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THE CULTURAL SEQUENCE AT CHICOMUCELO, CHIAPAS

by

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B.A., Trent University, 1970

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April 1, 1976

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ABSTRACT

This thesis presents the results of an archaeological reconnaissance in the Municipality of Chicomucelo, within the Central Depression of the State of Chiapas, Mexico. The analysis of data from the 73 sites recorded during the reconnaissance has resulted in the delineation of a cultural sequence spanning the last 3000 years. The sequence is composed of the following six periods with one large discontinuity in data. Each period can be characterized by at least one major event. The La Ceiba period (1050 - 550 B.C.) represents the earliest Olmec-influenced occupation, and is followed by a 500 year hiatus. The following Jolenton period (50 B.C. - A.D. 400) marks the beginning of trade with cultures of the Pacific coast. This trade route appears to have been extended northward into the Peten during the following Limonal period (A.D. 400 - 800). The Nueva America period (A.D. 800 - 1000) was a time of population expansion to a karstic, thin soiled, hilly plateau region, where large towns developed. During the Yayahuita period (A.D. 1000 - 1528) there was a depopulation and abandonment of the hilly plateau region, although people remained in the river bottomlands. The Chicomucelo period (A.D. 1528 - Present) has evidence of three settlement sites in the river bottomlands, with some local industrial activity.

The thesis turns to the problem of the depopulation of the hilly plateau region between A.D. 1000 and 1528. Guidelines around which an ecological model can be articulated are derived from other

relevant studies. Rainfall is a variable climatic feature today, and it is thought that its variation at A.D. 1000 is a likely cause of the disruption of the agricultural system. The adaptive social response would probably have been reproductive limitation, i.e., older ages at marriage, the reduction of the number of marriages, and family limitation practices. Depopulation would then have resulted from the combination of the climatic change and such adaptive social responses.

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CHAPTER 1

Introduction and Geographical Setting

INTRODUCTION

In 1974 I conducted an archaeological reconnaissance in the Municipality of Chicomucelo, Chiapas, Mexico (Fig. 1), for the New World Archaeological Foundation (N.W.A.F.). The reconnaissance was part of an archaeological resource inventory project, preparatory to a major program of excavations in the Upper Tributaries sub-region of the Central Depression, under the direction of Thomas A. Lee, Jr.

This thesis has two purposes. One is to provide a record of the sites discovered and the ceramics collected during the reconnaissance, and to integrate these data with those from the surrounding regions in order to furnish an outline of the culture history of the Municipality. The other purpose is to explore the problem of creating a model which describes and explains the depopulation of the Central Depression from the Late Classic to the Postclassic periods.

Data relevant to the achievement of these two objectives are presented in the following manner. Chapter 1 introduces the geography of the Central Depression in general and Chicomucelo in particular, with emphasis on features significant to human settlement. The Ecozone concept used in the thesis is also introduced. Chapter 2 discusses the method of the reconnaissance, the practical limitations on the fieldwork, the sampling problem, and the effect of the reconnaissance method on the final interpretation of the data. Chapter 3 presents the site descriptions, one of the main bodies of new data to come from the fieldwork.

An intuitive typology is created to ease the descriptive burden and to aid in final interpretation of the culture history. Periods of occupation are assigned to each site on the basis of architectural or ceramic data. The ceramic descriptions, the other main corpus of new data from the reconnaissance, were consigned to Appendix I because of their technical and repetitious nature; one need only consult the introduction to the typological and descriptive methods, and the discussion at the end of the description of each ceramic group, which argues its temporal placement and external relationships. Chapter 4 unifies ethnographic, ethnohistoric, and archaeological evidence to discuss the route, antiquity, and reason for a trade route which is a special feature of Chicomucelo prehistory. Chapter 5 is concerned with culture history integration. The first part of the Chapter presents a basic documentation of surrounding culture sequences to be used in the integration of the culture history of Chicomucelo, and in later demographic discussions of broader scope. Past archaeological investigations in the Central Depression and surrounding areas are discussed, and the information relevant to the interpretation of Chicomucelo prehistory and of prehistoric demography is condensed from them. The latter part of Chapter 5 integrates all of the foregoing material to provide an interpretation of the culture history of the Municipality of Chicomucelo. The rational for the period subdivisions and their temporal placement is presented; the quality of the data available to interpret each period is considered, and, within the limits of the data, conclusions are made concerning local cultural developments, settlement patterns and demography, the source of cultural influence and

trade relationships. Chapter 6 begins the consideration of the demographic problem with a review of the archaeological evidence concerning Postclassic settlement and population adjustments in the Central Depression. Following are considerations of animal ecology and European historic demography in order to develop a framework for the discussion of the mechanisms of human population decline. Chapter 7 draws evidence from other Mesoamerican regions in order to predict the stability of the agricultural system in the Central Depression at A.D. 1000. Chapter 8 integrates the demographic and agricultural information, creating a model of demographic decline for the Central Depression. Proposals are made for further research.

GEOGRAPHICAL SETTING

The purpose of this section is to describe the topographic, geological, and climatic features of the Central Depression in general and the Municipality of Chicomucelo in particular, to discuss those natural factors which influence human settlement and culture, and to introduce relevant maps.

The Central Depression is a 250 km. long by 25 to 70 km. wide valley, extended on a northwest-southeast axis between the Oaxaca limit and the Guatemala border (Fig. 2). The southwestern topographic boundary of the Central Depression is formed by the Sierra Madre Mountains, which creates a substantial but not insurmountable barrier between the Pacific Coastal Plain and the Depression. The northeastern wall of the Depression is formed by the Chiapas Plateau, and the Northern Highlands. At the southeastern end of the Depression rise the Cuchumatan Mountains of Guatemala. The Grijalva River system drains the whole of the Depression.

The upper portion of the Grijalva exits from the Depression through the deep and narrow Sumidero Canyon, just downstream of Chiapa de Corzo. Approximately midway between the Sumidero and the upper tributaries the Grijalva flows through the Angostura Canyon (the site of the recently closed Angostura Dam), forming a natural barrier to communication in the upper Central Depression. The western sector of the Depression is drained by the Rio de la Venta, a lower tributary of the Grijalva. The Grijalva river-bed drops gently from between 500 and 550 m. altitude at the Guatemala border to 380 m. at Chiapa de Corzo. The floor of the Depression averages 500 - 700 m. above sea level. A detailed map of rivers, settlements, and archaeological sites in the Central Depression is found in Lowe (1959: Fig. 64).

The following geological summary is from Mullerried (1957: 91-95; Mapa 6), the basic geological source for Chiapas. With only slight intrusions of Permian sediments and Tertiary volcanic rock, the geological base of the Central Depression is formed of Mesozoic era sedimentary strata, which run in relatively even bands parallel with the long axis of the Depression. The southwestern-most band is of lower Mesozoic strata, about 5 to 10 km. wide and 1500 m. thick. It is formed principally of sandstones, alternating with lutytes, sandy lutytes, conglomerates, sandy conglomerates, and arkose. In a central band, covering the bulk of the floor of the Depression, are marine strata of the upper Jurasic and lower and middle Cretaceous periods. The older material, about 300 m. thick, is composed of lutytes, marls, marley limestone, and sandstones, while the upper, later material is about 800 m. thick and is formed mostly of limestone, but also of marley limestones and lutytes. Marine strata of

the upper Cretaceous period, found in a wide band on the northeastern edge of the Depression, is about 800 m. or more thick, and is of various composition, including lutytes, sandstones, conglomerates, limestones, and intermediary types. Mullerried says that the most notable features of the upper Mesozoic formations, are the limestones of great thickness and extension which occupy the middle part of the Depression, and which are karstic in character.

Karstic features - caves and cenotes and springs - are often noted in the archaeological literature. Agrinier (1968) refers to the Rio de la Venta area, while Lowe (1959) and Lee (1974a,b) refer to such features in the Chapatengo-Chejel and Upper Tributaries subregions.

Climatic information about the Central Depression is provided by Helbig (1964:36-45), although the figures cited are not usually based on long-term observations. Temperature observations at La Concordia in 1957 recorded an annual average of 24.2°C., with a monthly average in January of 21°C. and in May of 27°C. At Tuxtla Gutierrez (at about 450 m. altitude) from 1955 to 1957, the annual average was 25°C., with a monthly average minimum of 21°C. in December, and a maximum of 28°C. in May. At nowhere in the Depression below 1000 m. altitude does the annual average temperature exceed 26°C., and the winter low and spring high temperature pattern is typical for the whole Depression.

The Central Depression is dry, due to the rainshadow effect of the surrounding mountains, and annual precipitation varies somewhat within it. Between 1944 and 1948 at various stations in the north and northeast the annual average was between 770 and 990 mm., while in the south and southwest it was between 1150 and 1900 mm.. The seasonal distribution of rain

increases the effect of the low annual totals in a tropical climate. The rainy season comes between April-May and October-November, in a generally double-peaked fashion with some let-up between July and September. There is consequently a period of about 4 months with virtually no rain, and 2 or 3 months with very little.

Lowe (1959:4) has described the Central Depression vegetation as follows:

> ... the usual semiarid vegetation is drab and bare much of the year with xerophytic varities common in many places. Low riverlands frequently sustain tall evergreen forest, however, and also within the Depression there are extensive areas of savannah or natural grassy plains. Pines descend the north slopes of the Sierra Madre into the Central Depression, especially on the southeast where they grow within a few kilometers of the Grijalva in the Chejel region.

The soils to the west of Tuxtla Gutierrez in the Depression, according to Mullerried (1957:137) are prairie soils produced by the dry climate. In the whole of the Depression very thin, greyish, clayish sandy soils are observed.

The climate and geology of the Central Depression make the procurment of water a significant factor determining settlement location. According to Mullerried (1957: 138-39) the water sinks in immediately in the karstic regions, and in the dry season arroyos dry up and rivers and springs have reduced flows. Helbig (1964:45-50) treats in more detail the water procurment problems. He notes that there is always at some distance a waterhole, on which may depend a whole town. Dwellers in the karstic regions often have to make major tripe to fetch water, sufficiently long that they have to carry their own water supply. Although some sources, for example the Rios Salinas and Blanco, near La Concordia, have mineral

contents too high to be useful for human consumption, there are many rivers and springs providing good dependable water supplies, but these are frequently located in deep valleys or canyons of difficult access. Helbig notes that frequently maps show towns located very near rivers, but it is not obvious that the towns are located 100 to 300 m. above the river-bed.

The Municipality of Chicomucelo, where the archaeological reconnaissance was conducted, is located in the southeastern end of the Central Depression, within a few kilometers of the Guatemala frontier. The Municipality is bordered on the north by the Grijalva River and the La Concordia municipal boundary, on the east by the San Miguel River, which is the municipal boundary with Frontera Comalapa, on the south by the Bella Vista municipal boundary, and on the west by the La Concordia boundary. A minimum estimate of the area of the Municipality is 600 sq. km.; its true extent is not known because it was not all mapped, but it is perhaps half as large again.

Although the boundary of the Central Depression as shown on Fig. 2a cuts through the Municipality just north of the Tachimula and San Miguel confluence, the areas which have been classified as Ecozone 1 and 2 should properly be considered as part of the Central Depression.

No topographic map in a scale larger than 1:1,000,000 was available, and so it became necessary to compile an adequate map (Fig.32) from other sources. Tracing from a non-stereoscopic set of aerial photos in the scale of 1:20,000 gave the basic drainage network, and the location of major settlements and roads. However, the photos were not of sufficiently fine grain that houses, small settlements, many trails, or seasonal surface drainage courses in Ecozone 2 could be picked out. The locations of these

features were estimated from field knowledge. Good topographic contour detail for the river valleys existed on the maps compiled by the Secretaría de Recursos Hidráulicos for the Angostura Dam, and this was transferred into the map, although the contour interval was increased by a factor of five. For those areas not mapped by the Secretaría, contours were estimated from field experience, with the aid of a few bench marks on the Recursos Hidráulicos maps. Maps compiled by the spraying crews of the Comisión Nacional para la Eradicacion de Paludismo gave detailed settlement names although they were topographically sketchy. Only the main settlements, or small settlements which were actually visited have been marked on the map. (In the absence of a grid system of locating settlement, a very elaborate naming system has developed, with settlements of only 1 or 2 houses bearing a name. However, many of these names change with the change of owner, and repetition of names is frequent).

A basic interpretative framework of Ecozone designation has been included on Fig.32 . These divisions are based on an assessment of natural factors governing human settlement, rather than on specific vegetational divisions.

Ecozone 1 encompasses the valley bottoms of the Tachinula, Yayahuita and San Miguel Rivers, where water is abundant and dependable throughout the year. Soils of this zone are thick alluvium. The rivers have down-cut into the alluvium so that the water surface is from 5 - 30 m. below the level of the valley floor, lowering the water table of the surrounding lands and making irrigation from the river difficult. On the planted land, apparently there is only one crop per year. On the southern side of the Yayahuita Valley, and the eastern side of the Tachinula Valley,

small streams from the mountain slopes water areas on the valley floor. In these areas, and in the occasional low-lying meadow, multi-cropping should be possible, but there is no evidence that it is practised today. Evergreen forests border the rivers, while open grassland, with some bush and forest extend from the evergreen forests to the mountains. The extensive grasslands of the Yayahuita Valley have probably resulted from cattle grazing by the large fincas (ranches). The vegetation of the Tachinula Valley tends to be bushier (Plate 1a), as there are no large fincas, and more of the land is held by ejidos, (agricultural co-operatives). The land is generally level, but is cut by deep arroyos.

Ecozone 2 is a hilly plateau region between the Yayahuita and Grijalva Rivers, and covers about half of the total reconnaissance territory. Soils are thin and the limestone bedrock is often visible (Plate 2d). The vegetation of the area has the character of dense bush, with small trees and thickets of undergrowth, which seem frequently to be thorny (Plate 3a). During the dry season the whole area has a drab brown-grey colour. The milpas cleared near the ejidos of Pablo Sidar, Alfonso Corona del Rosal and Nueva America are, at the end of the dry season, wastelands of grey rock, brown corn stocks, and blackened trees. Only one crop a year is possible. Expanses of grassland within one km. of either side of the La Concordia highway are found between El Cairo and La Llanada, and may also result from cattle grazing by the local large fincas. Smaller expanses of grassland are found further south near Aurora and San Antonio Ocotal. Water is a scarce resource during the dry season. Observations concerning the hydrologic conditions of this region were made during the reconnaissance in the latter half of March, and April,

near the end of the dry season. The only water source observed near Misolar, in the valley north of the Yayahuita, was surface ponding in the shaded part of an arroyo, although springs are probably to be found at the base of nearby canyon walls. The lower course of the valley's drainage system was completely dry, although sub-surface water may have been available in the arroyo. The colony of Pablo Sidar has a government-installed water system, which was dry. Water was drawn from a small stream of about 30 cm. width and a few cm. depth which flows through the town, and from a shallow well structure set in another arroyo - the stone courses of the well extend to bedrock, less than .5 m. below the surface, but allow seepage water to accumulate. Downstream in this arroyo system, near Argentina, surface ponding on very stagnant water was found. A small waterhole on a hillside near the road between these two settlements, was found to contain almost unpalatable water. Just south of La Llanada, on the highway to La Concordia at the municipal boundary, there is an arroyo with surface ponding of water, where local residents draw water, transporting it by burro and ox-cart. I was informed that when this source dried up, a trip of 3 leguas (about 12 km.) was necessary to fetch water from the Grijalva. Ch- 45, nearby, marks the site of a dry well. Two modern settlements, the twin colonies of Alfonso Corona del Rosal and Nueva America, and Calzada de la Cruz, both with major archaeological sites nearby, rely on shallow wells for water. Local informants reported that these wells do not go dry. Other important water resources must exist in Ecozone 2, but the penetration of this area was not thorough.

Ecozone 3 is the mountainous area of the Sierra Madre with steep slopes and steep narrow valleys. It covers a substantial area of the

mapped, and apparently all of the unmapped southwestern portion on the Municipality. It is not conducive to dense human habitation, although water appears to be abundant. The dominant vegetation is coniferous.

The Ecozone concept is important to the consideration of the demographic problem, later in the thesis. Although local conditions vary somewhat, the concept of Ecozone 1, with thick soils and perennial water supplies, and of Ecozone 2, with thin soils and scarce dry season water resources, can be applied to the whole of the Central Depression.

CHAPTER 2

The Fieldwork - Problems and Effects on Data

The purpose of this chapter is to describe the methods of the reconnaissance, their rational and probable effect on the quality of the data collected.

The reconnaissance was carried out in March and April of 1974, the second season of the New World Archaeological Foundation Upper Tributaries Project. Only one site (Ch-16) had previously been recorded in the Municipality by Lowe (1959). Thus, the reconnaissance priority set by the Foundation was to gather an archaeological inventory of the Municipality, to be used in the planning of more intensive investigations. Emphasis was given to broad area coverage, rather than intensive exploration at any one site. Our prime purpose was to locate all major and minor mound sites, to draw a plan of them, do a preliminary surface collection, gather ownership information, and plot their positions on a set of aerial photographs. Interest was centered on the Early Preclassic to Colonial periods.

The Municipality of Chicomucelo is most easily reached from Tuxtla Gutierrez by the Pan-American Highway which runs through the Highlands towards Guatemala. At Jocote, about 5 km. from the Guatemalan border, a turnoff to the west is made, and an all-weather gravel road is followed to Chicomucelo via the town of Comalapa, fording the San Miguel and Tachinula Rivers on the way. The gravel road has been completed almost to the town of Chicomucelo. Because of the lack of bridges as yet, this route is passable by motor vehicle only in the dry season. One other route into Chicomucelo follows the south side of the Grijalva River from

Tuxtla Gutierrez via La Concordia, entering the town of Chicomucelo across the Yayahuita River. This also is a dry season road, and is much slower and dustier.

The reconnaissance party of Alejandro Sanchez, an energetic and experienced Foundation foreman, my wife Nicole, and myself, was based in the town of Chicomucelo in 2 rooms rented from a local merchant, Senor Daniel Lopez.

A number of factors governed the conduct of the reconnaissance. The absence of a topographic map in a scale larger than 1:1,000,000 was a great hindrance. Without a topographic map it was impossible to plan the reconnaissance except in the most preliminary fashion. Personal exploration of the countryside was necessary, and we proceeded essentially by following different roads, watching from the vehicle, searching areas by foot, and asking local inhabitants about mounds or sherd deposits. A schematic plan of settlements prepared by the spraying crews of the Comisión Nacional para la Eradicacion de Paludismo (National Commission for the Eradication of Malaria) was also used to guide the explorations.

The quality of motor vehicle access varied throughout the region, and this had important bearing on the territory explored (Fig. 32). Much of the Municipality lies within the mountains (Ecozone 3), which is accessible only by foot and pack animal trails. Nueva Morelia in the Tachinula valley, Nuevo Pacayal in the Yayahuita Valley, and Misolar in the valley north of the Yayahuita were the limits of passable roads. The mountainous area was consequently explored only on the peripheries, and a few cave sites were recorded. It is doubtful that many mound or habitation sites would be located within this zone as river bottomland is scarce,

but an exploration of ceremonial caves would certainly be fruitful. Thomas Lee photographed an elaborately decorated vessel reported to have come from a cave in the mountains behind Chicomucelo during his reconnaissance in Frontera Comalapa. A list of reported caves was kept for future use (Appendix II).

The bottomlands of the Tachimula and Yayahuita River valleys (Ecozone 1) were most accessible. All of the land belongs to ejidos (agricultural co-operatives), ranchos (small private holdings), or fincas (large ranch estates), settlements are frequent, and dry season vehicle roads are extensive, although even in this area the roughness of the road restricted driving speed to an average of less than 15 km.p.h., and consequently much time was lost in travelling. I think that in this zone the record of mound sites is nearly complete, with some exceptions. Archaeological exploration within the town of Chicomucelo was limited by modern settlement. In addition, any prehistoric mounds which may have been there have likely fallen to the adobe-makers of the last four and one half centuries. One Ecozone 1 area virtually unexplored is the floor of the canyon of the San Miguel River, which we found to be accessible only in one place, due east of Pablo Sidar. Whether the canyon has more habitable land is unknown.

Ecozone 2 is lightly inhabited today, and road access is much more limited. Several large and old fincas are located along the road to La Concordia in a grassland area, but the rest of the area is occupied by small and widely spaced ranchos or ejido settlements. One might describe the settlement pattern as rancheria. The major settlements are Alfonso Corona del Rosal, Nueva America, and Pablo Sidar. In particular, the

northern part of Ecozone 2 was poorly explored due to the lack of roads. Two routes were followed into this section, one to Calzada de la Cruz, and the other to Nueva America - along both of these routes major sites were encountered. (Because it was not possible to trace the routes of the roads on the aerial photos, the location of the sites is only approximate.) Were the time available to penetrate by foot or horse between Ch- 38 and 47, or the area to the east of Ch- 38 towards the canyon, other major sites might have been found. The northern boundary for reconnaissance was approximately the 600 m. contour mark, as the territory further north had already been reconnoitered by Instituto Nacional de Antropologia e Historia (I.N.A.H.) personnel during the Angostura Salvage Project. In all, the archaeological record of Ecozone 2 is poor in comparison with Ecozone 1, except for the stripe along the roads traversed, and thus the comparative site counts are biased towards Ecozone 1.

One significant hindrance to the reconnaissance was acquiring permission to survey private land. It is solely the male owner's prerogative to grant such permission, and frequently return trips were necessary to find the owner at home.

Many landowners were suspicious of our intentions, because it is almost universally believed that the ancients had much gold. (Doubtlessly, our habit of carrying potsherds in sturdy white canvas bags resembling "money bags" did not enhance our disinterested appearance.) Local legend says that where a light is seen glowing at night, or a cock is heard to crow at dawn, there is gold to be found, and few major mounds are without at least one pothole. However, almost all landowners or ejidal officials graciously gave us permission to search the lands in their charge when

our letters of introduction were presented and our purpose explained, and many went to personal trouble to lead us to sites. The questioning of local inhabitants about the presence of mounds or sherd deposits was a productive method of finding sites.

When a site was located a pace-and-compass sketch map was made of surface features, it was plotted on aerial photos, information about ownership was recorded, and a diligent search for ceramics was made.

Most sites were covered by vegetation, and at many the bushes, thorns, and grass were especially dense making it impossible to find sherds (Plate 2b). According to Thomas Lee (Pers. Comm. 1974) the burning of the milpas was very late that year, for it had only just begun at the end of April when the reconnaissance terminated. During the reconnaissance we noted that signs had been posted throughout the Municipality indicating that people were required to obtain burning permits from state officials, and this new regulation may explain the late start. Had the burning begun earlier, larger ceramic collections and better plans could have been made for many sites.

A random sampling design was not employed; indeed, on a vegetation-covered site, any sampling technique which would prevent one from gathering sherds where they could be found would be counter-productive. Furthermore, it is unlikely in a ceremonial unit where mound building activity has caused a substantial amount of redeposition of materials, that a statistically valid sample of the surface deposits has any significance relative to the date of construction or localization of construction phases within the site. Excavated mound construction layers are dated by the *terminus post quem* principle in the absence of other architectural or

hieroglyphic methods of dating. In this situation, the relative frequency of ceramic types within the deposits is not a significant consideration. In undisturbed, multi-component situations where early material is partly or completely overlain, it can be argued that, in the absence of test -pitting, the best method of gathering a sample is to look for rodent holes, washouts, or other earth disturbances. At Ch- 15 and 19, small earth disturbances yielded more ceramic information than did surface collections of the rest of the site.

The problem of any surface collection, no matter how conducted, is that one does not know if the rarity of early material is due to it being hidden under later cultural, erosional, or soil formation deposits, or to its actual paucity.

In a myopic sense, the lack of major industrial or modern farming activity in Chicomucelo is to be regretted, for it was at the tractor ploughed Santa Teresa sites (Ch - 57-60) that the most abundant, albeit damaged, surface collections were made.

In summary, a preliminary reconnaissance was conducted in a virtually unknown area with the purpose of locating the archaeological resources and providing an outline culture history for the Early Preclassic to Hispanic periods. The information is to be used in the planning of further research. Field work was hindered by scant topographic information, poor access, vegetation covered sites, the difficulty of finding landlords to get permission to explore their lands, and some public suspicion of our intentions. The reconnaissance succeeded in building a detailed catalogue of archaeological information for the Municipality, but the limitations of the data merit consideration.

Intense investigation at any one site was impossible because of the priority of extensive area coverage. Consequently, the ceramic samples from sites are what could be collected without excavations - often little or nothing. The interpretations of periods of occupation must therefore be tentative, unless architectural of artistic data are available to supplement or supplant ceramic data. Interpretations of settlement patterns by phase must also be done with caution.

The small and fragmentary ceramic sample, without stratigraphic provenience, means that the ceramic interpretations are preliminary. Distinctive material from the Preclassic and Early Classic periods is meagre. Stratigraphic test-pitting perhaps should have been done, but would have involved a sacrifice of total area coverage; furthermore, it was only after laboratory analysis that pits could have been placed to most effectively fill the temporal gaps.

Unfortunately, the present information cannot be used as a controlled test case for the model developed in the thesis. A sampling program tailored to elucidate the Late Classic - Postclassic demographic and settlement problem could only have been formulated after the ceramic analysis and literature research had been done. It is that sort of carefully directed program which a preliminary reconnaissance should help to formulate, rather than hoping to solve the question with its data. Yet one can say that, within the framework of the problem, the Chicomucelo pattern appears to have been typical of the rest of the Central Depression. If used with due regard for their strengths and weaknesses, and in conjunction with data from surrounding areas, the reconnaissance results can, however, be used to build a culture history of the area.

CHAPTER 3

Site Typology and Descriptions

The purpose of this chapter is to describe the archaeological sites discovered during the reconnaissance. In order to emphasize the patterns which are evident in site layout and function, and to ease the burden of individual description, they have been grouped into various classes. In general, inferences about site function involve its placement on a ceremonial - residential continuum.

Some sites have occupation periods extending over one thousand or more years, and it is legitimate to question the extent that descriptions of the site features represent all of the occupancy period. In all probability, the final form of the site represents only its latest period of occupancy. However, due to the nature of Mesoamerican ceremonialism, a site which was a Small Hamlet in its last form probably never was a ceremonial centre, and likewise, early ceramics at what was later a ceremonial unit may represent the earliest beginnings of ceremonialism at the site; but such questions can only hope to be resolved through excavation, rather than reconnaissance data.

An initial attempt was made to utilize the settlement typology proposed for the Upper Tributaries by Lee (1974b) on the basis of his experience in La Trinitaria and Comalapa, but it became apparent that its application to the sites of the Tachimula and Yayahuita Valleys was inappropriate. A sufficient difference in the scale of site size exists between the former two Municipalities and the Ecozone 1 area of Chicomucelo that sites of surely ceremonial significance in Chicomucelo were placed in common residential categories developed for the Grijalva and San Gregario

areas. Thus, a separate site classification system was developed for Chicomucelo.

The site typology is intuitive, used for easing the descriptive burden and assisting in interpretation. I have not attempted to demonstrate its validity statistically because that would be a complex problem, and not the main focus of this thesis. There is no simple index available to classify sites. Mound height - the first one might turn to - is not adequate. For example, Ch-42, which is but one single mound about 4 m. high, would fall in the same class as Ch-38, a major townsite covering at least 60 ha., with a large ceremonial plaza whose major mound is about 4.5 m. high. A statistical correlation of a number of variables might be useful, but the attribute coding system for each site would have to include the number of mounds, sizes of mounds, topographic setting, total area, formality of layout, special features such as stelae or ballcourts, and the presence of surrounding residence. The attempt would be valuable, but good results might be impossible because we are in poor control of the time factor, nor can we assume that all of the architecture of any site is a product of contemporaneous building. In itself, typological and functional interpretation is a problem worthy of carefully planned field research.

The accompanying site plans were made by pace-and-compass field measurements, and mound heights estimated by eye. The measurements include some error, and it may be especially great if vegetation was so thick that it was impossible to walk in a straight line. I especially caution against setting too much interpretative faith in earthwork volumes which may be calculated from the plans, without a generous allowance for error; linear

error in the field measurements, when cubed, creates substantial volumetric error. The illustration of the mounds with flat sides and 90 degree corners follows a conventional style. In the field, mounds generally have a rounded appearance, and orientation of the sides can be difficult.

SMALL HAMLET

The criteria for a settlement of this type (designated as SH) is a maximum of five units of house remains ranging from stone foundation outlines to mounds of up to 2.0 m. height, but of a total of 58 mounds, 26 are between .25 and .75 m., and 19 are between .75 and 1.25 m. high. They must occur within a circle of about 50 m. radius, and may form L-or U-shaped patterns if they are close together. An SH is considered to be a settlement of one or two families, without ceremonial activity beyond a personal or family level. There were 25 SHs recorded, but some have been grouped into possible larger settlements (see Fig. 11).

LARGE HAMLET

This site type (designated as LH) is a group of over five house remains occurring within a circle of about 100 m. radius, or it may be a regrouping of SHs whose proximity (within a circle of about 200 m. radius) suggests that the SHs formed a larger settlement unit (excepting the regrouping of all of the Bella Vista sites which forms a loose LH extending for 1.5 km. along the Tachimula River). Within the LHs sometimes occur units of the Small Ceremonial or Elite Residence class, which raises the maximum mound height to 3 m. (e.g., Ch- 54, 57; BV- 3). Local ceremonialism must therefore be admitted in the LH. There are possibly 9 of these settlements occurring, including combinations of SHs. If all of the Bella Vista sites which are LHs in their own right are grouped together to form

one dispersed LH, the total number is reduced to 7. The number of house remains per LH ranges from 7 to 53. Of 153 mounds falling in this class (including a few regrouped SHs and SCERs), 89 were between .25 and .75 m., and 38 were between .75 and 1.25 m. high (see Fig. 10).

SMALL CEREMONIAL OR ELITE RESIDENCE

This class (designated as SCER) consists of mound groups which are substantially more prominent than common residences, but which lack the size, elaboration, and many specific ceremonial features of a large ceremonial centre. The 15 sites (but one might be a SH) of this class have between 1 to 13 mounds (the only instance of 1 mound perhaps being due to dense brush hiding other features). Of the 82 mounds in these sites, 20 are from .25 to .75 m., and 22 from .75 to 1.25 m. high; but 11 of the sites are dominated by a mound 3 to 6 m. high, three have 2.5 m. main mounds, and one (the possible SH) has a 2 m. main mound.

The mounds are roughly or precisely arranged around a plaza or around the main mound except in Ch-11, whose topographic location suggests that the dispersed mounds are not common residence (see Fig. 7, 17, 18).

Their function is not certain. Lee (1974b:8) includes structures of up to 4 m. height in his Small Hamlet, which he considers to be purely residential. Willey et al. (1965:572) define plazuela groups in the Belize Valley, which are courtyard arrangements of low secondary platforms on a basal platform. They conclude that plazuelas may symbolize social status above that of the simple mound groups. Only 1 plazuela was recorded for Chicomucelo (in Ch-47), but more high-status individuals must have lived in the Municipality. The large primary platforms of the SCER group may be a local way of indicating increased status.

However, argument can likewise be advanced that these centres are small ceremonial arrangements. Willey et al. (1965:561) also define minor ceremonial centres in a fashion which approximates those of Chicomucelo. These centres "... vary in architectural characteristics but they usually incorporate at least one pyramidal temple-type mound of small to medium size as well as lower buildings around a single plaza or court". In the Guatemala Highlands, Borhegyi notes a small Late Classic ceremonial centre which has three squarish, flat-topped mounds of 2 m. height, and a rectangular ballcourt (1965:31). Because the ballcourt indicates the ceremonial nature of the site, it is evident that mounds need not be high to have a ceremonial role. I am personally inclined to think of the SCER function as ceremonial, but careful excavations of refuse deposits are needed to give a firm answer.

If the groups are ceremonial, it probably indicates that some of the Maya pantheon were worshipped on a local level, in spite of the existence of major ceremonial centres nearby. If the groups are elite residence, they may help to trace the extent of various social units, organized probably on the basis of kinship; possibly some local worship was taking place in the residential compound of the elite - even a 4 m. mound is an imposing structure.

MAJOR CEREMONIAL

There is a substantial range in size and features in these seven sites (designated as MC), but they all share one or more attributes which mark them as distinctive ceremonial centres. These include a typical Classic plaza arrangement, mounds up to a maximum height of 10 m., momoztli (a low ceremonial platform which does not support a temple, see

Noguera 1973), plain or carved stela, and ballcourts. There may or may not be obviously related domestic residence. The smallest site has 12 mounds in the ceremonial precinct, but it is not possible to give a maximum size, as a clear separation between the ceremonial and surrounding residential areas in Ch- 38 and 47 does not exist. Because the sites represent important cultural functions, but exhibit considerable individual variation, they are treated at length individually in the descriptive text. (see Fig. 3, 4, 6, 12, 13, 14, 15)

SHERD AREA

These are recorded sites (designated as SA) with sherds but no obvious architectural remains. Although they indicate residence, they were not placed in the Hamlet categories because without structures, it was impossible to classify them as large or small. However, in Bella Vista they have been integrated with surrounding mound sites to form a LH. A site may be classified as a SA but have no sherds recorded in Table 1 if the sherds were too fragmented or weathered for analysis.

CEREMONIAL CAVE

The only cave sites (designated as CC) explored during the reconnaissance were very small and difficult of access (under 20 sq. m. and too low to stand in), and consequently were definitely ceremonial rather than habitational. There are only 4 individual cave sites, all within 200 m. of each other.

HISTORIC

Four sites have been placed in this category (designated as HIST). All are definitely post-Contact sites, and include a processing establishment, a settlement, a mine, and a possible church (Ch- 1, 10, 25, 43,

respectively). (see Fig. 5)

Site Descriptions

The notes on individual sites in this section are to be used in conjunction with Table 1, which for each site indicates the Ecozone occupied, the site classification, number of mounds and area covered, the ceramics present, and the period of occupancy; and Fig. 32, the insert map which shows the site location.

The purpose of this section is to justify the assigned dates, explain special features of considerations, and reference figures. In the present work plans and photographs of only the more significant sites have been chosen for illustration. The plans and photos of all sites with surface features are available in the files of the New World Archaeological Foundation, catalogued under the site designations used here.

Ch- 1 (HIST)

This stone structure with true arches, tunnels, and an aquaduct is the remains of a colonial industrial building of unknown use. Water was evidently drawn from the adjacent mountain slope down a cemented sluice on top of the structure, from there being let into lower arched chambers. From a restricted view, the low partially underground tunnels seemed to be roofed in the corbelled arch fashion - possible combination of Maya and European architectural elements. This site may be associated with nearby Yayahuita (Ch- 10). One sherd, found in a depression nearby, is not well associated with the structure.

Ch- 2 (SCER)

No sherds were found at this site due to dense grass, but its

proximity (300 m.) to the MC site, Ch- 3, suggests that it may be an associated elite residence, and tentatively assignable to the same date.

Ch- 3 (MC)(Fig. 3)

This is the only MC centre to be found in the Yayahuita valley. The somewhat scattered layout suggests an extended period of construction, the two largest mounds possibly representing a Preclassic phase of construction, and the plaza arrangement a Classic addition. It is therefore given a Jolenton to Nueva America period placement. Three low, square mounds, possibly momoztli, are present in the ceremonial precinct. The two southern parallel mounds might be a ballcourt, although they are widely spaced relative to length, and the ends appear not to be exactly opposite. Despite an intensive search, only a few indistinct sherds could be located in the dense grass cover.

Ch- 4 (SH)

Dense grass prevented the recovery of any sherds from this SH; its chronological placement is unknown.

Ch- 5 (SCER)

This SCER site is on top of a low hill beside the Yayahuita River. One 3 m. mound is placed on top of an elevation at least 3 m. higher than the rest of the hilltop, giving it substantial prominence. The few sherds collected suggest a Nueva America - Yayahuita period placement.

Ch- 6, 7, 8 (CC)

These small caves in the base of a cliff in the mountain pasture of the Finca Buenas Aires are ceremonial. Large sherds were found on the floors and partially embedded in calcerous deposits. The caves are probably associated with the mounds of Ch- 11. The eight sherds of San

Jacinto Black: San Jacinto Variety confirm a Jolenton phase use of Ch- 8, and a Santa Teresa Red sherd shows a Nueva America-Yayahuita period use of Ch- 6, but other placement is tentative due to the lack of clearly diagnostic ceramics.

Ch- 9 (MC)(Fig. 4; Plate 1a-d, 2a)

The MC site of Piedra Labrada ("worked stone") is built on the base of the mountain slope at the exit of the Tachinula River from the Sierra Madre mountains. The mountain slope, which descends from south to north has been terraced to form a major plaza which is surrounded by mounds (the soccer field of the present ejido), with a smaller plaza on the same level to the southeast. The ground surface drops sharply about 10 m. in the northwestern and northern sides of the main plaza, and the I-shaped ballcourt, on the northwestern extreme of the site, is on this lower level (see Plate 1a for an overhead view of the site).

A fragment of a stela in raised relief is erected in front of the Agencia Municipal (Plate 1b). The legs of a person are seen, below which is a rectangular box with raised border, within which are two squares of chevron patterns each carrying two long diagonal bars, framing a central diamond. Below this is an Initial Series Introductory Glyph outline (Lee, Pers. Comm. 1974; see also Thompson 1960: Fig. 23), underneath which are 4 empty hieroglyphic cartouches. The upper right corner of the stela is formed from cement and mounted on top is a head of vastly different material and style, reportedly sent by a museum to provide a head for the piece. During his exploration of Ch- 9, Thomas Lee discovered an upper portion of the stela showing the shoulders, face and elaborate head-dress of a typical slanted-forehead Maya person (Plate 1c).

The fracture on the upper end of the head fragment indicates another missing piece of unknown dimensions. It was reported that another portion of the stela, probably the one between the lower legs and shoulders, has been burned to make cement.

The possibility of a hieroglyphic text on the stela is a significant question. In contrast to Lee's opinion, I think that Maya hieroglyphs never were actually carved in the 4 cartouches (Plate 1d). On the assumption that the surface of the stela was once smooth, and that the present prominent veining is a result of weathering of the softer limestone, it would seem that the cartouch portion has not undergone more severe erosion than the other portions. The fact that no glyphs are now evident, yet details of the head-dress are quite clear, indicates to me that there never were carved hieroglyphs, with the exception of a rough outline of the Introductory Glyph. Hieroglyphs may have been painted on since painting of stela was known (see Thompson 1960:20), yet it seems unlikely that they would not have been carved if expertise was available to calculate an I.S. Long Count date. However, in spite of the lack of a date, the Classic Maya stela provides an important anchor for the interpretation of Chicomucelo ceramics and culture history.

One other sculptured fragment of unidentified design, and possibly basaltic rock was found on the site (Plate 2a).

Piedra Labrada is the most elaborate ceremonial site recorded during the reconnaissance, and is particularly important for its definite datability to the Classic period.

I believe that the presence of a trade route through the Sierras from the Tachinula Valley to the Soconusco coast explains the location of

this elaborate site in an otherwise obscure niche in the mountains (see Chapter 4 and 5 for further discussion).

Ch- 10 (LH, HIST) (Fig. 5)

This site is locally known as Pueblo Viejo ("old town"). On the eastern edge of the site are the 1.5 m. mound remains of the walls of a structure about 30 m. by 15 m. On the western edge of the site is another structure of about 45 m. by 10 m., with 2 m. wall mounds defining the side and one end, while the other end has a 3 m. mound - certainly the remains of the walls and edifice of a colonial church. Beginning at the western edge of the church, .3 m. mounds define a rectangular court 70 by 45 m., open on the NE corner, and of unknown function. Between these eastern and western structures are many low mounds, not mapable due to the vegetation; piles of river cobbles on the edges of fields attest to the presence of many destroyed house mounds. If the two major structures mark the site limits, it extends 600 m. in an east-west direction, and it extends at least 100 m. north-south, although little exploration was done in that direction.

This site is probably the abandoned hacienda of "Yayahüita", which is located on the right bank of the river, not far upstream of the hacienda "Chicomuselo" on the Carta General del estado ... by D. Angel A. Corzo of which the revised copy dates to 1889. However, the extent of the settlement seems much greater than would be expected of a hacienda. Prior to the establishment of the hacienda, the site must have been occupied by a town. Or it may be that the compilers of the map were mistaken in marking it as a hacienda; Chicomuselo itself must have been a town, rather than a hacienda at this time. Historical research into the

problem is required. (Another hacienda, labelled "Nyo Yayahuita" is placed on the opposite bank of the river further upriver; this is likely the Finca Yayahuita, now abandoned.)

Ceramic collections were obtained from the site, indicating possible Limonal to Yayahuita period occupations preceeding the colonial Chicomucelo period. For the prehistoric periods the site has been considered as LH.

Ch- 11 (SCER)

This site is located on the mountain pasture ("potrero del cerro") of the Finca Buenas Aires, near the cave sites Ch- 6, 7, 8, 12. The plateau commands a magnificent view to the north, as far as the Highlands on a clear day. The six scattered mounds with a maximum height of 2.5 m. would constitute a LH were it not that its inaccessibility, and the presence of the ceremonial caves, indicate a ceremonial function. Ceramic studies disclose use from the Jolenton to the Yayahuita period, and perhaps the Chicomucelo period as well.

Ch- 12 (CC)

This is the largest cave of the Ch- 6, 7, 8, 12 group. A hole in the floor of the small outer cave leads to an underlying chamber, within which were recovered some large sherds and almost complete vessels; others were irretrievable because of accumulated calcerous deposits. A small pile of sherds has accumulated on the floor directly below the entrance. Unfortunately, none of the recovered materials could be identified for dating purposes, but contemporaneous use with Ch- 8 is suggested.

Ch- 13 (SH)

Ceramics suggest a possible Limonal, and a definite Nueva America

-Yayahuita period occupation of this SH. One mound is faced with river cobbles.

Ch- 14 (LH)

The largest of the mounds of this LH is presently being excavated for house construction material. Ceramics suggest a Limonal and definite Nueva America-Yayahuita period occupation.

Ch- 15 (SH)

Two barely visible cobble outlines about 5 m. square mark this site on the top of a low hill. The sherds were collected from a washout about 90 m. to the northeast, and so may not be directly associated with the house remains. Four sherds belonging to the Jocotal - Similar group, one distinctly marked with the double-linebreak pattern, indicate a La Ceiba period occupation - the oldest definitely known in Chicomucelo. Two other sherds of the Regadillo group may be contemporaneous with the Ocós phase at Izapa, but the material is too fragmentary to be certain. Two other sherds suggest a Limonal period component as well.

Ch- 16 (MC) (Fig. 6; Plate 2b)

This site, originally recorded by Lowe (1959:64) is a MC centre, arranged around a plaza with three momoztli, one of which supported a blank stela (Plate 2b). Two parallel mounds define an open-ended ball-court, although one mound appears shorter than the other. The southern side of the plaza is enclosed only by a .5 m. mound; the lack of enclosure on one side may have been to give the plaza a sense of elevation, since there is a 4 m. drop to the next river terrace just beyond. It appears that most of the mounds were faced with river cobbles, which have been quarried extensively after abandonment. Architecturally, the site

is Classic. Heavy vegetation prevented extensive ceramic collections from the plaza area, but sherds from a milpa about 250 m. northwest indicate a possible La Ceiba period and Limonal period, and a definite Nueva America-Yayahuita period, and a possible early Chicomucelo period occupation of the immediate vicinity. These periods may or may not be represented in the site itself.

Ch- 17, 18 (SH)

Both of these sites have only a single small mound each, and no ceramics were collected from the vicinity.

Ch- 19 (LH)

This LH is located at the first narrowing of the valley of the Tachinula River. The mounds were dispersed over a considerable area. Sherd collections were taken from a road disturbance at the base of a steep hill to the south of the site, and indicate a possible La Ceiba and a Jolenton to Yayahuita period occupation. Sherds of the Cerecillo group were recovered from the roadcut, but were not discovered in any other site - evidence of the limitations of the other collections. A washout near the highest point of the site yielded the undatable Misc. 13 vessel, which protruded from one wall about .5 m. below the surface. There may be a burial nearby.

Ch- 20 (SCER) (Fig. 7)

The formal arrangement of this small site around two adjacent courts, a possible <u>momoztli</u>, and a 4 m. high mound argue for a small ceremonial function, but the presence of some sherds which date it contemporaneously with Piedra Labrada (Ch- 9), only 2 km. distant, raises the possibility that it may have served as elite residence. Although two

mounds are parallel and appear to be a very small ballcourt, one mound is much lower than that on the other side; consequently I doubt that it is indeed a ballcourt. In addition to Limonal, Nueva America-Yayahuita period ceramic indicators are also present, and it may have functioned as an unimposing Postclassic ceremonial centre.

Ch- 21 (SCER) (Fig. 8)

The irregular arrangements of lower mounds around a 5 m. mound do not give the impression of a planned architectural unit. There is slim ceramic evidence for a Nueva America-Yayahuita period occupation, and possibly mounds from these periods were congregated around an existing group. The 5 m. mound is evidence of a SCER function at one time. One low mound is terraced and faced with river cobbles.

Ch- 22 (SCER) (Fig. 9)

No evidence of common occupation was found in the vicinity of Ch- 22, which is found in a small side-valley of the Yayahuita Valley. The landowner reported that many housemounds about 4 m. square surround the centre, but vegetation was too dense to map them.

The landowner also reported that there was a small "door" about .75 m. square covered by a stone on the plaza side of the main mound, but there was nothing inside. The eastern-most mound had been trenched. Ceramic collections were very meagre, but the Limonal period is suggested, and a Nueva America placement more clearly defined.

Ch- 23 (SCER)

This site is of the SCER class, but is not clearly courtyard oriented. No ceramics were collected from the site, but Ch- 27, less than 200 m. distant, may provide a clue to its dating.

Ch- 24 (LH)

No ceramics indicating chronological placement were collected from this small LH.

Ch- 25 (HIST)

A site designation was allotted to the remains of a modern mine processing works, abandoned about 15 years ago, because it was thought that a record of the presence of such an operation might be of significance to historic research. The processing buildings were stepped down the mountain slope beside Nueva Morelia, but there was no trace of a smelter. The mines were reported to be one hour's walk up the mountain slope. A piece of ore picked up from the processing site appears to contain a high percentage of lead.

Ch- 26 (LH) (Fig. 10; Plate 2c)

A Limonal to Yayahuita period occupation is shown ceramically for this nucleated LH, which is located at the uppermost point of extensive habitable bottomlands and motor vehicle access because the Yayahuita Valley narrows greatly upriver. The operator of the parcel of land, Vincente Velasquez, donated a roughly carved, hand-sized stone head (Plate 2c) from the site to the State Museum in Tuxtla Gutierrez.

Ch- 27 (SH) (Fig. 11)

This SH may be contemporaneous with Ch- 23, thereby assisting in the latter's dating. A Limonal to Yayahuita period occupation is indicated ceramically. The mounds are faced with river cobbles.

Ch- 28 (SH)

Some mounds may have been destroyed in the tilling of the milpa around the present SH. Ceramics suggest a Limonal to Yayahuita period

occupation. Lowe (Pers. Comm. 1974) also thinks that there may be ceramic evidence of the Early Preclassic.

Ch- 29

This single house mound site yielded one sherd of San Jacinto Black: San Jacinto Variety ceramic, indicative of the Jolenton period. Other material suggests a possible Limonal period, and a definite Nueva America-Yayahuita period occupation.

Ch- 30 (SH)

Ceramics indicate a possible La Ceiba period, a Jolenton period, and a Nueva America-Yayahuita period occupation of an area which has at present only two partially destroyed stone outlines as other evidence of occupation.

Ch- 31 (SH)

Ceramic evidence points to a Nueva America-Yayahuita period occupation of this SH. See Ch- 34.

Ch- 32 (SH/SCER ?)

Four low mounds surfaced with river cobbles are roughly arranged around a courtyard, with a low pile of stones in the centre, which may be either a sweatbath of a <u>momoztli</u> depending on the interpretation of the site. It could be classified as a SH, or it might be a very unimposing SCER centre. Limonal to Yayahuita period occupations are suggested by the ceramics. See Ch- 34.

Ch- 33 (SH)

Three housemounds with traces of river cobble surface are arranged in a U-shape with a fourth mound 10 m. south. From the limited ceramic collection, a Limonal to Yayahuita period occupation is indicated, and

Lowe (Pers. Comm. 1974) suggested a Protoclassic component as well. See Ch- 34.

Ch- 34 (SH)

Two low, small housemounds were encountered, with no ceramics in evidence due to vegetation. Because Ch- 31 to 34 are within 300 m. of each other, they may constitute a LH of 15 mounds, including a possible SCER unit; however, ceramic proof of the contemporaneity of all of the sites is lacking.

Ch- 35 (SH)

The landscape surrounding this single mound is hilly and has very thin soil. Dry season water resources appear to be found only .5 km. to the south. Lowe's assessment of the small ceramic collection was Post-classic (Pers. Comm. 1974), but the sherds were too poorly preserved for further study.

Ch- 36 (SH)

This SH is located near an arroyo in which very stagnant surface ponding existed in March. A limited ceramic collection suggests the occupation to be Nueva America and Yayahuita period.

Ch- 37 (MC) (Fig. 12)

This MC site is located in the canyon of the San Miguel River on sloping terraces set below a cliff of at least 50 m. height, with a further steep 40 m. high slope from the site to the river. The 13 mounds are scattered on 3 terrace levels, and the edge of the middle terrace appears to have been faced with stone. Because mound height is under 1.5 m. the site would be classified as a LH were it not for the two parallel mounds with a stone-faced apron on the downhill end - most surely a ballcourt,

and indicative of MC status. Although all the mounds are low, the terrace layout of the site gives an elevation interval of 8 m., but the layout in informal. The vegetation was dense, and there may be much more than was recorded. Present nearby trails which cross the canyon from the Chicomucelo to the Frontera Comalapa side probably served pre-Hispanically. Lowe (Pers. Comm. 1974) suggested a Postclassic date for the ceramics, but the collections were so weathered and fragmentary that they were not retained for further study. The mixture of what may have been common residence mounds with ceremonial structures in an informal layout is similar to the pattern of Postclassic centres in the Guatemala Highlands.

Ch- 38 (MC) (Fig. 13; Plate 2d, 3a, b)

This site is located in a valley (see Plate 2d for panoramic view) on the northern edge of Ecozone 2, just south of the point where the ground begins to drop towards the Grijalva River. From the tops of the surrounding hills it is possible to look over the Grijalva River to the Highlands.

The major plaza of the ceremonial precinct and encompassing mounds alone cover an area 90 m. by 120 m., while the whole of the area probably related to ceremonialism exceeds 2 ha. The dominant main plaza mound is 4.5 m. high, whose central placement seems to divide the main plaza into a major and a minor sub-area. Within the major sub-area are three <u>momoztli</u>. The main plaza is tightly enclosed by the surrounding mounds on three sides. The mounds are faced with roughly squared slabs of local limestone, and the plaza was paved with the same material (Plate 3a). Interestingly, there is no ballcourt, and no stela was located. It is not possible to define the limits of the ceremonial centre because it is surrounded by

courtyard arrangements of mounds of .5 to 2 m. height which may have served as subsidiary ceremonial courts or as elite residences. The accompanying plan shows the major group and some of the surrounding sub-groups on all sides. The cut-off line for mapping was determined more by a time limitation than by an inherent differentiation in mounds. In the panoramic view of the valley a large mound can be seen on the hilltop to the right; this must be of ceremonial function, and possibly was used for communication with nearby centres.

Housemounds cover the valley floor and the terraced sides and top of the hill to the southeast of the plaza (Plate 3b), an area of at least 60 ha. by estimate; the necessity of terracing the hillside for residence is evidence that the whole of the valley floor was occupied simultaneously.

An admitted error in field methods was my failure to pace off a rectangular area of one or two hundred meters square, and count the housemounds within. Populations estimates therefore have to be made on the basis of much less precise data. However, if we assume an average of 100 sq. m. per person, probably a generous allowance, the population of 60 ha. would be about 6,000. To be very safe, and guard against the possibility that the site was not entirely occupied at any one time, the above figure can be divided by half, giving a very secure minimum of 3,000 people during the period of peak occupation.

The valley is presently occupied by the small community Calzada de la Cruz. The residents draw their water from two shallow wells in the southern end of the valley; water is encountered about 1.5 m. below the surface in the dry season. Informants indicated that more water was available on the other side of the hills to the southwest, but this must

also be from wells because a later reconnaissance towards Rancho Raisal revealed no streams.

The ceramic collections diagnose a predominant Nueva America period occupation, and one sherd of probable true plumbate (Misc. 6) indicates some occupation during the early half of the Yayahuita period.

Ch- 39 (Fig. 14)

This site is indicated to be a MC site by the prominent hilltop location, bounded by cliffs of steep ascents on all sides, with the nearest water supply being about 200 m. below, and by the six mounds of 2-3 m. height. Four of the highest mounds are arranged around a momoztli, forming an open-ended plaza. However, the rest of the site is not so formally arranged, and some of the mounds may have served as temporary residences. The very dense, thorny vegetation made mapping difficult and ceramic collecting impossible. It is customary to consider such a hilltop site to be Postclassic, but Borhegyi's caution (1965b:70) that this may not always be the case must be borne in mind. Although this site serves as evidence of surrounding settlement in this valley, few traces could be found.

Ch- 40 (SH)

This single housemound was found near the end of the road in the presently lightly inhabited valley. An arroyo with substantial surface ponding in March runs nearby. A few extremely eroded and subsequently unidentifiable sherds were collected.

Ch- 41 (SA)

Some sherds were picked up in a road cut near Ch- 39, but only one was useful for study, suggesting a Nueva America period date.

Ch- 42 (SCER)

Dense vegetation possibly obscured low platforms associated with this 4 m. high mound. Even alone it must be classified as a SCER site, since it represents too much labour to be a common residence. A few sherds were useless for dating.

Ch- 43 (HIST)

The lower portion of an end wall with a window, part of the side-walls, and a nearby corner were all that was evident of this historic construction. It may have been a church or hacienda building.

Ch- 44 (SH)

Each of the .5 m. high platforms which make up this site was clearly outlined with a stone retaining wall. No sherds were found.

Ch- 45 (SA)

A few sherds, none identifiable, were recovered from a dry well in a milpa near Nueva España.

Ch- 46 (SA)

A few tiny sherds, none datable, were collected in the town plaza of the ejido Nueva America. It is within the probable settlement area of Ch- 47.

Ch- 47 (MC) (Fig. 15; Plate 3c, d; 4d)

This MC site is located in Ecozone 2 on a level limestone area just on the northern edge of the hilly plateau region, at the beginning of the descent to the Grijalva River.

The main plaza and encompassing mounds alone cover an area of 80 m. by 130 m., or in excess of one ha. (Plate 3c), almost identical in size to the main plaza of Ch- 38. It is dominated by a 10 m. mound at one end,

and at the opposite end a blank stela was found between the base of a 4 m. mound and a momoztli, which probably supported it (Plate 3d). There is one other momoztli within the main plaza. The mounds were once faced with roughly squared local limestone (Plate 4a). The problem of the definition of the limits of the ceremonial area is the same as in Ch- 38. Surrounding the main plaza on all sides are courtyard arrangements of mounds .5 to 2 m. high, some appearing to be oriented to the backs of the main plaza mounds. On the south corner of the main plaza is a smaller plaza dominated by the 10 m. mound and two others of 3 and 4 m. heights. Further south is a primary platform surmounted by three secondary platforms, constituting the only plazuela found in Chicomucelo. The accompanying plan shows the main plaza and the most prominent adjacent mounds; the extension of the map to the northwest was made because the mounds were more prominent in that than in other directions, but courtyard complexes continue in all directions. The mounds are surfaced in roughly square limestone blocks which could be picked up throughout the surrounding area and would require little working - in fact the milpa is so stony that the stone-faced mounds seem to be a continuation of the ground surface.

The habitation area is estimated to extend at least 900 m. in a southwest to northeast direction, and if as large in the other dimension, it encompasses an area of 80 ha.; or it may be substantially longer.

Using the same method of estimation of population for this site as for Ch- 38, one arrives at a minimum figure of 4,000 people.

Drinking water was probably supplied by the source exploited presently by the ejidos Alfonso Corona del Rosal and Nueva America - a well in a densely wooded area in which water is encountered about 2 m. below

the surface in the dry season.

The milpa on which the site stands was reported by a local informant to be cropable for over 10 years continuously.

The preponderance of the ceramics belong to the Calzada de la Cruz group, indicating a Nueva America occupation. Nine sherds of the Santa Teresa groups were probably deposited during the Nueva America period.

Ch- 48 (SCER) (Plate 4b)

This site probably belongs to the SCER class, although the 7 mounds are scattered, rather than neatly arranged around the 3 m. mound. A large cut has been made through the centre of the main mound (Plate 4b), presumably in the search for gold, making it difficult to orient with certainty. Ceramic collections indicate a Nueva America and possible Yayahuita period occupation.

Ch- 49 (SH)

This single mound is located 300 m. northwest of Ch- 48. Few sherds were found, one suggesting a Limonal period occupation.

Ch- 50 (SCER)

This SCER site has 3 mounds, the highest of which is 2.5 m., loosely arranged around a wide court, and one low housemound is a short distance away. Ceramics suggest a Nueva America-Yayahuita period occupation.

Ch- 51 (SH)

The mounds of this SH are surfaced in river cobbles. No sherds were found. See Ch- 54.

Ch- 52 (SH)

One of the mounds of this SH is L-shaped, and there is a short terrace in the riverbank in front of the site. The mounds are faced with river cobbles. No sherds were collected. See Ch- 54.

Ch- 53 (SH)

The mounds of this SH are faced in river cobbles. No sherds were collected. See Ch- 54.

Ch- 54 (SCER)

Five river-cobble surfaced mounds, the main one being 3 m. high, are oriented towards a small courtyard, making this a SCER site. Another mound, probably a housemound, is 50 m. northeast. The ceramic collection was very meagre. One classified sherd suggests a Limonal period occupation, but in Gareth Lowe's opinion a Postclassic date is also possible (Pers. Comm. 1974).

Ch- 55 (SA)

Only sherds were found at this site, but they were not suitable for analysis. Lowe (Pers. Comm. 1974) was of the opinion that they were Late Classic or Postclassic.

Ch- 56 (SA)

A few sherds mark this site, which Lowe thought were Late Postclassic or Protohistoric (Pers. Comm. 1974).

Ch- 57 (SCER) (Fig. 16)

This SCER site serves as the focus point for the surrounding LH, composed of the sites Ch- 57-60.

The four sites are situated at the junction of the Tachimula River and the river flowing through Lazero Cardenas, and have close access to

two mountain entrances - one at Piedra Labrada and the other towards Emiliano Zapata.

The contemporaneity of the four sites is not in doubt. Ch- 57, 58 and 60 have some ceramics suggestive of a Limonal phase occupation, but the great preponderance of the ceramic collections belong to the Santa Teresa Red and Unfinished groups, indicative of a Nueva America-Yayahuita phase occupation. Although recorded as four separate sites, the occupation was probably continuous between them, extending at least 400 m. along the Tachimula River, with perhaps 100 m. depth back from the banks. The abundance of the ceramic collections results from their having been tractor ploughed.

Ch- 58

This is now only a sherd area. Any mounds have probably been destroyed by the 60 years of cultivation reported by the owner. See Ch- 57.

Ch- 59 (SA)

This is a sherd area only, and presently a milpa. See Ch- 57.

Ch- 60 (LH)

Only 6 housemounds are in evidence in the milpa, but the extent of the sherd distribution indicates a heavier occupation. See Ch- 57.

Ch- 61 (SA)

A few sherds were found 1 m. below the surface in the side of a road cut on the main road entering Chicomucelo from across the Yayahuita River. There was no evidence of a stratigraphic situation suitable for excavation. The sherds suggest occupation during the Limonal period and the late Yayahuita or early Chicomucelo period.

Ch- 62 (SA)

Abundant ceramics were found in the clay quarry of Chicomucelo's manufacturer of fired bricks and roof tiles. They indicate a Nueva America-Yayahuita period occupation on the outskirts of the modern town, along the Yayahuita River.

Ch- 63 (SA)

A few sherds were collected on the banks of the Tachinula River in the town of Chicomucelo, but none of these could be identified due to the advanced state of weathering.

Ch- 64 (SH)

A very small ceramic collection was made at this SH site, which later proved useless for analysis.

Ch- 65 (SCER) (Fig. 17)

This site is located on a prominent hill commanding an excellent view to the south and east. It fits in the SCER class, but I believe that it was definitely ceremonial in function. The mounds appear to have been surfaced in slightly water-worn, flat, locally available stone, although only a modern excavation in the side of the main mound reveals any trace of the original surface. A nearby arroyo would provide water in the wet season. The scanty ceramic collections could not be classified, but Gareth Lowe was of the opinion that they were Late Classic or Postclassic (Pers. Comm. 1974).

BV- 1 (SH)

A generous ceramic collection was obtained from the milpa around this SH. A Limonal to Yayahuita period occupation is indicated. See BV- 3.

BV- 2 (SH)

Two well preserved mounds were found 80 m. east of BV- 1, outside of the milpa area, and by association with the latter site have been assigned the same chronological position; no sherds were found at this site itself. See BV- 3.

BV- 3 (SCER) (Fig. 18)

This site contains a common residential section and a SCER section, the latter being the northern group on the plan. The residential group contains two T-shaped mounds, nowhere else found during the reconnaissance. The mounds are faced with river cobbles, and between the two groups there is an L-shaped allignment of cobbles of unknown significance. My ceramic placement of the site occupation is the Limonal period, contemporaneous with nearby CH- 9, but Gareth Lowe's opinion was that there was Middle Preclassic, Protoclassic or Early Classic, and Postclassic material in the collections (Pers. Comm. 1974).

It is likely that the right bank of the Tachinula River in Bella Vista was a more or less continuous strip of settlement during the latter part of the Limonal phase, probably earlier, and possibly later, serving the trade route through the mountains to the coast, and providing the service population for the important ceremonial site of Piedra Labrada. With this reasoning, a late Jolenton and Limonal period occupation has been indicated for all of the sites, even though the ceramic evidence per site is lacking, or in dispute.

BV- 4 (LH)

The ceramic material from this LH was useless for my analysis, but Gareth Lowe guessed it to belong to the Late Postclassic period (Pers.

Comm. 1974). See BV- 3.

BV- 5 (LH)

A Nueva America-Yayahuita period occupation is suggested by the limited ceramic collection for this LH. See BV- 3.

BV- 6 (SH)

These 2 mounds have been partially destroyed. A very small ceramic collection suggested a Limonal to Yayahuita period occupation. See BV-3.

BV- 7 (SH)

Sherds, but no mounds were found on the only habitable area on the left bank of the Tachinula River above Piedra Labrada. They suggest a Limonal period occupation in my classification, but Gareth Lowe thought that they might be Late Postclassic (Pers. Comm. 1974). See BV- 3.

BV- 8 (LH)

One mound of this LH is L-shaped. The ceramic collection indicates possible Limonal and Nueva America-Yayahuita period occupation, and one distinctive sherd of Chinautla Polychrome diagnoses a certain late Yayahuita or early Chicomucelo period occupation. See BV- 3.

CHAPTER 4

Trade Routes through Chicomucelo

The purpose of this chapter is to combine information from ethnographic, ethnohistoric, and archaeological sources to delineate the trading routes which were important to the prehistory of the Municipality of Chicomucelo, particularly to the Tachinula and Yayahuita River valleys.

During the reconnaissance information was collected from two informants regarding trails through the mountains to the Pacific coast: one informant, a workman in the Finca Buenas Aires said that there was a trail by which the coast could be reached in three days by horse; another individual from Nueva Pacayal, while leading Thomas Lee and myself up into the mountains by a broad trail behind that town, indicated that it was possible to continue to the coastal town of Huixtla via Siltepec and Motozintla within two twelve-hour days of walking.

Ethnohistoric documentation of routes from the Soconusco coast towards the eastern end of the Central Depression are found in a copy of a map from the archives of the church of Tuxtla Chico, which map Navarrete believes to date to the end of the 16th or early 17th century (Navarrete, 1973: Fig. 2). One trail leaves from a settlement called "Xoconusco" on the coast and goes through the mountains to "Xiximucelo" (Chicomucelo) which has a note above saying "aqui se comercia" ("here one trades"). A cargador is shown on the trail carrying a large load by tumpline. The coastal settlement of "Xoconusco" no longer exists, but Navarrete thinks that he has found the ruins of it between Mastepec and Acacoyagua. He believes also that this is essentially the same trail as now goes from

Mastepec to Chicomucelo, as is shown in his Fig. 1 (Pers. Comm. 1974). One other trail shown on the map goes from Viztlán (Huixtla), via Tzantlán (Tuzantan) to Motozintlán (Motozintla), with a note, "aqui se comercia", above the latter town as well (this is the route of the modern road from Huiztla to Motozintla). It is from Motozintla that our informant indicated the possibility of communicating with Nueva Pacayal, and Navarrete also cites the existence of this route (1973:49), although it is not the only route from the Central Depression to Motozintla.

Thus, the ethnographic and ethnohistoric evidence indicates there were and are two communication routes from the coast converging on Chicomucelo. It is not possible to determine whether the Mastepec - Chicomucelo trail arrives at Chicomucelo through the valley of the Tachimula or the Yayahuita River, because one or the other of the two rivers has been omitted on the sketch map (Fig. 1, in Navarrete 1973), and I do not have first-hand information which might resolve the problem. The trail mentioned by the informant in the Finca Buenas Aires may be that under discussion, but its precise route is unknown. On the other hand, the Motozintla - Nueva Pacayal extension of the Huixtla - Motozintla trail is not indicated on the old map, but it surely existed.

From the town of Chicomucelo, commerce with the rest of the Central Depression is easy, there being no major geographical barriers, and the southwestern region of the Peten itself is accessible through the natural saddle of the Comitan area between the Central Highlands of Chiapas and the Cuchumatan Mountains of Guatemala (see Lowe and Mason 1965:235). Travellers of such a route may well have followed the pathways documented historically. The 1774 manuscript of Garcia de Bargas,

cited by Navarrete (1973:81-82), describes a route of 10 leguas (a legua is approximately equal to 4 km.) from Chicomucelo to Escuintenango, with a further road of 13 leguas to Comitán (see Lowe 1959: Fig. 64, for locations). The route from Comitán to the Lacandon region is documented by the journal of friar Thomás Torres' vista of 1595 (Navarrete 1973: 40, 69).

Although historic sources, as well as the natural topography, elucidate the possibility of this route, the full trading connection from the Soconusco to the Peten was probably not made regularly during the Postclassic or Hispanic periods because the Peten was not a significant cultural centre, and consequently generated little demand for luxury goods. Archaeological evidence indicates that there were strong connections between the Peten, the Central Depression, and the Soconusco coast prior of the Postclassic.

Stelae, carved in the Classic Maya style, are reasonably numerous in the Upper Tributary region of the Grijalva, and in the adjacent Highlands about Comitán. The Highland sites are Tenam Puente, Sacchaná, and the more famous Chinkultic. Within the Central Depression are the stela sites of Tenam Rosario and Piedra Labrada. The stela of the five sites are closely related stylistically (Lee 1974b:11). No such carved stelae were discovered by Lowe in his 1959 reconnaissance of the major sites of the Grijalva River between the Sumidero Canyon and the upper tributaries. This lack of evidence from the downstream area emphasizes the cultural influence of the Classic Maya heartland on the Upper Tributaries, and the Piedra Labrada stela shows that this influence tends to cross-cut the upper valley along the lines of a possible trade route.

The distribution of the distinctive Protoclassic ceramic, San Jacinto Black: San Jacinto Variety is also significant to the trade route problem (see Chapter 5 for a more complete discussion of the significance of this ceramic). Brockington notes its concentration in the upper end of the Central Depression, and virtual absence from contemporary deposits elsewhere. However, Brockington (1967:65) notes Lowe's report of finding the polished black ware's typical wide- everted rim at Izapa. To this writer, Lowe reported the finding of San Jacinto Black: San Jacinto Variety sherds at Acacoyagua and Acapetahua on the Soconusco coast (Pers. Comm. 1974). These latter two settlements lie between Huixtla and Mastepec - the previously described termini of the modern trails to Chicomucelo. The ruins of "Xoconusco", of the 16th century map, lie between Acacoyagua and Mastepec. In addition, sherds of this distinctive type were located in the Tachinula and Yayahuita River valleys of Chicomucelo. Thus, the sum of the distribution evidence suggests that trade between the upper Central Depression and the Socomusco coast was taking place during Jolenton times by a route having termini in Chicomucelo and near "Xoconusco". It no doubt continued during the Classic period, with an extension into the Usumacinta drainage area (Rathje 1973, has emphasized the importance of trading systems to the Classic Maya).

Cacao was most likely the item which animated the trade route. Thompson (1956) has discussed the importance of this product in pre-and post-Contact Mesoamerica; it served as money, tribute (to the Aztecs), and as a ritual offering. He even speculates on the basis of linguistic evidence that it was first cultivated on the Pacific slopes of the Guatemala Highlands. The Socomusco was a prime production region,

controlled by the Aztecs at Conquest. Friar Thomás Torres, noting the cleanliness and good condition of the coastal road in 1595 wrote, "... por ella sacan sus productos de los que es el más principal el cacao, por lo que Moctezuma mantenía en buena vigilancia los pasos y poblados desta costa del Mar del Sur" (cited by Navarrete 1973:40).

Although cacao was surely a product of prime importance, other items of trade would probably include marine products such as shells and stingray spines, and ceramics.

In summary, modern and ethnohistoric evidence show that the Chicomucelo area has access to the Pacific coast through two routes. The distribution of San Jacinto Black: San Jacinto Variety of ceramic gives us good evidence that the routes were being used during the Jolenton period, although a much earlier date of first use is likely. The extension of the Classic Maya stela trait through the Comitán saddle area into the upper tributaries region, including Chicomucelo, suggests a reaching-out of the Peten trading network to the cacao-rich Soconusco province. It is likely that this route lost much of its importance with the demise of the centre area of Maya civilization, and with the Early Postclassic population reduction in the Central Depression.

CHAPTER 5

Cultural Historical Integration

The purpose of this chapter is to integrate and summarize the results of the reconnaissance of the Municipio of Chicomucelo and to relate its prehistory to the prehistoric cultural patterns of the surrounding regions.

The chapter is divided into two basic units. The first half is a source of documentation of the main features of regional sequences surrounding Chicomucelo. The information presented was chosen with regard to the integration of Chicomucelo culture history into that of the surrounding areas, and to the interpretation of demographic developments in the Central Depression in Chapter 6. The latter half of this chapter presents the integration of all previously presented information, and the ceramic descriptions, to form the cultural historical narrative of Chicomucelo.

SURROUNDING PATTERNS OF DEVELOPMENT

Table 2 shows phase sequences established by various authors whose work has been drawn upon for comparison of Chicomucelo ceramics and elucidation of the cultural milieu of the various periods of Chicomucelo prehistory. The temporal subdivisions are aligned by the absolute dates which the authors estimated for their own temporal divisions; no suggestions of more appropriate arrangements are made. White (1976) is the sequence proposed in this report for Chicomucelo.

Particularly significant to Chicomucelo is the Central Depression. For discussion purposes this long trench has been divided into an

upper and a lower portion, the division point being the centre of the Angostura Canyon. The upper portion extends upstream to the Cuchumatan Mountains of Guatemala, while the lower portion extends downstream to the exit of the Grijalva from the Central Depression through the Sumidero Canyon, and includes a narrow strip of valley extending towards the Isthmus of Tehuantepec.

The lower portion is by far the better known archaeologically. One of the longest Prehispanic sequences in Mesoamerica has been established by N.W.A.F. excavations at Chiapa de Corzo, just upstream of the Sumidero Canyon. This sequence begins at 1500 B.C. and extends to Contact. Summaries of the results of the excavations by Lowe and Mason (1965) and by Lee (1969) have been relied upon. It should be noted that the beginning and ending dates assigned to some phases, particularly in the Preclassic, are different in these two works. No explanation of the difference is given, but because Lee draws his dates from a 1962 publication, it is assumed that the Lowe and Mason dates are more modern estimates and they have been used throughout this thesis. Excavations just below the Angostura Canyon at Santa Cruz (Sanders 1961) confirmed the sequence established at Chiapa de Corzo up to Early Classic times. The Santa Marta rock shelter excavations of MacNeish and Peterson (1962) provided the preceramic background for the Central Depression with a chronological sequence beginning at 7000 B.C. The New World Archaeological Foundation has undertaken other minor excavations in this area; individual reports are available in the Papers series but Lowe and Mason's summaries of results have been relied upon for this thesis. Certain reconnaissance results are also drawn upon. Lowe's 1959 report

of the first major reconnaissance of the Central Depression has been cited extensively, though for this paper his site counts have been subdivided into the upper and lower regions (his report does not include the strip west of Chiapa de Corzo, and his treatment of the upper tributaries is very light). Because his report predates major discoveries concerning the antiquity of Olmec civilization he has labeled as "Early Preclassic" material which would now be considered Middle Preclassic, but this does not otherwise affect the results of his survey. Navarrete's reconnaissance of the Frailesca (1960), an area extending south and west of Chiapa de Corzo, provides important information for an area not immediately adjacent to the Grijalva River. He uses the Chiapa de Corzo phase sequence. Some revision of his earlier ideas is to be found in an important monograph on the Chiapanec (1966), the dominant occupants of the lower Central Depression at Contact. Finally, Agrinier's report (1968) on a reconnaissance of Varejonal, in the western end of the Central Depression has been used.

The only stratigraphic excavation in the upper Grijalva subdivision has been that at Santa Rosa, about 40 km. downstream of northern Chicomucelo. The ceramic report by Brockington (1967) has been used extensively, but unfortunately, a possible Early Classic - Late Classic, and a definite Postclassic gap exists in the sequence. Lowe's reconnaissance report (1959) provides information about this region, pertaining particularly to the lands immediate to the Grijalva River. The recently constructed dam in the Angostura Canyon necessitated a salvage project by the Instituto Nacional de Antropologia e Historia, which included lands up to the 600 m. contour. This was essentially a more intensive

exploration of the area previously worked by Lowe. No I.N.A.H. report is yet available, but site-occupation counts per period, based on Gareth Lowe's review of the ceramics, have been published by Lee (1973, 1974b, 1975). The Upper Tributaries Project of the New World Archaeological Foundation began in 1973 with two years of intensive reconnaissance of the Municipalities of La Trinitaria, Frontera Comalapa, and Chicomucelo. Preliminary results of the work have been made available by Lee (1973; 1974a,b; 1975). A program of excavations is now under way.

In the Central Highlands, a part of the highland plateau north of the Central Depression, intensive archaeological investigations have been done under the auspices of the University of Chicago. Adams (1961) has established the phase sequence and discussed the settlement patterns, while Culbert (1965) has provided the ceramic substantiation.

Just east of the Central Highlands, but still on the highland plateau, is the important but little studied area of the plains of Comitán. Some information has been extracted from Adams (1961), and Borhegyi (1970).

The Postclassic ceramic sequences of Tabasco and Campeche detailed by Berlin (1956) and Matheny (1970) are important to Chicomucelo. While Matheny has relied on Berlin's stratigraphy to establish his later phases, his ceramic inventory is more complete and better illustrated, and his nomenclature is in the typevariety pattern.

The Pacific Coast of Chiapas is known as the Soconusco. Green and Lowe (1967), and particularly Ekholm (1969) have been relied upon for information about the Early and Middle Preclassic. The latter author reports on excavations at Izapa. A report of further extensive

investigations by the New World Archaeological Foundation is in press, but for now, summary statements about the Soconusco in Lowe and Mason (1965) have been relied upon.

To the east of Chicomucelo are the Highlands of Guatemala. An archaeological synthesis and settlement pattern summary has been provided by Borhegyi (1965a,b). For ceramic comparisons from the Late Classic to Protohistoric period, the works of Wauchope (1948,1970) and Dutton and Hobbs (1943) have been used.

The beginning and ending dates of the general time divisions of Preclassic through Postclassic have been taken from Willey (1971: Fig. 2). This system originated with the study of the Maya lowlands, and the temporal divisions imply lowland cultural content as well. So important was the region to Mesoamerican prehistory that the divisions have come to be used in surrounding regions. However, because other regions developed on different timetables, to different levels of achievement, other authors have had to juggle dates to make the period names correspond to what they believe to be "Protoclassic", or "Late Classic" development in their region. I believe that this can only lead to confusion. The lowland-appropriate dates should be retained, and separate developmental terminology should be worked out surrounding regions, which may then be compared with contemporaneous Petén developments explicitly, or tacitly by use of a Peten period term; such has been done for the Yucatán Peninsula. The lowland terms provide a useful and commonly understood system of temporal division, and so are used here.

Early Preclassic: 1500 - 1000 B.C.

No Chicomucelo material dates to this phase, but important

foundations for later Mesoamerican development were laid during this and previous periods.

A predominantly agricultural and sedentary existence had developed. To this fact the manos and metates in Chiapa de Corzo - Chiapa I deposits, and charred corn cobs and corn pollen at the Santa Marta rock shelter in contemporaneous deposits, bear testament. Settlement preference was for the easily cultivated river margins (Lee 1969:192). A suggestion has been made by Lowe (in Green and Lowe 1967:56-60) that small obsidian flakes found in Barra and Ocós deposits on the Pacific coast - possibly used for manioc gratters, and the absence of definite manos and metates in the same deposits, indicate a manioc-based rather than a corn-based culture.

The first Mesoamerican earth-moving activities indicative of large-scale community effort were taking place at San Lorenzo Tenochtitlán (Coe 1968 :45-6).

It is likely that the occupants of the upper end of the Central Depression were Mayan speakers. The point of origin of the Mayan language group, as located by Kaufman and McQuown, is the Cuchumatan mountains of western highland Guatemala. The outward movement and differentiation into sub-groups began about 1800 B.C. (in Lee 1973:3-4).

Middle Preclassic: 1000 - 400 B.C.

In the lower Central Depression this division includes the latter part of Chiapa I to the early part of Chiapa IV. Chiapa I ceramics are the earliest, and show Ocos similarities. Chiapa II ceramics are more evolved and are similar to La Victoria - Conchas I, to late Izápa - Jocotal and to the earliest La Venta ceramics and include the double-

line-break pattern; the first rectangular house or temple platforms were built, and there are several contemporaneous sites in the Central Depression. The polished monochrome "waxy" slips mark Chiapa III, but Lowe and Mason concluded that this represented an intrusive culture because most refuse deposits grade from Chiapa II into IV, although there are distinctive period III burials and architecture. A limited quantity of Chiapa III ceramics appear in many sites (Lowe and Mason 1965:209-12; Warren 1961:77; Ekholm 1969:53). Lowe located 11 "Early Preclassic" (now called Middle Preclassic) sites in the lower region (1959:Fig. 3a).

In the upper Grijalva region, Santa Rosa Phases 1 to early Phase 3 fall within the Middle Preclassic. Phase I ceramics are typical of the widespread Middle Preclassic culture tradition, and are closely related to Chiapa II material. Phase 2 is defined by a sudden change in ceramic techniques, with jars, monochrome slips, volcanic temper and new forms - a tradition continuing to Phase 5. The first ceremonial platform is built, with a surrounding village. Early Phase 3 participates in the Mamón ceramic tradition, and is closely related to Chiapa IV (Brockington 1967:67).

Lowe (1959:Fig. 3a) located 7 "Early Preclassic" sites in his reconnaissance. Angostura salvage results show 35 sites at 800 B.C., dropping to 23 at 400 B.C., while at the same time the Upper Tributaries counts increased from 7 to 28 (Lee 1974b: Fig.2). The very large Upper Tributary site La Libertad, and the smaller Niagara, were in use (Lee 1974a:4-9).

At Izapa, Ekholm's late Cuadros, Jocotal, and Duende phases are Middle Preclassic (1969:94-99). The maize subsistence base appears to

have been well established in Cuadros. Cuadros is marked by a break in the ceramic tradition from Ocós. Tecomates and flaring-side, flat-bottom bowls are popular. Noteworthy are Olmec horizon-marking Coapa Black vessels with thickened rims and excised exterior design, including the double-line-break, which are the same as material found in the San Lorenzo phase at San Lorenzo Tenochtitlán, at Tlatilco, Las Bocas, and San José Mogote in the Oaxaca Valley. The Jocotal phase is a continuation of Cuadros, and both late Jocotal and Dili phase ceramics strongly resemble Late Olmec ceramics from La Venta. Duende phase ceramics, while particular to Izapa, lack Mamón traits and so are considered pre-Mamon. During this latter phase ceremonial construction and monument erection probably began.

In the Guatemala highlands, in the Las Charcas - B and Providencia phases, there was an expansion of the number of communities, dependency on the parent communities for craft goods, the beginning of the building of large burial mounds, probably "corvee" labour, and the use of uncarved stela (Borhegyi 1965a: 11-14).

Noting the conclusion by Willey and others that there seems to have been a general Mesoamerican population increase at this time, Lee (1969:194) suggests that it was linked to a more productive maize.

Late Preclassic: 400 B.C. - A.D. 1

Developments of Chiapa IV - VI in the lower region are described by Lowe and Mason (1965:215-21) and Lee (1969:194-99).

Chiapa IV at Chiapa de Corzo showed major cultural development, with Monte Alban I and Gulf Coast trade pieces appearing in collections, structural caches, abundant grave offerings, enlargements of previous

platforms, and lime plaster. The ceramics of this period are the most widespread of all the Preclassic in the Central Depression, appearing at over 50 sites (Lowe and Mason). Lee notes a general population peak at this time, and a great flowering of artifact types at Chiapa de Corzo.

Chiapa V at Chiapa de Corzo is marked by the introduction of Chicanel related medial and labial flanges, composite-silhouette vessels in red and black polished wares, and white rim black sherds, but many sites in the Depression do not show these Chicanel similarities (Lowe and Mason). A particularly significant artifact was a clay stamp with a bar-and-dot number 8 and a Zapotecean hieroglyph (Lee).

Cut stone architecture and ever-increasing mound size characterized Chiapa VI. Within the Depression there was increasing regionalization, with a hard finished orange ware in production at Mirador, and polished black at Santa Rosa (Lowe and Mason).

Navarrete (1960:34) briefly summarizes the whole Preclassic in the Frailesca, saying only that earth and boulder substructures on second river terraces were common throughout the period.

Lowe's reconnaissance site count for the lower region is 15, but this is for an 800 year period from 500 B.C. to A.D. 300 (1959: Fig. 4a).

In the upper region, the latter half of Santa Rosa Phase 3 had Chiapa V and Chicanel ceramic relationships. Brockington notes that, beginning at this time, he was progressively less able to find close ceramic similarities between Santa Rosa and other sequences. Phase 4 is characterized by the production of the distinctive polished black ware, San Jacinto Black: San Jacinto Variety (Brockington 1967:64,68).

Lowe's reconnaissance site count for the 800 year period in the upper region was 22 (1959:Fig. 4a). Angostura salvage counts drop from 23 at 400 B.C. to 20, and then rise to 50. The Upper Tributaries count starts at 28, climbs to 35, and then drops to 25 (Lee 1974b:Fig. 2).

The Late Preclassic Sak phase of the Chiapas Central Highlands is the earliest occupation in that region. The ceramics are equivalent to contemporaneous Central Depression and Chicanel ceramics. Occupation is light, and it is likely that colonization was from the Central Depression (Culbert 1965:79).

Late Preclassic and early Protoclassic material has been recovered from Izapa (Lowe and Mason 1965:201).

Protoclassic: A.D. 1 - 300

In the lower Central Depression, Chiapa de Corzo - Chiapa VII and early VIII fall in the Protoclassic. These phases are described by Lowe and Mason (1965:218-26) and Lee (1969:196-99).

In contrast to previous phases, Chiapa VII shows few relations with the Petén or the Guatemala Highlands. A smudged black pottery was present. Within the whole Central Depression, the regionalism began previously continued strongly (Lowe and Mason). Lee notes craft-specialist workshops near the "palace" structures at Chiapa de Corzo.

Lee says that at Chiapa de Corzo itself, Chiapa VIII is poorly known, and although the reduced number of artifact types indicates that it was losing its importance as a centre, it was still the most imposing site in the Central Depression. Lowe and Mason indicate that construction extended and increased the height of the platforms, and the first real stone-faced pyramid was constructed. A small amount of early

Tzakol polychrome was found. The smudged black ware continued in many sites in the Central Depression, and the good definition of their stratigraphic context indicate that western Chiapas was a major cultural centre at this time. An important feature of ceremonialism in this region was the use of inaccessible caves for massive ceramic offerings. For Lowe's reconnaissance site count see the previous section.

In the upper Central Depression, Santa Rosa Phase 4, and early Phase 5 occupy the Protoclassic (Brockington 1967:68-71). Phase 4 diagnosed by the distinctive polished black ceramic, San Jacinto Black:San Jacinto Variety, of which the best known form is a low plate with wide everted, deeply grooved and decorated rims. About the distribution of the polished black ceramic, Brockington writes:

> ... it can be noted that contemporary wares popular in surrounding regions are as scarce at Santa Rosa as the polished blak (sic) ware is outside. All of this suggests that a regional culture existed in the river valley of the upper Grijalva River between La Angostura Canyon and the Guatemala border (1961:80).

There was a great amount of Period 4 building activity at Santa Rosa.

The upper Central Depression concentration of the peculiar polished black ware is the source of substantial cultural information. Its significance to the elucidation of trade routes to the Pacific coast has been discussed above (see Chapter 4). The amount of building activity at Santa Rosa which is dated by this ceramic indicates a rising cultural energy which is consistent with the expansion of trade relationships. It is not known that Santa Rosa was the manufacturing centre of the polished black ware, but it must have shared closely in the central cultural development. Brockington (1967:69) speculates that the division

between the distribution of this ware and the white-rim blackware of the lower Central Depression represents a border between a western Mixeno and an eastern Mayan speaking population.

For Lowe's reconnaissance site counts see the Late Preclassic. The Angostura Salvage Project's results indicate a drop from 50 occupied sites at the beginning of the period to 25 at the end, while the Upper Tributary counts rose from 25 to 43 (Lee 1974b: Fig. 2). One settlement area in particular was located on poorly watered, soil-poor land, and because it had no traces of an earlier occupation it is thought that its occupation was due to population pressure in better land (Lee 1974b: 14-15).

In the Central Highlands there is a discontinuity in the archaeological record which covers most of the Protoclassic period (Culbert 1965: Table 1).

In the Soconusco, the Protoclassic period is poorly known (Lowe and Mason 1965:202).

In the Guatemala Highlands, the latter part of the Miraflores, and the succeeding Santa Clara phase, and most of the latter half of the rural Arenal phase is Protoclassic. Hollow, bulbous or mammiform feet in tripod or tetrapod combinations begin to develop earlier than the Santa Clara phase, and become the diagnostic feature of that phase (Borhegyi 1965a:11-14).

Early Classic: A.D. 300 - 600

In the lower Central Depression, Lowe and Mason (1965:226) indicate that the Chiapa IX phase at Chiapa de Corzo is poorly known, there being no construction identified for that phase. There are three

burial offerings of Teotihuacan-like vessels. Lee (1969:199-200) notes a drastic decline in the number of artifact types in this phase, as further evidence of the demise of the site. There is evidence of Teotihuacan influence at the site of Mirador, further west, and the suggestion has been raised that Teotihuacán-triggered armies were instrumental in the abandonment of this site, but Lee notes that at Mirador the evidence of Teotihuacán influence was restricted to tomb vessels.

In the Frailesca the Preclassic architectural patterns were followed (Navarrete 1960:34).

In the upper Central Depression, part of Santa Rosa Phase 5 falls in the Early Classic. The phase itself is poorly defined stratigraphically, and the only ceramic type which can be assigned to the period is the likewise poorly defined Polished Orange - B, which stylistically would appear to proceed Polished Black, but stratigraphically succeeds it. The production of Polished Black (San Jacinto Black:San Jacinto Variety) itself probably continued into the Early Classic, as it has been found in Kan phase material in the Central Highlands. There is also little mound construction, and a change in settlement pattern with a decline in population. The termination of Phase 5 is poorly defined, and there may be a hiatus between it and Phase 6, but because the artifact concentrations are similar, Brockington concluded that there was a strong relationship between the two (Brockington 1967:4,12,49-50,68).

Lowe's reconnaissance (1959: Fig. 5,a) indicates a much reduced occupation for the upper Central Depression as well as for the lower

region, but Brockington has suggested that the continued production of Polished Black into the Early Classic caused Lowe to classify sites which were Early Classic as Late Preclassic. Because the lower Central Depression was much better known ceramically at the time of Lowe's reconnaissance, the chronological placement of sites in that region can be considered as more accurate, and used as a comparison for the upper region results. Lowe's site counts are given below:

	ABOVE ANGOSTURA	BELOW ANGOSTURA	TOTAL
LATE CLASSIC	31	18	49
EARLY CLASSIC	2	6	8
LATE PRECLASSIC	22	15	37
TOTAL	55	39	94

It can be seen above that the Early Classic total upstream is relatively much smaller in comparison with the earlier and later periods than is the equivalent downstream total. This is probably evidence that the error Brockington pointed out was made. However, it does appear that there was a substantial reduction in sites occupied during the Early Classic in both regions. The Angostura salvage counts confirm this reduction during the first half of the period, but indicate a resurgence during the second half. The period began with 25 occupied sites, dropping to 20, and then climbing to 75 at the end. The Upper Tributary counts begin at 43 and climb to 105 (Lee 1974b: Fig. 2).

In the Central Highlands, Kan phase ceramic connections with the Maya lowlands appeared weak, and the ceramic similarities with the Central Depression were on a general level only. The Highland ceramics

are seemingly unrelated to those of the Comitán valley, as well. It was a time of substantial change in settlement pattern, from the valley-floor sites of the Sak phase to the hilltop sites of the Tsah phase. Culbert (1965:79-82) thinks that there is an abrupt transition from the preceeding period, and since the population increase was too marked to be the product of a normal increase he reasons that there must have been an influx, possibly from the Grijalva valley, as a result of the disruption there. However, the "... considerable isolation..." of the ceramic complex which he has described would seem to me to argue against the population increase by immigration. The isolation of the Central Highlands is in contrast to the Comitán region just to the east. In the area just southeast of Comitán an Initial Series Long Count date of A.D. 591 (11.16 correlation) has been found on a ballcourt marker at Chinkultic (Morley 1938:371, cited in Adams 1961:344).

The Early Classic on the Chiapas coast is poorly known, but it is likely that the Protoclassic continued until the arrival of Mexican influence, which disturbed the Guatemala Highlands (Lowe and Mason 1965:202).

Kaminaljuyu's Aurora and Esperanza phases, and the rural Amatle phase are predominantly Early Classic. Borhegyi (1965a:19-28, 40) says that this period has fewer sites than the preceeding or succeeding periods, and many important Preclassic sites were permanently abandoned in one area. However, settlement continued to move to the peripheries of the valleys and edges of the plateaux and agricultural terracing and perhaps irrigation were period developments. Ceremonial

centres became more closely arranged around plazas, with much smaller mounds than in the Preclassic - ranging from 5 to 8 meters. The Teotihuacán invasion about A.D. 400 was the most dramatic event, and they dominated Kaminaljuyu, introducing the ball court, of which the open-ended type became especially popular in the Western Highlands. The stela, and other cult items seemed to disappear.

Late Classic: A.D. 600 - 900

In contrast with the dense surrounding Late Classic populations in the lower Central Depression, the decline at Chiapa de Corzo continued into Chiapa X, with a much reduced assemblage, and only small shrines being built. Sites surrounding Chiapa de Corzo tended to be small and numerous. Lee thinks that the violence which Early Classic burials suffered may be indicative of social strife, and explain the degraded condition of the site in the Late Classic, (Lee 1969:200-01). A possible explanation for the failure of the site to recover is Navarrete's contention that the Chiapanecs entered the Central Depression from Central Mexico between A.D. 800 - 1000 (1966:89).

In the Frailesca, Navarrete (1960:34-36) noted great architectural development in the Late Classic, and a great population increase "... as indicated by the many kilometers of house foundations that appear without interruption in some places".

Many Late Classic sites were built on areas which today are very poorly watered (Lowe and Mason 1965; Lee 1969). An example of such a site from the western Central Depression is Varejonal, above the canyon of the La Venta River. Although the first construction in this impres-

sive site was Late Preclassic, the densest population was Late Classic. The surrounding region is particularly inhospitable for human occupation - built on karstic limestone, there is no water within a short distance, and there is practically no soil for cultivation (probably due to erosion after the cutting of the forest cover). Nonetheless, there is evidence of dense human settlement, with an extensive system of agricultural terraces and small check-dams in the immediate vicinity (Agrinier 1968:89-93).

Lowe's reconnaissance of the lower Central Depression indicates that 18 sites were occupied between A.D. 600 - 1000 (1959:Fig. 6,a).

In the upper Central Depression, Phase 6 at Santa Rosa covers the latter third of the Late Classic, and continues afterwards. Its relationship to Phase 5 is somewhat uncertain. Brockington (1967:4,50 65,68) notes that it is very different ceramically, but, on the other hand, the distribution of settlement in the site was the same, therefore suggesting a close connection. Coarse and medium textured ceramics with volcanic ash temper are common, and bowls with a mold impressed pseudo-glyph band of decoration around the outside are unique to the phase. A pseudo-glyph sherd identical to Santa Rosa material was also found at Laguna Francesa, a major ceremonial complex not far upriver from Santa Rosa. In the Acala subregion (which is partly in my lower Central Depression division) and the Chapatengo - Chejel subregion, Lowe (1959:29-56) describes possible or definite Late Classic sites having extensive distributions of housemounds, property division markers, and terraces; namely, Finca Amatle, Laguna Mora zone, Chachi, Guanacaste, and Buena Vista.

Lowe's reconnaissance indicates 31 upper Central Depression sites occupied between A.D. 600 - 1000 (1959: Fig. 6,a). Angostura salvage counts begin with 75 occupied sites at A.D. 600, rising to 108, and then dropping to 58 at A.D. 900, while the Upper Tributary counts are 105, 142, and 77, respectively (Lee 1974b: Fig. 2). It is noteworthy that not all of the sites located on the La Trinitaria and Comalapa reconnaissance were major ceremonial centres. Lee's (1974b) hierarchial plan of settlement shows each of the 13 regional ceremonial centres to be supported by at least 12 communities, the majority of which are purely residential, but some of which are subregional centres and may include residence. Terracing and check-dams and property division markers are common occurrences, and one whole settlement district (District 1) in La Trinitaria is built in an area with no permanent water supply other than springs sensitive to the rainfall of the preceeding year. One occupied ceremonial centre was Lagartero, beside the lush Lagartero Marsh. Much Late Classic Maya polychrome has come from recent excavations (S. Ekholm-Miller, Pers. Comm. 1975).

The Tsah phase of the Central Highlands falls predominantly in the Late Classic. Adams (1961:345-50) notes an increase of population and the most widespread occupation for this period. Settlements were concentrated on highly defensible hilltops surrounding medium-sized valleys, and one site has clear fortifications. The hills were terraced with masonry blocks, and some of the larger communities covered two or three summits - Yerba Buena was almost urban in extent. The possibility that these were vacant towns has been rejected due to the absence of

contemporaneous dispersed communities. Agricultural terracing was extensive, assisting in the control of erosion and water. Culbert's ceramic analysis (1965:82-84) indicates relative isolation for the Central Highlands. Tsah phase ceramics are little distributed outside the Highlands. They do not show strong Lowland influence, and except for common utility ware (large bowls and jars) the Central Depression ceramics are quite different. In sum, the defensive settlements and ceramic isolation would appear to me to indicate an embattled population successfully resisting its would-be conquerors.

On the plains of Comitán, architectural and hieroglyphic evidence demonstrates strong Lowland Maya influence during the Late Classic. An early date of A.D. 591 from Chinkultic, a site with many Classic -style stelae, was previously mentioned. The final date to appear was A.D. 879 (from Morley 1938:368-71, cited by Adams 1961:344).

An important development in the Usumacinta drainage during the last half of the Late Classic was the apparent entry and dominance of that region by the Putun Maya from the Tabasco and Campeche lowlands. Putun Fine Orange and Fine Grey ceramics are closely associated with the demise of the Classic centres of Palenque, Piedras Negras, Altar de Sacrificios, and Seibal. They evidently came in military force to secure commercial gain, and became an important force in subsequent Prehispanic times in the Maya region, controlling sea trade and much land trade around and in the Yucatán Peninsula (Thompson 1970:38-47; Rands 1973:43-62; Sabloff and Rathje 1975:72-82).

On the Pacific coast, San Juan and Robles plumbate are Late

Classic horizon markers. Both have been found in the southeastern section near Tapachula, and Tabasco-related Fine Oranges have been found at nearby Huehuetan (Lowe and Mason 1965:201-04).

The Late Classic in the Guatemala Highlands is subdivided into the Amatle and early Pamplona phases, which may be rural facies, with Kaminaljuyu developments being unclear. Teotihuacan traits have disappeared. Sites are in the open valleys. Compact groups of small pyramidal structures, tightly enclosing plazas, with completely enclosed rectangular ballcourts are the ceremonial centres. There is assumed to have been an intensification of trade with greater demand for luxury items such as cacao, and regional specialization in production. San Juan plumbate and Tequisate ware are common in the Amatle phase, while Z and Y Fine Oranges, Red-on-Buff "laquer" ware, and Robles plumbate are diagnostic of the Pamplona phase (Borhegyi 1965a:30-34,40).

Early Postclassic: A.D. 900 - 1200

A significant transition from the Late Classic did take place in the Central Depression, but somewhat later than in the Maya lowlands. Gareth Lowe's lead (1959:18) has been followed by other authors in using the term "Late Classic" in a culture-content sense, and in setting the end of that period at A.D. 1000. This date seems to signify the end of the time of peak population and elaborate public architecture in the Frailesca, along the banks of the Grijalva in the upper and lower regions, at Varejonal, and Santa Rosa. In the lowland chronological system used here, this date falls in the Early Postclassic. In general, the Postclassic is not well studied in the Central Depression.

In the lower Central Depression, no significant finds relating to Chiapa XI-A at Chiapa de Corzo are reported by Lowe and Mason (1965: 229-30), although they do note that Berlin found Tohil plumbate, the horizon marker for the period, in a Sumidero Canyon site, and in the Ruiz site, just below the Angostura Canyon.

Navarrete reports (1960:36) that his Frailesca reconnaissance indicated a sharp reduction in population during Chiapa XI-A. However, in his Chiapanec monograph (1966:91) he notes that the Frailesca population was still higher than that along the banks of the Grijalva River, this possibly being explained by the entry of peoples from the Pacific coast via passes which run through the region. There are but eight small, compact habitation centres.

An important consideration in the interpretation of the settlement patterns in the lower Central Depression is the presence of the Chiapanec. Navarrete (1966:89-92) believes them to have been in the process of expanding their domains along the Grijalva and in the Frailesca; a substantial disruption could be due to their presence.

The major site Varejonal, was possibly used in Postclassic times, but that judgement was made on the state of preservation of the structures (Lowe and Mason 1965:229).

Lowe counted 11 sites occupied in the lower region between A.D. 1000 - 1300 (1959:Fig.7,a;70). He notes variation in settlement type from lightly clustered plazas, to almost urban agglomerations, or hilltop ceremonial centres.

In the upper region, it is unfortunate that there is a gap in

the Santa Rosa sequence between the close of Phase 6 at A.D. 1000, and the time of Contact (Brockington 1967:Table 1).

Lowe counted 10 upper region sites occupied between A.D. 1000 - 1300 (1959:Fig.7,a). The Angostura Salvage Project counted 58 sites occupied at A.D. 900, dropping to 11 at A.D. 1200. The Upper Tributary counts are 77 and 16 respectively, with an intermediate low of 12 (Lee 1974b:Fig. 2).

In the Central Highlands the Tsah phase ends at A.D. 1000, and the Yash phase begins. The Yash phase continues the general pattern of artifacts and occupation of the Tsah period, making a gradual transition to the Lum phase, and avoiding the contemporaneous cultural disruption of the adjacent regions. There were no Mexican influences, and both Tohil plumbate and X-Fine Orange were rare in a large ceramic sample. Central Depression connections were also slight (Culbert 1965: 84-86). Adams (1961:352-57) says that the defensible sites ceased to be occupied during the Postclassic, most of them being abandoned during the Yash phase, but some earlier. With disruption and population reduction in the surrounding regions, it appears that the Central Highland inhabitants were able to relax their guard.

At Chinkultic, the Early Postclassic is represented by a Tohil plumbate effigy jar (Borhegyi 1970:122-24).

In the Pacific coast, the presence of Tohil plumbate indicates that there was an extensive occupation near the southeast corner of Chiapas (Lowe and Mason 1965:204).

In the Guatemala Highlands, the latter Pamplona and the Ayampuc

rural phases occupy the Early Postclassic (Borhegyi 1965a:40-52). X-Fine Orange and Tohil plumbate are the diagnostic ceramics. Mexican influence was strong in ceramics, and probably the popular ball game was played with Mexican rules and equipment. The abandonment of valley sites and the occupation of hilltops with public-cum-residential architecture was a dominant feature of the Postclassic, and is evidence of substantial internecine warfare. These hilltop retreats became the commercial and administrative capitals of warring nations. However, Borhegyi (1965b:71) cautions against arbitrarily assigning all hilltop sites to the Postclassic or Protohistoric period.

Dutton and Hobbs (1943:106) excavated a Postclassic site in the western Guatemala Highlands called Tajumulco. They noted the strong similarity of their ceramics to those of coastal Veracruz and Campeche. Ceramic features similar to Tajumulco are found broadly distributed in the Highlands.

Late Postclassic: A.D. 1200 - Contact

In the lower Central Depression this period is well known because of interest in Chiapanec studies.

V-Fine Orange (Matillas Orange: Matillas Variety) a Tabasco import, has been found at Chiapa de Corzo, identifying Chiapa XI-B. Distinctive ceramics, such as Nambariti Polychrome, identify the Chiapanec (Navarrete 1966:91) whose presence defines Chiapa XII (Lowe and Mason 1965:230).

The Chiapanecs were famous for their bellicose nature, dominating neighbouring linguistic groups, and resisting Aztec military pressure and one Spanish conquest attempt, until they were finally reduced

and Ciudad Real (San Cristobal las Casas) was founded in A.D. 1528. Their territory included both sides of the Grijalva from Chiapa de Corzo to the upper end of the Angostura Canyon, and Bernal Diaz reported that Chiapa de Corzo, their capital, held 4000 people (Navarrete 1966:Fig. 1; 89-98).

The Frailesca had a much reduced population, and much of the land was probably used for milpa (Navarrete 1966:91).

Lowe (1959:Fig.8, a) discovered only 9 occupied sites in his reconnaissance in the lower Central Depression for the period A.D. 1300 - 1521.

Stratigraphic excavations which will fill in the Postclassic gap have only recently begun in the upper Central Depression. Lowe's reconnaissance (1959:Fig. 8,a) identified 11 sites for the period A.D. 1300 - 1521. The Angostura salvage results indicate 11 sites occupied at A.D. 1200, dropping to 4 at A.D. 1350, with no sites occupied at A.D. 1521. The Upper Tributary site counts are 16 at A.D. 1200, and 12 at A.D. 1521 (Lee 1974b:Fig. 2). Lowe and Mason (1965:231) note that the failure of the Spaniards to make any mention of major centres in the upper Grijalva probably indicates that they had all passed their peak by Contact. The site of Lagartero continued to be occupied in the Late Post-Classic; Susanna Ekholm-Miller (Pers. Comm. 1975) reports abundant "postclassic censers" at the site. Lee (1974a:10-11) reports a major site in Comalapa on the canyon rim south of the ancient junction of the San Miguel and San Gregorio rivers. It contains a ceremonial centre with a zone of dense domestic habitation. From a small, badly worn

surface collection, Lee estimates a Late Postclassic date. However, because no major centres were reported in this region by the Spaniards, I consider it likely that the Late Postclassic occupation was vestigial only.

Within the Central Highlands strong regional divergences were exhibited during the Lum phase. Ceramic connections with surrounding regions were remote (Culbert 1965:86-87). Adams (1961:352-59) says that a concentration of population into large centres in large valleys took place, and he does not believe that there was a population reduction.

Comitán was occupied during this time, and temporarily conquered by the Aztecs (Adams 1961:359).

Ceramics from Tabasco and Campeche have proven to be important for the comparison of late Chicomucelo materials. Berlin (1956:135-41) identified two Fine Oranges for the Cintla horizon in Tabasco. V-Fine Orange marks the first half of the horizon, beginning shortly after A.D. 1200 while U-Fine Orange identifies the latter half, ending in the late pre-Hispanic period. Matheny (1970:93-99) uses Berlin's stratigraphy and dating to establish his Plantación ceramic complex in Aguacatal, Campeche. V- and U- Fine Oranges have been redesignated by Smith (cited by Matheny) as Matillas Orange:Matillas Variety, and Cunduacán Orange:Cunduacán Variety, respectively; they diagnose the early and late facets of the Plantación phase. Matheny's form inventory and illustrations are more complete than Berlin's.

The Pacific coast was populated in the Late Postclassic. It was conquered and held by the Aztecs (Lowe and Mason 1965:204).

In the Guatemala Highlands the Chinautla phase is a Kaminaljuyu elite and a rural phase. The settlement patterns described previously continued, and many facets of life were under strong Mexican cultural influence. Wauchope (1970) has described the "Protohistoric" pottery of the region. Particularly important for Chicomucelo studies is the Chinautla polychrome cremation jar, known to be both late pre-Contact and early post-Contact.

CHICOMUCELO CULTURE HISTORY

This section presents the interpretation of the culture history of Chicomucelo, integrating the information presented elsewhere about natural setting (Chapt. 1), reconnaissance methods (Chapt. 2), site descriptions and typology (Chapt. 3), trade routes (Chapt. 4), surrounding regional sequences (Chapt. 5), and ceramics (Appendix I). Special emphasis is given to the rational for the temporal subdivisions of Chicomucelo prehistory, to the strength of data pertaining to each period, to settlement patterns, to significant internal cultural developments, and to relations with surrounding areas. I have used the term "period" for the temporal subdivision in this regional sequence presentation, because I believe that the information is insufficient to clearly justify the term "phase" within Willey and Phillips' (1958:22) terminological system. The establishment of phase designations should await the results of the Angostura Salvage Project, and the report on the other two municipalities of the Upper Tributaries Project.

La Ceiba Period: 1050 - 550 B.C.

This period falls almost entirely in the Middle Preclassic, a time of substantial cultural uniformity in the Isthmian region.

The ceramic sample is very small - only seven sherds which have been cross-dated with Izapa-Cuadros and Jacotal ceramics. The most distinctive sherd compares strongly with Coapa Black, the Olmec horizon marker from the Izapa-Cuadros phase, and so the beginning date for Cuadros has been adopted as the beginning date for the La Ceiba phase. However, since the double-line-break pattern is also known throughout Chiapa de Corzo-Chiapa II, is was thought wise to make the closing date the same as that of Chiapa II.

Site occupation information is found in Table 3. Settlement is in Ecozone 1, following the pattern established in the Central Depression, in the Early Preclassic. The apparent concentration of sites along the Tachinula rather than the Yayahuita River is probably a result of the generally poor ceramic recovery in the latter valley.

No significant mound remains can be assigned to this phase, although ceremonial mound construction was taking place at La Libertad and El Niagra nearby, and at Chiapa de Corzo, Izapa, and in the Guatemala Highlands. This is probably a further indication of a relatively sparce population. The stone outlines of Ch- 15 and 30 may be the only architectural remains assignable to the period.

In Lowe's preliminary review of the ceramic collections he tentatively identified Middle Preclassic material from BV-3, and Early Preclassic from Ch- 28. Those periods could not be identified in the collections after the removal of the extremely fragmentary sherds, but the possibility must be kept open. Two tiny sherds make up the Regadillo ceramic group which might be comparable to Ocós Specular Red; if so,

they represent a pre-La Ceiba period, but the information is indefinite.

Chicomucelo inhabitants probably spoke an early form of Mayan, grew corn as a basic staple, and looked to San Lorenzo Tenochtitlán and La Venta as centres of spiritual and temporal power, although whether they were engaged in supporting these centres is an open question.

Discontinuity: 550 - 50 B.C.

The 500 year discontinuity which exists in the archaeological record presents a problem for interpretation.

No period ceramics, and none of the up to 20 m. high mound construction typical of the Preclassic along the Grijalva and in the Guatemala Highlands were found during the reconnaissance.

Chiapas IV times saw a Preclassic peak in Central Depression population and the beginning of Central Highlands occupation. Although the Mesoamerican cultural centre shifted from the Tabasco-Veracruz lowlands to the Peten, the Central Depression did not lose touch with the major developments because Mamon and Chicanel ceramics are mirrored in Central Depression deposits. Thus, with an expanding population and quickening cultural activity in the Central Depression generally, an abandonment of Chicomucelo does not seem reasonable.

The Tachinula and Yayahuita Valleys, being isolated from the Grijalva by the canyon of the San Miguel River, may not have received any of the expanding Grijalva population, but this does not preclude the response of the resident population to the same factors permitting demographic increase. One must conclude that the Chicomucelo population probably did increase to some extent, but that the hazard of archaeo-

logical recovery is to blame for our failure to recover relevant ceramic remains. If there had been a previous pattern of looking to sites nearer to the Grijalva, such as La Libertad, for ceremonial needs, this could explain the absence of major mound construction.

Jolenton Period: 50 B.C. - A.D. 400

This period begins in the terminal Late Preclassic, extends through the Protoclassic and into the early Early Classic.

The diagnostic ceramics are the only from Chicomucelo to fit into an established type - San Jacinto Black:San Jacinto Variety, and fortunately, it is chronologically significant. It is diagnostic of Phase 4 at Santa Rosa, and so the Phase 4 beginning date has been chosen for the Jolenton period. The closing date is not so well defined. It is Brockington's opinion that polished blackware production continued into the Early Classic, and so a closing date of A.D. 400 is suggested.

Tachinula Grey and its relative, Tachinula Red, may both have been produced during the Jolenton period, but in their plainness they are distinct contrasts to San Jacinto Black:San Jacinto Variety.

Site occupation figures are presented in Table 3. The total site occupation is possibly as high as 24, but only six are definitely defined by polished blackware. Other occupation possibilities are suggested by the weakly indicative Tachinula ceramics, and are thought to date only to the latter half of the period. The occupation of the Bella Vista sites is supposed because of evidence for the beginning of trade in this period through this area (see discussion in Chapter 4, and

below) and the unconfirmed suggestion of Protoclassic ceramics in BV- 3. The suggested occupation of the MC site Ch- 3 is based on doubtful architectural evidence.

The discovery of polished blackware indicates that the Ecozone 1 area of Chicomucelo was taking part in the strong regional development which characterized the upper Central Depression during the Protoclassic population peak. In light of the great amount of contemporaneous ceremonial activity at Santa Rosa, it would be surprising if there were not some similar developments in Chicomucelo at Ch- 3, 9, or 11. The discovery of polished blackware in the caves explored indicates that cave-related ceremonialism played an important part in the religious life - this also being a characteristic of the Chiapa de Corzo area during the Protoclassic.

The Jolenton period has the earliest certain evidence for the development of the trade route through Chicomucelo to the Soconusco. It is not certain that Chicomucelo was a trading centre per se at this time, only that a route passed through the Tachinula or Yayahuita Valleys. The trade was probably between the culturally energetic upper Central Depression and the Socomusco, with little if any connection to the Usumachinta area or the Peten.

Limonal Period: A.D. 400 - 800

This period covers the latter part of the Early Classic and the early part of the Late Classic, and is divided into an early and a late facet, the division being drawn at A.D. 650. Evidence concerning the early facet is weak, but the late facet has a much stronger evidential base.

The ceramic definition of this period is poor, this being a reflection of the developments in the upper Central Depression. After Phase 3b at Santa Rosa, Brockington was less and less able to find external comparisons for his ceramic material. It is fortunate for the interpretation of the Jolenton period that there was a stratigraphically well defined and distinct local ware associated with the Protoclassic, but with the post-Protoclassic demise of the good stratigraphic record at Santa Rosa, the ceramic isolation of the upper Central Depression becomes a major problem for the interpretation of Chicomucelo, as external comparisons are hard to find.

The ceramic groups used to determine the distribution of settlement in this period are the Tachinula Grey and the related Tachinula Red groups. Tachinula Grey is a coarse, reasonable dense paste ceramic with a well smoothed finish. No forms or modes appeared in the collections which are conclusively diagnostic of any one time period. Rather, the variety of modes - from narrow everted rims to a basal flange and strap handles - are indicative of a temporal range between Protoclassic and Postclassic, but are no more precise in placement; compared with the other ceramic groups, the modally based temporal placement is weak. The Tachinula Red group has no diagnostic modes; its chronological position is dependent entirely on the relationship seen between its paste and that of Tachinula Grey, and a very plausible suggestion has been made by Jorge Nuricumbo that Tachinula Red actually is more closely related to the Santa Teresa Red group.

The Tachinula Grey group has achieved its position as the

representative of the Limonal period partly through default. It is abundant at Piedra Labrada (Ch- 9) and in other Tachinula Valley sites, and because Piedra Labrada indicates a substantial Late Classic occupation of the Tachinula Valley without any other known ceramic group representing that period, Tachinula Grey is thought to be the relevant group. This reasoning is not at odds with the placement suggested by modal analysis, but is more precise. If the placement is correct, then both Tachinula groups were undoubtedly common culinary wares, since their plainness is their most notable feature. No Classic polychromes, or Polished Orange - B sherds were found during the reconnaissance.

The stela site of Piedra Labrada and its chronological placement is a significant source of information about the Limonal period. The opinion has been presented in Chapter 4 that the presence of obvious Petén-related ceremonial features is a result of the Classic period extension of trade routes from that centre. The earliest known Initial Series Long Count date in the Comitán area is A.D. 591. The Petén influence might have arrived at Chicomucelo more or less contemporaneously, or somewhat later. The erection of the stela and probably much ceremonial construction at Ch- 9 postdated A.D. 591.

The beginning date for the Limonal period is taken as the ending date of the previous period, in the absence of evidence of any cultural discontinuity. The terminal date is chosen not because of the end of any cultural feature, but to mark the important demographic developments in Ecozone 2. It is thought that the basic pattern in Ecozone 1 con-

tinued into the succeeding period. The rational for the selection of A.D. 650 as the division between the early and late facets is presented below. It is inferred from developments in the surrounding regions.

If the Chicomucelo demographic pattern coincides with that of the rest of the Central Depression, the early facet would have been a time of decline in settlement, as excavations and reconnaissance results indicate that for the Grijalva basin above Chiapa de Corzo, the period between A.D. 300 - 600 was a time of reduced population and of lessening building activity. With the decline in the rest of the Central Depression, there would have been a reduction in trade, causing a depression in the Chicomucelo economy. Also deleterious to Chicomucelo's commercial interests would have been the Teotihuacán invasion on the Guatemala Highlands at A.D. 400. The degree of disruption caused by the Teotihuacan armies as they crossed and probably occupied the Soconusco has not been clearly defined, but it was no doubt considerable. However, while trade may have suffered, Ecozone 1 would have been as desirable a settlement and milpa area as before, and surely retained a local population.

The revival of Chicomucelo's trading position came with the Late Classic population expansion in the Central Depression, the end of Teotihuacán influence in the Maya area, and the dynamic cultural development of the Maya lowlands during the Late Classic. Teotihuacán influence terminated by A.D. 600 or 700; Coe (1966) asserts the earlier date, while Borhegyi ends his Teotihuacán-dominated Esperanza phase at Kaminaljuyu at the later date. During the Late Classic, the Petén

reached the pinnacle of cultural achievement, and this must have stimulated the demand for trade goods from the Pacific coast. A date between A.D. 600 and 700, well after the first I.S. Long Count date to appear at Chinkultic has been chosen to demark the late facet period or trade revival and population increase. The greater part of local ceremonial construction must have taken place during this facet.

Site occupation figures are presented in Table 3. They are based on the distribution of Tachinula Grey and Tachinula Red, on architectural features, and on possible intersite associations. Eleven sites were definitely occupied during the phase (using Tachinula Grey as a diagnostic trait if present in some quantity) with 35 additional possible site occupations making a possible total of 46. Only two sites are diagnosed by Tachinula Red alone and so its possible chronological misplacement would not seriously affect site counts. Of all sites, 10 definite and 28 possibly occupied sites are found in Ecozone 1, no definite and four possibles in Ecozone 2, and one definite and three possibles in Ecozone 3.

Ch- 38 and 47 are included in the possibly occupied sites in Ecozone 2; if settlements were forming in these locations during this time, it was probably during the late facet. Settlement in Ecozone 2 probably followed the <u>rancheria</u> pattern which surrounded contemporaneous Chiapa de Corzo - a dispersed pioneer population expanding into the area, and gradually becoming denser. The generally poor ceramic recovery in this area can be explained by such a settlement pattern, where habitation sites are small and unobtrusive and small ceremonial site occupa-

tions intermittent, with major ceremonial centres still being in the old settled areas of Ecozone 1.

The Tachinula and Yayahuita Valleys were probably fully occupied during the late facet of this period, with major ceremonial and trading activity taking place.

An important problem in the interpretation of the structure of the society revolves around the SCER sites in Ecozone 1. In the Tachinula valley, two definite SCER sites, Ch- 20 and BV- 3, and two possible SCER sites, Ch- 21 and 32, closely surround the MC site of Piedra Labrada, but ceramics indicate contemporaneous occupation. In the Yayahuita valley, the definite SCER sites Ch 2, 22 and 54, and possible SCER sites Ch- 23 and 42, may also be contemporaneous with the MC site Ch- 3. The disparate points of view concerning the function of these sites have been discussed in Chapter 3. While the possibility cannot be ignored that these SCER sites were not contemporaneous with the MC sites, they do seem to fit the general pattern of Late Classic sites described by Borhegyi for the adjacent Guatemala Highlands, thereby lending support to the conclusions based on sketchy ceramic evidence. Thus, it appears that Ch- 3 and 9 had a subsidiary group of ceremonial or elite residence sites serving local groups, probably corporate lineages, but it is not clear how Ch- 16 would fit into this pattern, having no obviously associated SCER sites. This pattern would correspond to that which Lee has previously proposed, although the site sizes are much reduced. Even if the SCER sites are mutually contemporaneous, but later than the MC sites, there is still important

social information to be gained, although the previously proposed plan is invalid. The problem warrants more careful investigation.

One other problem, the absence of hieroglyphic writing other than the faint outline of an Initial Series Introductory Glyph in the glyph cartouches of the Piedra Labrada stela can be explained as the result of the lessening strength of cultural influence with increasing distance from the Peten. An expert carver can duplicate the image of an elaborately garbed chief, but a specialist of an entirely different order is necessary to calculate an I.S. Long Count date. Evidently, the most esoteric cultural traits were not transmitted to this small, frontier site, or the local population was not large enough to support that order of specialist.

Nueva America Period: A.D. 800 - 1000

This period includes the late Late Classic and early Early Postclassic periods, and has been separated from other phases to mark significant demographic developments. The ceramics which define the period have been cross-dated with material coming from controlled stratigraphic situations, and its interpretation is more certain than that of the previous period.

The Calzada de la Cruz ceramic group defines this phase. It shows close similarity to the ceramics of Phase 6 at Santa Rosa, and so the beginning and terminal dates of that phase have been chosen for the Nueva America period. The Calzada de la Cruz ceramics are distributed in the northern section of Ecozone 2 and are closely related to the ceramics of the Grijalva River region; they are distinctly different

from the contemporaneous ceramics of the Ecozone 1 area of the Municipio.

In Ecozone 1 of Chicomucelo, the Santa Teresa Red and Unfinished groups have their beginnings in this phase. A particular modal similarity with the Tres Naciones Gray:Tres Naciones Variety of the Bayal Boca ceramic complex fron Altar de Sacrificios and Seibal gives them an early chronological placement of Terminal Late Classic, or between A.D. 830 and 930.

The relationship between the Santa Teresa ceramic groups and the Tachimula ceramic groups is somewhat unclear, but it may be developmental, and thus some Tachimula ceramics may appear in the early part of the phase. There is consequently a difficulty in using these ceramic groups to define the settlement pattern of Ecozone 1. Both the Tachimula and Santa Teresa groups cover long periods of prehistory, and the use of all of these groups to define the settlement of this period would result in an exaggeratedly high figure for occupation - it being the sum of all sites occupied between the late Protoclassic and Historic periods. Because the Santa Teresa groups are more firmly defined and cross-dated, they alone will be used. This has the resulting disadvantage that distinctions in settlement pattern in Ecozone 1 between this and the following phase cannot be made, but if ceramic continuity indicates cultural continuity, the problem should not be serious.

Table 4 shows the sites occupied in the Nueva America phase.

The most significant cultural and demographic development of

this period is the dense settlement of Ch- 38 and 47 on the northern edge of Ecozone 2. These centres are much more related to developments along the Grijalva River than they are to Ecozone 1 of Chicomucelo; what location suggests the ceramic study has proven.

Both Ch- 38 and 47 have a settlement pattern not elsewhere identified in the reconnaissance territory. They are large towns or semi-urban centres, each in excess of .5 square kms., with a large ceremonial precinct in the centre of the habitation area. The force of attraction to life in the major centres is demonstrated particularly at Ch- 38 where the complete occupation of the valley floor area necessitated the terracing of one of the hill slopes behind the ceremonial precinct. The attractant initiating the growth of these centres, and a main force of attraction throughout their life was probably the presence of a dry season water source. Population for either site is difficult to estimate in the absence of a complete count of the house mounds, but I think that 3000 is a reasonable minimum for Ch- 38, and 4,000 for Ch- 47 (as large as Chiapa de Corzo in A.D. 1528). The two sites differed in ordinary settlement plan, at least near the ceremonial areas. The Ch- 38 house mounds tended to be distributed singly and without evident plan in the habitation area, while those of Ch- 47 were arranged in groups of 2 to 4 mounds facing on a small courtyard. The cultural significance of this difference is unknown.

The ceremonial plazas are remarkably similar in overall dimensions, but at Ch- 38 the main mound is less than half the size of that at Ch- 47, and the former mound is set in the centre of the plaza

rather than at the end, as in the latter case. The tight enclosure of the Ch- 38 plaza by continuous mounds was perhaps intended to protect its sanctity in the restricted valley floor space (and the expansion of settlement up the side of the nearby hill might have perturbed some of the priestly class, unless they themselves occupied it). Although there were three momoztli in the centre of the Ch- 38 plaza, there was no sign of a stela, but at Ch- 47 a blank stela was found at the base of one of the two momoztli. Both Ch- 47 has a main plaza and a large subsidiary plaza on one corner; the placement of the major mound in the middle of the area enclosed by the exterior mounds at Ch- 38 may be to create two ceremonial areas. More small courtyards surround the main ceremonial precinct at Ch- 47 than at Ch- 38, and Ch- 47 has a plazuela group. Notably, ballcourts are absent at both sites.

Limestone bedrock lies close to the surface at both sites, and the house mounds and ceremonial mounds are constructed of that material.

Populations presently resident near both of the sites rely on groundwater for culinary purposes during the dry season.

Although there must have been a gradual population build-up at each of the sites predating the Nueva America period, the peak occupation came during this period. This coincides with the general pattern known for the Central Depression at the same time.

In Ecozone 1 there are 25 definite site occupations, and 17 possible occupations during this period (the presence of the Santa Teresa ceramics being taken as a definite diagnostic trait). There is no evidence of semi-urban concentrations of population here, but the

distribution of water resources in Ecozone 1 would not have been conducive to settlement concentrations. Also, because the housemounds were not made of piled stone as in Ecozone 2, the evidence would be less enduring. The occupation around Santa Teresa may have been dense.

It is worth emphasis that the Calzada de la Cruz ceramic group is different from the contemporaneous Santa Teresa groups, and this is probably indicative of a linguistic difference between the Tachinula and Yayahuita Valleys, and the northern edge of Ecozone 2. The bulk of the population in Ch- 38 and 47 must have come from the margins of the Grijalva River. The apparent light concentration of sites in the southern end of Ecozone 2 might represent a buffer zone between the two groups. A linguistic difference may also explain why Lee's Late Classic site typology, formulated for the drainage basins of the San Gregorio and Lagartero Rivers, is not generally appropriate for the Tachinula and Yayahuita Valleys.

Trade through the Tachinula valley was probably at no time more intense than in the early half of this period, with demand being generated by the dense population of the Central Depression, and the Usumacinta area. Some of the Tabasco-originating Fine Oranges found at Huehuetan in the Soconusco during the Late Classic may have moved through Chicomucelo.

The final Chinkultic I.S. Long Count date falls about mid-period, but the significance of this fact for the Chicomucelo region remains unclear. The Fine Grey ceramic similarity indicates interaction with the Usumacinta drainage area during the final periods of

Classic life there, but the rim-form mode could have arrived in Chicomucelo a half-century before or after A.D. 879.

It is surely correct to conclude that ceremonial life relating to the I.S. Long Count calendar, such as the marking of katun endings, did not endure after A.D. 900, because no Maya stela postdates that time. However, ceremonial involvement did not cease, for this phase marks the beginnings of the Santa Teresa ceramic tradition which is associated with ceremonial centres as well. Piedra Labrada itself was probably re-used.

Trade relations with the Usumacinta region probably sharply diminished during the late half of the period, and with the sharp period-end drop in the Central Depression population, one would expect a diminution of Socomusco contacts as well.

Yayahuita Period A.D. 1000 - 1528

The Yayahuita period occupies the Postclassic period up to the time of Spanish contact.

The opening date of the period has been chosen as A.D. 1000 because this corresponds to the apparent end of the semi-urban centres in Ecozone 2. The time of first direct Spanish contact in Chicomucelo is unknown, but the date of the founding of Ciudad Real and the establishment of effective Spanish rule in Chiapas, A.D. 1528, has been considered the ending date.

The prime diagnostic ceramics of this phase are the contemporaneous and very similar Santa Teresa Red and Santa Teresa Unfinished groups, both soft, coarse, paste ceramics. The beginning of this

ceramic tradition is in the previous period. The strongly diagnostic modes of effigy feet and stepped slab feet are evidence of the contemporaniety of the groups with Matillas Orange:Matillas Variety, giving an early date of A.D. 1200, and Cunduacán Orange:Cunduacán Variety, which gives a terminal date of approximately the time of Contact. The ceramic similarities are predominantly with Tabasco and Campeche.

In addition to the Santa Teresa groups, site occupancy figures have been determined by using the distributions of one sherd of Tohil plumbate, the small Potrero del Cerro group of probable Postclassic date, and the definitely protohistoric and early historic Chinautla Polychrome.

Table 4 shows the sites occupied during the Yayahuita period. The important demographic adjustment taking place in the very early part of this period is the decline of the dense settlement at Ch- 38 and 47. One very hard plumbate sherd, probably Tohil plumbate, was recovered from Ch- 38 and would indicate some degree of residual population into the early half of the period. Evidence of a residual population at Ch- 47 is not conclusive - the few Santa Teresa sherds recovered could just as well have been deposited during the Nueva America period. The use of Ch- 48, 50 and 65 would indicate continuing population in Ecozone 2 as well, although not nearly as large as in the previous phase.

Because of the use of the Santa Teresa ceramic groups as the prime diagnostics, the settlement pattern in the Tachinula and Yayahuita Valleys appears to be unchanged from the previous period, but if

ceramic continuity is evidence of cultural continuity, this is entirely reasonable. A major population concentration appears to have existed at the confluence of the Tachinula and San Raphael Rivers. Population seems to have been distributed on both sides of the Tachinula River upstream of the confluence. Within the immediate area there is a small, simple plaza arrangement of mounds 3 m. and less height, which was the ceremonial centre. Although recorded as four separate sites, Ch- 57 to 60 constitute a single occupation unit. About one quarter of all ceramics retained for study came from these sites, but this cannot be taken to reflect the relative density of occupation, because these sites had been ploughed by tractor and thus yielded an abundance of sherds. However, this centre seems to have been a focus of the surrounding area.

At the site of the modern town of Chicomucelo relatively few pre-Hispanic remains were uncovered. Ch- 61 and 63 offered only the slightest ceramic remains, but in the brickyard clay quarry on the Yayahuita River (Ch- 62) Santa Teresa ceramics were recovered in relative abundance. Undoubtedly, a population lived in the vicinity of the confluence of the Tachinula and Yayahuita Rivers, but present evidence suggests that the main town was at Santa Teresa. This conclusion must be tempered by consideration of the poor conditions for archaeological recovery in the modern town of Chicomucelo, and the good conditions at Santa Teresa.

Ch- 39 was tentatively assigned to this period because its prominent and defensible hilltop location is thought to be a Postclassic

trait in the Guatemala Highlands, but Borhegyi's cautionary note should be heeded. There is little or no common residence area on the hilltop, and no evidence of extensive settlement in the valley below was discovered, but a very large population would not be required for its construction. The anomalous Ch- 37 in the San Miguel canyon was probably also used during this period. Only the ballcourt attests to a ceremonial function, although the location is spectacular in its own way.

The interpretation of the Gulf Coast ceramic connections of the Santa Teresa groups is important to a discussion of the Yayahuita phase. Although the ceramics are modally similar to the Fine Oranges they are not truely Fine Orange, but are coarse-paste poorly fired local imitations. Rather, they may be more closely related in terms of paste and hardness to the coarse red ware of Tajumulco or red-on-buff ware of Zacualpa, although I have not examined these materials personally. Interestingly, Dutton and Hobbs noted the Gulf Coast similarities of their ceramics from Tajumulco in 1943. The Putun traders from Tabasco and Campeche whose Fine Orange and Fine Grey wares were closely associated with the decline of the Classic centres in the Usumacinta drainage, were probably a significant factor in southern Mesoamerican Postclassic commercial life. The decline of trade through Chicomucelo, evident in the poor quality of the local ceramics, could be explained by the ability of the seafaring Putun traders to procure cacao from the Rio Hondo in Belize by boat more economically than from the Socomusco by land. However, was there still in the Tachinula Valley

some particular interest in the cultural products of the Gulf lowlands, or were these similarities only the result of a general diffusion of ceramic modes from that region which was felt equally in all thereas surrounding Chicomucelo? Further work will tell whether Chicomucelo is peculiar or ordinary in this regard.

The nature of ceremonial life in the Postclassic is an important question. No Yayahuita period site is as grandiose as Piedra Labrada, yet smaller sites do exist. In the discussion of the Limonal period it was noted that SCER centres appeared to function contemporaneously with the major centres, and it was suggested that they served lineage needs. It seems reasonable that even if a measure of social disintegration did take place, such that the higher levels of the social strata ceased to function, these lower levels of ceremonial activity would continue on. Thus, the Yayahuita period centres may show the continuation of a truncated Limonal and Nueva America period hierarchy.

Chicomucelo Period: A.D. 1528 - Present

This period spans the Colonial and Modern periods. Although the main focus of the reconnaissance was prehistoric investigation, data was collected which pertains to this historic period.

During the first few decades after the Conquest there were surely two cultures co-existing in the Municipio - a limited Spanish presence, and the continuation of the aboriginal culture, but the population reduction of up to 90% which has been documented for other parts of Mesoamerica for the century succeeding the Conquest would have

affected Chicomucelo as well and resulted in a disintegration of the Indian culture.

The historic ceramic sequence is not known. Following Berlin and Matheny's assessment of Matillas Orange:Matillas Variety, the Santa Teresa ceramic tradition has been considered as terminating about the time of Contact. Chinautla Polychrome, and possibly the Pueblo Viejo and Potrero del Cerro groups continued from the Protohistoric into the first decades of the Colonial period, and therefore period assignments have been made using these ceramics, but it is done only because it is better than nothing.

Distinct European types and styles of construction allow the assignment of certain structures to the Chicomucelo period, but where they belong within this four and one half centuries is unknown. Table 4 gives site occupation figures. In the absence of better archaeological information and documentary research, I prefer to confine my interpretation to a minimum. Ch- 1, a European industrial processing structure of unknown purpose, and possible early date is an intriguing aspect of the historic period. Ch- 10, with at least 1 church and another European structure and many housemounds is a settlement known as Yayahuita on a late nineteenth century map. Although listed as a hacienda, field evidence suggests that it once had a substantial population. Ch- 25 marks a now abandoned mine, probably of recent vintage, and exploiting lead ores. Ch- 43 is the ruin of some European-style structure. Evidence of possible historic Indian occupation is found at the modern settlements of Nuevo Pacayal, Piedra Labrada, Santa Teresa,

and the town of Chicomucelo. Fincas have probably been significant economic features since Contact.

Summary

The regional sequence of the Municipality of Chicomucelo spans more than 2500 years from the late Early Preclassic to the Present. It is divisible into six main time periods, with one major discontinuity.

The La Ceiba period (1050 - 550 B.C.) spans the late Early Preclassic and Middle Preclassic periods. Information is only sufficient to show that there was some occupation and that cultural influence was Olmec, similar to contemporaneous Izapa and Chiapa de Corzo.

A 500 year discontinuity in data during the Late Preclassic (550 - 50 B.C.) is probably through accident of recovery, there being no reason to suppose that the region was abandoned when strong cultural development and population growth was taking place in the rest of the Central Depression.

The Jolenton period (50 B.C. - A.D. 400) is Protoclassic and Early Classic, and reasonably well defined. The singular polished black ceramic shows a reasonably extensive occupation of the Tachimula Valley and probably the Yayahuita Valley, a sharing in the strong regional development of the upper Central Depression, trade connections with the Socomusco, and at least cave ceremonialism. There was probably a population increase as well.

The Limonal period (A.D. 400 - 800) is Classic and can be subdivided into early and late facets. The ceramic evidence for the whole period is uncertain, and so the early facet is poorly known; possibly

there was a population decline. The stela of Piedra Labrada is strong evidence to which much interpretation of the late facet can be anchored. This stela indicates the presence of Peten influence in Chicomucelo beginning around A.D. 650, probably due to trade connections with the Soconusco, with cacao being an important trade item. The trading relationship may have lasted into the Nueva America period. Elaborate Classic-style ceremonialism must have been taking place at Piedra Labrada. Likely also was a population build-up, both in Ecozone 1 and 2. A significant problem pertaining to this period is the interpretation of the social structure through the SCER and MC sites.

The Nueva America period (A.D. 800 - 1000) is Late Classic and Early Postclassic, and was a time of high population and the dense occupation of Ecozone 2, but ceramics show that the cultural relations of the urban centres on the northern edge of Ecozone 2 were with the Grijalva, rather than with the Yayahuita and Tachinula Valleys. The peak occupation and beginning of decline of these urban centres came during this period. There is no evidence of semi-urban settlement concentration in the Tachimula or Yayahuita Valleys, but there was probably at least one large town near modern Santa Teresa. About A.D. 900 the trade and cultural connections of this area with the Peten must have ceased, and Classic-style ceremonialism ended at Piedra Labrada.

During the Yayahuita period (A.D. 100 - 1528), which is Postclassic, there was a declining population in Ecozone 2, and an end to the semi-urban centres. The Tachimula and Yayahuita Valleys show cultural continuity from the previous period. Modal ceramic similarities

to the Tabasco-Campeche coast area permit the cross-dating of the local ceramics, but do not indicate direct trade relations. Ceremonialism continued on a more minor scale.

The Chicomucelo period (A.D. 1528 - Present), including the Colonial and Modern times, is poorly known. Likely disease caused a significant depopulation shortly after the Spanish Contact. However, for some time during the Chicomucelo period, but not necessarily contemporaneously, settlements were found at the modern townsite of Chicomucelo, at the now abandoned settlement of Yayahuita, and possibly at Santa Teresa. Fincas were a significant local economic feature, and there was some local manufacturing or processing activity.

CHAPTER 6

The Ecology of Population Decline

The purpose of this chapter is to summarize the demographic pattern of the Central Depression during the Late Classic and Postclassic periods, relating it to outside developments, and to consider the application of ecological principles to human populations, with particular emphasis on the ways in which populations adjust themselves to less favourable circumstances.

CENTRAL DEPRESSION DEMOGRAPHY

Figure 19 shows site occupation figures for various regions in the Central Depression. (The archaeological data on which the summary of the demographic history of the Central Depression is made has been presented in Chapter 5. Only part of the site-count information from Lowe (1959) - that from in and below the Angostura Canyon - has been presented because the upper area has been resurveyed by the Angostura Salvage Project.) The figures do not represent the whole of the Central Depression. Navarrete's reconnaissance report of the Frailesca is not arranged so that period site-counts can be extracted, nor is a reconnaissance report of the narrow western strip of the Depression available. However, precise quantitative information can be supplanted by various authors' estimates of site density per period for these regions. The Chicomucelo site frequency estimates are the totals of the definite and possible occupations for each period, these figures being generally substantially higher than the definite occupation

figures. The designation of certain or possible occupation is judged on the strength of the ceramic or architectural evidence; most possible occupation placements fall in the Jolenton to Nueva America periods, and result from the presence of sherds of the temporally vague Tachinula ceramic groups.

It is not possible to neatly divide the occupation information into Ecozones 1 and 2 because the necessary information is not available to me, except for Chicomucelo. However, some reasonable generalizations can be made. The Angostura Salvage results, from the margins of the Grijalva, are almost exclusively from Ecozone 1. Also, the information provided by Lowe for the Angostura Canyon to Sumidero Canyon area pertains primarily to Ecozone 1. The Upper Tributaries sites are predominantly from Ecozone 1, with some Ecozone 2 sites as well (ignoring the few Ecozone 3 sites). Although the inability to precisely define site distribution by Ecozone is not ultimately serious for this thesis, a definitive work requires that the Ecozone boundaries and site assignments be clearly defined. The lack of large scale topographic maps for Chiapas is a serious impediment.

The general pattern of site frequency is evident from a glance at Figure 19 - general upward trends begin in the Late Preclassic period, culminating in prominent peaks in the Late Classic, and falling off steeply in the Early Postclassic; this pattern is evident in varying degrees in all of the reports. The fluctuations in site occupation in the various areas prior to and during the Early Classic merit careful consideration, but that is outside the scope of this thesis, which is to

document and explore a model of population decline for the Late Classic - Postclassic period.

The interpretation of demographic trends from gross site frequency figures is fraught with dangers: sites are not directly comparable, some being single housemounds, whereas others are extensive ceremonial centres with dense surrounding habitation; furthermore, the size of a ceremonial site, or the extent of additions, even if perfectly known, only roughly reflects the size of the support population. Notwithstanding these problems, I believe that enough information is available to substantiate the contention that a significant population peak occurred in the Central Depression during the Late Classic period, followed by a significant decline, as is suggested by the site frequency graph. This assessment is certainly not original, having been noted by Lowe (1959), Lowe and Mason (1965), and Lee (1969,1974b), but because of its importance, I will outline the information on which it is based.

In the Municipality of Chicomucelo, the important feature of the Late Classic settlement pattern is the presence of the two large towns-cum-ceremonial-centres (Ch- 38, 47) in the northern part of Ecozone 2, in addition to a continuing occupation of the Ecozone 1 region of the reconnaissance territory. In the Frailesca, Navarrete notes dense and extensive housemounds, and infers a Late Classic population peak, while Agrinier describes a dense occupation at Varejonal in the western end of the Central Depression. Lowe refers to Late Classic sites with extensive distributions of housemounds, property walls and

terraces in the Acala and Chapatengo-Chejel subregions of the upper Central Depression. Lee describes the extension of settlement in the Municipality of La Trinitaria beyond the immediate vicinity of permanent water supplies to an area with rainfall-sensitive springs. Associated with Late Classic Small and Large Hamlets in this area are agricultural terraces, check dams, and stone fences. The dense concentration of housemounds surrounding a ceremonial centre in Frontera Comalapa I believe dates to the Late Classic, but Lee has tentatively assigned it to the Late Postclassic on the basis of a small sherd collection, and thus it cannot properly be taken as evidence of the pattern described here.

In the Upper Grijalva, where the most complete information is available, it is evident that these large settlements in the Ecozone 2 areas are contemporaneous with major sites along the river margins in Ecozone 1. In the lower Central Depression region, settlement along the Grijalva appears to have been thin, and Chiapa de Corzo was in a degraded condition, but the arrival of the Chiapanecs in that region may have caused substantial disruption in the settlement pattern.

The extent of the Postclassic decline is the next significant question. For Chicomucelo, the argument for the Postclassic decline in occupation is found in the discussion of the Calzada de la Cruz ceramic group in Appendix I, and in the Ch- 38 and 47 site descriptions in Chapter 3. Although Varejonal, in western Chiapas may have continued with a substantial Postclassic occupation, the Frailesca experienced a substantial decline according to Navarrete. The ceramics of sites with

extensive housemounds recorded by Lowe in the Acaland Chapatengo-Chejel subregions indicated a Late Classic, rather than a later occupation. Furthermore, the failure of the Spanish to leave a conquest record of any major population centre in the Central Depression other than Chiapa de Corzo makes it quite certain that the previously existing centres were well on the decline by A.D. 1528, and that the Late Classic populations were not merely amalgamated into larger centres during the Postclassic. (I believe that this is good reason for regarding the Comalapa site as earlier than Late Postclassic.) The rate of decline is difficult to determine from archaeological information, but the model proposed in Chapter 8 suggests that it was rapid.

In summary, the interpretation of a Late Classic population peak and Postclassic decline in the Central Depression does not rest entirely, or even primarily on raw site frequencies. More significant is the Late Classic expansion of the area of settlement from Ecozone 1 into Ecozone 2 where the impressive ceremonial centres and extensive distributions of housemounds manifest a large resident population. During the Postclassic, the settlement area contracted and Ecozone 2 was abandoned or had only a vestigiary population.

The pattern of Late Classic population increase which has been demonstrated for the Central Depression can be seen in surrounding regions as well. In the Central Highland of Chiapas, large, dense settlements - sometimes semi-urban - occurred during the Tsah phase. However, Adams believes that no diminution of population took place in the Postclassic; rather there was a reorganization of the population

into fewer and larger units. Donald McVicker shares this opinion (Pers. Comm. 1975). According to Rands and Smith (1965:131) the North and Central zones of the Guatemala Highlands had a large Late Classic population, and at the end of the Late Classic a decrease apparently took place on the Central Altiplano, although in the Northern zone the population appears to have remained stable. Demographic trends in the Guatemala Highlands are difficult to assess due to the shift from valley sites to fortified hillside sites. Sabloff (1970: Fig. 2) notes a great Late Classic population increase and then sharp decline at Seibal in the Usumacinta drainage. Even as far away as Belize, the Spanish Lookout phase (A.D. 700 - 1000) was a time of population increase (Willey et al. 1965b:567,578). The Postclassic population in both the Peten and Belize was much smaller than the Late Classic population (Bullard 1973:240).

When confronted with evidence of demographic fluctuations, archaeologists often turn to migration-type explanations, as have Lowe and Mason (1965:22-27) for the Late Classic-Postclassic variation in the Central Depression. This propensity can easily be understood in historical perspective. Language distribution studies have demonstrated that major migrations did take place pre-historically, and prior to refined seriation and C- 14 dating techniques, linguistic studies were one of the most promising methods for controlling prehistoric time - no wonder population movement was firmly impressed on archaeological thinking. However, as more regional sequences have been developed in southern Mesoamerica, we are beginning to see that large areas have similar contemporaneous demographic patterns. Thus, where would be the

bottomless source of immigrants, or to where would the stream of emigrants go, if the population of large areas increased and decreased in unison? More fundamental explanations are necessary, and the demographic problem should be faced within each region - in this instance, the Central Depression. I am not denying the existence of migrations, or their potential for significant local demographic effects; Irish history provides ample evidence to the contrary. However, migrations themselves may be better understood as symptoms of more fundamental variations. In the following discussions, an ecological approach is followed, utilizing information from animal studies and from historic demography to explore these other possibilities.

THE ECOLOGY OF HUMAN POPULATIONS

In this section I will briefly review the contributions of animal ecology to the understanding of population growth, stabilization, and decline, and with reference to historic demographic studies, will consider the degree to which these principles can be applied to human populations.

Kendeigh's Animal Ecology (1961:219-33) offers a summary of mechanisms which regulate population size. Only in the early stages of growth is a population free to grow at its biological potential, for soon environmental resistance begins to flatten the growth curve. This resistance can be divided into two categories, density-limiting, and density-stabilizing factors. Density-limiting factors include such variables as habitat area and climate (which determine food supply), and their prevailing average condition "... determines the level at which

density-stabilizing factors bring populations into equilibrium" (229). Density-limiting factors govern the upper limit of population density, and are generally independent of population density, although they may respond to it in some degree. Density-stabilizing factors act as a direct function of population density, and include such interrelated mechanisms as competition, reproductivity, predation, emigration, and disease. Competition has a notable effect in species which defend territories, particularly certain birds, amongst whom a specific minimum territory is required for nesting. When population pressure reduces the territory available for each nesting pair, acts of nest destruction, or forced emigration may occur - both effective density reducers. Reproductivity is concerned with the total number of young produced, and with the number which survive to sexual maturity. Experimental studies on laboratory mice with unlimited food supplies have shown that high density has the effect of lowering the fecundity or survival rates. The establishment of a social hierarchy which prevents some animals from breeding, cannibalism and disorders in maternal behavior, or the reduction of energy available for reproduction are observed effects of overcrowding. Predation, which included parasitic infection, tends to act increasingly with higher population densities of the prey. Predation may be especially effective if animals are driven from their ideal cover by population pressure. Uncontrolled emigration has the effect of relieving population pressure in a given habitat, and under normal conditions in the higher vertebrates it is the young, rather than the established adults, who are forced to emigrate. Disease is only a

stabilizing factor during epidemics, during which it may greatly lower the population size. It is usually most severe when population densities are high, as ease and rapidity of transmission are increased, and overcrowding may reduce the resistance of the host.

According to a hypothesis of Wynne-Edwards (1969) territorial behavior in animals and social competition are interacting density-stabilizing mechanisms, serving to adjust population to carrying capacity. He proposed that territorial behavior has evolved to prevent the overtaxing of the support capacity of the environment. Overly high population densities cause competition for breeding territory; the outcome is a social hierarchy in which the lowest are denied the right to breed. This mechanism, coupled with controls on the number of young that each pair is conditioned to produce (which may vary with social stress), form potent population controls.

The applicability of most of these concepts to human populations is obvious. Given a constant environment, technology, and food habits, density limits exist (this is the concept of carrying capacity). Of the density-stabilizing mechanisms, competition (warfare), emigration, and disease are common features of human populations. Only predation, except as a parasitic infestation, does not affect humans. Reproductive adjustment to changing density limits I believe to be one of the most significant human density-stabilizing factors. Yet the reproductive adjustment which results from overcrowding, given an unlimited food supply, has probably never been a significant population control feature in the human past because it is dependent on essentially artificial

conditions. (However, Katz (1972:360) notes that victims of extreme stress, such as concentration camp inmates, have shown menstrual disorders which eliminated or lowered fertility).

Nutrition is probably a very important population adjusting factor, both in growth and decrease. Although the effect of severe deprivation is obvious, the long-term effect of dietary imbalances, or of dietary improvements, need investigation. Hopefully future biochemical research will give archaeologists information to apply to the demographic problem (for a brief discussion, see Katz 1972:357-58).

In the following section some of the contributions of historic demography will be reviewed, with the intention of evaluating the application to human populations of the previously cited ecological principles. Of necessity, all of the case studies come from Europe, where local parish records and other statistical records have preserved valuable demographic information for a span of several hundred years and where the study of these records is advanced. Most of the information cited applies to entirely pre-industrial societies, in which poor transportation systems prevented the supplementing of one region's poor crops with the surplus from another region, nor was medical knowledge particularly effective. These features argue for the use of the studies as analogies for pre-Hispanic Chiapas.

Population and History by E.A. Wrigley (1969) provides an excellent summary of the principles and products of historical demographic investigations; unless stated otherwise, information cited below is condensed from Chapter 3 (p. 62-106). In a pre-industrial society,

long-term population trends may be evident, but population could fluctuate violently around the trend line. While a rate of increase of over 50 per 1000 per year would be rare, local populations could lose 200 to 400 per thousand in a bad year. These violent short-term fluctuations were caused by bad harvests, disease, or both.

Crop failures were reasonably common, and mortality could be high. The carry-over crop from a previous year might tide a community over one bad year, but could be insufficient for 2 bad years. For example, poor harvests caused the three French parishes of Auneuil, Breteuil, and Mouy to have marked surpluses of deaths over births in late 1693 and early 1694. Auneuil had a more diversified agricultural base, and its burial surplus was only 12%, while in Breteuil, based on cereal monoculture, the burial surplus was about twice as large and the population recovered much more slowly. Those involved in a rural industry such as textiles, and dependent on money for their subsistence suffered greatly. Grain prices in famine times rose greatly; wheat (in sols per mine aux blés) rose from 35 in 1690-91, to 150 in 1693-94, and dropped to 34 in 1695-96). The wool-workers in Mouy suffered severe hardships with a parish death rate about the same as Breteuil's. At the time when they most needed cash, the demand for their products was lowest.

Disease was another producer of violent, short-term mortalities, and might have a very broad effect. The Black Death of 1348 "... reduced European populations over areas measured in hundreds of thousands of square miles by up to a third in a single year" (Wrigley 1969:63).

A more localized example comes from London, which from 1600-60 grew from 200,000 to 450,000 inhabitants. In 1603 a plague killed 33,000; in 1625 plague killed 41,000; in 1665, plague killed 69,000, and all of the above figures are minima. Thus, disease could eliminate a sixth to a quarter of the population of a city in one year. Yet many rural parishes passed the period without any demonstrable increase in deaths due to plague - evidence that the chances of catching the disease and dying were much greater in the cities. Unlike famine mortalities, wheat prices gave no warning of impending epidemics, except to the degree that deaths from disease were heightened by famine. Warfare could produce mortalities from both causes, as armies were both carriers of disease and took men from agriculture. Marriage and birth rates varied inversely with death rates during a crisis, and afterwards. The elimination of many susceptible people meant a drop in deaths after the crisis, many postponed marriages were contracted, and there was an increase in births - all aiding rapid population recovery. As a rough rule of thumb, Wrigley says that the longer the time since the last crisis, the more severe would be the next.

In addition to short-term fluctuations, long-term trends can be traced by historic demographers. These trends may be evident in spite of violent short-term fluctuations, or regional variations. In England, the time from the Norman Conquest to 1300 was a time of growth in population. The trend stabilized at 1300, the Black Death of 1348 produced a sharp drop, and for the next century there was no discernable increase. By 1500 a rising trend was notable, which continued to about 1650.

Stability again ruled until about 1750, when there was a "... sudden, fierce acceleration in population growth" (Wrigley 1969:78).

The parish of Colyton is a carefully studied example of long-term demographic fluctuation and shows some of the mechanisms involved. It encompasses over 7000 acres in Devon, England. It had two towns and some small hamlets and farmsteads, diversified agriculture, and a woollen industry. Parish records date from 1550. A century of a surplus of births over deaths produced a population peak of about 2000 in the early 1640's, which a plague was reduced by one fifth in 1645-46. Following this, an excess of burials over baptisms continued until about 1735, and during this time population dropped about one third from the previous peak. Baptism's did not gain distinct ascendancy over burials until 1780. Part of the mechanism of change is evident in the marriage patterns. Between 1560 and 1647, the average age at marriage for males and females was 27, and the average completed family size for women marrying under 30 was 6.4 children. Between 1647 and 1719 (the time of the death surplus), women married at 30 on the average, and men at 28. The later age of marriage of women would automatically reduce the expected family by one, but it seems that other methods of family limitation were being practised. Even for women married under 30, the average completed family size was 4.2, substantially below the previous figure and below their potential. Between 1720 and 1769, females married at 27 years of age on the average, one year older than their husbands. The average completed family size was 4.4 From 1770 to 1837, the average age of marriage for females was 25, two years younger than their husbands, and the average

completed family was 5.9. Although this pattern did not necessarily hold for all parishes of England, similar developments must have taken place to result in the previously cited growth statis from the mid-1600's into the next century. As yet, there is no satisfactory explanation for the cause of the trends.

I now turn from Wrigley's review of pre-industrial population fluctuations to present information about one of the most dramatic demographic events in recent European history - the rise and fall of the Irish population from the 1700's to the 1900's. Strictly speaking, Ireland cannot be considered pre-industrial in the latter part of the 1900's. Nor were the demographic developments only a result of internal cultural and natural factors, being substantially influenced by English economics and politics. Nonetheless, I feel justified in considering the influence of English economic policies and English landlords as density limits essentially independent of the indigenous Irish population. Furthermore, early industrialization probably served only to mitigate the post-Famine demographic transition. In all, Irish history provides a fascinating example of extreme and long-term adjustments of population to changed density limits.

Connell (1950:25-26) says that in 1687 the Irish population numbered 2.167 million, and in 1841 it was 8.175 million. The rate of increase before 1780 was 9% per decade, and from 1780 to 1821 it was 17% per decade. This figure, he says, does not include emigrants who totaled 1.75 million between 1780 and 1845. It is Lyon's (1973:37-46) belief that the 17% increase figure may be too high, and he notes that

a decline in the rate of increase took place after 1821. From 1821-31 the decade rate was 15%, while from 1831-41 it was only 5.25%. However, with a large population, even those rates resulted in a prodigious absolute increase in population, from 6.8 million in 1821 to over 8 million in 1841. He placed the rate of emigration during 1815-45 at 33,000 per year. Lyons says that the potato crop failed partially or totally 14 times during 1816-42. According to Salaman (1949:291-92) the Blight (caused by a fungus Phytophthora infestans) damaged half the crop in 1845. In 1846, says Lyons, the potato crop failed again, and with a harsh winter starvation, typhus, relapsing fever, dysentry, and scurvy caused high mortality. In 1847, the crop was not a total failure, but the 1848 crop was again a complete loss. Starvation and disease took a tremendous toll. The British government took some relief measures in the form of public works and soup kitchens and workhouses; nearly 1 million people spent part of 1849 in the workhouses. In 1846, 116,000 people emigrated; in 1847, emigrants numbered 230,000; and during 1848-52 the annual average was over 200,000. In 1851, the Census population estimate was 6.5 million - a drop of 1.5 million from 1841, and a drop of 2.5 million from what the population would have been had the pre-Famine growth pattern continued. According to Lyons, half of these died of famine or disease, and the other half emigrated. (I believe that Lyons has failed to take into account the lost fertility of the Famine years, which must have accounted for a substantial amount of the missing population). Although emigration tapered somewhat after the Famine, in hard times it increased again, with 1.1 million emigrating

during the 1870's and 80's. The population fell to 4.3 million in 1911, around which figure it stabilized.

The potato was introduced to Ireland between 1585 and 1600 (Salaman 1949:190). According to Connell (1950:240-48), the potato has a prime place in the explanation of the rise and decline of the Irish population. The traditional Irish pattern of marriage bad been for the farm to be inherited by only one son, who would have to delay marriage until his father was willing to give up the control of the land, and had arranged a marriage with a neighbouring farmer's daughter. Other sons had little choice but to emigrate, or not to marry. The potato changed that pattern. It could provide an extraordinarily large crop on a small acreage, could be grown on land unsuitable for other crops, provided a nutritious diet when eaten in sufficiently large quantities and with dairy products, and could feed pigs which were used to pay the rent. Because of the abundance of the potato, the Irish peasant boy could marry at a young age and seek a small subdivision of his father's farm, rent a patch of another farm, or plant on previously unusable land. Landlords, eager to increase the tillage of their land to profit from exports to England, probably encouraged the subdivision of holdings to increase their labour force. A young age at marriage meant a long fertile period during marriage; furthermore, children were probably regarded as the only insurance against poverty in old age or widowhood. Thus, younger marriages and more marriages meant a growing population. Although Connell's work was published a quarter century ago, according to John Murphy, Professor of Irish History at the

University College, Cork, it still stands as the best explanation for the rise of the Irish population, in spite of minor quibbles (Pers. Comm. 1975).

Increasing subdivision of holdings was the rule for the one and a half centuries before the Famine. Lyons (1973:41) says that in 1841, 24% of all land holdings in the country were from 1-5 acres, 40% were from 5-15 acres, and 135,314 holdings were less than one acre. At the outset of the Famine, two thirds of the population depended on agriculture.

The post-Famine half of the 1900's were characterized by the abandonment of the potato as a single dominant staple, the great reduction of small holdings and consolidation of lands into larger holdings, a return to a single heir system of land inheritance, the dominance of pasturage over tillage, and a decline in the need for agricultural labour. For those who were not heirs, the choice was between being an unmarried relative on the family farm, or emigration. For the class of agricultural labourers who could never hope to hold land, and whose services were less needed, emigration was the brightest hope (Lyons, 1973:46-54).

Statistical evidence is limited prior to the early 1800's but later figures show interesting adjustments in marriage patterns. Lyons (1973:36-46) says that there have been arguments that the birth rate was declining prior to the Famine, resulting from fewer and later marriages. In 1830, 36.72% of women married under 20 years of age, but in 1840 the percentage was only 22.55; for men the figures were 11.01%

and 5% respectively. The number of first marriages in the country districts dropped from 32,650 in 1830 to 28,662 in 1840, despite an increase in population. After the Famine, Ireland had one of the lowest marriage rates in the world. Per thousand of unmarried population between the ages of 15 and 49, the annual average number of marriages was 36.7 for men and 38.8 for women in the early 1870's, dropping to 24.1 and 26.9 respectively in the 1890's. Although high fertility after marriage continued to produce a slight surplus of births over deaths (the average completed fertility of a marriage in 1911 was 6.75), infant mortality and emigration eliminated the increase.

The purpose of presenting the above evidence concerning historic human adjustments in population is to aid in understanding the ecology of human populations. Clearly, disease, greatly assisted in its depredations by high densities and poor nutrition, can be a cause of significant short-term fluctuations - reducing the population of a wide area by up to a third in a single year. Equally severe but localized occurrences are probably more common, particularly in high density, low hygiene conditions. Crop failures are also common causes of localized high mortalities through starvation and disease; those not directly dependent on agriculture may suffer as, or more, severely than others. Interestingly, if caused by plant disease, a crop failure may be considered a density-dependent hazard as well - large scale plantings of a single important food crop set ideal conditions for its destruction by disease. Likewise, in relying on any crop whose productivity depends on narrowly prescribed climatic conditions, man is setting himself an un-

certain future. Ecologically, simplicity means instability, and as the ultimate consumer in a food chain, man "reaps the harvest" of any instability which he has induced in his support system. Agriculturally diversified Auneuil suffered less than its neighbour Breteuil. In Ireland, repeated failures of one important crop in a short span of time had frightful results. While periodic high mortalities can be observed in animal and pre-industrial human populations, so can periods of rapid rebound (given no basic change in the density limit).

Human reproductive adjustment to changing economic (or cultural) conditions over the long term is evident in the historic evidence. Except in periods of severest ecological stress, these adjustments probably do not take place on an automatic physiological or behavioral level; rather, they appear to result from an assessment of economic prospects by individuals or families (Cowgill 1975, elaborates on this point), and the adoption of variations in marriage and reproductive patterns, the options adopted being culturally determined. Conscious fertility regulation is surely an important population stabilizing mechanism. Colyton serves as an example.

Irish history gives evidence of the relevance to human populations of Wynne-Edwards hypothesis connecting carrying capacity with territory and the number of breeding pairs. Simply, the potato, and English economic policies increased the density limit for Irish population by decreasing the territory required to support a family. The result was an increase in the number of people breeding and the number of years of breeding. Repeated failure of the potato crop, and the

reduction of its importance to the post-Famine economy by external economic considerations reduced the density limit. A brief period of high mortality and emigration, and a subsequent period of restrictive marriage patterns and emigration reflected the changed circumstances. Particularly interesting is evidence of a later age of marriage just prior to the Famine and of a flattening in the growth curve - suggesting an approach to the density limit with an increasing effectiveness of density-stabilizing mechanisms. Interesting also is the fact that variations in the age at marriage, rather than contraception or abortion appear to have been the only culturally acceptable family limitation options in Ireland.

Emigration was a significant relief to the Irish population problem before and during the nineteenth century. Had this option not been available, the check of growth would surely have come earlier, and possibly in a different form - either as rigorous marriage limitation and contraception, abortion, or infanticide practices, or as starvation and disease. Returning to a point raised earlier, while migrations may have significant effects on the donor and recipient populations, they are also symptoms of more fundamental demographic situations.

The principles and examples of human ecology discussed above are to be applied to the Central Depression prehistoric demographic problem. European sources have been used because the study of historic demography there is much more advanced, although in Mexico the development of parish records paralleled that of Europe, and the potential for similar studies exists (Cook and Borah 1971:1-72). Nonetheless, useful

information can be gleaned from modern literature. Cook (1946:324-35) has concluded from analysis of texts of herbal remedies that the prehistoric diseases in Central Mexico which could have has serious effects on public health and population numbers included pneumonia, tuberculosis, pleurisy, gastro-enteritis, dysentry, yellow fever, and intermittent fever. He believes that there is no evidence in Aztec records of pestilences independently causing mortalities, but famine and disease caused a high mortality during the period A.D. 1454-57, and famine alone caused a heavy loss of life during A.D. 1504-06. Thompson (1970:82) provided a tantilizing hint of family limitation practices when he notes that during the sixteenth century the Indians of Colima, Western Mexico, were reported to have taken steps to ensure that women did not conceive, or arranged abortions, so that their children did not live in "captivity and servility".

Further evidence of family limitation practices comes from recent ethnographic work amongst the Indians of the Peten, Guatemala, by Cowgill and Hutchinson (1963b). The recurrence of the family name Itzá, suggests that the people studied are descendants of the Itzá of the 1700's. An extraordinary sex ratio was observed of 178 males to 100 females for children under 15 years of age. This is not attributable to the neonate sex ratio, but to a high mortality of female children under 5 years of age, apparently caused by differential child care. A cultural favouring of males was noted, with male children being nursed after a younger female sibling had been weaned. The authors concluded that this differential mothering pattern might have some antiquity, and

is in accordance with reports of institutional homosexuality in the area. They note that a continuation of the pattern would cause depopulation.

In this Chapter, I have reviewed the archaeological evidence which indicates a major population drop in the Central Depression during the Postclassic period. The detailed discussions of animal ecology and case studies in historic demography have provided an ecological basis for the discussion of human depopulations. Both dramatic mortalities and long-term reproductive adjustments to changed density limits are amply demonstrated by European history. These European analogies and some scant Mesoamerican evidence provide guidelines for the formulation of a specific model of population decline for the Central Depression. Of particular interest is the Irish example, which offers a study of change in the density limit and consequent changes in human territoriality and reproductivity.

CHAPTER 7

Natural Constraints on Agriculture and Habitation in the Central Depression

The purpose of this chapter is to consider natural factors affecting prehistoric human land use and settlement in Ecozones 1 and 2 of the Central Depression, with particular emphasis on agricultural use. Adequate reference material on Chiapas is either not available to me, or the relevant research has not been done, so literature from similar Mesoamerican regions has been drawn upon.

Karstic regions (Ecozone 2) are particularly severe landscapes for human habitation - the scarcity of soil and surface water supplies, and the unreliability of waste disposal are significant problems (LeGrand 1973).

The unreliability of waste disposal stems from the fact that human waste may rapidly find its way back into the water supply of a settlement by means of the numerous underground solution channels, without any filtering or purification. The problem is discussed in relation to the Yucatan by Doehring and Butler (1974). Presumably, in a settlement without municipal sewerage works the worst problem would occur at the beginning of the rainy season when a substantial amount of accumulated waste would be flushed into the groundwater.

Soils developed from limestone may be thin (unless there have been deposits of sediment from other sources than the bedrock), but they are not infertile. The Land Use Survey Team of British Honduras notes that limestone soils are amongst the most fertile and most

enduringly fertile in the country, as lime reacts with small amounts of other food elements, enabling a food reserve to be built up (Romney 1959:23). Likewise, soils in the limestone-based Yucatan region are reported by Stevens (1964:303-05) to be generally very rich; even soil which is only a deposit of organic material directly on limestone is rich, but dries out readily endangering crops by drought. Surprisingly, Stevens (1964:289) asserts that soils formed from alluvium in Mesoamerica are frequently little better or worse than those of the surrounding watersheds, generally supporting the same crops although they may be deeper and retain more water.

In a karst landscape, water is rapidly lost to the surface by slow percolation through the soil and fissures in the bedrock, and by rapid passage underground through swallow holes and caves. Thenceforth, drainage is mainly vertical until the permanent water table is reached, possibly at great depth (Williams 1969:271). Thus, in the absence of a readily accessible water table, the thickness and water retentive capacity of the surface soil is critical to plant growth.

Soil erosion is influenced by the depth and permeability of the soil, the land gradient, the frequency of storms which are able to produce overland flow, the intensity of the rainfall and its ability to dislodge soil particles, and the vegetative cover during the rainy periods. Steep gradients, high intensity of rain (including the force of the raindrop impact and the total amount of water falling in a given period of time), and thin vegetative cover can greatly increase the amount of erosion (Kirkby 1969, Morgan 1969). In areas such as Chiapas

where intensive rainfall follows a dry season which has reduced the effectiveness of the vegetative cover, the erosive danger on hillslopes is high; especially so if land is burned over prior to the onset of the rains. In a karstic region, soil may be lost to underground solution channels (LeGrand 1973:863) or may merely be redeposited in local basins, a less serious result (Martin Kellman, Pers. Comm. 1975). It is obviously in man's interest to maintain an adequate and even distribution of soil for maximum agricultural output.

The clearing of trees to make milpa may have an environmental effect beyond increasing the danger of erosion. Wagner's observations (1969:182) at the greatly deforested coffee plantation, Prusia, on the north slope of the Sierra Madres of Chiapas, and in a nearby forested valley, showed that the effect of local deforestation was to produce a higher local temperature in the range of 8°C (his graph shows about 10°C difference, but I have subtracted 2°C for the lapse rate as the forested valley is 250 m. higher than the plantation). This surely results from the loss of the energy absorption of the water which is transpired by the trees. In a karstic area, if deeply rooted trees are able to tap a water layer below that which is available to the soil, the resultant transpiration would decrease local temperatures and increase humidity, thereby reducing a crop's water demand on the soil. However, if trees were drawing moisture from the soil their presence would be disadvantageous to agriculture. Yet it is not possible to say how this factor would operate in any particular circumstances without a local study.

Germane to a discussion of man-land relationships in the

Central Depression is a consideration of maize - today, and pre-Hispanically presumed to be, the single most important food item. An average of .77 kg. per person per day is consumed by Indian and Ladino families living in the Peten today, or about 281 kg. per person per year (Cowgill and Hutchinson 1963b:96). In her study of the Zapotec of the Oaxaca Valley, Kirkby (1973:127) estimated a need of two to three metric tons per family of five per year, including fiesta needs, exchange needs, and animal food; subtracting that not used for human food, both estimates likely fall in the same range. Probably the pre-Hispanic consumption of maize would have been higher because of the reduced variety of cereal crops available.

Kirkby's (1973) study of modern agriculture in the Oaxaca Valley can be used to shed light on the pre-Hispanic situation in the Central Depression. The average rainfall in the Oaxaca Valley is between 600 and 900 mm. per year, in the lower range of rainfall in the Central Depression, but the higher Oaxaca elevation means that the annual average temperature is somewhat lower, from 18° to 21°C (Kirkby 1973:15, 19), and consequently so would be the evapo-transpiration rate. However, both regions share annual potential excesses of evaporation over precipitation, and the dry winter - wet summer pattern. Although climatic, geological and hydrological differences preclude a detailed analogy, broad comparisons are possible.

Kirkby found that the availability of water, either as rainfall or as irrigation water, was the most important factor determining corn yield in the Oaxaca Valley, and farming practices varied according to

water availability (Kirkby 1973:35-51,63). Of the various practices, three are of interest for the Central Depression.

Dry-farmed fields only receive water as rainfall, and because in Oaxaca this is barely adequate to support one crop in the summer, water conservation techniques are employed; these include the reduction of transpiration loss by careful weeding, and cultivation to reduce overland flow and induce infiltration immediately around the plant. Also, barriers are built to check flow and hold soil and moisture at points where overland flows concentrate. Terraces are not today built for dry farming, but terraces in the piedmont zone of the valley, dating to about A.D. 1300, are evidence that they once were. (According to Romney 1959:113, in some places in the British Honduras, an estimated six to eight feet of soil above the original two feet have accumulated on pre-Contact agricultural terraces). In modern Oaxaca, dry-farming is practised only as a last resort.

Floodwater-farming involves the diversion of flash floods over much broader areas than they would naturally cover. Success depends on the amount, frequency, and magnitude of the water flows. It is most useful where floods can be expected about once per year, and where more reliable water sources are not available. Floodwater-farming may be conducted with canals used for more permanent irrigation schemes, or without any, but there are usually some short barriers to reduce flow velocity and increase spreading of water.

Watertable-farming can be practised where the surface of the water is found between 0.25 and 1.0 m. below the surface. It is usually

practised on the low alluvium zone, where the soil may require draining during the rainy season, but two or three crops are possible per year. High yields are possible continuously with some fertilization, but the area suited for this farming practise is limited. Other irrigation farming methods are practised in Oaxaca, but they appear not to have been utilized pre-Hispanically in the Central Depression, and so will not be discussed here.

Kirkby's (1973:61-65) analysis of the variables which affect corn production indicates that the availability of water is the most important factor, and that given sufficient irrigation water, similar yields could be produced anywhere in the valley on any gradient or soil type. A linear regression was found to produce a correlation between water consumption and corn yield significant to the 0.1 percent level. Dry-farming on the piedmont and high alluvium, where water consumption was below 750 mm. per annum produced yields ranging from .25 to 1.5 metric tons per ha.. Canal irrigation and watertable-farming water consumptions were between 1000 and 1750 mm. per annum, producing corn yields ranging from 1.5 to 4.25 metric tons per ha.

The time of water availability, in addition to the total amount is critical to corn yield (Shaw and Burrows 1966:121-42). Moisture stress is defined as a period when a combination of soil moisture and atmospheric demand cause evapotranspiration to fall below the level it would be, given unlimited moisture. Corn has the highest water need between tasseling and kernel formation. Total yields are particularly susceptible to stress during the silking stage, and even one or two

days of severe stress during tasseling or pollinating can reduce final yields by up to 20%. Thus, on these days the ability of the soil to hold a reserve of water is especially critical. However, some moisture stress in the early stages of growth can be beneficial as it encourages deeper rooting; potentially, corn can extract water from about 1.5 m. of soil. All of the above information was gained in modern corn belt studies; presumable pre-Columbian maize would, if anything, be hardier.

The Mesoamerican native maize farmer of today is not restricted to one variety. Kirkby (1973:57-58) has shown that a Zapotec farmer can choose from three Indian corn varieties; violento, maturing in three months and preferred in expected dry years, but producing the lowest yields even if moisture conditions are good; tardón, maturing in four to five months but producing better yields if moisture is adequate; and cajeta maturing in six months but used in higher altitudes only. Likewise, Romney (1959:45) notes a choice of several types of maize in the British Honduras, maturing in six weeks, two months, three months, or four months, with correspondingly increasing yields. The earliest maturing variety is used green, not as grain. Thus, a choice of maize varieties is now available, and presumably was pre-Hispanically, to meet various moisture conditions; but a maize farmer is caught in the same conundrum as a statistician - the more sure he is of his result, the less he has to be sure of.

Kirkby presents data on changing mean corn cob lengths over the last 7000 years, derived by the Tehuacan Valley Project, and modern

data from the Oaxaca Valley giving the mean yield of dried corn seed for various lengths of cob (1973: Fig. 48). From this information it can be shown that the average expected yield at A.D. 1000 was about 1.1 metric tons per ha., about 61% of the modern 1.85 metric tons per ha.

Modern studies in the Oaxaca Valley and in Chiapas indicate that weeding and harvest labour requirements limit a family of five to the cultivation of eight ha. or less. Given a need of at least 2.4 metric tons maize per annum for food and exchange needs, a yield of at least 200 kg. per ha. from all the land (including fallow) must be obtained. In fact, the Zapotec consider anything under 200-250 kg. per ha. as not worth harvesting (Kirkby 1973:53,127).

The following brief discussion of climatic variation has the purpose of noting only certain features of short-term fluctuations and long-term trends. The information does not specifically apply to the Central Depression, but gives an idea of the nature of variation to be expected. It is noteworthy that Cowgill and Hutchinson (1963a:279-83), through analysis of the chloride content of lake sediments, concluded that the Petén experienced a drying trend during the period of the decline of the Classic Maya civilization (but they believe that their studies have disproven any idea that external ecological change caused the collapse of the Classic Maya culture). Fluctuations rather than trends are more readily observed in modern meteorological records. In Oaxaca, climatic records of 19 to 40 years duration show that relative variation in mean monthly rainfall has been much greater than variation in mean monthly temperature or evaporation when comparisons are

made from year to year. Also, the absolute magnitude of the rainfall variation is much greater in the May-to-October rainy season than in the winter dry season (Kirkby 1973; Fig. 6). Vivó Escoto (1964:201) notes that the short dry period of one or two weeks duration which normally occurs during the wet season in much of Mexico and Central America sometimes does not appear, and at other times it lasts so long that crops are endangered by drought.

The information presented above must now be integrated to give some idea of the geographically determined differences between Ecozones 1 and 2, and of the stability of the subsistence system, focusing at A.D. 1000. Ecozone 1 has been defined in Chapter 1 as the river bottomlands, or those areas having access to abundant sources of water year-round. In contrast, Ecozone 2 is an area in which the karstic limestone dominates the ecology - soils are thin and water sources in the dry season are scarce and meagre.

The major non-agricultural effect of Ecozone 2 characteristics on human settlement would seem to be a concentration of residence around relatively reliable water supplies. Increased incidences of infection resulting from greater population density and from situations conductive to the spread of water-borne disease would seem to be consequent health problems, and the onset of the rainy season might be a particularly unhealthy time. Were a normally adequate water resource to fail during the dry season nobody would die of thirst, but substantial energy would have to be expended in transporting water from another source, or the community would have to temporarily move closer to the supply. Both

alternatives look unattractive; water transport without wheeled vehicles or beasts of burden would be particularly onerous, and temporary movement of a large community in a crowded region might beget substantial political problems, unless alliances had been specifically designed to cope with them.

Agriculturally, Ecozone 2's greatest handicap is water - the thinness of the soil, the rapidity of water loss to the surface, and the depth of groundwater. Dry-farming and flood-farming practices such as the construction of terraces, check dams, and water distribution channels which conserve soil and momentarily surplus water are partial answers to the problem, but in the absence of groundwater reserves which can be utilized to mitigate the effects of rainfall fluctuation, agriculture is dependent on annual rainfall. Modern meteorological records seem to indicate that one of the most variable climatic factors in Mesoamerica is rainfall. Ecozone 2 agriculture would be most susceptible to any change from a pattern of an even and predictable distribution of rain throughout the wet season, to less frequent and predictable periods of high rain intensity, even in the absence of any long-term drying trend. More overland flow controls might partially or completely compensate for the variation, but any erosion which took place before the remedial works were in place would further reduce the adaptability of the system. It has been shown that maize is particularly susceptible to water stress at certain stages of growth, and so if properly timed, even slight precipitation variation could seriously reduce crop yield. In choosing a faster maturing maize type, the reduced susceptibility to moisture

stress must be balanced against lower expected yields. In summary, one must conclude that agriculture in Ecozone 2 is essentially unstable.

Ecozone 1, on the other hand, is favoured. The perennial rivers may fluctuate in total flow volume from year to year, but always provide sufficient drinking water. Settlement could be spaced out along the rivers rather than concentrated in a few locations, and the resultant lower density would reduce the disease problem; human waste would present a less significant water contamination problem because of soil filtration and a greater volume of flushing water. Although Ecozone 1 soils are probably not inherently more fertile than those of Ecozone 2, their depth would permit retention of moisture, thereby reducing the danger of moisture stress on the maize crop. High yield watertable -farming and multiple cropping would probably be practicable near river margins. Seasonal river peaks and arroyo discharges from Ecozone 2 would probably permit some areas to be floodwater-farmed. In summary, Ecozone 1 agriculture would be more stable and less labour intensive than that of Ecozone 2, but excepting the watertable-farming, would probably not be more productive per ha. than Ecozone 2 under optimum conditions.

A significant difference between maize agriculture today and at A.D. 1000 is the one third smaller yield during the prehistoric time. While the lower yield might have partially compensated for by greater plantings and more weeding, the prehistoric labour limits on cultivable area prehistorically would presumably be similar to today. Thus, the farmer of A.D. 1000 must have been operating on a smaller margin of safety between productive potential and subsistence needs in both Ecozones.

CHAPTER 8

Agricultural Problems and Demographic Adjustments

In Chapters 5 and 6 I have presented the archaeological evidence which suggests that the Late Classic period was a time of population peak in the Central Depression, and that a substantial decline took place during the Postclassic. Evidence of this demographic event leads to the questions why, and how did the decline take place. The purpose of this chapter is to discuss that problem.

The cause of the population decline has been a source of speculation for many other Central Depression prehistorians. Navarrete (1960:36) has attributed the decline to an over-use of the land during the Late Classic population peak, culminating in reduced fertility and erosion. Agrinier (1968:92) attributes the abandonment of the Varejonal region also to the exhaustion of the soil. Guzman (1958:226) after viewing the extensive terracing on the north slope of the Central Depression between 1000 and 2000 m. altitude, denied that soil fertility depletion could be the cause of the collapse of the Classic culture (but I wonder whether these terraces nourished the Highlands or the Central Depression populations). Lee (1973:14) was drawn to the conclusion that climatic change best explains the temporal fluctuation in site frequency in the Ecozone 2 area. In an earlier assault on the problem (1974), I proposed that the exhaustion of community water resources in Ecozone 2 would result from extensive deforestation. Left without local water resources, and considering the difficulty of transporting water pre-

historically, I reasoned that the population would have to move into Ecozone 1, and dense crowding would result in a "population crash". (A consideration of the validity of these various theories follows after a brief summary of the results of Chapters 6 and 7.) While all the theories have centred around the failure of the subsistence system, no effort has been directed to the equally important consideration of the nature of demographic response to subsistence problems. In the following, I believe that I am able to advance the discussion of both aspects of the problem.

The considerations of pre-industrial demography in Chapter 6, and of natural constraints on settlement and agriculture in Chapter 7, have established the following points, around which a model of agricultural disruption and demographic decline can be articulated.

1) Dramatic, short-term reductions in population - even as high as one third in a single year - can be expected to take place from time to time in pre-industrial societies. These may be caused solely by epidemics, but are more commonly a result of starvation and disease following a series of partial or complete crop failures. The risk of a severe mortality increases with population density and dependence on a narrow subsistence base, but with no permanent lowering in the density limit the population should recover.
2) Human populations respond to long-term downward adjustments in the density limit primarily through emigration, and/or reproductive adjustments (marriage pattern alteration and family limitation).
3) Agriculture and settlement in Ecozone 2 is essentially unstable

relative to Ecozone 1 because of the hydrological characteristics of the limestone bedrock; various farming practices and maize variety choices can reduce the risk of crop failure from drought, but the agricultural system is more closely dependent on annual rainfall than is Ecozone 1. Rainfall is one of the most variable features of the Mesoamerican climate. Even a two-day period of severe water stress during the sexual reproductive stage of maize growth can significantly reduce the final yield.

4) With probably similar labour limits on area cultivable, but a one third smaller yield, the maize farmer of A.D. 1000 had a much smaller margin between potential production and subsistence needs than his descendants today.

All of the above ideas and observations have been gathered from research conducted outside of the Central Depression, and thus cannot be assumed to pertain exactly to the Central Depression at A.D. 1000. However, they can be used, first, to evaluate previous proposals, and second, as guidelines around which a model can be elaborated.

The loss of soil fertility in Ecozone 2 can be discounted as a significant prehistoric subsistence problem. Maize can produce high yields on almost bare limestone, given adequate water. I also reject my own previous model in which I suggested that deforestation would result in the exhaustion of dry season drinking water sources for communities. Extensive deforestation might even increase groundwater by reducing evapotranspiration loss (Martin Kellman, Pers. Comm. 1975). Even were Ecozone 2 to become unsuitable for dry season residence,

substantial areas could still be used for milpa while the population lived along the major streams. Furthermore, there is no evidence that the endocrine stress type of "population crash" phenomenon applies to human populations - except in concentration camp situations where captive populations achieve densities higher than those of the densest modern city. (Deevey 1966: 342-45; Hoagland 1966: 356). Nonetheless, it seems that a water-oriented approach can be satisfactory if related to agricultural productivity. The discussion of agricultural water supply centres around maize, which is assumed to have been the most important single food crop prehispanically - probably supplying at least 50% of all nutrition and having a status perhaps approaching that of the potato in pre-Famine Ireland. Given the sensitivity of corn yields to water stress, the retention of reserves of soil moisture is critical, but also particularly difficult in a karstic region. Water and soil conservation schemes are commonly mentioned features of the Late Classic occupation of Ecozone 2 (see Chapter 5).

Given the fact that rainfall fluctuation above and below the mean is to be expected, even within long-term stability, one may reasonably conclude that starvation and disease following partial or complete crop failures would periodically reduce the Ecozone 2 population. Probably the time of the most serious mortality would be at the onset of the rainy season, when the previous year's maize stores would be at their lowest or had already been exhausted, and when the danger of water-borne infection would be highest. Mortalities at this time would also be detrimental to the preparation for the next crop. If an analogy

with the parish of Mouy is valid, craftsmen and traders relying on the sale of goods for their subsistence would suffer the most, unless they were in the service of a high-ranking individual. Losses of population on the range of a fifth or a quarter seem reasonable to predict for the hardest hit areas, but the whole of Ecozone 2 would probably not suffer to the same degree. Ecozone 1 would suffer less still. Unless the Central Depression population was very fortunate, such mortalities probably occurred more than once during the Late Classic, with a longer interval between crises giving rise to more serious mortalities. However, such fluctuations can not be used to explain a long-term depopulation, for once reduced, a population should begin to recover and even temporarily have a greater immunity to further crises. More permanent depopulation is dependent on long-term reductions in the density limit.

The problem is, what would cause a long-term reduction in the density limit? I do not believe that it is reasonable to argue that a disruption in the socio-political structure, as shown by the demise of Classic-type ceremonialism, would itself cause depopulation, nor would it cause a failure in any of the agricultural intensification practices. While it is evident that the continuation of ceremonial construction requires the presence of a healthy labour force, able to devote a substantial amount of time to construction and to the support of a priestly hierarchy, I do not believe that there are any features of the subsistence system in the Central Depression whose maintenance depends on priestly or political control. All of the water control systems were relatively simple, small, and localized - definitely not requiring the

central control characteristic of a "hydraulic society". Nor could the collapse of trading networks seriously affect the subsistence of the majority of the population - with the transportation of the times, no substantial population could have established itself independent of a local food supply except as an imperial state such as the Aztecs. I think that one must look to the economic position of the milpero for the causes of the population decline. An understanding of the "end of the Classic" is more likely to be found through this direction of enquiry, than the reverse.

I am drawn, as is Lee, to the conclusion that climatic variation is the most likely explanation for the abandonment of Ecozone 2 because agriculture in that region is particularly dependent on rainfall. Climatic change might have been a slight overall drying trend, and evidence from the Petén gives this some credibility beyond speculation. Or climatic variation might have come in the form of reduced frequency and increased intensity of rainfall, to which the area would seem to be particularly susceptible. Solid, independent evidence of climatic trends is most difficult to obtain, but I think that the present-day lack of drinking water sources in the vicinity of Varejonal surely indicates that either rainfall was once more evenly distributed throughout the year, or that the soil was once sufficient to hold a dry season water reserve. It is possible that both climatic variation and a period of unwise human land use, resulting in great erosion before terracing could halt the problem, both contributed to the reduction of the density limit.

A climatic trend should not be conceived of as a slow, even variation, but as a period of increasingly severe droughts and less buoyant interludes, or as an increase in the ratio of bad years to normal good years. When population density was high it would have been susceptible to perhaps one major crop-failure induced mortality per one or two generations, but other mechanisms would have to come into operation to gradually adjust the population to the economic situation.

Given reducing yield per ha., a farmer would have two options - to expand his holdings and increase the planted area, or to abandon the least productive portion of his land, and gain new holdings where soil moisture was greater or more certain. Either of these alternatives essentially result in reductions of population density by increasing the amount of territory required per person. The first alternative would surely be the least desirable from a farmer's point of view. If one assumes the previously stated labour limits on area planted, reduced maize yield prehistorically, and the point at which the harvest is not considered worth the labour input, it would seem that the adaptive value of this option would be limited. The second option is by far the more attractive, and a period of high mortality would free the better holdings of the victims for the use of the survivors (although a high portion of victims would probably be those who held the worst land). Temporary stability might be achieved at this new density level.

At this stage of adjustment, the availability of drinking water might be a factor determining which lands would continue to be cultivated, and which would not. The failure of a local water supply near

marginally productive fields might eliminate their cultivation, for travel to and from a distant residence and produce transportation is equivalent to increased labour in production (Rappaport 1967:52 found that 16 to 22% of agricultural labour output amongst the Tsembaga of New Guinea was in travel and transport to and from the gardens).

Given a permanent lowering of the density limit, the mortality reduced population would have to be prevented from growing to its previous level. Emigration, and reproductive adjustments are the possible mechanisms. I have previously ruled out emigration as a significant factor in the demographic transition under consideration, because large areas of southern Mesoamerica were undergoing a population decrease at the same time, and there was no "New World" to absorb the surplus, as in the Irish situation. The unavailability of this option must have heightened the demographic crisis within the Central Depression. The method of adaptation would probably involve no fundamentally new social conventions, but a revision of existing ones. Marriage and the onset of reproduction might have been delayed until some member of the parents' generation was willing to give up his holding, with the complete holding passing to a single heir and younger siblings being entirely excluded from reproduction, as in post-Famine Ireland. Alternatively or simultaneously, family limitation might be practised. Interestingly, the type of male child preference practised by the Maya Indians of the Peten today would be highly adaptive to increased labour demand in agriculture, and to a permanent lowering of the density limit. The preference for boys would increase the ratio of field hands to household dependants,

and would greatly reduce the reproductive potential of the group. Such an option requires neither marriage limitation, contraception, or conscious infanticide. One wonders if it were once an adaptive social scheme which has continued through the force of tradition. Whatever the scheme employed, the archaeological evidence shows that it was effective.

The effect of a depopulation trend in Ecozone 2 would be to further decrease or eliminate town populations. The reduction in absolute numbers would tell both on the state of public architecture and on the size of hierarchy which could be supported. A smaller population would necessarily reduce the social distance between the highest and lowest on the social scale, and an increased secularization of ceremonial matters would seem to be the product.

The vector of population decline is impossible to predict. I think it probable that one severe mortality initiated the sequence, and the previous discussion has used that assumption. Evidence of a permanent decline in agricultural potential, perhaps taking the form of generally poor crops with one or two periods of particular hardship, or an increased frequency of bad years, especially on the poorer lands, would seem to be required to bring about adaptive changes in the reproductive conventions. Further adjustment might be as gradual and even downward trend, or as a series of downward steps of small mortalities, with or without periods of rise in between. I think a social adjustment bringing about a small but definite surplus of deaths over births over a long period of time, as in the Colyton case, most probable. As Cowgill (1975) points out, variations of 10 to 15% in fertility and

mortality rates can change population growth to decline, or vice versa. In any locality in the Central Depression, an initial famine and disease mortality of 25%, and a moderate average surplus of 2.5 deaths over births per thousand could bring about a 50% depopulation within a century.

The model does not require that all of the Central Depression have similar crises and depopulation rates at the same time. Local adjustments would depend on local agricultural conditions, but some other mechanisms would tend to even out the depopulation rates. The more favoured areas might have experienced substantial immigration pressure from other areas. If migrants were allowed to establish themselves, the increased density would reduce demographic stability. Were the intruders to be resisted, as is most likely, warfare and settlement dislocation would result. Indeed, Lowe (1959:18) has noted that Post-classic sites in the lower Central Depression are small settlements frequently built on hilltops - perhaps for defence. Disruption of agricultural labour at critical times of the year would also reduce productivity and increase the risk of famine.

Archaeologically, the most striking evidence of depopulation is seen as an abandonment of Ecozone 2. If the cause of depopulation was climatic fluctuation, the deeper soils and possibility of watertable -farming in Ecozone 1 would reduce its susceptibility to the changes, but some downward adjustment of the density limit might be expected.

While I have carefully avoided the problem of the cause of the population increase during the Late Classic, it is interesting to

speculate using a climatic variation model. The colonization of Ecozone 2, I believe, took place from Ecozone 1 during a period of optimum precipitation - either in total quantity or consistency of distribution within or between years. I doubt that it was occupied because of population pressure in Ecozone 1, as the elaboration of ceremonial construction seems to indicate a healthy population in a rich land, rather than a powerless, poor population forced onto marginal land. If one follows the Irish example, the availability of unused farmable lands would release the marriage or breeding constraints required to keep the population of Ecozone 1 within bounds. Economic opportunities open to younger family members would result in more and younger marriages, and a population boom. Large families and the export of surplus children might have become the norm in Ecozone 1 for up to a century. Consequently, it might be in Ecozone 1 that the greatest change in reproductive behaviour would have had to take effect once it became obvious that Ecozone 2 could no longer accept all of the offspring. However, the precedents for reproductive limitation would presumably be there (in Ireland, the post-Famine marriage patterns reverted to what they had been before the great subdivision of holdings began).

SUMMARY AND PROPOSALS FOR FURTHER RESEARCH

During the Late Classic period there was a large population living in towns in Ecozone 2 of the Central Depression. The Ecozone was abandoned during the Postclassic period, accompanied by a population decline in the whole of the Depression. Analysis of animal ecology and European historic demography, and of the relation of maize agriculture

to geology, soils, groundwater and rainfall have provided a set of guidelines around which a preliminary model of the demographic decline can be built. It is concluded that maize agriculture in Ecozone 2 is essentially unstable, being very dependent on the amount and pattern of annual rainfall, which presently appears to be one of the most variable climatic characteristics. There is also some limited evidence (the lack of water at Varejonal, and a drier period in the Petén) of a drying trend during the period considered. When the population was at its highest density, it is hypothesized that it was reduced by one or more starvation and disease induced mortalities following crop failures. However, some long-term lowering of the density limit is necessary to explain the depopulation. Variation in rainfall, either in total quantity or in its pattern of distribution is thought to be the factor most likely to produce a lowering in agricultural productivity resulting in an increase in the amount of cropland required per person, or a decrease in the total amount of arable land. The depopulation was probably initiated by a severe mortality, after which adjustments in marriage patterns and/or family limitation practices produced annual surpluses of deaths over births for perhaps a century.

The purpose of a model is as much to clarify directions for further research as to advance the state of understanding in itself. I propose the following as significant avenues of research leading to a greater understanding of pre-Hispanic demographic variations in the Central Depression.

1) A collection and classification of Indian Corn varieties of the

Central Depression should be undertaken. Sufficient seed should be collected so that experimental plots could be sown to evaluate maturation times and the effects of various soil, water and temperature conditions. Some plots should be sown on pre-Hispanic terraces to evaluate their productivity under todays' conditions. Similar studies should be conducted on beans.

2) Excavations should be conducted with the specific purpose of discovering the types, relative quantities and size of yield (through modern comparisons of grain size) of crops at various times in prehistory.

3) All climatological evidence available on the Central Depression should be exploited to divide it into climatically homogeneous sub-regions. The correlation with recent climatic fluctuations with maize and bean yields in these various subregions should be attempted.

4) One climatic subregion with an adequate representation of Ecozones 1 and 2 should be chosen for a carefully controlled study of settlement areas at different time periods.

5) All ethnohistoric records, and especially parish records, should be inventoried to find material which would permit the reconstruction of demographic patterns in the historic time. Hopefully, clues to population adjusting mechanisms would be found.

6) Ethnographic research reports from modern Highland Indian communities should be explored to determine whether there are presently any conscious or unconscious methods of adjusting the population to

the economic circumstances. New research may be required.

7) The ecology of potentially epidemic human and plant diseases of the prehistoric period should be explored.

REFERENCES CITED

Adams, Robert M.
1961 Changing Patterns of Territorial Organization in the Central Highlands of Chiapas, Mexico. American Antiquity 26:341-60.

Agrinier, Pierre
1968 Reconocimiento de Varejonal, Chiapas, Mexico. In Anales del Instituto Nacional de Antropologia e Historia 20. Mexico.

Berlin, Heinrich
1956 Late Pottery Horizons of Tabasco, Mexico. Carnegie Institution of Washington Pub. 606 (Contributions to American Anthropology and History no. 59), pp. 95-153.

Borhegyi, Stephan F. de
1965a Archaeological Synthesis of the Guatemalan Highlands. In Handbook of Middle American Indians vol. 2, pp. 3-58, edited by R. Wauchope. University of Texas Press, Austin.

Borhegyi, Stephan F. de
1965b Settlement Patterns of the Guatemalan Highlands. In Handbook of Middle American Indians vol. 2, pp. 59-75, edited by Robert Wauchope. University of Texas Press, Austin.

Borhegyi, Stephan F. de
1970 Archaeological Reconnaissance of Chinkultic, Chiapas, Mexico. In Archaeological Studies in Middle America, Tulane University, Middle American Research Institute, Pub. 26, pp. 119-134. New Orleans.

Brainerd, George W.
1958 The Archaeological Ceramics of Yucatan. University of California Press, Anthropological Records No. 19. Berkeley.

Brockington, Donald L.
1961 A Prolongation of the Preclassic Period Indicated by the Ceramics of Santa Rosa, Chiapas. In Los Mayas del Sur y sus relaciones con los Nahuas Meridionales, pp. 85-92. VIII Mesa Redonda, San Cristobal las Casas, Chiapas, Sociedad Mexicána de Anthropología.

Brockington, Donald L.
1967 The Ceramic History of Santa Rosa, Chiapas, Mexico. Papers of the New World Archaeological Foundation 23. Brigham Young University, Provo.

Bullard Jr., William R.
1973 Postclassic Culture in Central Peten and Adjacent British Honduras. In. The Classic Maya Collapse, pp. 221-41, edited by T. Patrick Culbert. University of New Mexico Press, Albuquerque.

Coe, Michael D.
1966 The Maya. Praeger, New York.

Coe, Michael D.
1968 San Lorenzo and the Olmec Civilization. Dumbarton Oaks Conference on the Olmec, pp. 41-78, edited by Elizabeth P. Benson. Harvard University, Washington.

Connell, K.H.
1950 The Population of Ireland 1750 - 1845. Oxford.

Cook, S.F.
1946 The Incidence and Significance of Disease Among the Aztec and Related Tribes. Hispanic American Historical Review 36:320-35.

Cook, S.F., and W.W. Borah
1971 Essays in Population History: Mexico and the Carribean. Vol. 1. University of California Press.

Corzo, D. Angel A.
1856 Carta General del estado l. y s. de Chiapas. Revised in 1889 by Manuel Carrascosa. In the Blom Museum, San Cristobal las Casas, Chiapas, Mexico.

Cowgill, George L.
1975 On Causes and Consequences of Ancient and Modern Population Changes. American Anthropologist 77:505-525.

Cowgill, U.M., and G.E. Hutchinson
1963a Ecological and Geochemical Archaeology in the Southern Maya Lowlands, Southwestern Journal of Anthropology 19:267-286.

Cowgill, U.M., and G.E. Hutchinson
1963b Sex Ratio in Childhood and the Depopulation of the Peten, Guatemala. Human Biology 35:90-103.

Culbert, T. Patrick
1965 The Ceramic History of the Central Highlands of Chiapas, Mexico. Papers of the New World Archaeological Foundation 19. Brigham Young University, Provo.

Deevey, Edward S.
1966 The Hare and the Haruspex: A Cautionary Tale. In Human Ecology, pp. 336-50, edited by J.B. Bresler. Addison-Wesley Ltd., Don Mills, Ont.

Delgado, Agustin
1965 Excavations at Santa Rosa, Chiapas, Mexico. Papers of the New World Archaeological Foundation 17. Brigham Young University, Provo.

Doehring, Donald O. and J.H. Butler
1974 Hydrogeologic Constraints on Yucatan's Development. Science 186:591-95.

Dutton, Bertha P.
1961 Chiapas - Guatemala Relationships. In Los Mayas del Sur y sus Relaciones con los Nahuas Meridionales, pp. 111-14. Sociedad Mexicana de Anthropologia, VIII Mesa Redonda, San Cristobal las Casas, Chiapas.

Dutton, B.P., and H.R. Hobbs
1943 Excavations at Tajumulco, Guatemala. Monographs of the School of American Research No. 9. Santa Fe.

Ekholm, Susanna M.
1969 Mound 30a and the Early Preclassic Ceramic Sequence of Izapa, Chiapas, Mexico. Papers of the New World Archaeological Foundation 25. Brigham Young University, Provo.

Green, Dee F., and Gareth W. Lowe
1967 Altamira and Padre Piedro, Early Preclassic Sites in Chiapas, Mexico. Papers of the New World Archaeological Foundation 20. Brigham Young University, Provo.

Guzman, L.E.
1958 The Agricultural Terraces of the Ancient Highland Maya. Annals of the Association of American Geographers 48:266.

Helbig, Karl M.
1964 La Cuenca Superior del Rio Grijalva. Instituto de Ciencias y Artes de Chiapas, Tuxtla Gutierrez.

Hoagland, Hudson
1966 Cybernetics of Population Control. In Human Ecology, pp. 351-59, edited by J.B. Bresler. Addison-Wesley, Don Mills.

Katz, Solomon H.
1972 Biological Factors in Population Control. In Population Growth: Anthropological Implications, pp. 351-69, edited by Brian Spooner. M.I.T. Press, Cambridge.

Kendeigh, S. Charles
1961 Animal Ecology. Prentice-Hall, N.J.

Kirkby, Anne
1973 The Use of Land and Water Resources in the Past and Present Valley of Oaxaca, Mexico. Memoirs of the Museum of Anthropology, University of Michigan no. 5. Ann Arbor.

Kirkby, M.J.
1969 Erosion by Water on Hillslopes. In Water, Earth, and Man, pp. 229-38, edited by Richard J. Chorley. Methuen, Gt. Br.

Lee, Jr., Thomas A.
1969 The Artifacts of Chiapa de Corzo, Chiapas, Mexico. Papers of the New World Archaeological Foundation 26. Brigham Young University, Provo.

Lee, Jr., Thomas A.
1973 The Upper Grijalva Basin: A Preliminary Report of a New Maya Archaeological Project. Presented at the XIII Mesa Redonda of the Sociedad Mexicana de Antropología, Jalapa, Veracruz, México.

Lee, Jr., Thomas A.
1974a Preliminary Report of the Second and Final Reconnaissance Season of the Upper Grijalva Basin Maya Project (January-May, 1974). New World Archaeological Foundation, Brigham Young University. Unpublished MS.

Lee, Jr., Thomas A.
1974b Terminal Late Classic Settlement Pattern Responses to Demographic and Ecological Pressures in Southeastern Chiapas: A Socio-Political Model. Paper presented to the 41st. International Congress of Americanists, Mexico, D.F.

Lee, Jr., Thomas A.
1975 The Uppermost Grijalva Basin: A Preliminary Report of a New Maya Archaeological Project. In Sociedad Mexicána de Antropología, XIII Mesa Redonda, pp. 35-47, Arqueologia II, Xalapa, Sep. 9-15 de 1973. México.

Le Grand, H.E.
1973 Hydrological and Ecological Problems of Karst Regions. Science 179:859-64.

Lowe, Gareth W.
1959 Archaeological Exploration of the Upper Grijalva River, Chiapas, Mexico. Papers of the New World Archaeological Foundation 2. Orinda.

Lowe, Gareth W., and J. Alden Mason
1965 Archaeological Survey of the Chiapas Coast, Highlands, and Upper Grijalva Basin. In Handbook of Middle American Indians vol. 2, pp. 195-236, edited by Robert Wauchope, University of Texas Press, Austin.

Lyons, F.S.L.
1973 Ireland Since the Famine. Collins/Fontana, Glasgow.

MacNeish, Richard S., and Fredrick A. Peterson
1962 The Santa Marta Rock Shelter, Ocozocoautla, Chiapas, Mexico. Papers of the New World Archaeological Foundation 14. Brigham Young University, Provo.

Matheny, Ray T.
1970 The ceramics of Aguacatal, Campeche, Mexico. Papers of the New World Archaeological Foundation 27. Brigham Young University, Provo.

Morgan, M.A.
1969 Overland Flow and Man. In Water, Earth, and Man, pp. 239-55, edited by Richard J. Chorley. Methuen, Gt. Br.

Mullerried, Fedrico K.G.
1957 La Geología de Chiapas. Edicion del Gobierno del Estado de Chiapas, Mexico D.F.

Munsell Colour Company, Inc.
1954 Munsell Soil Colour Charts. Baltimore.

Navarette, Carlos
1960 Archaeological Explorations in the Region of the Frailesca, Chiapas. Papers of the New World Archaeological Foundation 7. Orinda.

Navarette, Carlos
1962 La Ceramica de Mixco Viejo. Humanidades, Universidad de San Carlos de Guatemala. vol. 3, no. 7. Guatemala.

Navarette, Carlos
1966 The Chiapanec History and Culture. Papers of the New World Archaeological Foundation 21. Brigham Young University, Provo.

Navarette, Carlos
1973 El Sistema Prehispanico de Comunicaciones Entre Chiapas y Tabasco (Informe Preliminar). Anales de Antropología Volumen X, pp. 33-92. Instituto de Investigaciones Históricas, U.N.A.M. México.

Noguera, Eduardo
1973 Las Funciones del Momoztli. In Anales de Antropologia Volumen X, pp. 111-22. Instituto de Investigaciones Históricas, Universidad Nacional Autonoma de México.

Rands, Robert L.
1961 Elaboration and Invention in Ceramic Traditions. American Antiquity 26:331-40.

Rands, Robert L.
1973 The Classic Collapse in the Southern Maya Lowlands: Chronology. In The Classic Maya Collapse pp. 43-62, edited by T. Patrick Culbert. University of New Mexico Press, Albuquerque.

Rands, Robert L. and Robert E. Smith
1965 Pottery of the Guatemala Highlands. In Handbook of Middle American Indians, vol. 2, pp. 95-145, edited by Robert Wauchope. University of Texas Press. Austin.

Rappaport, Roy A.
1967 Pigs for the Ancestors. Yale University Press. New Haven.

Rathje, William
1973 Classic Maya Development and Denouement: A Research Design. In The Classic Maya Collapse, pp. 405-54, edited by T. Patrick Culbert. University of New Mexico Press, Albuquerque.

Robinson, W.S.
1951 A Method for Chronologically Ordering. Archaeological Deposits. American Antiquity 16:293-301.

Romney, D.H. (ed)
1959 Land in British Honduras: Report of the British Honduras Land Use Survey Team. Colonial Research Publications no. 24. Her Majesty's Stationery Office, London.

Sabloff, Jeremy A.
1970 Type Descriptions of the Fine Paste Ceramics of the Bayal Boca Complex, Seibal, Peten, Guatemala. In Monographs and Papers in Maya Archaeology, edited by William R. Bullard, Papers of the Peabody Museum of American Archaeology and Ethnology. vol. 61, pp. 357-404. Harvard University, Cambridge.

Sabloff, Jeremy A. and William L. Rathje
1975 The Rise of a Maya Merchant Class. Scientific American, 233:72-82.

Salaman, R.N.
1949 The History and Social Influence of the Potato. Cambridge.

Sanders, William T.
1961 Ceramic Stratigraphy at Santa Cruz, Chiapas. Papers of the New World Archaeological Foundation 13. Brigham Young University, Provo.

Shaw, R.H., and W.C. Burrows
1966 Water Supply, Water Use, and Water Requirement. In Advances in Corn Production: Principles and Practices, pp. 121-42, edited by W.H. Pierre S.H. Aldrich, W.P. Martin. Iowa State University Press, Ames.

Shepard, Anna O.
1948 Plumbate, A Mesoamerican Trade Ware. Carnegie Institution of Washington, Pub. 573.

Shook, Edwin M.
1965 Archaeological Survey of the Pacific Coast of Guatemala. In Handbook of Middle American Indians, vol. 2, pp. 180-194, edited by Robert Wauchope. University of Texas Press, Austin.

Smith, Robert E.
1955 Ceramic Sequence at Uaxactun, Guatemala, vol. I, II. Carnegie Institution of Washington and Middle American Research Institute, Tulane University, New Orleans.

Smith, Robert E.
1957 Tohil Plumbate and Classic Maya Polychrome Vessels in the Marquez Collection. Carnegie Institution of Washington, Department of Archaeology, Notes on Middle American Archaeology and Ethnology. vol. 5, no. 129.

Smith, Robert E., Gordon R. Willey, and James C. Gifford
1960 The Type-Variety Concept as a Basis for the Analysis of Maya Pottery. American Antiquity 25:330-40.

Stevens, Rayfred L.
1964 The soils of Middle America and Their Relation to Indian Peoples and Cultures. In Handbook of Middle American Indians, vol. 1, pp. 265-315, edited by Robert Wauchope. University of Texas Press, Austin.

Thompson, J. Eric S.
1956 Notes on the Use of Cacao in Middle America. In Carnegie Institution of Washington, Dept. of Archaeology, Notes on Middle American Archaeology and Ethnology, vol. v, no. 128, pp. 95-116.

Thompson, J. Eric S.
1960 Maya Hieroglyphic Writing. University of Oklahoma Press, Norman.

Thompson, J. Eric S.
1970 Maya History and Religion. University of Oklahoma Press, Norman.

Vivó Escoto, Jorge A.
1964 Weather and Climate of Mexico and Central America. In Handbook of Middle American Indians, vol. 1 pp. 187-215, edited by Robert Wauchope. University of Texas Press, Austin.

Wagner, Helmuth O.
1969 Subsistence Potential and Population Density of the Maya on the Yucatan Peninsula and Causes for the Decline in Population in the Fifteenth Century. In Proceedings of the 38th International Congress of Americanists München Verhardlurger, vol. 1, pp. 179-196.

Warren, Bruce W.
1961 The Archaeological Sequence at Chiapa de Corzo. In Los Mayas del Sur y Sus Relaciones con los Nahuas Meridionales VIII Mesa Redonda, San Cristobal las Casas, Chiapas, pp. 75-83. Sociedad Mexicana de Antropología, México.

Wauchope, Robert
1948 Excavations at Zacualpa, Guatemala. Middle American Research Institute Pub. 14. Tulane University, New Orleans.

Wauchope, Robert
1970 Protohistoric Pottery of the Guatemala Highlands. In Papers of the Peabody Museum of Archaeology and Ethnology vol. 61, pp. 89-243. Harvard University.

White, James M.
1974 The Results of the Archaeological Reconnaissance in Chicomucelo, Chiapas, Mexico, and a Trial Model to Explain the Collapse of the Late Classic in the Central Depression of Chiapas. Unpublished Ms.

Willey, Gordon R.
1971 An Archaeological Frame of Reference for Maya Culture History. In Desarrollo Cultural de Los Mayas, pp. 137-86, editado por Evon Z. Vogt y Alberto Ruz L. Universidad Nacional Autonoma de México.

Willey, Gordon R., and Philip Phillips
1958 Method and Theory in American Archaeology. University of Chicago Press, Chicago.

Willey, Gordon R., William R. Bullard, Jr., John B. Glass and James C. Gifford
1965 Prehistoric Maya Settlements in the Belize Valley. Papers of the Peabody Museum of Anthropology and Ethnology, Harvard University. vol. LIV. Cambridge, Massachusetts.

Williams, Paul W.
1969 The Geomorphic Effects of Ground Water. In Water, Earth and Man, pp. 269-84, edited by Richard J. Chorley. Methuen, Gt. Br.

Wrigley, E.A.
1969 Population and History. World University Library, McGraw-Hill, Toronto.

Wynne - Edwards, V.C.
1969 Self-Regulating Systems in Populations of Animals. In The Subversive Science, pp. 99-111, edited by Paul Shepard and Daniel McKinley. Houghton Mifflin, Boston.

APPENDIX I

Ceramic Classification

This Appendix describes the treatment of the ceramics, and the resultant ceramic groups, which were used to date the Chicomucelo sites.

All of the sherds were dumped onto a large table. Small fragments of undecorated body sherds were removed from the collection, but were held separately in the hope that they could be classified once the typology had been established on the basis of better material. This was attempted, but it was found to be impossible; consequently, in some cases no information could be gleaned from the handful of ceramics which had been gathered from a site. About 1500 sherds were collected, of which 1057 were retained for study and description; 856 were placed in the large ceramic groups, 76 in the small groups, and 15 were separately described. In addition, there were 110 large fragments which could not be classified, but did not warrant individual description. Generally, the ceramics did not fit into previously established typologies.

The typological process followed was to separate obvious nucleates, and then separate other sherds into the previously determined classes. The class criteria were finish and paste, and the most distinctive groups are unified by both of these characteristics. However, because the material was badly fragmented and weathered some groups are unified by paste only - the paste constituted the surface on these eroded sherds. This is particularly true of the Calzada de la Cruz group, and the Santa Teresa Unfinished group.

The separation of the sherds which lay on the continuum between the nuclei often was a time of anguished indecision, and provenience was sometimes used to assist in the classification. While this might be anathema to a typological purist, it was a method of determining where a sherd probably belonged. The effect may be to bias the distribution data to reinforce my "hunches" about centres of concentration. Nonetheless, I do not know of another way to deal with the problem.

The relationships between the five major ceramic groups is discussed in the text of the ceramic descriptions, however, a summary is appropriate here. The accompanying Figure 20 represents those relationships. The circles represent the idealized characteristics of the ceramic groups, and the distances between the circles are proportional to the degree of typological relationship between these groups. The lines connecting the circles show the traits which were considered important in indicating typological similarity; the density of the line indicates the strength of the relationship. Note that the Tachinula Red and Tachinula Grey groups, and the Santa Teresa Red and Santa Teresa Unfinished groups are placed close together, the diagnostic feature being paste. However, the paste of the Santa Teresa groups is allied with that of the Tachimula groups, having somewhat the same texture, but differing in terms of hardness, density, and colour. The red finish of the Santa Teresa and Tachinula Red groups is also somewhat similar, but the Tachinula Red finish is thinner, more like a slip than a paint. The ambivalent position of Tachinula Red is notable in the Figure, and discussed further below in its group description. The

Calzada de la Cruz group is very different from the others in terms of paste. It is generally without finish, although a few sherds with faint traces of a reddish-brown or polished black-brown are found.

In three cases the typological divisions are reinforced by the distribution of the groups in Chicomucelo. The Calzada de la Cruz group is concentrated in the northern sector of the reconnaissance territory, while the Santa Teresa groups are concentrated at the junction of the Tachinula and San Rafael Rivers.

In order to be more certain of the chronological relationship of the various major ceramic groups, a Robinson-Brainerd seriation was attempted using rim shapes as the basis for the tabulation of the degree of relationship. This attribute was chosen because the data is consistent and directly comparable for all of the groups. The best seriational arrangement which could be obtained by a manual manipulation was as follows:

	CC	STR	TG	STU	TR
CC	200				
STR	136.6	200			
TG	100.3	124.8	200		
STU	74.5	100.3	130.1	200	
TR	62.5	74.4	94.8	120.9	200

It can be seen that this arrangement of groups is excellent according to Robinson's seriational criteria (1951), however the arrangement of the groups is not what one would expect on the basis of other evidence. Specifically, the separation of the STR and STU groups is shown to be

illegitimate by paste and decoration attributes, and by distributional information. The arrangement of groups based on these other indicators is violated by the seriation, and I believe that it gives an erroneous chronological ordering. It is likely that rim profiles are not significant for chronological study. Other arrangements were tried along the lines of the expected order, but none suited the numerical ordering required in seriation as well as the above.

Due to the lack of stratigraphic information, the chronological placement of the ceramic collections could be done only by external comparisons. Only one group fitted into an established type:variety (San Jacinto Black:San Jacinto Variety). For the dating of the other groups, comparisons were carried out on a modal level.

The definition of mode used was that provided by Smith, Willey, and Gifford (1960:331):

> A mode...becomes the term designating a ceramic attribute (or collectively a small group of inseparable attributes) that has been observed to have singular import and meaning beyond that of any purely descriptive aspect because it appears in several or a number of different varieties (of different types) remaining all the while unaltered in its own essential characteristics.

Rouse (cited by Rands 1961:331) considered modes to be more useful than ceramic types for establishing regional chronologies because they have a broader geographical distribution. In considering the problem of utilizing modes for cross-dating, Rands (1961:331-40) noted their tendency to reappear in very similar form on various time levels, due to a continuation in residual centres, or the attempts of potters to create something new while working within established limits of tech-

nique and style. The focus of elaboration on everted rims in Classic Palenque is given as an example of the continuation of a mode normally considered to be Protoclassic in Maya ceramics. Within the Central Depression, a similar example would be the fillet decoration, which has little chronological diagnostic value.

In cases where ceramic collections or groups were too small or fragmentary to yield any diagnostic modes, tentative temporal assessments have been made on the advise of Gareth Lowe, Susanna Ekholm-Miller, and Jorge Nuricumbo, who have substantial ceramic experience in the Central Depression and the Soconusco; their opinions are derived from "ceramic sense" in many cases.

In addition to the general fragmentation of the collections, the fact that many came from habitation sites and were probably common culinary vessels hindered external comparison. Borhegyi (1965a:24) notes that such vessels from the rural areas surrounding Kaminaljuyu were much less sensitive to the arrival of Teotihuacan influence that were ceremonial wares.

Answers to the ceramic conundrums of Chicomucelo will no doubt come from the further work in the N.W.A.F. Upper Tributaries Project, and from the study of ceramics gathered during the I.N.A.H. Angostura Dam Salvage Project.

DESCRIPTIVE TERMS AND CONVENTIONS

Virtually no complete or even semi-complete vessels were found to assist in establishing the form classification. In general, the vessel shape category to which a sherd belonged was determined by its

angle of orientation, curvature, and robustness. In some cases a form diagnosis is possible with great confidence (e.g. tecomates), and in others it is equivocal, especially in the distinction between flat-bottom bowls with outslanting, outflaring sides, and jars with outslanting, outflaring necks. In the latter instance, the decision was made on the basis of the apparent angle of curvature. It is likely that missorting has taken place, so that anyone who wishes to use this material for comparative purposes should look under categories which would have similar shapes.

Figure 21 shows the various shapes recognized in this report. Where a commonly accepted term designating a shape is available, it has been used, but in other cases shapes are designated by a descriptive phrase. In the descriptive phrases, inslanting/outslanting refers to the angle of the wall and rim relative to the vertical axis of the vessel, whereas incurving/outcurving refers to the curvature of the side and rim.

Colour designations of paste and surface were done with the Munsell Soil Colour Charts (1954). Although lighting and individual perception do affect the interpretation of colours, it is a better measure than personal colour names (however, Munsell colour names do seem particularly nondescript and inadequate). The colour designations for any group are, of course, only approximate. Munsell readings were taken from several sherds which seemed to reflect the range of variation within the groups. In the descriptive summaries found at the beginning of each group's description, the first paste and surface

colour designations were taken from one sherd, both of the second designations from another sherd, and so on. Paste colour descriptions were taken from the most oxidized part of the sherds, and firing variation was not mentioned, but in none of the major groups was firing consistently complete - many sherds, especially the thicker ones, had dark centres.

Technical analysis of paste composition was not done. The paste texture descriptions "course", "medium", and "fine", approximately follow Brainerd (1958:Plate I).

All dimensions are in centimeters. The measure of diameter (dia.) was taken from the outside of the orifice, representing the maximum diameter of the vessel, except for bowls with incurving rims, tecomates, and jars with necks. Wall thickness (wlt.) was taken from the lowest part of the rim sherds to give the best estimate of the vessel wall. The height (ht.) of the vessels was generally unknown, but estimates were made where a substantial portion of the vessel was available.

The group descriptions are arranged in chronological order from earliest to latest under the period they represent, although not all groups are diagnostic of only one period. At the end are the descriptions of small groups and individual sherds whose chronological placement is very uncertain. (Due to some confusion in the arrangements in Chiapas for taking sherd photos, it has not been possible to illustrate photographically many of the chronologically important modes.)

LA CEIBA PERIOD

Cuadros-similar Group

Sample: 3 Figure: 22, a-c

Paste: reddish-yellow, (7.5 YR 7/6) varying lighter and darker in the same sherd due to firing variation; medium texture with a sandy temper which includes some fine pebbles and some quartz particles; medium hard.

Surface: very pale brown (10 YR 7/3); all the sherds seem to have traces of a grey-brown slip over the surface; smooth to rough texture.

Decoration: traces of red finish.

Forms:

Tecomates (3)

Profiles: unthickened rim, rounded lip (1) (Fig. 22,b); thickened rim, rounded lip (2) (Fig. 22, a,c).

Dimensions in cms.: wlt. - .4-1.0, ht. - unknown, dia. - 13-33.

Decoration: one sherd (Fig. 22,a) is moderately smoothed on the interior and exterior with faint evidence of horizontal brushing on the exterior; one sherd (Fig. 22,b) has upper-right to lower-left diagonal incisions beginning 2.5-3.0 cm. below the rim and extending down at least 1.5 cm. to the break; one sherd well smoothed internally and externally (Fig. 22,c) with very faint traces of a red or orange-red finish on the lip.

Discussion: Susanna Ekholm-Miller identified this material as similar to Izapa-Cuadros phase material.

Cuadros/Jocotal-Similar Group

Sample: 4 Figure: 22, d,e Plate: 4,c

Paste: colour varies greatly from dark grey to grey, (10 YR 4/1) (2.5 Y

6/0) with traces of strong brown (7.5 YR 5/8) and very dark grey (7.5 YR 3/0); fine and dense texture with a sand temper which includes many white particles, possibly shell; hard.

Surface: colour varies from light grey (7.5 YR 7/0) to grey (7.5 YR 5/0) and two sherds have a yellowish-brown (7.5 YR 5/8) cast; the best preserved sherds are smooth textured; hard.

Decoration: most important decorative design is the double-line-break pattern described below.

Forms:

Tecomates (1)

Profile: unthickened rim, beveled on the interior, pointed lip (1) (Fig. 22, d).

Dimensions in cms.: wlt. - .8, ht. - unknown, dia. - 20.

Decoration: a smooth shallow groove around the orifice, 1.2 cms. below lip.

Comment: the groove around the orifice is also known in the Vergel Group, Tonala Recess, of Tonala Variety tecomates of the Chiapa II phase in the Chiapa de Corzo typology in the Museo de Antropologia e Historia, Tuxtla Gutierrez, Chiapas.

Flat-bottom Bowls (2)

Profile: basal-break fragments having flat bottoms and slightly outslanted sides (2) (Fig. 22, e; Plate 4, c).

Dimensions in cms.: wlt. - .5, ht. - unknown, dia. (of base) - 17.

Decoration: double-line-break pattern.

Comment: This sherd's closest relative in form and decoration is found

in the Olmec-diagnostic Coapa Black ware from the Izapa-Cuadros phase, as illustrated by Ekholm (1969:Fig. 35, k). Other double-line-break patterns occur in the Izapa-Jocotal phase, but normally as rim decoration on tecomates (Ekholm 1969:Fig. 43, c,d). Warren (1961:77) notes this as a diagnostic decorative element for Chiapa II, but also normally as a rim decoration. Flat-bottom bowls also occur in Chiapa II at Chiapa de Corzo.

Body Sherds (1)

Profile: concave.

Dimensions in cms.: wlt. = .5.

Decoration: distinct horizontal brushing marks on interior surface, probably it is from near the rim of a tecomate.

Discussion: Susanna Ekholm-Miller examined these ceramics and places them in the Jocotal or perhaps the Cuadros phase of Izapa (Pers. Comm. 1974). The Chiapa II similarities of the tecomates, and the Coapa Black comparison for the basal-break sherd verify this placement. Because the material is so limited, a broad chronological placement is preferred, ranging from early Izapa-Cuadros to late Chiapa de Corzo - Chiapa II.

JOLLETON PERIOD

San Jacinto Black:San Jacinto Variety

Sample: 16 Figure: 22, f-i Plate: 4,d

Paste: dark grey (10 YR 4/1); medium fine texture with fine white particles included as temper; hard; even firing.

Surface: slip is black (7.5 YR 2/0) but where the black has been worn off the finish is pinkish (5 YR 7/4); both black and pink surfaces are

highly polished; hard.

Decoration: most significant decorative features are the wide-everted rims and black slip.

Forms:

Bowls with vertical sides (2)

Profile: sharply out-turned rim flat on top and slightly pointed lip (2) (Fig. 22, f).

Dimensions in cm: wlt. - .4 - .7, ht. - unknown, dia. - 16.

Decoration: polished black finish.

Comment: The rim form compares to Brockington's (1967) Fig. 31, e which he lists as a form for San Jacinto Black:San Jacinto Variety, but he calls his form a vase, and illustrates it with outslanting sides. This sherd definitely has vertical sides and so I have included it in a form category which Brockington (1967:5) does not list for this ceramic type. It is possible that it is a variant of a bridge-spout effigy jar such as illustrated by Delgado (1965: Fig. 52).

Bowls with everted rim and flat bottom (8)

Profile: fragments of wide, everted rims (8) (Fig. 22,g,h,i).

Dimensions in cm.: wlt. - .5-.7, ht. - unknown, dia. (from outside of rim) 44-47, thickness of rim - .8-1.0.

Decoration: one sherd (Fig. 22,g) has 4 shallow incised concentric grooves between the inner edge of the rim and a ridge placed approximately 2/3 of the way outwards on the rim, beyond the ridge the rim is smooth the concentric circles are cross cut at one point by a square of incised lines; one sherd (Fig. 22,h) is smooth except for 3 shallow

concentric incisions towards the outer edge and appears to flare out towards a peak on the lip; one sherd (Fig. 22,i) is thickened towards the outer rim and has raised nubbins on the outer edge (Plate 4,d). All incisions penetrate the black finish.

Comment: This form of vessel is diagnostic of San Jacinto Black:San Jacinto Variety. Fig. 22,g compares with Brockington, 1967:Fig. 39,p, but the other two forms of rims appear to be new to this type, except that the presence of peaks on the lip is common (see Brockington 1967: Fig. 3,b,c).

Jars with flaring necks (2)

Profile: outflaring, unthickened rim, rounded lip or squared lip (2).

Dimensions in cms.: wlt. - .6-.9, ht. - unknown, dia. - unknown.

Decoration: even black finish.

Comment: Brockington does not list jars as a form known to San Jacinto Black:San Jacinto Variety although they may be present, because jar forms are listed for False Polished Black (see Fig. 30,n). The Chicomucelo sherds might also be part of a Compound-Silhouette Vessel such as shown in Brockington's Fig. 35,N, belonging to San Jacinto Black:San Jacinto Variety, but broken so that the compound silhouette does not show. Although the form to which these sherds belong is in some question, they have been assigned to a category consistent with the forms recognized by this ceramic study.

Body Sherds (4)

Profile: very fragmentary.

Dimensions in cm.: wlt. - .4-.6.

Decoration: both have an even polished black surface, and one has a slightly gadrooned surface.

Discussion: This is the only ceramic group from the Chicomucelo reconnaissance which can be definitely assigned to an established ceramic type and variety, and, happily, this variety is chronologically distinct. Brockington notes that at Santa Rosa the polished black ware is typical of Phase 4, or the Protoclassic period (50 B.C.), and probably continued into Early Classic times (1967:4,50). Rands (1961: 336-38) notes that wide, everted, grooved rims were generally an important feature of Preclassic Maya pottery.

JOLETON - LIMONAL - NUEVA AMERICA PERIODS

Tachinula Grey Group

Sample: 117 Figure: 22 j-t;23,a-r;24,a-c Plate: 4,e

Paste: colour range is white (5 YR 8/1), light grey (10 YR 7/2), brown (7.5 YR 5/2), pink (7.5 YR 7/4), and reddish yellow (5 YR 7/6); texture is medium with a temper which appears to be predominantly sand, including some fine pebbles; medium hard.

Surface: colour range is white (7.5 YR 8/0), pinkish grey (7.5 YR 7/2), greyish brown (10 YR 5/2), pinkish grey (5 YR 6/2) and pink (7.5 YR 7/4) the surface is reasonably fine and smooth suggesting that it was either polished when damp or slipped; medium hard, although some powder can be scraped off with the fingernail.

Decoration: perhaps a thin grey slip.

Forms:

Comales (15)

Profiles: rims may be tapered or untapered, and have rounded or rarely squared lips (12) (Fig. 22,j); thickened rim and lip beveled to inside (2) (Fig. 22,k); slightly upturned rim and a bulge 2.5 cm. below rim on outside, possibly serving as a support (1) (Fig. 22,l).

Dimensions in cm.: wlt. - .7-1.0, ht. -2 for most complete vessel, but this is probably a minimum, dia. - 23-47.

Decoration: smoother on the inside than the outside; one sherd has a rectangular gauge 1.0 by .5 cm. and .2 cm deep on outside 2 cm. below the lip, but its roughness suggests that it is an accidental mark made prior to firing.

Bowls with incurving rims (7)

Profile: thickened rim and squared lip (7) (Fig. 22,m,n).

Dimensions in cm.: wlt - .7-.7, ht.-6 minimum for most complete vessel, dia. - 16-35.

Decoration: smoothed surface, 3 sherds have a fillet design 2-4 cm. below lip (Fig. 22,m); one sherd broken at what appears to be a basal flange (Fig. 22,n) or perhaps a z-angle.

Comment: Basal flanges on bowls predominate during Tzakol times at Uaxactun, although they are known in Tepeu 1 and 2 phases as well (Smith 1955:23-25). The unnotched basal z-angle is abundant at Palenque but confined to a horizon approximately contemporaneous with Tepeu - 3 (Rands 1961:335).

Bowls with flat bottoms and outslanting sides (21)

Profile: straight slightly thickened rim, rounded lip (3) (Fig. 22,o); short, everted rim (5) (Fig. 22,p); slightly outflaring rim and side, rounded lip (2) (Fig. 22, q,r); squared rim and slight outcurve on ex-

terior lip (1); straight, thickened rim with squared lip or a bevel towards the interior (8) (Fig. 22,s,u); straight, thickened rim, rounded lip with sharp line of break between inner surface and top of lip (2) (Fig.22,t).

Dimensions in cm.: wlt.- .5-1.0, ht. - unknown, dia. -8-44, everted rim width - 1.5-2.5.

Decoration: more smoothed on interior than exterior, 2 smallest sherds have a band of incised, curvilinear decoration just below the rim (Fig. 22,r,s).

Comment: The great range of forms included in this class is probably indicative of substantial chronological variation. Jorge Nuricumbo (Pers. Comm. 1974) gave the opinion that the everted rim form belongs to the Protoclassic period, however, a perusal of the literature shows that everted rims occur in the Santa Rosa sequence from Phase 3 to Phase 6, although the Phase 5 and 6 forms are apparently much reduced in width (Brockington 1967:46-50). They also occur in the Early Classic, and occur strongly in the Late Classic, in the Guatemala Highlands (Rands and Smith 1965:Fig. 4). Rands (1961:333-38) notes that in the Classic rim eversion was rare in the Peten, but did continue into Classic Piedras Negras pottery, and was a major focus of ceramic elaboration in Palenque during the Late Classic.

Bowls with vertical sides (23)

Profiles: substantial variation in size, straight rims, generally untapered or unthickened, rounded or squared lip (23) (Fig. 23, a-f).

Dimensions in cm.: wlt. - .4-.9, ht. -6 for most complete vessel,

dia. - 10-34.

Decoration: smooth finish, and one sherd has three horizontal lines just below exterior lip. (Fig. 23,b).

Basins (5)

Profiles: outflaring, thickened rim with rounded lip and internal bevel (1) (Fig. 23,g); slightly tapered rim with rounded or squared lip (2) (Fig. 23,h); untapered rim, squared lip (1) (Fig. 23,i); greatly thickened, slightly out-turned rim, rounded lip (1) (Fig. 23,j).

Dimensions in cm.: wlt. - .8-1.4, ht. - unknown, dia. - 30-44.

Decoration: smoothed inside and outside; three sherds have fillet band on external rim.

Tecomates - (2)

Profile: slightly thickened rim, squared lip (2) (Fig. 23,k).

Dimensions in cm.: wlt. - .7, ht. - unknown, dia. of orifice - 14.

Decoration: both sherds have a fillet design 2-4 cm. below the lip.

Robust jars with outflaring rims (13)

Profiles: rim curved sharply outwards, rounded lip and flat upper surface, substantial variation in neck length (13) (Fig. 23, l-p).

Dimensions in cm.: wlt. - .6-1.4, ht. - unknown, dia. - 25-35.

Decoration: smoothed on interior and exterior.

Comment: these are probably storage jars, the sharply everted rim being an assistance in the grasping of the vessel.

Jars with flaring necks (10)

Profile: tapered, outflaring rim, rounded lip (8) (Fig. 23,q); untapered, outflaring rim, square or pointed lip (2) (Fig. 23,r).

Dimensions in cm.: wlt. - .7-1.1, ht. - unknown, dia. - 10-25.

Decoration: smoothed inside and outside.

Comments: possibly the sherds represented by Fig. 23,q, belong in the Bowl-with-vertical-sides class (compare with Fig. 23,d,e), however, the decision to place the sherds in this class was based on the angle of orientation of the sherd, as best it could be determined.

Vessel Handles (16)

Profile: broad strap handles oriented vertically (14) (Fig. 24,a); strap handle oriented horizontally (1) (Fig. 24,b) (Plate 4,e); possible lug handle (1) (Fig. 24,c).

Dimensions in cm.: vertical strap handles, width-3-5, thickness-.5-1.0, span-3.5 for only complete handle; horizontal strap handle, width-2, thickness-.5, span-2.5; lug handle width-2-3, thickness-.7, length-1.5, vessel wall thickness for all handles-.5-1.0.

Decoration: well smoothed.

Comment: These handles are probably associated with the jar forms, and possibly with the basins. The sherd classified as a lug handle might be a vessel support, but is not a basal-flange fragment. A lug handle is illustrated by Brockington (1967:Fig. 37). Lug handles also occur in red ware at Tajumulco (Dutton and Hobbs 1943:Fig. 83,c). Gareth Lowe (Pers. Comm. 1974) has indicated that strap handles are generally a Late Classic trait in the Central Depression

Body sherds (3)

Large sherds probably associated with a jar form.

Miscellaneous Forms (2)

1) A duck-bill effigy fragment (1);

2) A hand or foot effigy fragment (1).

Discussion: The chronological placement of this group is difficult, and the substantial variation which occurs within each form class suggests a wide temporal range. The everted rim on a bowl is associated generally with the Protoclassic and early Early Classic period but is also a Late Classic mode at Santa Rosa, Palenque, Piedras Negras, and the Guatemala Highlands. The basal flange or z-angle is associated with the late Early Classic at Uaxactun and Palenque, and strap handles suggest the Late Classic in the Central Depression while the lug handle occurs in Tajumulco in the Postclassic, but none of these traits are conclusively diagnostic of a time period. The amount and quality of the material does not permit a typology which sorts out the precise chronological implications. Although the supporting evidence is meagre, a chronological estimation must be made, and I therefore place it in the late Jolenton, Limonal and Nueva America phases, which represent the general Maya periods of Early and Late Classic. In part, this decision is based on its occurrence in and about the stela site of Piedra Labrada (Ch-9), where no other ceramic group seems to be present to represent the Classic period.

Although the temporal placement is broad and indistinct, this group does present one of the most uniform appearances of all the groups when laid out together. The defining smooth greyish surface may result from the properties of local clays, and from local finishing traditions of long duration.

Sample: 65 Figures: 24, d-t

Paste: colour is mainly light grey (7.5 YR 7/0), but includes the range of very pale brown (10 YR 8/3), pink (7.5 YR 7/4) and light brown (7.5 YR 6/4); texture is medium; medium hardness.

Surface: where not eroded the surface is covered by a finish either red or weak red in colour (the amount of colour showing on sherds is not large enough for a Munsell reading); finish is applied thinly, and is reasonably hard although it can be scratched off in a powder form by the fingernail; finish tends to be dull in appearance, although it is not possible to determine how much of this is due to weathering.

Decoration: traces of a red finish visible on all sherds, and occasional fillet designs.

Forms:

Bowls with concave, outslanting sides (18)

Profiles: untapered rim, rounded lip often with bevel on inside (17) (Fig. 24,d), small bowl with rounded lip (1) (Fig. 24,e).

Dimensions in cm.: wlt. - .5-1.1, ht. - unknown, dia.-10-26.

Decoration: solid red finished exteriors extending up to the lip, and usually forming a band from .5-2.0 cm. wide on interior lip; one sherd (Fig. 24,e) has an excised line about 1 cm. below the lip, with small round buttons applied just below the line, red finish does not extend below the excised line.

Bowls with incurving rims (5)

Profiles: substantial rim thickening, especially on the outside, with a flat lip (3) (Fig. 24,f); untapered rim, squared or rounded lip (2) (Fig. 24,g).

Dimensions in cm.: wlt. - .4-.6, ht. - unknown, dia.-16-28.

Decoration: one sherd with red finish on interior and thin strip on exterior rim, one with band on exterior rim only, and three with red on exterior and lip, but not interior (Fig. 24,f).

Bowls with outslanting sides and flat bottoms (14)

Profile: thickened rim with rounded or square lip, one associated with a basal-break body sherd (9) (Fig. 24,h,i,j); thickened rim, rounded lip with internal bevel (4) (Fig. 24,k); externally thickened rim, rounded lip (1) (Fig. 24,l).

Dimensions in cm: wlt. - .4-.6, ht. - approx. 6.5, dia.-16-28.

Decoration: red on upper rim only, or red exterior and a narrow strip on the interior lip only, or red on interior and exterior of vessel.

Bowl with vertical sides (1)

Profile: outslanting but concave rim, slightly thickened, with squared lip (1) (Fig. 24,m).

Dimensions in cm.: wlt. - .9, ht. - unknown, dia. - 28.

Decoration: fillet design just below outslanting rim and traces of red finish.

Comment: This sherd belongs to a shape of vessel not otherwise evident in Chicomucelo ceramics. Had the sherd been broken slightly above the angle it would have been put in the "Bowl with outslanting sides" class - an excellent demonstration of the dangers of identifying vessel shape on the basis of the rim form.

Jars with everted rims (7)

Profile: sharply everted, tapered rim, rounded lip (5) (Fig. 24,n); outslanting rim, slightly tapered, rounded lip (2) (Fig. 24,o).

Dimensions in cm.: wlt. - .7-1.1, ht. - unknown, dia.-24-26.

Decoration: red finish on exterior and on lip, and in one instance on interior rim as far down as the constriction.

Comment: The heavy strap handles found in this group are probably associated with this shape class.

Basins (6)

Profile: pronounced rim thickening, rounded lip and internal bevel (3) (Fig. 24,p); externally thickened rim, squared lip (1) (Fig. 24,q); slightly thickened rim, squared lip (1) (Fig. 24,r); rim stepped down on outside so that it is thinner than the vessel wall, rounded lip with slight internal bevel (1) (Fig. 24,s).

Dimensions: in cm.: wlt.-.7-1.5, ht. - unknown, dia.-30-44.

Decoration: generally a heavy red finish on the lip with a thinner finish on the interior, although the thinness may be due to use, and an unfinished exterior; two vessels (Fig. 24,r,s) have a fillet design in a horizontal band 1-2 cm. below the rim, and a red finish on the interior surface only.

Vessel handles (4)

Profile: vertically oriented strap handles (4) (Fig. 24,t).

Dimensions in cm.: width-3-5, thickness-1.0-1.5, length of span - 9 for most complete handle.

Decoration: red finish on handle and interior and exterior of vessel.

Comment: These handles probably belong to the jars with everted rims, and the basin forms.

Body sherds (8)

Decoration: red exterior finish only (7); red interior finish only (1).

Miscellaneous (2)

A deeply concave body sherd, possibly a jar shoulder, with red finish on the exterior and an incised rectilinear design (1); 2) deeply concave body sherd with red finish and a fillet design (1).

Discussion: It has not been possible to find any external form or decorative comparisons for this group. Similarities are found between Tachinula Red and Tachinula Grey and Santa Teresa Red, but it was separated from either group because it was felt that "splitting" is preferable to "lumping" in a preliminary study. Figure 20 indicates that the connection to Tachinula Grey is strong using a paste criterion, but that there are loose paste similarities to Santa Teresa Red, and, of course, a red finish is common to both. The decision to ally the Tachinula Red with the Tachinula Grey, was due to the general importance paste criterion have assumed in the study, and because of a perceived difference in the red finished, the Tachinula Red finish seeming to be thinner, duller, and better bonded to the sherd than the Santa Teresa Red.

It should be noted that Jorge Nuricumbo expressed the opinion that the Tachinula Red group was contemporaneous with the Santa Teresa Red group (Pers. Comm. 1974), thereby placing it in the Nueva America - Yayahuita period. However, I remain with the opinion formed when I was sorting the material, and suggest that the Tachinula Red group is more closely alligned with the Tachinula Grey group, and shares its chronological position. This opinion may very well be proven wrong by subsequent work.

NUEVA AMERICA PERIOD

Calzada de la Cruz Group

Sample: 183 Figure: 24,u-w; 25,a-t; 26,a-p Plate: 4,f

Paste: predominantly very pale brown (10 YR 7/4), but varies to include white (2.5 Y 8/0), light brown (7.5 YR 6/4), and reddish yellow (5 YR 7/8); medium texture with a very gritty temper; hard.

Surface: On unpainted sherds it varies in colour from very pale brown (10 YR 7/3) (first two sherds) to light brown (7.5 YR 6/4) and pink (5 YR 7/4); the surface colours are generally somewhat darker than the paste, possibly due to weathering, the overall colour effect is Munsell pale brown, commonly called tan; the surface is hard, does not powder in the hand, and generally has the feel of a worn piece of 100 grade sandpaper (probably indicative of a volcanic ash temper), although some are quite smooth(sherds with the brown or red paint discussed below are smooth to the touch).

Decoration: a few sherds have the remains of a smooth, very dark greyish brown (10 YR 3/2) slip finish and a few have traces of a likewise smooth finish which is reddish-brown (5 YR 5/4); where present, finishes are much harder than those of Santa Teresa Red; a fillet design is very common, and mold-impressed false 'glyphs occur on some sherds.

Forms:

Comales (7)

Profile: slightly tapered rim, rounded or squared lip (4) (Fig. 24,u); rim angled upwards and slightly tapered, rounded lip, or slight bevel towards interior (3) (Fig. 24,v,w).

Dimensions in cm.: wlt.-.8-1.5, ht. approx. 3 for most complete vessel, perhaps higher for others, dia.-26-56.

Decoration: two sherds have traces of a stain on the lip which may have been a reddish finish, while one sherd (Fig. 24,w) has a soft clay-like layer .5-1.0 mm. thick on parts of the interior of the vessel which has some stains suggesting a reddish-brown finish. The soft white layer may be lime used in the cooking of tortillas.

Bowls with concave. outslanting sides (20)

Profile: thickened rim, rounded lip (3) (Fig. 25,a); slightly tapered rim, lip beveled towards interior, and possible the remains of a basal-flange (2) (Fig. 25,b); slightly thickened rim, squared lip with bulge on exterior lip (2) (Fig. 25,c); tapered rim, squared lip (1); thickened rim, lip beveled towards the interior (1); outflaring rim with rounded lip and thickening on exterior vessel wall below rim (6) (Fig. 25,d); tapered, straight rim with pointed lip and slight bevel toward interior (1); thickened rim with lip beveled towards interior and pronounced point on outer edge (1); untapered rim, rounded lip, the largest sherd has a solid conical vessel support (3) (Fig. 25,e).

Dimensions in cm.: wlt. - .6-1.3, ht. - 6, but probably a minimum, dia.-17-42.

Decoration: two sherds have traces of reddish-brown finish on the exterior, and three have traces on the interior and exterior; four sherds have a fillet design 1-3 cm. below the lip.

Comment: Brockington (1967:18, Fig. 40) includes a solid conical vessel support as a form found in his Dark Brown Slip group, although its orientation is vertical, and Fig. 25,e, does have traces of a reddish-brown finish, rather than dark brown.

Bowls with vertical sides (10)

Profile: thickened rim, rounded lip (4) (Fig. 25,f); less robust, thickened rim, rounded lip (2) (Fig. 25,g); unthickened rim, squared lip (2) (Fig. 25,h); small vessel with untapered rim, rounded lip, and external thickening on the body wall (2) (Fig. 25,i).

Dimensions in cm.: wlt. - .6-.9, ht. - prob. greater than 5 for all vessels, dia.-15-30.

Decoration: one sherd has a fillet design below the rim (Fig. 25,f), and one has traces of a reddish-brown finish.

Bowls with incurving rims (8)

Profile: thickened rim, squared lip, one with a strap handle scar just below rim (4) (Fig. 25,j); slightly thickened rim, rounded lip (2) (Fig. 25,k,l); pronounced rim thickening on interior with internal bevel (1) (Fig. 25,m); pronounced rim thickening on interior, flattened lip, and distinct bulge on outside just below rim (1) (Fig. 25,n).

Dimensions in cm.: wlt. - .5-1.0, ht. - unknown, dia.-24-38.

Decoration: four of the sherds have a fillet design 1-3 cm. below the rim.

Bowls with flat bottoms and outslanting sides (10)

Profile: gently outflaring side with a thickened or slightly tapered rim, rounded or squared lip (6) (Fig. 25,o,p,q); steeply out-turned rim almost producing a short rim flange, slightly tapered, rounded lip (1) (Fig. 25,r); thickened rim with lip beveled slightly inwards (2); robust vessel with tapered rim, rounded lip (1).

Dimensions in cm.: wlt. - .5-1.0, ht. - 6 minimum for most complete vessel, dia.-18-32.

Decoration: Four sherds (Fig. 25,o,p) have a band of mold-made pseudo-glyphs below the rim. For Fig. 25,o,p, the bands are 2 and 1.5 cm. wide,

and start 2 and 2.5 cm. below the rim respectively, and one sherd has a 1.2 cm. impressed line running vertically down the side of the vessel below the band. The finish of Fig. 25,o, and one other sherd (illustration accidentally omitted) is unique for this group, being a deep brown-black, smooth, and with a dull sheen, although the paste is similar to other sherds of this class. One sherd has a fillet design below the rim (Fig. 25,q).

Comment: The mold-made pseudoglyph band in evidence on 4 sherds provides conclusive dating for these sherds, because this decoration occurs in Phase 6 (800-1000 A.D.) at Santa Rosa and the bowls on which they are found have a coarse tan paste with a temper of volcanic ash, precisely the same as the Calzada de la Cruz paste. Further chronological substantiation is found in the fact that the Dark Brown Slip group is a predominant type in Phase 6 (Brockington 1967:50,65). Lowe (1959: Fig. 52,a;52) illustrates sherds from San Francisco on the Grijalva River with Tepeu-3 like pseudo-glyph decoration. Mold-made decoration appears in the Guatemala Highlands but in the Protoclassic period, predominantly on ladle censers. Although the vessels in the Calzada de la Cruz group are not complete enough in themselves to give a certain definition of the vessel form I have included them in this class on the advice of Gareth Lowe (Pers. Comm. 1974). The precise correspondence of paste and slip between the Calzada de la Cruz sherds and those of Santa Rosa, supports the use of the earlier Santa Rosa Phase 6 date, rather than the later, Protohistoric date for this type of decoration from the Guatemala Highlands, as do the Tepeu-3 similarities.

Basins (64)

Profile: thickened rims with squared lips or lips beveled inwards (4) (Fig. 25,s); thickened rim, generally rounded lip with slight bevel on inner side (2) (Fig. 25,t); rims with very pronounced thickening and rounded lips (56) (Fig. 26,a-f); basal-break fragment most likely associated with this class of vessel, indicating a flat bottom (2) (Fig. 26, g).

Dimensions in cm.: wlt. - .9-1.5; ht. - unknown, dia.-35-69.

Decoration: fillet band is present on 53 of the sherds, within 2-7 cm. of the lip; three sherds have traces of a reddish-brown finish, one on the interior and two on the exterior; basal-break sherds have deeply raked horizontal lines on interior surface.

Comment: The two sherds represented by Fig. 25,t, are so identical that they appear to come from the same vessel, although one is from Ch-38 and the other from Ch-47, indicating the close ceramic similarities between these two sites. A close comparison to the extremely robust, thickened basins represented by Fig. 5,a-f, is illustrated in Brainerd (1958: Fig. 2,e) although that vessel has diagonal raking on the outside and a ring base, and belongs to the Regional Coarse Redware category. Lowe (1959:Fig. 52,a) also illustrates identical rim sherds from the site of San Francisco in the Chapatengo-Chejel sub-region of the Grijalva valley, of Late Classic or Early Postclassic date. Culbert (1965:64) indicates that the open-mouthed fillet bowl appears in numerous Central Depression sites during the Late Classic and Early Postclassic, and rarely in the Maya lowlands during the early part of the Late Classic.

Tecomates (1)

Profile: extremely heavy vessel, slightly thickened rim, rounded lip (1)

(Fig. 26,h).

Dimensions in cm.: wlt. - 1.5, ht. - unknown, dia. - 16.

Decoration: none.

Comment: This vessel is surprisingly robust, and is unique to the collection for this form class, because of its size. A comparative material, although not exactly similar in form, may be found in Tsah Phase large diameter, restricted orifice bowls from the Chiapas Highlands, illustrated by Culbert (1965:Fig. 29,a).

Collard Jars (6)

Profile: very robust vessel with an unthickened rim, lip squared or beveled slightly inwards (2) (Fig. 26,i); slightly thickened rim, rounded lip (1) (Fig. 26,j); tapered rim, rounded lip (3) (Fig. 26,k).

Dimensions in cm.: wlt. - .6-1.4, ht. - unknown, dia.-12-31.

Decoration: one sherd (Fig. 26,k) has the remains of the deep brown-black, low sheen finish and on the vessel's shoulder, 2.5 cm. below the rim, is a horizontal incised line joined in a 1 cm. section by 5 vertical lines from below.

Comment: The brown-black finished vessel bears some resemblance both in form and decoration to the Moxviquil Black:Moxviquil Variety sherds pictured by Culbert (1965:Fig. 26,c,d) from the Chiapas Highlands; its chronological position is not certain, but appears most common during the Tsah Phase (ibid. 62).

Jars with inslanting necks (5)

Profile: inslanting neck with short, unthickened, out-turned rim, rounded or squared lip (5) (Fig. 26,l).

Dimensions in cm.: wlt. - .6, ht. - unknown, dia.-12-26.

Decoration: none.

Comment: This vessel form is very rare in the Chicomucelo ceramics. Culbert's "Vague-neck jars" approximate this form (1965:Fig. 36,p. 74-5), however, other such attributes as red slip, loop handles and effigy bird's heads are missing from the Chicomucelo collection. The Highlands form is predominantly Lum Phase, but does rarely occur in the Kan and Tsah Phases. The large diameter vessels might belong in the class of bowls with incurving rims.

Jars with flaring necks (9)

Profile: unthickened and outflaring rim, rounded or squared lip (5) (Fig. 26, m,n); slightly thickened rim with rounded lip and internal bevel (3) (Fig. 26,o); thickened, sharply out-turned rim, rounded lip (1) (Fig. 26, p).

Dimensions in cm.: wlt. - .7-1.0, ht. - unknown, dia. - 18-32.

Decoration: one sherd has traces of reddish-brown finish on the exterior.

Comment: Fig. 26,p would appear to belong to the immediately preceeding form class, were it not for its angle of orientation.

Handles (11)

Profile: vertically oriented handles (11) (Fig. 26,q).

Dimensions in cm.: width-3-6.5, thickness-1-1.5, span-4.5-12; vessel wall thickness-.6-1.0.

Decoration: none.

Comment: These handles are probably associated with bowls with concave, outslanting sides, and bowls with incurving rims.

Body sherds (28)

Six concave bottoms, and 22 other body sherds, none assignable to any

particular form category.

Decoration: none.

Miscellaneous (4)

1) fragment of an effigy, possibly the leg of a reclining figure on an unidentifiable sherd fragment (1); 2) flared tassel on the end of a solid cylinder (1), dia.-1.2 cm., total length-5.5 cm.; 3) solid, slightly curved, undecorated cylinder, expanding at one end (1), dia. 2.2 cm., length 6.5 cm (Plate 4,f); possibly a solid incensario support, as illustrated by Brockington (1967:Fig. 41,o;18) occurring only in the Dark Brown Slip group; 4) fragment of a hollow cylinder, appearing to flare out at both ends, possibly part of a cylindrical handle (1), internal dia. 1.7 cm., external dia. 2.8 cm., length 5.5 cm.

Discussion: The Calzada de la Cruz ceramic group is one of the most distinctive in Chicomucelo, typologically and spatially. It is also one of the most firmly datable, since it bears substantial similarities to the ceramics of Phase 6 of Santa Rosa.

Brockington's Dark Brown Slip group, and possibly his Maroon Slipped group, both occurring in Phase 6, are represented in the Calzada de la Cruz group, but the fact that designations had already been assigned to these sherds was not appreciated until after the typology had been completed and the literature search had begun. They are similar in paste to the rest of the group, and so are included in it.

A dominant and diagnostic feature of the Calzada de la Cruz group is the mold-made pseudo-glyph, found on bowls with a coarse tan paste and a dark brown slip, which also occurs on identical vessels at Santa Rosa only in Phase 6 (Brockington 1967:50). The Tepeu-3 similar-

ities are noted by Lowe (1959:52). However, mold-made pseudo-glyphs do occur frequently in the Protohistoric ceramics of the Guatemala Highlands on ladle incensarios (Wauchope 1970), a form which does not occur in Santa Rosa Phase 6. It is not possible to be absolutely certain that the Chicomucelo sherds belong to a bowl rather than a ladle incensario form. If the sherds are from an incensario, they might represent a Protohistoric period, rather than a Late Classic and Early Postclassic period.

There are only two sherds in the Chicomucelo collection which can be compared to Brockington's Dark Brown Slip group, although the comparison is certain. There are twelve sherds with traces of a reddish-brown finish which might compare to Brockington's Maroon Slipped group, but it is not possible to determine whether the finish is specular or not. The comparison is tenuous, but is suggested because the Maroon Slipped group is abundant in Phase 6.

Brockington's description of the Santa Rosa Phase 6 pastes as predominantly light brown, commonly coarse, and with a coarse volcanic ash temper (with rare exceptions) describes well the typical Calzada de la Cruz paste.

The great abundance of the basins in the sample is undoubtedly partly a result of sampling bias. The closest illustrated comparative material for these sherds is found in Regional Period Yucatán ceramics, dating between A.D. 215–680 by the Goodman-Martinez-Thompson correlation (Brainerd 1958:Chart 22), which is too early for the rest of the collection. However, Culbert chose the same Yucatán basin illustration as the best comparison for open-mouth fillet bowls found in the Chiapas

Highlands, but dates them to the Tsah Phase, describing them as part of a complex of open-mouthed, finger impressed bowls known in Late Classic sites in the Maya lowlands, and in Late Classic and Early Postclassic sites in the Central Depression. They are, then, contemporaneous with Santa Rosa Phase 6.

Other ceramic comparisons between the Calzada de la Cruz group and Chiapas Highland ceramics - the incised decoration on Moxviquil Black:Moxviquil Variety, and the jars with inslanting necks - are not out of accord with the Phase 6 date.

One is on solid grounds in saying that the Calzada de la Cruz group is contemporaneous with Santa Rosa Phase 6 ceramics and with Tepeu-3 of Uaxactún, but equivocation concerning the vessel form of the false-glyph bearing sherds might suggest that there was a continuation of this tradition into the Protohistoric period. However, the consideration of other evidence - the complete lack of modes characteristic of the Postclassic and Protohistoric such as are found in the Santa Teresa Red group (esp. effigy feet and slab feet), and of painted decorative modes which occur in the Guatemala Highlands contemporaneous with the false-glyph ladle incensarios - lead one to conclude that the terminal date falls early in the Postclassic. Brockington's terminal date of A.D. 1000 seems appropriate. The incipient date for the Calzada de la Cruz group is also difficult to pin down, but I will accept Brockington's A.D. 800 date for the beginning of Phase 6. Conclusive answers must await excavations which will fill in the possible A.D. 200-800, and definite A.D. 1000-1521 gaps in the Santa Rosa sequence (Brockington 1967:4).

NUEVA AMERICA - YAYAHUITA PERIOD

Santa Teresa Red Group

Sample: 264 Figure: 26,r-x; 27,a-z; 28,a-m Plate 4,g

Paste: colour is predominantly reddish yellow (5 YR 7/6), but includes range of white (10 YR 8/1), yellow (10 YR 8/6), pink (7.5 YR 8/4); medium coarse texture, the tempering material appearing to be sand with many brown particles; soft and crumbly to crisp and crumbly, definitely the least durable of all of the non-Santa Teresa Chicomucelo groups, and tends to powder in the hand when handled.

Surface: surface finish colour is light red (7.5 R 6/8), dark red (7.5 R 3/8), dark red (2.5 YR 3/6), and red (7.5 R 5/6); colour determination is difficult as the sherds are badly eroded, due to their softness and to the fact that they are plough-damaged; the least damaged sherds indicate that the finish was thick but soft - it looks like a thick varnish and has a soft sheen when undamaged; the finish can be flaked off because of the poor quality of the paste.

Decoration: red finish discussed above, post-finish rectilinear incision, effigy feet, stepped-slab feet, and fillet design.

Forms:

Comales (7)

Profile: thickened rims with internal bevel, rounded lip (6) (Fig. 26, r,s), unthickened rim, squared lip (1).

Dimensions in cm.: wlt. - .5-1.0, ht. - unknown, dia. - 23-46.

Decoration: all sherds have traces of red finish on lip and exterior, and 4 have traces on interior rim.

Bowls with concave, outslanting sides (37)

Profile: rim slightly tapered with a rounded or sharp lip, two of which have strap handle scars (9) (Fig. 26,t); slightly thickened rim with squared lip (1); sherds from a small vessel with slightly tapered rim, rounded lip (2) (Fig. 26,u); (the following vessels are deeply concave in the interior rim zone) pronounced thickening on exterior approx. 2.5 cm. below lip, and then tapering to a squared lip (4) (Fig. 26,v); compound silhouette formed by a pronounced thinning of the rim about 1 cm. below the lip, and then thickening to a squared lip (7) (Fig. 26,w); substantially thickened rim, squared lip (14) (Fig. 26, x).

Dimensions in cm.: .4-1.2, ht. - unknown, dia.- 17-32.

Decoration: all sherds appear to have had red finish on the interior and on the lip, and many on the exterior; one sherd with strap handle scars (Fig. 26,t) has two thin, incised horizontal lines between the lip and the handle.

Comment: A rim form comparable to the peculiar Fig. 26,w is found in the Tres Naciones Gray:Tres Naciones Variety tripod plates with a basal angle and incurving sides (Sabloff 1970: Fig. 68, h-j, especially i). Lowe (1959:Fig. 59,a;49) also illustrates an identical rim, which is probably Late Classic from Yaxchilán. If Fig. 26,v were angled slightly differently it would bear a great resemblance to Sabloff's Fig. 68,o, of the same variety and vessel form as above. Tres Naciones Gray:Tres Naciones Variety is part of the Bayal Boca ceramic complex, and occurs at Altar de Sacrificos, and Seibal.

Bowls with incurving rims (6)

Profile: unthickened rim with steep bevel on interior lip and slight out-turn on exterior (1) (Fig. 27, a); thickened or unthickened rim,

rounded lip (5) (Fig. 27,b).

Dimensions in cm.: wlt. .5-.7, height - unknown, dia.-22-37.

Decoration: three sherds have traces of red finish on lip, one on exterior, and 2 on interior.

Bowls with outslanting, outflaring sides and flat bottoms (18)

Profile: large vessel, untapered rim, rounded lip (6) (Fig. 27,c); untapered rim, slightly outflaring, with squared lip and outside bevel (2) (Fig. 27,d); thickened rim with rounded or pointed lip, beveled on interior (5) (Fig. 27,e); less robust vessels, unthickened or slightly thickened rims, rounded lips (5) (Fig. 27,f,g).

Dimensions in cm.: wlt. - .5-1.0, ht. - unknown, dia.-22-48.

Decoration: most sherds have traces of red finish on exterior and interior, and one sherd has excised rectilinear design on the exterior (Fig. 27,g).

Comment: The sherds represented by Fig.27,f,g may belong to the ladle incensario class. Sherds represented by Fig. 27,c-e,also may not belong in this class, perhaps being basins or large jars.

Bowls with vertical sides (16)

Profile: thickened rim with slight outflare at lip, internal bevel (2) (Fig. 27,h); thickened rim, slightly beveled towards interior (1); thickened rim, rounded lip (4) (Fig. 27,i); small vessels with slightly tapered, outflared rim, rounded lip (3) (Fig. 27,j); untapered rim, rounded or pointed lip (6) (Fig. 27,k).

Dimensions in cm.: wlt. - .5-.9, ht. - unknown, dia.-16-39.

Decoration: red band on lip and internal and external rim common, with only two instances of red finish on internal vessel wall and six on

external wall, however, all sherds badly eroded; thin horizontal excised or incised line on exterior approx. 2 cm. below lip in two instances (Fig. 27,j,k).

Basins (15)

Profile: thickened rim, squared lip (2) (Fig. 27,l); rim thickening more pronounced on interior or exterior, rounded lip (3) (Fig. 27,m,n); thickened rim, rounded lip (9) (Fig. 27,o); thickened rim with exterior bulge, squarish lip (1) (Fig. 27,p).

Dimensions in cm.: wlt. - .7-1.2, ht. - unknown, dia.-26-50.

Decoration: three sherds (Fig. 27,l,m) have fillet band 2-5 cm. below the lip; all have traces of red on lip, interior or exterior.

Comment: These are specimens of the class of open-mouth fillet bowls discussed by Culbert (1965:64), and above under the Calzada de la Cruz group.

Collared jars (10)

Profile: medium sized vessel with untapered rim, squared lip (1); medium sized vessel with slightly outflaring, tapered rim, rounded lip (1); small vessel with unthickened rim, rounded lip (4) (Fig. 27,q); tapered rim, rounded lip (3) (Fig. 27,r); thickened rim, rounded lip (1).

Dimensions in cm.: wlt. - .5-1.0, ht. - unknown, dia.-13-approx. 20.

Decoration: most sherds have traces of red on exterior and lip, and less frequently on interior.

Jars with flaring necks (77)

Profile: slightly to substantially thickened rims with rounded or pointed lips (58) (Fig. 27,s-u, w-z); thickened rim with internal bevel, pointed lip (4) (Fig. 27,v); pronounced rim thickening on internal wall,

rounded lip (4) (Fig. 28,a,b); pronounced rim thickening on external lip, squarish lip (2) (Fig. 28 c,d); unthickened rim, rounded lip (2) (Fig. 28,e); sharply out-turned, thickened at juncture between rim and neck, then tapering rim, rounded lip (3) (Fig. 28,f); robust jars with thickened, out-turned rim, rounded lip (4) (Fig. 28,g).

Dimensions in cm.: wlt. - .5-1.0, ht. - unknown, dia.-12-36.

Decoration: almost all have traces of red finish, more common on outer surface than on inner surface; one sherd (Fig. 27,v) has an incised band of two horizontal lines .4 cm. apart connected at .4 cm. intervals by diagonal incisions on the neck of the vessel.

Comment: It is possible that some errors have been made in assigning sherds to this class, e.g., the 11 sherds represented by Fig. 28,a-f, since the determination of whether they belong to a jar or bowl class on the basis of rim form does not produce certain results. The prime criterion for assigning a sherd to this class was evidence of a continuing curve of the neck towards a globular body, and a secondary criterion was the diameter of the orifice in relation to the robustness of the sherd - a thick sherd with a small diameter of orifice is likely to be from a heavy vessel such as a jar, rather than from a small bowl. I consider the jars to be similar in shape to those of Matillas Orange: Matillas Variety, illustrated by Matheny (1970: Fig. 50,e,f; 51,n;p.93).

Vessel Supports (18)

Profile: hollow, roughly conical support with a round hole on one side (8) (Fig. 28,h); rounded, hollow supports with a slash-type hole on one side (2) (Fig. 28,i; Plate 4,g); solid, conical supports smaller than other supports (4); slab-like supports with stepped bottom (3) (Fig. 28,

j); hollow effigy-supports, badly eroded but probably a monkey (1) (Fig. 28,k).

Dimensions in cm.: conical support, length-2-4, max. dia.-2.5-4.0, vessel wall thickness-.4-.7; round support, length - 3, max. dia.-3.5, vessel wall thickness-.7; stepped support, length-2-3, width-3-5, thickness-1.5, vessel wall thickness-.8; effigy support, length-4, dia.-5.5, vessel wall thickness - 1.

Decoration: Only the effigy foot has evidence of red on the exterior, but all have some red paint on the interior wall of the vessel.

Comment: Bulbous, hollow feet with a slash-type or round hole (Fig. 28, h,i) and solid conical feet (not illustrated) are found on tripod plates from Tres Naciones Gray:Tres Naciones Variety pottery from the Bayal Boca Ceramic Complex of the Terminal Late Classic. Tres Naciones Gray:Tres Naciones Variety can also have a reddish brown slip, although black is more common (Sabloff 1970: Fig. 69,70; p.389). A bulbous foot with slash-type hole is found at Tajumulco on red and buff carved ware (Dutton and Hobbs 1943: Fig. 89,a). A bulbous foot with a "T"-shaped slash hole occurs in Tabasco from the Jonuta Horizon, which is placed by Berlin at the end of the Late Classic, although he does indicate that the ceramic fashion might have continued some time after the end of major cultural activities in the Maya lowlands (1956: Fig. 4,w,x; p. 132-33). Bulbous feet with slash-type holes occur in Tohil Plumbate, but the slash-hole is much larger, the foot is oriented more outwardly, and it occurs on jars (see Shephard 1948:Fig. 10-12; and Smith 1957:Fig. 2,3).

Berlin illustrates stepped feet on tripod bowls of the U Fine Orange type which are more or less comparable to Chicomucelo Fig. 28,j,

and in addition Berlin's Fig. 6,j has a rim and interior covered with a red-orange slip similar to Santa Teresa Red, but the bowls have a medial moulding, for which there is some evidence in the Santa Teresa Red group (Misc. 1). Berlin places the U Fine Orange in the Cintla horizon of Tabasco, which is just prehispanic (1956: Fig. 6,i,j; 147). Mold-made effigy feet are a characteristic of V Fine Orange which is diagnostic of the early Cintla horizon of Tabasco, and those illustrated by Berlin in Fig. 10,i appear to be comparable to Fig. 28,k from Chicomucelo. V Fine Orange also has incised decoration, whereas U Fine orange does not. The criterion for the chronological separation of the earlier V, from the later U Fine Orange is the change from effigy to slab feet (respectively) on the tripod forms (Berlin 1956:135-36).

Wauchope (1948:Fig. 57) also illustrates tripod bowls with effigy-head supports from Zacualpa, Guatemala Highlands, which belong in the Tohil Phase, and these vessels are known with a red finish. Effigy legs occur at Tajumulco and are illustrated for a red and buff ware tripod bowl, for redware, and for red and buff carved ware (Dutton and Hobbs 1943: Fig. 80,g; 81,a; 86;87;89,c).

Effigy suspension handles (2)

Profile: jaguar effigy (1); human head effigy (1).

Dimensions in cm.: jaguar, length - 6, width - 4, height - unknown; human, length - 4, width - 7, height - 7.

Decoration: red finish.

Comment: The suggestion that these sherds belong in a class separate from effigy feet was made by Jorge Nuricumbo, but the eroded state of the material makes it difficult to determine for certain. Effigies

placed on the shoulders of jars are found in Matillas Orange:Matillas Variety (Matheny, 1970:Fig. 51,n); and in Tohil plumbate ware (Shepard 1948: Fig. 14,a-d; Smith 1957:Fig. 4; and Type 75 of the N.W.A.F. Izapa type-collection from the Remanso phase); and redware from Tajumulco (Dutton and Hobbs 1943:Fig. 81,e). It should be noted that Matheny considers them to be suspension handles and pictures them in pairs on large jars, whereas in Plumbate ware they occur singly, and therefore must be decorative.

Strap handles (14)

Profile: vertically oriented strap handles (14) (Fig. 28,1).

Dimensions in cm.: width - 4.7, thickness - 1, span - 4-7, vessel wall thickness - 5-7.

Decoration: Traces of red finish on the exterior, but not on the interior of the vessel.

Comment: Matheny indicates that suspension handles occur only in Matillas Orange:Matillas Variety (1970:Table 2; Fig. 50,51), thereby indicating a Late Postclassic date, however, at Santa Rosa in the Central Depression it is known as early as Phase 4. They also occur on red ware jars from Tajumulco (Dutton and Hobbs 1943: Fig. 83,a). The handles may be associated with jars or basins.

Body sherds (42)

Profile: Generally curved sherds, some appearing to be from the shoulder region of medium sized jars (42).

Dimensions in cm.: wlt. - .3-1.5.

Decoration: All sherds are red finished on outside; one sherd has two incised lines 1.5 cm. apart around the shoulder of a jar, with evidence

of a vertical line joining the lower horizontal line; one sherd has two incised lines .4 cm. apart at the junction of the neck and shoulder of a jar, connected every 5 cm. by a diagonal incision, and with four vertical lines joining the lower horizontal line, one of which has short, oblique, lateral incisions; one sherd has double-line incisions spaced .5-1.0 cm. apart with triangular shaped incised panels attached, which are filled by diagonal incision; in all cases the incision is through the red finish.

Comment: The incision pattern on red ware from Tajumulco (Dutton and Hobbs 1943:Fig. 84,a) is similar to the Santa Teresa Red pattern. Simple geometric incised decoration on jar shoulders is illustrated on Tohil Plumbate by Shepard (1948:Fig. 35,a), but is not exclusive to that time period in Mesoamerica as it also appears in the Late Formative stage monochrome pottery from Kani (Brainerd, 1958: Fig. 31,e). Unfortunately, no photographs of the Santa Teresa Red incised designs are available.

Miscellaneous (2)

1) Fragment of a basal or medial flange with red finish (1) (Fig. 28,m);

2) Fragment of the neck of a very narrow-neck jar, with red finish.

Comment: The jar fragment may be from a vessel imitative of the typical shape of Tohil Plumbate vessels (see Shepard 1948:Fig. 3-5).

Discussion: This ceramic group, of all the Chicomucelo groups, is one of the most distinctive and internally consistent groups in terms of paste and finish. The good fortune of having a substantial collection of diagnostic sherds makes it one of the most certainly datable.

The problem of the relationship between Santa Teresa Red and Tachinula Red has been discussed under the latter group. The relationship of Santa Teresa Red to Santa Teresa Unfinished is also problematic. The pastes are exactly similar, being soft and crumbly - from which any finish would easily erode - and so it is possible that some, or perhaps all, of the Santa Teresa Unfinished sherds belong in the Santa Teresa Red group. However, I felt that to lump the two groups was making the unwarranted assumption that the red paint was used on all sherds. The groups do share distinctive forms such as effigy feet, and stepped slab feet, and are surely contemporaneous. The two groups should be treated as closely similar, and possibly identical, for comparisons by other workers.

An opinion was expressed by Jorge Nuricumbo, that those sherds represented by Fig. 26,x and 27,q,r, are San Juan Plumbate, an opinion with which I do not agree, although Fig. 27,q and r do indeed approximate plumbate shapes as shown by Brainerd (1958:Fig. 91, a,3,4), and described by Shepard (1948:91). First, I do not believe that some sherds of the group would be San Juan plumbate, without the whole group being so, because it is highly consistent internally in paste and finish. Second, criteria other than shape indicate that the group is quite different from true plumbate. Shepard (1948:101-02) writes that the outstandingly constant feature of plumbate is its distinctive temper which is so fine that it requires petrographic analysis. Typical also is the vitrification of the slip with its distinctive extreme hardness, luster, and grey and olive-grey colours. While Shepard acknowledges that great variability exists within the plumbate class due to poorly

controlled firing, no sherds of the relatively large Santa Teresa Red group approximate plumbate in fineness of paste, firing, or finish. Furthermore, effigy feet, a distinctive trait of the Santa Teresa Red group, are not found in plumbate ware.

The Santa Teresa Red group does bear some relation to plumbate. Red finished ware with effigy feet were found in association with plumbate in the Tohil phase at Zacualpa (Wauchope 1948:137, 143) and at Tajumulco (Dutton and Hobbs 1943:88-97, 107). Jar forms are abundant in plumbate (Shepard 1948:6) as they are in the Santa Teresa Red group, although the shape of the Santa Teresa jars is similar to that of Matillas Orange:Matillas Variety, rather than that of plumbate. Shepard also indicates that post-slip incision is typical of imitation plumbate, as it is of the Santa Teresa Red group. The possibility exists that there are jar effigy heads within the Santa Teresa Red group, but these occur in Matillas Orange:Matillas Variety, and red ware, as well as in plumbate, and are therefore not diagnostic of plumbate, although related to it.

A caution must be made concerning the comparisons between Santa Teresa Red and the Fine Grey and Fine Orange ceramics. Although there exist distinctive similarities of form and decorative attributes, the Santa Teresa Red group does not belong to either of the other groups, because it has a very coarse, tempered, poorly fired paste.

The Santa Teresa Red group does not appear to belong to any other known ceramic type, in spite of its close relations with the red ware of the Guatemala Highlands and the orange ware of Tabasco. However, the modal comparisons permit it to be assigned a broad temporal position.

Similarities of rim profile and foot shape with Tres Naciones Gray:Tres Naciones Variety of the Bayal Boca ceramic complex give a probable early date of Terminal Late Classic, or A.D. 830-930 (Sabloff 1970:360). The Yaxchilán similarity corroborates the ceramic direction of influence, but the dating is less well known. The Late Classic and Early Postclassic date of the basins has been discussed above with the Calzada de la Cruz group. Red finished bowls with effigy feet are dated by Vauchope to the Tohil phase at Zacualpa, from 10.8.0.0.0 to 10.19.0.0.0 or 11.1.0.0.0 (1948: 32), which approximately ranges between A.D. 980 - 1230, using the generally accepted Goodman-Martinez-Thompson correlation (Brainerd 1958: Chart 22). Jar effigy heads and collared jars are found in Tohil plumbate which Dutton (1961:111) dates between A.D. 987 - 1244. Jar effigy heads, effigy feet on bowls, large jars with strap handles and incised decoration are found in Matillas Orange: Matillas Variety (V Fine Orange), which by Berlin's placement, belongs to the early facet of the Cintla phase of Tabasco. Stepped-slab feet are diagnostic of Cunduacán Orange:Cunduacán Variety (U Fine Orange) which belongs to the late facet of the Cintla horizon. Berlin estimates the Cintla horizon to date between A.D. 1200 and the early decades of the sixteenth century. I therefore believe that the Santa Teresa Red group represents a local ceramic tradition beginning in the ninth century A.D., and ending about the time of Spanish contact.

Santa Teresa Unfinished Group

Sample: 227 Figure: 28,n-u; 29,a-u; 30,a-k Plate: 5 a,b

Paste: colour is predominantly reddish yellow (7.5 YR 7/6), but varies through pinkish white (7.5 YR 8/2), very pale brown (10 YR 7/4), and

yellow (10 YR 7/6); texture is medium coarse, the tempering material appears to be sand with many brown particles; soft and crumbly to crisp and crumbly, often can be broken easily by hand.

Surface: colour ranges through pinkish grey (7.5 YR 6/2), pinkish white (7.5 YR 8/2), pinkish grey (7.5 YR 7/2), and pinkish grey (7.5 YR 7/2); the surface colours are usually slightly darker than the paste, this perhaps being due to the adherence of some soil on the rough surface, fire clouding, weathering, or use, but there is no evidence of a slip or paint; generally, the surface has a gritty feeling, and some of the surface wears off every time a sherd is handled.

Forms:

Conales (1)

Profile: thickened rim, rounded lip (1).

Dimensions in cm.: wlt. - .5, ht. - unknown, dia. - 38.

Bowls with concave. outslanting sides (41)

Profile: unthickened or slightly thickened rim, rounded lip, (10) (Fig. 28,n); slightly thickened rim, pointed lip (6) (Fig. 28,o); thickened rim producing pronounced bulge on exterior surface, rounded lip (9) (Fig. 28,p); thickened rim, lip squared or beveled towards interior (6) (Fig. 28,q,r); unthickened rim, lip beveled towards interior and rounded, two sherds with strap handle scars (4) (Fig. 28,s); thickened rim with steep bevel towards interior, pointed lip (6) (Fig. 28,t,u).

Dimensions in cm.: wlt. - .6-.9, ht. - unknown, dia.-17-42.

Decoration: Five of the sherds have a fillet design and two sherds, represented by Fig. 28,n have a lateral flange consisting of ridges approx. 2 cm. long, separated by vertical grooves.

Comment: The lateral flange compares with that of the bowls of Matillas Orange:Matillas Variety, illustrated by Matheny (1970: Fig. 49,a-d).

Bowls with vertical sides (17)

Profile: thickened rim, squared lip (5) (Fig. 29,a); unthickened rim, rounded lip (4) (Fig. 29,b); unthickened rim, pointed lip with interior bevel (6) (Fig. 29,c); slightly thickened rim, squared lip (1); pronounced rim thickening on exterior, squared lip (1) (Fig. 29,d).

Dimensions in cm.: wlt. - .7-1.0, ht. - unknown, dia.-22-43.

Decoration: one sherd has a fillet band, and three sherds, represented by Fig. 29,a,d, have the lateral flange pattern described immediately above.

Comment: The comparative material for lateral flanges has been discussed in the previous section, however, these differ from Matheny's illustrations in that these are placed closer to the lip, and are on bowls with vertical sides.

Basins (30)

Profile: thickened rim, beveled toward the interior (7) (Fig. 29,e,f); thickened, slightly outflaring rim, rounded lip (5) (Fig. 29,g); very robust vessel with thickened rim, rounded lip (2) (Fig. 29,h); unthickened rim with steep interior bevel on lip, 3 sherds have probable strap handle scars 3-5 cm. below lip (4) (Fig. 29,i); thickened rim, rounded lip (4) (Fig. 29,j); thickened rim with steep bevel on interior lip and shallow bevel on exterior lip (1); thickened rim, generally rounded lip with slight interior bevel (4) (Fig. 29,k); pronounced rim thickening, squared top (2) (Fig. 29,l); thickened, outflaring rim, pointed lip (1).

Dimensions in cm.: wlt. - .6-1.2, ht. - unknown, dia.-30-70.

Decoration: one sherd has a fillet band, and one sherd (Fig. 29,h) has six faint, horizontal, incised lines on the interior rim.

Comment: The Late Classic-Early Postclassic placement of basins in the Central Depression has been discussed in the Calzada de la Cruz group.

Tecomates (12)

Profile: very robust vessel with thickened rim, and rounded lip with slight internal bevel (1) (Fig. 29,m); thickened rim, rounded lip (4) (Fig. 29,n); thickened rim with exterior bevel (2) (Fig. 29,o); slight orifice restriction, thickened rim with internal bevel and pointed lip (3) (Fig. 29,p); slight orifice restriction, thickened rim, squared lip (2) (Fig. 29,q).

Dimensions in cm.: wlt. - .7-1.4, ht. - unknown, dia.-12-34.

Decoration: one sherd has a fillet band (Fig. 29,n), and one sherd has an appliqué band with the lateral flange pattern discussed above (Fig. 29,o).

Comment: The presence of the lateral flange pattern on one sherd is problematic, since in Matillas Orange:Matillas Variety it occurs only on bowls with outslanting sides. When these sherds were first classified, the pattern was considered to be a variant of an ordinary fillet band, its designation as a lateral flange and association with bowls being unknown until later literature research. The appearance of this pattern on a tecomate is an indeed unusual use of a lateral flange - perhaps my original supposition was correct. However, the published designation has been followed in this report.

Bowls with outslanting sides and flat bottoms (6)

Profile: short rim flange and rounded lip (2) (Fig. 29,r); small vessel with thickened rim, rounded lip (1) (Fig. 29,s); unthickened, slightly outflaring rim, rounded lip (1) (Fig. 29,t); low, unthickened, outslanting side, flat bottom with conical support (2) (Fig. 29,u).

Dimensions in cm.: wlt. - .4-1.0, ht. - 5.5 for most complete vessel, but others probably vary substantially, dia.-18-41.

Decoration: one sherd (Fig. 29,s) has a fillet band; one sherd has a band of three horizontal incised lines below the rim, with evidence of diagonal incisions further below.

Comment: Fig. 29,u resembles the Matillas Orange:Matillas Variety bowl illustrated by Matheny (1970:Fig. 48,g). The rim flange of Fig. 29,r is generally associated with Protoclassic ceramics in the Central Depression, but is not exclusive to that period (see discussion above under the Tachinula Grey group).

Jars with flaring necks (20)

Profile: rim thickened externally, lip beveled towards interior (3) (Fig. 30,a); thickened rim, rounded lip (2); unthickened rim, pointed or rounded lip (13) (Fig. 30,b,c); slight bulge on exterior or rim, just below lip, squared lip (2).

Dimensions in cm: wlt. - .5-.8, ht. - unknown, dia. -12-43.

Vessel Supports (16)

Profile: hollow animal effigy supports, too badly eroded for definite identification, but probably 5 jaguars and 1 badger, and 4 unidentifiable (10) (Fig. 30,d,e); hollow bulbous or conical supports (3) (Fig. 30,f; Plate 5,a); stepped slab support, one with a rounded bottom (2) (Fig. 30,g; Plate 5,b); squarish, hollow support with a pronounced bulge

on the inner surface (1) (Fig. 30,h);

Dimensions in cm.: animal effigy, vessel wall thickness - .3-.5, length-3-5, dia.-4-5.5; bulbous, vessel wall thickness - .5-.6, length-3-3.5, dia.-3.5; stepped slab, vessel wall thickness - .7, length-3, width-4.5, thickness-1; hollow slab, vessel wall thickness - .6, length-4, width-5, max. thickness-3.

Decoration: the hollow slab support may have had an effigy on the outer surface.

Comment: The chronological significance of the effigy, hollow bulbous, and stepped slab supports has been discussed above under the Santa Teresa Red group. Squarish, hollow feet which may be comparable to Fig. 30,h appear in Tabasco in Calax Red-polychrome:Calax Variety, of the Peninsula ceramic complex, and Costa Red-and-buff:Costa Variety, and Cuyo Orange-polychrome:Cuyo Variety of the Conchada ceramic complex (Matheny 1970:Fig. 35,43,44). A very similarly shaped foot is illustrated by Brainerd (1958: Fig. 108,f,4) and it belongs to Late Mexican Coarse Redware. Square, slab feet with effigy decoration and an anterior circular hole, of Guatemala Pacific coast Late Classic Tiquisate ware, are illustrated by Shook (1965:Fig. 3,h).

Handles (62)

Profile: vertically oriented strap handles (62) (Fig. 30,i,j).

Dimensions in cm.: width-3-6, thickness-1-1.5, span-3-approx. 7.

Comment: These handles are probably associated with jars with flaring necks, bowls with concave, outslanting sides, and with basins.

Body sherds (20)

Profile: concave bottoms (13); body fragment with fillet band (1);

unidentifiable fragments (6).

Dimensions in cm.: wlt.-4-1.6.

Comment: Jorge Nuricumbo indicated that the concave form of bottom first appeared in Chiapa III, and continues up to the present (Pers. Comm. 1974).

Miscellaneous (2)

1) small fragment, probably from an effigy on a vessel (1); 2) thickened fragment with gouged channel and eye-like design at end (1) (Fig. 30,k).

Discussion: The relationship between this group and the Santa Teresa Red group has been partially discussed above under the latter group. In addition to the identity of paste, and the sharing of diagnostic effigy and stepped-slab foot forms, evidence of the close typological and chronological similarity between these two groups is found in the presence of the distinctive "lateral flange" pattern of Matillas Orange: Matillas Variety on Santa Teresa Unfinished bowls. However, the unique presence of this pattern on bowls with vertical sides, and on one tecomate, suggests that it might be better considered a variant of a fillet pattern, rather than a lateral flange.

A chronologically problematic piece is the squared but hollow vessel support, possible comparative material being found in the Peninsula and Conchada ceramic complexes of Tabasco (Early and Late Classic respectively, Matheny 1970:Chart 1), in the Late Mexican stage of the Yucatán and in the Late Classic period of coastal Guatemala. The Late Mexican stage date (approximately A.D. 1340 to Contact, Brainerd 1958:Chart 22) is more appropriate to the other chronological

indicators, but a Late Classic date would not be seriously out of allignment.

Chinautla Polychrome

Samele: 2 Plate: 5,c

Paste: (of sherd) white (2.5 Y 8/2); fine and chalky with a fine temper, but some dark particles; medium hard; (paste of jar not recorded).

Surface: (of sherd) white (2.5 Y 8/0); smooth texture; medium hard; surface of jar similar in colour.

Decoration: The sherd has dark grey geometric painting, and the jar has reddish brown geometric painting.

Forms:

Jar with flaring neck (1)

Profile: globular jar with a tall, narrow, slightly flaring neck and strap handles (1) (Plate 5,c).

Dimensions in cm.: wlt. - (not recorded), ht. - 39, dia. of body - 26, dia. of orifice - 8.

Decoration: geometric designs in rust - reddish brown paint on jar shoulder.

Comment: This jar is probably a cremation jar; note the three "kill holes" drilled on the shoulder. It was photographed in El Paraiso, and was reported to have come from a cave in the mountains. It compares well in form and decoration to that illustrated by Wauchope (1970:Fig. 7) and to those illustrated by Lowe (1959:Fig. 55, a-c).

Body sherds (1)

Profile: deeply concave, possibly from a jar shoulder (1).

Dimensions in cm.: wlt. - .9.

Decoration: corner of a triangle with an oblique line inside, and the edge of a line outside, all in dark brown paint is visible on the sherd.

Discussion: Gareth Lowe (Pers. Comm. 1974) identified this material as "Horse polychrome" which is formally designated as Chinautla Polychrome, and which was produced during the Protohistoric and Early Historic periods. In 1942 at Kaminaljuyu, A.L. Smith found two jars of this type in association with the bones of a horse, thus confirming its historic presence and giving rise to its pseudonym. Wauchope notes that the term has come to designate a number of distinctive, but related ceramic groups and subdivides it further. It would appear that both of the Chicomucelo specimens belong to his dull paint style, which is distributed in Chiapas and Guatemala (see Wauchope 1970:108-114 for a complete discussion of Chinautla Polychrome styles and distribution).

SMALL GROUPS AND MISCELLANEOUS SHERDS OF SPECULATIVE DATE

Guapinole Orange Group

Sample: 14 Figure: 30,1

Paste: colour is light red (2.5 YR 6/6) to reddish yellow (5 YR 6/6); medium texture with a sand temper including particles up to .4 cm. in dia.; medium hard.

Surface: The surface is classified as reddish yellow (5 YR 7/6, both sherds) by Munsell colours, but would commonly be considered a mottled orange and grey; medium hard with a texture of fine grade worn sandpaper, and does not erode in the hand; not slipped.

Decoration: one sherd has traces of red finish on interior.

Forms:

Bowl with concave, outslanting side (4)

Profile: untapered rim, rounded lip (2); tapered rim, rounded lip (2).

Dimensions in cm.: wlt. - .5-1.5, ht.-unknown, dia.-15-25 (by estimate).

Decoration: one sherd has faint traces of red finish on the interior.

Bowl with incurving rim (4)

Profile: unthickened rim, squared lip (1); pronounced thickening on interior rim with a generally squared lip (3) (Fig. 30,l).

Dimensions in cm.: wlt. - .5-.8, ht. - unknown, dia.-30-34 (by estimate).

Decoration: unthickened sherd has a bulge 2 cm. below lip, possibly a fillet band.

Bowl with vertical sides (2)

Profile: unthickened, slightly outflaring rim, squared lip (2).

Dimensions in cm.: wlt. - .8, ht. - unknown, dia.-25 (by estimate).

Decoration: one sherd has three horizontal incised lines .5 cm. apart on the interior rim, and the other has a fillet band on exterior.

Basins (2)

Profile: extremely thickened rim, rounded lip (2).

Dimensions in cm.: wlt.-1.4, ht. - unknown, dia.-44-64.

Decoration: one sherd has a fillet band below the rim.

Handles (2)

Profile: body sherds with handle scars (2).

Dimensions in cm.: width - 4-4.5, thickness - 1, span - unknwon.

Discussion: The presence of the two basin sherds suggests a Late Classic or early Postclassic date (see discussion under Calzada de la Cruz group).

Cerecillo Group

Sample: 11 Figure: 30 m,n

Paste: colour ranges from pinkish white (7.5 YR 8/2) to very pale brown (10 YR 8/3); medium fine texture; medium hardness.

Surface: colour is pink (7.5 YR 8/4) or light reddish brown (5 YR 6/4), several sherds have a dark surface stain with the appearance of a fine tar, possibly a soil patina; texture is moderately rough, but not like sandpaper, with traces of horizontal brushing; hard.

Decoration: some sherds have faint evidence of a red finish, possibly in horizontal bands.

Forms:

Bowl with concave, outslanting side (3)

Profile: unthickened rim, squared lip (2) (Fig. 30,m); thickened rim, rounded lip (1).

Dimensions in cm.: wlt. - .7, ht. - unknown, dia.-36-41.

Decoration: all three sherds have a fillet band 1-2 cm. below lip, and two have traces of red finish, one on the interior, and one on the exterior.

Bowl with incurving rim (3)

Profile: thickened rim, rounded or pointed lip (2); thickening low on rim, then tapered towards lip, squared lip (1).

Dimensions in cm.: wlt. - .6-.9, ht. - unknown, dia.-32.

Decoration: one sherd has a fillet band 3 cm. below the lip.

Bowl with vertical sides (3)

Profile: unthickened rim, squared lip (1); thickened rim beveled to interior one with a handle scar, and rounded or pointed lip (2) (Fig. 30,n).

Dimensions in cm.: wlt. - .4-.7, ht. - unknown, dia.-19-32.

Decoration: one sherd has a fillet band 2 cm. below the lip.

Body sherds (2)

Profile: one sherd may be from the point of curve between the shoulder and neck of a jar.

Dimensions in cm.: wlt.-1.0-1.1.

Decoration: the jar sherd has a faint red band approx. 1 cm. wide.

Discussion: Jorge Nuricumbo indicated that this group is probably Late Classic (Pers. Comm. 1974).

Pueblo Viejo Group

Sample: 6 Figure: 30,o

Paste: colour is dark grey (5 YR 4/1) to pink (7.5 YR 7/4); coarse textured, with a temper which appears to be coarse sand including many white particles; medium hard.

Surface: pink (7.5 YR 8/4) to pinkish grey (7.5 YR 7/2); moderately rough surface; hard - does not erode when handled.

Decoration: two sherds have a red finish on the interior and one on the exterior.

Forms:

Bowl with incurving rim (4)

Profile: very robust vessel with thickened rim, concave lip, heavy strap handle (2) (Fig. 30,o); unthickened rim, rounded lip, heavy strap handle (2).

Dimensions in cm.: wlt.-1-1.5, ht. - unknown, dia.-30-40; strap handle, width-4, thickness-1.5; span-7.

Decoration: one sherd has a red finish on the exterior.

Basins (2)

Profile: thickened rim, rounded or squared lip (2).

Dimensions in cm.: (not recorded).

Decoration: one sherd has traces of red finish on the interior, and a fillet band 3 cm. below exterior lip.

Discussion: Jorge Nuricumbo indicated that the group is probably Post-classic, basing his opinion on the presence of strap handles (Pers. Comm. 1974). The large fillet bowl suggests a Late Classic or Postclassic date (see discussion under Calzada de la Cruz group). The concave lip is unique to Chicomucelo ceramics.

Potrero del Cerro Group

Sample: 6 Figure: 30,p,q

Paste: colour is white (7.5 YR 8/0) to reddish yellow (5 YR 7/6); coarse, and appears porous; medium hard.

Surface: colour is light reddish brown (2.5 YR 6/4) and pinkish white (7.5 YR 8/2), and some have mottled traces of a black finish; smooth and hard, with traces of even horizontal brushing on interior and exterior of all sherds.

Forms:

Tecomates (1)

Profile: slightly out-turned, tapered rim, rounded lip (1) (Fig.30,p).

Dimensions in cm.: wlt. - 1.4, ht. - unknown, dia.-18.

Jar with flaring neck and rim (5)

Profile: tapered, flaring rim, rounded lip (5) (Fig. 30,q).

Dimensions in cm.: wlt. - .8-1.2, ht. - unknown, dia.-22-27.

Discussion: In terms of hardness and density, and to a lesser extent in colour, this group seems to bear some relationship to the Tachimula

Unfinished group, however, Jorge Nuricumbo is of the opinion that this group dates to the Postclassic period (Pers. Comm. 1974).

Tuju Crange Group

Sample: 5 Figure: not illustrated

Paste: colour is reddish yellow (7.5 YR 8/6, 5 YR 7/6); coarse and porous texture, but the temper material is very fine; medium hardness, and crisp.

Surface: colour of slip is reddish yellow (5 YR 7/8, both sherds), more commonly called orange, and more brilliant than the paste; least eroded sherds are smooth to the touch; moderately hard, but powders when scratched by the fingernail.

Decoration: the rim on one sherd has a very dark orange-red finish, suggesting that this may have been the original colour.

Forms:

Bowl with concave, outslanting side (1)

Profile: thickened rim, rounded lip (1).

Dimensions in cm.: wlt. - not recorded, ht. - unknown, dia.-16.

Comment: This sherd was a very small fragment.

Bowl with everted rim and flat bottom (1)

Profile: short everted rim with slight downcurve at lip (1).

Dimensions in cm.: width of rim (not recorded), thickness of rim-.8, ht. - unknown, dia.-37.

Decoration: a deep reddish-orange finish on the lip suggest that this sherd might have been wholly finished in this colour.

Bowl with vertical sides (1)

Profile: unthickened rim, squared lip (1).

Dimensions in cm.: wlt. - .7, ht. - unknown, dia.-16.

Decoration: lip has a reddish orange finish similar to the everted rim bowl.

Body sherds (2)

Profile: concave bottom (1); other body sherd (1).

Dimensions in cm.: wlt. - .6-1.

Discussion: Jorge Nuricumbo (Pers. Comm. 1974) indicated that the sherds are probably Middle Classic, excepting the everted rim, which he considers to be Protoclassic (see the discussion of the everted rim problem under the Tachinula Grey group).

Cardenas Banded Red Group

Sample: 7 Figure: not illustrated

Paste: colour is reddish yellow (7.5 YR 8/6) to pinkish white (5 YR 8/2); texture is coarse with a coarse temper like the Santa Teresa groups; medium hard, and crisp.

Surface: colour is pinkish white (7.5 YR 8/2) to very pale brown (10 YR 8/4); texture is smooth to rough, like fine sandpaper; hard, and does not erode when handled.

Decoration: red paint (7.5 YR 5/6) in bands, which is hard and thin.

Forms:

Handles (3)

Profile: strap handles, probably vertically oriented (3).

Dimensions in cm.: width-6-9, thickness-.8-1.3, span - unknown, vessel wall thickness - .4-.7.

Decoration: traces of red finish on the exterior, on one sherd it appears to be in a distinct band.

Body sherds (4)

Profile: deeply concave sherds, possibly from a jar (4).

Dimensions in cm.: wlt. - .8-1.2.

Decoration: the red finish on all sherds appears to be in bands, which is 2.5 cm. wide on the only sherd with a complete band, but greater than 4 cm. wide on the others.

Discussion: the presence of strap handles and deeply concave sherds suggest that jars are an important form in this class. It is not possible to make certain conclusions, but the probable presence of jars, and the use of painted strips suggests a similarity to the Protohistoric pottery of the Guatemala Highlands, as illustrated by Navarette (1961), and Wauchope (1970), and so it is tentatively assigned to that period.

Regadillo Group

Sample: 2 Figure: 30,r Plate: 5,d

Paste: colour ranges through white (2.5 Y 8/0); very dark grey (2.5 Y 3/0), red (2.5 YR 5/6), and all colours are evident in the paste of the same sherd, the red appears to be an iron oxide; medium texture with fine temper including white particles; one sherd is very soft and crumbly, while the other is hard.

Surface: unfinished surface is pinkish grey (5 YR 7/2), and sparkles when held up to the light; red finished surface is smooth and hard and not scratchable with the fingernail.

Decoration: finish is red (7.5 YR 4/8), and sparkles a little when held up to the sunlight, but this may also be the paste showing through.

Forms:

Bowl with concave. outslanting side (1)

Profile: unthickened rim, lip forms a sharp line with interior wall,

but is rounded, and slightly beveled on the exterior (1) (Fig. 30,r).

Dimensions in cm.: wlt. - .6, ht. - unknown, dia.-18.

Decoration: red finish on the interior to within .5 cm. of lip, and outside is smooth but without red finish; short vertical notches placed 2 cm. apart where lip meets exterior surface (Plate 5,d).

Body sherd (1)

Profile: a very small basal-break fragment of a flat-bottom vessel (1).

Dimensions in cm.: wlt. - .7, bottom thickness - .5.

Decoration: red finish on the interior.

Discussion: Susanna Ekholm-Killer indicated that these sherds might be Izapa-Ocós Specular Red, but they are too small and few to be sure (Pers. Comm. 1974). The vertical notches in the exterior lip is similar to that illustrated by her for Ocós Specular Red (1969:Fig. 25,h). The association of these two sherds with other early material at Ch-15 lends support to an Early Preclassic placement.

Miscellaneous 1

Figure: 30,s

Paste: reddish yellow (7.5 YR 6/6); medium texture with sandy but fine temper; medium hard, and crisp.

Surface: colour is pink (7.5 YR 7/4); unpainted surface is rough.

Decoration: dark red (7.5 R 3/8) paint on the exterior surface which is not covered by the pedestal; there appears to be a hand with three splayed fingers rising from pedestal ridge.

Form: lower part of a pedestal vessel, including the part covered by the pedestal, a ridge, and the lower wall of the vessel.

Discussion: Jorge Muricumbo made the form identification; pedestal

vessels appear in the Chiapa de Corzo typology at the Museo de Antropología e Historia, Tuxtla Gutierrez, between late Chiapa IX to late Chiapa X, (approx. A.D. 500-950).

Miscellaneous - 2

Figure: 30,t

Paste: pinkish grey (7.5 YR 7/2); fine paste with fine temper; hard.

Surface: very pale brown (10 YR 7/3); rough surface; hard.

Decoration: an incised band decoration, 2.5 cm. wide, bordered on the top by a line .5 cm. below the lip, and on the bottom by two lines .5 cm. apart, divided into panels by double vertical lines, interiors of the panels are cross-hatched.

Form: concave bowl with outslanting sides, thickened rim, rounded lip.

Dimensions in cm.: wlt. - .5, ht. - unknown, dia.-19.

Discussion: the sherd was identified by Jorge Nuricumbo as early Postclassic (Pers. Comm. 1974).

Miscellaneous 3

Figure: not illustrated.

Paste: reddish yellow (7.5 YR 8/6); fine texture and temper; medium hard but powdery.

Surface: remains of a dark brown finish (7.5 YR 4/2); soft and powdery.

Decoration: dark brown finish and traces of curving, parallel, incised lines.

Form: concave body sherd, possibly a jar shoulder.

Dimensions in cm.: wlt. - .5.

Discussion: this sherd is probably an imitation plumbate, and the decoration is similar to Izapa-Remanso phase, Type 76-3 in the NWAF

type collection at Tuxtla Gutierrez.

Miscellaneous 4

Figure: 30,u

Paste: reddish yellow (5 YR 7/6); fine texture with sandy temper; medium hard.

Surface: almost completely eroded, similar to paste except for a tiny patch of shiny brown finish.

Form: a rounded button with a circular groove on the top, creating a central nipple.

Dimensions in cm.: ht. - 1, dia.-3.5.

Discussion: Jorge Muricumbo indicated that this is a decorative piece from a Postclassic incensario (Pers. Comm. 1974).

Miscellaneous 5

Figure: 30,v

Paste: very pale brown (10 YR 7/3); fine texture; hard.

Surface: completely eroded.

Form: a beehive-shape, solid piece with a spiral design encircling it, appearing to have been attached from the top, one side and bottom.

Dimensions in cm.: ht. - 3.8, max. dia. - 2.5.

Discussion: This may be from an incensario, but I have seen no similar object described in other ceramic reports. It has been sketched from memory.

Miscellaneous 6

Plate: 5,e

Paste: grey (2.5 Y 5/0); very fine paste with tiny white particles in the temper; extremely hard.

Surface: very dark grey (2.5 Y 3/0); hard, with traces of criss-cross brushing visible in photo, interior has parallel, horizontal brushing.

Form: concave body sherd.

Dimensions in cm.: wlt. - .5.

Discussion: In its colour, hardness, and fineness of paste the sherd seems to satisfy the criteria of true plumbate, as established by Shepard (1948:101-02), however, without the sherd to examine, I do not know whether the evident streaks on the surface might have been made by a polishing tool used after firing - which would immediately disqualify it from being true plumbate - or were made before firing. I think that the latter is the case and therefore consider the sherd to be true plumbate, probably Tohil plumbate, and assignable to the period A.D. 987 to 1244 as established by Dutton (1961:111).

Miscellaneous 7

Figure: 30,w

Paste: pink (7.5 YR 7/4); medium texture; hard.

Surface: dark brown (7.5 YR 3/2), but a badly eroded sherd, so that the dark brown may be soil discoloration rather than the original finish; soft, erodes easily in the hand.

Form: a flat sherd with a rectangular stump rising from one corner.

Dimensions in cm.: wlt. - .8, length of top of stump-3.5, width of same-1.3.

Discussion: Jorge Nuricumbo identified this sherd as part of a Post-classic incensario (Pers. Comm. 1974).

Miscellaneous 8

Figure: 30,x

Paste: pink (5 YR 7/4); fine texture and fine temper.

Surface: heavily patinated, but appears to be same colour as paste.

Form: vessel with slightly flaring, outslanting sides, slightly thickened rim, rounded lip, and a spike below lip.

Dimensions in cm.: wlt. - .5, ht. - unknown, dia.-24.

Discussion: This sherd is probably from an incensario.

Miscellaneous 9

Figure: 31,a

Paste: light reddish brown (5 YR 6/4); medium texture with medium temper; medium hardness.

Surface: red (10 R 4/6) finish applied to inner rim and exterior of vessel; smooth and hard.

Form: large jar with short, straight neck and outflaring rim.

Dimensions in cm.: wlt. -.5, ht. - unknown, dia.-22.

Discussion: This jar is possibly Late Classic or Early Postclassic. It is well preserved because it was deposited in a cave.

Miscellaneous 10

Figure: 31,b

Paste: very pale brown (10 YR 7/4); medium texture with a fine temper; hard.

Surface: general slipped surface is light red (2.5 YR 6/8); smooth; hard; interior is heavily fire-clouded, and interior bottom is smooth but unfinished; shallow groove around vessel 1 cm. below lip.

Decoration: decorated on exterior with two bands of red (7.5 YR 4/8); one 1.5 cm. wide beginning 1.5 cm. below the lip, and other just above the basal break.

Form: bowl with flat bottom and outslanting sides, tapered rim, rounded lip.

Dimensions in cm.: wlt. - 1.6, ht. 8, dia.-27.

Discussion: Gareth Lowe indicated that this cave-find appears similar to Berriozabal Polychrome, named after a cave in which it is found near Tuxtla Gutierrez (Pers. Comm. 1974); it might be a Late Classic sherd.

Miscellaneous 11

Figure: 31,c

Paste: very pale brown (10 YR 7/3), medium texture, fine temper.

Surface: dark brown (7.5 YR 4/2), but possibly results from a soil stain, as there appears to be a thin red slip underneath; smooth and polished inside and out.

Decoration: a groove 1.5 cm. below the rim, and an incised cable design 2.5 cm. wide, beginning 3 cm. below the rim, of two interwoven bands of three parallel lines each with cross hatching in the centre. It has been sketched from memory.

Form: a bowl with vertical or slightly outslanting sides, slightly thickened rim, rounded lip.

Dimensions in cm.: wlt. - .5, ht. - unknown, dia.-13.

Discussion: Jorge Muricumbo indicated that this vessel is probably Postclassic (Pers. Comm. 1974).

Miscellaneous 12

Figure: 31,d

Paste: light reddish brown (5 YR 6/3); fine texture; fine temper; hard.

Surface: all of the surface is fire clouded in light brown and grey; smooth with a dull polish.

Decoration: band of red (7.5 YR 4/8) around rim.

Form: bowl with flat bottom and outslanting sides, tapered rim, pointed lips.

Dimensions in cm.: wlt. - .5, ht. - 4, dia.-13.

Discussion: Jorge Muricumbo indicated that this vessel is Late Classic (Pers. Comm. 1974).

Miscellaneous 13

Figure: 31,e

Paste: pink (5 YR 7/4) coarse texture and temper; medium hard, evenly fired.

Surface: light reddish brown (5 YR 6/3) appears to have been the colour of the original surface; original surface rough; soft and sandy; powders in the hands.

Form: bowl with flat bottom and gently outslanting, outflaring sides, tapered rim, rounded lip.

Dimensions in cm.: wlt. - .8, ht. - 6, dia.-20.

Discussion: The paste of this vessel appears to bear some relationship to the Santa Teresa groups, although the surface treatment is different. Consequently, it might date to the Terminal Late Classic or Postclassic periods.

Miscellaneous 14

Figure 31,f

Paste: reddish brown (5 YR 5/4); medium texture and temper; medium hardness; evenly fired.

Surface: reddish yellow (5 YR 6/6); very smooth on exterior, inner surface is rougher with horizontal brushing marks.

Decoration: incised band encircles the orifice, .5 cm. below the lip.

Form: a tecomate, two associated body sherds suggest a squat, teardrop shape; two holes drilled from outside 3 cm. below the rim, probably for suspension.

Dimensions in cm.: wlt. - .8, ht. - 27 (by estimate), dia.-12.

Discussion: This vessel is well preserved because it was deposited in a cave; its temporal placement is unknown.

Miscellaneous 15

Figure: 31,g

Paste: light reddish brown (5 YR 6/4); medium texture and temper; medium hardness, grey interior from uneven firing.

Surface: reddish brown (5 YR 5/3), but with many grey firing clouds; surface has a sheen, but is rough, with uneven, deep criss-cross brushing marks over body; more even horizontal brushing marks on interior and exterior rim.

Form: collared jar with slightly flaring rim, rounded lips.

Dimensions in cm.: wlt. - .4, ht. - approx. 24, dia.-18.

Discussion: This jar is well preserved because it was deposited in a cave. Its temporal placement is unknown.

[redacted]

APPENDIX II

Cave Reports

The following reports of caves were received:

1) several still uninvestigated caves exist in the potrero del cerro of the Finca Buenas Aires in the Yayahuita Valley, and there is a cave near the milpa in the lower lands, to which Don Avelardo could lead us (see Ch- 6,7,8,12);

2) Buffrano Ramires of Regadillo, Yayahuita Valley, reports that his brother who lives in Las Flores knows of a mountain cave from which figurines have been taken;

3) Octavio Lopez of the town of Chicomucelo reports that his cousin Hedaro Lopez of Regadillo, knows of a large cave from which ceramics and figurines have been taken (this may be the same cave as the preceeding report);

4) Bordez Garcia Tobar, of the Finca San Miguel and encargado of the Finca Reforma, both near the Chicomucelo - Comalapa road, knows of a mountain cave from which ceramics have been taken;

5) Domingo Peres of El Paraiso, Tachinula Valley, has an entire Chinautla Polychrome vessel from a mountain cave (see Plate 5,c);

6) Emberto Rodrigez Consino, of Jobo, in the Valley north of the Yayahuita, knows of a cave with a large painting of a turkey;

7) a report was investigated of a large "Church Cave" with paintings, one hours walk into the mountains behind Nueva Pacayal, Bella Vista, and the "paintings" were found to be natural rock colouring.

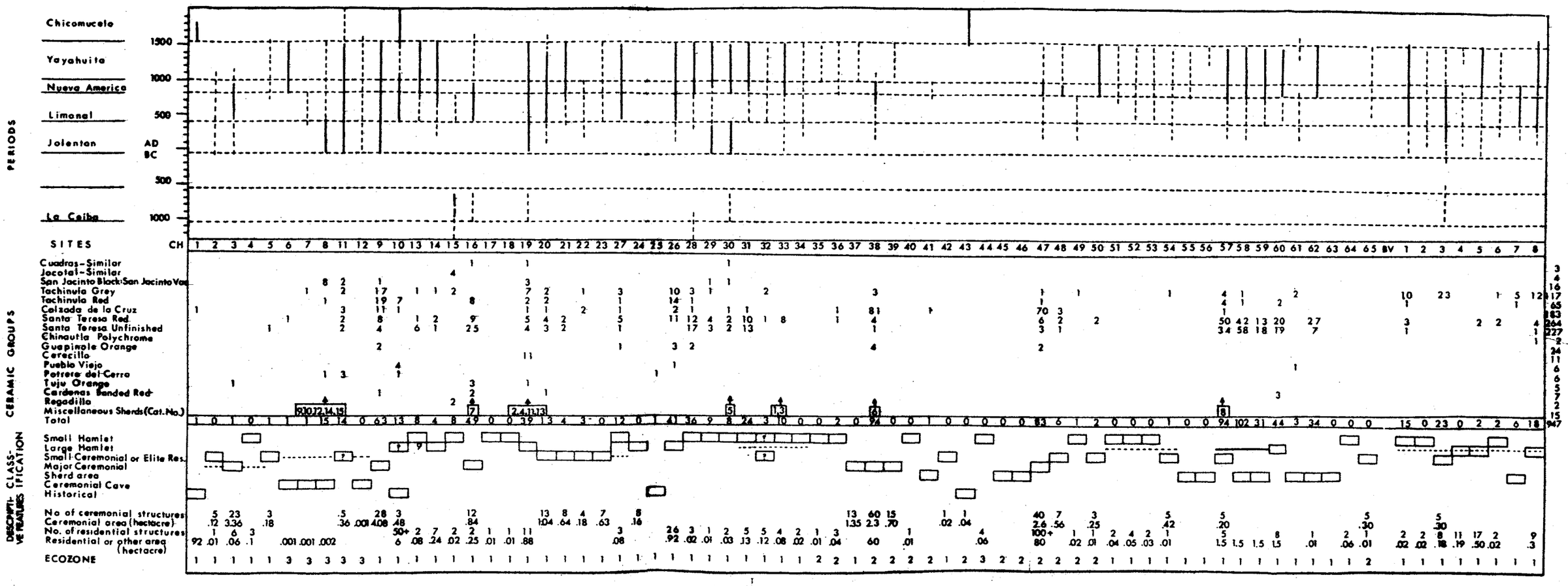


Table 1. Site Description Chart

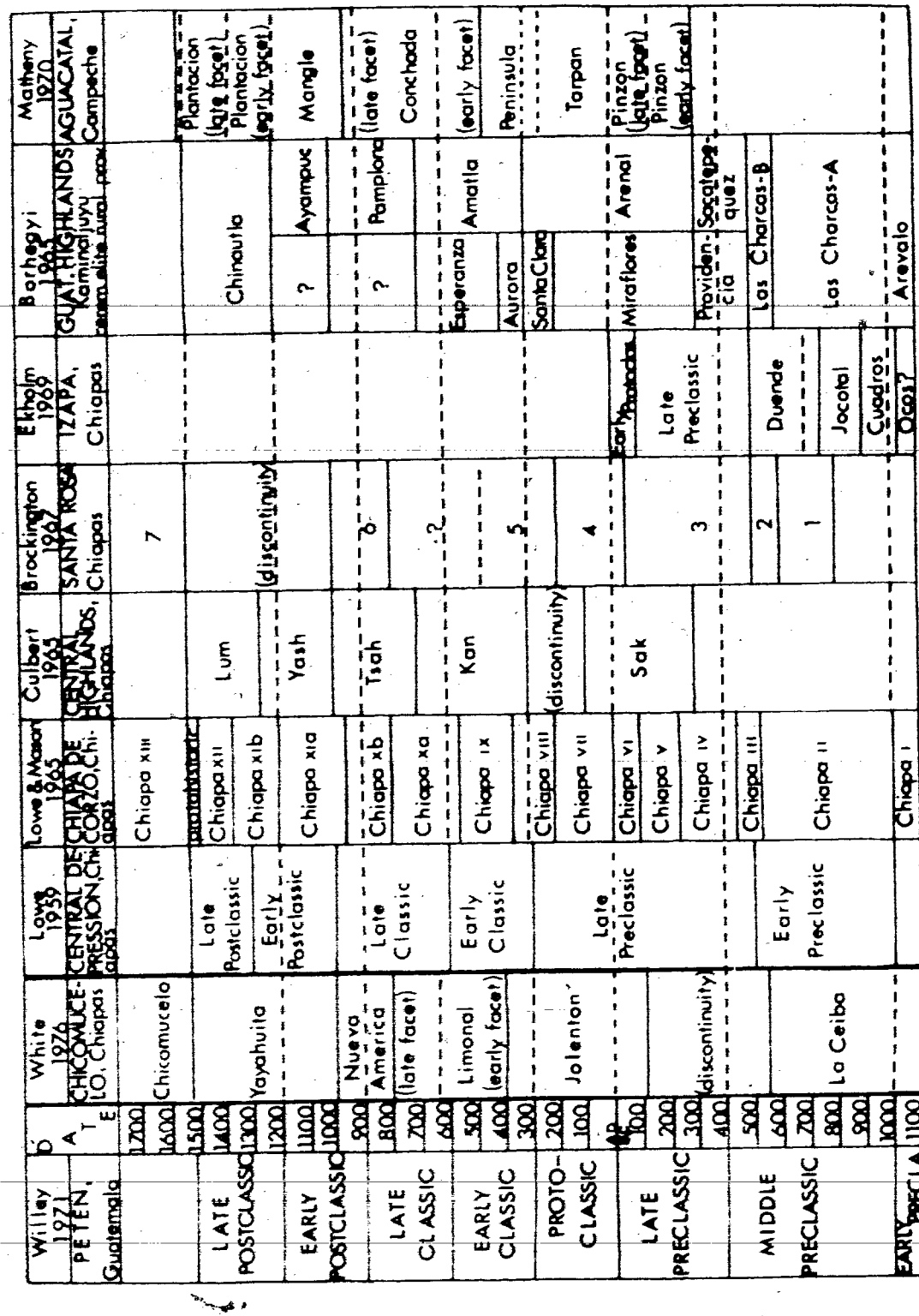


Table 2. Chronological Divisions for Chicomucelo and Surrounding Areas

	Site Type	ECOZONE 1		ECOZONE 2		ECOZONE 3		Total
		Certain	Possible	Certain	Possible	Certain	Possible	
LIMONAL PERIOD	SH	Ch-27 BV-1	Ch-13,15,28,29,31, 33,34,51,52,53, BV-2,6		Ch-49			15
	LH	Ch-19,26 BV-8	Ch-10,14,60, BV-4,5					8
	SCER	BV-3	Ch-2,20,21,22, 23,32,54,57		Ch-65	Ch-11		11
	MC	Ch-3,9,16			Ch-38,47			5
	SA	BV-7	Ch-58,59,61					4
	CC						Ch-7,8,12	3
	Total	10	28	0	4	1	3	46
JOLENTON PERIOD	SH	Ch-29,30	Ch-33,34 BV-1,2,6		Ch-49			8
	LH	Ch-19	Ch-14,26 BV-4,5,8					6
	SCER	Ch-2	Ch-2,20,22,54, 57, BV-3			Ch-11		7
	MC	Ch-9	Ch-3		Ch-38,49			4
	SA		Ch-58, 61					3
	CC					Ch-8		1
	Total	5	19	0	3	2	0	29
LA CEIBA PERIOD	SH	Ch-15	Ch-16,28,30					4
	LH		Ch-19					1
	SCER		BV-3					1
	MC							0
	SA							0
	CC							0
	Total	1	5	0	0	0	0	6

Table 3. Chiconcelo Site Occupation by Period

	Site Type	ECOZONE 1		ECOZONE 2		ECOZONE 3		Total
		Certain	Possible	Certain	Possible	Certain	Possible	
CHICOMUCELO PERIOD	SH							
	LH	BV-8						1
	SCER		CH-20				CH-11	2
	MC		CH-16					1
	SA		CH-61					1
	CC							0
	HIST	CH-1, 10, 25		CH-43				4
	Total	4	3	1	0	0	1	9
YAYAHUITA PERIOD	SH	CH-13,27,29,30-1,33; BV-1	CH-34 51, 52, 53; BV-2,6		CH-35,36			16
	LH	CH-14,19,26,60; BV-5,8	CH-10 BV-4					8
	SCER	CH-20,21,57	CH-2,5,23,32, 54; BV-3	CH-50	CH-39,48, 65	CH-11		14
	MC	CH-9,	CH-3,16,37	CH-38	CH-47			6
	SA	CH-58, 59,62	CH-55,56,61 BV-7					7
	CC					CH-6	CH-8,12	3
	Total	21	21	2	6	2	2	54
NUEVA AMERICA PERIOD	SH	CH-13,27,29,30-1,33; BV-1	CH-34,51,52, 53;BV-2,6		CH-36			15
	LH	CH-10,14,19,26,60;BV-5,8	BV-4					8
	SCER	CH-20,21, 22,57	CH-2,5,23,32, 54,65; BV-3	CH-48, 50		CH-11		14
	MC	CH-3,9, 16		CH-38, 47				5
	SA	CH-58, 59,62	CH-55,61, BV-7		CH-41			7
	CC					CH-6	CH-8,12	3
	Total	25	17	4	2	2	2	52

Table 4. Chicomucelo Site Occupation by Period

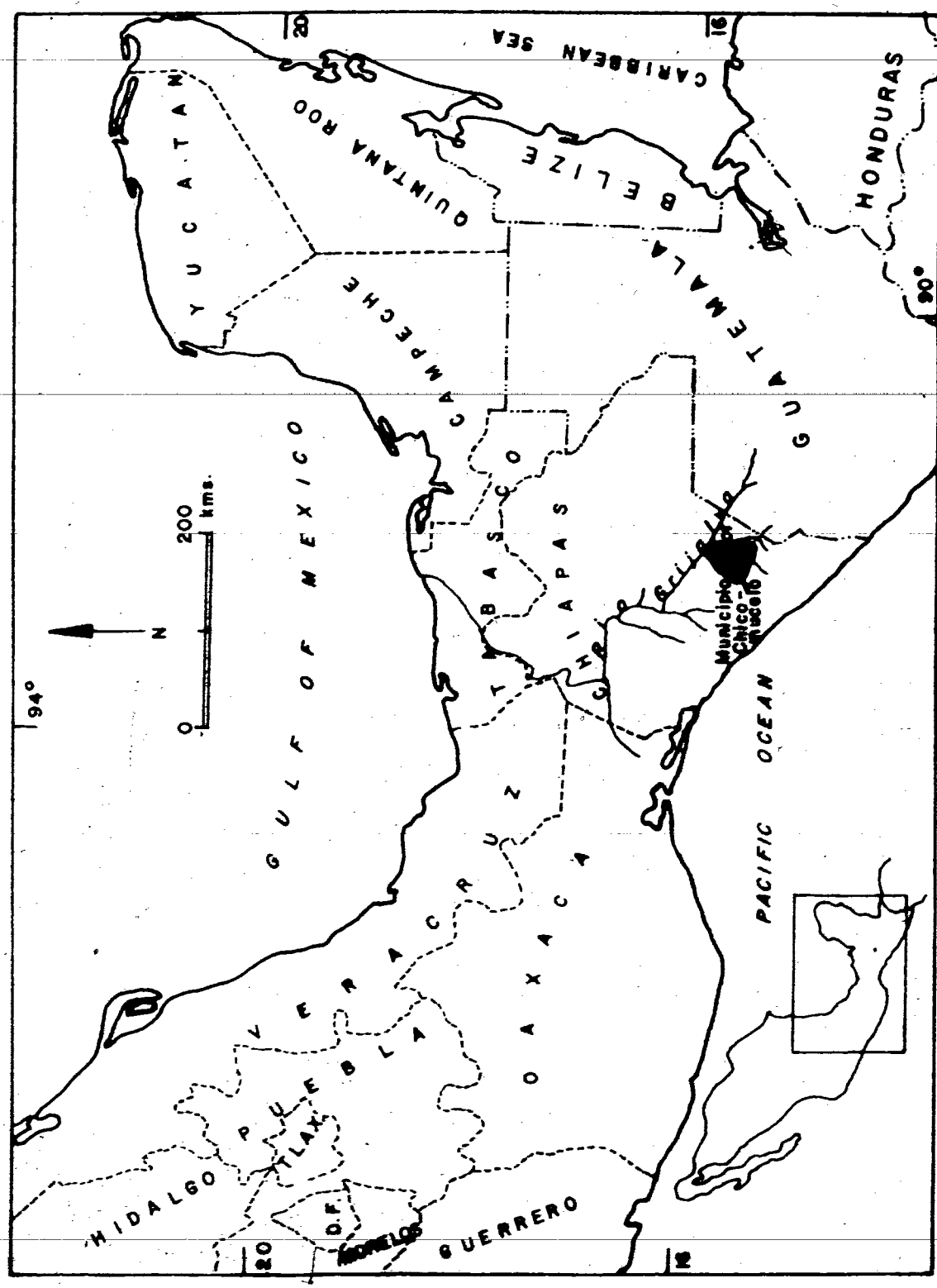
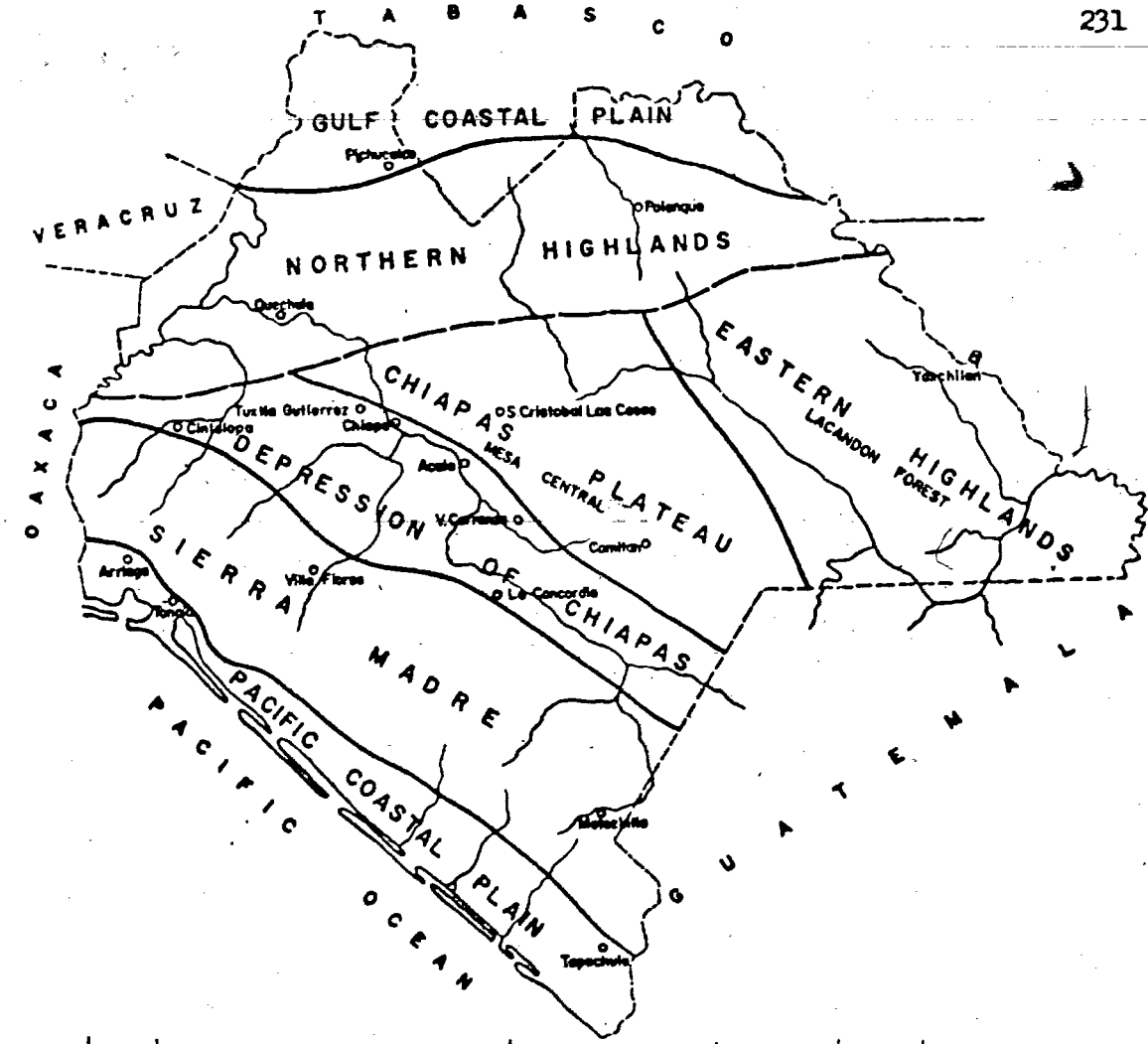
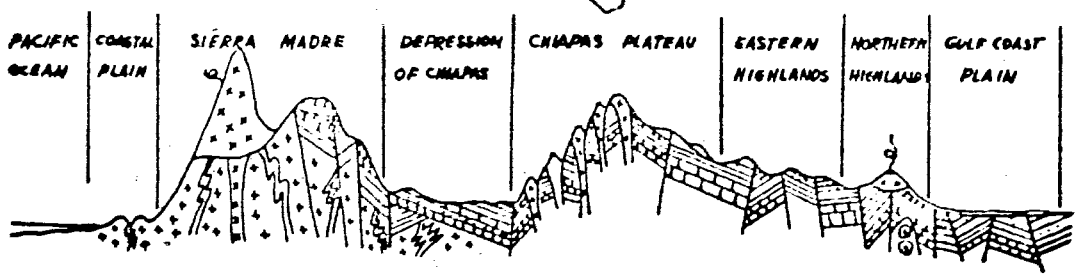


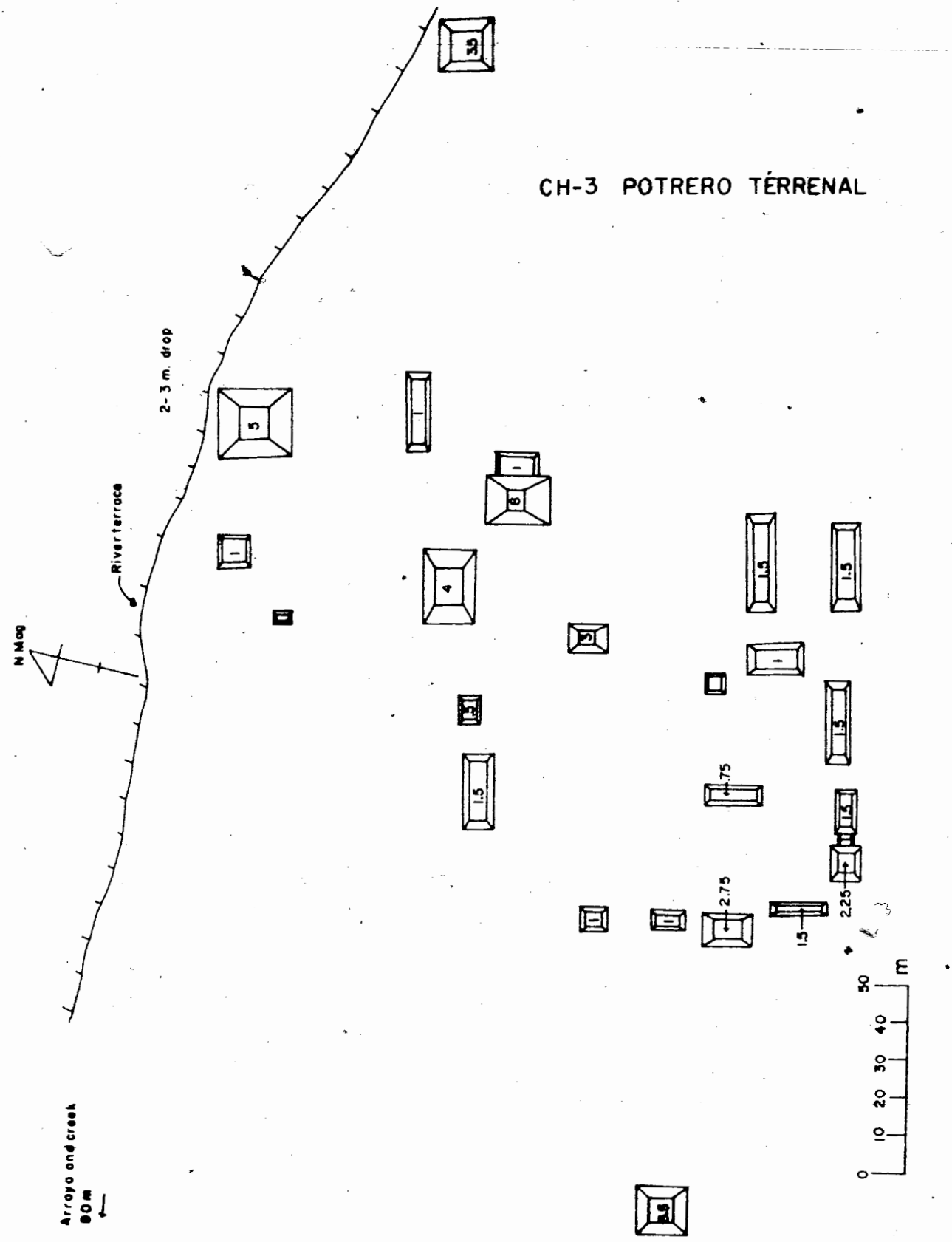
Figure 1. Location of the Municipality of Chicomucelo





Superficial deposits of the Quaternary and Pliocene
Volcanic rock (extrusive) of the upper Tertiary and Quaternary
Intrusive rock of the upper Miocene
Marine strata of the lower and middle Tertiary (Paleocene?, Eocene, Oligocene, lower and middle Miocene)
Marine strata of the upper Mesozoic (upper Jurassic, lower Cretaceous, middle Cretaceous and upper Cretaceous
Continental strata of the lower Mesozoic (end of the Triassic?, lower Jurassic and middle Jurassic)
Marine strata (limestones) of the middle Permian
Marine strata (slates) of the lower Permian
Metamorphic strata (crystaline schists) and intrusive rock of the Precambrian and Paleozoic

Figure 2,a,b. a. (above), Physiographic regions of Chiapas, and; b. (below), Schematic Geological Profile of Chiapas (from Lowe 1959).


CH-3 POTRERO TÉRRENAL
2-3 m. drop
River terrace
N Mag
Arroyo and creek
80m
35
5
1
8
4
3
1.5
1.5
1.5
1.5
1.5
.75
1.5
2.75
2.25
1.5
1.5
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10
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30
40
50
m

Figure 3

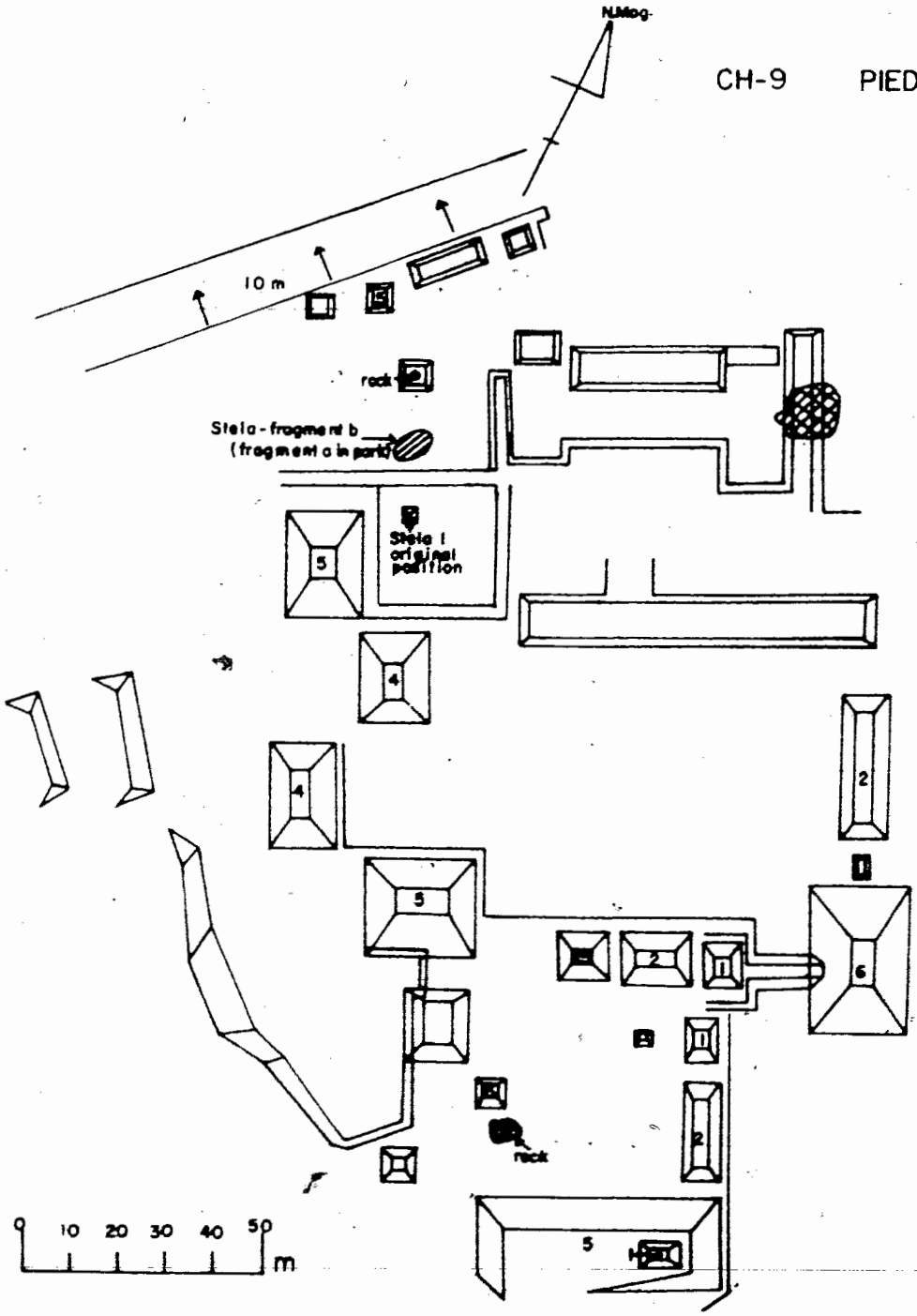

N.Mag.
CH-9 PIEDRA LABRADA
10 m
rock
Stela - fragment b
(fragment a in part)
Stela 1
original
position
5
4
4
2
5
2
6
2
5
rock
0 10 20 30 40 50
m

Figure 4

CH-10 PUEBLO VIEJO

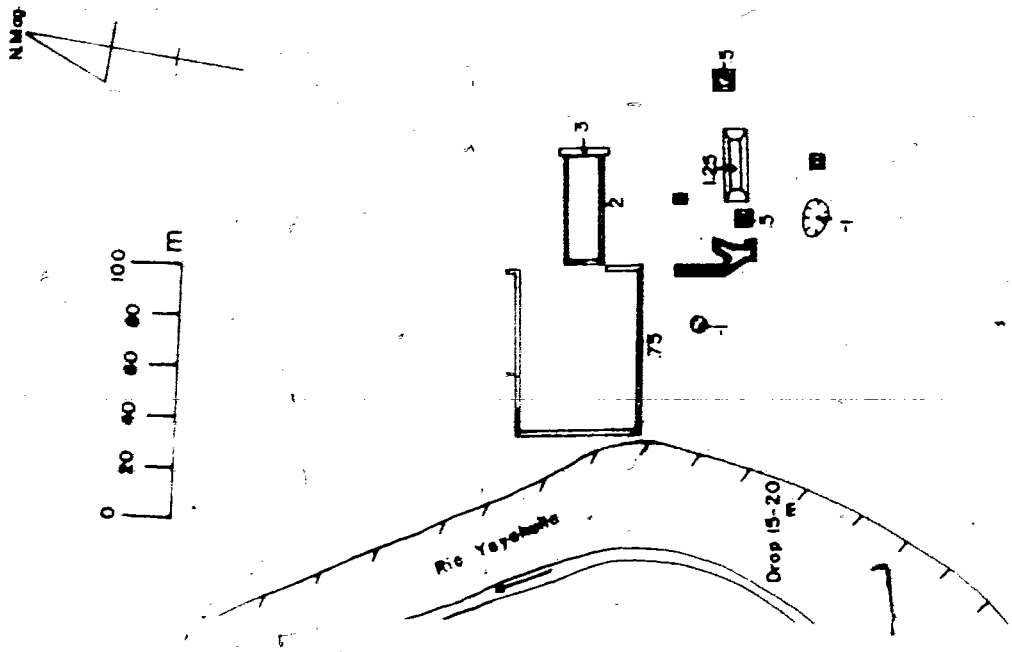


Figure 5

CH-16 TUJU

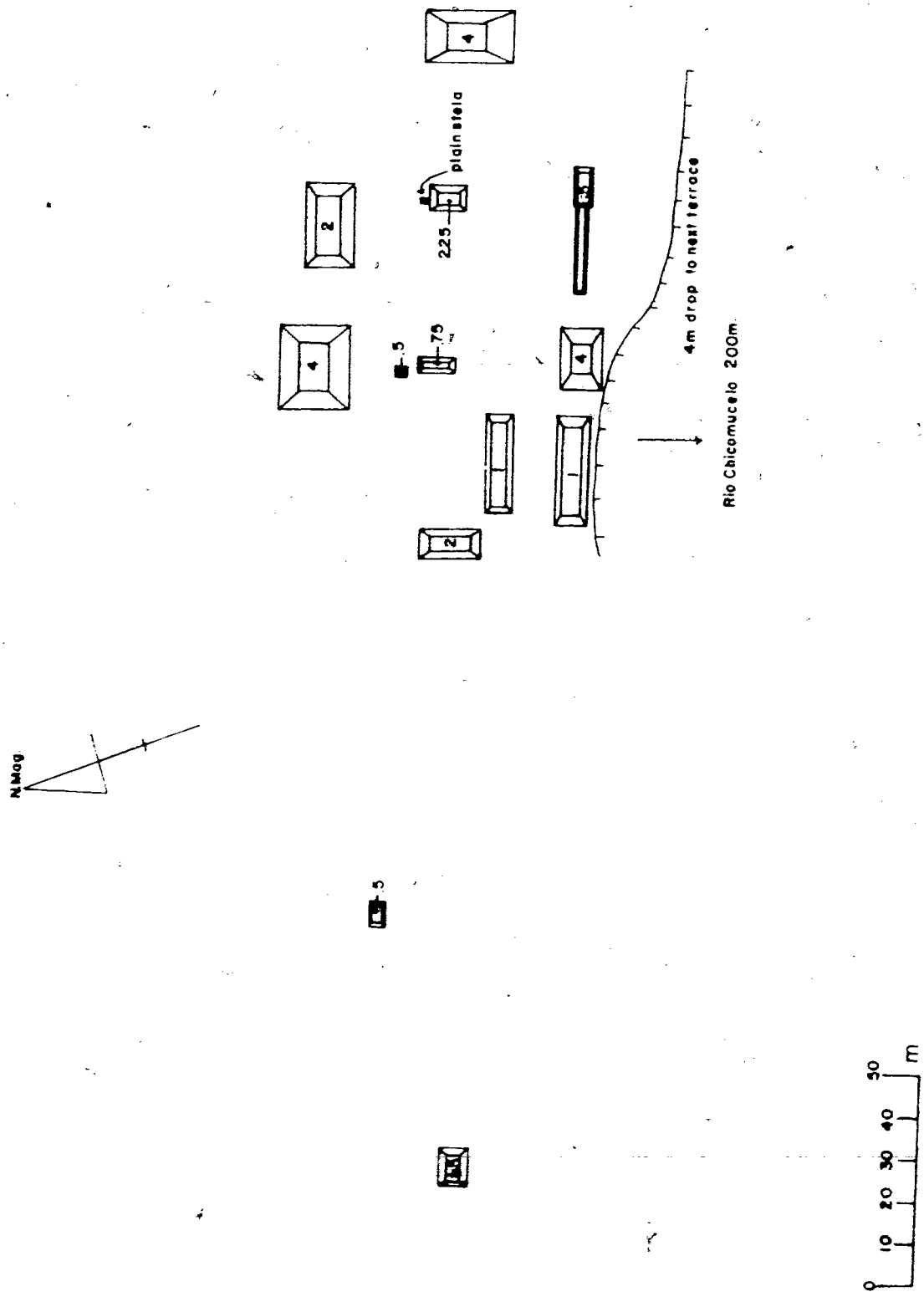


Figure 6

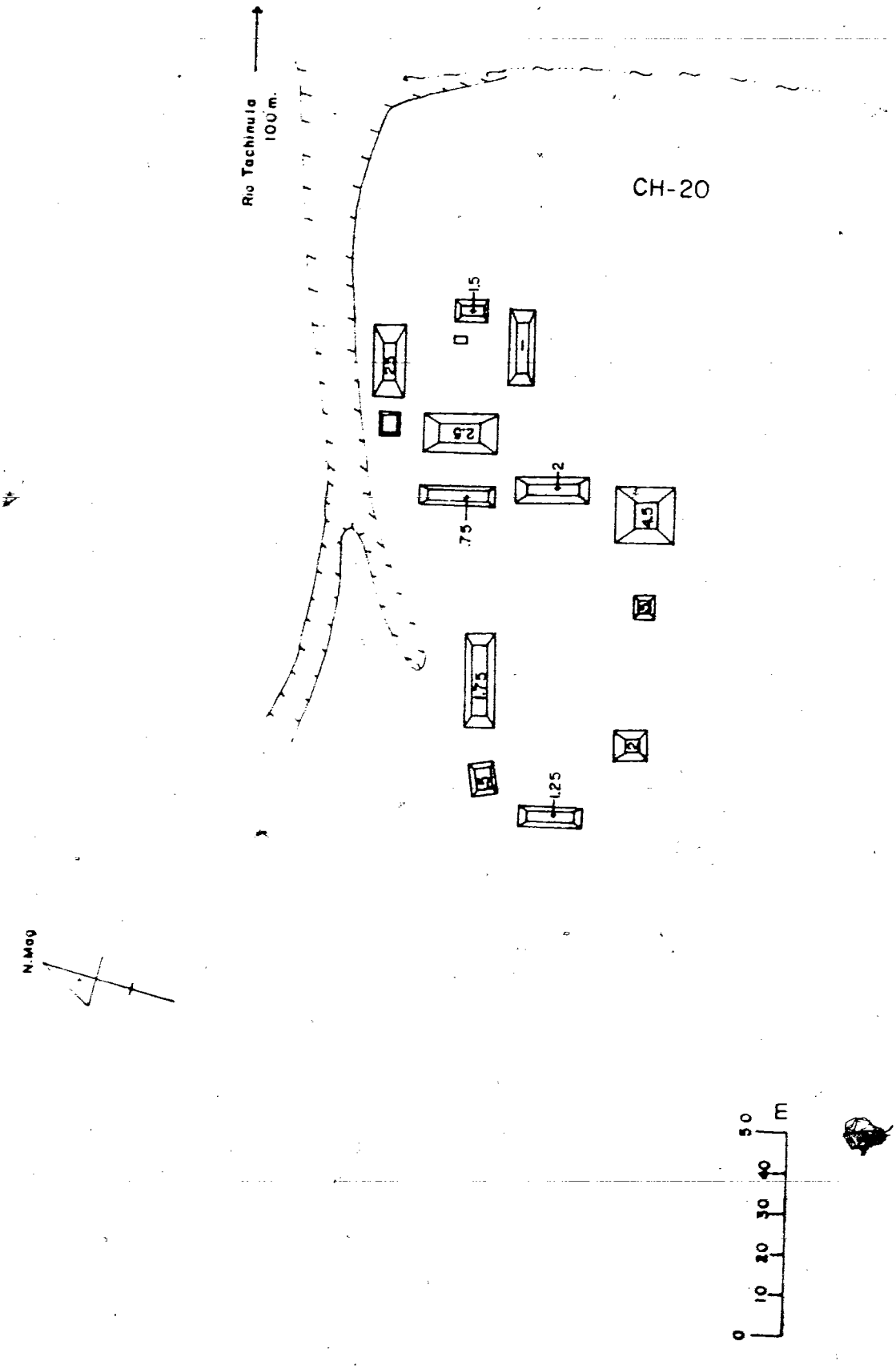

Rio Tachinula
100 m.
CH-20
1.5
2.5
2.5
2
.75
4.5
1.75
1.25
N.Mag
E
50
40
30
20
10
0

Figure 7

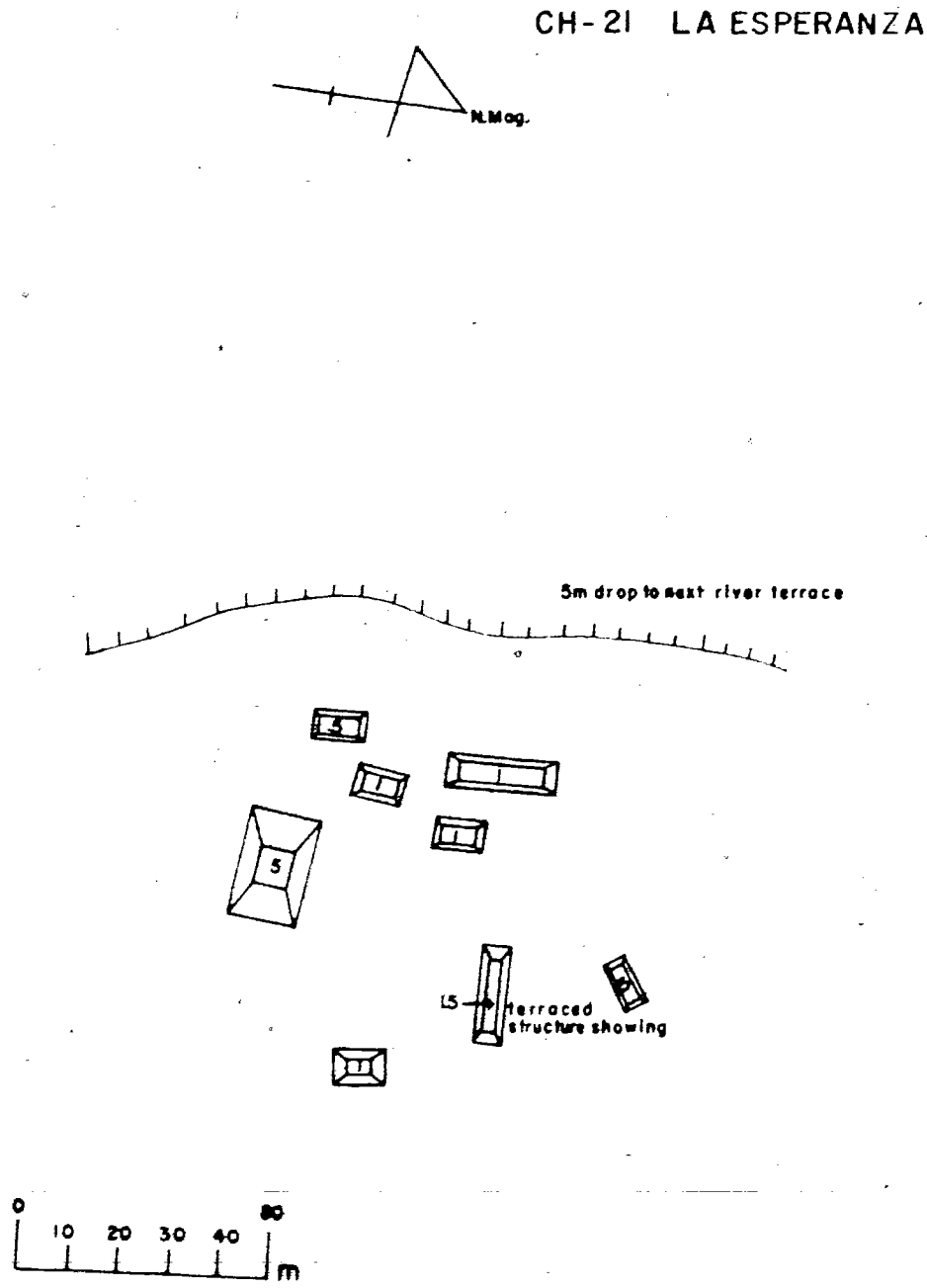

CH-21 LA ESPERANZA
N.Mag.
5m drop to next river terrace
3
1
5
1
LS
terraced structure showing
1
0
10
20
30
40
80
m

Figure 8

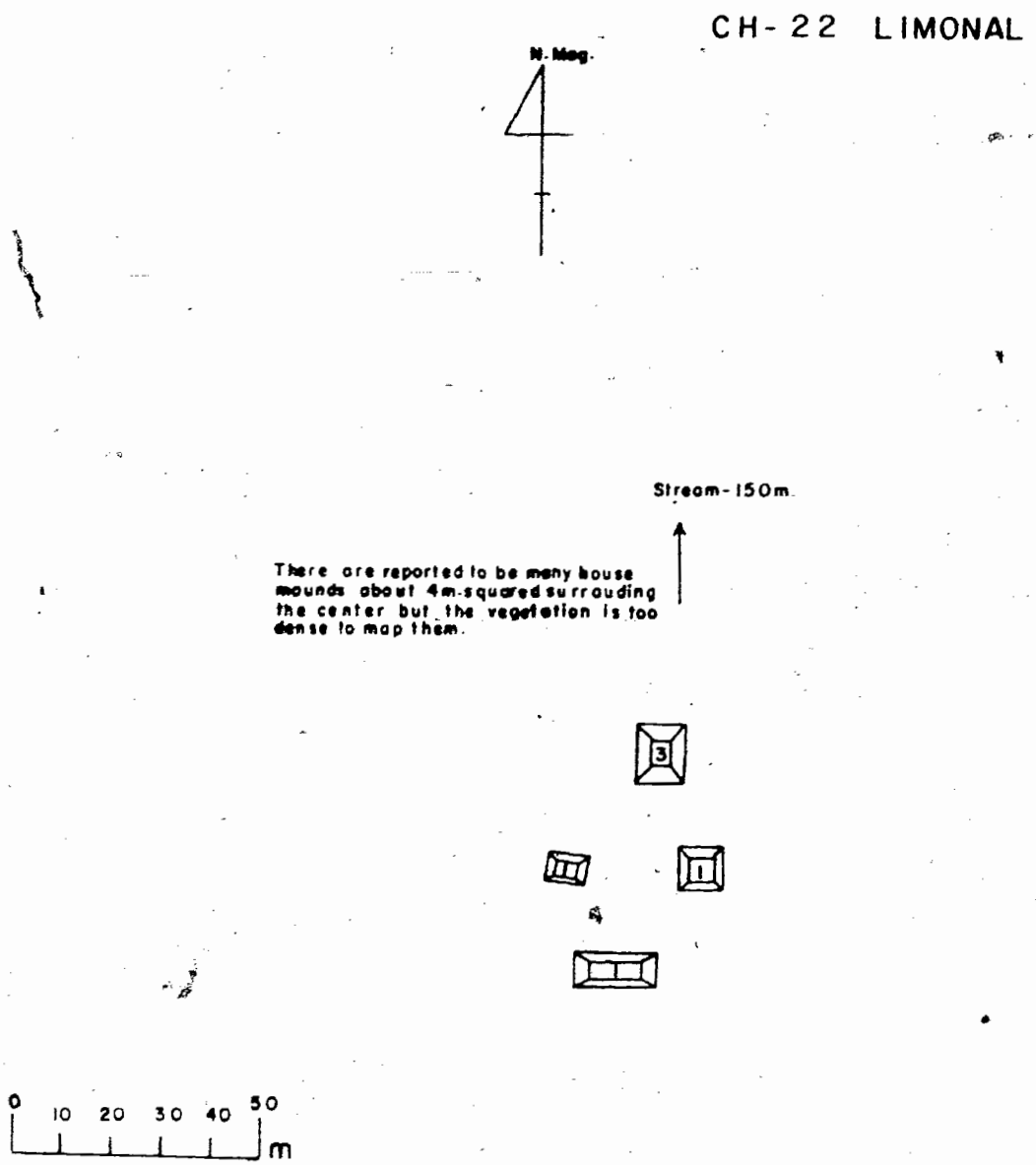

CH-22 LIMONAL
N. Mag.
Stream-150m.
There are reported to be many house mounds about 4m-squared surrounding the center but the vegetation is too dense to map them.
3
2
1
4
0 10 20 30 40 50
m

Figure 9

CH-26 ZAPOTE VENTANA

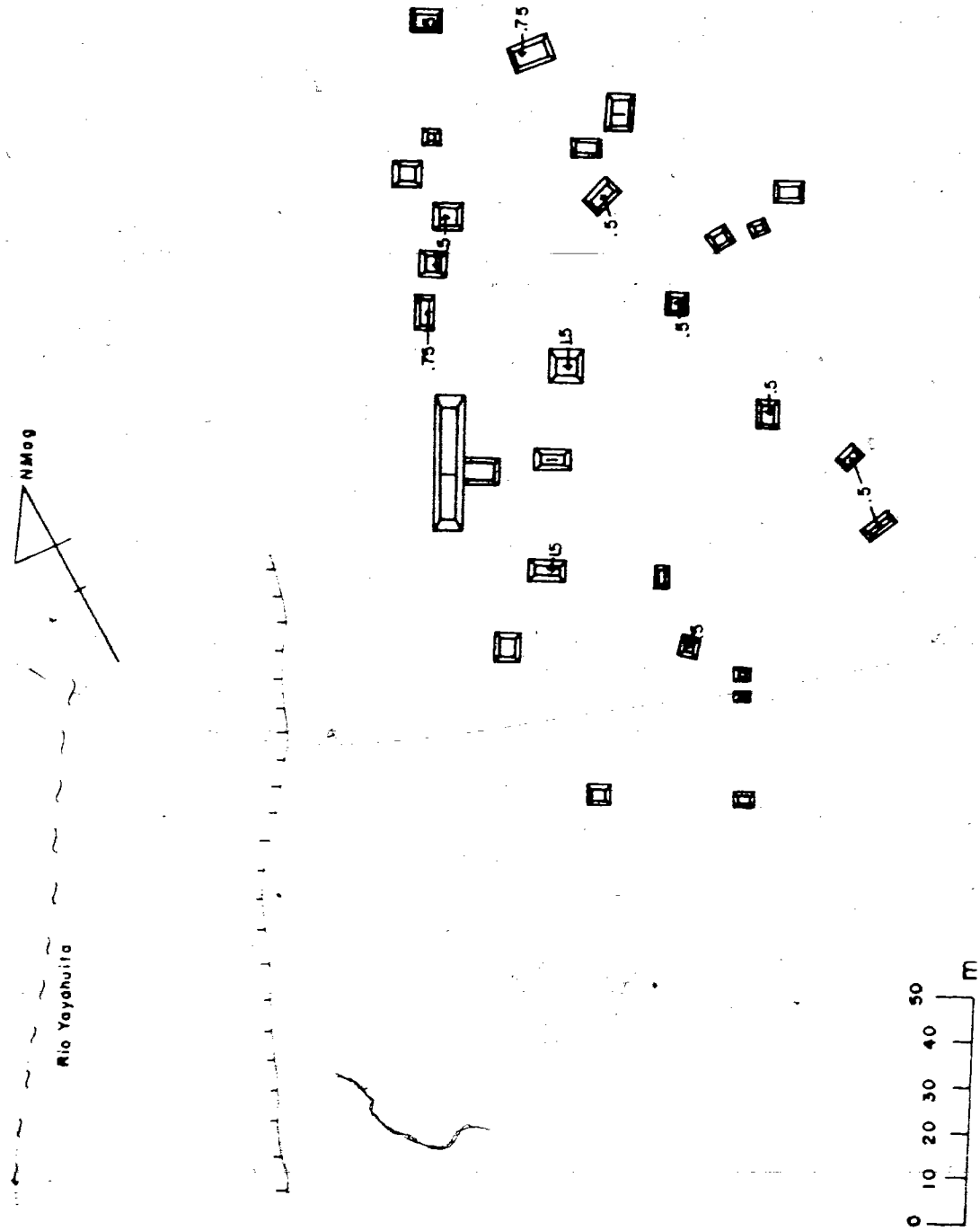
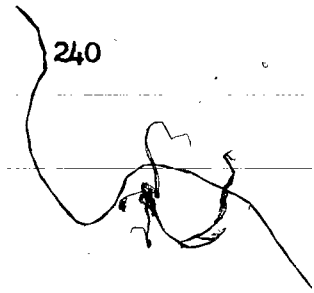
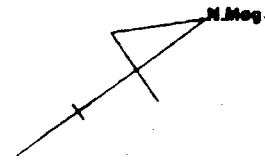
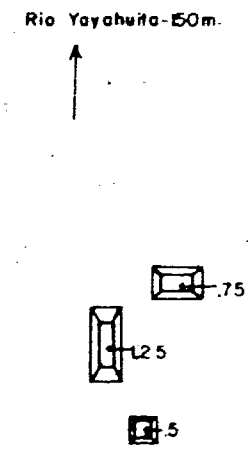


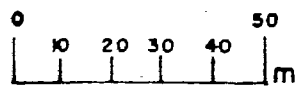
Figure 10



CH-27 LA PINTA 2







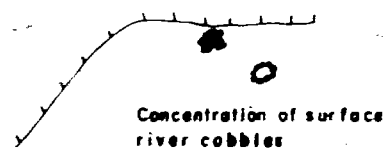


Figure 11

CH-37

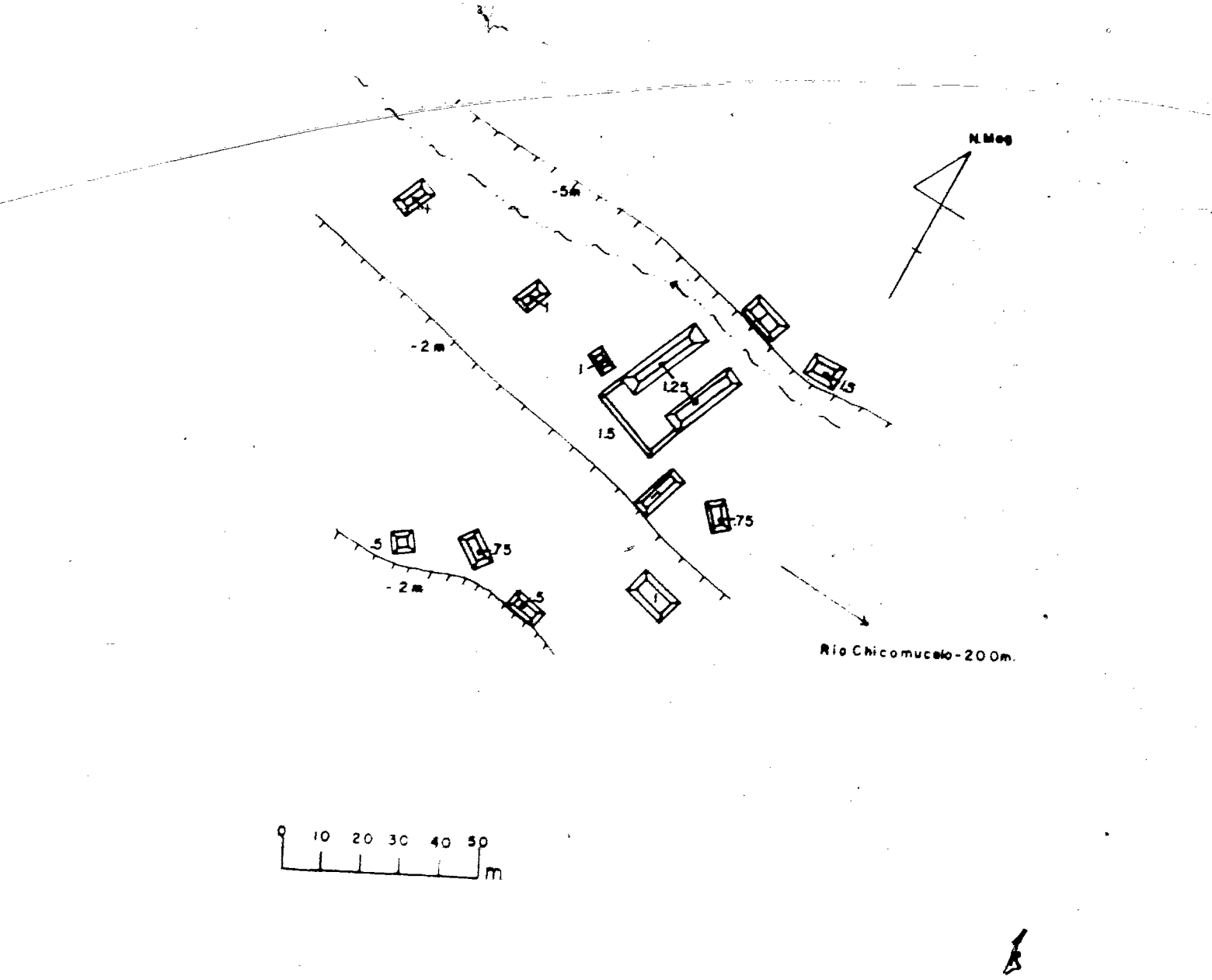


Figure 12

CH-38 CALZADA DE LA CRUZ

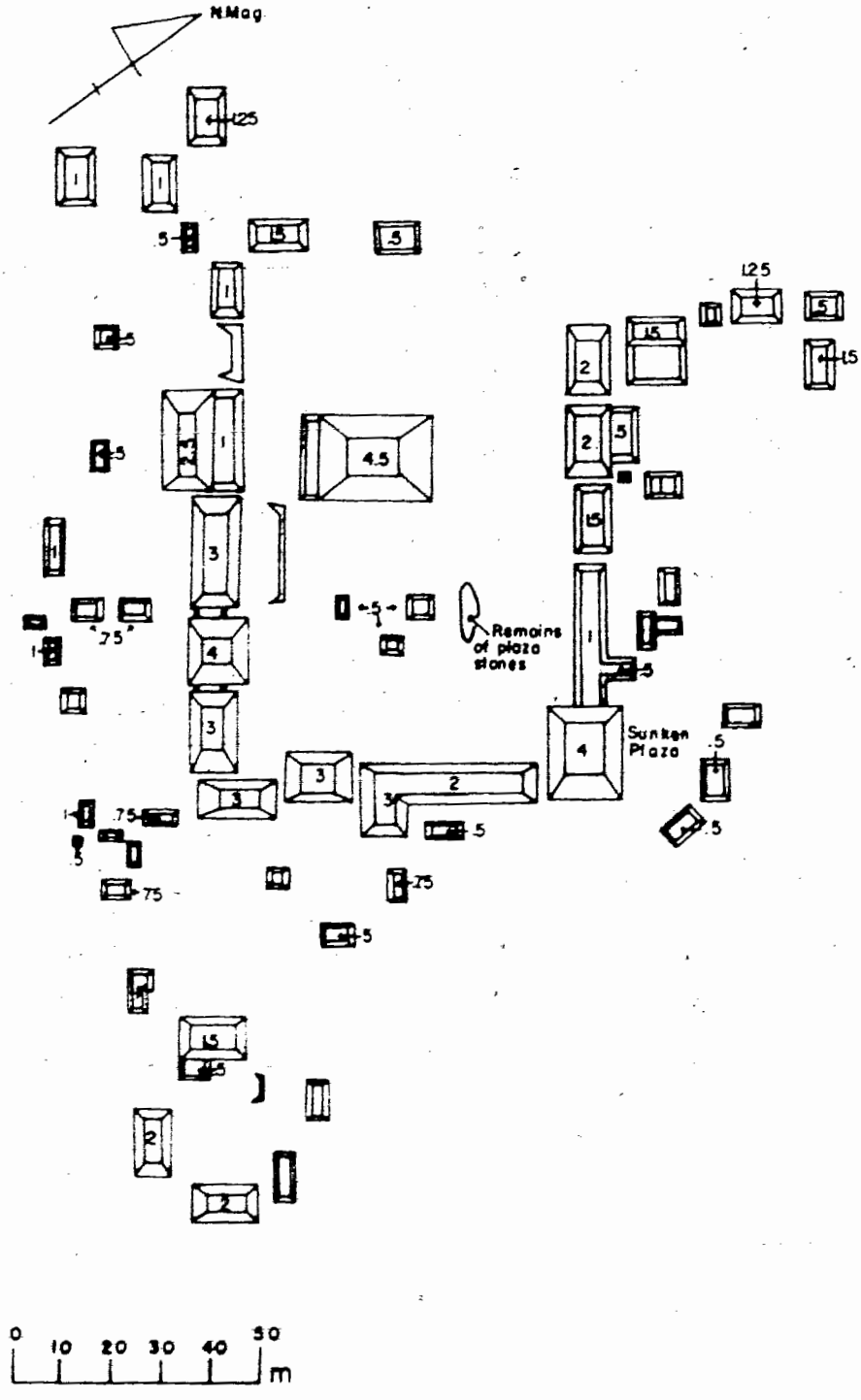


Figure 13

CH-39 JOBO I

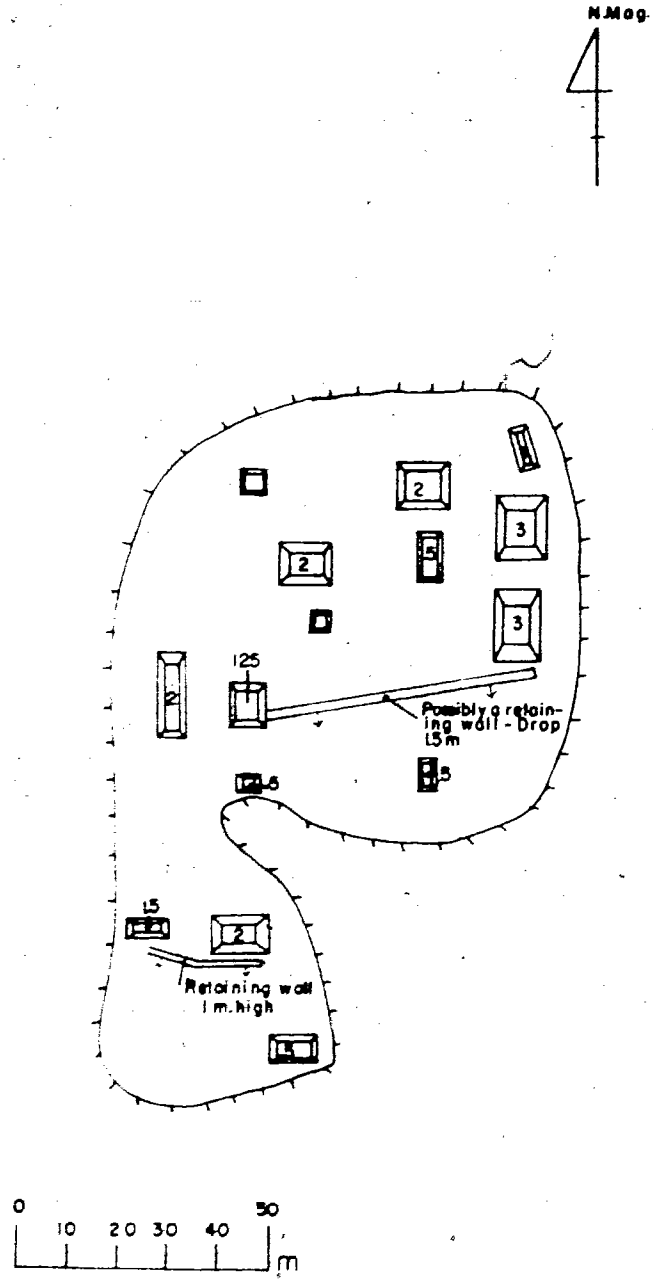


Figure 14

CH-47 ALFONSO CORONA DEL ROSAL

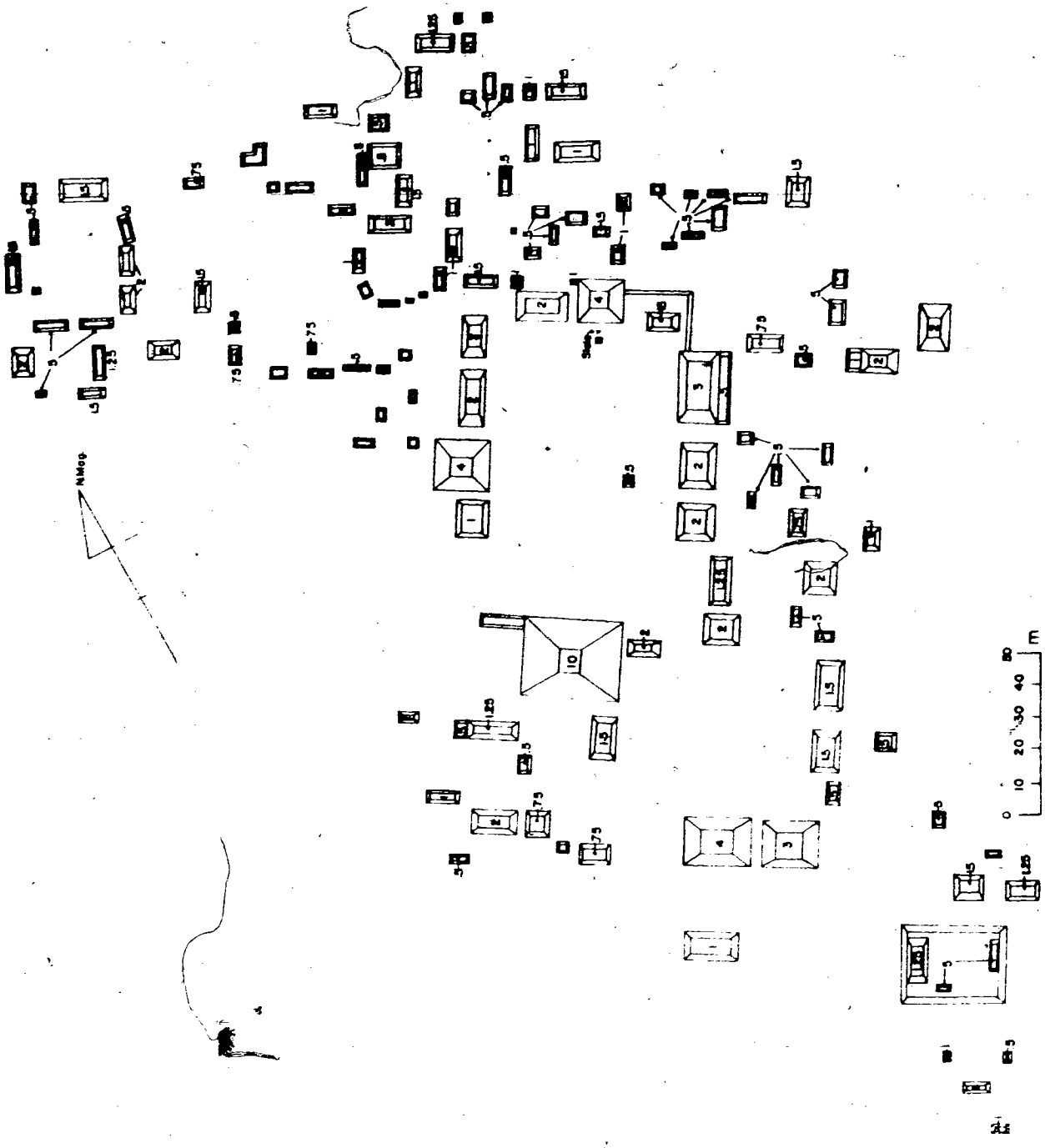


Figure 15

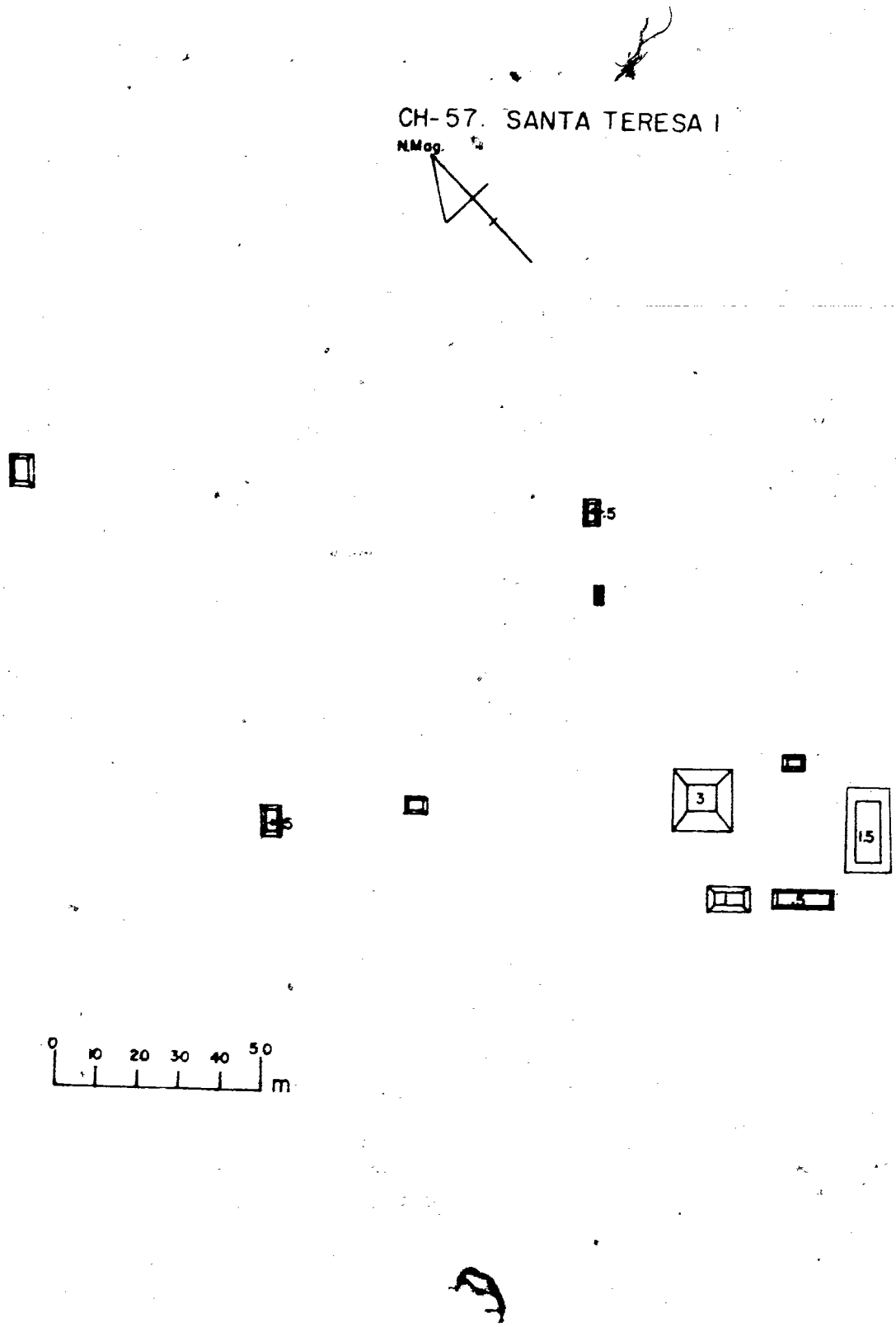
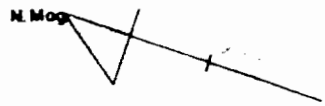
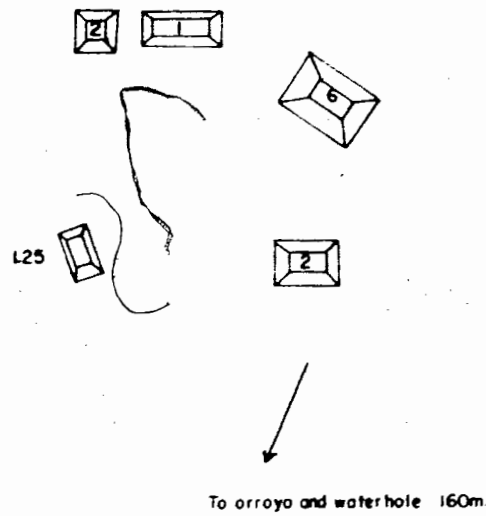


Figure 16

CH-65





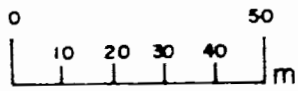


Figure 17

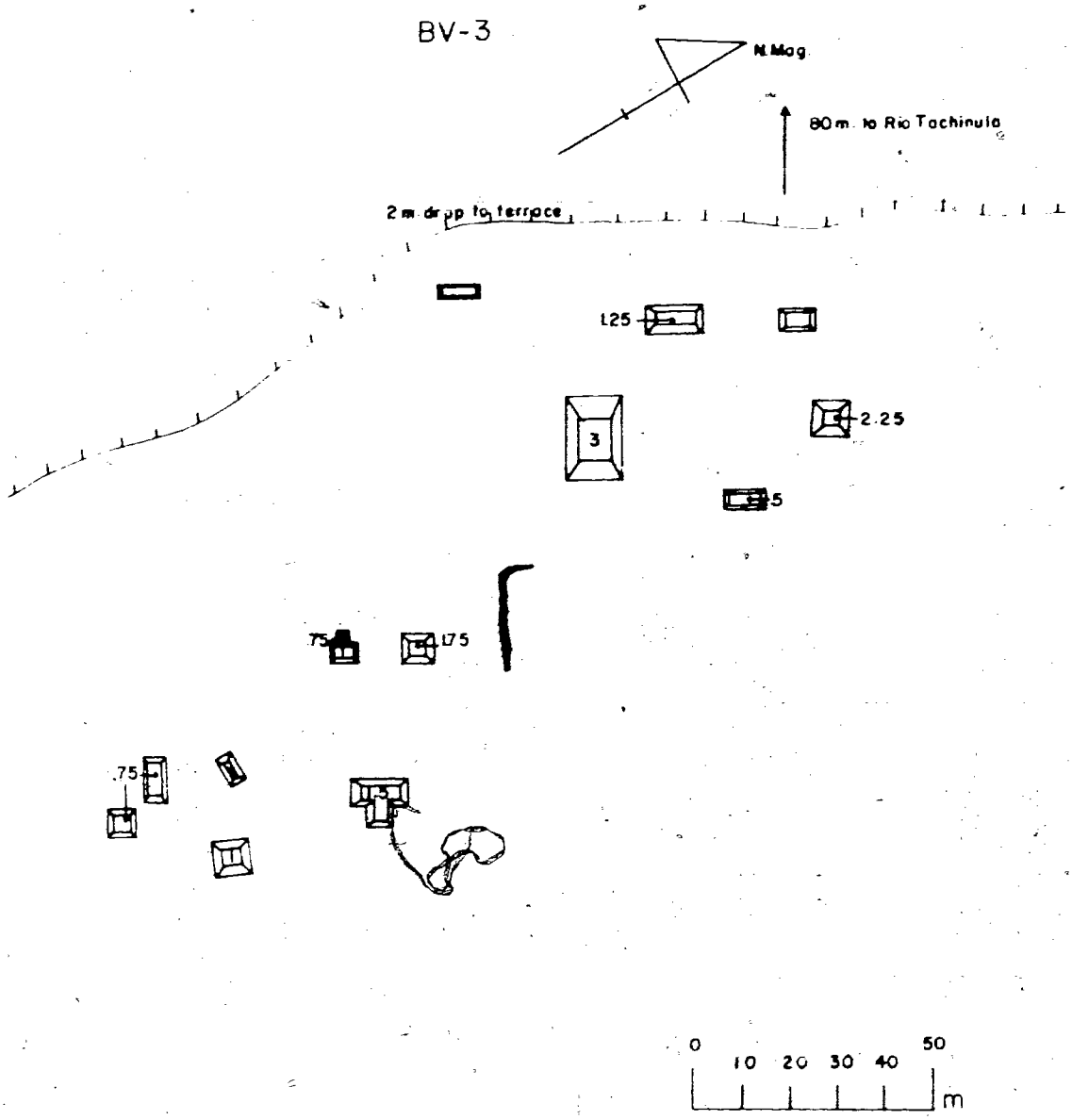

BV-3
N. Mag.
80 m. to Rio Tachinula
2 m. drop to terrace
1.25
3
2.25
.75
1.75
.75
0
10
20
30
40
50
m

Figure 18

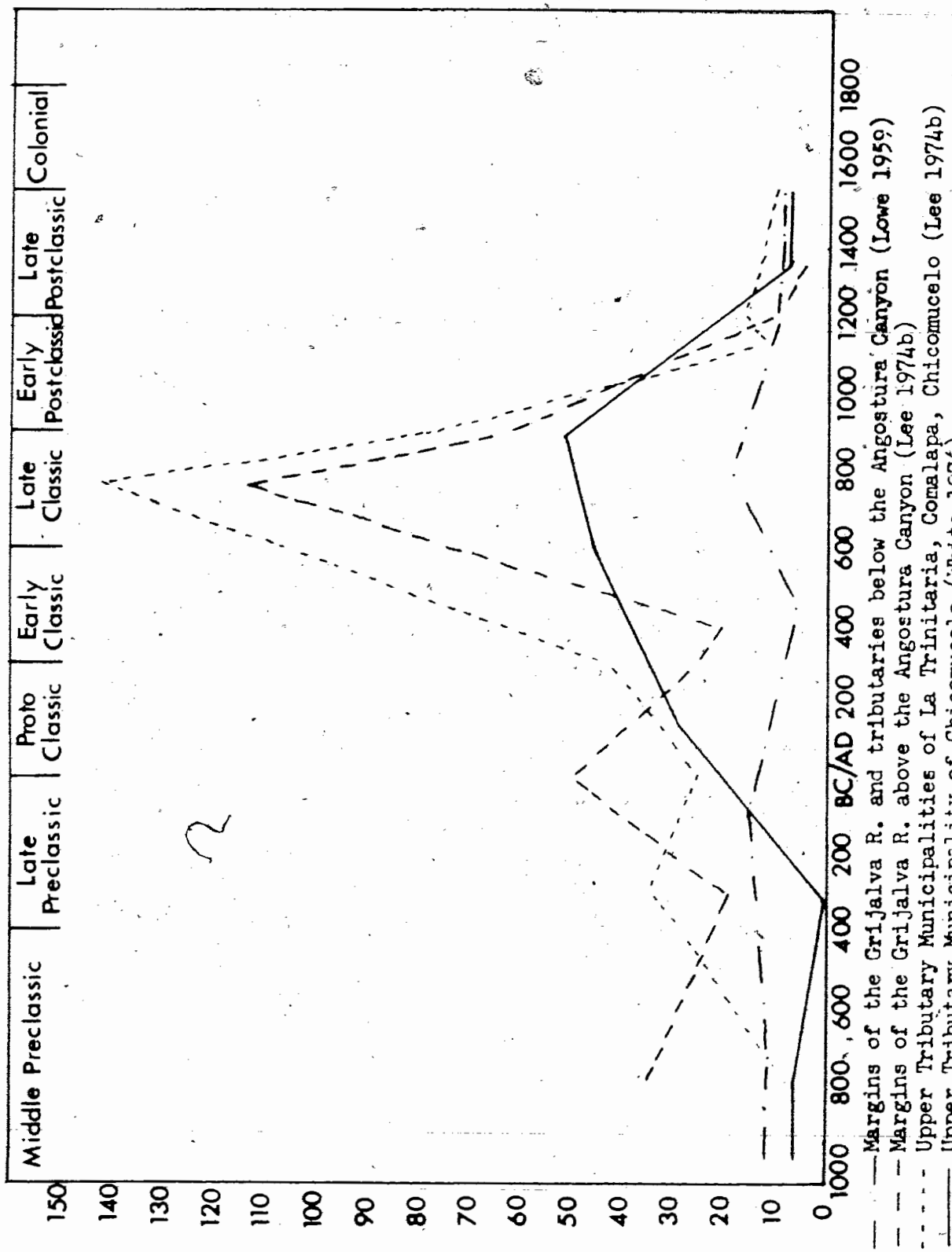


Figure 19. Site Frequency through Time in the Central Depression

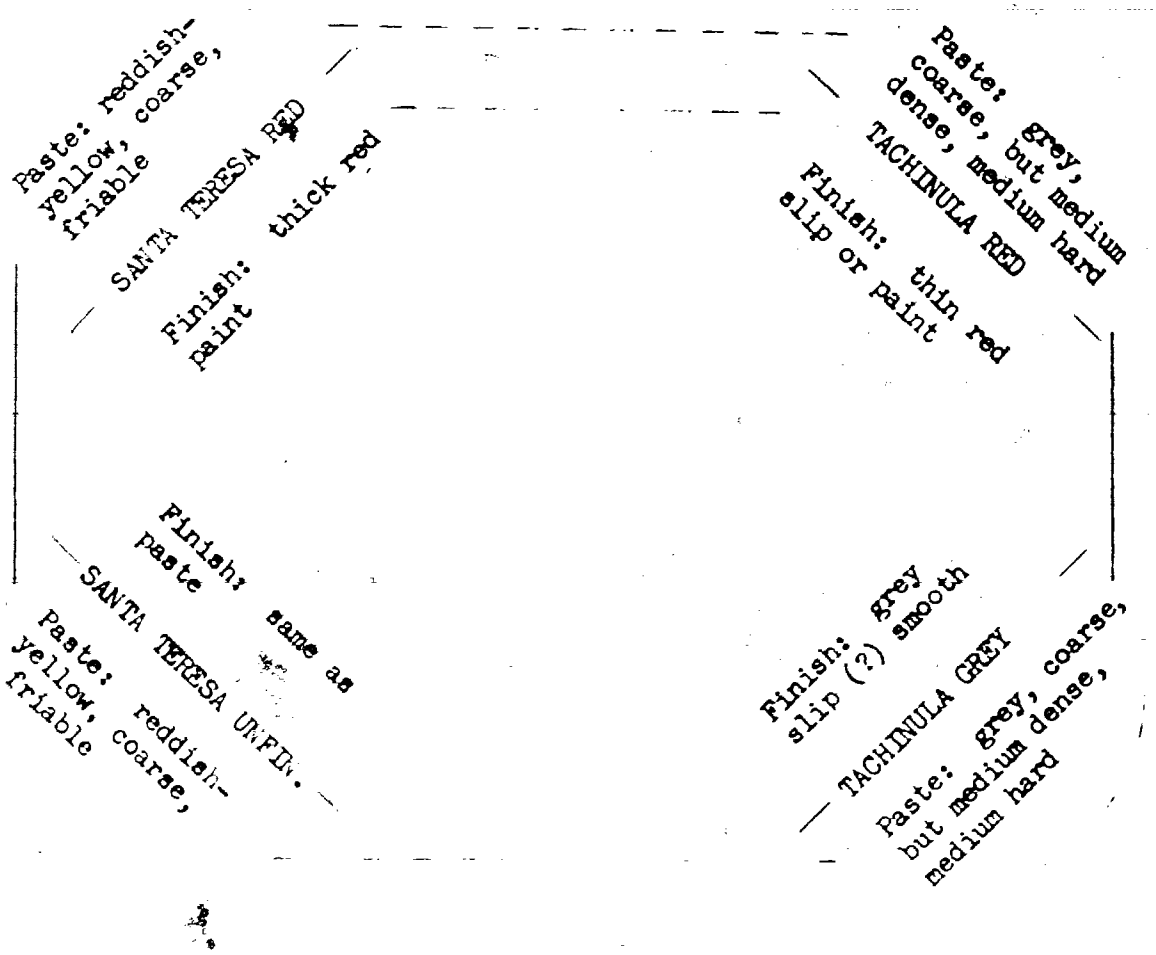


Figure 20. Idealized Relationships Between Major Ceramic Groups (relationship shown by distance and line density)

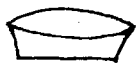
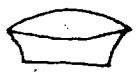
 Comale	 Jar with tall, vertical neck
 Bowl with concave, outslanting sides	 Jar with inslanting neck
 Bowl with incurving rim	 Jar with outflaring neck and rim
 Bowl with straight, outslanting sides and flat bottom	 Ladle incensario
 Bowl with outslanting, outflaring sides and flat bottom	 Jar effigy
 Bowl with everted rim and flat bottom	 Pedestal vessel
 Bowl with vertical sides	Vessel supports (various shapes)
 Basin (robust vessel with straight or slightly concave, outslanting sides)	Vessel handles (various shapes)
 Tecomate, or neckless jar	Body sherds
 Collared jar	Miscellaneous
 Jar with everted rim	

Figure 21. Recognized Ceramic Forms

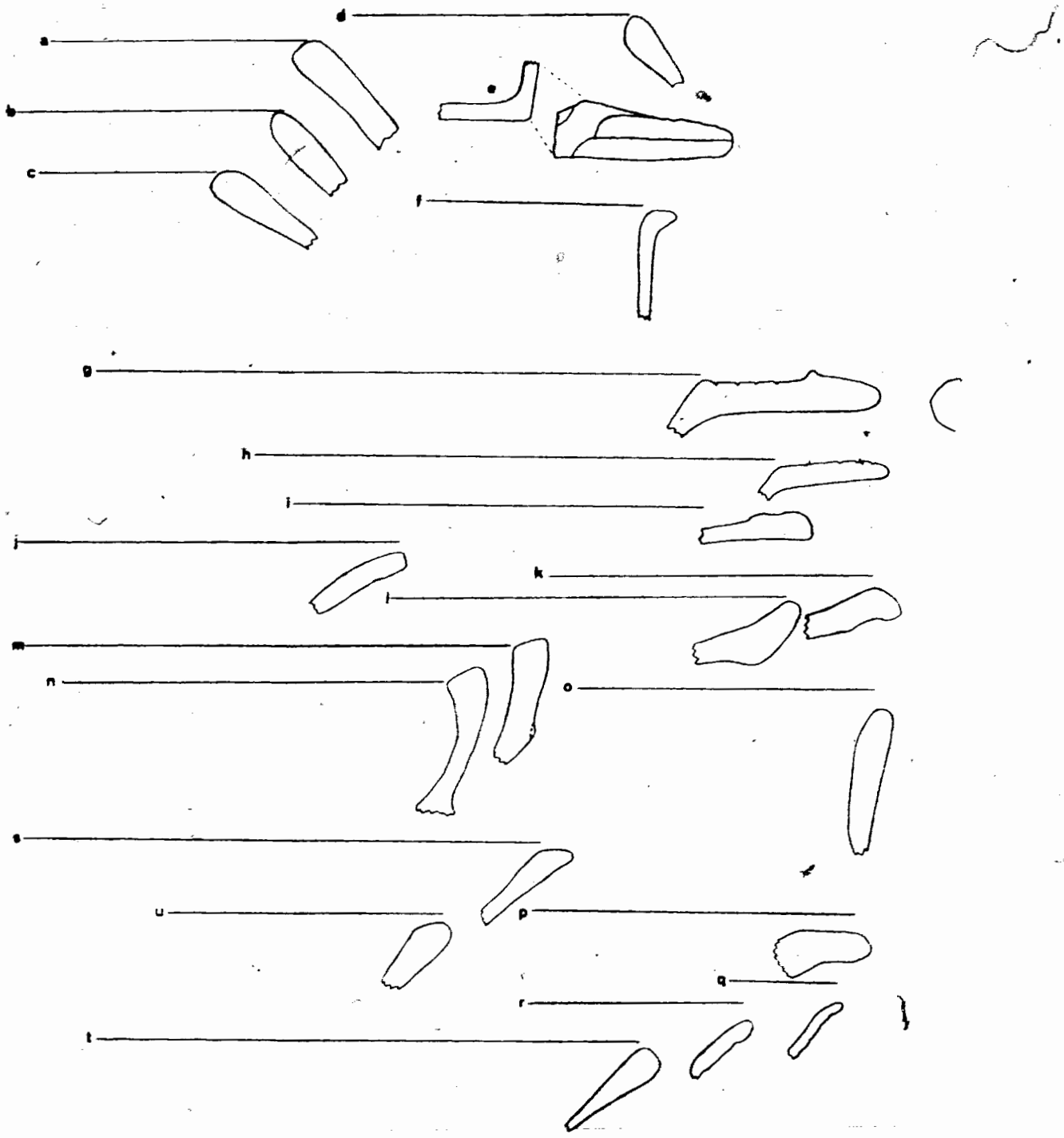


Figure 22. Cuadros-Similar Group, a-c; Cuadros/Jocotal-Similar Group, d,e; San Jacinto Black: San Jacinto Variety, f-i; Tachimula Grey Group, j-t. Scale: 44% of original.

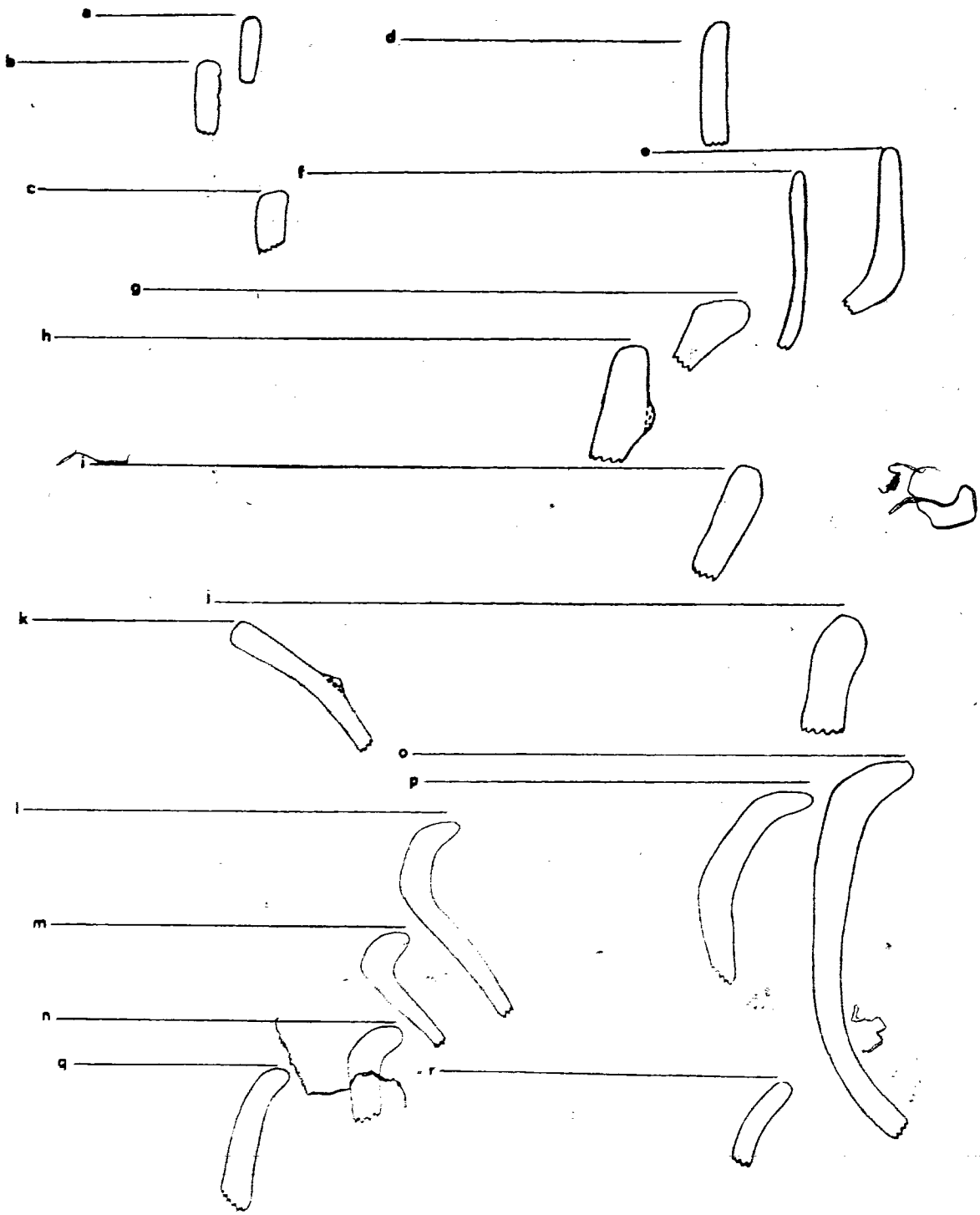


Figure 23. Tachinula Grey Group, a-r. Scale: 44% of original.

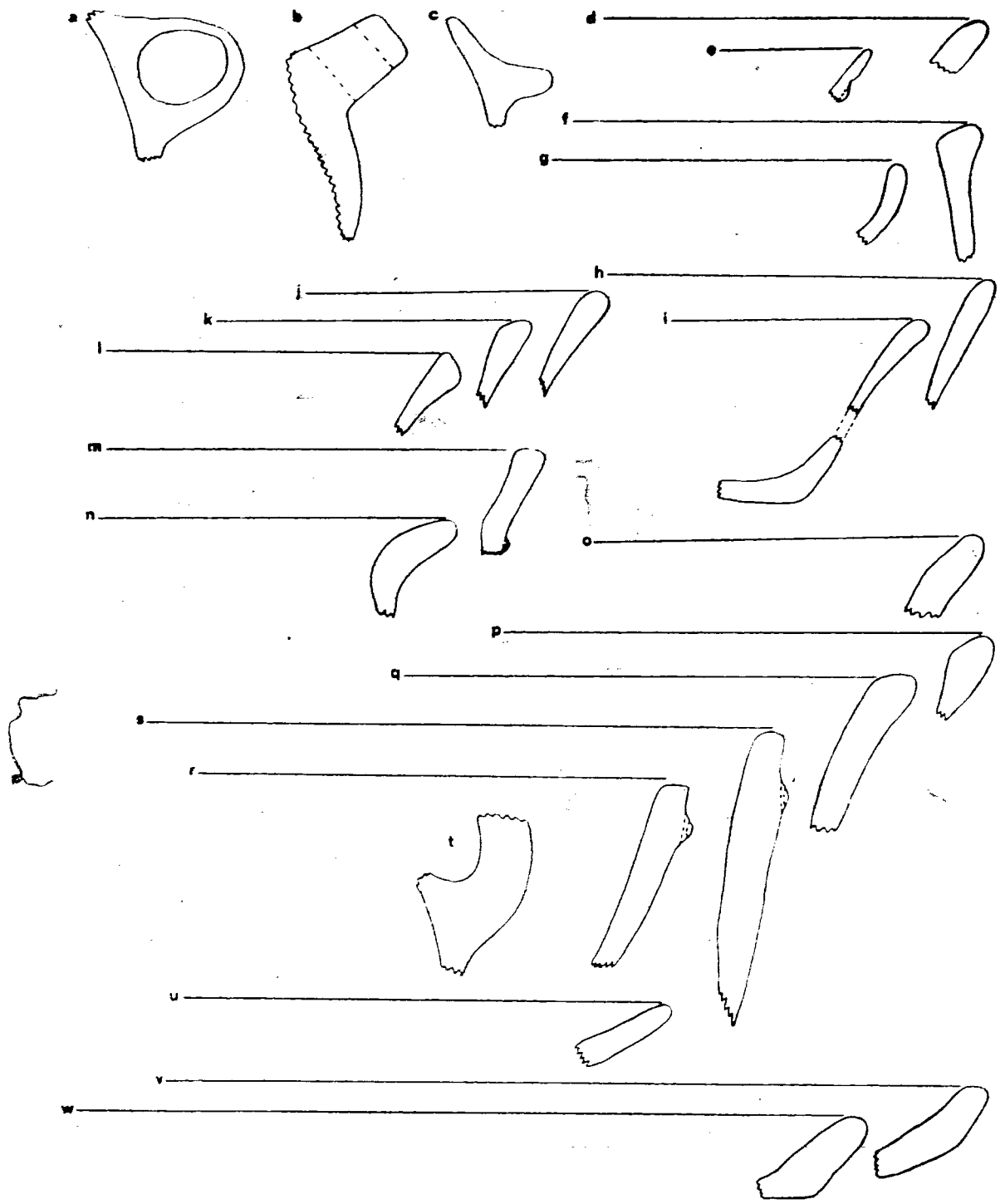


Figure 24. Tachinula Grey Group, a-c; Tachinula Red Group, d-t; Calzada de la Cruz Group, u-w. Scale: 44% of original.

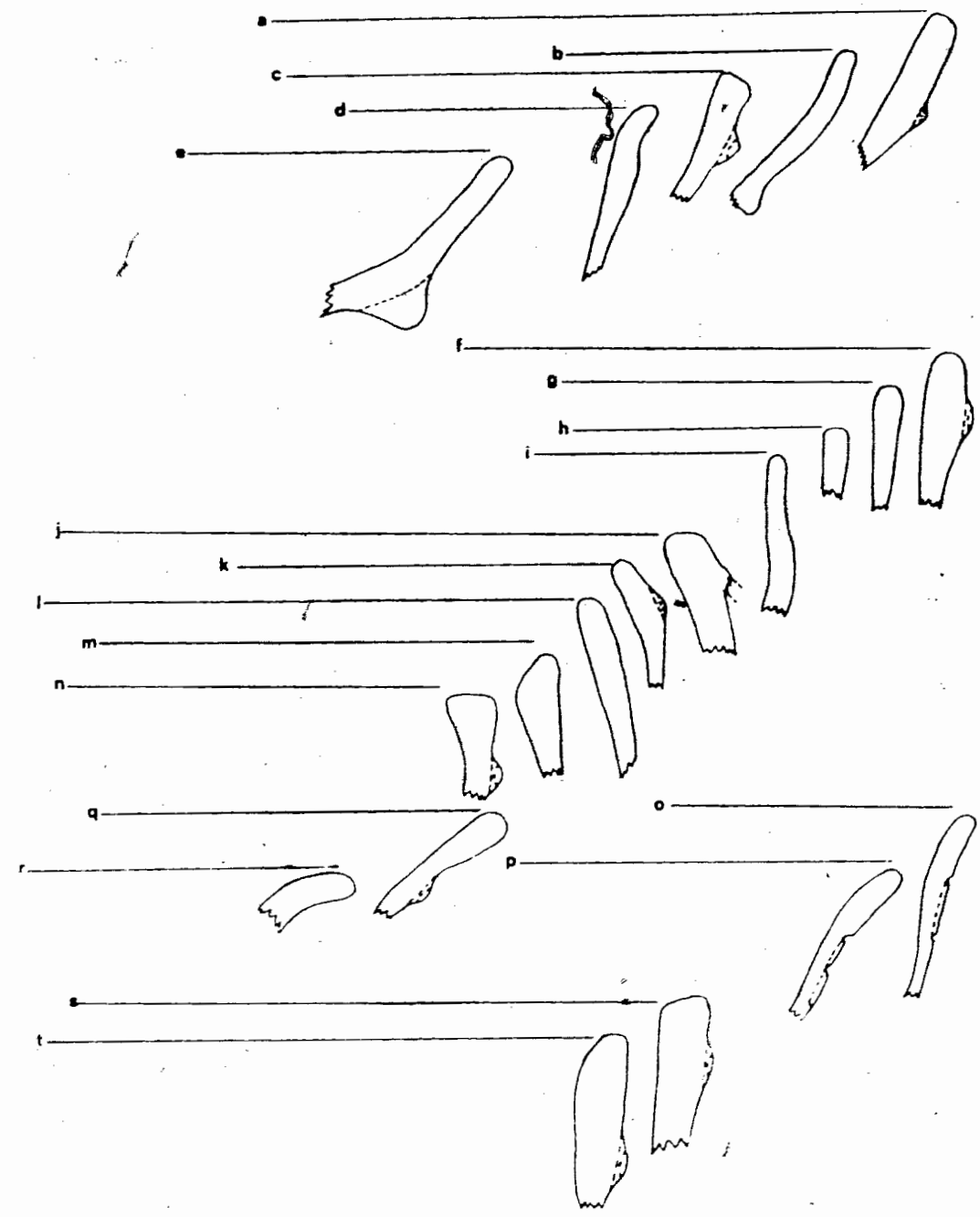


Figure 25. Calzada de la Cruz Group, a-t. Scale: 44% of original.

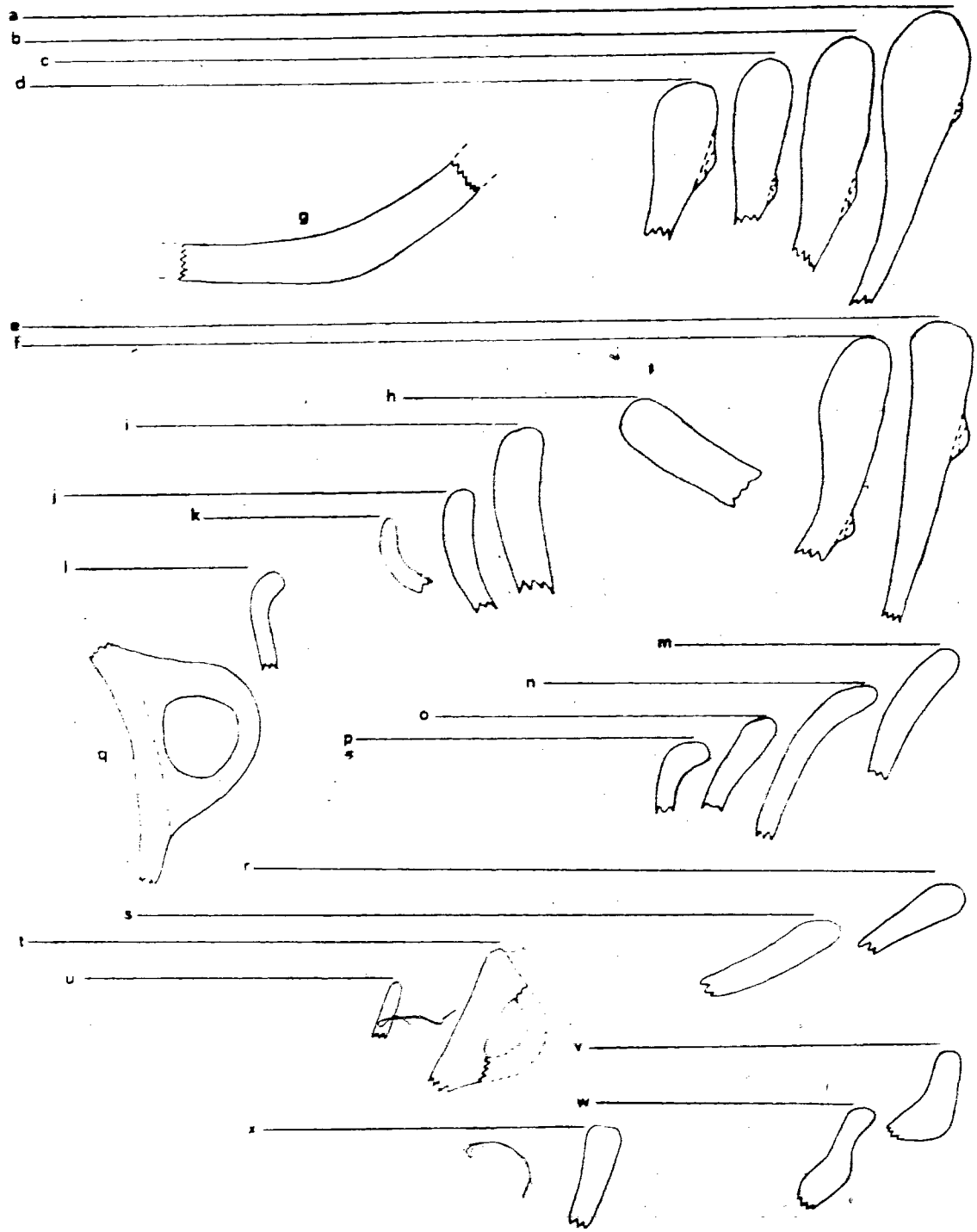


Figure 26. Calzada de la Cruz Group, a-q; Santa Teresa Red Group, r-x. Scale: 44% of original.

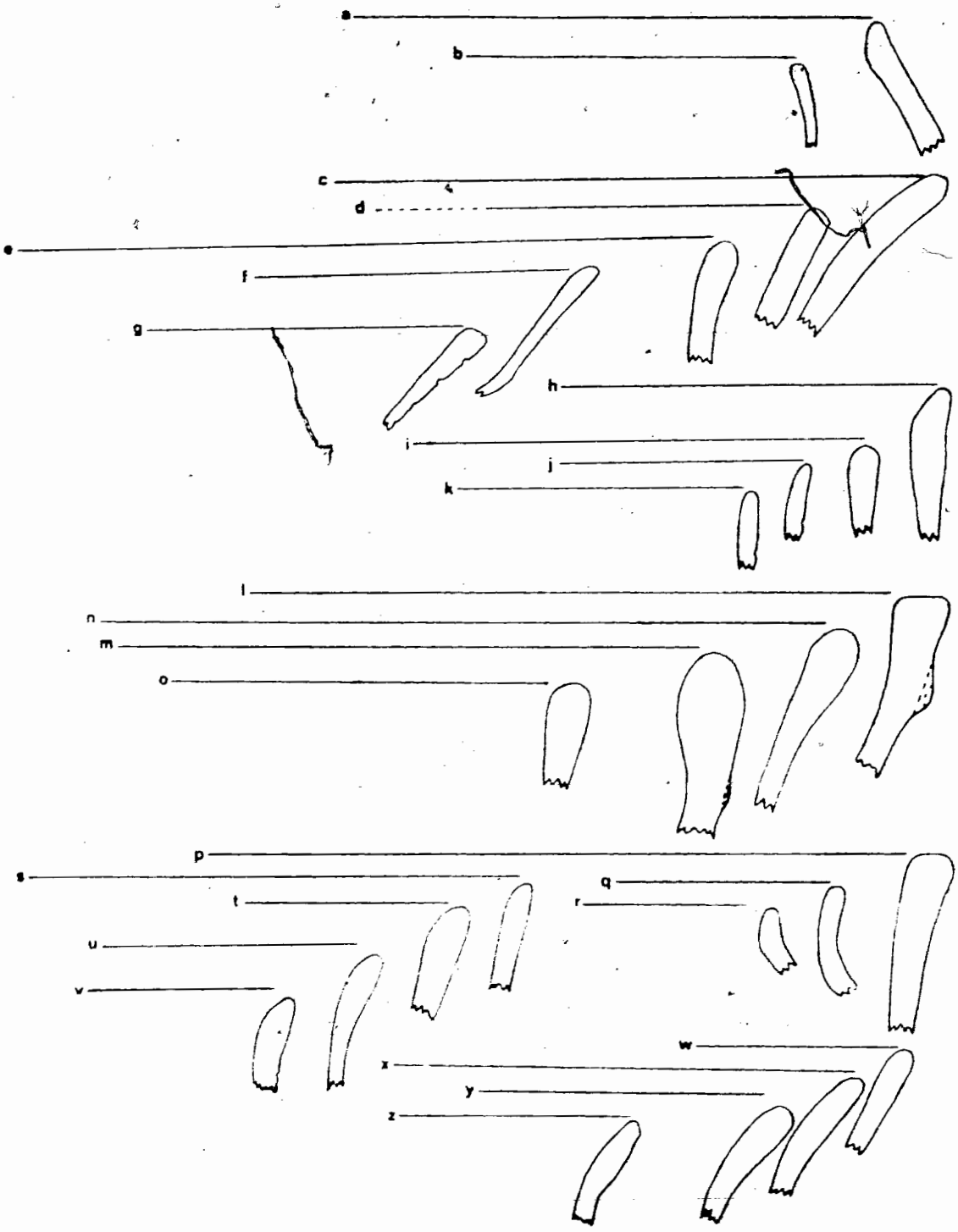


Figure 27. Santa Teresa Red Group, a-z. Scale: 44% of original.

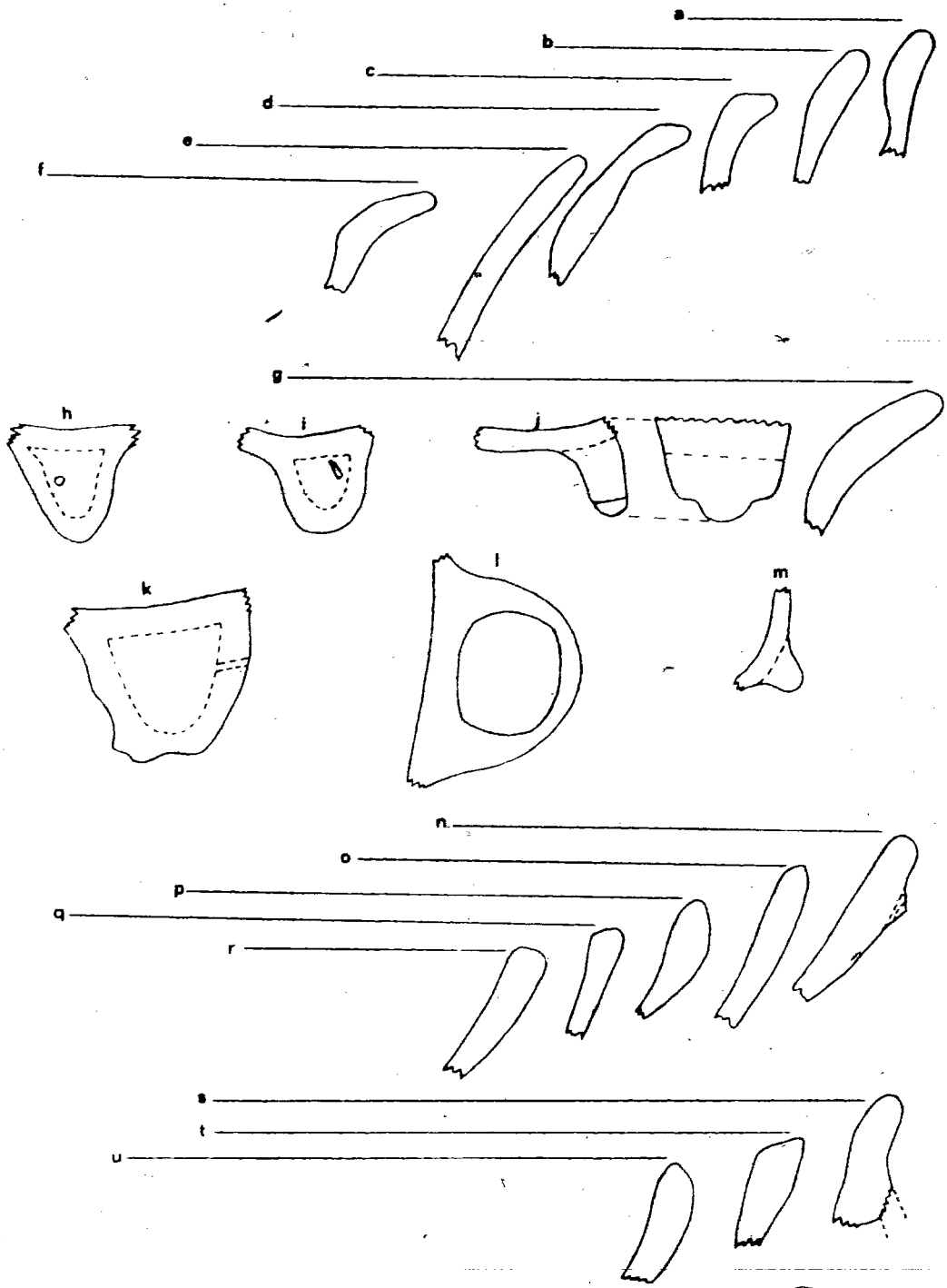


Figure 28. Santa Teresa Red Group, a-m; Santa Teresa Unfinished Group, n-u. Scale: 44% of original.

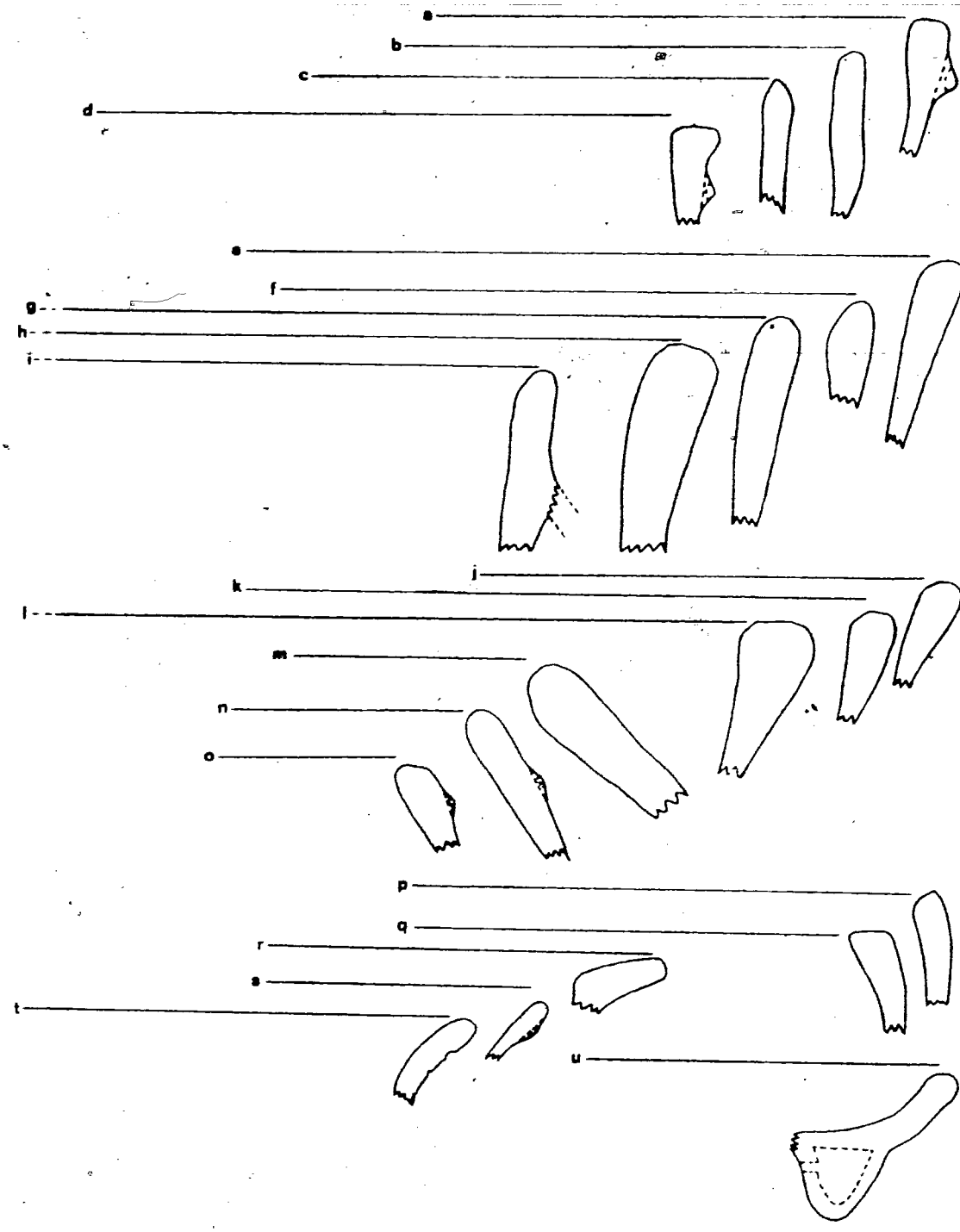


Figure 29. Santa Teresa Unfinished Group, a-u. Scale: 44% of original. (Real semidiameters in cm., g=30, h=35, i=22, l=31.)

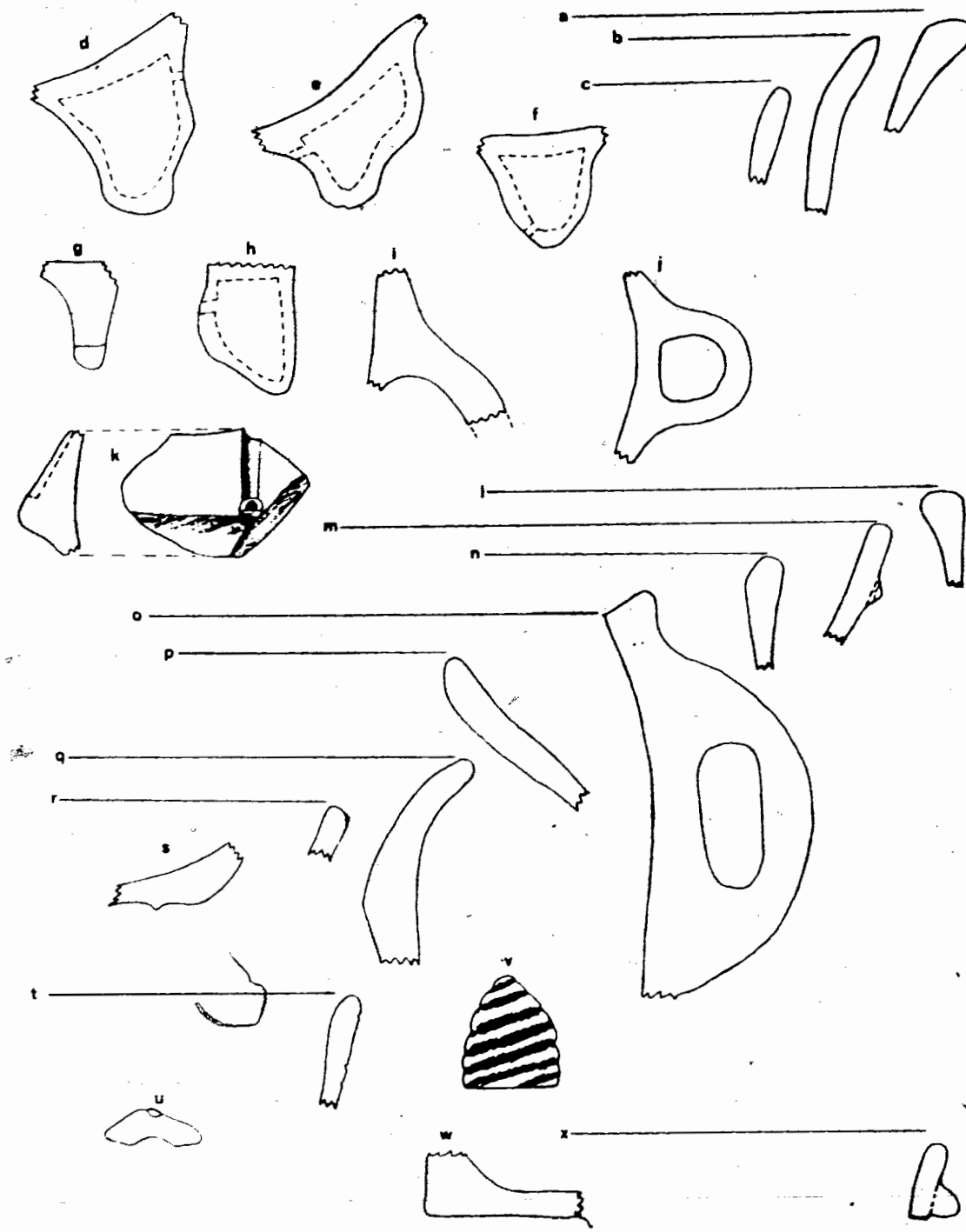


Figure 30. Santa Teresa Unfinished Group, 2-k; Guapinole Orange Group, l; Cerecillo Group, m,n; Pueblo Viejo Group, o; Potrero del Cerro Group, p,q; Regadillo Group, r; Miscellaneous 1,s; Misc. 2, t; Misc. 4, u; Misc. 5, v; Misc. 7, w; Misc. 8, x. Scale: 44% of original.

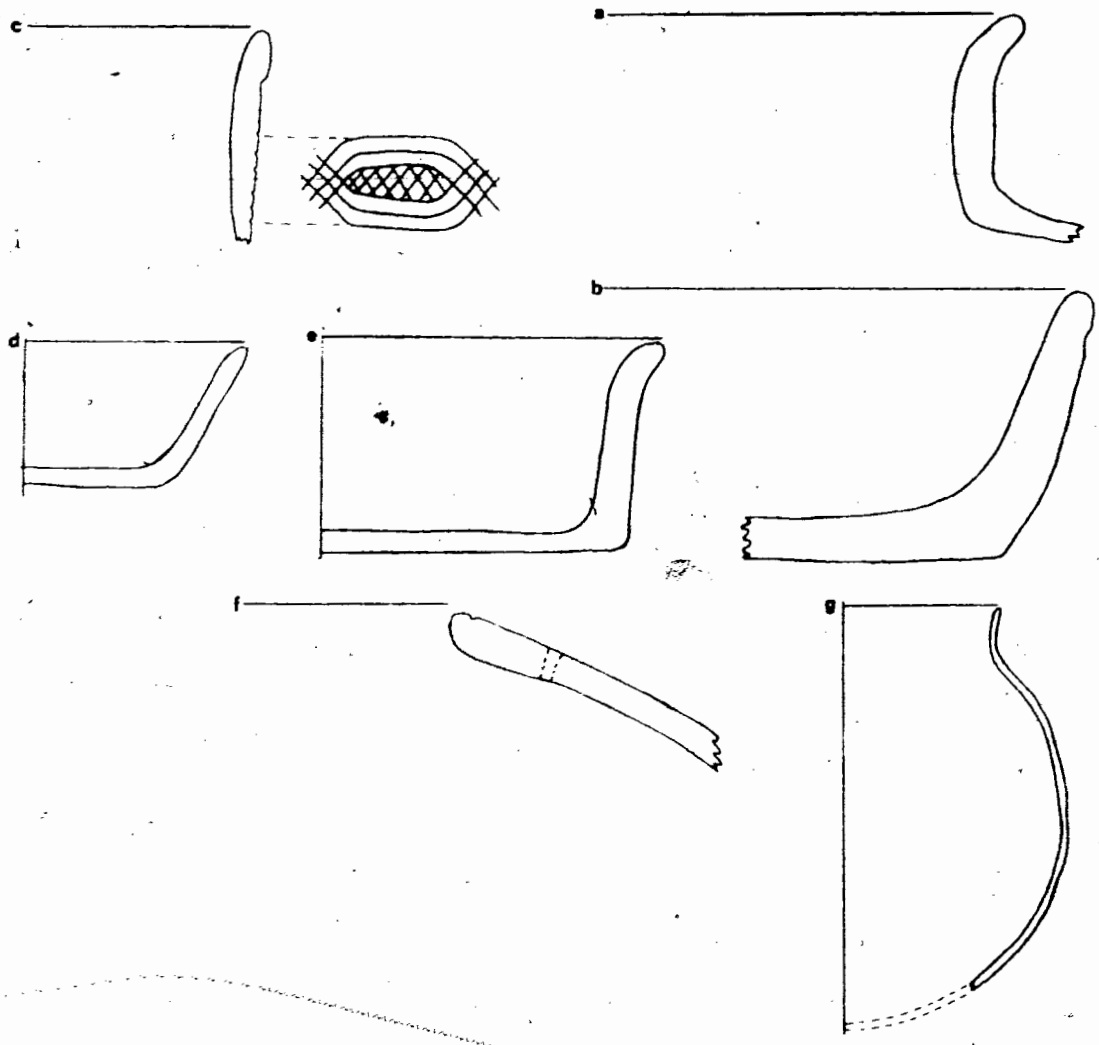


Figure 31. Miscellaneous 9, a; Misc. 10, b; Misc. 11, c; Misc. 12, d; Misc. 13, e; Misc. 14, f; Misc. 15, g. Scale: 44% of original, except for g, which is 22% of original.

MUNICIPIO DE SOCOLTENANGO

MUNICIPIO DE LA TRINITARIA

MUNICIPIO DE LA CONCORDIA

MUNICIPIO DE CHICOMUCELO

MUNICIPIO DE COMALAPA

MUNICIPIO DE BELLA VISTA

ECOZONE 1

ECOZONE 2

ECOZONE 3

Río Grijalva

TRUE NORTH

MUNICIPALITY OF CHICOMUCELO, CHIAPAS, MEXICO
TOPOGRAPHY, SETTLEMENT, AND ARCHAEOLOGICAL SITES

1:100,000

Interval of true contour 50 meters
Interval of estimated contours 100 meters

TOWN OF CHICOMUCELO approx. 93° 46', N 92° 16'

LEGEND

River
Stream
Intermittent Stream
Contour
Estimated contour
Beach bars
All weather gravel road
Dry season motor vehicle road
Dry season motor vehicle road estimated route
Ox cart or pack trail
Town
Small settlement
Finca headquarters
Municipal boundary
Airfield
Archaeological site (U.S.A.)
Archaeological site (U.S.A.)
Ecozone boundary

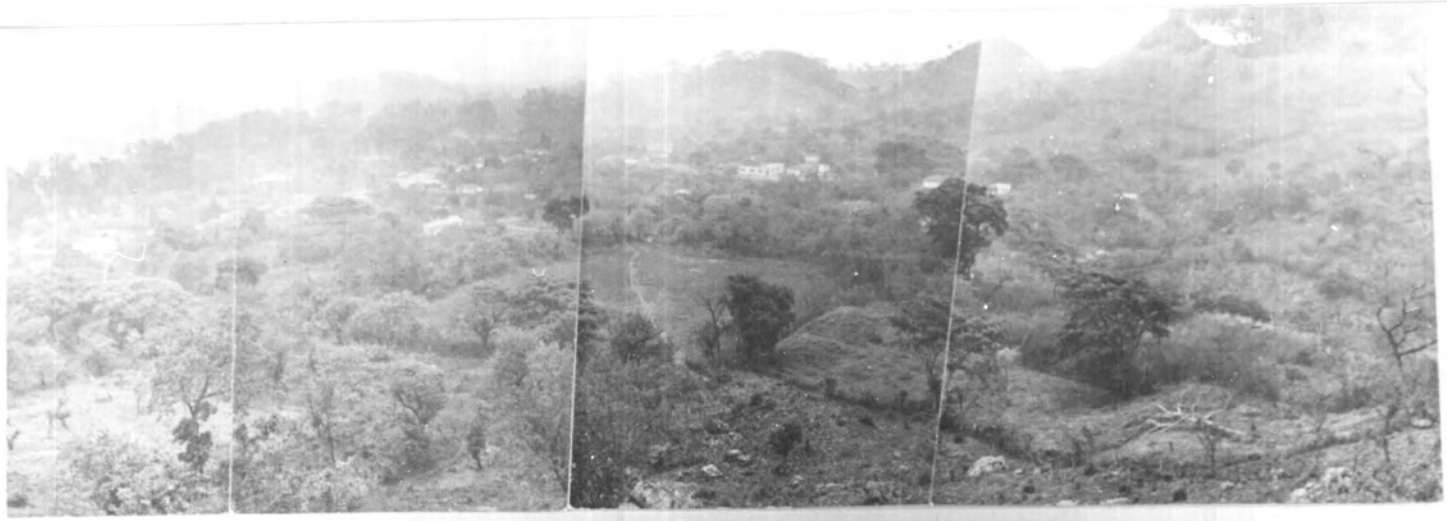
This map is drawn from contour plates at a scale of 1:50,000.
Roads in mountain areas and beach bars are from Secretaría de Recursos Hidráulicos Angostura Dam Project maps.
All other contours estimated from topography of boundaries.
Municipal names and municipal boundary are from the maps of La Comisión Nacional para el Fraccionamiento de Petrolíferos.

Archaeological sites on the Grijalva River were recorded by the Instituto National de Antropología e Historia during the Angostura Dam salvage project.
All other archaeological sites were recorded during the New World Archaeological Foundation Upper Tributary Project, 1974

Compiled by A.M. Shutes - Drafted by R.S. Sneddon 1974

Figure 32

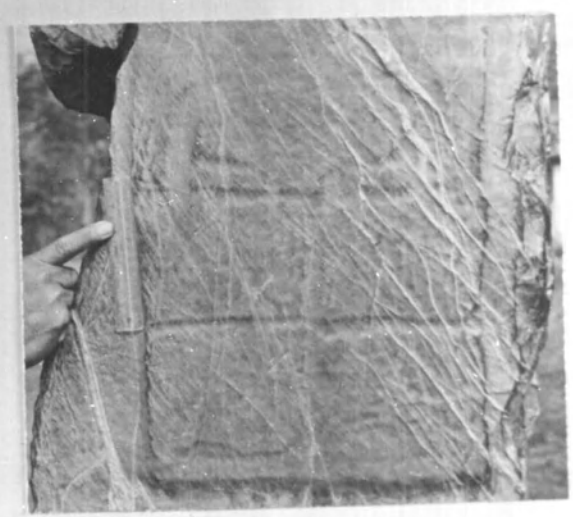
Plate 1



a. Ch-9, looking northwest, main plaza in middleground

b. Ch-9, erected stela fragment

c. Ch-9, stela proper head fragment



d. Ch-9 glyph cartouches from stela (scale: 15 cm.)

Plate 2

a. Ch-9, unidentified sculpture fragment (about 1m. high)

b. Ch-16, blank stela at base of momoztli

c. Ch-26, pecked stone head (about 13 cm. high)

d. Valley of Ch-38 looking south, after burning (ceremonial centre outlined)

Plate 3

a. Ch-38, ceremonial plaza paving stones

b. Ch-38, view up terraced hillside showing housemounds

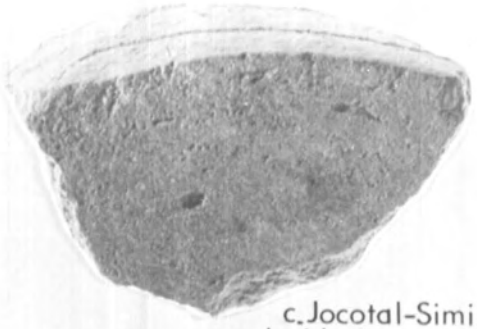
c. Ch-47, viewing north across main plaza (main mound about 10 m. high)

d. Ch-47, blank stela

Plate 4

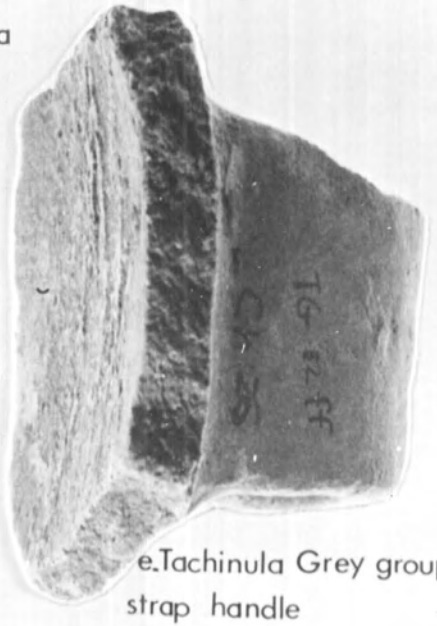
a. Ch-47, limestone mound facing in main plaza

b. Ch-48, main mound showing bulldozer cut



c. Jocotal-Similar group, double-line-break decoration

d. San Jacinto Black: San San Jacinto Variety, everted rim sherd



e. Tachinula Grey group strap handle

f. Calzada de la Cruz group, solid cylinder

g. Santa Teresa Red group, hollow vessel support

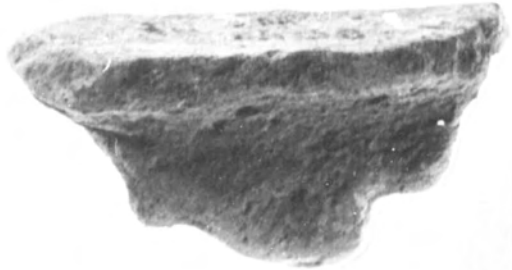
Scale for c to g

Plate 5

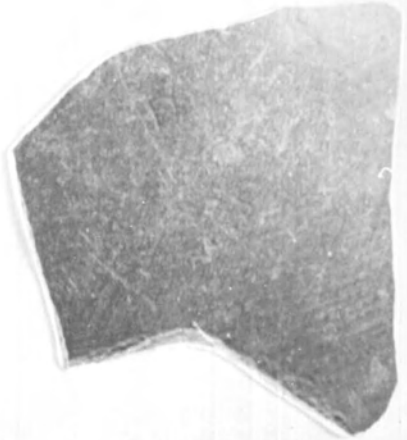
a. Santa Teresa Unfinished group, hollow support

c. Chinautla Polychrome burial urn

d. Regadillo Group, rim sherd



b. Santa Teresa Unfinished group, stepped-slab support



e. Tohil Plumbate body sherd

Scale for a, b, d, e