms. average

Decoration: None

Occurrence: Levels 1, 3, 4, 6, 7, and 8 with one example each

Convex Bowl Rim Forms also have been grouped into series according to form similarities. In most cases assumptions have been made as to total vessel form. That is, rim forms that appear to be from tall, nearly straight-walled convex bowls are so described.

Sipolite Convex Bowl Series: Convex Bowl Series 1 (6)

Form: High, nearly straight-walled convex bowl (Attributes 14 and 16)

Slip: Unslipped, 66%; browns, 33%

Paste: Browns, 50%; grey, 33%; light reddish-brown, 16%

Finish: All smoothed and/or polished

Temper: All very fine or none visible

Rim Radius: Range of 8 to 23 cms. with 12.8 cms. average

Decoration: One example of Attribute 30

Occurrence: Levels 6, 7, and 8 with 2, 3, and 1 examples

Comment: Early Sipolite indicator

Convex Bowl Series 2: (13)

Form: High bowl that rises with convex wall that flares outwards becoming concave (Attributes 4, 9, and 11)

Slip: Unslipped, 38%; reddish-browns, 54%; brown, 8%

Paste: Reddish-brown, 54%; brown, 38%; other, 8%

Finish: Smoothed, 61%; smoothed or polished interior and rude exterior, 23%; rude, 16%

Temper: Medium, 54%; coarse, 46%

Rim Radius: Range from 13 to 27 cms. with 17.4 cms. average

Decoration: One example of Attribute 122

Occurrence: Levels 2 through 5 and 8 with 3, 3, 2, 3, and 2 examples

Convex Bowl Series 3: (52)

Form: Medium convex bowls with rounded rims (Attributes 26, 27, 30, 32, and 57)

Slip: Unslipped, 65%; reddish-browns, 15%; greys, 10%; browns, 10%

Paste: Reddish-brown, 26%; tan, 5%; browns, 35%; greys, 22%; others, 12%

Finish: Smoothed, 50%; polished, 20%; smoothed or polished interior and rude exterior, 15%; rude, 15%

Temper: Fine or none visible, 23%; medium, 30%; coarse, 47%

Rim Radius: Range from 4 to 26 cms. with 14.2 cms. average

Decoration: One example each of Attributes 28, 30, 46, and 48

Occurrence: Levels 1 through 8 with 3, 8, 11, 11, 7, 6, 4, and 2 examples

Convex Bowl Series 4: (47)

Form: Medium convex bowl with exterior rim beveled and beaked interior rim (Attributes 58 and 67)

Slip: Unslipped, 73%; reddish-browns, 10%; browns, 10%; others, 7%

Paste: Reddish-brown, 25%; browns, 25%; greys, 33%; others, 12%

Finish: Smoothed, 34%; polished, 34%; smoothed and polished, 7%; smoothed or polished interior with rude exterior, 25%

Temper: Fine or none visible, 68%; medium, 20%; coarse, 12%

Rim Radius: Range from 5 to 24 cms. with 13 cms. average

Decoration: One example of Attribute 51

Occurrence: Levels 1 through 8 with 1, 2, 8, 12, 7, 10, 6, and 1 examples

Convex Bowl Series 5: (37)

Form: Medium bowl with nearly straight walls and pointed rims (Attributes 59, 60, and 62)

Slip: Unslipped, 65%; reddish-brown, 5%; browns, 15%; and others including orange, black and buff

Paste: Reddish-brown, 24%; browns, 40%; greys, 25%; others, 11%

Finish: Smoothed, 24%; polished, 33%; smoothed and polished, 10%; smoothed interior and rude exterior, 30%; rude, 3%

Temper: Fine or none visible, 43%; medium, 20%; coarse, 37%

Rim Radius: Range from 7 to 25 cms. with 14.8 cms. average

Decoration: One example each of Attributes 33, 34, and 40

Occurrence: Levels 2 through 8 with 4, 3, 5, 10, 11, 3, and 1 examples

Convex Bowl Series 6: (52)

Form: Deep bowls with evenly convex walls and pointed rims (Attributes 8, 13, 15, and 83)

Slip: Unslipped, 54%; black, 20%; and others including reddish-brown, brown, red, cream and grey

Paste: Reddish-brown, 12%; cream, 4%; tan, 6%; browns, 33%; greys, 40%; others, 5%

Temper: Fine and none visible, 98%; coarse, 2%

Rim Radius: Range from 5 to 23 cms. with 10.3 cms. average

Decoration: Three examples of Attribute 59 and one each for Attributes 30, 35, 45, 46, and 48

Occurrence: Levels 1 through 8 with 2, 7, 12, 16, 10, 4, 0, and 1 examples

Convex Bowl Series 7: (81)

Form: Deep bowls with simple, rounded rims (Attributes 1, 2, 3, 5, 6, 7, 28, 29, and 31)

Slip: Unslipped, 42%; reddish-browns, 48%; browns, 5%; black, 5%

Paste: Reddish-brown, 52%; browns, 35%; greys, 8%; others, 5%

Finish: Smoothed, 37%; polished, 15%; smoothed and polished, 15%; smoothed or polished interior and rude exterior, 28%; rude, 5%

Temper: Fine or none visible, 7%; medium, 50%; coarse, 43%

Rim Radius: Range from 4 to 28 cms. with 15.6 cms. average

Decoration: One example each of Attributes 30 and 71

Occurrence: Levels 1 through 8 with 4, 8, 28, 27, 6, 6, 1, and 1 examples

Convex Bowl Series 8: (66)

Form: Medium bowl with small everted rim (Attributes 51, 52, 53, 54, and 65 and Everted Rim Forms 21, 22, and 23)

Slip: Unslipped, 59%; reddish-browns, 20%; browns, 9%; and others including red, black and grey

Paste: Reddish-brown, 45%; browns, 40%; greys, 15%

Finish: Smoothed, 32%; polished, 28%; smoothed and polished, 14%; smoothed or polished interior and rude exterior, 15%; rude, 11%

Temper: Fine or none visible, 43%; medium, 30%; coarse, 23%

Rim Radius: Range from 3 to 26 cms. with 15 cms. average

Decoration: One or two examples of Attributes 28, 32, 33, 82, 88, 101, and 106

Occurrence: Levels 1 through 8 with 3, 13, 12, 18, 10, 6, 3, and 1 examples

Convex Bowl Series 9: (50)

Form: Medium or high bowl with finger groove around outside rim (Attributes 10 and 12 and Everted Rim Forms 53, 54, and 55)

Slip: Unslipped, 70%; reddish-browns, 12%; browns, 10%; creams, 4%; greys, 4%

Paste: Reddish-brown, 24%; browns, 56%; greys, 10%; others, 10%

Finish: Smoothed, 34%; polished, 8%; smoothed and polished, 14%; smoothed or polished interior and rude exterior, 38%; rude, 6%

Temper: Fine or none visible, 40%; medium, 42%; coarse, 18%

Rim Radius: Range from 7 to 26 cms. with 15.7 cms. average

Decoration: One example of Attribute 1

Occurrence: Levels 1 through 7 with 1, 16, 15, 9, 7, 1, and 1 examples

Convex Bowl Series 10: (34)

Form: Low bowl with even walls and pointed rim (Attributes 118 and 119)

Slip: Unslipped, 80%; browns, 12%; and others including red, cream and grey

Paste: Reddish-brown, 3%; browns, 24%; greys, 50%; cream, 12%; others, 11%

Finish: Smoothed, 60%; polished, 40%

Temper: Fine or none visible, 100%

Rim Radius: Range from 4 to 21 cms. with 9.9 cms. average

Decoration: One example each of Attributes 1, 28, 29, and 38

Occurrence: Levels 1 through 7 with 1, 4, 4, 8, 5, 6, and 6 examples

Convex Bowl Series 11: (209)

Form: Low bowl with variable rim (Attributes 85, 101, 104, 105, 107, 110, 111, 115, and 117)

Slip: Unslipped, 58%; reddish-browns, 19%; browns, 10%; and others including red, black, grey, white and orange

Paste: Reddish-brown, 35%; browns, 30%; greys, 22%; and others

Finish: Smoothed, 30%; polished, 19%; smoothed and polished, 6%; smoothed or polished interior and rude exterior, 34%; rude, 11%

Temper: Fine or none visible, 48%; medium, 23%; coarse, 29%

Rim Radius: Range from 5 to 28 cms. with 14.8 cms. average

Decoration: Four examples of Attribute 28; two examples of Attributes 35 and 36; and one example each for Attributes 30, 33, 37, 39, 43, 44 and 125

Occurrence: Levels 1 through 8 with 11, 24, 41, 41, 33, 23, 28, and 8 examples

Convex Bowl Series 12: (125)

Form: Medium bowl with pointed rim (Attributes 61, 75, 76, 77, 78, and 81)

Slip: Unslipped, 70%; browns, 9%; and others including grey, red, orange, black, cream and dirty white

Paste: Reddish-brown, 10%; browns, 25%; greys, 52%; cream, 8%; and others

Finish: Smoothed, 21%; polished, 69%; smoothed and polished, 5%; rude, 5%

Temper: Fine and none visible, 92%; medium, 2%; coarse, 6%

Rim Radius: Range from 3 to 22 cms. with 9.4 cms. average

Decoration: Twenty-five percent of the series bear decoration but there is great variation. There are seven examples of Attribute 28, three for Attribute 132 and one or two examples of Attributes 8, 15, 29, 30, 34, 41, 43, 45, 47, 53, 54, 55, 56, 57, 58, 87, 119, 127, and 128.

Occurrence: Levels 1 through 8 with 2, 9, 18, 25, 19, 24, 19, and 9 examples respectively

Convex Bowl Series 13: (43)

Form: Medium or low bowl with evenly curved walls and squared rim (Attributes 72, 73, 106, 112 and 113)

Slip: Unslipped, 59%; reddish-browns, 25%; browns, 4%; greys, 7%; others, 5%

Paste: Reddish-brown, 37%; browns, 45%; grey, 9%; others, 9%

Finish: Smoothed, 14%; polished, 23%; smoothed and polished, 14%; smoothed or polished interiors and rude exteriors, 44%; rude, 5%

Temper: Fine and none visible, 23%; medium, 46%; coarse, 31%

Rim Radius: Range from 6 to 26 cms. with 17 cms. average

Decoration: One example each of Attributes 6, 30, 31 and 52

Occurrence: Levels 1 through 8 with 3, 2, 11, 9, 5, 4, 5 and 4 examples

Convex Bowl Series 14: (81)

Form: Medium bowl with bolstered rim (Attributes 63, 64, 66, 68, 69, 70, 71 and 74)

Slip: Unslipped, 40%; reddish-browns, 35%; browns, 10%; and others including black, orange and grey

Paste: Reddish-brown, 35%; browns, 45%; greys, 10%; and others

Finish: Smoothed, 25%; polished, 22%; smoothed and polished, 12%; smoothed or polished interior and rude exterior, 39%; rude, 2%

Temper: Fine and none visible, 41%; medium, 40%; coarse, 19%

Rim Radius: Range from 6 to 27 cms. with 14.5 cms. average

Decoration: Two examples each for Attributes 31 and 50 and one each for Attributes 28, 30, 34, 41, 42 and 122

Occurrence: Levels 2 through 8 with 16, 26, 16, 12, 9, 1 and 1 examples

Convex Bowl Series 15: (12)

Form: Medium bowl with nearly straight walls (Attributes 82 and 84)

Slip: Unslipped, 75%; black, 17%; red, 8%

Paste: Greys, 92%; brown, 8%

Finish: Smoothed, 58%; polished, 33%; smoothed and polished, 8%

Temper: All fine or none visible

Rim Radius: Range from 6 to 22 cms. with 11 cms. average

Decoration: One example of Attribute 28

Occurrence: Levels 1 through 5 with 1, 2, 3, 3 and 3 examples

Convex Bowl Series 16: (2)

Form: Low bowl with bolstered exterior rim (Attribute 120)

Slip: Unslipped and light grey

Paste: Light grey

Finish: Polished

Temper: Fine and none visible

Rim Radius: 7 and 8 cms.

Decoration: None

Occurrence: Levels 6 and 7

Convex Bowl Series 17: (11)

Form: Medium or low bowl with beveled interior rim (Attributes 87 and 116)

Slip: All unslipped

Paste: Grey, 91%; brown, 9%

Finish: Smoothed, 45%; polished, 36%; smoothed and polished, 18%

Rim Radius: Range from 8 to 19 cms. with 12.5 cms. average

Decoration: Two examples of Attribute 35 and one of Attribute 60

Occurrence: Levels 3, 6, 7 and 8 with 1, 4, 4 and 2 examples

Sipolite Concave Bowl Series: Concave Bowl Series 1 (92)

Form: Low bowl with fairly straight walls and variable but simple rim (Attributes 1, 2, 3, 4, 5, 6, 11 and 12)

Slip: Unslipped, 54%; reddish-browns, 23%; browns, 22%; black, 1%

Paste: Reddish-brown, 40%; browns, 44%; grey, 3%; light reddish-brown, 8%; others, 5%

Finish: Smoothed, 23%; polished, 5%; smoothed and polished, 9%; smoothed or polished interiors and rude exteriors, 45%; rude, 18%

Temper: Fine, 2%; medium, 33%; coarse, 65%

Rim Radius: Range from 7 to 28 cms. with 16.5 cms. average

Decoration: One example each of Attributes 31, 33, 60 and 66

Occurrence: Levels 1 through 8 with 1, 12, 12, 23, 17, 14, 8 and 5 examples

Concave Bowl Series 2: (47)

Form: Low bowl with pointed rim (Attributes 7, 8 and 9)

Slip: Unslipped, 60%; reddish-browns, 24%; browns, 12%; red, 4%

Paste: Reddish-brown, 40%; browns, 42%; greys, 4%; others, 16%

Finish: Smoothed, 19%; polished, 5%; smoothed or polished interior and rude exterior, 62%; rude, 14%

Temper: Fine or none visible, 13%; medium, 34%; coarse, 53%

Rim Radius: Range from 8 to 28 cms. with 15.8 cms. average

Decoration: One example each for Attributes 4 and 50

Occurrence: Levels 1 through 8 with 2, 0, 17, 13, 9, 4, 1 and 1 examples

Concave Bowl Series 3: (41)

Form: Low bowls with bolstered rim (Attributes 10, 15, 18, 19, 20, 22, 23, 25 and 26)

Slip: Unslipped, 44%; reddish-browns, 32%; browns, 24%

Paste: Reddish-brown, 46%; browns, 32%; grey, 5%; light reddish-brown, 7%; others, 10%

Finish: Smoothed, 15%; polished, 7%; smoothed or polished interior with rude exterior, 75%; rude, 3%

Temper: Fine, 3%; medium, 30%; coarse, 67%

Rim Radius: Range from 11 to 28 cms. with 17.2 cms. average

Decoration: One example of Attribute 31

Occurrence: Levels 1 through 8 with 2, 7, 8, 9, 7, 5, 2 and 1 examples

Concave Bowl Series 4: (166)

Form: Very low convex or concave vessels with heavily bolstered rims (Concave Bowls 13, 14, 16, 17, 21 and 24 and Convex Bowls 102, 103, 108, 109 and 114) -- probably comal forms

Slip: Unslipped, 39%; reddish-browns, 30%; browns, 30%; black, 1%

Paste: Reddish-brown, 46%; browns, 47%; grey and black slips, 7%

Finish: Smoothed, 25%; polished, 3%; smoothed and polished, 4%; smoothed or polished interior and rude exterior, 65%; rude, 7%

Temper: Fine or none visible, 3%; medium, 45%; coarse, 52%

Rim Radius: Range from 7 to 30 cms. with 16.1 cms. average

Decoration: One example each of Attributes 31, 60, 61 and 122

Occurrence: Levels 1 through 8 with 4, 11, 35, 51, 28, 21, 13 and 3 examples

Comment: Considering form, size, and surface treatment, most of these sherds could be from comals. The finding of such in early levels is unusual.

Concave Bowl Series 5: (22)

Form: Low bowls with tapered rims (Attributes 27, 28 and 29)

Slip: Unslipped, 50%; grey, 18%; orange, 18%; reddish-brown and brown, 12%

Paste: Reddish-brown, 4%; browns, 22%; greys, 54%; light reddish-brown, 14%; others, 6%

Finish: Smoothed, 18%; polished, 82%

Temper: All fine or none visible

Rim Radius: Range from 7 to 26 cms. with 13 cms. average

Decoration: One example each of Attributes 30, 69, 70 and 73

Occurrence: Levels 2 through 6 with 2, 9, 5, 4 and 2 examples

Concave Bowl Series 6: (15)

Form: Low, very open concave bowl (Attribute 30)

Slip: Unslipped, 66%; orange, 20%; reddish browns and greys, 14%

Paste: Reddish-browns, 4%; tans, 20%; browns, 33%; greys, 43%

Finish: Smoothed, 40%; polished, 60%

Temper: Fine or none visible, 96%; medium, 4%

Rim Radius: Range from 9 to 18 cms. with 12.7 cms. average

Decoration: One example of Attribute 28

Occurrence: Levels 2 through 6 with 1, 6, 6, 1 and 1 examples

Concave Bowl Series 7: (79)

Form: Medium bowl with nearly straight walls (Attributes 51, 53, 55 and 62)

Slip: Unslipped, 45%; reddish-browns, 30%; greys, 8%; and others including brown, red, and black graphite

Paste: Reddish-brown, 44%; brick, 5%; browns, 46%; and greys, 5%

Finish: Smoothed, 27%; polished, 8%; smoothed and polished, 8%; smoothed or polished interiors and rude exteriors, 40%; rude, 17%

Temper: Fine or none visible, 5%; medium, 32%; coarse, 63%

Rim Radius: Range from 6 to 27 cms. with 16.7 cms. average

Decoration: One example of Attribute 31

Occurrence: Levels 1 through 8 with 2, 7, 12, 17, 20, 10, 9 and 2 examples

Concave Bowl Series 8: (67)

Form: Medium bowl with slightly concave wall and bolstered rim (Attributes 52, 58, 59, 60, 61 and 80)

Slip: Unslipped, 37%; reddish-browns, 31%; browns, 28%; black, 4%

Paste: Reddish-brown, 49%; brick, 6%; browns, 38%; reddish-brown, 7%

Finish: Smoothed, 21%; polished, 12%; smoothed and polished, 10%; smoothed or polished interiors and rude exteriors, 50%; rude, 7%

Temper: Fine, 4%; medium, 46%; coarse, 50%

Rim Radius: Range from 7 to 27 cms. with 18 cms. average

Decoration: One example of Attribute 60

Occurrence: Levels 1 through 8 with 2, 9, 17, 14, 10, 10, 4 and 1 examples

Concave Bowl Series 9: (123)

Form: Medium bowl with bolstered rim (Attributes 54, 56, 57, 63, 64, 65 and 68)

Slip: Unslipped, 38%; reddish-browns, 33%; browns, 27%; black, 2%

Paste: Reddish-brown, 50%; browns, 46%; and others including brick, grey and light reddish-brown

Finish: Smoothed, 25%; polished, 4%; smoothed and polished, 7%; smoothed or polished interior and rude exterior, 58%; rude, 6%

Temper: Fine or none visible, 6%; medium, 30%; coarse, 64%

Rim Radius: Range from 3 to 28 cms. with 17 cms. average

Decoration: One example each of Attributes 34 and 60

Occurrence: Levels 1 through 8 with 1, 9, 23, 29, 28, 22, 9 and 2 examples

Concave Bowl Series 10: (88)

Form: Medium bowls with external rims heavily bolstered (Attributes 66, 67, 69, 70, 71, 72, 73 and 74)

Slip: Unslipped, 33%; reddish-browns, 34%; browns, 30%; others, 3%

Paste: Reddish-brown, 42%; browns, 51%; brick, 5%; others, 2%

Finish: Smoothed, 51%; polished, 6%; smoothed and polished, 8%; smoothed or polished interior and rude exterior, 30%; rude, 5%

Temper: Fine, 5%; medium, 28%; coarse, 67%

Rim Radius: Range from 9 to 27 cms. with 18.2 cms. average

Decoration: Two examples of Attribute 60

Occurrence: Levels 1 through 8 with 2, 5, 19, 18, 15, 14, 8 and 7 examples

Concave Bowl Series 11: (8)

Form: Medium bowl with nearly straight walls and rolled bolstered rim (Attribute 75)

Slip: Unslipped, 62%; reddish-browns, 25%; brown, 13%

Paste: Reddish-brown, 62%; browns, 25%; brick, 13%

Finish: Polished and smoothed, 13%; polished or smoothed interior with rude exterior, 62%; rude, 25%

Temper: Medium, 38%; coarse, 62%

Rim Radius: Range from 13 to 30 cms. with 21 cms. average

Decoration: None

Occurrence: Levels 1, 3, 4 and 5 with 1, 1, 3 and 3 examples

Concave Bowl Series 12: (10)

Form: Medium bowls with even, unbolstered walls (Attributes 76, 77, 78 and 79)

Slip: Unslipped, 30%; reddish-brown, 30%; browns, 40%

Paste: Reddish-brown, 40%; browns, 50%; grey, 10%

Finish: Smoothed, 30%; polished, 10%; smoothed and polished, 20%; smoothed or polished interior and rude exterior, 40%

Temper: Medium, 50%; coarse, 50%

Rim Radius: Range from 6 to 19 cms. with 13.5 cms. average

Decoration: None

Occurrence: Levels 2, 3, 4, 5 and 7 with 1, 3, 3, 1 and 2 examples

Concave Bowl Series 13: (48)

Form: Low bowls with divergent walls and basal break or Z angle (Attributes 32, 33 and 34)

Slip: Unslipped, 33%; greys, 36%; red, 4%; dirty white, 9%; cream, 4%; orange, 9%; reddish-brown, 2%; brown, 3%

Paste: Reddish-brown, 2%; tan, 44%; light brown, 21%; brown, 7%; greys, 16%; light reddish-brown, 10%

Finish: Smoothed, 13%; polished, 85%; rough, 2%

Temper: All fine or none visible

Rim Radius: Range from 6 to 20 cms. with 12 cms. average

Decoration: Attributes 4, 18, 50 and 73 with four, one, seven and one examples respectively

Occurrence: Levels 1 through 5 with 3, 13, 15, 13 and 4 examples

Comment: The series is similar to Concave Bowl Series 14 and enjoys a similar distribution. It is indicative of the Middle and Late periods at Sipolite.

Concave Bowl Series 14: (177)

Form: Bowls with walls more erect than for the last series and with basal break or Z angle (Attributes 81, 82, 83, 84, 85, 86 and 87)

Slip: Unslipped, 38%; black, 24%; greys, 18%; browns, 12%; and others including reddish-brown, dirty white, cream and orange

Paste: Reddish-brown, 10%; tan, 21%; light brown, 12%; brown, 12%; light grey, 13%; grey, 19%; dark grey, 6%; light reddish-brown, 7%

Finish: Smoothed, 10%; polished, 88%; smoothed and polished, 2%

Temper: Fine and none visible, 99%; coarse, 1%

Rim Radius: Range from 5 to 18 cms. with 11.5 cms. average

Decoration: Attribute 50 with 13 examples; Attributes 4, 28, 30 and 94 with average of three examples; and one each for Attributes 73, 79, 85, 86 and 95.

Occurrence: Levels 1 through 8 with 14, 40, 62, 41, 14, 3, 2 and 1 examples

Concave Bowl Series 15: (46)

Form: Medium to deep bowl with erect and slightly concave walls (Attributes 88 and 89)

Slip: Unslipped, 80%; browns, 7%; greys, 13%

Paste: Tan, 11%; light brown, 13%; brown, 11%; light grey, 19%; grey, 30%; and others including reddish-brown, dark grey, and light reddish-brown

Finish: Smoothed, 26%; polished, 67%; smoothed and polished, 7%

Temper: Fine or none visible, 98%; medium, 2%

Rim Radius: Range from 5 to 24 cms. with 10.8 cms. average

Decoration: One example each for Attributes 28, 68, 71, 96, 97 and 98

Occurrence: Levels 2 through 5 and 8 with 3, 17, 18, 7 and 1 examples

Concave Bowl Series 16: (32)

Form: Bowl with wall that rises as convex and turns outwards to become concave (Attribute 90)

Slip: Unslipped, 84%; reddish-brown, red, black, and brown slips at 4% each

Paste: Greys, 80%; browns, 10%; others, 10%

Finish: Smoothed, 20%; polished, 80%

Temper: All fine or none visible

Rim Radius: Range from 6 to 17 cms. with 11 cms. average

Decoration: One example each for Attributes 15, 88, 100 and 101 and two for Attribute 99

Occurrence: Levels 3 through 8 with 1, 1, 8, 12, 9 and 1 examples

Concave Bowl Series 17: (113)

Form: Bowl with evenly concave wall flaring outwards at approximately 60° (Attributes 91, 92, 93, 94, 95 and 96 and Convex Bowl Form 80)

Slip: Unslipped, 75%; blacks, 5%; browns, 6%; and others including reddish-brown, grey, red, dirty white, orange and black graphite

Paste: Reddish-brown, 11%; tan, 4%; browns, 22%; greys, 56%; and brick, light reddish-brown and orange

Finish: Smoothed, 15%; polished, 85%

Temper: Fine or none visible, 99%; medium, 1%

Rim Radius: Range from 5 to 21 cms. with 12 cms. average

Decoration: Twenty-eight percent are decorated. Attribute 63 has seven examples and Attributes 42 and 90 have three. Attributes 6, 10, 28, 29, 43, 50, 60, 79, 86, 87, 88, 89, 91 and 118 are represented by one or two examples each.

Occurrence: Levels 1 through 8 with 1, 0, 3, 9, 32, 34, 17 and 17 examples respectively

Comment: This form is generally considered typical of the Mesoamerican Preclassic, especially the early and middle segments. At Sipolite it extends through the Early and Middle periods or well into the Classic. The examples from upper levels may be due to drift. The form is discussed below with Problem IV.

Concave Bowl Series 18: (48)

Form: Medium bowl with exterior rim beveled and interior rim beaked (Attributes 97, 98 and 99)

Slip: Unslipped, 89%; browns, 9%; red, 2%

Paste: Reddish-brown, 5%; tan, 9%; browns, 20%; greys, 66%

Finish: Smoothed, 22%; polished, 72%; smoothed or polished interior with rude exterior, 6%

Temper: Fine and none visible, 98%; medium, 2%

Rim Radius: Range from 8 to 18 cms. with 11 cms. average

Decoration: One example each for Attributes 8, 15, 28 and 63

Occurrence: Levels 3 through 8 with 1, 4, 10, 18, 7 and 8 examples

Concave Bowl Series 19: (25)

Form: Tall, slightly concave vessel with nearly erect wall (Attributes 101, 102, 105 and 109)

Slip: Unslipped, 36%; reddish-browns, 16%; browns, 48%

Paste: Reddish-brown, 48%; browns, 48%; greys, 4%

Finish: Smoothed, 36%; polished, 24%; smoothed and polished, 12%; smoothed or polished interior and rude exterior, 28%

Temper: Fine or none visible, 12%; medium, 36%; coarse, 52%

Rim Radius: Range from 5 to 24 cms. with 14.5 cms. average

Decoration: One example of Attribute 85

Occurrence: Levels 1 through 7 with 2, 5, 1, 5, 8, 2 and 2 examples

Concave Bowl Series 20: (18)

Form: Tall, slightly concave vessel with erect walls (Attributes 103, 104, 106, 108 and 116)

Slip: Unslipped, 44%; reddish-browns, 28%; browns, 22%; red, 6%

Paste: Reddish-brown, 22%; tan, 11%; browns, 50%; greys, 11%; others, 6%

Finish: Smoothed, 39%; polished, 15%; smoothed or polished interior and exterior rude, 28%; rude, 18%

Temper: None visible, 15%; medium, 39%; coarse, 46%

Rim Radius: Range from 8 to 27 cms. with 18.2 cms. average

Decoration: None

Occurrence: Levels 2 through 6 with 1, 5, 6, 4 and 2 examples

Concave Bowl Series 21: (125)

Form: Nearly erect and slightly concave bowls (Attributes 110, 111, 112 and 113)

Slip: Unslipped, 85%; brown, 12%; red and black slips, 3%

Paste: Tan, 4%; browns, 8%; greys, 82%; light reddish-brown, 6%

Finish: Smoothed, 18%; polished, 82%

Temper: All fine or none visible

Rim Radius: Range from 5 to 21 cms. with 12 cms. average

Decoration: Eighty-five percent of the series are decorated with 52% having Attribute 30 (two lines incised around the exterior rim). Attributes 28, 68 and 71 have six, ten and fourteen examples respectively while Attributes 50, 62, 64, 67, 73, 74, 75, 77, 78 and 79 are represented by one or two examples each. The incision of one or, more commonly, two lines around the outside rim and use of red paint on the exterior wall is most typical of this form series.

Occurrence: Levels 1 through 8 with 2, 12, 19, 40, 31, 17, 3 and 1 examples

Comment: The long duration and relatively constant percentage of this distinctive vessel form and decoration methods suggests the form must have had a special and long lasting purpose.

Concave Bowl Series 22: (62)

Form: Medium bowl with wall flaring outwards at approximately 60° with slightly rolled rim (Attributes 114 and 115)

Slip: Unslipped, 79%; greys, 12%; and others including black, reddish-brown and light brown

Paste: Greys, 75%; browns, 21%; and others including tan and light reddish-brown

Finish: Smoothed, 10%; polished, 90%

Temper: All fine or none visible

Rim Radius: Range from 7 to 19 cms. with 11.5 cms. average

Decoration: Decoration occurs on 92% of this form with 50% of the series having Attribute 30 and with four examples of Attribute 28, seven of Attribute 49 and from one to three examples of Attributes 33, 44, 46, 71, 72, 73, 74, 75 and 76.

Occurrence: Levels 2 through 7 with 6, 14, 10, 19, 8 and 5 examples

Comment: The decoration on this series is practically identical with that on the last series and, except for the basal angle and rolled rim, the two series are quite similar in other respects.

Concave Bowl Series 23: (3)

Form: Small compound silhouette vessel (Attribute 118)

Slip: Unslipped and black

Paste: Brown and grey

Finish: All fine and none visible

Rim Radius: Range from 5 to 12 cms. with 7.5 cms. average

Decoration: None

Occurrence: Levels 2 and 3 with 2 and 1 examples respectively

Concave Bowl Series 24: (2)

Form: Bowl with outflaring slightly concave wall (Attribute 117)

Slip: Black

Paste: Light grey

Finish: Polished

Temper: Very fine

Rim Radius: 9 and 12 cms.

Decoration: None

Occurrence: Levels 3 and 4

Concave Bowl Series 25: (63)

Form: Erect bowl with concave wall and thinned lip (Attributes 119 and 120)

Slip: Unslipped, 68%; browns, 6%; light grey, 6%; and others including black, red, orange and cream

Paste: Reddish-brown, 5%; tan, 5%; browns, 19%; greys, 66%; light reddish-brown, 5%

Finish: Smoothed, 12%; polished, 81%; smoothed and polished, 7%

Temper: Fine or none visible, 99%; medium, 1%

Rim Radius: Range from 5 to 18 cms. with 11.5 cms. average

Decoration: Decoration occurs on 41% of the series. There are thirteen examples of Attribute 30, five and two examples of Attributes 28 and 42 and one example each of Attributes 33, 80, 81, 82, 83 and 84. Incised lines around the outside rim and incised triangles of one variety or another are most common on this form series.

Occurrence: Levels 1 through 7 with 1, 8, 13, 15, 12, 11 and 3 examples

Sipolite Everted Rim Series: Everted Rim Series 1: (113)

Form: Concave bowl with nearly straight walls and nubbin everted rim (Everted Rim Forms 16, 26, 41 and 43 and Concave Bowl Form 31)

Slip: Unslipped, 55%; black, 8%; browns, 9%; reddish-brown, 2%; grey, 12%; and red, orange, cream, white and dirty white slips

Paste: Reddish-brown, 9%; cream, 2%; tan, 12%; browns, 24%; greys, 47%; and others

Finish: Smoothed, 10%; polished, 86%; others, 4%

Temper: Fine and none visible, 98%; medium and coarse, 2%

Rim Radius: Range from 6 to 21 cms. with 13.3 cms. average

Decoration: Thirty-seven percent of the series are deccrated. Attributes 28, 30 and 33 have eight, seven and sixteen members respectively with one or two examples for Attributes 42, 68, 71, 72, 74, 75, 86, 92 and 93 each.

Occurrence: Levels 1 through 7 with 6, 10, 19, 32, 27, 14 and 5 examples

Everted Rim Series 2: (42)

Form: Probably a slightly convex bowl with small flat everted rim (Attributes 8, 9, 10, 15 and 24)

Slip: Unslipped, 74%; black, 8%; greys, 11%; and brown, light brown and cream slips

Paste: Reddish-brown, 12%; browns, 31%; greys, 43%; and cream, tan and light reddish-brown

Finish: Smoothed, 27%; polished, 73%

Temper: Fine or none visible, 99%; medium, 1%

Rim Radius: Range from 4 to 28 cms. with average of 12.4 cms.

Decoration: One or two examples each for Attributes 16, 28, 30, 33, 50, 63, 87, 88 and 107

Occurrence: Levels 1 through 7 with 1, 4, 9, 10, 9, 3 and 6 examples

Everted Rim Series 3: (24)

Form: Concave bowl with small everted rim angled slightly downwards (Attributes 25, 27 and 28)

Slip: Unslipped, 41%; reddish-browns, 17%; grey, 17%; browns, 13%; black, 8%; white, 4%

Paste: Reddish-brown, 25%; tan, 9%; browns, 33%; greys, 29%; and cream and light reddish-brown

Finish: Smoothed, 5%; polished, 90%; polished interior and rough exterior, 5%

Temper: Fine and none visible, 95%; medium, 5%

Rim Radius: Range from 10 to 24 cms. with 15 cms. average

Decoration: Ten examples of Attribute 33 and one each for Attributes 60 and 71

Occurrence: Levels 2 through 5 with 4, 6, 8, and 6 examples

Everted Rim Series 4: (20)

Form: Straight or slightly concave outflaring bowl with sharp nubbin rim (Attribute 50 and Convex Bowl Form 55)

Slip: Unslipped, 70%; reddish-browns, 15%; with one example each of red, brown, light grey and cream slips

Paste: Reddish-brown, 20%; cream, 5%; tan, 15%; brown, 10%; greys, 50%; light reddish-brown, 5%

Finish: Smoothed, 20%; polished, 80%

Temper: Fine or none visible, 80%; medium, 15%; coarse, 5%

Rim Radius: Range from 7 to 19 cms. with 12.7 cms. average

Decoration: Four examples of Attribute 30 and one or two of Attributes 28, 33 and 63

Occurrence: Levels 2 through 7 with 2, 6, 7, 2, 2 and 1 examples

Everted Rim Series 5: (32)

Form: Nearly straight-walled concave bowls with small everted rim (Attribute 32)

Slip: Unslipped, 80%; reddish-brown, 7%; browns, 4%; grey, 9%

Paste: Reddish-brown, 22%; brick, 6%; tan, 3%; browns, 28%; greys, 41%

Finish: Smoothed, 31%; smoothed and polished, 10%; polished, 59%

Temper: Fine and none visible, 66%; medium, 19%; coarse, 15%

Rim Radius: Range from 6 to 24 cms. with 13.3 cms. average

Decoration: One example each of Attributes 28, 33, 59, 102 and 103

Occurrence: Levels 1 through 8 with 1, 1, 2, 5, 3, 8, 4 and 8 examples

Everted Rim Series 6: (98)

Form: Outflaring concave bowl with nubbin everted rim (Attributes 38, 39, 44, 46, 47 and 48)

Slip: Unslipped, 37%; browns, 11%; grey, 19%; black, 26%; and reddish-brown, red, dirty white and light grey slips

Paste: Reddish-brown, 16%; cream, 5%; tan, 16%; browns, 26%; greys, 37%

Finish: Smoothed, 8%; polished, 92%

Temper: All fine or none visible

Rim Radius: Range from 6 to 21 cms. with 11.8 cms. average

Decoration: Decoration occurs on 56% of this series with forty examples of Attribute 33 and from one to three examples each of Attributes 28, 30, 50, 71, 72, 75, 77, 105, 108 and 109.

Occurrence: Levels 1 through 7 with 3, 6, 27, 29, 25, 6 and 2 examples

Comment: Red painted rims are quite common in this series.

Everted Rim Series 7: (121)

Form: Nearly straight but slightly concave-walled bowl with rim that curved outwards evenly (Attributes 2, 11, 12, 13, 17 and 18)

Slip: Unslipped, 46%; reddish-browns, 6%; browns, 6%; greys, 18%; cream, 7%; and white and dirty white slips

Paste: Reddish-brown, 14%; tan, 13%; browns, 22%; greys, 45%; and brick and light reddish-brown

Finish: Smoothed, 12%; polished, 88%

Temper: Fine and none visible, 94%; medium, 4%; coarse, 2%

Rim Radius: Range from 4 to 25 cms. with 11.5 cms. average

Decoration: Fifteen, six and seven examples of Attributes 33, 28 and 30 and one or two examples of Attributes 29, 50 and 71

Occurrence: Levels 1 through 8 with 3, 7, 28, 33, 28, 12, 9 and 1 examples

Everted Rim Series 8: (22)

Form: Concave Bowl with everted rim pointing downwards or angled back towards the base (Attributes 29, 30, 31, 32 and 33). This series does not include those members bearing Slip Attribute 74 all of which are included in the next series.

Slip: Unslipped, 83%; and dark brown, grey or cream slips

Paste: Reddish-brown, 25%; tan, 15%; browns, 20%; and greys, 40%

Finish: Smoothed, 55%; polished, 40%; smoothed interior and rude exterior, 5%

Temper: Fine and none visible, 75%; medium, 15%; coarse, 10%

Rim Radius: Range from 4 to 16 cms. with 11.5 cms. average

Decoration: None

Occurrence: Levels 2 through 7 with 9, 5, 4, 3, 0 and 1 examples

Everted Rim Series 9: (24)

Form: Same as Series 8 (Attributes 29, 30, 31, 32 and 33)

Slip: All with thick, creamy slip on exterior and lapping over into interior for two centimeters (Slip Attribute 74). All members of Slip Attribute 74 are included herein.

Paste: Reddish-brown, 55%; tan, 8%; browns, 25%; grey, 8%; light reddish-brown, 4%

Finish: Smoothed, 92%; polished, 4%; smoothed interior and roughened exterior, 4%

Temper: Fine or none visible, 82%; medium, 12%; coarse, 6%

Rim Radius: Range from 6 to 14 cms. with 11.3 cms. average

Decoration: None

Occurrence: Levels 1 through 5 with 1, 4, 13, 4 and 2 examples

Everted Rim Series 10: (17)

Form: Bowl, usually concave, with small everted rim angling downwards and having groove on top of rim (Attributes 35, 36 and 37 and Convex Bowl Form 56)

Slip: Unslipped, 24%; reddish-brown, 18%; greys, 24%; blacks, 18%; browns, 16%

Paste: Reddish-brown, 12%; tan, 24%; browns, 36%; greys, 28%

Finish: Polished, 94%; rude, 6%

Temper: Fine or none visible, 94%; medium, 6%

Rim Radius: Range from 8 to 19 cms. with 13 cms. average

Decoration: Decoration occurs on 82% of the series with one, nine and four examples of Attributes 28, 33 and 104.

Occurrence: Levels 1 through 5 with 1, 1, 2, 9 and 4 examples

Everted Rim Series 11: (16)

Form: High basal angle or, more likely, high shouldered vessel with constricted orifice (Attribute 57)

Slip: Unslipped, 81%; tan, 6%; brown, 13%

Paste: Reddish-brown, 19%; orange, 6%; browns, 25%; greys, 50%

Finish: Smoothed, 25%; polished, 63%; smoothed and polished, 12%

Temper: Fine or none visible, 50%; medium, 25%; coarse, 25%

Rim Radius: Range from 6 to 13 cms. with average of 9.1 cms.

Decoration: One example of Attribute 28

Occurrence: Levels 4 through 8 with 1, 2, 4, 7 and 2 examples

Everted Rim Series 12: (9)

Form: Recurved open convex bowl with everted rim (Attributes 7, 14 and 51)

Slip: Unslipped, 67%; greys, 33%

Paste: Browns, 11%; greys, 78%; black, 11%

Finish: Polished, 89%; smoothed interior and rough exterior, 11%

Temper: None visible, 78%; medium, 11%; coarse, 11%

Rim Radius: Range from 12 to 24 cms. with 15.7 cms. average

Decoration: One and two examples of Attributes 63 and 104

Occurrence: Levels 1, 4, 6, 7 and 8 with 1, 2, 2, 2 and 2 examples

Everted Rim Series 13: (10)

Form: Outflaring concave bowl with sharp nubbin everted rim (Attribute 40)

Slip: Unslipped, 10%; reddish-brown, 10%; browns, 50%; grey, 20%; black, 10%

Paste: Tan, 40%; browns, 30%; greys, 20%; reddish-brown, 10%

Finish: All polished

Temper: All fine or none visible

Rim Radius: Range from 4 to 16 cms. with 11.8 cms. average

Decoration: All examples have red painted rims, Attribute 33

Occurrence: Level 4 with six and Level 5 with four examples

Comment: good indicator of Middle Sipolite

Everted Rim Series 14: (15)

Form: Nearly erect walls with basal break and small, flat everted rim (Attributes 34 and 49)

Slip: Unslipped, 57%; grey, 29%; and brown and dirty white examples

Paste: Grey, 50%; with reddish-brown, brick, tan, and light brown

Finish: Smoothed, 29%; polished, 71%

Temper: Fine or none visible, 93%; medium, 7%

Rim Radius: Range from 7 to 18 cms. with 12.9 cms. average

Decoration: One, three, two and one examples of Attributes 4, 28, 3[illegible] and 71

Occurrence: Levels 1 through 6 with 1, 2, 4, 5, 1 and 1 examples

Everted Rim Series 15: (3)

Form: Varied (Attributes 56, 58 and 59)

Slip: Unslipped and light brown

Paste: Cream and greys

Finish: Smoothed or polished

Temper: None visible or medium

Rim Radius: 8, 11 and 15 cms.

Decoration: Attribute 4 (one), Everted Rim Attribute 56

Occurrence: Levels 3, 4 and 5 respectively

Four series have been defined on bases other than vessel form and are presented below.

Sipolite Polychrome Series: (7)

Form: Concave Bowl Form 4; Everted Rim Form 45; and Basal Angle Forms 45, 70 and 72

Slip: Creamy white interior with orange-on-white exterior; black interior with white-and-red exterior; black and red-on-white interior and exterior (bowls)

Paste: Light brown, brown, light reddish-brown, and reddish-brown

Finish: Polished interiors with polished or smoothed exteriors

Temper: All fine or none visible

Rim Radius: Unknown, except for bowls which are 13 and 21 cms.

Decoration: Designs unknown but probably were angular and geometric

Occurrence: Levels 4 and 5 for Basal Angle Forms and Level 7 for bowls

Comment: None appear comparable to the polychrome vase from Pit 9 illustrated in Plate VIII which probably is assignable to Late Sipolite.

Sipolite Bichrome Series 1: (40)

Form: Extremely varied (Tecomate Form 25; Basal Angle Forms 15, 26, 38, 40, 42, 44, 46, 49, 56, 59, 68, 70, 71, 72, 73 and 84; Convex Bowl Forms 15, 71, 76, 81 and 83; Concave Bowl Forms 53, 83, 85, 89 and 117; and Everted Rim Forms 13, 18, 28, 39 and 49)

Slip: Almost always a combination of white or cream and red colors with orange-white, brown-white, and brown-red combinations rare

Paste: Reddish-brown, 25%; tan, 23%; light brown, 20%; brown, 6%; and orange, light reddish-brown, cream, dark brown, light grey and grey examples

Finish: Smoothed, 2%; polished, 78%; polished interior and smoothed exterior, 20%

Temper: Fine or none visible, 98%; medium, 2%

Rim Radius: Range from 4 to 21 cms. with 10.5 cms. average

Decoration: The series apparently represents area painting and slipping with noticeable elements lacking. There are three examples of Attribute 33, four of Attribute 4 and one of Attribute 47.

Occurrence: Levels 1 through 5 with 1, 3, 11, 18 and 6 examples

Comment: Most common during Middle Sipolite

Sipolite Bichrome Series 2: (5)

All members of the series have black used with another color.

Form: Basal Angle Forms 46, 48 and 49; Concave Bowl Forms 61 and 91

Slip: Black or white opposing each other on interiors and exteriors for basal angle forms while bowls have black interiors with light brown or red exteriors.

Paste: Light brown

Finish: Either polished or smoothed interior and exterior

Temper: Fine or none visible, except for Concave Bowl Form 61 which has coarse quartzite temper

Rim Radius: For bowls, 10 and 21 cms.

Decoration: None

Occurrence: Bowls from Level 6 and bases from Level 3

Comment: The other members of the bowl forms that here bear bichrome slip or painting are mostly from lower levels or the Early and Middle periods while the other examples of Basal Angle Forms that here bear bichrome painting are never found below Level 5 and so are Middle and Late in placement. The bichrome painting or slipping is therefore consistent.

Further, it appears that the use of black paint in a bichrome or polychrome combination is more typical of Early Sipolite and during later periods.

Sipolite Banded Series: (38)

Form: All forms have a raised band around the exterior rim with the band being tapered to a point at the superior edge. (Tecomate Form 25 and Convex Bowl Forms 17 and 86)

Slip: Unslipped, 74%; reds, 13%; and others including reddish-brown, dirty white, orange, light brown, and brown-red bichrome

Paste: Reddish-brown, 8%; tan, 18%; browns, 15%; greys, 55%; light reddish-brown, 4%

Finish: Smoothed, 37%; polished, 58%; smoothed and polished, 5%

Temper: All fine or none visible

Rim Radius: Range from 4 to 14 cms. with 8.4 cms. average but since the series includes bowls and tecomates, the measurement is useless.

Decoration: One example of Attribute 50

Occurrence: Levels 1 through 6 with 5, 4, 8, 6, 12 and 3 examples

Problem IV

Problem IV is to demonstrate change through time within a form series. That is, the degree of association of attributes that make up a series or type change and do not remain constant. Further, each attribute system may change independently of others.

The purpose of showing such change is not only to document it but, if regular change within a series is shown, a hypothesis of temporal sequence and continuity is better supported. If mixture or drift had occurred, we might expect to find no or little change in successive levels. However, if a given series is found through several levels without changing in one respect, such as vessel form, but does change in other respects and in a regular pattern, then temporal sequence is indicated. If change can be shown for several series, the indication becomes stronger.

Three form series were selected for testing with selection being based upon homogeneity and distinctiveness of forms and the size of the series. Concave Bowl Series 17 and 21 and Everted Rim Series 8 and 9 were chosen with the Everted Rim series being combined into a single unit to have larger numbers. The two series have the same vessel forms and are distinguished on the basis of slip differences. Indices of Dissimilarity (ID) were calculated for each of the series. Complete distribution tables for attributes and calculation of ID's for each are given in Appendix B, while results are summarized and discussed below.

The Index of Dissimilarity for temper differences within Concave Bowl Series 17 for Levels 4 through 8 is 20.14%. The incidence of fine temper decreases in higher levels while the incidence of sherds without temper increases. Expressed as a proportion, the ratio of no temper to other tempers changes from 2:1 in Level 8 to 5:1 in Level 4. The ID for hardness is 14.88% with the proportion of Hardness 1 to 2 and 3 changing from approximately 1:1 in Level 8 to 5:1 in Level 4.

The ID for decorated versus undecorated sherds is 12.38% with the proportion changing from 1:5 in Level 8 to 1:1 in Level 4. To summarize, Concave Bowl Series 17 shows regular and constant change for all three factors tested with temper becoming progressively finer, sherds softer, and with decoration becoming more common. Contributions of individual levels to the overall ID can be seen in Appendix B.

For the Concave Bowl Series 21 the ID of no temper to fine temper for Levels 2 through 6 is 27.13% while the proportion changes from 21:1 in Level 6 to 6:1 in Level 2. Again, the change is fairly constant and even. The hardness ID between Scale 1 and 2 and 3 combined is 52.56% with the proportion shifting from 4:3 to 5:1 and 14:0 in higher levels. The decorated versus undecorated sherd proportions change from 4:1 to 13:1 with an ID of 21.24% although the change is not regular. Looking at the most common decoration, Attribute 30, we see it constitutes 23.5% of decorated sherds in Level 6 and 65.5%, 57.1%, 73.3% and 84.6% in successively higher levels. In summary, Concave Bowl Series 21 sherds become softer, have larger inclusion particles, and are more often decorated in higher levels with Decoration Attribute 30 becoming progressively more common.

The Everted Rim Series 8 and 9 have no temper, fine, medium and coarse tempers and the change pattern is complicated but the ID for Levels 2 through 5 is 29.01% or approximately the same as for Concave Bowl Series 17 and 21. The hardness ID is 13.16% with sherds being softer in higher levels. The Series are not decorated but an ID was computed for Slip 74, distinctive of Series 9, against all other slips and an ID of 31.44% resulted. Everted Rim Series 8 and 9 do not show

the same variations shown by the Concave Bowl Series but there still is change between levels.

External Comparisons

Preliminary conclusions formed in the field and laboratory indicated Sipolite ceramics were related to those of Monte Alban and southern - here meaning that part south of the Valley of Oaxaca - and northern Mesoamerica in that order of closeness. As the study neared completion and attention was given to finer and more explicit comparisons, the first conclusions were altered. To be sure, specific similarities to ceramic design elements, support forms and figurines from Morelos, the Valley of Mexico and farther north can be seen. The incised cursive line design is found at Tlatilco[9] and Zacatenco[10] in the Valley of Mexico and Chalcatzingo, Morelos[11] and rocker stamping at Tlatilco and Chalcatzingo. As discussed in the following chapter, mammiform, zoomorphic and slab supports of certain varieties and ring bases all have close counterparts in northern Mesoamerica. The I-A figurines and others are shown to be similar to ones from Cerro de las Mesas and Morelos. However, there is little evidence that Sipolite was directly influenced by northern Mesoamerica. First, all of the listed traits appear in southern Mesoamerica and usually in variations more similar to the Sipolite examples. Second, the great majority of similarities are with southern Mesoamerica and many such traits do not appear in the north except as obvious imports. It should not be surprising to find Sipolite related more to the south since it is located there.

Several factors make comparisons difficult and one of these is the lack of comparable material. Fifteen years ago Robert Wauchope in a pioneer attempt to form a sequence of Preclassic ceramics used some twenty characteristics such as cross-hachure, punctate-incising, wide everted rims, incised red slip, red-on-white, mammiform supports, large mounds and others.[12] We may excuse a small village or hamlet such as Sipolite for not having produced large mounds but the lack of other traits is remarkable. There are no examples of cross-hachure below Level 4, no punctation below Level 4, no red-on-white below Level 5, never any of the wide everted rims discussed by Wauchope nor any negative painting, and nubbin supports which he considers "...among the most persistent of pre-Classic ceramic features..."[13] do not appear until Level 6 at Sipolite and then only in low percentages. Early Sipolite including Levels 6, 7 and 8 are considered comparable to the Preclassic elsewhere.

Several years later John Sorenson attempted a similar chronological ordering using forty-two significant traits.[14] Of these, about five are found at Sipolite and all are general traits. Richard MacNeish attempted an ordering similar to Wauchope's using thirty-seven traits and eleven appear at Sipolite.[15] When we discard general traits such as hemispherical bowls, strap handles and potsherd disks, the list shrinks to four or five present at Sipolite. Without belaboring the point further, it should be recognized that Sipolite ceramics do not include many of the traits commonly used for making inter-site comparisons.

Another problem in making comparisons is the marked tendency for traits to persist at Sipolite. In most cases the point of appearance is taken for discussion.

A third problem is the apparent uniqueness of many Sipolite traits. Many should be useful but are not. For example, see the discussion below of the two mold-made sherds.

An additional difficulty results from the system of description which differs from those used elsewhere. The Monte Alban ceramics are described and classified primarily on the basis of paste and decoration, taken to include slip, polish, painting, incisions and so forth, and to a lesser extent on vessel form which is described only in general summary terms for the most part.

It is therefore necessary to make comparisons on two levels, a general level on which gross similarities are discussed and a specific level using individual attributes.

Early Sipolite ceramics are most similar to those of Monte Alban I and II although influences from farther south may be present. With the beginning of Middle Sipolite the situation is reversed with the southern relationships becoming stronger until very specific influences and trade items were arriving from the Tabasco-Campeche region during Upper Sipolite and Monte Alban is not represented.

Oaxacan Coast

Nearly identical examples were found at Tukidi only fifteen kilometers from Sipolite. Specific similarities include incision of series of lines on and around base interiors, vertical placement of applique lumps similar to the vertical finger-punched fillet of

Sipolite and in conjunction with a horizontal decoration like the cursive line design. Also, one may note the low comal-like forms and bolstered rim tecomate and interior beveled rims on concave bowls.[16] Tukidi also is the only site away from Puerto Angel where aviform lugs have been reported. Obviously, Tukidi shares much with Sipolite, as might be expected.

No similarities were noted with materials from the Sipolite airport site[17] nor with La Soledad near Tututepec. La Soledad materials show vague resemblance to Monte Alban III ceramics but none to the Preclassic periods.[18] The Mixtec grey and polychrome sherds from Cerro de los Pajaros near Tututepec[19] are not represented at Sipolite although the vessel support in form of a human foot purchased in 1956[20] and a sherd with a painted red-on-white advancing S design illustrated in Chapter V and found on the surface probably should be assigned to the Postclassic Mixtec.

The only excavations previously conducted on the Oaxacan coast were at Piedra Parada Jamiltepec. While the ceramics from that site are related to Monte Alban Preclassic periods, rather few similarities to Sipolite remains are apparent. The elaborate decoration found at Piedra Parada is mostly lacking at Sipolite, a difference that may reflect the fact that one site was a large ceremonial center and the other a small hamlet. Similarities between materials from the two sites include interiorly beveled rims of concave bowls, incision on the interiors of bases, olla rims of the Olla Series 3 and low comal-like forms.[21] Both sites have high frequencies of grey and reddish-brown pastes with utilitarian vessels being made of the latter

for the most part. Vessel supports and metate forms are also quite similar or identical. There is little doubt that Early Sipolite and Piedra Parada are roughly contemporaneous. Further, both relate more closely to Monte Alban I and/or II than elsewhere.

Monte Alban

While Early Sipolite ceramics are similar to those of Preclassic Monte Alban, we cannot dismiss Sipolite as another Monte Alban site for the majority of ceramics at both sites share little or nothing. At both sites grey pastes are most common during the first periods and diminish somewhat later. At both sites the grey wares are thicker, harder and more often decorated by line incision during early periods. However, at Monte Alban half of the Preclassic sherds are of cream paste and at Sipolite less than one percent are of the same paste. The "feel" of Early Sipolite and Monte Alban Preclassic sherds is much the same.

There are great differences such as the high proportion of tecomate forms and low proportion of ollas at Sipolite while at Monte Alban the situation is reversed. At Monte Alban there are many vessel forms such as small animal figures, "Olmec" braceros, ollas in the form of a calabasa and elaborations such as wide everted rims, labial molding, rim incisions, pot lids and pot stands which never appear at Sipolite.

Similarities can be seen between the incised interior bases, especially Monte Alban Types G14 and G24 and Sipolite Decoration Attributes 14, 111, 115 and 140.[22] The Sipolite examples are fragmentary and so it is not possible to compare complete designs. The

half bowl shown in Plate XXVII is identical in form with those of Type G24, except for not having multiple grooves around the interior rim. No mention has been found of polish lines on interior bases for Monte Alban.

A general similarity can be noted between the grooves around interior rim attribute which is common at Monte Alban in Periods I and II and rare at Sipolite in Levels 5 through 7. Further, at Monte Alban the grooves often form a "double line break" while such is unknown at Sipolite.

Finger-punched fillet around a vessel base, Decoration Attributes 1 and 5 at Sipolite and beginning in Levels 6 and 7 but continuing until Level 1, are found at Monte Alban in Period I and but rarely in Period II.[23]

Graphite paint occurs at Monte Alban in Period II and always is mentioned in conjunction with red paint with the two being applied in bands which may have incised lines in or separating them.[24] Decoration Attributes 12, 40, 90, 91, 96 and 103 are similar and especially Attribute 12. They are found in Levels 7 and 8 with one case in Level 4.

Concave Bowl Series 21 is found in several Monte Alban versions but Type A13 is alike in form and decoration. The Sipolite series is predominately of grey pastes and begins in Level 7 continuing into Level 1 while the Monte Alban type is most common in Period I. At Monte Alban it may have two incised lines around the base of the exterior wall while at Sipolite the lines are groove incised above the middle.

Decoration Attributes 132, 139 and 128 which involve modeled-carving of decorative and/or glyphic elements are found in Levels 3 through 7 but sherds from lower levels are small and definite glyphic elements are from Levels 5 and above. At Monte Alban incision of glyphs with this technique is not earlier than the Transitional period but is most common in Periods IIIA and B, the Classic periods.[25]

The long mammiform supports of Levels 5 through 8 are duplicated in Monte Alban I and are very rare in Period II.

In summary, throughout Early Sipolite we find attributes that at Monte Alban belong to Periods I and II. The neat division of the two periods at Monte Alban is not apparent at Sipolite, a conclusion identical to that formed from study of Piedra Parada Jamiltepec ceramics.[26]

Central Chiapas

The long ceramic sequence from central Chiapas, based primarily on excavations at Chiapa de Corzo and often called the Chiapa sequence, has not been published except for a few preliminary reports. Fortunately Gareth Lowe and Bruce Warren, those most familiar with the Chiapa ceramics, have been able to examine part of those from Sipolite. They agree it is a tradition quite different from central Chiapas with similarities being of a general nature. Later correspondence with Warren has suggested close similarities in certain types but always on a late Classic/early Postclassic time level when central Chiapas was receiving strong influences from the lowland Maya area, probably the Usumacinta-Palenque region which is not well known.

Sipolite parallels central Chiapas in having a preponderance of tecomate forms in Period I with a relative dearth of olla forms which, when occurring, have straight and vertical necks.[27] Later, tecomates decrease in percentage as the olla forms increase and have more curved and divergent necks, again a tendency paralleling that at Sipolite.

Rocker stamping, usually in bands, occurs in Period I with but one example from Period II.[28] Two examples of simple rocker stamping, not in bands, were found in Level 7 of Sipolite.

Period II vessel forms are similar to Early Sipolite forms. The tecomates frequently have a bolstered rim, a common feature at Sipolite but one that persists until the site was abandoned.[29] The second most common vessel form in Periods I and II is a flat-bottomed bowl with evenly concave walls flaring outwards at about 60° as does the Concave Bowl Series 17.[30] In Period I most such bowls have a bolstered rim while in Period II the rims usually are rounded as at Sipolite.

Design elements for Periods I and especially II are similar to those of Early Sipolite. The incised cursive line is most common in Period II judging from illustrations. Two incised vertical zigzag lines similar to Decoration Attribute 150 from Sipolite Level 6 are found in Period II[31] but also in Period IV from nearby San Agustin.[32]

Again, as with Monte Alban, we can note the custom of incising one or two lines around the inside rim of bowls, often with a "double line break," in Period II.

The majority of Chiapa designs, forms and pastes never appear at Sipolite. We can suggest similarities between Chiapa II and Early Sipolite but the two traditions are quite different in most regards.

During the late Preclassic the central Chiapas sequence is related to the south and east. Mammiform supports appear in Chiapa VI and VII[33] or centuries later than the disappearance of the Period II traits mentioned above. All are found together in Early Sipolite.

Carlos Navarrete illustrates an example of a white-rimmed black ware sherd from a deep convex bowl with a raised band around the rim which is tapered to a point, as with the Sipolite Banded Series which is found in Levels 1 through 6 but never is of the distinctive white-rimmed black ware. (We may note that that ware is completely lacking from Sipolite.) Navarrete considers the sherd to be Early Classic which agrees fairly well with its appearance at Sipolite.[34]

From the Frailesca region of central Chiapas Navarrete reports the incised cursive line for Period VIII or very early Classic,[35] as well as an incised meander in a band around the outside rim of a bowl, an incised band of super-imposed rectangles, and an incised cross-hatched panel at the bottom of a nearly vertical vessel wall which has a small laterally projecting flange, all from the Maravillas Phase or Period X.[36] The corresponding Sipolite Decoration Attributes would be 67, 39 and 130 which are found in Levels 3 and 6; Level 4; and Levels 2, 3 and 4 respectively. Lowe considers Period X to be middle Classic corresponding with Tepeu 1-2.[37] The cluster around Sipolite Levels 3 and 4 suggests the possibility of an equation.

Bruce Warren has been helpful in helping place several Sipolite examples.[38] Working from photographs, some sketches and written descriptions, he finds Sipolite Everted Rim Series 9 very similar to his Tapalapa Unslipped: Copanaila Variety of the Laguna Phase which he equates with Tzakol 2-3. The Series begins in Level 5 or Middle Sipolite. The tall, black-slipped vases of Offering 1, Pit 10 he considers Mayoid and belonging to his Jimba Phase which equates with Tepeu 3 while the polychrome vase from Pit 9 is quite similar to his Buena Fine: Buenacuti Variety and corresponds to Tepeu 2. It is surprising how well Warren's judgments agree with the Sipolite sequence and conclusions reached on other grounds.

Highland Guatemala

The Sipolite materials have but the most general resemblance with those from Kaminaljuyu, Zaculeu and Zacualpa.[39]

Lowland Guatemala

Inspection of a type sample collected by Lee Parsons and Stephan Borhegyi from Bilbao (Santa Lucia Cotzumalhuapa) revealed only general similarities which, in the light of several parallels between La Victoria and Sipolite, is somewhat surprising.

Several general and specific similarities can be seen between Early Sipolite and the Conchas Phase of La Victoria. The tecomate is a common form during the earlier Ocos Phase but during Conchas has a rim bolstered on the interior, is most often undecorated, and may have lugs which all agrees more with Sipolite tecomates.[40] The Conchas flat-bottomed bowl with slightly concave and out-flaring walls and

rounded or squared rim is typical of the Conchas Phase and comparable to Concave Bowl Series 17. We can note comb-incised multiple lines and patterns of polish lines on the interiors of vessel bases.[41] Similar incisions are rare on Ocos Phase materials. The Conchas designs are similar to the fragmentary Sipolite examples, especially the "Undulating Parallel Lines" which Coe in his thorough discussion compares with MacNeish's Aguilar Phase in the Panuco. He does not mention that it is found in Monte Alban I, at least on Type G-24.[42] However, the Conchas and Aguilar bowls have supports and seem to be true grater bowls while the basal incision of Sipolite examples does not seem to have been deep enough for service other than decoration and there is no indication of supports.

Rocker-stamping is found only during Ocos but the two Sipolite examples from Level 7 do not necessarily relate to Ocos. Coe observes that plain rocker-stamping like the Sipolite cases is the most common variety although the technique in any variation is rare in Meso-america.[43]

A Conchas Phase Z-angle bowl with a finger groove around the interior base perimeter is identical in form with one from Level 7 as illustrated in Basal Angle Form 54.[44]

One or two incised lines around the interior rim may be found in both Ocos and Conchas but is most common during the latter. The double line break is found in Conchas but, we repeat, never at Sipolite.

Coe observes that "...Conchas looks much more like a "typical" Formative should look than does Ocos..."[45] The great differences and

few similarities between La Victoria and Sipolite probably are due to both sharing in a common "typical" tradition. There are not sufficient similarities to claim any direct relationship between the two sites.

Southern Veracruz

Philip Drucker reports bowls from La Venta identical to the Concave Series 17 but they usually have the incised lines around the interior rim and double line break found on similar vessels from Monte Alban, Chiapa de Corzo and La Victoria. They also may have incised designs on the rim which is found at the other three sites but never at Sipolite.[46] The incised cursive line and rocker-stamping also are present at La Venta.[47] Tecomate forms with heavily bolstered rims are common through all La Venta levels, as at Sipolite.[48]

Several similarities can be noted between Sipolite ceramics and those from Tres Zapotes but it is seldom possible to place those traits with any precision. The incised cursive line appears frequently, vessel forms similar to the Sipolite Banded Series are present[49] as are bands of horizontally placed chevrons, the basal break and Z-angle forms and many other general elements. One may equate Early Sipolite with Lower and/or Middle Tres Zapotes on the basis of general vessel forms and design elements.

Lowland Maya Region

There are many obvious similarities, general and specific, between the Sipolite ceramics and those of the Maya lowland. This may be partly due to the superior reporting and publication of Maya

materials. We can note vessel form much like Concave Bowl Series 17 in the Uaxactun Mamom Phase.[50] Interior beaked bowls similar to Concave Bowl Forms 97 and 98 appear in the following Chicanel Period.[51] Series 17 and the other forms all begin in Level 8, Early Sipolite. The rounded Z-angle bowls of Concave Bowl Series 13, appearing in Level 5, are much like some Robert Smith considers "general Tzakol" or early Classic which is in agreement with the Sipolite placement.[52]

The plain black-slipped Z-angle bowls of Concave Bowl Series 14 begin in Level 4 but are most common in Level 3. While similar vessels are found in both Tzakol and Tepeu periods, the Tzakol examples usually have everted rims and/or basal flanges while the Tepeu vessels usually have a rounded rim and basal ridge as do the Sipolite vessels.

The greatest similarities are seen with a complex or tradition centered in Tabasco. The elaborate Maya polychrome ceramics, the true basal flange, painting or incision of Maya glyphic elements, the distinctive Mamom and Chicanel orange and red wares all are missing from Sipolite. Likewise, we have no counterparts for the wares distinctive of northern Yucatan. However, there is a block of traits present at Sipolite that also are present in Tabasco and indicate a probably rather direct relationship between the two areas. It is unfortunate that we know so little about the Tabasco-Campeche region and have only one detailed description. Brainerd frequently refers to a collection gathered by Carlos Berendt a century ago at Cintla, Tabasco, and illustrates supports practically identical with those of Sipolite as is discussed in Chapter V.

The only detailed report is by Heinrich Berlin. He describes his collections in two groups with each representing different horizons. The Jonuta horizon is considered late Classic beginning at the end of Tepeu 2 and terminates in the early Postclassic before the appearance of plumbate pottery. The Cintla horizon is considered late Postclassic. Fine Orange Z and X are found in the Jonuta horizon with the X variety being infrequent and very late.[53] The Fine Orange sherds from Sipolite appear to be most like Z Fine Orange. They have a fine, untempered orange paste that may vary to grey, the surface is smooth and may rub off on one's finger, the sherds are soft and will scratch with the fingernail or even talc and there is no indication of a slip remaining. Sherd thickness is approximately from 3 to 4 mm., well within the Z Fine Orange range and thinner than the X variety. Sherds appear to be from cylindrical vessels. Incision is fine and there are several gouged out areas. Only in one case can we say how the decoration was placed and then it was in a series of panels with designs in at least one of the panels. It is not the continuous band more typical of X Fine Orange.[54] Brainerd associated the Z Fine Orange with the late Classic and suggested Isla de Carmen as the possible point of manufacture.[55] Berlin's findings in Tabasco agree with Brainerd's but were based on additional information.[56] At Oaxactun Fine Orange is present only in Tepeu III.

Berlin sees three phases within his Jonuta Horizon with each being characterized by a different ware, Classic Maya polychrome, black and Fine Orange. The Classic Maya examples are the end of a long polychrome tradition which is followed by monochrome wares,

predominately black at first and later Fine Orange. Such seems to be true of Sipolite with the polychrome being represented only by the tall vase from Pit 9. The vase does not have the elaborate treatment of the Tzakol or early Tepeu. The Fine Orange appears in Levels 2 and 3 with one example in Level 4. It is most plentiful in Level 2. Meanwhile, the black wares are more common in Level 3 but yet numerous in Level 4.

A similar change from polychrome to monochrome dominated by black and then Fine Orange has been seen at Palenque and dated as extending from the late Classic into the Postclassic but without plumbate.[57]

The only ceramic tradition that matches with the upper levels of Sipolite is that of Tabasco. Many of the Tabasco wares and forms do not appear at Sipolite and understanding more of the relationships between the two areas must await further investigation and study in each.

The mold-made sherds shown in Plates XLVII and XLVIII pose a perplexing problem. Photographs and descriptions were sent to three authorities and shown to a fourth. All responded with different opinions. Tatiana Proskouriakoff wrote:

> "...I do not recognize any ware I am familiar with in the photo you sent me. The design of the human head in the jaw of a serpent, as this seems to be, is of course, widespread in the Maya area, but the features of the head are not typically Maya, and the scroll in front, which seems to be a speech-scroll, is an element decidedly non-Maya which occurs only intrusively.
>
> "The Tepeu 3 and early post-Classic molded and carved vessels of the lowlands have quite different motifs. If this is an import from the Maya area, it would have to be from some southern region where the Maya tradition was strongly diluted..."

J. Eric Thompson had essentially the same opinion pointing out that while the sherd has a "Maya feeling,...a speech scroll joining the nose would make a Maya attribution even less likely..." but, "On the other hand, the curl in the eye of the serpent is a feature found not at all, or only rarely, outside the Maya area..." He agrees that the sherd is not Maya but sees Maya influences.

Ignacio Bernal writes: "...No es igual a ninguno de los tipos que conozoco del Valle de Oaxaca, sin embargo, tiene un sabor general bastante zapoteco..."

Howard Leigh considered the human head and serpent figure to be quite Zapotec in nature but not precisely and never had seen a Zapotec piece produced in such a manner.

In our opinion the sherd represents a combination of Maya and Zapotec motifs and elements produced in a manner familiar to the Maya but not to any known Zapotec center. Robert Smith has suggested that it was produced as a part of his Carved Ferruginous; the sherd was not carved but the mold in which it was made had to be carved. On stratigraphic evidence we would consider the sherds late Classic.

We may note that Stelas 1 and 3 of Xochicalco, Morelos bear representations of anthropomorphic heads emerging from serpents' mouths and in each case the heads are interpreted as being versions of Quetzalcoatl,[58] a suggestion Bernal made for the Sipolite sherds. We may note that Xochicalco long has been regarded as exhibiting numerous Maya motifs and architectural features and also some ceramic traits.[59] A distinct Zapotecan influence is also noted. Both influences seem to have been present during the late Classic and early

Postclassic which would agree with the Sipolite occurrence. No similar sherds are reported from Xochicalco and so the combination probably occurred elsewhere. The fine workmanship and complexity speaks for a well-developed and competent tradition perhaps located between Sipolite and Xochicalco.

ENDNOTES

[1]Robert Ridgway, Color Standards and Color Nomenclature (Washington, 1912).

[2]Anna O. Shepard, Ceramics for the Archaeologist, Carnegie Institution of Washington Publication 609 (Washington, D. C.: U. S. Government Printing Office, 1961), pp. 187-191.

[3]Ibid., p. 54.

[4]Michael D. Coe, La Victoria: an Early Site on the Pacific Coast of Guatemala, Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, Vol. LIII (Cambridge, 1961), pp. 58-59.

[5]Robert E. Smith, Ceramic Sequence at Uaxactun, Guatemala, Middle American Research Institute, Tulane University, Publication 20, Vol. I (New Orleans: The Tulane University, 1955), Chapter 5.

[6]Charles F. Brush, "Pox pottery: earliest identified Mexican ceramic," Science, Vol. CXLIX, No. 3680 (9 July 1965), 194-195.

[7]Ibid., p. 195.

[8]Webster's Third New International Dictionary (Springfield: G. and C. Merriam Company, 1961), p. 2073.

[9]Román Piña Chán, Tlatilco, Vol. I (México: Instituto Nacional de Antropologia e Historia, 1958), Figures 17a and j.

[10]George C. Vaillant, Excavations at Zacatenco, Anthropological Papers of the American Museum of Natural History, Vol. XXXII, Part 1 (New York, 1930), Plate IV, for an example.

[11]Román Piña Chán, Chalcatzingo, Morelos, Dirección de Monumentos Prehispánicos (México: Instituto Nacional de Antropologia e Historia, 1955), Laminas 7d and e and 17 e and f.

[12]Robert Wauchope, "A tentative sequence of pre-Classic ceramics in Middle America," Middle American Research Records, Vol. I, No. 14 (New Orleans: The Tulane University, 1950).

[13]Ibid., p. 232.

[14]John L. Sorenson, "A chronological ordering of the Mesoamerican Pre-Classic," Middle American Research Records, Vol. II, No. 3 (New Orleans: The Tulane University, 1955).

[15]Richard S. MacNeish, "An early archaeological site near Panuco, Vera Cruz," Transactions of the American Philosophical Society, n.s., Vol. XLIV, Part 5 (Philadelphia, 1954), 626-639.

[16]DeCicco y Brockington, op. cit., pp. 107-110.

[17]Ibid., pp. 76-78.

[18]Ibid., p. 81.

[19]Ibid., pp. 68-70.

[20]Ibid., p. 100.

[21]Brockington, "Piedra Parada...," p. 53 and following.

[22]Ignacio Bernal, "La cerámica preclásica de Monte Albán" (microfilm copy of Master's thesis, La Escuela Nacional de Antropologia e Historia, Mexico, 1946), Laminas 17 and 27.

[23]Ibid., pp. 69 and 104.

[24]Ibid., p. 104 and Type K5.

[25]Ibid., p. 25.

[26]Brockington, "Piedra Parada...," p. 124.

[27]Keith A. Dixon, Ceramics from Two Preclassic Periods at Chiapa de Corzo, Chiapas, Mexico, Papers of the New World Archaeological Foundation, No. 5 (Orinda, 1959), pp. 4-5.

[28]Ibid., p. 23.

[29]Ibid., pp. 20-21.

[30]Ibid., p. 21.

[31]Ibid., p. 36.

[32]Carlos Navarrete, Explorations at San Agustin, Chiapas, Mexico, Papers of the New World Archaeological Foundation, No. 3 (Orinda, 1959), Figure 3i.

[33]Bruce W. Warren, "The archaeological sequence at Chiapa de Corzo," Los Mayas del Sur y sus Relaciones con los Nahuas Meridionales (Mexico: Sociedad Mexicana de Antropologia, 1961), p. 81.

[34]Navarrete, op. cit., p. 11.

[35]Carlos Navarrete, Archaeological Explorations in the Region of the Frailesca, Chiapas, Mexico, Papers of the New World Archaeological Foundation, No. 7 (Orinda, 1960), p. 39.

[36]Ibid., p. 30.

[37]Gareth W. Lowe, "Algunos resultados de la temporada 1961 en Chiapa de Corzo, Chiapas," Estudios de la Cultura Maya, Vol. 2 (México, 1962), 195.

[38]The following is a summary of a letter to the author from Bruce Warren dated January 4, 1965. I assume responsibility for any misinterpretations of Warren's statements.

[39]Stephan Borhegyi and Lee Parsons inspected a type sample of the Sipolite material. Neither could see any particular resemblance with their Bilbao materials and Borhegyi could not with the Kaminaljuyu materials with which he is quite familiar.

[40]Coe, op. cit., p. 61.

[41]Ibid., p. 67 and elsewhere.

[42]Bernal, "Ceramica preclasica...," Lamina 27.

[43]Coe, op. cit., p. 57.

[44]Ibid., Figure 35i, upper right.

[45]Ibid., p. 62.

[46]Philip Drucker, La Venta, Tabasco: A Study of Olmec Ceramics and Art, Bureau of American Ethnology Bulletin 153 (Washington, D. C.: U. S. Government Printing Office, 1952), pp. 108-110.

[47]Ibid., pp. 86-88 and Figure 25d.

[48]Ibid., p. 117.

[49]Drucker, Tres Zapotes..., Figure 31d.

[50]R. Smith, op. cit., II, Figure 14a.

[51]Ibid., Figure 16e 4-8.

[52]Ibid., Figure 18a.

[53]Heinrich Berlin, "Late pottery horizons of Tabasco, Mexico," Contributions to American Anthropology and History, Vol. XII, No. 59, Carnegie Institution of Washington Publication 606 (Washington, D. C.: U. S. Government Printing Office, 1956), 133.

[54]George W. Brainerd, "Fine Orange pottery in Yucatan," Revista Mexicana de Estudios Antropologicos, Tomo V, Nums. 2-3 (Mexico: Sociedad Mexicana de Antropologia, 1941), 175-176.

[55]George W. Brainerd, "The archaeological ceramics of Yucatan," Anthropological Records, Vol. XIX (Berkeley: University of California Press, 1958), 54.

[56]Berlin, "Late pottery...," 132-133.

[57]Robert L. Rands and Barbara C. Ranis, "The ceramic position of Palenque, Chiapas," American Antiquity, Vol. XXIII, No. 2 (October, 1957), 144.

[58]César A. Saenz, "Tres estelas en Xochicalco," Revista Mexicana de Estudios Antropológicos, Tomo 16 (México: Sociedad Mexicana de Antropologia, 1961), 46 and 58.

[59]Ibid., 49; and César A. Saenz, "Exploraciones en la pirámide de las serpientes enplumadas, Xochicalco," Revista Mexicana de Estudios Antropológicos, Tomo 19 (México: Sociedad Mexicana de Antropologia, 1963), 23.

CHAPTER V

FURTHER ARTIFACT DESCRIPTION AND ANALYSIS

Below are descriptions and analyses of other ceramic objects - vessel supports and handles, figurines, and assorted objects - and the few non-lithic, non-ceramic remains found at Sipolite.

Handles

Applying the definitions and terminology developed by Fay-Cooper Cole and Thorne Deuel[1], two main varieties of handles are found at Sipolite - Loop Handles and Lug Handles. The Loop Handles are either circular or flattened in cross-section with the former having been named "Circular Loop Handles" and the latter "Strap Loop Handles." The Strap Loop Handles are grouped into fine and coarse paste divisions of stratigraphic significance and therefore presumably of chronological and cultural significance. See Table 34 for the stratigraphic occurrences of handle forms.

Two fine paste high-necked olla sherds from a surface collection have Strap Loop Handles attached but all other Loop handles of either variety from stratipits are associated with tecomate forms whenever vessel form is known or can be inferred. All Loop handles were placed about one-third down the vessel wall and never attach to the rim. All, except for the fine paste Strap Loop Handles, appear to have been placed vertically with another minor exception being from surface collections where three comal sherds have Circular Loop Handles placed horizontally following the contours of the vessel perimeter.

Loop handles are strips of clay that have been attached to the exterior of the vessel wall. The ends of the handles are splayed and, judging from broken examples, the adhesion normally was accomplished by working the splayed portions to vessel walls, not the ends proper of the handles to walls. Since most Loop handles broke free from vessels, the union usually was rather poor.

Loop handles are the earliest handle form at Sipolite. The coarse ware Strap Loop handles decline from 19% in Level 8 to 6% in Level 3 and 11.1% in Level 2. The Circular Loop handles follow a similar pattern beginning in Level 9 as 100% - a single example - decreasing to 11.1% in Level 1. For Levels 2 through 4 the percentage of Circular Loop handles remains fairly constant, near 13%.

There are three sub-varieties of Lug Handles - a vertically flattened solid or horizontally perforated lug, a plain or effigy upcurving conical lug, and a small nubbin lug usually placed at the rim of some small fine paste tecomates. The vertically flattened lugs have a slight projection, similar to a bird's beak, protruding downwards or up from the extremity of the handle with the direction of projection depending upon whether one holds the lug one way or another. There are no examples of such handles attached to a rim portion and orientation is therefore problematic but most likely projected upwards. With the projection flattened lugs are morphologically similar to the Effigy Aviform Lugs." They are solid or horizontally perforated (See Plate LV). Since the perforated ones appear in the stratigraphic column after the Loop handles and since the Loop handles decline in percentage as the perforated Flat

HANDLES

Level	LOOP			EFFIGY LUGS								NUBBIN LUGS	TOTAL
	STRAP		CIRCULAR	FLAT AVIFORM		CONICAL AVIFORM				OTHER EFFIGY			
	FINE PASTE	COARSE PASTE		PREFORMATED	SOLID	SHORT DECORATED		LONG DECORATED		PLAIN			
						GOUGED	REED PUNCH	GOUGED	REED PUNCH				
1	2 / 22.2		1 / 11.1		1 / 11.1		2 / 22.2				1 / 11.1	2 / 22.2	9 / 2.7
2		4 / 11.1	5 / 13.9	4 / 11.1	1 / 2.8	2 / 5.6	8 / 22.2		5 / 13.9	1 / 2.8	5 / 13.9	1 / 2.8	36 / 10.7
3	4 / 6.0	4 / 6.0	9 / 13.4	13 / 19.4	2 / 2.9	9 / 13.4	16 / 23.9		5 / 7.5	1 / 1.5	2 / 2.9	2 / 2.9	67 / 20.0
4	2 / 2.9	4 / 5.7	9 / 12.9	19 / 27.1	6 / 8.6	11 / 15.7	10 / 14.3		3 / 4.3	4 / 5.7	2 / 2.9		70 / 20.9
5		6 / 11.5	18 / 34.6	9 / 17.3	5 / 9.6	7 / 13.5	7 / 13.5						52 / 15.5
6		9 / 18.4	24 / 48.5	9 / 18.4	2 / 4.1	4 / 8.1						1 / 2.0	49 / 14.6
7		5 / 16.7	22 / 73.3	3 / 10.0									30 / 9.0
8		4 / 19.0	17 / 81.0										21 / 6.3
9			1 / 100.										1 / .3
	8 / 2.4	36 / 10.7	106 / 31.6	57 / 17.0	17 / 5.1	33 / 9.9	43 / 12.8		13 / 3.9	6 / 1.8	10 / 2.9	6 / 1.8	335 GRAND TOTAL

TABLE 34. -- Distribution of handle forms

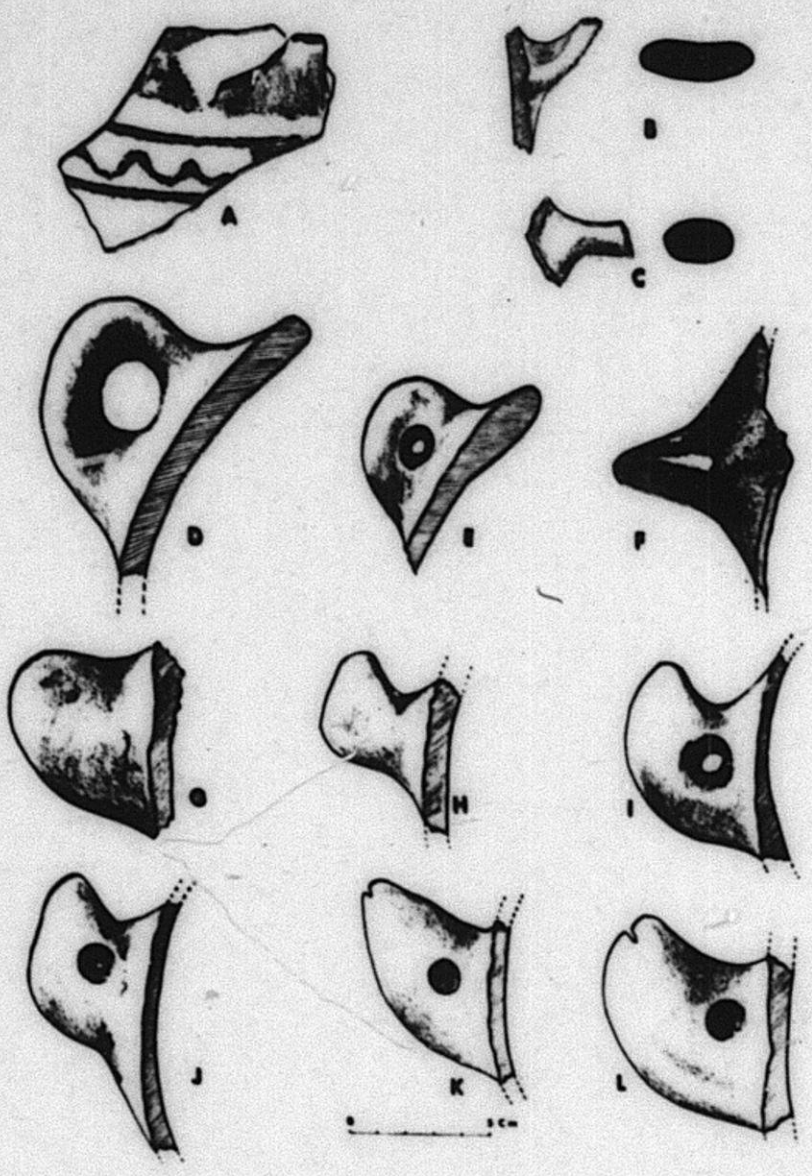
Aviform lugs increase, it would appear that the latter replaced the former. Perforated lugs would have served the same function, actual and/or possible, as the Loop handles, i.e., suspending the vessel from cords passed through the handle opening. The change of handle form would therefore appear to be functionally superfluous.

Since there are no other known examples of perforated Flat Aviform lugs in Mesoamerica, we consider them to have been a local invention the proliferation of which partially displaced the older and previously established Loop handles. The decline from level to level in the popularity of Loop handles is matched by a corresponding increase in popularity of perforated Flat Aviform lugs.

The Conical lugs, which in all cases where rims are attached curve upwards, appear to be an elaboration upon the stratigraphically earlier perforated ones, since there are form similarities as well as temporal difference. Conical lugs of this form are not known from elsewhere in Mesoamerica, except from Anclero near Puerto Angel and Tukidi near Pochutla.[2] A logical bridge between the perforated lugs and the stratigraphically later Conical Aviform lugs is provided by the solid Flat Aviform lugs which appear only after the perforated version of the same had been established. The solid Flat Aviform lugs declined in percentage two levels higher while the Conical Aviform lugs continued to enjoy a considerable popularity.

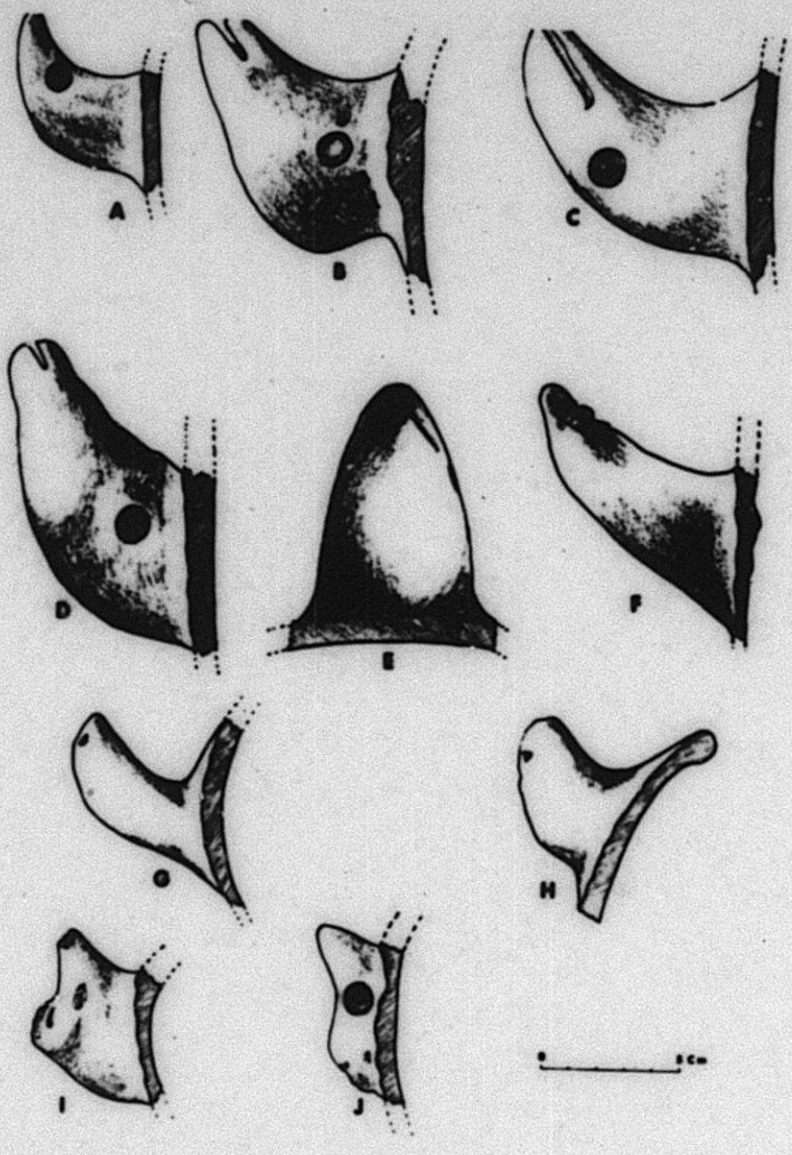
The Conical Aviform lugs, as the name states, may represent bird figures, although such is by no means always certain. The figures are too vague to permit positive identification of species. Some examples seem to represent seagulls, others to represent

PLATE LV



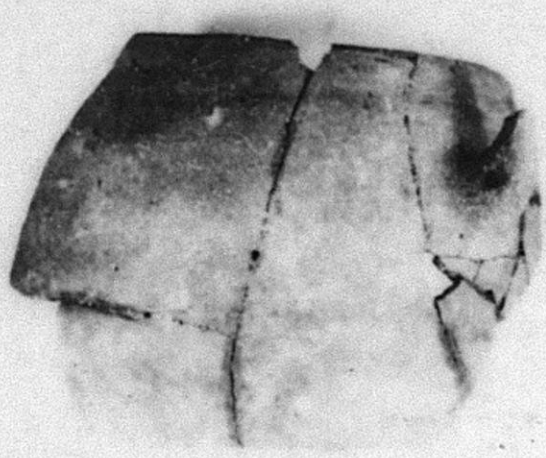
HANDLES - A, FINE PASTE STRAP LOOP; B, COARSE PASTE STRAP LOOP; C AND D, CIRCULAR LOOP; E AND F, TWO VIEWS OF A PERFORATED FLAT AVIFORM; G AND H, SOLID FLAT AVIFORM; I AND J, REED PUNCHED SHORT CONICAL AVIFORM; K AND L, GOUGED SHORT CONICAL AVIFORM

PLATE LVI



HANDLES - A, GOUGED SHORT CONICAL AVIFORM; B, REED PUNCHED SHORT CONICAL AVIFORM; C - F, REED PUNCHED LONG CONICAL AVIFORM; G AND H, PLAIN CONICAL AVIFORM; I AND J, OTHER EFFIGY LUGS

PLATE LVII



GOUGED SHORT CONICAL EFFIGY LUG ATTACHED TO LARGE SHERD

parrots, and yet others to represent seals, dolphins, turtles or fish, all of which are found near Sipolite. Since the majority, in the opinion of the author, most resemble birds, the group has been named "Aviform." Drawings of all varieties are presented in Plates LV, LVI and LVII.

The Conical Aviform lugs have been divided into two groups, long and short, with the long being in excess of six centimeters. The short examples are decorated by either gouging or poking with the finger or by punching with a hollow reed-like implement or imitating such a mark by incision. The decoration usually represents eyes, although a mouth is sometimes represented by an incised line. Reed punching begins in Level 5, one level above the earliest occurrence of finger punching, and presumably evolving from it. The long variety of Conical Aviform lugs apparently evolved from the short since it appears in Level 4, two levels above the earliest short example. Since the long variety is decorated only by reed punching, we have further justification for suggesting reed punching evolving from finger punching.

Another group of Conical Aviform lugs is plain and short, none being over five centimeters long. They are only found in Levels 2, 3 and 4.

A third class of Effigy lugs, consisting of ten examples, is similar to the Conical Aviform lugs but more surely represent bird forms. Five examples are extremely short, mere nubbins, more adornments than lugs (see Plate LVI i and j). They are found in upper levels, Level 1 through 4.

In summary, the handles exhibit an evolution in form, function, and decoration. The earliest handles are loop varieties that could have served for suspending vessels by cords. The function, actual and/or possible, was taken over by a lug handle that was vertically thinned but perforated. Solid conical lugs apparently evolved from the pierced lugs and in higher levels increased in length. The earliest decoration of the solid conical lugs was by simple gouging, probably with the finger, which was partially replaced by reed punching in still higher levels. Finally, in the four upper levels, reed punching, long conical aviform lugs, small completely plain aviform lugs, and exotic effigy lugs complete the final elaboration of the lug and handle developmental sequence. The loop varieties of handles persisted throughout the occupation of the site but their frequencies, absolute and relative, altered.

We can note that not only is the process of evolution complex with an interplay of function, size, and decoration through time but also that the process was continuous. From this it seems permissable to infer a continuous occupation of the site. It is only in Level 3 with the appearance of fine paste Strap Loop handles that a foreign influence may be posited to explain the new association of handle and vessel forms but even granting such slight influence, the previous tradition continued little altered.

The Sipolite pottery handles do not appear to be valuable for comparative purposes. The Loop handles are more or less identical with others from most parts of Mesoamerica for most ceramic periods. Only the fine paste Loop handles are of much use, and because of the

surface find mentioned above, may be suggested to be Postclassic temporally but with a specific cultural assignment not possible.

The lug series are nearly useless for comparative purposes. What appears to be a Flat Aviform lug has been reported from Yucatan for the "Late Mexican" period shortly before the European arrival.[3] Several pottery pestles from Chichen Itza are similar to broken Conical Aviform lugs and are considered "Early Mexican."[4] Within Mesoamerica there are no good comparative materials although animal effigies are not unknown. Upon examination most such lugs are seen to have only superficial resemblances. It is only to the south in Central America,[5] northern South America,[6] and on the north coast of Peru[7] that such objects with stronger resemblances are found but as parts of traditions completely unlike that of Sipolite. Our present evidence will not permit more than the observation that there are morphological similarities.[8]

Supports

One hundred and ninety-one supports, complete or sufficiently so to reveal overall forms, were recovered from stratipits. Most are hollow and rather fragile and were shattered during excavation, if not before. Many have been eroded on their tips through use until the interior cavities were penetrated. Fragments were laid out by excavation units and re-assembled when possible to give a maximum number of examples. However, since the solid supports are more durable, the total count probably favors them over the hollow supports. The latter still dominate in every level. See Table 35 for stratigraphic occurrences of vessel support classes.

SUPPORTS

LEVEL	HOLLOW										SOLID			ANNULAR		SLAB						DUCK-BILL	MOLD-MADE EFFIGY	TOTAL
	MAMMIFORM		CYLINDRICAL	BALL		CONICAL					NUB		CONE	HIGH	RING	SQUARE		CURVED						
	LONG	FULL		SIMPLE	CONSTRICTED	PUNCHED		SLIT			PEG	SLAB				HORIZONTAL	VERTICAL	STEPPED		SIMPLE				
						LONG	SHORT	LONG	SHORT									PLAIN	DECORATED	PLAIN	DECORATED				
1					1 12.5		1 12.5											1 12.5		3 37.5		1 12.5	1 12.5	8 4.2
2		5 14.3		2 5.7	3 8.6		3 8.6		1 2.8			1 2.8	1 2.8					2 5.7		9 25.7			8 22.9	35 18.3
3		4 7.8	2 3.9	1 1.9	4 7.8	3 5.9	3 5.9	3 5.9	3 5.9		1 1.9	1 1.9			3 5.9	1 1.9		1 1.9	1 1.9	9 17.7	1 1.9	2 3.9	8 15.7	51 26.7
4	1 2.0	6 12.5	1 2.0	3 6.3	3 6.3	2 4.2	3 6.3	3 6.3	3 6.3			3 6.3		2 4.2	2 4.2	2 4.2		2 4.2	1 2.0	6 12.5	4 8.3		1 2.0	48 25.1
5	2 6.5		2 6.5	5 16.1	1 3.2	2 6.5	6 19.3	3 9.7	2 6.5		1 3.2				2 6.5		1 3.2	2 6.5		2 6.5				31 16.2
6	1 10.0		1 10.0			1 10.0	2 20.0		1 10.0		3 30.0								1 10.0					10 5.2
7	3 60.0			1 20.0			1 20.0																	5 2.6
8	3 100.																							3 1.6
9																								
	10 5.2	15 7.9	6 3.1	12 6.3	12 6.3	8 4.2	19 9.9	9 4.7	10 5.2		5 2.6	5 2.6	1 .5	2 1.1	7 3.7	3 1.6	1 .5	8 4.2	3 1.6	29 15.2	5 2.6	3 1.6	18 9.4	191 GRAND TOTAL

TABLE 35 -- Distribution of vessel support forms

The supports have been classified by using criteria of form, measurements, details of manufacturing techniques, and decoration. A description of each class and sub-class is provided and includes measurements, paste and temper characteristics, and special comments when such seem necessary. The classification is presented below in outline form.

Hollow Supports: Hollow Mammiform Supports

The Long and Full varieties, evidently anthropomorphic representations of female breasts, are differentiated by their relative basal diameters and heights. The basal diameter of Full examples exceeds the length while the length is greater for the Long examples.

All mammiform supports have been pierced by a single punch of a round instrument, evidently to make a vent to permit air passage and help prevent breakage during firing. Complete supports contain clay pellets or tinklers, as do all hollow supports found at Sipolite. Free pellets often have been pinched to form a slight ridge on one surface with the ridge being pierced. It is suggested that the perforation served to suspend the tinkler inside the support until they dried. The pellet otherwise might have adhered to the damp inner surfaces of the supports. The postulated suspension thread would have burned away during firing leaving the pellet to tinkle inside the hollow chamber of the support.

It has not been possible to ascertain whether the mammiform supports were tripods or tetrapods but it is this form that occurs most often as tetrapods at Monte Alban and throughout sourthern Mesoamerica.

SUPPORTS

I Hollow
- A. Mammiform
  - 1. Long
  - 2. Full
- B. Cylindrical
- C. Ball
  - 1. Simple
  - 2. Constricted
- D. Conical
  - 1. Punched
    - a. long
    - b. short
  - 2. Slot
    - a. long
    - b. short

II Solid
- A. Nub
  - 1. Peg
  - 2. Slab
- B. Cone

III Annular
- A. High
- B. Ring

IV Slab
- A. Square
  - 1. Hollow
  - 2. Solid
- B. Curved
  - 1. Stepped
    - a. plain
    - b. decorated
  - 2. Simple
    - a. plain
    - b. decorated

V Duck-Bill

VI Mold-made Effigy

TABLE 36. - Summary of support classification

Long: 10 examples - Plate LVIII A and B

Size:	Varies from 3.7 to 5.0 cms. with modal example approximately 4.0 cms.
Material:	Soft grey clay with fine or very fine quartzite temper
Finish:	All smoothed; no slip
Decoration:	One example each from Levels 6 and 8 bear traces of red pigment
Comment:	In all three examples where the vessel wall is present, the support was placed at the outside perimeter of the base. The form is the earliest support found at Sipolite and apparently is replaced by the Full variety.

Full: 15 examples - Plate LVIII C

Size:	Varies from 2.0 to 4.5 cms. high with modal example approximately 3.2 cms.
Material:	Half of the examples from each level are of soft grey paste; two examples of light brown paste are from Level 4, one from Level 3 and two from Level 2; one tan paste example is from Level 4. All contain very fine quartzite temper.
Finish:	All smoothed; no slip
Decoration:	The two light brown paste examples from Level 4 bear traces of red pigment.
Comment:	This form strongly resembles the swollen versions associated with Holmul I and II. However, at Sipolite the Full variety succeeds the Long and so presumably is an elaboration on the earlier. At Sipolite the Full version abruptly replaces the Long in the stratigraphic sequence.

Hollow Cylindrical Supports: 6 examples - Plate LVIII D

All are hollow with a round vent hole, except for a solid example from Level 5. The tips are rounded, not flat.

Size:	From 1.5 to 3.2 cms. with modal example about 2.0 cms. high
Material:	Soft grey paste with fine or very fine quartzite temper
Finish:	Smoothed; no slip
Decoration:	None

Hollow Ball Supports:

The class has been sub-divided on the basis of the presence or absence of a slight constriction at the root of the support where it joins with the vessel bottom. The fact that the Constricted variety is stratigraphically later than the Simple variety indicates the distinction may be valid. All complete examples have a single round vent and contain a tinkler.

Simple Ball: 12 examples - Plate LVIII E and F

Size:	1.5 to 4.2 cms. with modal example about 2.2 cms. high
Material:	Light grey or light brown paste in equal numbers in each level and with fine or very fine quartzite temper
Finish:	Smoothed; no slip
Decoration:	None

Constricted Ball: 12 examples - Plate LVIII G

Size:	1.6 to 9.0 cms. with modal example about 3.0 cms. high
Material:	Except for solitary grey paste examples in Levels 2 and 3 and a tan paste example in Level 3, all are of light brown paste. All have very fine quartzite temper.
Finish:	Smoothed; no slip
Decoration:	None
Comment:	The variety apparently develops from the Simple Ball and outlasts it. Also, note that while half of the Simple Ball supports were of grey paste, light brown paste dominates for this form.

Hollow Conical Supports:

All are truncated cones, hollow, and contain a tinkler when complete. The class, most numerous of all support classes, has been divided into those which have a punched round vent hole or a slot vent hole and then each division is sub-divided into long and short groups. All slot vent holes are vertical or diagonal.

Punched Long: 8 examples - Plate LVIII H and I

Size: 4.2 to 5.4 cms. with modal example about 4.7 cms. high
Material: All are of soft light brown paste, except for single examples of a soft grey paste in Levels 3, 4, and 5. All contain very fine quartzite temper.
Finish: Smoothed; no slip
Decoration: None

Punched Short: 19 examples - Plate LVIII J

Size: 2.0 to 3.6 cms. with modal example approximately 2.8 cms. high
Material: One example from Level 5 is of light brown paste with medium quartzite temper. All other examples for Levels 5 through 7 and half of those from higher levels are of soft grey paste with the remainder being of light brown paste. With the one exception, all contain very fine quartzite temper.
Finish: Smoothed; no slip
Decoration: None
Comment: The Punched Short supports appear stratigraphically before the Punched Long.

Slot Long: 9 examples - Plate LVIII K

Size: 3.2 to 4.3 cms. with the modal example about 3.7 cms. high
Material: Except for one light brown paste example in Level 3, all are of soft grey paste and all contain very fine quartzite temper.
Finish: Smoothed; no slip
Decoration: One example in Level 4 bears traces of red pigment.

Slot Short: 10 examples - Plate LVIII L

Size: 2.0 to 3.0 cms. with the modal example about 2.7 cms. high
Material: Except for one light brown paste example in Level 3, all are of soft grey paste. All contain very fine quartzite temper.
Finish: Smoothed; no slip
Decoration: None
Comment: The Short variety of Slot supports is stratigraphically earlier than the Long. Also, note that the pastes and materials for both are identical.

Solid Supports: Nub Peg: 5 examples - Plate LVIII M

Size: .7 to 1.4 cms. with modal example about 1.0 cm.
Material: Except for an example of light brown paste in Level 3, all are of grey paste and all contain very fine quartzite temper.
Finish: Smoothed; no slip
Decoration: None

Nub Slab: 5 examples - Plate LVIII N

Size: .6 to 1.0 cm. high with modal example about .7 cm.
Material: Level 4 examples are of grey paste with very fine quartzite temper; Level 3 example is of brown paste with fine quartzite temper; Level 2 example is of tan paste with no visible temper.
Finish: Smoothed; except for one from Level 3 with black slip, all are unslipped.
Decoration: None
Comment: They may be versions of Solid Slab Supports of Class IV and, in fact, have the same stratigraphic occurrences.

All appear to have been placed at the perimeter of vessels having slightly outflaring straight or nearly straight walls.

Cone Support: 1 example - Plate LVIII O

Size: 2.2 cms.
Material: Grey paste with very fine quartzite temper
Finish: Smoothed; no slip
Decoration: None

Annular Supports:

Annular supports are found at Sipolite in two versions, High and Ring. Both appear to have been made by attaching a strip of clay to vessel bases but with the high versions the strip was wide. The use of the terms "annular" and "ring" makes for a redundancy. "Ring" is used to refer to low versions, less than 1.5 cms., with "annular" referring to the more inclusive class of high and low forms.

High Annular: 2 examples - Plate LIX A

Size: 2.3 and 2.7 cms. high
Material: Reddish-brown paste and grey paste, both with medium quartzite temper
Finish: Smoothed; no slip
Decoration: None
Occurrence: Level 4 only

Ring Annular: 7 examples - Plate LIX B and C

Size: 1.2 to 1.4 cms. high
Material: Level 3 and 5 examples are of tan paste and very fine quartzite temper; Level 4 examples are of grey and light brown pastes and fine quartzite temper.
Finish: Smoothed; no slip, except for one example each from Levels 3 and 5 with polished orange slip on the interior of the vessel bases.
Decoration: None
Occurrence: Levels 3, 4 and 5
Comment: Appears to be associated with convex-walled bowls

Slab Supports:

The square examples are square or rectangular when viewed from their sides and rectangular when viewed from below. The lower margins of the curved forms are rounded and, when viewed from below, are seen to curve following the vessel perimeter. Each class is further sub-divided.

Solid Square Slab Supports: 1 example - Plate LIX D

Size: 5.5 cms. wide, 1.8 cms. thick, and 6.6 cms. high
Material: Orange paste with medium quartzite temper
Finish: Smoothed; no slip
Decoration: None

Hollow Square Slab Support: 3 examples - Plate LIX E

Size: Level 4 examples are 1.0 cm. thick at lower edge with other measurements being uncertain; Level 3 example is 5.6 cms. wide, .7 cm. thick at lower edge and thickened to 2.0 cms. at the root and at least 7.0 cms. high.
Material: Level 4 examples are of light grey paste with very fine quartzite temper, Level 3 example is of light brown paste and no visible temper.

Finish: Smoothed; no slip
Decoration: In all cases a triangular design has been cut away with a portion of the support interior hollow.
Occurrences: Levels 3 and 4

Curved Slab Supports:

These have been divided into Stepped and Simple categories with each being sub-divided into Plain and Decorated groups. The Stepped versions were made by cutting away notches at the bottom of the corners or by jabbing inwards at the bottom corners with a finger or round-ended dowl. The stepped supports are identical with some "Tau" supports of southern Mesoamerica.

Stepped Curved Slab Supports, Decorated: 3 examples - LIX H, I and J

Size: 1.7 cms. to 3.0 cms. with modal example about 2.4 cms.
Material: Examples from Levels 4 and 6 are of light brown paste with fine quartzite temper. The Level 3 example is of grey paste with no visible temper.
Finish: Smoothed; no slip
Decoration: Incised rectangular pattern on exterior face of the support
Occurrence: Levels 3, 4, and 6
Comment: The Level 6 example appears to be out of place stratigraphically.

Stepped Curved Slab Supports, Plain: 8 examples - Plate LIX F and G

Size: 1.4 cms. to 2.4 cms. with modal example approximately 2.2 cms.
Material and Finish: Varied: One each from Levels 2 and 5 are of light brown paste without visible temper. Both have polished brown slip on the interior of attached bases but the supports are smoothed, not slipped. The other example from Level 5 has fine quartzite temper, both from Level 4 have very fine quartzite temper, and the single example from Level 1 has fine quartzite temper but all of these are made of light grey paste. The last mentioned support from Level 5 has a polished dark grey slip on the interior of the attached vessel base and outside wall and red paint in a band around the outside base. One of the examples from Level 4 has a polished dark brown slip on the base interior of the wall. Grey paste and no visible temper were used for

single examples from Levels 2 and 3 with the latter having red pigment on the support exterior.

Decoration: See above.

Simple Curved Slab Supports, Decorated: 5 examples - Plate LX C

Size: Uniformly about 2.2 cms. high, 3.7 cms. wide and .5 cm. thick

Material: Three examples from Level 4 are of light grey paste and one is of tan paste. A single example from Level 3 is of grey paste. All contain very fine quartzite temper.

Finish: Smoothed; no slip

Decoration: Four examples bear series of excised parallel lines running from the root to the support base on the exterior surface. One bears on its exterior incised rectangles similar to those on Decorated Step supports.

Simple Curved Slab Supports, Plain: 29 examples - Plate LX A and B

Size: Height varies from 1.3 to 3.3 cms., width from 4.0 to 9.3 cms., thickness is about .5 cm. at the base and widens towards the root. A modal example would be approximately 2.2 cms. high and 5.0 cms. wide.

Material: Varied. (1) Tan paste, one example each from Levels 4 and 5 and three from Level 3, all with no temper visible. (2) Light grey paste, one example in Level 4, five in Level 3, and six in Level 2. One each of the Level 3 and 4 examples have very fine quartzite temper - both have polished dark grey slip on the base interiors and vessel wall exteriors as do four examples from Level 2. All other examples of light grey paste have no visible temper. One example of those from Level 2 bears polished dark grey slip on the interior and exterior portions of attached vessel walls. (3) Brown paste with fine quartzite temper was used for single examples from Levels 1 and 4 with the latter bearing polished dark grey slip on the interior and exterior of attached vessel walls. (4) Grey paste was used for two examples from Level 3, one from Level 2, and three from Level 1 with all, excepting the latter which has no visible temper, containing fine quartzite temper.

Finish: All are smoothed; slip as noted above.

Decoration: One example from Level 1 has red pigment on its exterior.

Comment: There apparently is a paste change stratigraphically for this group. Tan, light grey, brown, and grey pastes appear in that order.

Duck-Billed Supports: 3 examples - Plate LX D

These are hollow, have a slot vent, and contain a tinkler. The form resembles a duck's head and bill.

Size: 3.3 cms. long; length and width varies
Material: Grey paste with very fine quartzite temper
Finish: Smoothed; no slip
Decoration: None

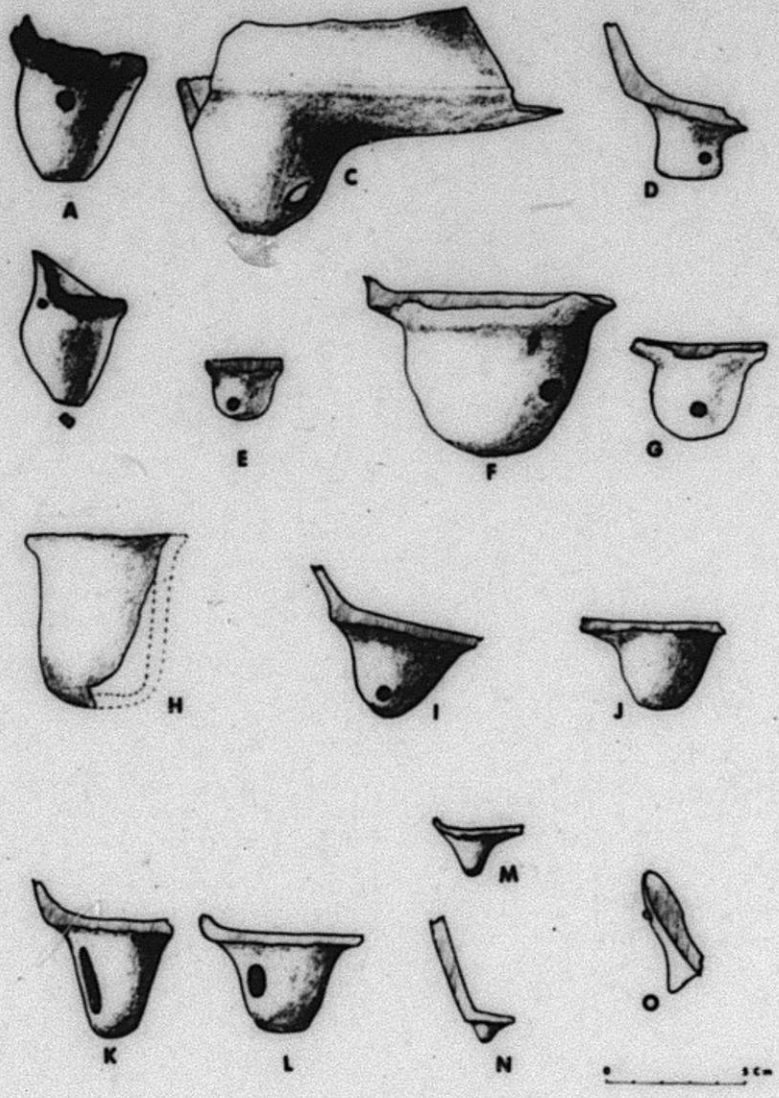
Mold-Made Effigy Supports: 10 examples - Plate LX E and F

All are hollow with the exterior surfaces having a mold-made face looking downwards. The face may be zoomorphic (monkey and only possibly a serpent) or anthropomorphic (a fat or old person). All effigies are countersunk into the support, except for the Level 4 example which protrudes slightly. When the support is intact, a tinkler is inside.

Size: Uniformly 3.2 cms. high
Material: Varied. (1) The Level 4 specimen differs from others in being of light grey clay, containing medium quartzite temper, being rather round on its surface, and in having red pigment on its exterior. (2) Grey paste was used for two examples from Level 2 - fine and very fine quartzite temper - and one from Level 1 with fine quartzite temper. (3) Tan paste was used for one specimen from Level 3 and four from Level 2 with one from each level having fine quartzite temper and the others having no visible temper. (4) Three examples from Level 3 and two from Level 2 have brown paste with fine quartzite temper. All have dull black exteriors due to reducing firing, not slipping. (5) Three examples from Level 3 are of reddish-brown paste with fine quartzite temper. All are hard and covered with a fairly thick black slip.
Finish: All smoothed, except as noted for the Level 4 example; slipped as described.
Decoration: All are effigies, as noted.
Occurrences: Single examples from Levels 1 and 4 and the remainder from Levels 3 and 2.
Comments: Paste changes parallel those noted for the Plain Simple Curved Slab supports.

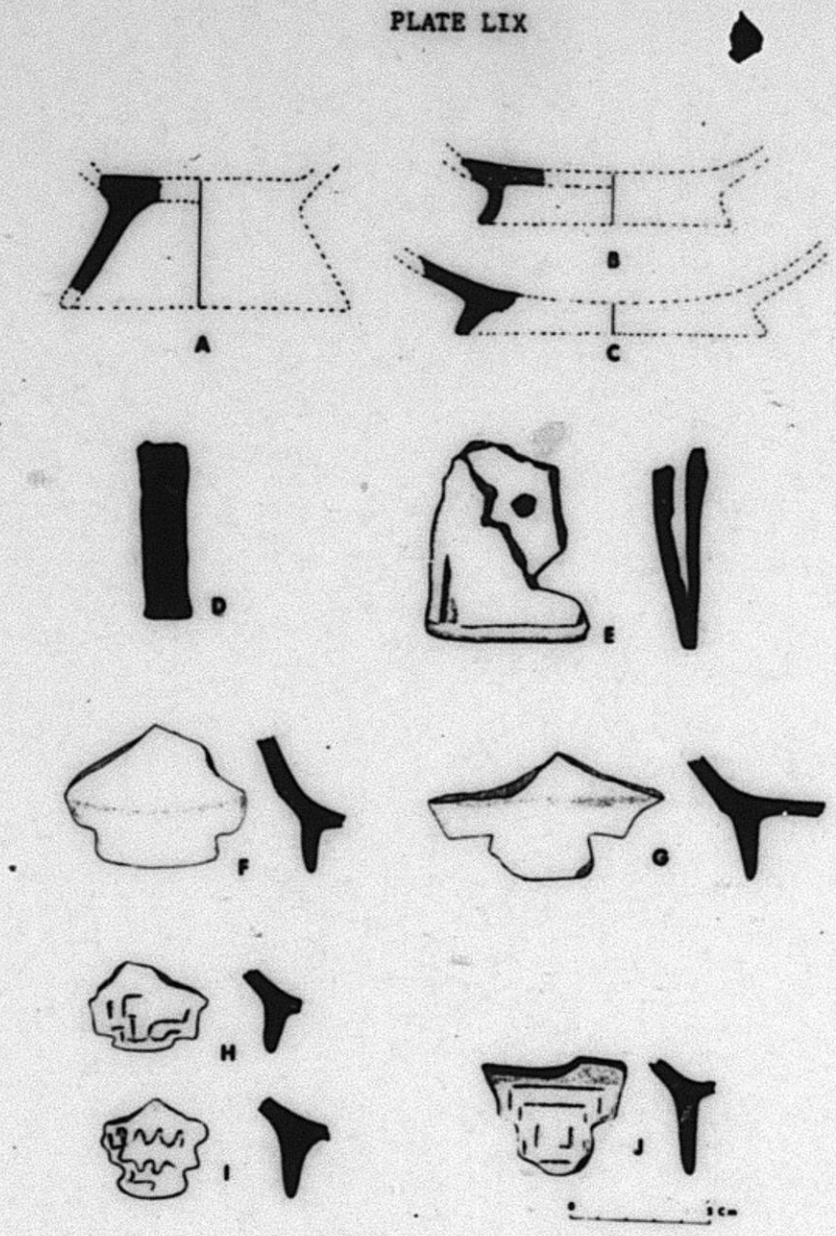
The Level 4 example differs from others regarding material, finish, temper, and method of manufacture. It may represent first attempts to produce the class at Sipolite.

PLATE LVIII



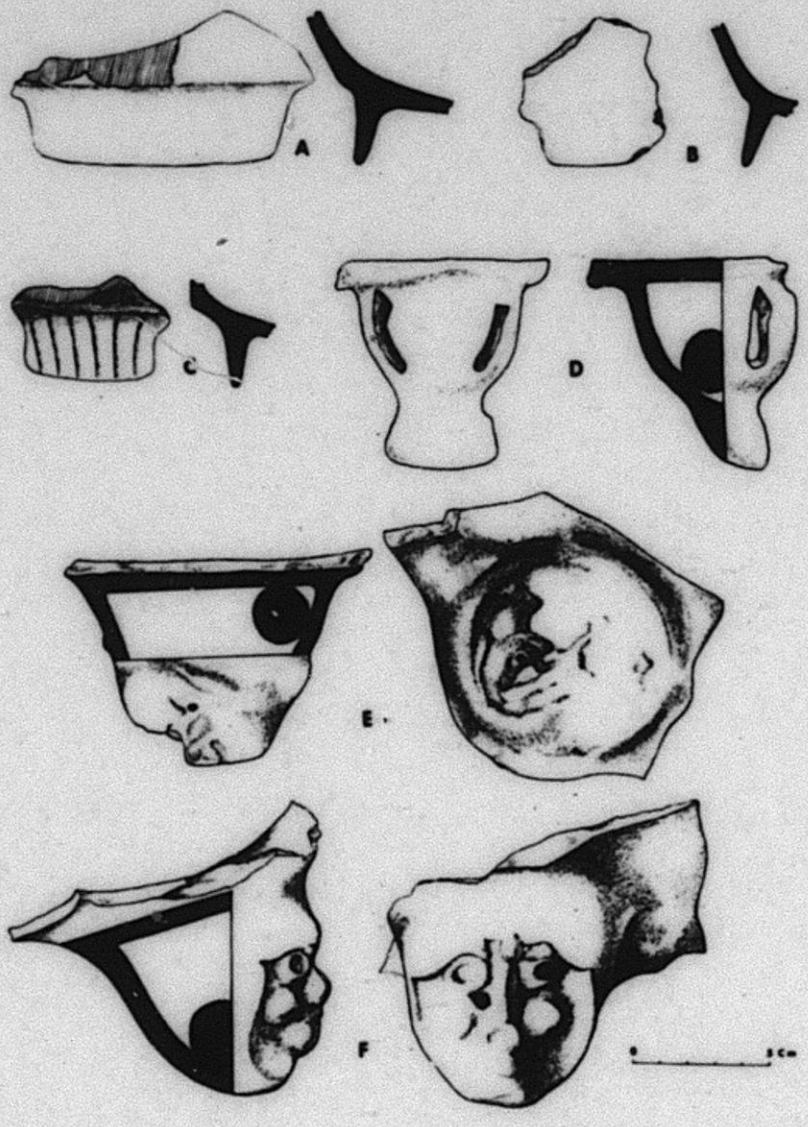
SUPPORTS - A AND B, LONG MAMMIFORM; C, SHORT MAMMIFORM; D, CYLINDRICAL; E AND F, SIMPLE BALL; G, CONSTRICTED BALL; H AND I, LONG CONICAL PUNCHED; J, SHORT CONICAL PUNCHED; K, LONG CONICAL SLIT; L, SHORT CONICAL SLIT; M, SOLID PEG NUB; N, SOLID SLAB NUB; O, SOLID CONE

PLATE LIX



SUPPORTS - A, HIGH ANNULAR; B AND C, RING ANNULAR; D, SOLID SQUARE SLAB; E, HOLLOW SQUARE SLAB; F AND G, PLAIN STEPPED CURVED SLAB; H - J, DECORATED STEPPED CURVED SLAB

PLATE LX



SUPPORTS - A AND B, PLAIN SIMPLE CURVED SLAB; C. DECORATED SIMPLE CURVED SLAB; D, DUCKBILL EFFIGY; E AND F, MOLD-MADE EFFIGY (D - F ARE 3/4 ACTUAL SIZE)

Not all supports are useful for comparative purposes. Small Solid Conical and Hollow Ball supports are general, common forms which have wide distributions in time and space in Mesoamerica. Others have highly specific distributions and are excellent for comparative purposes. Our conclusions are somewhat at variance with other findings and it is therefore necessary to review evidence for assuming that the Sipolite stratigraphy is correct. Assumptions as to temoral placement and cultural assignment of support forms have been major reasons for interpreting certain ceramic collections.[9] To avoid such a priori errors with the Sipolite materials conclusions are based upon the actual stratigraphic positions of support forms. However, we must re-examine the support stratigraphy itself to further justify accepting it.

Note the many consistencies that occur in Table 36. The numerous mold-made effigy supports occur in Levels 1 through 3 with a single Level 4 example and it is aberrant in several respects. Likewise, the "Duck-bill" supports, a possible effigy form, are found in Levels 1 through 3. Mold-made supports are considered Post-classic in time and affiliation but may occur as early as very late Classic in the lowland Maya region, to anticipate discussion below.

The ring base supports which are firmly associated elsewhere with the early and middle Classic appear in the Sipolite sequence in Levels 3, 4 and 5 which is precisely where we would expect them if the mold-made effigy supports are accepted as very late Classic and Post-classic and if the stratigraphic record is correct. Repeated internal consistency and agreement with other sequences gives credulance to the stratigraphy.

With regard to mammiform supports, the Long variety, appearing in Levels 4 through 8, is replaced in Level 4 by the Full variety. The former never re-appears later nor the latter earlier. Complementary distributions of form elaborations are further evidence that the stratigraphy is correct. However, if we accept the mammiform support sequence as correct while accepting the Ring base and mold-made Effigy support sequence as also correct, we would have to conclude that the Full mammiform supports are Classic and even Post-classic which is contrary to current notions. But since the Sipolite sequence is consistent, there is no alternative but to accept the evidence and conclusions which follow. Further treatment of the problem is provided below and in Chapter VII.

Returning to the support stratigraphy, both Punched and Slot varieties of Conical Hollow supports have Short versions occurring before the Long. Further, the Punched varieties appear first and in earlier support forms, such as the Long Mammiform and Hollow Cylindrical, there are punched vent holes, never slots.

Within any variety of support or when considering features that appear in more than one variety, there is consistency. The only evidence of inconsistency is the Level 6 position of one decorated Stepped Curved Slab support.

There appears to be no reason for rejecting the Sipolite support stratigraphy on internal grounds but only when one attempts to compare the Sipolite data with external sequences. In many respects the Sipolite sequence does inter-mesh nicely with others. Let us examine some of these agreements and disagreements.

Hollow mammiform supports have been used as horizon markers indicating a late Preclassic or Protoclassic position but such cannot be completely justified. Long hollow mammiform supports are found in lower levels of Sipolite and also at Monte Alban in Periods I and II.[10] The Sipolite Full versions found in Levels 2, 3, and 4 have no counterpart in the Monte Alban sequence, judging from Ignacio Bernal's study of Preclassic Monte Alban ceramics. When Wauchope and others have used mammiform supports as horizon markers, thereby including within a single category the swollen Holmul I supports and the elongated Monte Alban supports, they not only have been including within a single type rather unlike objects but have been equating periods widely separated in time.[11] Holmul I is considered to have been a period around the second century A.D.[12] while radiocarbon dates for the <u>end</u> of Monte Alban I place it perhaps four hundred years earlier.[13] Error seems to have originated because of mistaken type definition.

Full mammiform supports are found at Chupicuaro,[14] and the Valley of Mexico[15] in the north and Uaxactun,[16] Holmul,[17] Central Chiapas,[18] Zacualpa,[19] and elsewhere in southern Mesoamerica but in less satisfactorily defined or incomplete sequences. The absolute dating of phases containing Full mammiform supports apparently is in sufficient agreement to permit using them as horizon markers, indicating the end of the Preclassic ceramic traditions and the beginning of the Classic. The Long variety do not agree in form or termporal placement with the Full.[20]

Both Simple and Constricted Hollow Ball supports are found at Monte Alban during Preclassic periods.[21] Wauchope reports both from Zacualpa, Guatemala for the partially contemporaneous Balam Phase and notes that round punched vent holes precede slots in each variety,[22] as at Sipolite with the somewhat similar Hollow Conical supports.

The Hollow Conical supports are too widespread in time and space to be useful for comparative purposes. We may note they occur at Monte Alban in Periods I-C and II with slot vents on bowls with a basal fillet, slightly convex bottoms, and slightly concave walls,[23] all of which is duplicated at Sipolite, as was discussed in Chapter IV.

Solid Nub Peg supports are known at Monte Alban for Period I, but not for Period II, and from elsewhere in southern Mesoamerica appearing during the early Classic.[24] The Solid Nub Slab apparently is not found at Monte Alban but elsewhere appears during the early or late Classic. It is not useful at present for comparative studies.[25]

The High Annular support has such a wide distribution in time and space as to be useless for comparative purposes. The Ring Base or Ring Annular support is more useful and has been singled out for special comment by several authors with the discussion by Kidder, Jennings, and Shook having been the most comprehensive.[26] There is general agreement that it appears in the early Classic; it may be a horizon marker. There are two exceptions that caution against automatically accepting the form as a horizon marker. Vaillant reports an example from a middle Zacatenco deposit[27] and Bernal depicts another from Monte Negro, apparently a Monte Alban Period I site.[28] In both

cases the vessels are not the simple convex bowls usually associated with ring bases.

Evidence favoring acceptance of the ring base as an indicator of early Classic temporal positioning is overwhelming. It is associated with the first corbelled arch at Holmul, a feature diagnostic of the beginnings of the Old Empire.[29] At Finca Santa Rosa, Chiapas, the ring base was found with Protoclassic pottery but the chronological position of such according to radiocarbon dating favors the theory of the Protoclassic ceramic tradition having survived into later times.[30] Similar survivals are apparent at Sipolite too.

Occurrences of ring bases in Levels 3, 4 and 5 at Sipolite indicate the beginning of the Classic at that time, as has been suggested earlier.

Hollow Slab supports, especially in conjunction with a vase form, may be another horizon marker for the Classic period in Mesoamerica but are slightly later than the ring base. It reached its greatest popularity at Teotihuacan in Periods III and IV[31] and at Uaxactun during Tzakol II and III.[32] At Uaxactun the ring base was earlier.[33] The ring base and hollow slab support appears at Monte Alban during the Transitional period when Teotihuacan influences were bring incorporated into the local tradition.[34] Occurrence at Sipolite of the Hollow Slab supports in Levels 3 and 4 and the Ring base in Levels 3, 4 and 5 agrees with the appearance of the same forms at Monte Alban and almost everywhere in Mesoamerica where those periods are known. We cannot determine from whence the characteristics arrived at Sipolite. There are few other indications of relationships with Monte Alban during the period in question - the early Classic - and

certainly nothing suggesting primary connections with the Valley of Mexico where both traits presumably originated. The Ring base examples from Sipolite are made of light colored pastes with orange slip, as is the case with Finca Santa Rosa examples most often.[35] A southern Mesoamerican source may be indicated.

The evidence for the Curved Slab supports is confusing but the form is useful for comparative purposes. Stepped and Simple Curved Slab supports, the two major varieties, are found in Levels I through 5 with a single example from Level 6. The latter is decorated and there are no other occurrences of decorated Curved Slab supports until Level 4. To have been the earliest example of the form and decorated is doubly unlikely. It must be out of correct position.

Level 5 where Stepped and Simple forms appear, has been assigned an Early Classic temporal position and these supports should have the same placement. However, in northern Mesoamerica slab supports are usually taken to indicate the beginning of the Postclassic, although there is evidence that it is earlier in a somewhat different form. There are square slab supports in Period II at Teotihuacan but the form is square and erect. The examples found at Cholula in Cholulateca I and equated with the Mazapan period in the Valley of Mexico are more similar to those of Sipolite.[36] Drucker reports plain rounded slab supports identical to those of Sipolite from Upper Tres Zapotes[37] and from Cerro de las Mesas Upper I.[38] However, inspection of Table II in the latter report suggests the form is found along with hollow slab legs considered to be Lower II or contemporaneous with Teotihuacan III and IV of the late Classic.

In southern Meoamerica association of slab supports with the Classic is better documented. Plain round slab supports are present at Uaxactun by Tzakol II[39] and in Yucatan at Acanceh[40] and Yaxuna[41] during the Regional and Florescent periods. Stepped slab supports are found at Uaxactun for Tepeu II and III[42] and in Yucatan at Mani Cenote during the Florescent[43] and at Chichen Itza for the Florescent and Early Mexican periods.[44] The form also is found at numerous places in northern and southern Mesoamerica during the Postclassic.

Examples identical with the Sipolite "finger punched" stepped supports are reported from Central Chiapas during the Marvavillas Phase or Late Classic.[45]

Further, decorated simple curved slab supports almost identical to those from Sipolite are reported at Acanceh from the Yucatan Regional period and have the same series of vertical incised lines,[46] as illustrated in Plate LX.

One even more early example of a stepped slab support is reported by Ricketson from her Period I at Uaxactun[47] but Smith believes it to be a lid handle fragment, not a support.[48] It is similar to Sipolite examples but, being perforated, well may be a handle.

One further comparison should suffice. Thompson illustrates slab supports incised with geometric and other designs from coastal Guatemala. They are similar to Sipolite examples but, unfortunately, are surface finds and of uncertain association. He suggests an early Classic or slightly later temporal placement.[49]

In summary, the solid slab supports of Sipolite are internally associated with early and late Classic indicators. According to

northern Mesoamerican sequences they would be Postclassic and, according to southern Mesoamerican sequences, middle Classic to Postclassic. Obviously the problem deserves comment. First, we might adjust differences between northern and southern placements by pointing out that there is increasing evidence that southern Mesoamerica is slightly later than northern Mesoamerica in adopting and developing these characteristics. Second, there may be a typological problem which has added much confusion. The square slab support of Classic Teotihuacan seems a good candidate for an ancestor of the later slab leg. The wide-flaring, multi-stepped solid slab legs of Aztec ceramics are most distinctive. Our small, more-or-less vertical single stepped supports would, on morphological grounds, be a reasonable candidate for a link between the later Aztec and earlier Teotihuacan forms. A genetic approach to ceramic morphology is hazardous but in this case seems not unreasonable. There is no reason why we must include within a single type the Aztec stepped support and the stepped supports of Sipolite and southern Mesoamerica. Third, one wonders whether the northern Mesoamerican examples have been interpreted in terms of agreeing with the Aztec varieties and thereby ignoring the possibility of earlier placement. The Sipolite sequence would indicate that stepped supports indeed are Classic and most likely early Classic. An alternative to questioning the placement of the form in Northern Mesoamerica would be to claim that the form originated on the coast of Oaxaca. Such a claim would not be defensible with the little knowledge we have of the coast. We may note, however, that one incised slab support was found at Piedra Parada Jamiltepec with apparently exclusively Monte Alban I/II remains.[50]

The Duck-bill supports seem to be hand-made effigies and are without parallel elsewhere. They appear only in Levels 1 and 3 and must be late.[51]

Hollow mold-made effigy supports are excellent for comparative purposes. It has been suggested that effigy supports are exclusively Postclassic in time, but there is evidence that hand-made effigy supports occur during Preclassic times. Effigy supports are found at Panuco,[52] Zaculeu,[53] Piedra Parada Jamiltepec,[54] and Ticoman[55] during late Preclassic or early Classic levels, a distribution of sufficient extent to certify the occurrence as being something more than purely local or abberrant. Wauchope favored the late placement in his excellent treatment of effigy supports in 1940[56] but later modified his view to point out that while effigy supports may be early, mold-made effigy supports are only late.[57]

The first occurrence of mold-made effigy supports in northern Mesoamerica was during Cholulateca I[58] and Cerro de las Mesas.[59] All are cylindrical. The Cholula examples usually are zoomorphic, occasionally anthropomorphic, and those from Cerro de las Mesas are only zoomorphic.

In southern Mesoamerica the form was found at Zacualpa with late Pokom (late Classic) and Tohil (early Postclassic) remains but were typical of the latter.[60] They are elongated and almost all are zoomorphic and quite similar to those of Cholula. Wauchope relates them to influences from northern Mesoamerica, which seems justified.[61]

In the lowland Maya region many effigy supports are anthropomorphic and conical or bulbar in form, not cylindrical. One "fat god" support is reported from Uaxactun and is of Tepeu II date.[62]

Similar supports occur in Yucatan from the Florescent and Mexican periods.[63] The Yucatecan supports are very similar to those of Sipolite and are likewise associated with slightly round-based bowls with slightly concave outflaring walls and sharp basal breaks or ridges. The same support form is reported from Central Chiapas at Laguna Francesa, a very late Classic site with many Maya influences,[64] and Cupia, another Maya-influenced late Classic site.[65] The Chiapas examples are identical in form to those of Sipolite and in both places one finds frequent representations of monkeys as the main zoomorphic figure. Warren places this form with its distinctive slip in his Jimba Phase which he equates with Tepeu 3.

There is abundant evidence of mold-made effigy supports during Postclassic periods, as has been discussed by Wauchope[66] and others.

The mold-made effigy supports of Sipolite are most closely related to southern Mesoamerica, especially Yucatan. The temporal placement of the Sipolite examples also is in agreement with the southern Mesoamerican placements. At Sipolite they occur in Levels 1, 2 and 3 with one example from Level 4. It is aberrant in form, finish, paste, and technique of manufacture and so well may represent first attempts to produce the form.

In summary, the Sipolite supports are similar to supports found elsewhere. The early examples are most similar to examples from Monte Alban during Periods I and II but beginning with the Classic or Level 5 we find most resemblances with southern Mesoamerica, especially Yucatan. The ring base, curved slab, stepped slab and effigy supports have their closest analogies in form and temporal placement with objects from southern Mesoamerica. The decorated solid

slab supports suggest relationships with the Pacific coast of Guatemala during the Classic but the relationship is tenuous. It is only with a single surface find of a polychrome support in the form of a foot that we have definite indication of late Postclassic Mixtecs of the historic period.[67]

FIGURINES: Introduction

Ceramic figurines are especially valuable for diagnosing temporal placement and cultural affiliation in Mesoamerica. It has been demonstrated that most change in time and space but also that others were widespread. They have received considerable attention and study and so we know more about them than other artifact classes. Figurines are fairly easy to classify when large collections are available. The Sipolite collection is not satisfactory; with so few examples any typology is not secure nor are cross-sequence comparisons certain. Regardless, the general conclusions emerging from the figurine study are consistent with those reached with other evidence. For instance, mold-made supports and figurines appear for the first time in the same level, Level 4. Also, cultural affiliations suggested by figurines are identical with some suggested by other artifacts. The greatest service of the figurine study is to confirm or question conclusions based on other evidence.

Typology

The proposed typology must remain tentative. The system used has numerals for general categories and letters for subdivisions. For example, "1" indicates the figurines were hand-made; "3" that they were mold-made. The collection has been divided into anthropomorphic

FIGURINES

	1																2					3								4				
Level	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	A	B	C	D	E	A	B	C	D	E	F	G	H	A	B	C	D	Total
Surface									1		1	1		1	1						2	1		1			2		1	1			1	1	15
1						2																										1			3
2					1	4			1								2	1											1	1					11
3					2	2												1	1	1		1			2		1	1		1	1		2		16
4			1		1			2	1								4						1	1	1	1				1					14
5		1	2		1								1			1	9																		15
6									2								1																		3
7	1						1		1	1			1	1																					6
8	1			1													3																		5
9																																			
Total	2	1	3	1	5	8	1	2	6	1	1	1	2	2	1	1	19	2	1	1	2	2	1	2	3	1	3	1	2	4	1	1	3	1	88

TABLE 37. -- Distribution of figurines

and zoomorphic groups, a distinction that is sometimes uncertain, with heads and body fragments treated separately.

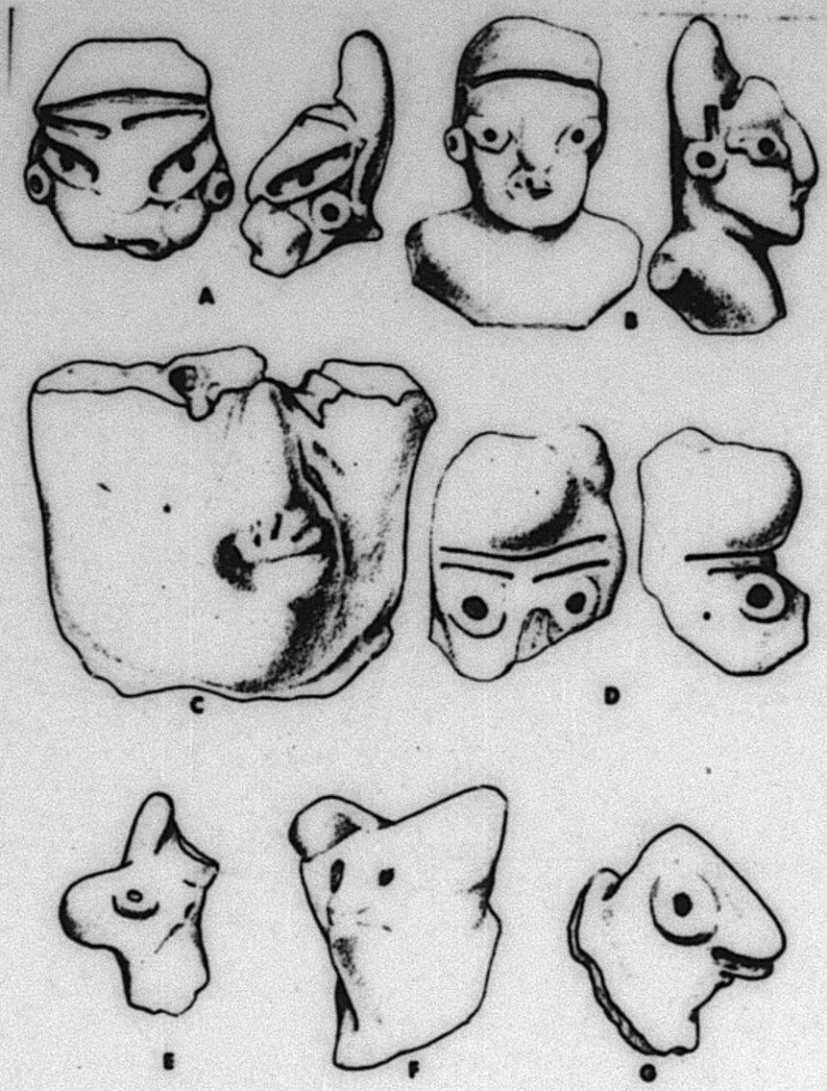
Group 1 (solid, hand-made) - 1-A Anthropomorphic - Plate LXI

This figurine type has a flat back and a flat headdress rising high above the forehead. Facial outline is somewhat triangular and the profile exhibits midfacial prognathism with a receding forehead and chin. The nose is a flattened appliqued lump, the mouth a shallow horizontal groove. Eyes are appliqued ovals slanting up and outwards at about 45 degrees with a dowel tool having been impressed in the oval or pulled through it making a groove running its full length. Pupils are indicated by a single round punch about three millimeters in diameter. All lines and marks are of the same width and presumably were made by the same tool. Eyebrows are represented by incised lines above the eyes paralleling them. A horizontal incised line separates the brow top from a plain headdress. Vertical lines, perhaps setting off ears, descend from the upper corners of the eyes along the sides of the head. At the lower ends of the lines are earplugs, circular appliqued pieces with round punched center holes. One example bears a flattened appliqued lump on its left cheek, possibly representing a labret.

Both examples are unslipped but one has a trace of red pigment in the incised line at the base of the headdress. Both are rather soft, poorly baked, made of light brown paste, and have thick, unoxidized cores.

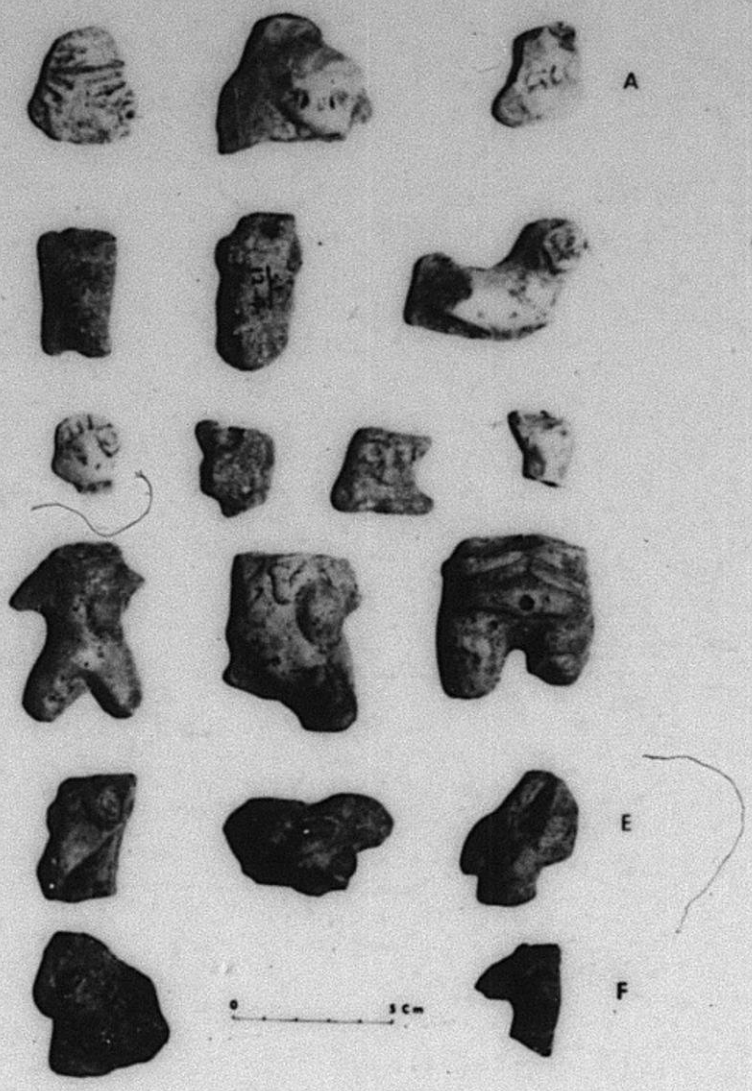
This figurine type is practically identical to Type IG of Cerro de las Mesas in Lower I and II periods.[68] The Frizzell Museum of Zapotecan Art in Mitla has numerous very similar figurines but

PLATE LXI



FIGURINES - A, 1-A; B, 1-B; C, 1-C; D, 1-D; E - G, 1-F (A - D, 3/4 SIZE; E - G, 1 1/3 SIZE)

PLATE LXII



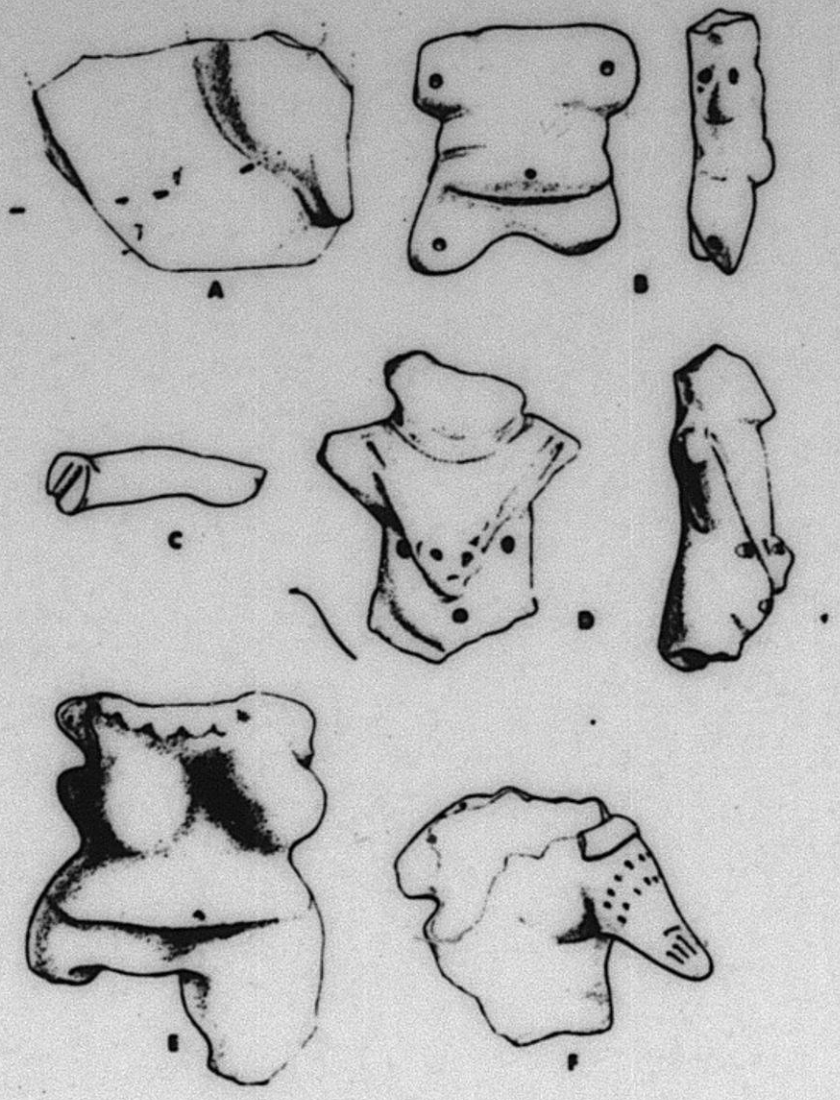
FIGURINES - LEFT TO RIGHT, FIRST ROW, 1-A, 1-C, 1-C; SECOND ROW, ALL 1-E; THIRD ROW, ALL 1-F; FOURTH ROW, ALL 1-I; FIFTH ROW, ALL 1-I; SIXTH ROW, 1-L AND 1-M

PLATE LXIII



FIGURINES - LEFT TO RIGHT, FIRST ROW, 1-N, 1-N, 1-O, 1-P; SECOND ROW, ALL 1-Q; THIRD ROW, ALL 1-Q; FOURTH ROW, 2-E, 3-E AND 3-E

PLATE LXIV



FIGURINES - A, 1-G; B, 1-H; C, 1-N; D, 1-J; E, 1-K; F, 1-M
(ALL APPROXIMATELY 3/4 SIZE)

PLATE LXV



FIGURINES - TWO VIEWS OF FIGURINES 2-D, 2-D AND 3-F

PLATE LXVI



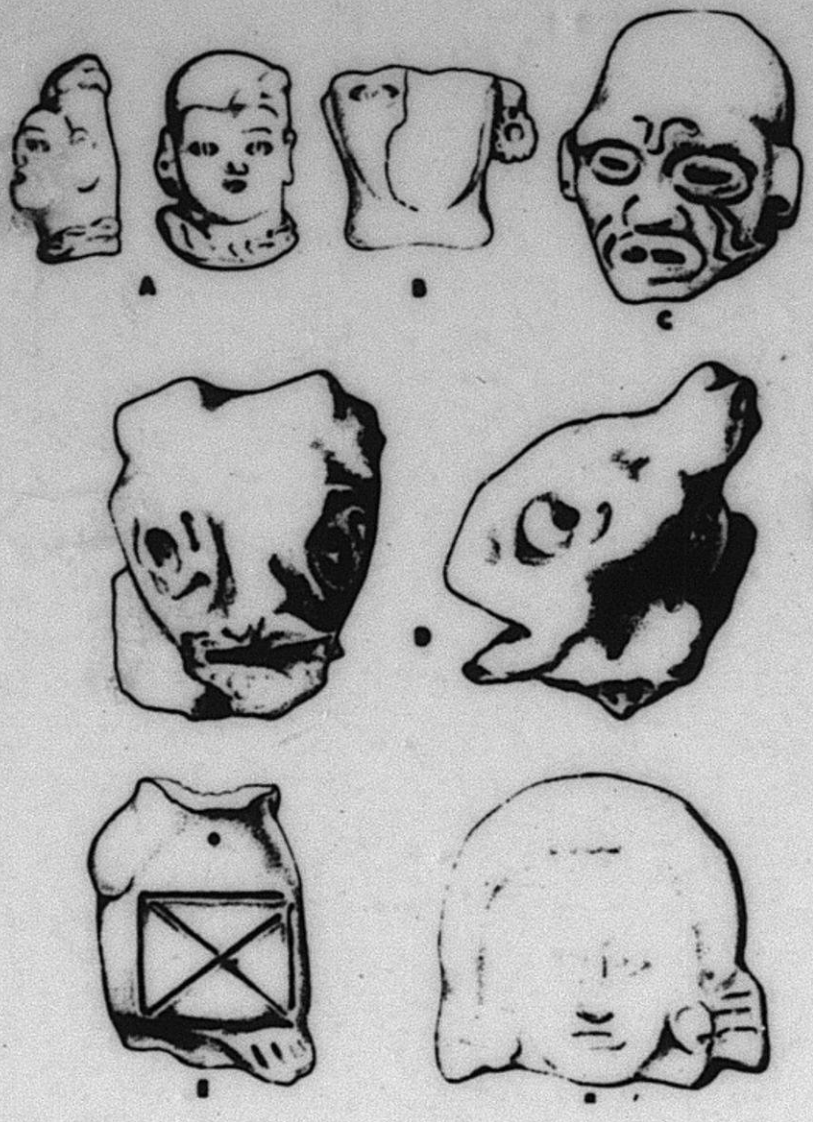
FIGURINES - LEFT TO RIGHT, FIRST ROW, 3-G, 3-H, 3-H; SECOND ROW, ALL 4-C; THIRD ROW, ALL ANCLERO SURFACE COLLECTION, 3-C

PLATE LXVII



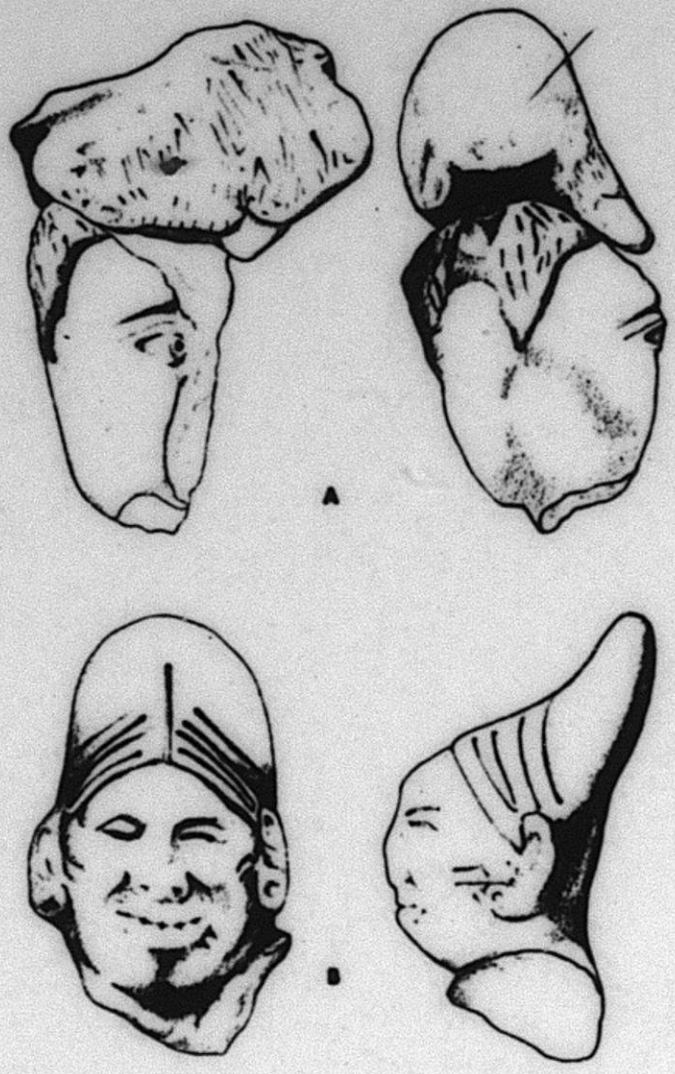
FIGURINES - A, 3-B; B, 3-C; C, 3-C; D, 3-C; E, 3-D; F, 3-E; G, 3-G (ALL APPROXIMATELY 3/4 SIZE)

PLATE LXVIII



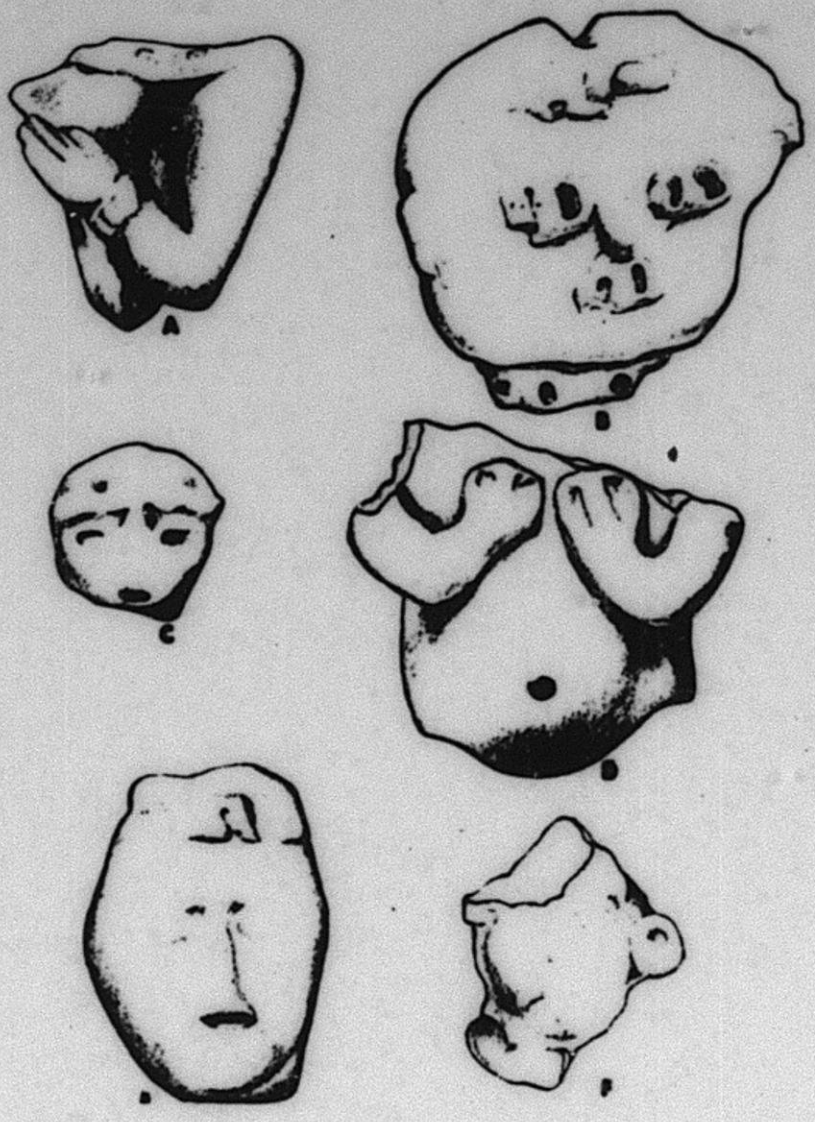
FIGURINES - A, 2-A; B, 2-A; C, 2-B; D, 2-C; E, 2-E; F, ANCLERO SURFACE COLLECTION (ALL APPROXIMATELY 3/4 SIZE, EXCEPT D WHICH IS 4/5 SIZE

PLATE LXIX



FIGURINES - A, 3-A; B, 3-B (BOTH ARE APPROXIMATELY 3/4 SIZE)

PLATE LXX



FIGURINES - A, 3-H; B, 4-A; C, 4-B; D, 4-D; E, SIPOLITE SURFACE;
F, ANCLERO SURFACE

provenience is noted as Isthmus of Tehuantepec. Forster illustrates other examples from Juchitan and Guiengola and assigns them to the Archaic period.[69] Vaguely reminiscent pieces are known from Acapulco[70] and Chupicuaro[71] with the temporal position of the latter probably being late Preclassic.

These figurines are quite similar to but not identical with, Vaillant's Type Dii, which he places in late Zacatenco in one report[72] but later is assigned to a somewhat earlier position, Gualupita I.[73] He considers it a Morelos type and mentions that it is found in Puebla.[74]

It has been stated that labrets did not occur in Mesoamerica until Postclassic times[75] but two Preclassic or stylistically Preclassic figurines from Guerrero[76] and the Valley of Mexico[77] bear representations of them. The Sipolite example is not surprising.

The spatial distribution of the figurine type is interesting for it extends from the western end of the Isthmus of Tehuantepec westward on the coast of Oaxaca, then northward into Morelos and in few numbers in the Valley of Mexico, then east through Puebla and into central Veracruz. It apparently does not occur in the center of the circle, the Monte Alban region. Western Mexico examples are only vaguely similar.

The temporal position is not too clear but apparently extends from the Middle Preclassic to late Preclassic times. At Sipolite it is found only in Levels 7 and 8 which are most closely related to Monte Alban Period I.

1-B Anthropomorphic - Plate LXI

A single example from Level 5 is similar to Type 1-A differing in being better or more realistically modeled. The facial outline is squarish but the same incised lines frame the face and the same plain headdress juts upward. The eyes are appliqued lumps cut away on their margins leaving an oval or exotic appearance. Pupils are indicated by a single circular punch. The nose is slightly modeled and, in profile, hooked. The mouth, damaged during excavation, has a "comb-toothed" aspect. The earplug is placed facing laterally, not anteriorly as in 1-A. The back of the head is flattened and the attached shoulders are represented drawn back in a realistic manner. No slip or paint are visible. The figurine is made of a grey paste, is soft, and has no visible temper.

I know of no similar pieces and suggest that it is a local development of the 1-A type.

1-C Anthropomorphic (?) - Plate LXI

Since only three examples of lower portions of faces are known it is not possible to ascertain whether a grotesque human or animal is being represented. If human, the figure was obese or grotesque.

An example from Level 5 has a long triangular nose that continues downwards to the outer margin of the mouth. Pupils of the same figure were made by round punches but the eye itself must have been modeled, not applique. Mouths are indicated by a wide horizontal groove with a series of somewhat carelessly incised vertical lines. The result is somewhat similar to the "comb-toothed" mouths described by Drucker for his Type I-H from Cerro de las Mesas Lower I and II.[78]

Other resemblance with the same examples include the obese aspect, the common grotesqueness, and general conception. Comb-toothed figurines are known from western Mexico and San Geronimo, Guerrero[79] but the similarities are not great and temporal positions not clear.

At Sipolite the three examples occur in Levels 4 and 5, which suggests that they may form a legitimate type.

I-D Zoomorphic (?) - Plate LXI

The single examples depicts a crested animal, probably a howler monkey. Eyes are appliqued disks with circular punches for pupils. Eyebrows are indicated by horizontal lines and a continuous line is incised across the forehead. The nose projects outwards but is broken and the lower face is missing. The crest, bulbar in appearance, projects forward hanging over the forehead.

This type shares methods of manufacture with Type I-A and also the same stratigraphic position. The same concepts seem to be involved but 1-A is anthropomorphic while this is zoomorphic.

I-E "Zapotec dogs" - Zoomorphic - Plate LXII

These usually are but flattened cylinders of clay with stubs where limbs, head and tail were attached. In one case the head is present turned to the right. A hole pierces the figure's back vertically. Features are indicated by slight modeling and by punching.

Such figures appear during all periods at Monte Alban[80] and so are useless for indicating temporal associations. At Sipolite they occur in Levels 2 through 5. While the method of manufacture is Preclassic in concept, the long time span of the figures does not permit us to say all are Preclassic in origin, as has been pointed out earlier.[81]

I-F Small appliqued heads, Zoomorphic - Plate LXI and LXII

These small heads, apparently hand made, seem to have been attached to the walls of vessels. All are small, usually two or three centimeters long. Features are indicated by appliqued bits, punching, and incising.

The stratigraphic distribution of these figures at Sipolite is late; they are found in Levels 1 through 3. Similar pieces are reported from central Chiapas for late Classic and early Postclassic periods and from Postclassic Cholula.[82]

I-G Effigy Vessel - Plate LXIV

A sherd, possibly from an effigy vessel, suggests a squarish, squat figure. The base is flat and the body slightly modeled. A stubby arm or paw may be represented. The exterior of the fragment is well polished and is covered by red pigment.

Similar pieces are extremely common at Monte Alban during Preclassic periods and are found at Tlatilco but our example is not complete enough to permit confident comparisons with either. The Sipolite example is from Level 7.

I-H Body, Articulated Figurine - Anthropomorphic - Plate LXIV

This example is a complete female body, judging from the breasts and swollen stomach. The head is missing. An incised line crosses below the swollen stomach and the navel is represented by a circular punch. Triangular stubs extend laterally and downwards and each are perforated anterior to posterior for attaching movable arms and legs. Around the waist is a band of clay, perhaps representing a belt.

An arm fragment was found in the same level (Level 4) of another pit. It is round at the root and flattened distally to form a hand. The proximal end has been perforated and so probably was articulated by means of a thread to a body. The proximal end is rounded, not flattened, and it would have been extremely clumsy to attach to the body described above.

Articulated figurines are found over much of Mesoamerica and southward to at least Columbia. The best known for Mesoamerica are the fine examples from Teotihuacan Period III but others are known from northern and southern Mesoamerica. Forster illustrates one very similar to the Sipolite examples and considers it Archaic.[83] Delgado reports others from near Juchitan in a Monte Alban I context but no illustrations are provided for comparative purposes.[84] Articulated figurines are placed in a late Preclassic context in the Mirador collection from central Chiapas.[85] Others are known from Campeche for the early and late Classic.[86] Wolfgang Haberland reports articulated figurines dated by comparisons being between 700 and 1000 A.D. from El Salvador.[87] With such a temporal span the form does not appear extremely useful for comparative purposes. However, Forster's figurine and Delgado's temporal position suggest a Monte Alban Period I date. The Sipolite examples occur in Level 4 which, by other evidences, appear to be early to middle Classic. No external evidence would make such placement totally unexpected.

1-I Female Anthropomorphic body fragments, with necklaces, limb form indeterminant - Plate LXII

Sex is indicated by the large breasts. A necklace is always present and consists of a strip of clay. The figures are rather

stocky and when the stomach is present it is swollen with a groove or line below it giving additional emphasis. The navel is indicated by a circular punch. The general aspect is with body contours and musculature being realistically represented.

Similar body fragments are found over Mesoamerica and the form occurs over most levels -- 2 through 7 -- at Sipolite. It does not appear useful for comparative purposes.

On the basis of style and method of manufacture such bodies are often regarded as Preclassic. However, there is evidence from Juchitan that similar bodies were being made to attach to mold-made Maya-style heads during the late Classic or Postclassic.[88]

1-J Anthropomorphic body, aberrant - Plate LXIV

This single fairly complete example deserves special comment. The body is naturalistic with a swollen stomach and with diagonal lines separating thighs from stomach. No breasts are represented but in a pectoral position are two punched holes that penetrate into but not through the body. Breasts may have been made of another material and inserted into the holes. The navel is represented by a punch. Around the neck hanging down to the stomach is a necklace with what appears to be a skull at the bottom of the necklace. The skull, if it is such, is round with circular punches for eyes and a shallow slit for a mouth.

One complete arm is a stubby triangle with no markings to indicate hand or wrist. The lower portion of the face is present but no features are visible. One is reminded of Vaillant's often featureless Type H, but the lack of features may be due in this case to the incompleteness of the piece or erosion.

If the object on the necklace is a skull, it would be the earliest known occurrence of a skull necklace. Howard Leigh has studied representations of skull necklaces and found them only on Classic and Postclassic figurines and sculptures.[89] Trophy heads, however, do occur in Preclassic art, usually being associated with the Olmec style.[90]

1-K Anthropomorphic bodies, exaggerated female - Plate LXIV

This example, similar to Type 1-I, differs in its exaggerated features. The hips are very broad and the breasts huge. The stomach is more swollen. A necklace is around the neck. Limb forms are unknown.

1-L Anthropomorphic bodies, female, with naturalistic limbs - Plate LXII

This example has the familiar swollen stomach with horizontal incised line below it and a punched navel. Breasts are represented and naturalistic arms are curved so that the hands appear to be supporting the breasts.

Figurines with hands supporting breasts deserve further comment. Types 1-L, 3-H, and 4-D have the same characteristic posture which is typical of Tonantzin, the Earth Mother of the Aztec pantheon, who is frequently represented in Postclassic figurines. One of the attributes of Tonantzin is Itzpapalotl, the Obsidian Butterfly,[91] who, it will be recalled, was the patroness of Pochutla near Sipolite. These figures may represent depictions of Itzpapalotl Tonantzin. It should also be pointed out that Tonantzin along with Xipe are considered by Vaillant to have been Postclassic imports into the Valley of Mexico from

Oaxaca.[92] The popularity of the posture and its occurrence as early as Level 4 is not unexpected.

1-M Anthropomorphic bodies, female, with short stubby arms - Plate LXII

These body fragments are similar to Type 1-L but differ in having short peg-like arms (legs unknown) with lines at the tips indicating fingers and a cross line indicating the wrists. In one example there is a double row of punched holes on the shoulder, possibly indicating dress, adornment, or body decoration. Necklaces are always present.

1-N Anthropomorphic bodies, gender unknown, short stubby arms - Plate LXIII

These fragments, naturalistic representations of human bodies, are slender without breasts being indicated. They are undecorated. Arms are short and stubby without hands being present.

1-O Anthropomorphic body, female with short trunk and arms - Plate LXIII

In the one example the trunk is grotesquely short with legs beginning just below the arms. Arms are mere stubs while legs are proportionate to the body. Breasts are represented and there is a circular punch for a navel. Hands and feet are indicated by short lines.

1-P Spurred foot, anthropomorphic - Plate LXIII

This foot fragment differs from others known from Sipolite in having a heel spur extending backwards, presumably to give the figurine support and making it capable of standing free. The anterior portion has lines representing toes.

Such feet are known from much of Mesoamerica from various periods.

I-Q Other anthropomorphic solid figurine fragments - Plate LXIII

These fragments, too small or plain to permit classification, are depicted in noted plates and proveniences are given. Further treatment seems unfruitful.

Group 2 consists of solid, probably mold-made but retouched figurine heads. The stratigraphic distribution is restricted to Levels 1 through 3; all probably are Late Sipolite.

2=A Anthropomorphic, cuniform eye - Plate LXVIII

These two examples may have been mold-made and then retouched. The facial outline of the most complete is squarish. Its face has been disfigured with the mouth contorted. The nose is nicely modeled. The forehead slopes backwards from pronounced supraorbital ridges and a high headdress, possibly a turban, rises from the forehead. The realistic ears have no earplugs. A twisted cord is worn around the neck. Eyes are similar to that of 3-A and could have been made by an impression of a cuniform tool which was then reversed to make the other half of the eye. A light vertical line represents the pupil.

The second example is badly damaged but the eye is identical. A mold-made lobated earplug is worn and traces of red pibment are present in the convolutions of the earplug. No other lobated earplug is known from Sipolite.

2-B "Old God," Anthropomorphic - Plate LXVIII

The intricate and very deep lines on this head suggest that a mold was used to produce the basic form which was then considerably

retouched to accentuate the features. The plain headdress rising from a sloping forehead resembles Types 1-A and 1-B. Supraorbital ridges are pronounced and between them on the forehead is a "U"-shaped design. The eyes are oval outlines with pupils represented by a deep punch of a wide pointed object. The nose is realistically moulded with alari represented by external lines. The mouth is a horizontal oval slightly downcurving at the ends. The bucal cavity is formed by what seems to be two strokes of the same instrument used for the pupils. The two strokes are in a horizontal line with a slight seperation between them. The result is one of teeth being represented. On the right side of the mouth are two vertically placed curved incised lines often interpreted as representing the sunken cheeks of an aged person. The lines are not repeated on the left cheek but rather there are two stepped lines originating below the eye and going down and outwards to the neck. The ears are simple projecting vertical rectangles but exhibit the unusual feature of being pierced by holes large enough for passage of a small thread.

The figurine apparently represents two different dieties, if we judge it in terms of Mesoamerican cosmology. First, the lines on the cheek represent the Old God, the god of fire, one of the earliest recognizable gods in the Mesoamerican pantheon. The heavy brow ridges and oval eyes suggest Tlaloc, the rain god. The "U" design on the forehead may present the Ik sign which is related to the Itzamas or rain gods of the Maya.[93]

2-C Rabbit figure (?) - Plate LXVIII

This figurine is similar in execution to 2-B. It has the same oval outline within a depression as eyes and a deep punch, here with

a round object, representing pupils. A broad nose is set off by depressions on either side. A deep slash represents a gaping mouth. The now-damaged ears set far back on the head are reminiscent of rabbit ears. The figure may have been a vessel adornment. Modeling suggests use of a mold but the mouth and eyes suggest hand work.

2-D Pegged heads - Plate LXV

Two surface finds appear to be mold-made representations of a feline and a skull at the end of a clay cylinder. The other end is pegged, possibly for insertion. Heads were made for inserting into a figurine body in Mesoamerica but also heads seem to have been made separate and then attached to the bodies permanently.

2-E Skirted female figure - Plates LXVIII and LXIII

This solid figure represents a person, presumably female, wearing a skirt which falls to the angles with feet protruding. It seems to have been mold-made and later retouched. A clay lump is attached to the right hip suggesting a knot, perhaps of a belt not otherwise indicated. The navel is represented by a punch above the skirt which must have been worn on the hips leaving the body bare from the midriff upwards.

Similar skirted figures appear in late Classic and Postclassic contexts but except for one from Cerro de las Mesas none appear more then slightly similar.[94]

Group 3 consists of mold-made figurines which have been only slightly retouched, if at all.

3-A Realistic solid anthropomorphic - Plate LXIX

The one example is badly shattered but, judging from the two fragments, it was realistically modeled in the round. The right

zygomatic region and half of the orb are present. Hair is depicted by series of short lines, apparently added after the object was released from a mold. The hair comes down over the forehead to near the eyes and is parted away in the center. A headdress, now missing, seems to have been tossed off to the right.

As has been pointed out several times, Maya figurines are not well studied but this example is most similar to some "Jaina style" figurines from Campeche and Tabasco.[95] Ruz considers such figurines to have been transitional Tzakol-Tepeu in time.[96]

3-B Naturalistic solid anthropomorphic - Plate LXIX

One example is complete but so complicated that a full description may only confuse; the reader is referred to the illustration. We may note a receding, wrinkled forehead with a high triangular headdress, evidently composed of arranged hair, above it. The eyes are slightly sunken. The nose is represented in great detail as are ears with earplugs. The mouth is puckered. There are lines in the maxillary regions to each side of the nose and other lines on the cheeks. The total impression of one of an aged person represented in great detail.

The other example, a surface find, depicts an individual with a bead hung on his forehead between the eyes.

The first figure probably represents the Old God although the headdress is similar to Type 19 of Teotihuacan. The second figure is of a general form similar to late Classic Maya and Early Postclassic ones.[97]

3-C Solid anthropomorphic flat with flat back - Plate LXVII

In these heads the face is outlined by a headdress above and fringes, perhaps of hair, falling down the sides to circular earplugs at the level of the mouth or slightly lower. The nose is prominent and hooked. Eyes bulge slightly with an eyeball represented and the pupil being a small, round punch. The facial outline is generally triangular and supraorbital ridges very slight. The mouth is an elongated oval. The face is covered by a thick but fragile white slip.

3-D Solid anthopomorphic flat with curved back - Plate LXVII

This example is similar to Type 3-C but has a concave back and never has earplugs or hair on the sides of the face. Eyes and nose are similar to Type 3-C but the impression is one of less refined work. The facial expression of the 3-C figurines is serene or haughty while this stares open-eyed and blank. Since 3-D is stratigraphically earlier than 3-C, it may be an early attempt to produce the latter.

Figurines similar to 3-C and 3-D are reported from Cholula[98] and Cerro de las Mesas.[99] At the latter site Drucker has noted the same differences we have discussed above.[100] In both places the temporal placement of the types is early Postclassic.

3-E Solid anthropomorphic rounded - Plates LXVII and LXVIII

These figurines are similar to Type 3-C but are rounded on their backs and are not so flat. The fine detail of 3-C is not present but these seem more realistic. They also are covered sometimes with a fragile white slip.

3-F Hollow anthropomorphic (?) - Plate LXV

Unfortunately this fragile hollow figure received a blow in its face during excavations and many tiny fragments were lost. Reassembled fragments suggest a person or perhaps a monkey. The ears were pierced and are more human than ceboidean in proportion. The eyebrows and all remaining features are shallow lines. The chin may have been prominent. The head apparently was attached to a tube-like body with shoulders being suggested. There is a circular hole in the top of the head, possibly a vent hole.

Somewhat similar figurines are known from Tres Zapotes but resemblances are not strong.[101]

3-G Zoomorphic heads - Plate LXVII

Two heads, probably of monkeys, with flat backs curved laterally, probably were vessel adornments. The fine detail is similar to Type 3-B.

Figures of similar detail but ot form are known from central Chiapas from late Classic sites with strong indications of Maya influences.[102]

3-H Flat-backed body - Plate LXX

Two examples, one a surface find and the other from Level 4, could have been produced from the same mold. Other stratigraphic finds also have their arms folded inwards with hands covering or supporting the breasts. The backs are flat. The surface find is pierced below the armpit, presumably for suspension.

Similar figurines are found over much of Mesoamerica during the Postclassic and it does not appear possible to theorize a particular origin of influence. The posture is typical of Tonantzin,

as discussed above. Piercing below armpits on such figurines is known at Cholula during Postclassic periods.[103]

Group 4 - Rude handmade anthropomorphic figurines - consists of examples so rough as to be considered idle attempts, children's play, or rude attempts to make figurines when the custom began. Stratigraphic positions - Level 3 and above - denies their having been the initial attempts but other possibilities cannot be ignored.

Figurines of Group 4 are found only in those levels wherein are mold-made examples. While it is only speculation, it might be argued that an impecunious person may have been reduced to making his own figurines when not able to purchase from specialists who controlled the molds. Loss of self-sufficiency because of introduction of molds would have meant that inferior products would result when molds and/or their products were not available.

Similar rude figurines are known from elsewhere, but always in late contexts,[104] except for some from the Valley of Mexico. Vaillant depicts one rather similar to a Sipolite example and includes it in his Type L.[105] We should note that the provenience is given as Level 1 and it is that level which is most likely to contain materials from later periods. Regardless, the consistent positions of the class in the Sipolite stratigraphy is convincing evidence for a late temporal placement.

4-A Anthropomorphic heads with applique features - Plate LXX

This fist-sized fragment is a slightly flattened disk with short strips stuck on to represent ears, eyes, nose, mouth, hair, and a necklace. Each strip has been punched with a pointed tool to give it the aspect of the part being represented. The top of the head has a narrow cleft.

4-B Anthropomorphic head, punctated features - Plate LXX

A small flattened oval has a pinched ridge running across the brow and downwards in the center to form a nose. Eyes and the mouth have been represented by a single punch with an oval-ended tool.

4-C Anthropomorphic body with stubby appendages - Plate LXVI

Three slightly flattened clay bars with stubby appendages apparently represent human figures. Breasts are represented by simple bumps in pectoral regions.

4-D Round anthropomorphic body - Plate LXX

This example is poorly modeled in the round with appliqued arms, joined to the chest, and hands splayed out over where breasts, not present, would have been represented. The stomach is swollen and a large navel indicated by a round punch.

Miscellaneous Ceramic Objects

The following ceramic objects are capable of being recognized for form or function. Most do not seem to be useful for comparative purposes. Table 38 gives stratigraphic positions of the objects.

Pierced worked sherd disks (Plate LXXI) vary from 2.5 to 5.0 cms. in diameter. They have been made by grinding the edges and piercing, usually with a tapered drill, a hole near the center. The margins have been carefully formed. Use or uses are unknown but they could have served as beads, separators, counters, wheels, or spindle whorls, among other possibilities. Such objects are found all over Mesoamerica from all ceramic periods.

Solid worked sherd disks (Plate LXXI) vary from 3.0 to 6.5 cms. in diameter. Some have a slight pit, always on the concave side, as though they were in the process of being pierced. Use is unknown,

MISCELLANEOUS CERAMIC OBJECTS																												
	WORKED SHERDS				SPOUT			STAMP																				
LEVEL	PIERCED DISK	SOLID	SHARPENED RECTANGULAR	PLAIN	SUPPORTED	OTHER	WIDE STRAP HANDLE	CYLINDRICAL	RECTANGULAR	CIRCULAR	MINIATURE VESSEL	BRACERO KNOBS	COLLANDER SHERDS	TWISTED STRANDS	IMITATION TWISTS	REED PUNCHED	LARGE TUBES	EFFIGY WHISTLE	COFFEE-BEAN EYE	TINKLERS	BIFURCATED OBJECTS	EARPLUG	LOBATED OBJECT	STRIPS WITH APPLIQUE	OTHER OBJECTS	TOTAL
SURFACE	1	1						1	1	1	1							2			1				7	16
1		1	1										1	1											1	5
2		2									3			1	1		1		1					1		10
3	6	4	1		2	2				1	2	2			1		8	1		2	1			2	2	37
4	3					1					2	1	3	1	1	1	3			7		1	1	4	1	30
5	2	2	2												1	1	1		2	2				2	1	16
6	3	2	1	1			1						1		1	2		1	1	1					1	16
7	1			2			1									2						1				7
8			1	1																					1	3
9				2																						2
TOTAL	16	12	6	6	2	3	2	1	1	2	8	3	5	3	5	6	13	4	4	12	2	2	1	9	14	142

TABLE 38. -- Miscellaneous ceramic objects

but it has been suggested that they served as counters for a game. The pitting may suggest that some were used as a butt for holding a twirling stick.

Sharpened worked rectangular sherds (Plate LXXI) are about 4.0 cms. long and utilize thin sherds. One edge on the long axis has been sharpened creating, if you will, a sherd knife. The material seems inadequate for a cutting instrument but if a scraping tool with a straight, even edge was desired, one edge of a sherd may have been rubbed in a groove. As the edge became marred or worn, it could have been renewed by further rubbing. The use of such a tool is not known but it could have served for smoothing the interiors of pottery vessels.[106]

Plain worked rectangular sherds (Plate LXXI) measure about 4.0 cms. long and 1.5 to 2.5 cms. wide. All edges are polished flat. Use is unknown.

Supported spouts may be represented by two ceramic tubes with solid rectangular stubs on one side (Plate LXXI). Other tubes (Plate LXXII) may be fragments of spouts. Their stratigraphic occurrences are nearly identical.

Two examples of wide, slightly over 4.0 cms., flat ceramic straps may be fragments of strap handles. Both ends of one and one end of the other have concavities suggesting sections of vessels. See Plate LXXI.

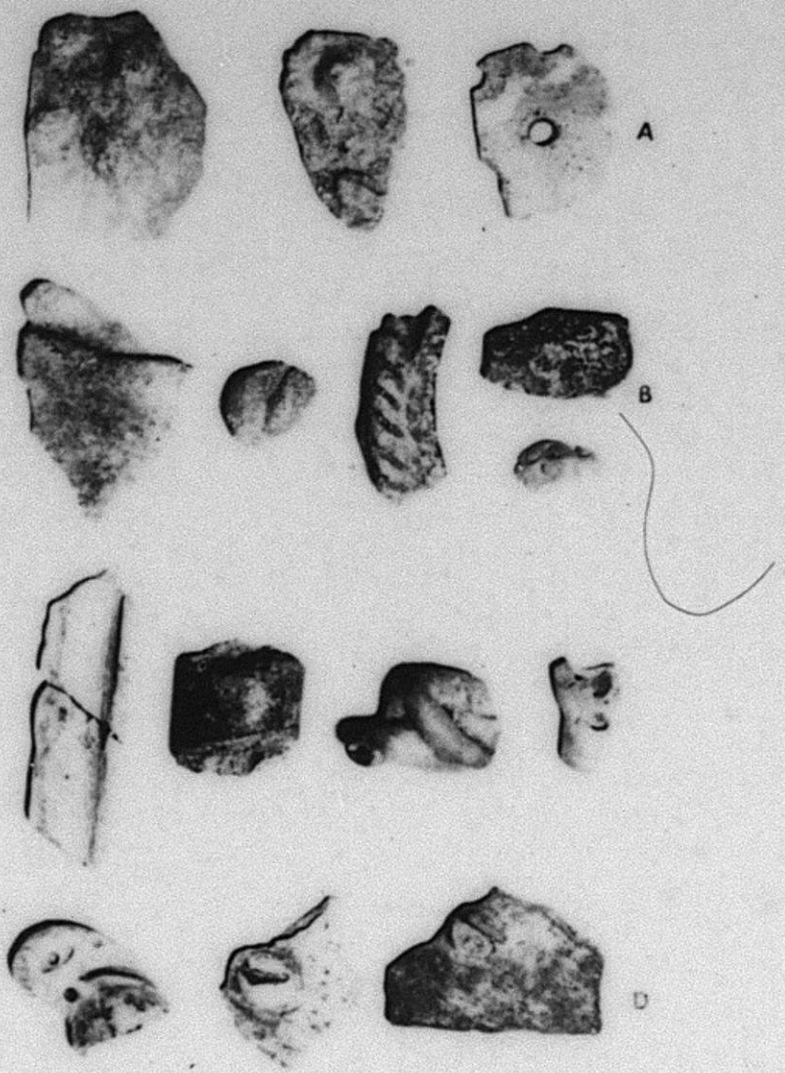
A solid cylindrical stamp was found on the surface. A drawing of the design it produces is presented in Plate LXXIV. The stamp has a slightly irregular but level surface and could have been used on a flat surface.

PLATE LXXI



MISCELLANEOUS CERAMIC OBJECTS - LEFT TO RIGHT; FIRST ROW, PIERCED AND PLAIN DISK SHERDS; SECOND ROW, SHARPENED AND PLAIN RECTANGULAR SHERDS; THIRD ROW, SUPPORTED AND OTHER SPOUTS; FOURTH ROW, WIDE STRAP HANDLE AND MINIATURE VESSELS

PLATE LXXII



MISCELLANEOUS CERAMIC OBJECTS - LEFT TO RIGHT; FIRST ROW, BRACERO KNOBS AND COLLANDER SHERD; SECOND ROW, TWISTED STRANDS, IMITATION TWISTED STRANDS AND REED PUNCHED OBJECTS; THIRD ROW, LARGE TUBES AND EFFIGY WHISTLES; FOURTH ROW, EFFIGY WHISTLE AND COFFEE-BEAN EYE ATTRIBUTE

PLATE LXXIII



MISCELLANEOUS CERAMIC OBJECTS - LEFT TO RIGHT; FIRST ROW, TINKLERS AND BIFURCATED OBJECTS; SECOND ROW, EARPLUGS, LOBATED OBJECT AND STRIPS WITH APPLIQUE; THIRD ROW, UNIDENTIFIED OBJECTS INCLUDING ANTHROPOMORPHIC FOOT

Cylindrical stamps are not common in Mesoamerica but are found over a wide area from middle Preclassic[107] into Postclassic periods.[108]

A fragment of a solid rectangular stamp was found on the surface. The face is slightly convex laterally and concave longitudinally. A drawing of the stamp and its design is presented in Plate LXXIV.

Two similar stamps were included in a collection purchased in 1956.[109] Both were surface finds.

Two fragments of circular "potato masher" stamps made on the splayed end of a cone were found, one on the surface and the other in Level 3. In one the design is geometric (See Plate LXXIV) and in the other the design consists of holes punched into the face. Using such a tool, a series of undyed dots would be left in a dyed circle. Similar objects are reported from Yucatan from the Mexican period.[110]

Miniature vessels include those that could be considered very small but useful to those of thimble size of doubtful utility. Regardless, the stratigraphic occurrences are quite restricted, Level 4 and above. Also, all share the trait of having vessel walls disproportionately thick. Height varies from 5.4 to 3.2 cms. All are made with reddish-brown paste with medium or coarse quartzite temper. See Plate LXXI.

Miniature vessels are found at Monte Alban from the earliest period but the Preclassic examples are of grey paste and nicely polished. Similar vessels are found from all periods elsewhere in Mesoamerica.

PLATE LXXIV



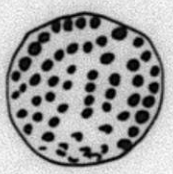
A



B



C



D

CERAMIC STAMP IMPRESSIONS WITH DARK AREAS INDICATING CUT-AWAY PORTIONS - A, CYLINDER STAMP; B, CIRCULAR STAMP; C, RECTANGULAR STAMP; D, CIRCULAR "POTATO MASHER" STAMP

Several coarse paste sherds have solid conical projections on the convex exteriors and probably are pieces of braceros which occur from middle Preclassic through Postclassic periods over Mesoamerica. See Plate LXXII.

Several sherds with holes of uniform size punched from the exterior completely through the vessel wall must be from "collander" vessels, presumably used for preparing maize dough. Such are found from Classic and Postclassic periods over Mesoamerica. See Plate LXXII.

Two strands of clay have been twisted together and attached to vessel rims with the vessels being of unknown form. Such strands are common in Mesoamerica but only three examples were found at Sipolite. See Plate LXXII.

Imitations of twisted strands may be represented by single strips attached to the exteriors of vessel walls. They have vertical or diagonal lines incised giving the impression of twisted strands. See Plate LXXII.

A hollow reed-like object has been used to punch fragments of figurines of unknown form and possibly the everted rims of some vessels. The punching seems to have been done to decorate a sizeable area since in all cases the fragments bear the impressions over all of their surfaces. See Plate LXXII.

Reed impressions are considered an early characteristic in Mesoamerica but persisted into Late Classic times.[111] Also, note that the technique appears on these objects before it does on the Aviform Effigy lugs.

Several fragments of tubes, too large to be sections of spouts, may be pieces of incensario handles, large hollow figurine limbs, etc. They appear too large for spout sections but their stratigraphic distribution parallels that of supported spouts and small tubes.

Several fragments seem to be from whistles. A hollow stem directed the air stream over a slightly lower opening into a resonating chamber which was shaped into an effigy form. See Plate LXXII. In one case the zoomorph is an unidentified bird and in another a parrot with the latter having been pierced, presumably for suspension. In a surface find a small figure, possibly a monkey, is mounted upon the stem.

One example purchased in 1956 is in the form of a turtle but follows the plan described above.[112]

Effigy whistles enjoy a long temporal span and a wide distribution in space. It has been suggested that they are Protoclassic in time but the effigy whistles of the Classic in Veracruz[113] and Yucatan[114] demonstrates their later occurrence.

Some portions of anthropomorphic faces on the exteriors of vessels have oval applique eyes with horizontal slits, the coffee-bean eye. Unfortunately the fragments are not complete enough to permit further description nor comparisons. See Plate LXXII.

Several small ceramic pellets, presumably tinklers from hollow supports, were found during evcavation, a testimony to the watchfulness of our workers. Several of the pellets have the tiny perforations mentioned above. The stratigraphic occurrences of the pellets agrees with the distribution of hollow supports.

Two bifurcated objects, reminiscent of certain support forms, were found in Level 3 and surface. Such supports often are associated with effigy supports in western and northern Mesoamerica.[115] See Plate LXXIII.

Two objects (Plate LXXIII) of pottery and chalk may be crude earspools. The ceramic example is 2.1 cms. long, a maximum of 1.8 cms. and 1.0 cm. in the groove. It is very similar to objects reported by Drucker as loom-weights or net-weights[116] and by Lister as earplugs.[117] It is impossible to determine the true function of the object but such may have been worn by poor persons or may have served as "training" plugs as the pierced ear hole was being enlarged to receive a larger size of a better finished plug.

The chalk object is only reminiscent of an ear plug with the spool being irregular. The flange diameter is 3.6 cms., total width 2.4 cms., and spool diameter varies from 2.4 to 3.0 cms. The form is approximately that of an earspool and we may note that ceramic figures of Levels 7 and 8 bear representations of just this type of plug.

A lobated object consisting of two clay balls joined together and covered by a thick creamy white slip is of unknown purpose. See Plate LXXIII. It may have been hung from a cord tied around the middle construction but the soft slip shows no indication of wear.

Strips bearing appliqued lumps were found in the top five stratipit levels. The lumps sometimes have been incised with lines crossing them or punched in their centers. They must be portions of decorations of figurines or vessels. See Plate LXXIII.

Other ceramic objects of unknown purpose are presented in Plate LXXIII.

OTHER OBJECTS

Few non-ceramic, non-lithic remains were found at Sipolite. A fragment of polished bird long bone measuring 2.6 cms. long and 1.3 cms. wide was found in Level 6, Pit 14. At each end of the fragment is the margin of a drilled hole. Apparently it is from a bone tube that had holes drilled along its long axis, as for a whistle or flute.

A fragment of a carbonized wooden object was found in Pit 14, Level 6. It seems to be a portion of a shaft and has a shallow groove cut around the end, possibly for tying with a string. The object has been highly polished (with a pumice polisher?).

Fragments of charred copal were found in Level 8 of Pits 11 and 12. After qualified persons rejected the possibility of the material being mineral or animal, identification was made upon the basis of its smell when burned. The copal from Pit 12 has been submitted for radiocarbon dating. The Pit 11 remains are too small.

Numerous fragments of hardened or burnt earth were found during excavations. Many fragments bear impressions of sticks or rods and presumably are burnt daub from house constructions. However, it is possible that the fragments are from cooking platforms, which may account for their considerable numbers. Their distribution is given in Table 39.

A few bone and shell fragments were recovered from excavations. Mr. Richard Morlan has identified them as mammal, reptile, bird, fish and shellfish categories with further identification not being

Level	Fired Daub	Fired Earth
1	1	1
2	6	1
3	9	5
4	8	3
5	15	3
6	15	14
7	15	8
8	4	2
9		

TABLE 39.- Stratigraphic distribution of fired earth and fired daub fragments.

possible, except for two examples of deer bone. Table 40 notes the stratigraphic distribution of the fragments.

Levels

	1	2	3	4	5	6	7	8	9
Mammalia		1	3*	11	15	4	1	3	
Reptiles					7				
Birds				1	2	1			
Fish			1						
Shellfish	2	2	11	8	11	4	2		

TABLE 40.- Stratigraphic distribution of bone and shell remains with two deer bones in Level 3.

ENDNOTES

1
Fay-Cooper Cole and Thorne Deuel, Rediscovering Illinois (Chicago, 1937), p. 282.

2
DeCicco y Brockington, op. cit., pp. 91, 101 and 110.

3
Brainerd, "Archaeological ceramics...," p. 54.

4
Ibid., Figure 72.

5
Gordon R. Willey and Charles R. McGimsey, The Monagrillo Culture of Panama, Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, Vol. XLIX, No. 2 (Cambridge: Harvard University, 1954), Figure 32a; Thomas A. Joyce, Central American and West Indian Archaeology (London, 1926), Figure 31c; and among many others, Lothrop, op. cit., II, Plate 102 and Figures 122, 144 and others. The examples presented in the last source appear to be adornments rather than utilitarian lugs, a distinction not always made.

6
Effigy lugs are common in northern South America for several periods but none are very similar to those from Sipolite. For examples, see J. M. Cruxent and Irving Rouse, An Archaeological Chronology of Venezuela, Vol. II, Social Science Monographs, VI (Washington, D.C.: Pan American Union, 1959), Plates 25, 27, 32, 44 and others.

7
Wendell C. Bennett, The Gallinazo Group, Viru Valley, Peru, Yale University Publications in Anthropology, No. 43 (New Haven, 1950), Figure 22 a-o.

8
There are considerable morphological similarities between Gallinazo and Sipolite effigy lugs and the two series are in partial chronological agreement. However, the Sipolite lugs undergo constant development and only in upper levels are they truly similar to Gallinazo examples. Therefore, similarities occur subsequent to the Gallinazo phase and we can hardly derive one from the other. On the other hand, the Sipolite lugs apparently are unique for Mesoamerica and one is tempted to postulate stimulation from an external source as a causative factor.

9
Berlin in Late Pottery Horizons...," pp. 135-141 depends heavily upon evidence of support forms to place in time the Cintla collection. In turn, Brainerd, "Archaeological ceramics...," p. 304 and Figure 103 uses Berlin's placement as evidence for constructing part of his Yucatan sequence.

In light of the Sipolite finds, the Cintla materials, or part of them, could as well be early or late Classic as the late Post-classic assignment proposed by Berlin. The Cintla materials used

by Brainerd were collected by Carlos Berendt from a now lost site near the mouth of the Grijalva River and are deposited in the Peabody Museum, Harvard University. Berlin's collections were from the same vicinity but there is no reason to assume that both collections were from the same site or sites nor that they represent the same occupations or traditions.

10 Bernal, "La ceramica preclasica...," Laminas 1h; 2j, l, m and n; 3a; 5h, k, l and o. Consult page 25 for temporal placements.

11 Wauchope, A Tentative Sequence...," 233.

12 Raymond E. Merwin and George C. Vaillant, The Ruins of Holmul, Guatemala, Memoirs of the Peabody Museum of Archaeology and Ethnology, Harvard University, Vol. III, No. 2 (Cambridge, 1932), 82.

13 J. R. Arnold and W. F. Libby, "Radiocarbon dates," Science, Vol. CXIII (1951), 119 gives 2600 ± 170 B.P. (648 B.C. ± 170) for Monte Negro, a Monte Alban I site, and 2223 ± 145 B.P. (272 B.C. ± 145) for Monte Alban II. "Notes and News," American Antiquity, Vol. XXVI, No. 4 (April, 1961), 597 gives 390 B.C. ± 275 for a Monte Alban I-C tomb at Yagul and the same source, Vol. XXVII, No. 4 (April, 1962), 621 mentions a date of 240 B.C. ± 150 for a Monte Alban II structure, also at Yagul in the Valley of Oaxaca.

14 Muriel Noe Porter, "Excavations at Chupícuaro, Guanajuato, Mexico," Transactions of the American Philosophical Society, n.s., Vol. XLVI, Part 5 (Philadelphia, 1956), Figure 5a and d; Figure 4r; and Figure 6c.

15 Beatriz Barba de Piña Chán, "Tlapacoya, un sitio preclásico de transicion," Acta Anthropológica, Epoca 2, Vol. I, Núm. 1 (México: Escuela Nacional de Antropología e Historia, 1956), 83 and Lámina 15.

16 R. Smith, Ceramic Sequence...," II, Figures 52, 12 and 13; I, 50.

17 Merwin and Vaillant, op. cit., Plates 18 and 19; 62 and 63 for discussion.

18 Gareth Lowe, Archaeological Exploration of the Upper Grijalva River, Chiapas, Mexico, Papers of the New World Archaeological Foundation, No. 2 (Orinda, 1959), Figure 9i; Donald L. Brockington, The Ceramics of Finca Santa Rosa, Municipality of La Concordia, Chiapas, Mexico, report in preparation for the New World Archaeological Foundation.

19 Robert Wauchope, Excavations at Zacualpa, Guatemala, Middle American Research Institute Publication No. 14 (New Orleans: The Tulane University, 1948), p. 98.

20
Since at Sipolite the Long variety occurs before the Full and since Monte Alban, having no Full examples, supports are so similar to the Sipolite ones, it would appear that the form may have originated at Monte Alban.

A possible source of confusion concerning mammiform supports is the fact that both varieties occur in sets of four, except in northern Mesoamerica where all, with only Full varieties present, are tripods. An explanation that would account for morphological differences and temporal discontinuities would be that the Long variety appeared earliest at Monte Alban as a tetrapodal form and then spread northward becoming shorter and thereby Full while conforming to the native tradition of tripodal arrangement. At the same time, the form was spreading southwards from Monte Alban, again becoming shorter and Full but retaining the original tetrapodal aspect. The explanation is highly speculative but accounts for temporal differences and conforms to current knowledge.

21
Bernal, "La cerámica preclásica...," Laminas 17 and 27 and pp. 99-100.

22
Wauchope, Zacualpa..., p. 102.

23
Bernal, "La ceramica preclasica...," p. 133.

24
Ibid., Lámina 27.

25
Brockington, Ceramics of Finca Santa Rosa...

26
Alfred V. Kidder, Jesse D. Jennings and Edwin M. Shook, Excavations at Kaminaljuyu, Guatemala, Carnegie Institution of Washington Publication 561 (Washington, D.C.: U. S. Government Printing Office, 1946), pp. 177-178.

27
Vaillant, Zacatenco..., Plate 4a.

28
Bernal, "La cerámica preclásica...," pp. 139-140 and Lamina 80.

29
R. Smith, Ceramic Sequence..., I, 22-23; Also see A. Ledyard Smith, "The corbeled arch in the New World," The Maya and Their Neighbors (New York, 1962), pp. 203-205.

30
Brockington, "A prolongation...," p. 91.

31
There is a problem getting good references for ceramic studies of Teotihuacan materials. The best and most authoratative study is an unpublished one in the files of the Instituto Nacional de Antropologia e Historia by Pedro Armillas. I am following classroom discussion by Eduardo Noguera, Mexico City College, 1956. Our statements may need revision when current studies of Teotihuacan ceramics by Robert Smith are published.

32
R. Smith, Ceramic Sequence..., p. 50.

33 Ibid.

34 Bernal, "Monte Albán and the Zapotecs," pp. 5-6.

35 Brockington, Ceramics of Finca Santa Rosa...

36 Noguera, Cholula..., p. 146.

37 Drucker, Tres Zapotes..., p. 49.

38 Philip Drucker, Ceramic Stratigraphy at Cerro de las Mesas, Veracruz, Mexico, Bureau of American Ethnology Bulletin 141 (Washington, D.C.: U. S. Government Printing Office, 1943), p. 76.

39 R. Smith, Ceramic Sequence..., p. 23.

40 Brainerd, "Archaeological ceramics...," Figure 18e-1 and g-14.

41 Ibid., Figure 10g.

42 R. Smith, Ceramic Sequence..., p. 50.

43 Brainerd, "Archaeological ceramics...," Figure 32h-23 and 24, e-11.

44 Ibid., Figure 67.

45 Navarrete, Frailesca..., p. 30.

46 Brainerd, "Archaeological ceramics...," Figure 18e-1, g-14.

47 Edith B. Ricketson, "Part II: the artifacts," Uaxactún, Guatemala, Group E - 1926-31, Carnegie Institution of Washington D.C.: U. S. Government Printing Office, 1937), Figures 153e, f and k. Actually, examples e and f are more similar than k.

48 R. Smith, Ceramic Sequence..., p. 50. He refers to Ricketson's Figure 153k.

49 J. Eric Thompson, "An archaeological reconnaissance in the Cotzumalhuapa region, Escuintla, Guatemala," Contributions to American Anthropology and History, Vol. IX, No. 44, Smithsonian Institution of Washington Publication 574 (Washington, D.C.: U. S. Government Printing Office, 1948), 50-51. See the discussion opposite Figure 46.

50 Brockington, "Piedra Parada...," Plate 22b.

51 Stephan Borhegyi informs me that Heinrich Berlin has found similar supports in Tabasco but I have not been able to locate any publication dealing with them. Gareth Lowe informs me that such "duck-bill" supports are found on the southern margins of Mesoamerica but have not been published.

52 Gordon F. Ekholm, Excavations at Tampico and Panuco in the Huasteca, Mexico, Anthropological Papers of the American Museum of Natural History, Vol. XXXVIII, Part 5 (New York, 1944), Figure 4b. Wauchope, "Tentative sequence...," 233 refers to the above as an effigy support but it does not appear to be such to me. It may be an accidental result.

53 Richard B. Woodbury and Aubrey S. Trik, The Ruins of Zaculeu, Guatemala (Richmond, Virginia, 1953), Vol. I, 141.

54 Brockington, "Piedra Parada...," Plate 25.

55 George C. Vaillant, Excavations at Ticoman, Anthropological Papers of the American Museum of Natural History, Vol. XXXII, Part 2 (New York, 1931), Plate 75w through z and Plate 76.

56 Robert Wauchope, "Effigy head vessel supports from Zacualpa," Los Mayas Antiguos (México, 1940), pp. 230-231.

57 Wauchope, "Tentative sequence...," 233.

58 Noguera, op. cit., p. 146.

59 Drucker, Cerro de las Mesas...," p. 76.

60 Wauchope, Zacualpa..., pp. 137-139.

61 Ibid., p. 139.

62 R. Smith, Ceramic Sequence..., p. 50.

63 Brainerd, "Archaeological ceramics...," pp. 306-307 and Figure 58g-6.

64 Lowe, Archaeological Exploration..., Figure 29e.

65 Ibid., Figure 9i.

66 Wauchope, Zacualpa..., pp. 137-139; Wauchope, "Effigy head...," pp. 230-231.

67 DeCicco y Brockington, op. cit., Lamina 21ff.

68 Drucker, Cerro de las Mesas..., Plates 50 and 52.

69 James R. Forster, "Notas sobre la arqueología de Tehuantepec," Anales del Instituto Nacional de Antropologia e Historia, Tomo VII (México, 1955), Lámina 2, Figures 10 and 13.

70 Alejandro Von Wuthenau, "Pretty ladies of Acapulco," Mexico, This Month, Vol. III, No. 11 (November, 1957), 20.

71 Porter, Chupícuaro..., Figure 19a-c and others.

72 Vaillant, Zacatenco..., Table 1.

73 Susannah B. Vaillant and George C. Vaillant, Excavations at Gualupita, Anthropological Papers of the American Museum of Natural History, Vol. XXXV, Part 1 (New York, 1934), Figure 6, Numbers 4-8, especially 6 and 7.

74 Ibid, p. 58.

75 Andre Emmerich, Art before Columbus (New York: Simon and Schuster, 1963), p. 200.

76 Jane Powell Rosenthal, "Exploring ancient Guerrero," The Brooklyn Museum Annual I-II, 1960-1962 (New York, 1963), p. 14.

77 Herbert Joseph Spinden, Maya Art and Civilization, Indian Hills, Colorado, 1957), p. 228.

78 Drucker, Cerro de las Mesas..., Plate 27t-x.

79 Vaillant and Vaillant, op. cit., Figure 17.

80 Bernal, "Ceramica preclasica...," p. 25.

81 Hand-molding or modeling, punctating and simple uncluttered forms are generally considered Preclassic. However, the long occurrence of such figurines at Monte Alban should be sufficient warning against using stylistic and manufacturing features as the exclusive bases for associating artifacts.

82 Frederick A. Peterson, Some Ceramics from Mirador, Chiapas, Mexico, Papers of the New World Archaeological Foundation, No. 13 (Provo, 1963), pp. 105-110; Noguera, op. cit., pp. 162-163.

83 Forster, op. cit., Lamina 3, Figure 8.

84 Agustin Delgado, "La sequencia arqueológica en el Istmo de Tehuantepec," Los Mayas del Sur y sus Relaciones con los Nahuas Meridionales, (México: Sociedad Mexicana de Antrpología, 1961), p. 98.

85 Peterson, op. cit., p. 119.

86 Emmerich, op. cit., p. 189.

87 Wolfgang Haberland, "Ceramic sequences in El Salvador," American Antiquity, Vol. XXVI, No. 1 (July, 1960), 22.

88 Delgado, op. cit., p. 99.

89 Howard Leigh, "Head shrinking in ancient Mexico," Science of Man, Vol. I, No. 5 (December, 1961), 4-7.

90
Matthew W. Stirling, Stone Monuments of Southern Mexico, Bureau of American Ethnology Bulletin 138 (Washington, D.C.: U. S. Government Printing Office, 1943), pp. 12-13. Armando Duvaillier of the Regional Museum of Chiapas excavated a remarkable stela at Izapa, Chiapas which bears a representation of a human figure holding a head by its hair while below is a headless individual supline. The find is published in an obscure source. Recent New World Archaeological Foundation excavations at Izapa have uncovered the stela anew.

91
Thomas A. Joyce, Mexican Archaeology (London, 1920), pp. 33 and 52, presents a detailed discussion of Itzpapalotl and her various associations, which are several and complicated.

92
George C. Vaillant, Aztecs of Mexico (Garden City, N. Y., 1947), pp. 78-79.

93
I know of three figures bearing such a design on their foreheads, Monuments 2 and 8 from Cerro de las Mesas and the stone head at Piedra Parada Jamiltepec. See Stirling, op. cit., pp. 46-46 and Brockington, "Piedra Parada...," Plate 37, and pp. 86-88 for a discussion. In all cases the heads depict versions of a rain god, which concurs with one aspect of the Sipolite figurine head.

94
Drucker, Cerro de las Mesas...," Plate 54g.

95
Berlin, Late Pottery Horizons..., Figure 9 and others; Sylvanus G. Morley, The Ancient Maya (Palo Alto: Standford University Press, 1947), Plate 81c and 82, and many others.

96
Alberto Ruz Lhuillier, "Campeche in la arqueologia Maya," Acta Anthropológica, Vol. I, Núms. 2-3 (México: Escuela Nacional de Antropologia e Historia, 1945), 85.

97
Lowe, Archaeological Exploration..., Figure 40b.

98
Noguera, op. cit., pp. 154, 156, 159 and 160.

99
Drucker, Cerro de las Mesas..., Plate 27.

100
Ibid., p. 64.

101
Drucker, Tres Zapotes..., Plates 48, 50 and 51.

102
Lowe, Archaeological Exploration..., Figure 17 l and n.

103
Noguera, op. cit., pp. 154, 155 and 158.

104
Wauchope, Zacualpa..., pp. 126 and 152; Ekholm, op. cit., 453 and Figure 39a-i and k.

105
Vaillant, Ticoman..., Plate 50, top row. See the opposing page for discussion.

106
For a discussion of pottery-making functions of a similar tool made from a gourd section see George M. Foster, "Archaeological implications of the modern pottery of Acatlan, Puebla, Mexico," American Antiquity, Vol. XXVI, No. 2 (October, 1960), 207 and 209.

107
Porter, Tlatilco..., p. 42 and may other sources. See Coe, La Victoria..., p. 105 for a fuller discussion.

108
Jorge Encisco, Design Motifs of Ancient Mexico (New York, 1953), pp. 18, 24, 133 and many others.

109
DeCicco y Brockington, op. cit., Lamina 23.

110
Brainerd, "Archaeological ceramics...," Figure 72g 1-5.

111
MacNeish, "Panuco...," 626; Brainerd, "Archaeological ceramics ...," 52 and Figures 10g8 and 19b,

112
DeCicco y Brockington, op. cit., Lamina 20z.

113
Alfonso Medellin Zenil and Frederick A. Peterson, "A smiling head complex from central Veracruz, Mexico," American Antiquity, Vol. XX, No. 2 (October, 1954), 166.

114
Brainerd, "Archaeological ceramics...," Figure 93 z-cc.

115
Wauchope, Zacualpa...," p. 103; Pedro R. Hendrichs Perez, Por Tierras Ignotas, Tomo I (México, 1945), Figures 107 and 108; and many others.

116
Drucker, Tres Zapotes...," Plate 65o and p, Plate 45b and c, and P. 87 for discussion.

117
Robert H. Lister, Excavations at Cojumatlan, Michoacan, Mexico, University of New Mexico Publications in Anthropology No. 5 (Albuquerque: University of New Mexico Press, 1949), pp. 56-57.

CHAPTER VI

LITHIC MATERIALS

The few lithic artifacts found at Sipolite have been grouped into form and use categories for descriptive and comparative purposes. I do not intend to undertake complete comparative studies of all lithic artifacts, not that such a study would be without value, but because the data are widely scattered and an enormous amount of time would be needed for a proper study. Further, when the investigations of Richard MacNeish and others in the Tehuacan Botanical-Archaeological Project are completed, we will have available for the first time a large block of knowledge of the varieties of Mesoamerican lithic artifacts and their cultural and chronological assignments.

Hammerstones

The hammerstones, mostly smooth, oval water-washed stones, vary considerably in size. Those from Level 2 and 3 are heavier and more round or discoid in form while those from lower levels are lighter, smaller, and tend to be ovoid in form. Only twenty-two examples are sufficiently complete to give accurate weights. The averages by levels are: Level 9, no examples; Level 8, 70 grams; Level 7, 90 grams; Level 6, no examples; Level 5, 190 grams; Level 4, 220 grams; Level 3, 410 grams; Level 2, 385 grams; Level 1, no examples. If two hammerstones left in the field are included by estimating their weights from known measurements, the trend remains the same.

About two-thirds of the hammerstones are of a grey or brownish granitic stone while one-third are of whitish or white quartzite or quartz.

One hammerstone is stained red on an edge, suggesting it has been used for grinding pigment. Three unbattered pebbles, one pestle, and two manos bear similar stains. On the pestle and one mano the stains occur around the working surfaces but not on them, as though pigment had been ground with subsequent use of the tool removing pigment traces from the tools' work surface.

Hammerstones have an enormous span in time and space and comparative treatment does not now appear fruitful.

Pestles

Three pestles were found in stratipits. The first, from Pit 7, Level 4, measuring 11.6 by 5.3 by 4.4 cms., is quadrangular in cross-section, rectangular in length, and has been battered on both ends. The second, from Pit 7, Level 4, measuring 14.4 by 9.0 by 8.0 cms., is circular in cross-section, and has two polished side surfaces, as though it has served as a mano as well as pestle. The battered ends bear the red stains mentioned above. The third pestle, a small broken fragment from Pit 13, Level 3, exhibits evidence of use as a grinding stone on two lateral surfaces and has battered marks on an end indicating use as a pestle.

Mulling stones/Hammerstones

Two discoid stones with flat sides apparently served as mulling stones and also hammerstones. The flat sides are polished and the edges battered. The first, from Pit 6, Level 6, measures approximately 8.0 cms. across and 4.0 cms. thick. The second, from Pit 7, Level 5, has a diameter of approximately 7.0 cms. and 3.5 cms. thick.

Whet-stones

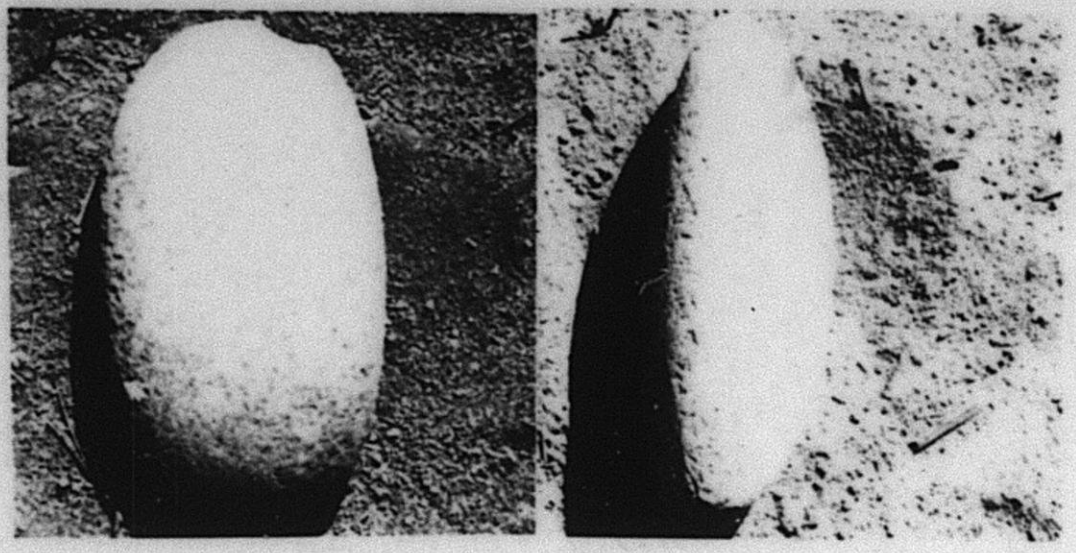
A flat length of a fine granitic stone measuring 11.4 by 3.0 cms. from Pit 15, Level 3, has been rubbed smooth on both of its flat sides. A similar stone measuring 6.5 cms. wide, 17 cms. thick, and 6.9 cms. long (broken) from Pit 2, shows the same rubbing on one flat side. Both may have served as whet stones for stone tools. See Plate LXXV.

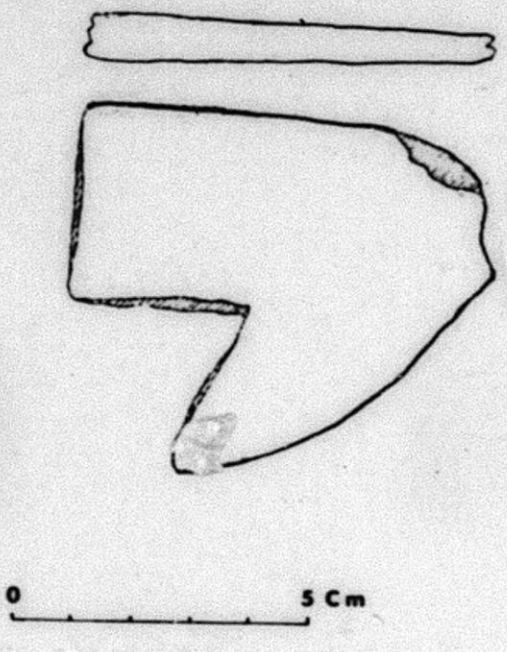
Manos and Metates

Twelve manos, whole or fragmentary, were found in the stratipits. Two were left at the site after being measured and photographed. They vary from about ten to twenty centimeters long and are flatten oval in cross-section and often thickened somewhat in the center with ends thinned. All are of the form that could be used in a trough metate; no overlapping or square manos were found. All are made on unmodified river pebbles.

Five whole or fragmentary metates were found but only one came from a stratipit. Four of the five are made on long oval stones about ten centimeters thick with a shallow trough about three centimeters deep with evenly raised sides and ends. A typical metate was found covering the burial in Pit #3. It measured 53 cms. long, 28 cms. wide in the middle, and 9.5 cms. high (See Plate LXXVI). A large metate was found by Don Luciano while digging a well. It measures 59 cms. long, 39 cms. wide, and 40 cms. high. The trough is 28.5 cms. wide, 45 cms. long, and 3 cms. deep (See Plate LXXVI). While the width and total height is extraordinary, the trough measurements are fairly typical of other metates found on the site. The bottoms

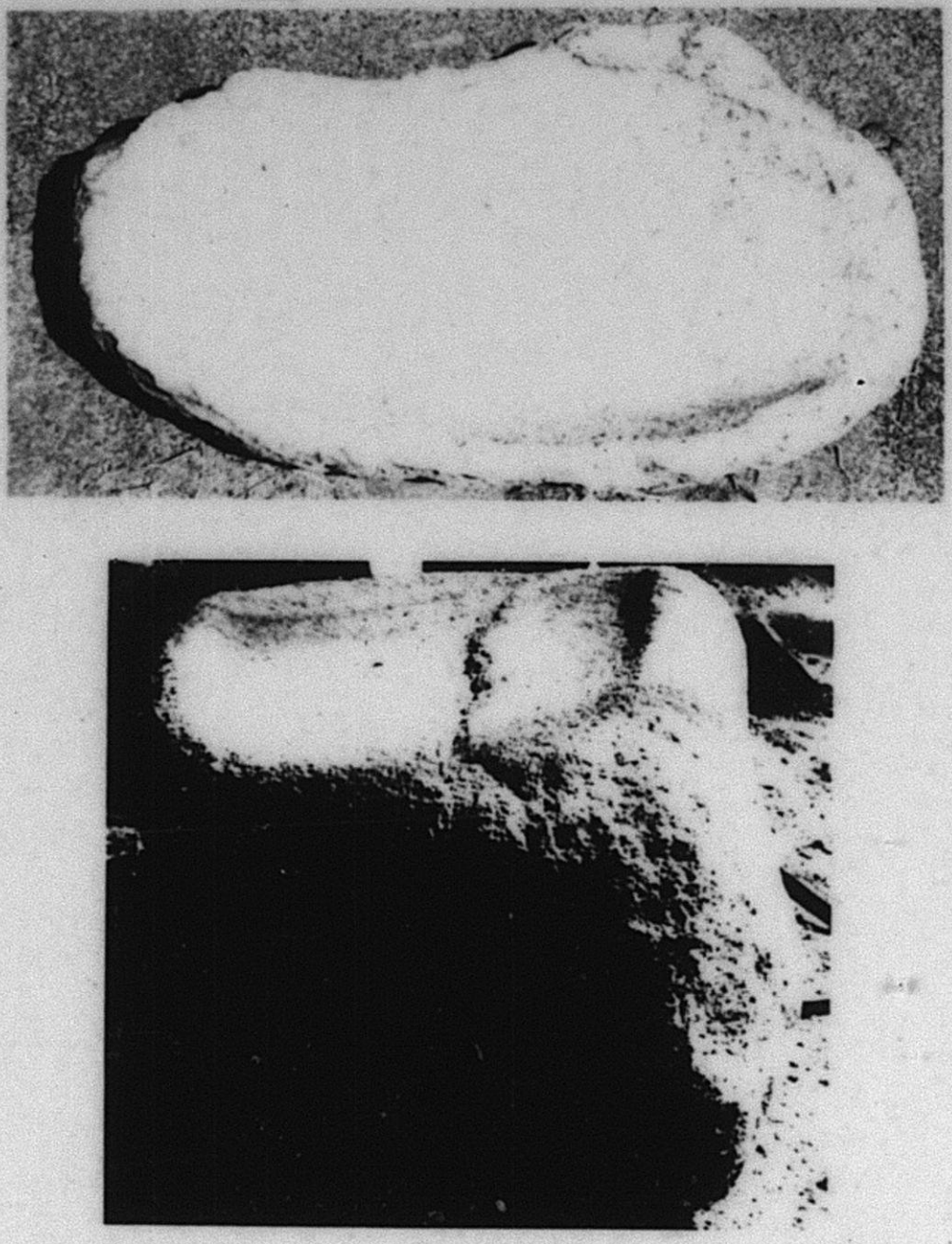
PLATE LXXV





UPPER, FLAT AND SIDE VIEWS OF MANO; LOWER, FLAT AND SIDE VIEWS OF POSSIBLE WHET-STONE

PLATE LXXVI



UPPER, BASIN METATE; LOWER, LARGE METATE MADE ON A BOULDER

of all of the metates have been rounded longitudinally and laterally by pecking.

It is difficult to envision how these shallow, round-bottomed metates were used. They would have rolled unless supported somehow. A. V. Kidder suggests that very similar metates found at Uaxactun may have been set in depression or steadied with small stones.[1] Another suggestion comes from an example seen in a house in Puerto Angel. A modern metate of the typical Mexican tripod form was seen wedged into a three pronged branch inserted vertically into the earthen floor of the house. The metate, about thirty centimeters above the floor, was used from the standing position, not in the kneeling position assumed with the tripod metate. If placed in such a device, the round bottomed metates of Sipolite would have served without rolling.

The practice of placing the metate in a stand enjoys a rather limited known distribution in Mexico and has been reported ethnographically from Guerrero.[2]

The shallow, closed-end trough, legless metate is ubiqutous on the coast of Oaxaca;[3] at least, the tripod metate is rarely seen at archaeological sites. Although information is sparse, there is but one report of the tripod metate having been found in a prehispanic context on the coast of Oaxaca. Two complete metates were found in a corn field near San Agustin Loxicha as part of a cache which included copper axes of the thin, non-functional variety that served as a medium of exchange during the Postclassic period.[4] Present data concerning metates appear insufficient for comparative purposes, other than for indicating that those of Sipolite are very similar to

metates found from western Mexico to Guatemala along the western side of the continent.

Obsidian Blades

Seventy-six fragmentary or complete obsidian blades were recovered from the eight stratipits. Except for three flakes, all show evidence of usage by their battered edges. Material has been divided into four color groups. The black obsidian is impervious to lamplight, even at the thinnest edge. The dark grey obsidian is slightly translucent and the light grey stone is quite translucent, even when a millimeter thick. The fourth class is a translucent or transparent light green material, but is not, by my observations, the "Teotihuacan" green obsidian.

Three, possibly four, obsidian sources would seem suggested. The black and green color groups appear sufficiently distinctive to indicate separate sources while the dark and light grey obsidians may be from two other sources or only variants from a single third source. Our workers never had seen obsidian before and knew of no source for it. However, the reported local deposit of pumice and the 1870 report of volcanic activity suggest that at least one obsidian source may have been close at hand. Kidder suggests that the jet-black obsidian of Uaxactun came from Guatemala and the green obsidian from the Valley of Mexico.[5] If such is correct and applicable here, Sipolite was receiving raw materials from both Guatemala and the Valley of Mexico for the entire duration of the site. Such contact need not have been direct however.

I know of no thorough study of Mesoamerican obsidian sources.[6] It is suggested that obsidian was traded in and that blades were produced locally since one core was seen in a private collection from Sipolite.

All of the Sipolite blades have been used but there is no regular chipping that would indicate secondary retouching, The blade itself must have been the desired tool form. We may infer some general uses of the blades by applying the simple criteria suggested by Robert Nero.[7] Twelve blades, fifteen percent of the collection, seem to have been used for scraping, one as a spokeshave. All others appear to have been used in cutting operations. None of the blade edges appears badly shattered so the material worked may have been comparatively soft, such as wood.

The intensity of occurrences of blades does not follow the fluctuation that has been noted for ceramic remains. Levels 3 and 4 contain forty-four percent of the recovered sherds but seventy-one percent of the obsidian blades.

The small number of specimens makes further treatment ill advised. Occurrences of blades by color groups are presented in Table 41.

Pumice Polishers and Stones

Seventy-five pumice stones ranging in size from two by two centimeters to ten by seven centimeters with an average around three by five centimeters were found in the stratipits. All exhibit at least one surface which is polished and some are smoothed evenly to be almost balls. One example from Pit 3, Level 8, has five grooves around its edges and must have served to polish shafts. Michael Coe has called similar pumice stones from La Victoria polishing stones[8] and,

Obsidian Color

Level	Black	Dark Grey	Light Grey	Green	Total
1			1		1
2		2	4	1	7
3	5	11	13	2	31
4	2	10	6	5	23
5	2	1	2	1	6
6	1	2	1		4
7			1		1
8			1	1	2
9		1			1
Total	10	27	29	10	76

TABLE 41.- Stratigraphic occurrences of obsidian noting color distinctions

since their glassy texture would serve admirably for polishing wooden implements, I have applied the term here.

The stratigraphic distribution of pumice stones indicates that the majority were used during the first half of the occupation period. Level 5 accounts for 29.3 percent and Level 6 for 26.7 percent of all pumice stones found. However, it should be noted that examples were found in all levels; the custom appears to have been continuous with intensity of use varying.

Our workers recognized pumice when it was first found but said that it was not to be found locally. One worker, he who lives at Sipolite, said that there is a pumice deposit under the beach and

that the sea exposes it periodically. We were not able to obtain samples of it. The presence of a local deposit is further indication of local volcanic activity.

Level	Pits 6	7	10	11	12	13	14	15	
1	1					1			2
2		1	1			2	1		5
3		4					2		6
4		1	1	3	1	1			7
5	16	3		1	2				22
6	2	1	6	2	1	5	2	1	20
7		4	1			3	1		9
8		2				1	1		4
9									
	19	16	9	6	4	13	7	1	75

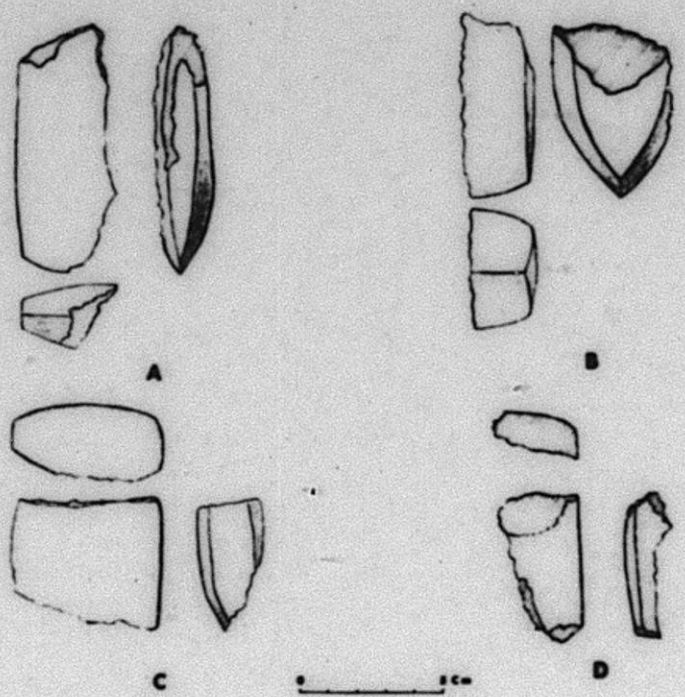
TABLE 42. - Stratigraphic occurrences of pumice polishers by stratipits

Pumice polishing stones are not often found in Mesoamerica but Coe reports them from La Victoria on the coast of Guatemala for during all Preclassic periods.[9]

Celts

Four fragments of celts were found, two on the surface and two from excavations in Pit 14, Level 3, and Pit 13, Level 5. All were made of green stone. In each case the celt appear to have been more or less rectangular in cross-section with a convex bit. The pieces

PLATE LXXVII



CELT FRAGMENTS

are nicely polished. One which has a portion of the butt present exhibits on it battering marks, suggesting that the celts were used not only as blades inserted in handles but also as chisels. See Plate LXXVII for drawings of the celt fragments.

As Coe has observed, celts are not common during the Preclassic period in Mesoamerica, except in Olmec sites.[10] Those found at Sipolite are quite similar to Coe's La Victoria celts but also to Postclassic Valley of Mexico celts. The form is too generalized to lend itself to study with the little evidence presently available.[11]

Adze

A fragment of an adze was found in Pit 13, Level 1. It appears to have been made on a split stone fragment by polishing down one end to form the bit.

Ear Spool

What may be an ear spool made of a chalk-like stone has been described and discussed in Chapter V along with a ceramic ear plug.

ENDNOTES

1 Alfred V. Kidder, The Artifacts of Uaxactun, Guatemala, Carnegie Institution of Washington Publication 576 (Washington, D.C.: U. S. Government Printing Office, 1947), p. 33.

2 Robert J. Weitlaner and R. H. Barlow, "Expeditions in western Guerrero: the Weitlaner Party, Spring, 1944," Tlalocan, Vol. I, No. 4 (1944), pp. 366 and 370.

3 Brockington, "Piedra Parada...," pp. 91-93.

4 Native informant to author, near San Agustin Loxicha, February, 1956.

5 Kidder, op. cit., p. 10.

6 A study of obsidian from archaeological contexts together with studies of sources would be valuable for, among other purposes, suggesting ancient trade routes and patterns, as has been done in Great Britain for stone axes and elsewhere in Europe.

7 Robert Nero, "Primary flake implements," The Wisconsin Archaeologist, Vol. XLIV, No. 2 (June, 1948), 23-27. When chips are removed from both sides of an edge, a cutting operation is indicated and when they have been removed from but one side, a scraping operation presumably was the cause. Hard and/or rough materials cause more severe breakage than do soft and/or smooth materials.

8 Coe, La Victoria..., 102.

9 Ibid., pp. 102 and 107.

10 Ibid., p. 107.

11 I have a strong impression that celts are not at all common in any part of Mesoamerica until stone architecture appears. Further, a distribution chart of occurrences of stone celts may be misleading since an examination of the evidence suggests that most early celts had a ceremonial function or at least a function that did not involve their being used severely. Note that the celts from Ticoman and Zacatenco, earliest examples in the Valley of Mexico, are made of semi-precious materials and are highly polished and show no usage marks. The frequency of "Olmec" jade celts and paucity of examples made from other materials further emphasizes the point.

The apparent lack of "useful" celts may suggest that slash and burn agriculture may have depended more upon burning than slashing, at least during the Preclassic.

CHAPTER VII

SUMMARY AND CONCLUSIONS

Summary

The following summary description of the three major periods mentions those attributes and trends regarded as being especially important at Sipolite. The summary should not obscure the fact that there is an essential unity, a common tradition, that flows without interruption and with rather minor additions. The same techniques, materials and often forms of the tradition extend through all levels and periods.

Early Sipolite - Levels 9 through 5 - have few ollas and these have ovoid bodies and usually straight, vertical necks. Tecomates are far more common and frequently have bolstered rims and sometimes a single line incised around the exterior rim. Other decoration is rare. While tecomates decline slightly in percentage in high levels, they always are prominent as a form class. Ollas increase in frequency.

The vessels of Concave Bowl Series 18 are typical of Early Sipolite and rarely have one or two lines incised around the interior rim. Concave and convex bowls with beveled exterior rims and beaked interior rims are concentrated in the Early period but continue into the Middle. Convex and Concave bowls with "finger-thinned" interior rims also are typical. Comal-like forms with very low and widely divergent walls and heavily bolstered rims begin in Level 7 and continue throughout all levels. Basal break and Z-angle bowls are rare.

Incision is the most common means of decoration with the cursive wavy line design being most frequent in the Early period but continuing until later. Decoration by comb-incising or polishing lines on interior bases also is typical. The use of graphite paint, frequently in conjunction with red paint, is almost restricted to the Early period. Rocker-stamping is very rare as are red spots within an incised line.

Loop handles, usually circular in cross-section, are known and solid and perforated simple effigy lugs begin their long development. The lugs seldom are decorated and then only by gouging.

Long hollow mammiform supports are typical, but there are hollow cylindrical, ball and conical supports which are shorter than those of later periods. Solid nub supports appear in the top level of the period.

Figurines are of Type 1-A or are zoomorphic examples produced by the same techniques. All are hand-modeled and decorated by incision and punching.

All of the plain worked circular sherds are from this period, but perforated and sharpened sherds are present. No spouts are known. Most examples of sherd decoration by reed punches are from this period.

Early Sipolite is more closely related to Monte Alban I and II than to any other sequence but is not very similar. Rather, Sipolite seems to have been sharing in a common basic tradition with Monte Alban.

Middle Sipolite - Levels 4 and 5 - contains a great variety. Many of the Early period features either cease or diminish in frequency

although the basic tradition continues. Old traits may undergo elaboration and new traits appear.

Ollas are more frequent and have globular bodies and necks and rims that are more divergent and everted, a tendency that continues into the next period. Tecomates may have a faint groove around the exterior rim and the banded rim appears here on tecomate as well as convex bowl forms. Deep or medium convex bowls with nearly vertical, slightly convex and rather thin walls appear. Tall or medium convex bowls with a deep finger groove around the exterior rim which is flattened and sometimes slightly everted are typical of Middle Sipolite. Concave bowls with Z-angle or basal break are frequent in occurrence. Their walls may be widely divergent but usually are nearly erect, slightly concave, and have evenly rounded or slightly pointed rims and may be covered with a black slip. Small everted rims, flat or rounded, horizontal or angle downwards, plain or grooved, begin here and increase in frequency during the next period. The rims often are painted with red.

Everted Rim Series 8 and 9 begin and are most frequent during the Middle period, and the thick cream slip of Series 9 is typical.

Z Fine Orange and a mold-made sherd are found at the end of the Middle period, although most of the former and one of the latter were found in Upper Sipolite.

Decorative techniques especially associated with this period include cross-hachure, punctation, pecking, groups of incised vertical lines, and parallel horizontal lines enclosing a row of gouges. Vertical finger-punched fillet, often accompanies by the incised cursive wavy line design, is a Middle period feature. Excised

glyphic elements are most frequent here and red-and-white bichrome appears in Level 5 continuing into the Late Period.

A wide variety of effigy lugs occur and become longer and more often and more elaborately decorated by gouging and reed-punching. Loop strap handles begin to increase in percentage at the end of the period, and the circular strap handles to decrease.

Long and full mammiform supports are found. The sequence from long to full is consistent with findings elsewhere but placing of the full varieties in Middle and Late periods is not. Practically all varieties of supports known from Sipolite occur during the Middle period. Ring base and square supports are found in Levels 3, 4 and 5. Curved supports of all varieties are well represented.

Figurines are found in about the same frequency as before with some being hand-made and, in Level 4, some are mold-made and perhaps retouched afterwards. Articulated figurines and the "Jaina" figurine fragment are from the Middle period.

Middle Sipolite almost surely is early Classic in temporal placement but contains many Preclassic survivals. It has some similarities with Classic Monte Alban but more with the Chiapas-Tabasco region. It could be considered a transitional period. When the elaborate materials are removed from consideration, the bulk is very much like that of the Early period.

Late Sipolite - Levels 1, 2 and 3 - vessel forms are about the same as those of the Middle period although frequencies may change. Everted rims become more common. Tecomates may have slightly raised rims, either pointed or square. The globular olla with sharply di-

verging rim that thins to a point is limited to this period. Most of the fine vessels and sherds belong to the Late Period and also the majority of the Z Fine Orange.

Loop handles increase in frequency with the circular variety almost vanishing. Effigy lugs continue the trend established earlier, becoming longer and more often decorated although small nubbin lugs, plain and effigy, are not uncommon.

The full mammiform support is still present. Hollow ball and conical supports decline in frequency while the ring base and square supports cease with Level 3. Curved slab supports, stepped and unstepped, become very popular but tend to be plain. The mold-made effigy supports are almost restricted to the Upper period.

Figurines are mold-made and frequently covered with a fragile white slip. Crude hand-made figurines are found.

Late Sipolite is regarded as being late Classic and perhaps early Postclassic. In terms of the Maya sequence we have no definite indication of Postclassic materials. All items used for making comparisons with the Maya region could be placed in Tepeu 2 and 3. However, several items, such as the mold-made effigy supports and white-slipped mold-made figurines, relate to the Postclassic period in northern Mesoamerica. We might conclude that the Classic ceramic tradition lasted longer in the south than in the north or, as one alternative, that the ceramic definitions for the border between the Classic and Postclassic are inadequate.

Conclusions

It can be concluded on the basis of several lines of evidence that the Sipolite ceramic tradition was conservative, long-lived and a continuous tradition. The long duration of many ceramic forms, the single complex of paste types in approximately the same proportions to each other, and similarities in frequencies of difference size categories of the same tempering material all indicate a single ceramic tradition. While changes occurred and the fine pottery of other areas was either being imported or duplicated in or around Sipolite, the basic "household wares" changed in but minor ways. The same forms and sizes of tecomates and ollas were being produced throughout the site occupation. Some of the finer ceramics also show little change, as with Concave Bowl Series 21 with its one or two lines incised around the exterior below the rim and commonly painted with red. The use of red paint on rims and finger-punched basal fillet are two examples of decorative elements found in every level. Considering figurines, we have noted that the I-B figurines of Level 5 are but a better made and more sophisticated version of the I-A figurines of Levels 7 and 8.

The handles show continuous change with the effigy lugs undergoing constant and uniform alterations through successive levels. The same continuous change has been demonstrated for vessel supports and, while the sequence is not in complete agreement with sequence found elsewhere, the general pattern is in agreement.

Statistical analysis of ceramics has shown beyond reasonable doubt that there was change, both for gross ware categories and for

narrowly defined attributes within form groupings. Drift or displacement cannot be used to explain the presence of Early style remains in Middle and Late levels. In short, there is every reason to assume that the Sipolite tradition was continuous and conservative and little evidence to the contrary.

There were influences from elsewhere in Mesoamerica but there is no evidence of contacts with external regions. The handle forms that suggested influences from South America were shown to be domestic developments, beyond reasonable doubt.

Two factors are suggested as possibly having contributed towards keeping the Sipolite ceramic tradition conservative and preventing or discouraging change: small population and relative isolation.

Judging from known surface area of the site and sherd densities at different levels, we are of the opinion that Sipolite was at its largest a small village. Survey of the surrounding area revealed no other village nor a city or large center with Anclero possibly having had a half dozen houses, a hamlet. Population growth may have been hampered by low agricultural potential.

Edwin Ferdon has proposed a scale for judging agricultural potential and then, which is irrelevant for our purposes, points out that cultural development often determines how the potential may be exploited.[1] By his scale the Puerto Angel region would be rated as either IVb, Dry Marginal, or V, Sub-Marginal. Milpa agriculture is possible in Dry Marginal conditions but not with Sub-Marginal. If such conditions existed when Sipolite was occupied in prehispanic times, survival may have been precarious and the statement in the

Relaciones that agriculture was practiced only in damp areas suggests that in the sixteenth century milpa agriculture was not important. Further, Sipolite and Anclero, the only known settlements in the area, both are located in places that even today are recognized as especially desirable. We suspect that conditions similar to those of the present existed in ancient times. Further, there is at present a shortage of drinking water in the area with only Sipolite having a dependable supply throughout the year. Limited potential may have discouraged settlement in the Puerto Angel area, except at Sipolite, as well as hampering its expansion.

One may speculate whether or not Sipolite was desirable for other reasons, such as being a source for the Purpura dye. There is no evidence that the dye source was being exploited but, no good evidence to the contrary.

We suggest that Sipolite was occupied because the location provided a satisfactory although perhaps limited water supply, was damp enough to permit dependable agriculture, and because of small lagoons that existed until several decades ago behind the beach line. The lagoons may have provided the supplementary essentials. Such a situation would hardly have been conducive to great cultural growth nor especially attractive to outsiders. The result would have been a small, isolated village.

We do find strong outside influences present beginning in the Middle period. Along with the influences there seems to have been an increase in population, if inferences can be made from the greater numbers of sherds in Levels 3 and 4. There also are indications of

of trade, such as the presence of the Z Fine Orange.

A major migration cannot be inferred since the basic household ceramics remain practically unchanged, unless the hypothetical immigrants brought a nearly identical complex. The evidence suggests more of an accretion to the existing ceramic tradition than a replacement. Why there should have been a population growth and trade is unknown. Bettered climatic conditions, improved cultural practices for more effectively exploiting resources, and increased participation in the cultural growth of the larger region may be suggested as possibilities. Of these the latter is preferred.

It is risky to extend our knowledge of the Sipolite sequence and apply it to the coast of Oaxaca; too little is known to permit a confident reconstruction or interpretation. Wauchope has expressed the point nicely:

> "...Pottery is still our most reliable tool in constructing correlated sequences in Middle America, but when we try to use it for interpretation, in our present state of knowledge, I am afraid it is like a hatchet in the hands of a two-year-old child."[2]

Realizing the dangers of working with such limited data for the Oaxacan coast, the following reconstruction is offered as a hypothesis.

The earliest known cultural remains are of a general southern Mesoamerican middle and late Preclassic tradition most closely resembling Monte Alban I and II but distinct from it. This horizon may have been influenced by the La Venta culture since "Olmec" jade, stone and clay figures have been found at Tututepec,[3] Jamiltepec,[4] and Pochutla.[5] The nature or extent of such influences is unknown. There are resemblances between the ceramics of Piedra Parada Jamil-

tepec and Sipolite on the Oaxacan coast and La Venta and Tres Zapotes to the east but the differences are great. With the beginning of the Classic the Monte Alban resemblances decline. We may note that Chatino on the coast is considered to have separated from Valley Zapotec approximately 2,000 years ago, a good agreement with the archaeological indications of a cultural rupture, as mentioned in Chapter II. The Preclassic inhabitants, or part of them, may have survived as the modern Chatino.

With the beginning of the Classic, a regional culture began forming and established contacts across the Isthmus of Tehuantepec with those of the Tabasco region. It is possible that the contacts resulted from the suggested Olmec association. Another possibility for explaining how Tabasco contacts came to be is offered by the legend of Chichimec migrations. Ixtlilxochitl wrote that Chichimecs from Tula (Teotihuacan?) in the fourth century after Christ traveled to Jalisco, sailed southward to Huatulco (on the coast of Oaxaca), established a dynasty there, and traveled across the Isthmus to southern Veracruz-Tabasco leaving colonies in cities on the way. The legend may not be accurate and, in fact, we can note no strong appearance of northern traits in the Sipolite sequence. There are three sets of evidence that tend to confirm or at least agree with the legend. First, the lexicostatistical estimates are that Pochuteca Nahuat separated from Valley of Mexico Nahuatl fourteen centuries ago. Second, the legend would establish a direct line of associations between the Oaxacan coast and Tabasco, a line that is strongly suggested by the archaeological evidence from Sipolite.

Third, Parsons has archaeological evidence of Mexican highland influences on the Guatemalan coast dated by radiocarbon methods as between 400 and 500 A.D.[6] The evidence is poor but highly suggestive.

Maya influences may have followed the Chichimec colonies back to the Oaxacan coast and there integrated with the Zapotec survivals to produce a distinctive regional culture, as is indicated by the mold-made sherds, one manifestation of which we may see at Xochicalco, Morelos. Maya influences long have been noted at Xochicalco, and the Oaxacan coast and Guerrero mentioned as the most logical path for their transmission. Manuel Gamio pointed this out forty years ago.[7] Also, we are reminded of Berlin's report of Maya figurines in Tututepec.[8] Further, a recent study of Mesoamerican metallurgy finds much evidence of connections between western Mexico and the Maya region.[9]

> "...metal artifacts appear on the West Coast of Mexico as early as 900...At the same time, or at most only slightly earlier, metals made their first appearance in the Southern Maya area. Since transmission of metal objects from the Southern Maya area to west Mexico in the space of 25 or 50 years seems highly unlikely, we are forced to turn to Central America as the source of both early Mesoamerican occurrences..."[10]

If, as we have suggested, there were established trade and travel routes between the coast of Oaxaca and/or Xochicalco and the Maya region, rapid transmission of objects would not be an unreasonable possibility.

To consider another view, it should be noted that a recent study of Maya commerce does not mention trade relations with the Oaxacan coast or Guerrero.[11] Further, there is no recorded or known tradition of Maya language or presence in Oaxaca or Guerrero. The

conflict of evidence may be resolved by pointing out that the last rulers of the Oaxacan coast were Mixtecs who, according to lexicostatistical estimates, arrived between 1300 and 1400. Mixtec-style remains were found on the surface at Sipolite; that is, the Mixtec occupation apparently was later than the Maya influences. The warlike, powerful and domineering rulers of Tututepec may have destroyed a more ancient pattern of associations.

The foregoing historical reconstruction is admittedly highly speculative but it considers the available evidence and is capable of being tested. Research with historical documents may be revealing for later periods but a program of archaeological survey and excavation is needed. One possibility might be to begin in towns that existed at the time of the Conquest, such as Tonameca and Tututepec, and to give attention to the large ceremonial centers such as Piedra Parada Jamiltepec. Investigation around lagoons such as the Lago de Chacahua may be especially informative for the early periods.

Any future investigation also should be concerned with the problem of conservatism and survival of traits, for confusion in making cultural and/or temporal associations may hamper making valid interpretations. One purpose of this study has been to demonstrate not only survivals of a ceramic tradition but a methodology for detecting and studying such. The minute descriptions admittedly are laborous and tedious but the conclusions are documented. They may be important for understanding not only the culture history of one part of Mesoamerica but others. Mention was made earlier of Rands' theory of reinvention of Preclassic ceramic traits at Palenque.

Rands notes the reappearance of the notched basal ridge and everted rim at Palenque in a Tepeu 3 temporal position after they had disappeared in Tepeu 1. He considers the possibility of the traits having survived in an unknown region but, since there was no knowledge of such region, he advances a theory of reinvention of early traits by making elaborations upon existing themes. That is, the basal flange, for example, was altered in size and vessel placement and notched to resemble the earlier late Preclassic Chicanel examples.[12] Rands may be correct but we have shown that both traits were present during almost all Sipolite periods and that there were connections between the region just east of Palenque and Sipolite on a Tepeu 2-3 horizon. It is possible that the reappearance of Preclassic traits at Palenque is due to influences from the Oaxacan coast.

Turning to Mesoamerican cultural development as a whole, archaeologists have depended heavily upon ceramic comparisons for establishing chronologies and postulating relationships between sites. Demonstration of survivals, not just of attributes but of traditions, should caution against automatically assuming synchronic relationship of analogous materials.

ENDNOTES

1 Edwin N. Ferdon, Jr., "Agricultural potential and the development of cultures," Southwestern Journal of Anthropology, Vol. XV, No. 1 (Spring, 1959), 17-18.

2 Wauchope, "Tentative sequence...," 245.

3 Berlin, Fragmentos Desconocidos..., p. 13. Also, a magnificent example of Olmec jadework attributed to Tututepec is part of the Robert Bliss collection.

4 DeCicco y Brockington, op. cit., pp. 12-15.

5 Piña Chan, "Sitios arqueológicos...," pp. 65-68.

6 Lee A. Parsons, "Archaeological research at Bilbao," Lore, Vol. XV, No. 3, Milwaukee Public Museum (Summer, 1965), 94.

7 Manuel Gamio, "The sequence of cultures in Mexico," American Anthropologist, n.s., Vol. XXVI, No. 3 (July-September, 1924), 319.

8 Berlin, Fragmentos Desconocidos..., p. 13.

9 David M. Pendergast, "Metal artifacts in prehistoric Mesoamerica," American Antiquity, Vol. XXVII, No. 4 (April, 1962), 536-540 and elsewhere.

10 Ibid., 534.

11 Amalia Cardos de Mendez, "El comerico de los Mayas antiguos," Acta Anthropológica, Epoca 2, Vol. II, Núm. 1 (México: Escuela Nacional de Antropologia e Historia, 1959).

12 Rands, op. cit., 334-335.

APPENDIX A

Level	Stratipits								
	6	7	10	11	12	13	14	15	Total
1	10	13	10	17	20	20	25	30	145
2	21	98	27	36	62	78	116	112	550
3	22	139	62	74	167	200	282	163	1,109
4	45	130	102	199	306	179	91	120	1,172
5	133	100	66	117	234	126	71	86	933
6	132	65	99	57	32	91	97	58	631
7	35	91	77	4	1	52	78	85	423
8 & 9	11	44	9		3	14	45	42	168
Total	409	680	452	504	825	760	805	696	5,131

TABLE 43. - Sherd distributions by pits and levels

Level	Stratipits							
	6	7	10	11	12	13	14	15
1		1	1	2	1	1	1	3
2	2	8	1	2	6	5	10	8
3	2	10	6	4	18	20	26	15
4	3	11	7	15	32	19	6	12
5	13	10	6	5	18	8	2	5
6	12	2	10	1	3	4	6	3
7	1	6	8	1		3	7	6
8	1	2	2				1	2

TABLE 44. - Distribution of Reddish-brown Tecomate sherds

Level	Stratipits							
	6	7	10	11	12	13	14	15
1	1							2
2		1			2	1		
3		4	3	3			3	2
4		3		2	4	2	1	1
5	2	3		5	4		2	1
6	6	2	2	2	1	2	3	1
7	1	4				4	2	3
8		1					1	

TABLE 45. - Distribution of Grey Tecomate sherds

Level	Stratipits							
	6	7	10	11	12	13	14	15
1	1			1	2		3	2
2		7	3	1	2	4	5	14
3	2	10	1	2	10	10	15	11
4	3	6	7	9	12	18	6	10
5	4	2	1	4	14	8	1	2
6	4	2	3	2	1	4	2	3
7	1	3			1	3	1	
8		2	1			1	2	1

TABLE 46. - Distribution of Reddish-brown Convex Bowl sherds

Level	Stratipits							
	6	7	10	11	12	13	14	15
1								1
2		2				2	3	4
3		6			1	1	7	5
4			1	4	1	3		1
5						1		2
6			1	1	1	2	1	1
7								
8								

TABLE 47. - Distribution of Black-slipped Concave Bowl sherds

Level	Stratipits							
	6	7	10	11	12	13	14	15
1					1			
2		2						1
3		2	1		1	2	3	2
4		1				1		
5								
6								
7								
8								

TABLE 48. - Distribution of Cream-slipped Concave Bowl sherds

Level	Stratipits							
	6	7	10	11	12	13	14	15
1	1		1			3	2	3
2	5	4	2	1	3	5	4	10
3	1	4	2	8	15	6	15	10
4	1	12	9	19	20	10	12	5
5	17	14	11	15	14	6	8	5
6	7	6	9	5	2	15	7	8
7	1	6	5	2		4	6	6
8		5			1	1	5	

TABLE 49. - Distribution of Grey Paste Concave Bowl sherds

APPENDIX B

Concave Bowl Series 17: (113)

Occurrence:

Level	1	2	3	4	5	6	7	8
Examples	1	0	3	9	32	34	17	17
Corrected to				13	32	34	17	17

Temper Distribution:

Level	4	5	6	7	8
None	11	27	23	11	12
Fine	2	5	9	6	5
Medium			2		

Hardness Distribution:

Level	4	5	6	7	8
Hardness 1	11	24	29	13	9
Hardness 2	1	7	8	4	7
Hardness 3	1	1	1		

Decoration Distribution:

Level	Undecorated	Decorated	(Attribute and Examples)
4	7	6	(50,1; 63,3; 79,1; 86,1)
5	22	10	(10,2; 28,1; 29,1; 63,4; 86,1; 87,1)
6	25	9	(6,1; 29,1; 42,2; 43,1; 50,1; 60,1; 87,1; 89,1)
7	12	5	(28,1; 42,1; 90,1; 91,1; 118,1)
8	14	3	(88,1; 90,2)

Computation of I.D. for Temper:

Level	No Temper	X	(X-Y)	Y	All Other Tempers
4	11	13.09%	6.19	6.90%	2
5	27	32.14	14.90	17.24	5
6	23	27.38	10.55	37.93	11
7	11	13.09	7.90	20.69	6
8	12	14.29	2.95	17.24	5
	$84=N_X$	99.99%	42.49	100.00%	29

$S|X-Y|/2 = 21.245$ $(S|X-Y|/2)N_X = 21.245(84)$

$= 17.85$

Level	Fine Temper	X	(X-Y)	Y	All Other Tempers
4	2	7.40%	5.39	12.79%	11
5	5	18.52	12.87	31.39	27
6	9	33.33	4.26	29.07	25
7	6	22.22	9.43	12.79	11
8	5	18.52	4.57	13.95	12
	$27=N_X$	99.99%	36.52	99.99%	86

$S|X-Y|/2 = 18.26$ $(S|X-Y|/2N_X = 18.26(27)$

$= 4.93$

$N = 113$

$$I.D. = \frac{17.85 + 4.93}{113} 100$$

$I.D. = 20.14\%$

Computation of I.D. for Hardness:

Level	Hardness 1	X	(X-Y)	Y	Hardness 2 & 3
4	11	12.79%	5.65	7.14%	2
5	24	27.91	2.91	25.00	7
6	29	33.72	5.15	28.57	8
7	13	15.11	.82	14.29	4
8	9	10.47	14.53	25.00	7
	$86=N_X$	100.00%	29.06	100.00%	28

$S|X-Y|/2 = 14.53$ $(S|X-Y|/2)N_X = 14.53(86)$

$= 12.4958$

Level	Hardness 2	X	(X-Y)	Y	Hardness 1 & 3
4	1	3.70%	9.78	13.48%	12
5	7	25.93	2.16	28.09	25
6	8	29.63	4.08	33.71	30
7	4	14.82	.21	14.61	13
8	7	25.93	15.82	10.11	9
	$27=N_X$	100.01%	32.05	100.00%	89

$S|X-Y|/2 = 16.025$ $(S|X-Y|/2)N_X = 16.025(27)$

$= 4.32675$

$N = 113$

$$I.D. = \frac{12.4958 + 4.32675}{113} 100$$

$I.D. = 14.88\%$

Computation of I.D. for Decoration:

Level	Decorated	X	(X-Y)	Y	Undecorated
4	6	18.18%	9.43	8.75%	7
5	10	30.30	2.80	27.50	22
6	9	27.27	3.98	31.25	25
7	5	15.15	.15	15.00	12
8	3	9.09	8.41	17.50	14
	33	99.99%	24.77	100.00%	80

$S|X-Y|/2 = 12.38\%$

I.D. = 12.38%

Concave Bowl Series 21: (125)

Occurrence:

Level	1	2	3	4	5	6	7	8
Examples	2	12	19	40	31	17	3	1
Corrected to		14	19	40	31	21		

Temper Distribution:

Level	2	3	4	5	6
None	12	18	34	27	21
Fine	2	1	6	4	

Hardness Distribution:

Level	2	3	4	5	6
Hardness 1	14	18	39	26	12
Hardness 2		1	1	5	6
Hardness 3					3

Decoration Distribution:

Level	Undecorated	Decorated	(Attributes and Examples)
2	1	13	(28,1; 30,11; 46,1)
3	4	15	(28,1; 30,11; 71,2; 75,1)
4	6	34	(28,4; 20,10; 64,1; 68,3; 71,3; 74,1; 77,1; 79,1)
5	2	29	(30,19; 50,1; 68,4; 71,5)
6	4	17	(30,4; 62,1; 67,1; 68,3; 71,4; 73,1; 75,1; 77,1; 78,1)

Computation of I.D. for Temper:

Level	No Temper	X	(X-Y)	Y	Fine Temper
2	12	10.71%	4.68	15.39%	2
3	18	16.07	8.38	7.69	1
4	34	30.36	15.79	46.15	6
5	27	24.11	6.66	30.77	4
6	21	18.75	18.75	---	0
	112	100.00%	54.26	100.00%	13

$S|X-Y|/2 = 27.13$

I.D. = 27.13%

Computation of I.D. for Hardness:

Level	Hardness 1	X	(X-Y)	Y	Hardness 2 & 3
2	14	12.84%	12.84	---	0
3	18	16.51	10.26	6.25%	1
4	39	35.78	29.53	6.25	1
5	26	23.85	7.25	31.25	5
6	12	11.00	45.25	56.25	9
	109	99.98%	105.13	100.00%	16

$S|X-Y|/2 = 52.56$

I.D. = 52.56%

Computation of I.D. for Decoration:

Level	Decorated	X	(X-Y)	Y	Undecorated
2	13	12.04%	6.16	5.88%	1
3	15	13.89	9.64	23.53	4
4	34	31.48	3.81	35.29	6
5	29	26.85	15.09	11.76	2
6	17	15.75	7.79	23.53	4
	108	100.00%	42.49	99.99%	17

$S|X-Y|/2 = 21.24$

I.D. = 21.24%

Everted Rim Series 8 and 9: (22 + 24 = 46)

Occurrence:

Level	1	2	3	4	5	6	7	8
Examples	1	13	18	8	5		1	
Corrected to		14	18	8	6			

Temper Distribution:

Level	2	3	4	5
None	4	1	2	2
Fine	8	13	2	3
Medium	1	3	2	
Coarse	1	1	2	1

Hardness Distribution:

Level	2	3	4	5
Hardness 1	2	3		1
Hardness 2	12	14	7	5
Hardness 3		1	1	

Slip 72 Distribution:

Level	2	3	4	5
Slip 72	5	13	4	2
No Slip 72	9	5	4	4

Computation for I.D. for Temper:

Level	None	X	(X-Y)	Y	Others
2	4	44.44%	17.41	27.03%	10
3	1	11.11	34.84	45.95	17
4	2	22.22	6.00	16.22	6
5	2	22.22	11.41	10.81	4
	$9=N_X$	99.99%	69.66	100.01%	37

$S|X-Y|/2 = 34.83$ $(S|X-Y|/2)N_X = 34.83(9)$

$= 3.1347$

Level	Fine	X	(X-Y)	Y	Others
2	8	30.77%	.77	30.00%	6
3	13	50.00	25.00	25.00	5
4	2	7.69	22.31	30.00	6
5	3	11.54	3.46	15.00	3
	$26=N_X$	100.00%	51.54	100.00%	20

$S|X-Y|/2 = 25.77$ $(S|X-Y|/2)N_X = 25.77(26)$

$= 6.7002$

Level	Medium	X	(X-Y)	Y	Others
2	1	16.67%	15.83	32.50%	13
3	3	50.00	12.50	37.50	15
4	2	33.33	18.33	15.00	6
5	0	---	15.00	15.00	6
	$6=N_X$	100.00%	61.66	100.00%	40

$S|X-Y|/2 = 30.83$ $(S|X-Y|/2)N_X = 30.83(6)$

$= 1.8498$

Level	Coarse	X	(X-Y)	Y	Others
2	1	20.00%	11.71	31.71%	13
3	1	20.00	21.46	41.46	17
4	2	40.00	25.37	14.63	6
5	1	20.00	7.80	12.20	5
	$5=N_X$	100.00%	66.34	100.00%	41

$S|X-Y|/2 = 33.17$ $\quad (S|X-Y|/2)N_X = 33.17(5)$

$= 1.6585$

$N = 46$

$$I.D. = \frac{3.1347 + 6.7002 + 1.6585 + 1.8498}{46} 100$$

$I.D. = 29.01\%$

Computation of I.D. for Hardness:

Level	Hardness 2	X	(X-Y)	Y	Hardness 1 & 3
2	12	31.58%	6.58	25.00%	2
3	14	36.84	13.16	50.00	4
4	7	18.42	5.92	12.50	1
5	5	13.16	.66	12.50	1
	38	100.00%	26.32	100.00%	8

$S|X-Y|/2 = 13.16$

I.D. = 13.16%

Computation of I.D. for Slip 72 and Others:

Level	Slip 72	X	(X-Y)	Y	Others
2	5	20.83%	20.08	40.91%	9
3	13	54.17	31.44	22.73	5
4	4	16.67	1.51	18.18	4
5	2	8.33	9.85	18.18	4
	24	100.00%	62.88	100.00%	22

$S|X-Y|/2 = 3.44$

L.D. = 31.44%

APPENDIX C

A CHI-SQUARE TEST FOR INTERDEPENDENCE OF VARIABLES
SUBMITTED BY ROBERT M. SCHACHT

FREQUENTLY IT IS DESIREABLE TO PROVE THAT SEVERAL SAMPLES ARE DERIVED FROM THE SAME POPULATION. ONE OR MORE DIAGNOSTIC CHARACTERISTICS OF THE POPULATION MAY BE CHOSEN AS EXHIBITING HOMOGENEITY AMONG THE SAMPLES IN THE FOLLOWING MANNER.

IN THE MOST SIMPLE CASE, THERE ARE TWO SAMPLES, DESIGNATED AS NS(1) AND NS(2). FROM THESE SAMPLES, INDIVIDUALS POSSESSING A COMMON CHARACTERISTIC ARE SELECTED, YIELDING A FREQUENCY OF N(1) INDIVIDUALS IN THE FIRST CLASS, NS(1), AND N(2) INDIVIDUALS IN THE SECOND CLASS, NS(2), LEADING TO THE FOLLOWING TABLE.

TABLE 1

SAMPLE NUMBER	1	2	TOTAL
CHARACTERISTIC			
FREQUENCY, N(1)	N(1)	N(2)	N(1)+N(2)
TOTAL SAMPLE SIZE	NS(1)	NS(2)	NS(1)+NS(2)

CHI-SQUARES FOR THIS TABLE ARE GIVEN BY

$$X^{**2} = \frac{(N(1)-N(2)*NS(1)/NS(2))^{**2}}{N(2)*NS(1)/NS(2)} + \frac{(N(2)-N(1)*NS(2)/NS(1))^{**2}}{N(1)*NS(2)/NS(1)}$$

THE WHOLE FORMULA IS BASED ON THE SIMPLE NOTION THAT WE EXPECT ROUGHLY THE SAME PROPORTION OF A CHARACTERISTIC TO EXIST IN EACH SAMPLE. THE CHI-SQUARE TEST TELLS US HOW CLOSELY THE PROPORTIONS HAVE TO CORRESPOND TO PERMIT COMBINING THE SAMPLES WITHIN A CERTAIN DEGREE OF CONFIDENCE.

IN THE CASE THAT MORE THAN TWO SAMPLES ARE USED, THE PREVIOUS CHI-SQUARE FORMULA BECOMES

$$X^{**}2 = \sum_{I=1}^{K} \frac{(N(I)-NS(I)(RT-N(I))/(RTS-NS(I))^{**}2}{NS(I)(RT-N(I))/(RTS-NS(I))}$$

RT=SUM. N(I)

RTS=SUM. NS(I)

THE RESULTING CHI-SQUARE POSSESSES K-1 DEGREES OF FREEDOM. THE FORMULA MAY ALSO BE EXTENDED TO THE CASE OF MORE THAN ONE OBSERVATION PER SAMPLE...

$$X^{**}2 = \sum_{J=1}^{L} \sum_{I=1}^{K} \frac{(N(I,J)-NS(I,J)*(RT(J)-N(I,J)/(RTS(J)-NS(I,J))^{**}2}{NS(I,J)*(RT(J)-N(I,J)/((RTS(J)-NS(I,J))}$$

IN THIS CASE, THE RESULTING CHI-SQUARE HAS L(K-1) DEGREES OF FREEDOM. NOTE THAT IN EVERY CASE THE CHI-SQUARE FORMULA (O-E)**2/E IS USED, AND THAT ONLY THE FORMULA FOR E IS CHANGED.

FOR DETERMINATION OF DEGREES OF FREEDOM, SEE

STEEL AND TORRIE, PRINCIPLES AND PROCEDURES OF STATISTICS

PP. 365,375.

APPENDIX D

PROVENIENCE OF ILLUSTRATED MATERIALS

All sherd profiles are two-thirds actual size.

Plate XVI - Basal Angle Form Profiles - 1, Pit 12, Level 5; 2, Pit 15, Level 4; 3, Pit 13, Level 4; 4, Pit 7, Level 4; 5, Pit 13, Level 3; 6, Pit 14, Level 3; 7a, Pit 12, Level 5; 7b, Pit 13, Level 2; 8, Pit 11, Level 4; 9, Pit 12, Level 4.

Plate XVII - Basal Angle Form Profiles - 10, Pit 13, Level 7; 11, Pit 12, Level 3; 12a, Pit 12, Level 4; 12b, Pit 12, Level 5; 13, Pit 10, Level 3; 14a, Pit 13, Level 3; 14b, Pit 7, Level 3; 15a, Pit 14, Level 7; 15b, Pit 12, Level 4; 16a, Pit 7, Level 7, 16b, Pit 13, Level 6; 16c, Pit 15, Level 3; 17a, Pit 6, Level 5; 17b, Pit 6, Level 6; 18a, Pit 15, Level 3; 18b, Pit 11, Level 4; 19a, Pit 14, Level 3; 19b, Pit 7, Level 1; 20, Pit 12, Level 4; 21a, Pit 13, Level 4; 21b, Pit 12, Level 5; 22, Pit 12, Level 5.

Plate XVIII - Basal Angle Form Profiles - 23a, Pit 7, Level 7; 23b, Pit 6, Level 7; 24a, Pit 7, Level 7; 24b, Pit 12, Level 5; 25a, Pit 6, Level 5; 25b, Pit 14, Level 3; 26, Pit 11, Level 4; 27, Pit 12, Level 5; 28a, Pit 15, Level 5; 28b, Pit 11, Level 4; 29, Pit 13, Level 5; 30, Pit 7, Level 7; 31a, Pit 11, Level 4; 31b, Pit 15, Level 4; 32, not used; 33a, Pit 11, Level 3; 33b, Pit 14, Level 2; 34a, Pit 15, Level 3; 34b, Pit 13, Level 3; 35, Pit 12, Level 3; 36, Pit 14, Level 2; 37a, Pit 11, Level 5; 37b, Pit 13, Level 4; 38, Pit 13, Level 7.

Plate XIX - Basal Angle Form Profiles - 39a, Pit 15, Level 4; 39b, Pit 11, Level 4; 40, Pit 10, Level 4; 41, Pit 11, Level 5; 42a, Pit 15, Level 2; 42b, Pit 13, Level 5; 43, Pit 6, Level 2; 44a, Pit 13, Level 9; 44b, Pit 13, Level 2; 45a, Pit 13, Level 4; 45b, Pit 7, Level 4; 46a, Pit 15, Level 4; 46b, Pit 13, Level 3; 47a, Pit 7, Level 4; 47b, Pit 13, Level 5; 48, Pit 13, Level 3; 49a, Pit 14, Level 4; 49b, Pit 13, Level 5; 49c, Pit 12, Level 4; 50, Pit 13, Level 5; 51, Pit 12, Level 4; 52, Pit 14, Level 3; 53, Pit 14, Level 2; 54, Pit 7, Level 8; 55a, Pit 14, Level 3; 55b, Pit 13, Level 5; 56, Pit 12, Level 7; 57, Pit 14, Level 3.

Plate XX - Basal Angle Form Profiles - 58, Pit 14, Level 3; 59, Pit 12, Level 5; 60a, Pit 10, Level 4; 60b, Pit 13, Level 6; 61, Pit 7, Level 7; 62, Pit 12, Level 4; 63a, Pit 11, Level 4; 63b, Pit 12, Level 2; 64, Pit 14, Level 7; 65, Pit 15, Level 6; 66, Pit 13, Level 3; 67, not used; 68a, Pit 14, Level 3; 68b, Pit 7, Level 5; 69, Pit 6, Level 6; 70, Pit 10, Level 5; 71a, Pit 11, Level 3; 71b, Pit 14, Level 6; 72a, Pit 13, Level 4; 72b, Pit 10, Level 5; 73, Pit 12, Level 5; 74, Pit 12, Level 5; 75, Pit 6, Level 6; 76, Pit 6, Level 6; 77, Pit 15, Level 7.

Plate XXI - Basal Angle Form Profiles - 78, Pit 12, Level 4; 79a, Pit 10, Level 7; 79b, Pit 15, Level 5; 80, Pit 10, Level 6; 81, Pit 12, Level 4; 82, Pit 15, Level 4; 83a, Pit 7, Level 4; 83b, Pit 13, Level 3; 84, Pit 13, Level 4; 85, Pit 11, Level 5; 86a, Pit 14, Level 8; 86b, Pit 7, Level 7; 87a, Pit 14, Level 3; 87b, Pit 12, Level 3; 88a, Pit 7, Level 8; 88b, Pit 11, Level 6; 89, Pit 10, Level 7; 90a, Pit 15, Level 3; 90b, Pit 11, Level 5.

Plate XXII - Tecomate Rim Form Profiles - 1a, Pit 6, Level 5; 1b, Pit 10, Level 5; 1c, Pit 12, Level 4; 2a, Pit 14, Level 9; 2b, Pit 11, Level 4; 2c, Pit 15, Level 3; 3a, Pit 7, Level 5; 3b, Pit 7, Level 5; 4a, Pit 12, Level 4; 4b, Pit 13, Level 4; 5a, Pit 13, Level 5; 5b, Pit 14, Level 2; 6a, Pit 11, Level 4; 6b, Pit 7, Level 3; 6c, Pit 12, Level 5; 6d, Pit 15, Level 3; 7a, Pit 11, Level 4; 7b, Pit 12, Level 5; 8a, Pit 12, Level 4; 8b, Pit 12, Level 5; 9a, Pit 13, Level 4; 9b, Pit 12, Level 5; 10a, Pit 12, Level 5; 10b, Pit 11, Level 4; 10c, Pit 13, Level 5; 10d, Pit 6, Level 5; 11, Pit 6, Level 6; 12a, Pit 13, Level 4; 12b, Pit 10, Level 4; 12c, Pit 6, Level 6.

Plate XXIII - Tecomate Rim Form Profiles - 13a, Pit 11, Level 4; 13b, Pit 15, Level 5; 13c, Pit 10, Level 5; 13d, Pit 15, Level 4; 14, Pit 6, Level 6; 15a, Pit 6, Level 5; 15b, Pit 7, Level 4; 16a, Pit 7, Level 3; 16b, Pit 15, Level 4; 17a, Pit 12, Level 4; 17b, Pit 6, Level 5; 17c, Pit 15, Level 9; 18, Pit 15, Level 8; 19a, Pit 11, Level 4; 19b, Pit 15, Level 8; 20a, Pit 7, Level 4; 20b, Pit 12, Level 4; 21, Pit 6, Level 6; 22a, Pit 10, Level 7; 22b, Pit 6, Level 5; 23, Pit 6, Level 6, 24a, Pit 15, Level 5; 24b, Pit 14, Level 3; 24c, Pit 12, Level 8; 25a, Pit 6, Level 5; 25b, Pit 11, Level 3.

Plate XXIV - Tecomate Rim Form Profiles - 26, Pit 10, Level 3; 27, Pit 12, Level 2; 28, Pit 10, Level 4.

Plate XXV - Olla Rim Form Profiles - 1a, Pit 6, Level 6; 1b, Pit 15, Level 2; 2a, Pit 15, Level 5; 2b, Pit 14, Level 6; 3a, Pit 11, Level 5; 3b, Pit 10, Level 4; 4a, Pit 13, Level 2; 4b, Pit 13, Level 1; 5, Pit 13, Level 3; 6, Pit 11, Level 5; 7, Pit 11, Level 5, 8a, Pit 15, Level 2; 8b, Pit 15, Level 3; 9, Pit 12, Level 2; 10a, Pit 13, Level 3; 10b, Pit 13, Level 3; 11a, Pit 7, Level 2; 11b, Pit 11, Level 2; 12a, Pit 15, Level 3; 12b, Pit 13, Level 3; 13a, Pit 14, Level 3; 13b, Pit 13, Level 3.

Plate XXVI - Olla Rim Form Profiles - 14a, Pit 12, Level 3; 14b, Pit 14, Level 2; 15a, Pit 10, Level 3; 15b, Pit 14, Level 3; 16a, Pit 14, Level 7; 16b, Pit 7, Level 5; 17a, Pit 7, Level 2; 17b, Pit 15, Level 2; 18a, Pit 15, Level 3; 18b, Pit 12, Level 5; 19a, Pit 7, Level 5; 19b, Pit 15, Level 3; 19c, Pit 14, Level 3; 20a, Pit 14, Level 2; 20b, Pit 7, Level 4; 21a, Pit 13, Level 3; 21b, Pit 13, Level 3; 22, Not illustrated; 23a, Pit 10, Level 7; 23b, Pit 15, Level 3; 23c, Pit 14, Level 4.

Plate XXVII - Convex Bowl Rim Form Profiles - 1, Pit 15, Level 4; 2, Pit 10, Level 6; 3, Pit 15, Level 4; 4, Pit 15, Level 3; 5, Pit 15, Level 3; 6, Pit 15, Level 3; 7, Pit 7, Level 8; 8, Pit 7, Level 4; 9, Pit 12, Level 1; 10a, Pit 15, Level 4; 10b, Pit 15, Level 4; 11, Pit 12, Level 5; 12, Pit 13, Level 4; 13, Pit 12, Level 4; 14, Pit 7, Level 7; 15a, Pit 7, Level 4; 15b, Pit 12, Level 4.

Plate XXVIII - Convex Bowl Rim Form Profiles - 16, Pit 13, Level 6; 17, Pit 11, Level 3; 18 - 25, Not used; 26, Pit 15, Level 2; 27, Pit 13, Level 5; 28, Pit 13, Level 3; 29, Pit 15, Level 3; 30, Pit 10, Level 3; 31a, Pit 12, Level 4; 31b, Pit 15, Level 3; 32, Pit 13, Level 3; 33 - 50, Not used; 51, Pit 12, Level 6; 52a, Pit 14, Level 2; 52b, Pit 6, Level 4.

Plate XXIX - Convex Bowl Rim Form Profiles - 53a, Pit 15, Level 5; 53b, Pit 12, Level 4; 54a, Pit 12, Level 4; 54b, Pit 7, Level 9; 55, Pit 7, Level 4; 56, Pit 12, Level 3; 57, Pit 10, Level 6; 58a, Pit 12, Level 3; 58b, Pit 12, Level 4; 59, Pit 11, Level 5; 60a, Pit 13, Level 6; 60b, Pit 12, Level 6; 61, Pit 6, Level 3; 62a, Pit 13, Level 4; 62b, Pit 14, Level 5; 63, Pit 10, Level 4; 64a, Pit 11, Level 4; 64b, Pit 12, Level 2; 65, Pit 12, Level 4; 66, Pit 15, Level 7; 67a, Pit 14, Level 8; 67b, Pit 6, Level 3; 68, Pit 7, Level 3.

Plate XXX - Convex Bowl Rim Form Profiles - 69, Pit 15, Level 4; 70, Pit 14, Level 3; 71a, Pit 13, Level 2; 71b, Pit 12, Level 5; 72, Pit 13, Level 4; 73, Pit 15, Level 8 (with Basal Angle Form 26); 74, Pit 13, Level 5; 75a, Pit 14, Level 3; 75b, Pit 12, Level 4; 76, Pit 12, Level 5; 77a, Pit 12, Level 3; 77b, Pit 6, Level 1; 78a, Pit 13, Level 3; 78b, Pit 13, Level 4; 79, Pit 7, Level 8 (with Basal Angle Form 88); 80, Pit 14, Level 4; 81a, Pit 14, Level 3; 81b, Pit 12, Level 4; 82, Pit 12, Level 4; 83a, Pit 7, Level 5; 83b, Pit 13, Level 6; 84a, Pit 7, Level 3; 84b, Pit 15, Level 2; 85a, Pit 14, Level 3; 85b, Pit 14, Level 3; 86a, Pit 7, Level 1; 86b, Pit 6, Level 5.

Plate XXXI - Convex Bowl Rim Form Profiles - 87, Pit 10, Level 6; 88 - 100, No used; 101a, Pit 14, Level 3; 101b, Pit 10, Level 1; 102a, Pit 10, Level 5; 102b, Pit 12, Level 4; 103, Pit 13, Level 5; 104a, Pit 14, Level 3; 104b, Pit 11, Level 4; 104c, Pit 12, Level 5; 105, Pit 15, Level 1; 106, Pit 13, Level 4; 107a, Pit 13, Level 5; 107b, Pit 14, Level 3; 108, Pit 14, Level 7; 109a, Pit 6, Level 5; 109b, Pit 14, Level 3; 110, Pit 6, Level 5; 111, Pit 12, Level 5; 112a, Pit 14, Level 5; 112b, Pit 7, Level 9.

Plate XXXII - Convex Bowl Rim Form Profiles - 113, Pit 7, Level 7; 114, Pit 14, Level 3; 115a, Pit 6, Level 6; 115b, Pit 15, Level 7; 116, Pit 14, Level 8; 117, Pit 13, Level 7; 118a, Pit 7, Level 6; 118b, Pit 12, Level 1; 118c, Pit 6, Level 5; 119a, Pit 12, Level 3; 119b, Pit 6, Level 4; 120, Pit 15, Level 7.

Plate XXXIII - Concave Bowl Rim Form Profiles - 1a, Pit 6, Level 6; 1b, Pit 14, Level 3; 2a, Pit 12, Level 5; 2b, Pit 14, Level 6; 3a, Pit 13, Level 6; 3b, Pit 6, Level 6; 4a, Pit 6, Level 7; 4b, Pit 14, Level 4; 5a, Pit 14, Level 2; 5b, Pit 12, Level 5; 6a, Pit 13, Level 4; 6b, Pit 10, Level 6; 7a, Pit 7, Level 4; 7b, Pit 15, Level 3; 8a, Pit 6, Level 5; 8b, Pit 11, Level 4; 9a, Pit 6, Level 5; 9b, Pit 14, Level 3; 10, Pit 7, Level 7; 11, Pit 13, Level 6.

Plate XXXIV - Concave Bowl Rim Form Profiles - 12, Pit 7, Level 3; 13a, Pit 15, Level 2; 13b, Pit 12, Level 4; 14a, Pit 13, Level 6; 14b, Pit 14, Level 3; 15, Pit 15, Level 3; 16a, Pit 11, Level 4; 16b, Pit 12, Level 6; 17a, Pit 6, Level 6; 17b, Pit 14, Level 7; 18, Pit 11, Level 5; 19, Pit 11, Level 4; 20, Pit 10, Level 6; 21, Pit 13, Level 4; 22, Pit 12, Level 4; 23, Pit 14, Level 3; 24, Pit 7, Level 4; 25, Pit 14, Level 8; 26, Pit 13, Level 2; 27, Pit 12, Level 3; 28a, Pit 15, Level 3; 28b, Pit 7, Level 6; 29a, Pit 11, Level 4 (with Basal Angle Form 68); 29b, Pit 10, Level 4 (with Basal Angle Form 68).

Plate XXXV - Concave Bowl Rim Form Profiles - 30, Pit 12, Level 3 (with Basal Angle Form 58); 31a, Pit 7, Level 3; 31b, Pit 7, Level 6; 32, Pit 13, Level 3 (with Basal Angle Form 89); 33a, Pit 7, Level 4 (with Basal Angle Form 50); 33b, Pit 7, Level 2; 34a, Pit 13, Level 3 (with Basal Angle Form 29); 34b, Pit 13, Level 3 (with Basal Angle Form 29); 35 - 50, No used; 51a, Pit 6, Level 5; 51b, Pit 14, Level 4; 52, Pit 13, Level 9; 53, Pit 12, Level 4; 54, Pit 7, Level 6; 55a, Pit 7, Level 7; 55b, Pit 6, Level 6; 56a, Pit 6, Level 6; 56b, Pit 13, Level 3; 56c, Pit 6, Level 6; 57a, Pit 15, Level 6; 57b, Pit 12, Level 4.

Plate XXXVI - Concave Bowl Rim Form Profiles - 58, Pit 15, Level 5; 59, Pit 11, Level 1; 60, Pit 10, Level 5; 61a, Pit 14, Level 7; 61b, Pit 7, Level 6; 62, Pit 14, Level 3; 63a, Pit 12, Level 4; 63b, Pit 6, Level 5; 64a, Pit 12, Level 3; 64b, Pit 7, Level 4; 65a, Pit 7, Level 6; 65b, Pit 7, Level 4; 66a, Pit 14, Level 4; 66b, Pit 14, Level 4; 66c, Pit 14, Level 5; 67a, Pit 7, Level 5; 67b, Pit 15, Level 3; 68a, Pit 6, Level 8; 68b, Pit 14, Level 5; 69a, Pit 7, Level 8; 69b, Pit 11, Level 4; 70a, Pit 7, Level 8; 70b, Pit 14, Level 4.

Plate XXXVII - Concave Bowl Rim Form Profiles - 71a, Pit 14, Level 3; 71b, Pit 6, Level 6; 72a, Pit 12, Level 6; 72b, Pit 7, Level 3; 73a, Pit 6, Level 6; 73b, Pit 10, Level 6; 74, Pit 15, Level 5; 75a, Pit 15, Level 4; 75b, Pit 11, Level 4; 76, Pit 15, Level

3; 77, Pit 15, Level 4; 78, Pit 13, Level 4; 79, Pit 14, Level 2; 80a, Pit 14, Level 3; 80b, Pit 11, Level 4; 81a, Pit 13, Level 2 (with Basal Angle Form 29); 81b, Pit 12, Level 4; 81c, Pit 13, Level 8; 82a, Pit 13, Level 2 (with Basal Angle Form 50); 82b, Pit 15, Level 3 (with Basal Angle Form 48); 83a, Pit 12, Level 3 (with Basal Angle Form 48); 83b, Pit 13, Level 3 (with Basal Angle Form 48; 84a, Pit 13, Level 4 (with Basal Angle Form 50); 84b, Pit 13, Level 2 (with Basal Angle Form 48).

Plate XXXVIII - Concave Bowl Rim Form Profiles - 85a, Pit 13, Level 3 (with Basal Angle Form 47); 85b, Pit 12, Level 3; 86a, Pit 15, Level 3 (with Basal Angle Form 48); 86b, Pit 15, Level 3; 87a, Pit 12, Level 4 (with Basal Angle Form 47); 87b, Pit 14, Level 3 (with Basal Angle Form 47); 88a, Pit 14, Level 4; 88b, Pit 13, Level 3; 89, Pit 7, Level 4; 90, Pit 11, Level 6 (with Basal Angle Form 23); 91a, Pit 12, Level 5 (with Basal Angle Form 59); 91b, Pit 6, Level 5 (with Basal Angle Form 59); 92, Pit 7, Level 6 (with Basal Angle Form 87); 93a, Pit 10, Level 7 (with Basal Angle Form 25); 93b, Pit 7, Level 6 (with Basal Angle Form 88); 94, Pit 11, Level 5 (with Basal Angle Form 87); 95a, Pit 14, Level 3; 95b, Pit 7, Level 6; 96, Pit 6, Level 6 (with Basal Angle Form 64); 97a, Pit 6, Level 5; 97b, Pit 10, Level 3; 98a, Pit 15, Level 8; 98b, Pit 7, Level 4; 99, Pit 11, Level 6; 100, No used; 101, Pit 15, Level 2; 102, Pit 12, Level 5.

Plate XXXIX - Concave Bowl Rim Form Profiles - 103, Pit 10, Level 4; 104, Pit 14, Level 3; 105, Pit 11, Level 1; 106, Pit 12, Level 5; 107, No used; 108a, Pit 12, Level 6; 108b, Pit 15, Level 6; 109, Pit 11, Level 4; 110, Pit 13, Level 5; 111, Pit 14, Level 8; 112, Pit 13, Level 3; 113a, Pit 15, Level 6; 113b, Pit 7, Level 4; 114a, Pit 7, Level 3 (with Basal Angle Form 68); 114b, Pit 7, Level 6; 115a, Pit 14, Level 3 (with Basal Angle Form 68); 115b, Pit 14, Level 2; 116a, Pit 10, Level 3; 116b, Pit 14, Level 3; 117, Pit 10, Level 3 (with Basal Angle Form 48); 118, Pit 14, Level 3; 119a, Pit 10, Level 2; 119b, Pit 14, Level 3; 120a, Pit 15, Level 6; 120b, Pit 13, Level 3.

Plate XL - Everted Rim Form Profiles - 1, Pit 14, Level 2; 2, Pit 7, Level 2; 3, Pit 12, Level 3; 4, Pit 12, Level 4; 5, Pit 15, Level 3; 6, Pit 13, Level 7; 7, Pit 7, Level 8; 8, Pit 12, Level 4; 9, Pit 6, Level 5; 10a, Pit 7, Level 4; 10b, Pit 14, Level 2; 11, Pit 13, Level 6; 12, Pit 11, Level 3; 13, Pit 10, Level 8; 14, Pit 7, Level 8; 15, Pit 10, Level 7; 16, Pit 10, Level 3; 17, Pit 13, Level 6; 18, Pit 12, Level 5; 19, Pit 12, Level 5; 20, Pit 13, Level 5.

Plate XLI - Everted Rim Form Profiles - 21, Pit 14, Level 5; 22, Pit 10, Level 3; 23, Pit 15, Level 3; 24, Pit 10, Level 7; 25, Pit 13, Level 3; 26, Pit 11, Level 2; 27, Pit 7, Level 5; 28, Pit 12, Level 5; 29, Pit 10, Level 3; 30, Pit 10, Level 4; 31, Pit 14, Level 3; 32, Pit 7, Level 3; 33a, Pit 7, Level 2; 33b, Pit 14, Level 2; 34, Pit 12, Level 4 (with Basal Angle Form 49); 35a, Pit 7, Level 4; 35b, Pit 13, Level 4; 36, Pit 15, Level 5; 37a, Pit 12, Level 5; 37b, Pit 10, Level 4; 38, Pit 13, Level 5; 39a, Pit 14, Level 2 (with Basal Angle Form 29); 39b, Pit 14, Level 3; 40, Pit 12, Level 4.

Plate XLII - Everted Rim Form Profiles - 41, Pit 11, Level 4; 42, Pit 14, Level 3 (with Basal Angle Form 29); 43, Pit 14, Level 2; 44a, Pit 13, Level 5; 44b, Pit 15, Level 5; 45a, Pit 6, Level 4; 45b, Pit 7, Level 5; 46, Pit 13, Level 5; 47, Pit 15, Level 3; 48a, Pit 12, Level 4 (with Basal Angle Form 53); 48b, Pit 12, Level 4 (with Basal Angle Form 49); 49, Pit 12, Level 9 (with Basal Angle Form 48); 50, Pit 13, Level 2; 51a, Pit 7, Level 4; 51b, Pit 13, Level 3; 52a, Pit 11, Level 5; 52b, Pit 10, Level 5; 53a, Pit 15, Level 2; 53b, Pit 6, Level 3; 54, Pit 15, Level 4; 55a, Pit 7, Level 2; 55b, Pit 13, Level 2; 56, Pit 13, Level 3 (with Basal Angle Form 42); 57a, Pit 7, Level 7; 57b, Pit 6, Level 6; 58, Pit 13, Level 4.

Plate LXI - Figurines - A through D are approximately three-fourths and E, F and G are approximately one and one-third actual size. A, Pit 7, Level 8; B, Pit 12, Level 5; C, Pit 11, Level 5; D, Pit 14, Level 8; E, Pit 15, Level 1, F, Pit 14, Level 2; G, Pit 10, Level 2.

Plate LXII - Figurines - Left to right, First Row, Pit 10, Level 7; Pit 12, Level 4; Pit 15, Level 5. Second Row, Pit 6, Level 5; Pit 12, Level 4; Pit 14, Level 3. Third Row, Pit 13, Level 2; Pit 14, Level 3; Pit 14, Level 3; Pit 6, Level 1. Fourth Row, Pit 15, Level 2; Pit 10, Level 6; Sipolite Surface. Fifth Row, Pit 12, Level 4; Pit 6, Level 6; Pit 6, Level 7. Sixth Row, Pit 3, Level 3; Pit 11, Level 5.

Plate LXIII - Figurines - First Row, Pit 15, Level 7; Sipolite Surface; Pit 3, Level 2; Pit 10, Level 5. Second Row, Pit 11, Level 5; Pit 13, Level 5; Pit 13, Level 5; Pit 11, Level 4; Pit 15, Level 8. Third Row, Pit 13, Level 5; Pit 7, Level 2; Pit 13, Level 5; Pit 6, Level 5; Pit 7, Level 4. Fourth Row, Pit 14, Level 3; Sipolite Surface; Sipolite Surface.

Plate LXIV - Figurines - All are approximately three-fourths actual size. A, Pit 14, Level 7; B, Pit 12, Level 4; C, Pit 7, Level 4; D, Pit 13, Level 7; E, Pit 3, Level 4; F, Pit 13, Level 7.

Plate LXV - Figurines - All are approximately actual size. For both photographs, left to right, Sipolite Surface; Sipolite Surface; Pit 11, Level 3.

Plate LXVI - Figurines - First Row, Sipolite Surface; Pit 12, Level 3; Pit 15, Level 2. Second Row, Sipolite Surface; Pit 7, Level 3; Pit 14, Level 3. Third Row, all Anclero surface.

Plate LXVII - Figurines - All approximately three-fourths actual size. A, Sipolite Surface; B, Pit 12, Level 3; C, Pit 7, Level 3; D, Pit 13, Level 4; E, Pit 13, Level 4; F, Pit 14, Level 3; G, Pit 14, Level 2.

Plate LXVIII - Figurines - All approximately three-fourths actual size except for D which is four-fifths. A, Pit 6, Level 3; B, Pit 12, Level 2; C, Pit 15, Level 3; D, Pit 14, Level 3; E, Pit 3, Level 2; F, Anclero Surface.

Plate LXIX - Figurines - both are approximately four-fifths actual size. A, Pit 11, Level 4; B, Pit 10, Level 4.

Plate LXX - Figurines - All approximately three-fourths actual size. A, Sipolite Surface; B, Pit 13, Level 3; C, Pit 10, Level 1; D, Sipolite Surface; E, Sipolite Surface; F, Anclero Surface.

Plate LXXI - Miscellaneous ceramic objects - First Row, left to right, Pit 7, Level 3; Pit 15, Level 5; Pit 7, Level 1; Sipolite Surface. Second Row, Pit 11, Level 6; Pit 14, Level 3; Pit 6, Level 6; Pit 6, Level 6. Third Row, Pit 12, Level 3; Pit 14, Level 3; Pit 15, Level 3. Fourth Row, Pit 6, Level 6; Sipolite Surface; Pit 10, Level 4.

Plate LXXII - Miscellaneous ceramic objects - First Row, left to right, Pit 10, Level 4; Pit 10, Level 3; Pit 15, Level 4. Second Row, Pit 11, Level 1; Pit 13, Level 2; Pit 11, Level 6; Pit 15, Level 7; Pit 12, Level 7. Third Row, Pit 6, Level 3; Pit 15, Level 3; Sipolite Surface; Pit 13, Level 6. Fourth Row, Sipolite Surface; Pit 15, Level 2; Pit 11, Level 6.

Plate LXXIII - Miscellaneous ceramic objects - First Row, left to right, Pit 14, Level 2; Pit 15, Level 4; Pit 15, Level 3; Sipolite Surface. Second Row, Pit 15, Level 2; Pit 6, Level 4; Pit 11, Level 4; Pit 14, Level 3; Pit 14, Level 4; Pit 10, Level 5. Third Row, Sipolite Surface; Pit 12, Level 4; Sipolite Surface; Pit 14, Level 4.

BIBLIOGRAPHY

Arnold, J. R. and W. F. Libby. "Radiocarbon dates," Science, Vol. CXIII (1951).

Barba de Piña Chán, Beatríz. "Tlapacoya, un sitio preclásico de transición," Acta Anthropológica. Epoca 2, Vol. I, Núm. 1. México: Escuela Nacional de Antropologia e Historia, 1956.

Barlow, Robert. "Extent of the empire of the Culhua Mexico," Ibero-Americana, Vol. XXVIII. Berkeley: University of California.

Bender, Margaret M., Reid A. Bryson and Davia A. Baerreis. "University of Wisconsin Radiocarbon Dates I," Radiocarbon, Vol. VII (1965), 399-407.

Bennett, Wendell C. The Gallinazo Group, Viru Valley, Peru. Yale University Publications in Anthropology No. 43. New Haven, 1950.

Berlin, Heinrich. Fragmentos Desconocidos del Codicé de Yanhuitlán. México: Antigua Libreria Robredo de Jose Purrua e Hijos, 1947.

_____. "Late pottery horizons of Tabasco, Mexico," Contributions to American Anthropology and History, Vol. XII, No. 59. Carnegie Institution of Washington Publication 606. Washington, D. C.: U. S. Government Printing Office, 1956.

Bernal, Ignacio. "La cerámica preclásica de Monte Albán," Microfilm copy of unpublished M. A. thesis, Escuela Nacional de Antropologia e Historia, 1946.

_____. "Monte Albán and the Zapotecs," Boletín del Centro de Estudios Oaxaqueños, Núm. 1. Oaxaca: Mexico City College, 1958, 1-13.

Bevan, Bernard. "Travels with a donkey in Mexico," The National Geographic Magazine, Vol. LXVI, No. 6 (1934), 757-788.

Boas, Franz. "El dialecto Mexicano de Pochutla, Oaxaca," International Journal of American Linguistics, Vol. I, No. 1. (July, 1917).

Borah, Woodrow. "Early colonial trade navigation between Mexico and Peru," Ibero-Americana, Vol. XXXVIII. Berkeley: University of California Press, 1954.

Borgatta, Edgar F. "Some comments on methodological developments in the last quarter-century," The Sociological Quarterly, Vol. IV, No. 4. (October, 1962).

Brainerd, George W. "Fine Orange pottery in Yucatan," Revista Mexicana de Estudios Anthropológicos, Tomo V, Núms. 2-3. México: Sociedad Mexicana de Antropologia, 1941.

_____. "The archaeological ceramics of Yucatan," Anthropological Records, Vol. XIX. Berkeley: University of California Press, 1958.

Brockington, Donald L. "A brief report on an archaeological survey of the Oaxacan Coast," Mesoamerican Notes, No. 5. Mexico: Mexico City College, 1957, 98-105.

_____. "Piedra Parada: A comparative study of a site in Jamiltepec, Oaxaca." Unpublished M. A. thesis, Mexico City College, 1957.

_____. "A prolongation of the Preclassic period indicated by the ceramics of Santa Rosa, Chiapas," Los Mayas del Sur y sus Relaciones con los Nahuas Meridionales. México: Sociedad Mexicana de Antropologia, 1961, 85-92.

Brown, J. A. and L. G. Freeman. "A Univac analysis of sherd frequencies from Carter Ranch pueblo," American Antiquity, Vol. XXX, No. 2 (October, 1964), 162-167.

Brush, Charles F. "Pox pottery: earliest identified Mexican ceramic," Science, Vol. CXLIX, No. 3680 (9 July 1965), 194-195.

Cardos de Mendéz, Amalia. "El comércio de los Mayas antiguos," Acta Anthropologica, Epoca 2, Vol. II, Núm. 1. México: Escuela Nacional de Antropologia e Historia, 1959.

Caso, Alfonso. "Las relaciones de Ixtlahuaca, Tehuantepec, Coatzacoalco, Cozuatepec, Peñoles e Iztepec," Revista Mexicana de Estudios Históricos, Tomo II, Núm. 5 (1928), 133-164.

Coe, Michael D. La Victoria: An Early Site on the Pacific Coast of Guatemala. Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, Vol. LIII. Cambridge, 1961.

Cole, Fay-Cooper and Thorne Deuel. Rediscovering Illinois. Chicago, 1937.

Conzatti, C. Las Regiones Botánico-geográficas del Estado de Oaxaca, IV Congreso Botánico Internacional. Oaxaca, 1926.

Cortes, Hernando. Five Letters: 1519-1526. J. B. Morris, translator. New York, 1929.

Cruxent, J. M. and Irving Rouse. An Archaeological Chronology of Venezuela, Vol. II. Social Science Monographs, VI. Washington, D. C.: Pan America Union, 1959.

Dahlgren de Jordan, Bárbara. La Mixteca. México: Imprenta Universitaria, 1954.

DeCicco, Gabriel y Donald Brockington. Reconocimiento Arqueológico en el Suroeste de Oaxaca. Informe Núm. 6 de la Dirección de Monumentos Prehispánicos. Traducción por Eduardo Noguera. México: Instituto Nacional de Antropologia e Historia, 1956.

Deetz, James J. F. "An archaeological approach to kinship change in eighteenth century Arikara culture." Unpublished Ph.d. dissertation, Harvard University, 1960.

_____. The Dynamics of Stylistic Changes in Arikara Ceramics. Illinois Studies in Anthropology No. 4. Urbana: University of Illinois Press, 1965.

Delgado, Agustín. "La sequencia arqueológica en el de Tehuantepec," Los Mayas del Sur y Sus Relaciones con los Nahuas Meridionales. México: Sociedad Mexicana de Antropologia, 1961, pp. 93-104.

del Paso y Troncoso, Francisco. Suma de Visitas, Papeles de Nueva España. Segunda serie, Tomo I. Madrid, 1905.

_____. Relaciones Geográficas de la Diócesis de Oaxaca, Papeles de Nueva España. Segunda serie, Tomo IV. Madrid, 1905.

Dixon, Keith A. Ceramics from Two Preclassic Periods at Chiapa de Corzo, Chiapas, Mexico. Papers of the New World Archaeological Foundation No. 5. Orinda, 1959.

Downie, N. M. and R. W. Heath. Basic Statistical Method. New York: Harper and Brothers, 1959.

Drucker, Philip. Ceramic Sequences at Tres Zapotes, Veracruz, Mexico. Bureau of American Ethnology Bulletin 140. Washington, D. C.: U. S. Government Printing Office, 1943.

_____. Ceramic Stratigraphy at Cerro de la Mesas, Veracruz, Mexico. Bureau of American Ethnology Bulletin 141. Washington, D. C.: U. S. Government Printing Office, 1943.

_____. La Venta, Tabasco: A Study of Olmec Ceramics and Art. Bureau of American Ethnology Bulletin 153. Washington, D. C.: U. S. Government Printing Office, 1952.

Duncan, Otis D. and Beverly Duncan. "Residential distribution and occupational stratification," in Cities and Society, P. K. Hatt and A. J. Reiss, Jr., editors. Glencoe: The Free Press, 1957, pp. 283-296.

Ekholm, Gordon F. Excavations at Tampico and Panuco in the Huasteca, Mexico. Anthropological Papers of the American Museum of Natural History, Vol. XXXVIII, Part 5. New York, 1944.

El Atlas Arqueológico de la República Mexicana. Instituto Panamericano de Geografía e Historia Publicación Núm. 41. México, 1939.

Emmerich, Andre. Art Before Columbus. New York: Simon and Schuster, 1963.

Encisco, Jorge. Design Motifs of Ancient Mexico. New York, 1953.

Enriques, Martin. "Letter to the Viceroy of Peru," in New Light on Drake. Zelia Nuttall, editor. Second series. Vol. XXXIV. Cambridge: The Hakluyt Society, 1914.

Ferdon, Edwin N. Jr., "Agricultural potential and the development of cultures," Southwestern Journal of Anthropology, Vol. XV, No. 1 (Spring, 1959), 1-19.

Fernández de Miranda, Maria Teresa, Mauricio Swadesh y Roberto J. Weitlaner. "El panorama etno-linguístico de Oaxaca y el Istmo," Revista Mexicana de Estudios Antropológicos, Tomo XVI. México: Sociedad Mexicana de Antropologia, 1960.

Ford, James A. "The type concept revisited," American Anthropologist, n.s., Vol. LVI, No. 1 (February, 1954), 42-54.

Forster, James R. "Notas sobre la arqueología de Tehuantepec," Anales del Instituto Nacional de Antropologia e Historia, Tomo VII. México, 1955, 77-100.

Foster, George M. "Archaeological implications of the modern pottery of Acatlan, Puebla, Mexico," American Antiquity, Vol. XXVI, No. 2 (October, 1960), 205-214.

Gage, Thomas. A New Survey of the West Indies. Third edition. London, 1677.

Gamio, Manuel. "The sequences of cultures in Mexico," American Anthropologist, n.s., Vol. XXVI, No. 3 (July-September, 1924), 307-322.

Gerhard, Peter. Pirates on the West Coast of New Spain, 1575-1742. Glendale: Arthur H. Clark Co., 1959.

_____. "Emperors' dye of the Mixtecas," Natural History, Vol. LXIII, No. 1 (January, 1964), 26-31.

Haberland, Wolfgang. "Ceramic sequences in El Salvador," American Antiquity, Vol. XXVI, No. 1 (July, 1960), 21-29.

Haury, Emil, Chairman. "An archaeological approach to the study of cultural stability," Seminars in Archaeology: 1955. Robert Wauchope, editor. Memoirs of the Society of American Archaeology, No. 11. (October, 1956), 31-57.

Hendrichs Perez, Pedo R. Por Tierras Ignotas. Tomo I. México: Editorial Cultura, 1945.

Huxley, Aldous. Beyond the Mexique Bay. London: Chatto and Windus, 1949.

Iturribarría, Jorge Fernando. Oaxaca en la Historia. México, 1955.

Ixtlilxochitl, don Fernando de Alva. Obras Historicas. Tomo I. México: Alfredo Chavero, 1952.

Joyce, Thomas A. Mexican Archaeology. London, 1920.

_____. Central American and West Indian Archaeology. London, 1926.

Keen, A. Myra. Sea Shells of Tropical West America. Palo Alto: Stanford University Press, 1958.

Kidder, Alfred V. The Artifacts of Uaxactun, Guatemala. Carnegie Institution of Washington Publication 576. Washington, D. C.: U. S. Government Printing Office, 1947.

Kidder, Alfred V., Jesse D. Jennings and Edwin M. Shook. Excavations at Kaminaljuyu, Guatemala. Carnegie Institution of Washington Publication 561. Washington, D. C.: U. S. Government Printing Office, 1946.

Labovitz, Sanford I. "Technology and division of labor." Unpublished Ph.d. dissertation, University of Texas, 1963.

Leigh, Howard. "Head shrinking in ancient Mexico," Science of Man, Vol. I, No. 5 (December, 1961), 4-7.

Lister, Robert H. Excavations at Cojumatlan, Michoacan, Mexico. University of New Mexico Publications in Anthropology No. 5. Albuquerque, 1949.

Lothrop, Samuel K. Pottery of Costa Rica and Nicaragua. Vol. I. New York: Museum of the American Indian, Heye Foundation, 1926.

Lowe, Gareth. Archaeological Exploration of the Upper Grijalva Valley, Chiapas, Mexico. Papers of the New World Archaeological Foundation No. 2. Orinda, 1959.

_____. "Algunos resultados de la temporada 1961 en Chiapa de Corzo, Chiapas," Estudios de la Cultura Maya, Vol. II. México, 1962, 185-196.

Lowie, Robert H. The History of Ethnological Theory. New York: Holt, Rinehart and Winston, 1937.

MacNeish, Richard S. "An early archaeological site near Panuco, Vera Cruz," Transactions of the American Philosophical Society, Vol. XLIV, Part 5. Philadelphia, 1954.

Maldonado-Koerell, Manual. "Geohistory and paleogeography of Middle America," Handbook of Middle American Indians, Vol. I. Robert C. West, editor. Austin: University of Texas Press, 1964, 3-32.

Martínez Gracida, Manuel. Colección de 'Cuadros Sinópticos' de los Pueblos, Haciendas y Ranchos del Estado Libre y Soberano de Oaxaca. Oaxaca, 1883.

Medellín Zenil, Alfonso and Frederick A. Peterson. "A smiling head complex from central Veracruz, Mexico," American Antiquity, Vol. XX, No. 2 (October, 1954), 162-169.

Merwin, Raymond E. and George C. Vaillant. The Ruins of Holmul, Guatemala. Memoirs of the Peabody Museum of Archaeology and Ethnology, Harvard University, Vol. III, No. 2. Cambridge, 1932.

Morley, Sylvanus G. The Ancient Maya. Palo Alto: Standford University Press, 1947.

Navarrete, Carlos. Explorations at San Agustin, Chiapas, Mexico. Papers of the New World Archaeological Foundation No. 3. Orinda, 1959.

_____. Archaeological Explorations in the Region of the Frailesca, Chiapas, Mexico. Papers of the New World Archaeological Foundation No. 7. Orinda, 1960.

Nero, Robert. "Primary flake implements," The Wisconsin Archaeologist, Vol. XLIX, No. 2 (June, 1948), 23-27.

Nicholson, H. B. "The use of the term 'Mixtec' in Mesoamerican archaeology," American Antiquity, Vol. XXVI, No. 3 (January, 1961), 431-433.

"Notes and News," American Antiquity, Vol. XXVI, No. 4 (April, 1961), 597.

"Notes and News," American Antiquity, Vol. XXVII, No. 4 (April, 1962), 621.

Nuttall, Zelia. "A curious survival in Mexico of the use of the Purpura shell-fish for dyeing," Putnam Anniversary Volume, Anthropological Essays. New York, 1909.

Parsons, Lee A. "Archaeological research at Bilbao," Lore, Vol. XV, No. 3, Milwaukee Public Museum (Summer, 1965), 89-96.

Pendergast, David M. "Metal artifacts in prehispanic Mesoamerica," American Antiquity, Vol. XXVII, No. 4 (April, 1962), 520-545.

Peterson, Frederick A. Some Ceramics from Mirador, Chiapas, Mexico. Papers of the New World Archaeological Foundation No. 15. Provo, 1963.

Piña Chán, Román. "Hallazgos arquelógicos en tierras de Oaxaca," Tlatoani. Núm. 8-9 (1954), 31-33.

_____. Chalcatzingo, Morelos. Dirección de Monumentos Prehispánicos. México: Instituto Nacional de Antropologia e Historia, 1955.

_____. Tlatilco. Vol. I. México: Instituto Nacional de Antropologia e Historia, 1958.

_____. "Algunos sitios arqueológicos de Oaxaca y Guerrero," Revista Mexicana de Estudios Antropológicos, Tomo XVI. México: Sociedad Mexicana de Antropologia, 1960, 65-76.

Porter, Muriel Noe. "Excavations at Chupícuaro, Guanajuato, Mexico," Transactions of the American Philosophical Society. n.s., Vol. XLVI, Part 5. Philadelphia, 1956.

Rands, Robert L. "Elaboration and invention in ceramic traditions," American Antiquity, Vol. XXVI, No. 3 (January, 1961), 331-340.

Rands, Robert L. and Barbara C. Rands. "The ceramic position of Palenque, Chiapas," American Antiquity, Vol. XXIII, No. 2 (Ocotober, 1957), 140-150.

Relaciones Topográficas de Pueblos de México. Vol. I, MS. 2449 (cf. Pax, Catálogo, #465). Madrid: Biblioteca Nacional, 1789.

Ricketson, Edith B. "Part II: the artifacts," Uaxactun, Guatemala. Group E - 1926-31. Carnegie Institution of Washington Publication 477. Washington, D. C.: U. S. Government Printing Office, 1937.

Ridgway, Robert. Color Standards and Color Nomenclature. Washington, 1912.

Rootenberg, S. "Archaeological field sampling," American Antiquity, Vol. XXX, No. 2 (October, 1964), 181-188.

Rosenthal, Jane Powell. "Exploring ancient Guerrero," The Brooklyn Museum Annual I-II, 1960-62. New York, 1963.

Rouse, Irving. Prehistory in Haiti: A Study in Method. Yale University Publications in Anthropology No. 21. New Haven: Yale University Press, 1939.

Rowe, John Howland. "Stratigraphy and seriation," American Antiquity, Vol. XXVI, No. 3 (January, 1961), 324-330.

Ruz Lhuillier, Alberto. "Campeche en la arqueología Maya," Acta Anthropológica, Vol. I, Núms. 2-3. México: Escuela Nacional de Antropología e Historia, 1945.

Sáenz, César A. "Tres estelas en Xochicalco," Revista Mexicana de Estudios Antropológicos, Tomo XVI. México: Sociedad Mexicana de Antropología, 1961, 39-64.

_____. "Exploraciones en la pirámide de las serpientes enplumadas, Xochicalco," Revista Mexicana de Estudios Antropológicos, Tomo XIX. México: Sociedad Mexicana de Antropología, 1963, 7-23.

Santamaría, Francisco J. Diccionario de Mejicanismos. México: Editoral Porrua, S. A., 1959.

Shepard, Anna O. Rio Grande Glaze Paint Ware. Contributions to American Anthropology and History, No. 39, Carnegie Institution of Washington Publication 528. Washington, D. C.: U. S. Government Printing Office, 1942.

_____. Ceramics for the Archaeologist. Carnegie Institution of Washington Publication 609. Washington, D. C.: U. S. Government Printing Office, 1961.

Smith, A. Ledyard. "The corbeled arch in the New World," in The Maya and Their Neighbors. New York, 1962.

Smith, Robert E. Ceramic Sequence at Uaxactun, Guatemala. Middle American Research Institute Publication 20. 2 Vols. New Orleans: The Tulane University, 1955.

Smith, Robert E., Gordon R. Willey and James C. Gifford. "The type-variety concept as a basis for the analysis of Maya pottery," American Antiquity, Vol. XXV, No. 3 (January, 1960), 330-340.

Sorenson, John L. "A chronological ordering of the Mesoamerican Pre-Classic," Middle American Research Records, Vol. II, No. 3. New Orleans: The Tulane University, 1955.

Spaulding, Albert C. "Statistical description and comparison of artifact assemblages," in The Application of Quantitative Methods in Archaeology. R. F. Heizer, editor. Viking Fund Publications in Anthropology No. 28. New York, 1960.

_____. "The dimensions of archaeology," in Essays in the Science of Culture. G. E. Dole and R. L. Carneiro, editors. New York: Thomas Y. Crowell Company, 1960.

Spinden, Herbert Joseph. Maya Art and Civilization. Indian Hills, Colorado, 1957.

Stirling, Matthew W. Stone Monuments of Southern Mexico. Bureau of American Ethnology Bulletin 138. Washington, D. C.: U. S. Governemtn Printing Office, 1943.

Stuart, L. C. "Fauna of Middle America," Handbook of Middle American Indians, Vol. I. Robert C. West, editor. Austin: University of Texas Press, 1964, 316-362.

Tamayo, Jorge L. Geografía General de México. 2 Vols. México, 1949.

_____. Geografía Moderna de México. Segunda edición. México, 1955.

T. de la Peña, M. Problemas Sociales y Económicas de las Mixtecas. Memorias del Instituto Nacional Indigenista, Vol. II, Núm. 1. México, 1950.

Thompson, J. Eric. "An archaeological reconnaissance in the Cotzumalhuapa region, Escuintla, Guatemala," Contributions to American Anthropology and History, Vol. IX, No. 44. Smithsonian Institution of Washington Publication 574. Washington, D. C.: U. S. Government Printing Office, 1948.

Time Magazine. Latin American edition (March 8, 1954), p. 43.

Torquemada, Fray Juan de. Monarquia Indiana. Tercera edición. Tomo I. México: Salvador Hayhoe, 1943.

Vaillant, George C. Excavations at Zacatenco. Anthropological Papers of the American Museum of Natural History, Vol. XXXII, Part 1. New York, 1930.

_____. Excavations at Ticoman. Anthropological Papers of the American Museum of Natural History, Vol. XXXII, Part 2. New York, 1931.

_____. Aztecs of Mexico. Garden City, 1947.

Vaillant, Susannah B. and George C. Vaillant. Excavations at Gualupita. Anthropological Papers of the American Museum of Natural History, Vol. XXXV, Part 1. New York, 1934.

Von Wuthenau, Alejandro. "Pretty ladies of Acapulco," Mexico, This Month, Vol. III, No. 11 (November, 1957), 20-21.

Warren, Bruce W. "The archaeological sequence at Chiapa de Corzo," Los Mayas del Sur y Sus Relaciones con los Nahuas Meridionales. Mexico: Sociedad Mexicana de Antropologia, 1961, 75-83.

Wauchope, Robert. "Effigy head vessel supports from Zacualpa," Los Mayas Antiguos. Mexico: Fondo de Cultura Economica, 1941, pp. 211-232.

_____. Excavations at Zacualpa, Guatemala. Middle American Research Institute Publication No. 14. New Orleans: The Tulane University, 1948.

_____. "A tentative sequence of pre-Classic ceramics in Middle America," Middle American Research Records, Vol. I, No. 14. New Orleans: The Tulane University, 1950.

Webster's Third New International Dictionary. Springfield, Mass.: G. and C. Merriam Company, 1961.

Weitlaner, Robert J. and R. H. Barlow. "Expeditions in western Guerrero: the Weitlaner Party, Spring, 1944," Tlalocan, Vol. I, No. 4 (1944), 364-375.

West, Robert C. "Surface configuration and associated geology of Middle America," Handbook of Middle American Indians, Vol. I. Robert C. West, editor. Austin: University of Texas Press, 1964, 33-83.

West Coasts of Mexico and Central America. U. S. Navy Hydrographic Office Bulletin 26. Washington, D. C.: U. S. Government Printing Office, 1951.

Willey, Gordon R. and Charles R. McGimsey. The Monagrillo Culture of Panama. Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University. Vol. XLIX, No. 2. Cambridge, 1954.

Willey, Gordon and Philip Phillips. Method and Theory in American Archaeology. Chicago: University of Chicago Press, 1962.

Woodbury, Richard B. and Aubrey S. Trik. The Ruins of Zaculeu, Guatemala. Vol. I. Richmond, 1953.