

POLITICAL EVOLUTION AND THE FORMATIVE PERIOD  
OF MESOAMERICA

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## I. Introduction

Most contemporary scholars divide the prehistory of Mesoamerica after the establishment of agriculture into three stages: the Formative or Pre-Classic, the Classic, and the Post Classic. Willey and Phillips have defined these stages in a manner which reflects the thinking of most, but not all, Mesoamericanists. They define the Formative stage by ". . . the presence of agriculture, or any subsistence economy or comparable effectiveness, and by the successful integration of such an economy into a well established, sedentary village life " (Willey and Phillips, 1958, p. 146). The Classic stage is ". . . characterized by urbanism and superlative performance in many lines of cultural endeavor " (Ibid, p. 183). These many lines of cultural endeavor "include art, government, technology, religion, etc." The Post Classic stage is ". . . marked by the breakdown of the old regional styles of the Classic stage, by a continued or increased emphasis on urban living, and inferentially, by tendencies toward militarism and secularism " (Ibid, p. 193).

These divisions are cultural stages, not chronological periods, but the stage names are frequently used to designate chronological periods. Willey, Ekholm and Millon (1964) maintain that both usages are valid if one is specific and explicit about which is being used. I agree with this position.

This paper deals with the Formative; defined as a chronological period, not as a developmental stage. The Formative is here defined as the period of time between the establishment of sedentary village life and reasonably effective agriculture and the emergence of the Classic state organizations (approximately 2500 BC to 1 AD). The objectives of the study are:

1. to describe the social systems which existed during the Formative;
2. to test the validity of a societal evolutionary sequence proposed by Elman R. Service.

The first objective will involve an analysis of the published and unpublished sources on Formative period archaeological remains. The literature on the Formative is voluminous but much of it contains disappointingly little concrete data and even most site reports leave much to be desired. There are exceptions, however, and these are particularly valuable. The increased pace of research on Formative sites in the past decade has produced much important data which has not yet been published in detail. This material has been gathered from preliminary publications and through personal communications.

The second objective is more theoretical than the first. Elman R. Service (1962) published a sequence of societal evolution which he felt might have universal applicability. The sequence has four major stages; band, tribe, chiefdom, and state. Several archaeologists have attempted to use this scheme as a framework for their data; Sanders and Price (1968) did it for the entirety of Mesoamerican prehistory.

## (1). Published Syntheses of the Formative Period

The following section summarizes the more important syntheses of Formative period cultures. Those concerning specific, particularly significant geographical areas will be dealt with first, followed by the broad general syntheses.

### Basin of Mexico

Herbert J. Spinden (1913, 1928) proposed one of the earliest sequences of cultural development for Mesoamerica. He postulated an "Archaic Horizon" prior to the development of highland Mexican and Mayan civilizations. Spinden argued that plants were first domesticated and agriculture invented during this period. He thought irrigation was practiced at this time and that its practice preceded plant domestication.

Clay figurines were the best known Archaic Horizon remains in Spinden's time. These had been found at several Basin of Mexico sites, including Teopitzalco, Copilco, and Cuicuilco. Something was known of the ceramics associated with the figurines and of stone statuettes carved in the same style as the figurines. Spinden traced the Archaic figurine complex over a wide area encompassing central and southern Mexico, all of Central America, and parts of northern South America. He felt that a homogeneous culture had existed throughout this area and that the later regional cultures had emerged from this common substratum.

George C. Vaillant conducted numerous excavations in Central Mexico from 1920 to 1935. His goal was to augment the meager data on the Archaic Horizon cultures. The excavations were concentrated in the Basin of Mexico but one season was spent at Gualupita, near Cuernavaca, Morelos. He renamed the Archaic Horizon with the term Middle Cultures because he felt that future work would reveal remains of an Early Period during which agriculture was invented. Thus the Middle Cultures stood between the period of initial plant domestication and the fully developed civilizations of the Maya and Teotihuacan.

Vaillant (1944) divided the Middle Cultures into two periods, Lower and Upper. Lower period remains included Copilco, a site excavated by Rafael Gandio in the 1920's, and Zacatenco and El Arbolillo, both excavated by Vaillant. He suggested that the period began circa 400 B.C. The people lived in small villages clustered around the lake shores in the Basin of Mexico and agriculture, aquatic resources and hunting were all important subsistence activities. Numerous clay female figurines were found in the refuse deposits. Vaillant felt they had been used in a fertility cult connected with agriculture. Some burials had offerings, others did not. Social stratification was lacking and society was basically egalitarian. Life was peaceful and conflict was minimal, according to Vaillant.

The Upper Middle culture sites known to Vaillant were Ticoman and Gualupita, both excavated by him, and Cuicuilco, dug by Byron Cummings. Vaillant assigned this culture a wide geographical range and its remains were evident in the Basin of Mexico, Puebla, Morelos, Michoacan and

Veracruz. The period began with a migration into the Basin of Mexico, possibly from Morelos. The majority of the population continued to live in villages and practice agriculture as before; but a new elite appeared, along with social stratification and economic specialization. Trade was more extensive than before; the trade goods included jade objects, shells and pottery. Figurines were more varied stylistically and Olmec "babyface" figurines appeared for the first time. Representations of Huehuetéotl, the earliest recognizable Mesoamerican deity, appeared at this time. Cuicuilco provided the earliest known temple platform. This community was engulfed by a lava flow during the Upper Middle period; Vaillant suggested that its inhabitants had moved to Teotihuacan prior to the volcanic explosion.

Most later writers use either the term Preclassic or Formative for the overall period. Roman Pina Chan is a leading authority on the Formative and though his ideas and opinions have changed considerably over the years, they may be summarized in the following way. He divides the period into three phases, Early, Middle and Late Formative. Zacatenco, El Arbolillo and Tlatilco were small Early Formative villages occupied by farmers who also did some hunting. Early Formative society was essentially egalitarian, lacking well-defined social, political and economic groups. The inhabitants may have been organized into matrilineal clans, as indicated by the frequency of female versus male figurines. These figurines may also represent a fertility cult.

The Basin population increased in the Middle Formative and Tlatilco became semi-urban, with perhaps 1000 inhabitants. Olmec-related people entered the Basin, possibly from Morelos, and settled at Tlatilco where they dominated the indigenous inhabitants. They introduced a religion centered upon Jaguar worship (possibly a totemic representation) and involving a ritual ball game and the use of masks by the priests. Several specialized occupations existed, including shaman, priest, dancer, ball player, and warrior. The elite class was concentrated at Tlatilco but probably controlled most of the Basin of Mexico.

The population increased during the Late Formative and new centers were occupied, though Tlatilco was not abandoned. These cultures were characterized by increased occupational specialization, more trade and a more elaborate politico-religious organization. Temple platforms were introduced at this time.

### The South Gulf Coast

Several syntheses of Olmec culture have been published. Robert Heizer (1960, 1961) has published two papers on Olmec social, economic and political structure, based primarily on data from La Venta. He maintains that La Venta was a ceremonial center with a small resident population of priests and their attendants. The majority of the population were farmers practicing swidden agriculture in the region between the Tonala and Coatzacoalcos Rivers. The priests were the societal leaders and Heizer characterized Olmec society as "theocratic." The platform mounds, stone monuments, jade objects, hematite mirrors were all part

of the elaborate ritual complex connected with the worship of agricultural dieties. The Olmecs maintained trade relations with neighboring peoples from whom they received jadeite, basalt, serpentine and other raw materials.

Heizer offers several explanations for the abandonment of La Venta and the demise of Olmec culture. One is a peasant revolt, possibly a reaction against increasingly heavy demands by the priests. Foreign invasion is an alternative. Another is agricultural failure, leading to public disenchantment with the priests.

M.D. Coe, a leading scholar on the Olmec, postulates that Olmec culture involved complex state organizations (Coe, M.D., 1968, a and b). He argues that San Lorenzo was not a ceremonial center with a small resident population, but rather a settlement of at least 1000 people. He hypothesizes highly developed occupational specialization and marked social stratification. The manipulation of manpower implicit in the construction and stone monuments and the evidences of widespread trade lead him to reject the idea that Olmec society was a chiefdom (see discussion of political typology presented in Part III). He calls it the first state in Mesoamerica and the model for all later states.

Alfonso Caso (1964) has postulated the existence of an Olmec empire; his concept of empire is synonymous with Coe's state. Caso points out the potential of intensive agriculture on the riverine floodplains of the South Gulf Coast. This potential enabled the area to support the earliest civilization in Mesoamerica; in fact, he calls this area the "Mesoamerican Mesopotamia". The empire included parts of the modern states of Veracruz, Tabasco, Oaxaca, Chiapas, and Guerrero and contained numerous subjugated ethnic groups. A state religion evolved around a feline cult, a rain god, a human head cult, and a ritual ball game. Active commerce was maintained between the empire and its neighbors.

### The Lowland Maya

Maya studies are over a century old, but relatively little is known of the Formative and few syntheses have been attempted. Morley (1946) maintained the Maya were the primary culture innovators of the New World. He postulated a "Pre-Maya" or Pre-Classic period, subdivided into Pre-Maya I, II, and III. The lowland area was inhabited by Maya speaking hunters and gatherers during Pre-Maya I. Ceramics and maize agriculture were introduced during Pre-Maya II by Maya speakers from highland Guatemala but architecture, monuments, writing and calendrics were still absent. Stone architecture was first used in Pre-Maya III, the earliest known example was Structure E-VII-sub at Uaxactun. Morley postulated that the Maya carved inscriptions on perishable wooden monuments during this period. He was certain that writing and calendrics were lowland Maya inventions and denied claims of priority for the Tuxtla statuette, Stela C at Tres Zapotes and Stela I at El Baul, Guatemala. He postulated that hieroglyphic writing and the corbelled arch both originated somewhere near Tikal and Uaxactun.



J. Eric Thompson (1966) sees more heterogeneous roots at the base of Maya society than did Morley. The earliest known civic structures belong to the Late Formative Chicanel phase at Uaxactun and Tikal. The corbelled vault and the hieroglyphic writing were also introduced at this time. Thompson traces the origin of writing to the Pacific coast and piedmont region of Guatemala, from whence it spread to highland Guatemala and later to the lowlands. He denies the implications of the "Olmec Mother Culture" concept for the Maya Formative though he does admit the possibility that Olmec culture predated Maya.

### General Syntheses

General syntheses covering Mesoamerica in its entirety are rare. Robert Wauchope (1951) published a paper on Formative ceramics in which he divided the Formative into three developmental stages; the Village Formative, the Urban Formative and the Proto-Classic. The Village Formative was the stage during which sedentary village life first came into existence. The Urban Formative stage was defined on the basis of the existence of large pyramidal mounds and his use of the term "urban" did not imply "urbanism". The Proto-Classic stage was defined by certain ceramic traits such as swollen mammiform supports and negative painting. Wauchope felt that not all Formative period sites had gone through the Proto-Classic stage; some moved directly from the Urban Formative to the Early Classic.

Wauchope did not present absolute dates for his stages because the Carbon-14 dating technique was still in its infancy and no dates had been published. He did feel, however, that changes from one stage to another did not necessarily occur simultaneously throughout the entire area.

Miguel Covarrubias discussed the Formative at length in his book Indian Art of Mexico and Central America (Covarrubias, 1957). He maintained that Olmec culture belonged to this period, contrary to those who called it Classic. He postulated that it originated in the coastal lowlands of Oaxaca and Guerrero and diffused to the South Gulf Coast, where it reached its highest development. Olmec society contained two different cultural and ethnic groups; one composed of indigenous peasants, the other an "intellectual aristocracy". The latter included religious leaders, shamans and magicians, who could predict the weather through astrology. The aristocracy formed an "Incipient Theocracy". The Olmec was the "Mother Culture" of Mesoamerica because it originated many of the basic elements of Mesoamerican civilization such as jade carving, monumental sculpture, the institutionalized worship of rain, sky and earth deities, and other culture traits. The Olmecs later expanded into the Mexican highlands, conquering Morelos and the Basin of Mexico, where they encountered an indigenous culture of non-civilized, sedentary agriculturalists. The remains of this local culture can be found at El Arbolillo and Zacatenco. The community of Tlatilco began its existence as a Zacatenco culture center, but later became an Olmec colony dominated by a small group of Olmec priests. The Olmecs later disappeared or amalgamated with the local population. The Ticomán culture eventually replaced that of Zacatenco and Tlatilco, leading to a cultural and artistic regression.

The earliest known occupation in the Maya lowlands took place in Middle Formative times; the Xe phase at Altar de Sacrificios and Seibal, and the later Mamom phase at Uaxactun and Tikal, are the best known remains of this culture. The Xe and Mamom phase peoples did not erect civic structures, lacked social stratification and economic specialization, and had a relatively simple level of culture. Mamom occupation seems to have been quite extensive and its remains have been found at most Maya sites.

Coe includes the Las Charcas phase in the Guatemala highlands in the Middle Formative. The Las Charcas people seem to have been sedentary farmers. The culture lacked social stratification, though some evidence exists for the construction of temple mounds.

The Middle Formative occupation of the Basin of Mexico shows a diminution of Olmec influence and a regression to a simpler cultural level. The sites occupied include El Arbolillo, Tlatilco, Tlapacoya, and Zacatenco.

The major outlines of the subsequent regional Classic civilizations first became apparent during the Late Formative.

The Gulf Coast experienced a cultural eclipse at this time. Tres Zapotes continued to be occupied and Cerro de las Mesas became a major center. The Gulf Coast societies received strong influences from the piedmont area of Chiapas and Guatemala; this influence is evident in ceramics and sculpture.

The Basin of Mexico was relatively isolated at this time. Cuicuilco was the major site. It is famous for its large circular temple base. Ticoman, Chupicuaro and Tlapacoya are other well-known sites of the phase.

An advanced Late Formative culture existed at Monte Alban during phases I and II. Its manifestations included writing, the fifty-two year calendar round, an unusual stone carving style and the construction of large public buildings. The texts and glyphs indicate extensive warfare and the conquest of neighboring groups.

An important late Formative culture existed in the Guatemala-Chiapas Piedmont. The major center seems to have been Izapa, a large site with many mounds. There are numerous stone monuments carved in a highly distinctive style. Calendric inscriptions have not been found at Izapa but are known on Izapa style monuments at other sites.

A major Late Formative culture centered on Kaminaljuyu, in the Guatemala Highlands. Large-scale building activity during the Miraflores phase resulted in the construction of perhaps 100 earth mounds, including temple mounds, which have yielded the richest Formative grave offerings known in Mesoamerica. Elaborately carved stone monuments have been found; some are stylistically related to the Izapa sculptures.

The Chicanel period of lowland Maya culture registered impressive advances over the preceding Mamom period. Numerous pyramids and temples were constructed around plaza courtyards. The earliest elaborate burials belong to this period. The corbelled arch may have been used at this time but evidence of writing and Long Count dates is lacking, even though they existed in other parts of Mesoamerica.

Aside from his specific research on the South Gulf Coast, M.D. Coe has been perhaps the most active scholar working on the Mesoamerican Formative generally in the past decade. The following synthesis is based upon several publications, particularly 1962, 1965c, 1966a, 1968a and 1968c.

Coe divides the Formative into three chronological periods; Early, Middle and Late. The Early Formative lasted from 1500 to 800 B.C., the Middle Formative from 800 to 300 B.C. and the Late Formative from 300 B.C. to 300 A.D.

The Early Formative cultures were practically unknown until a few years ago but recent research has produced significant data on this period. The Olmec culture of the South Gulf Coast is placed in the Early Formative, with its florescence occurring between 1200 and 800 B.C. The major centers of San Lorenzo and La Venta were occupied at this time; the same is probably true of Tres Zapotes, though that site's major occupation seems to have been in the Middle and Late Formative. Following Coe, Early Formative Olmec culture exhibited many of the characteristics of complex civilizations. One was a highly developed art style, executed in both large stone sculptures and small portable objects made of semi-precious stones. Society was divided into two social strata, a numerically small class of rulers, priests and merchants and a large subordinate class of subsistence farmers. Extensive trade was done with groups in Oaxaca, Morelos, Guerrero, Puebla, the Basin of Mexico, and as far south as Costa Rica. The procurement of jade, serpentine, ilmenite, magnetite, and other semi-precious stones was one facet of this trade. Coe even argues for evidence of a professional merchant group, similar to the Aztec pochteca. The merchants apparently established trade stations or warehouses at strategic points along the trade routes; these stations are represented by archaeological sites such as Chalcatzingo, Las Bocas, Tlatilco, Ayotla, and Chalchuapa in El Salvador.

Finally, according to Coe, the Olmecs had a civilizing effect upon the people they contacted and their religion, political and social organization and other traits were diffused to areas where complex cultures had not existed. Cultures outside the sphere of Olmec influence were simpler and lacked social stratification, great art styles, complex economic organization and expansive tendencies. These cultures include the Cotorra phase of the Central Depression of Chiapas; the Arevalo phase in highland Guatemala; the Ocos, Cuadros, and Jocotal phases on the Pacific coast of Guatemala; and the El Arbolillo phase in the Basin of Mexico.

As the previous discussion demonstrated, ideas concerning the Middle Formative have undergone considerable change. Prior to 1966 the Olmec florescence was placed in this period, but the recent radio-carbon dates from San Lorenzo and La Venta have changed the picture. The La Venta occupation did overlap into this period, terminating at about 600 B.C. (Berger, Heizer, and Graham, 1967). The Palangana phase at San Lorenzo (600-400 B.C.) is Middle Formative. Tres Zapotes has a Middle Formative occupation, though its extent and nature is unclear.

### III. Methodological and Theoretical Considerations

Cultural evolution has been a major focus of interest in anthropology during the past century. It was the main theoretical emphasis of the discipline during the nineteenth century and many early anthropologists postulated sequences of universal cultural evolution, with stages through which mankind had passed on his ascendancy to modern western civilization. A justifiably critical reevaluation of these evolutionary schemes took place during the early twentieth century and interest in cultural evolution remained moribund for many years. Subsequently, V. Gordon Child, Leslie White and Julian Steward have revived cultural evolution as an important aspect of anthropology. This work has been furthered by two former students of White and Steward, Marshall Sahlins and Elman Service.

Service has presented his ideas in two books: Primitive Social Organization (1962) and Profiles in Ethnology (1963). He defined several social-organizational types which form an evolutionary sequence. These types are the band, tribe, chiefdom, and state. The latter three are of concern for this discussion.

#### Tribes

Tribal societies are almost always agricultural. The few exceptions are hunters and gatherers in relatively rich environments, such as the tribes of the North American plains. No known agricultural societies are on the band level. Agriculture, no matter how primitive, is productive enough to sustain a sufficiently large population to stimulate a tribal level of organization. Thus tribes are usually agricultural and they always have larger total populations than bands. They also have an integrating mechanism not found in bands, what Service calls a pan-tribal sodality. He defines a sodality as " . . . a non-residential association that has some corporate functions or purposes " (Service 1962: 21). Pan-tribal sodalities involve all the tribal members. The most common are clans, followed in frequency by age-grade societies, secret societies and special purpose groups such as curing and warrior societies. They may or may not be kin based. The former strengthen the existing kin ties, the latter establish ties that would otherwise not exist.

Tribal societies, like bands, are essentially egalitarian. High statuses are not institutionalized; political or religious institutions or corporate bodies do not exist, nor do economic specialists. The lack of political authority makes justice largely an individual matter and problems are settled by the interested parties, not the entire society. This results in considerable intra-tribal conflict and might well result in dissolution of the group. This does not normally occur because of the advantages tribal structure gives the group vis-a-vis neighboring groups and the defense the organization provides against other tribes. The defensive function of tribes is extremely important, and Service feels it is sufficient to account for the formation of tribes.

## Chiefdoms

The chiefdom concept was first proposed by Steward and Faron (1959) and later amplified by Service (1962). The best study of chiefdom organization is Social Stratification in Polynesia by Marshall D. Sahlins, though he did not use the term chiefdom.

Chiefdoms have larger total populations than bands or tribes and generally number in the thousands and tens of thousands. Chiefdoms also have higher population densities than tribes.

Chiefdom social organization is kin based, like that of bands and tribes. However, chiefdoms have hierarchically-ranked positions with certain associated perogatives and obligations. Two, and often three, rank categories can be defined. One is that of chief or societal leader, another is the commoner rank. A third intermediate rank category, found in more complex chiefdoms, is composed of minor officials and leaders of sub-societal groups. They are often relatives of the chief.

The primary determinant of rank position is geneological nearness to certain ancestors and the chief is one of the closest living relatives to the exalted ancestor. Descent rules such as primogeniture or ultimogeniture are generally operative in these societies. Although in reality each individual occupies a distinct and unique position in the rank structure, the three groupings can be used for convenience. These should not be confused with the socio-economic classes of state societies.

The chief's position has limited political and economic power but provides great prestige. Chiefs are often permitted certain distinctive clothing, ornaments and sumptuary goods; they are treated with respect and deference; and their life crises are times of group action and celebration.

Chiefs occupy an important position in the economic structure and often act as middlemen in commodity exchanges. Despite this, they are not significantly richer than most commoners and great wealth does not accompany the position.

The chief's political power varies from one society to another and is greatest in the more complex chiefdoms. It often depends to a large degree on the personal characteristics and charisma of the individual chief. His power is always subject to numerous checks and is never absolute. Thus the position is primarily social, not political or economic.

The subsistence base of chiefdoms is almost always agriculture. The Nootka of British Columbia are one exception listed by Service, but they are probably the least complex chiefdom known and are certainly not typical of the level. Chiefdom agricultural systems tend to be quite well developed with a variety of crops adapted to several environments. This promotes exchange among different sub areas of the chiefdom and permits more effective exploitation of the total environment. Crop assemblages often include plants which mature at different times of the year, minimizing the possibility of famine due to crop failure or natural disaster.

Chiefdom agricultural systems include swidden, dry or rainfall agriculture, and simple irrigation systems. They lack highly developed water control systems involving large expenditures of labor or governmental control; these systems are usually associated with states.

Chiefdom economics emphasize intergroup exchange of food, raw materials, and certain manufactured goods. The exchange involves accumulation of goods by the chiefs through "gifts", and redistribution of these goods at a later date. The chiefs' household and retainers are supported out of this accumulation. The chief's power and prestige is related directly to the exchange system and vary with variations in productivity and surplus. This economic system is well suited to areas of marked geographical complexity. The most profitable method of resource exploitation in such areas is one in which people produce the goods best suited to their region and exchange them for the products of other regions. This could be accomplished through a market system, but markets are more typical of states, not chiefdoms.

Chiefdoms have a few occupational specialists; at times only the chief and his retainers. Larger and more complex chiefdoms have a few specialists who devote their full time to manufacturing things for the chief and his retainers. These goods include personal ornaments and sumptuary goods. Chiefdoms normally contain numerous part-time specialists who practice subsistence agriculture but also have special skills.

Chiefdom settlement patterns range from scattered, non-nucleated hamlets to relatively densely settled villages depending on factors such as agricultural systems, prevalence of warfare, etc. Chiefdoms never have large urban centers; this distinguishes them from states.

Chiefdoms have the ability and man power to undertake public works projects such as the erection of temples, public buildings, and similar structures.

Chiefdom religion often involves ancestor worship. This is in keeping with the emphasis on genealogy as the main determinant of rank position. The chief often serves as a priest; though in some cases, chiefs and priests are different, though related individuals. Whichever the case, there are full-time specialists with religious functions.

Chiefdoms often maintain trade relations with neighboring groups, primarily to obtain exotic raw materials or manufactured goods. Such trade is most likely to occur in areas of geographical and ecological complexity.

Chiefdoms have competitive advantages vis-a-vis less highly organized groups and their more complex organization and enhanced military potential enable them to expand territorially. They occasionally absorb conquered populations as slaves, but expulsion of the conquered people and expropriation of their land is the more general rule. The chiefdom kin structure makes it difficult to incorporate non-related peoples into the society.

Sahlins (1958) analyzed fourteen Polynesian societies and classified them into four levels of structural complexity: Level I, IIa, IIb, and III. Level III societies are, in reality, tribes rather than chiefdoms. These complexity levels appear to be cross-culturally valid. Three Polynesian chiefdoms will be described in the following paragraphs; each represents a different level of complexity. The descriptions are derived from Sahlins' presentation.

The Hawaiian societies were the most complex Polynesian chiefdoms and are a good example of Sahlins' Level I. Eight volcanic islands were inhabited aboriginally. Differences in altitude and position vis-a-vis winds and currents have created numerous ecological zones. Five vegetation zones have been defined, each providing economically-useful plants. The major cultivated foods were taro, sweet potatoes, yams, and bananas, supplemented with fish, pigs, and chickens. Agricultural techniques included irrigation, terracing, dry, and swidden farming.

Sahlins calculates that at contact each Hawaiian society contained an average of 60,000 members. The Hawaiian stratification system contained three status levels. The highest level included paramount chiefs of entire islands, chiefs of major districts, and the immediate families of both. The intermediate level consisted of district administrators, who were often distant relatives of chiefs. Commoners formed the third level and the bulk of the population.

The high chiefs' position entailed greater responsibility, power, prestige, and privilege than it did elsewhere in Polynesia. Paramount chiefs determined the disposition of agricultural produce and could prevent its use by commoners through application of personal taboos. They could redistribute lands within their domain and controlled access to irrigation water and fishing grounds. They also controlled household production of agricultural and craft goods. They commanded communal labor from their subjects. Chiefs did not practice subsistence agriculture, but were supported by the commoners. They were treated with marked deference and respect and were permitted the use of special clothing and rank insignia.

The paramount chief was considered to be the nearest living relative of a divine ancestor, and his religious function included consecration of temples and performing special rituals. Certain dieties were worshipped only by paramount chiefs. Life-crisis rites for chiefs were more elaborate than those for commoners. A chief's death occasioned elaborate ceremonies involving the entire society, and chiefs were accorded elaborate burial treatment.

Economic exchange centered upon the chiefs. Local chiefs gathered produce from the commoners and passed it onto the paramount chief, who, in turn, redistributed it to the entire society at feasts and celebrations. Both paramount and local chiefs extracted a portion for personal use but most was redistributed to commoners. This exchange system facilitated movement of specialized local products to consumers in all parts of the islands and fostered maximal exploitation of all the environments. Certain foods and luxury goods (whales teeth, feather helmets, staves of office, and other regalia) were upper level status indicators and were reserved for chiefs.

Hawaiian society contained two kinds of occupational specialists: societal leaders (chiefs), and craftsmen. The latter included carpenters, canoe builders, and architectural specialists. Most were part-time, rather than full-time specialists. A craftsman's status depended more upon geneological position than upon his skills.

Public works projects, such as construction and maintenance of temples and irrigation systems, depended upon communal labor.

Sahlins classified the Easter Island societies as Level Ia indicating they were less complex than Level I societies.

Easter Island is a volcanic cone similar to the Hawaiian islands, but is less complex ecologically. The main agricultural crops included sweet potatoes, bananas, and yams; fish were an important item in the diet. Irrigation and terracing were not practiced.

Total population at time of contact is estimated to have been 3000-4000, much less than Hawaii.

Easter Island society had two basic status levels: chiefs and commoners. Chiefs were the leaders of ten unilineal descent groups. Two paramount chiefs existed; a secular ruler who maintained power through military prowess and a hereditary sacred ruler. Each had retainers who were close relatives. A third level, war captives and slaves, is alluded to by some writers but its existence is questionable.

Easter Island chiefs lacked the power of their Hawaiian counterparts; they had no direct control over household production and could not confiscate economic goods. They did act as focal points in the redistribution network. They were permitted special rank insignia, were exempt from subsistence activities, and were accorded elaborate burial.

Specialized occupations were less highly developed than those of Hawaii. The famous stone sculptures may or may not have been products of full-time specialists. Public works projects, such as transportation of the sculptures and temple construction, were supervised by the chiefs.

Interchiefdom warfare was endemic on Easter Island; defeated people were either expelled from their lands or a major portion of their production was confiscated.

Tikopian society is a typical example of Sahlins' Level IIb. The single volcanic island has a limited amount of flat land. Taro, coconut, and breadfruit were the major foods supplemented by fish. Irrigation, terracing, and other specialized agricultural techniques were not practiced.

Sahlins calculates the total population at contact time at 1250 inhabitants.

The Tikopian ranking system contained only two basic levels: chiefs and commoners. Four chiefs ruled simultaneously; their near relatives shared their prestige to a minor extent.



The chiefs exercised only limited control over resources. They could not seize land from commoners, nor did they control fishing grounds. They could not coerce participation in communal labor projects but depended on personal charisma and example to secure cooperation. They were the foci of a redistribution network but could not force commoners to surrender goods. Differences in consumption between chiefs and commoners were minimal. A chief's house was larger than most others but his furnishings, clothing, and ornaments were similar to those of commoners. Chiefs were self-supporting, subsistence agriculturalists. They had only limited power to resolve disputes, and their opinions were not necessarily accepted. The chiefs position gave prestige to the occupant but lacked power and authority.

Part-time craft specialists existed, but they were also subsistence farmers.

Sahlins' data demonstrates a close relationship between several aspects of culture in chiefdoms. Societies with the most highly developed rank systems also have the highest total population and occur on the ecologically most complex islands.

Ecological zonation in Polynesia is largely dependent upon altitude; high volcanic cones have more zones and trap more rainwater for irrigation than do low volcanoes or coral atolls. They also have more fertile soils than do low islands. The increased complexity and larger fertile areas of high volcanoes permits greater productivity, higher total populations, and potentially greater surpluses. The population size differentials seem to be the key factor in determining the level of societal complexity. Islands with limited demographic potential and small populations had less complex societies; Hawaii had the greatest demographic potential, the highest population, and the most complex chiefdoms. State organizations never evolved in Polynesia in PreContact times, probably due to the size of the islands and the demographic limits resulting from this and the aboriginal technological level. The demographic levels of a state were never approached and states did not evolve. Territorial and demographic limits would not be as restricted in a continental area such as Meso-america, a fact to which we will return later.

### Primitive States

Service discusses two levels beyond the chiefdom, primitive states and empires. Only a single level is defined here.

Primitive states are larger and more complex than chiefdoms and their population numbers range from the tens of thousands to the millions.

States encompass such large areas that several different agricultural systems are always practiced within their boundaries. The relationship between certain intensive agricultural techniques, such as terracing and irrigation, and the evolution of primitive states has been a major concern of some anthropologists. A full-scale presentation of the concepts, alternate hypotheses and supporting data is beyond the scope of this monograph, but a brief review of the problem is warranted. Armillas, Palerm, Sanders, Wittfogel, Wolf and other scholars maintain that certain

types of irrigation systems can only function in the presence of a well-organized, coercive political structure. This structure assures the cooperation of all interested parties in essential matters, such as the building and maintenance of canals and dams, water distribution, etc. These scholars hypothesize that the introduction and expansion of such systems in certain areas (i.e. the Basin of Mexico) led to the formation of state political structures. Other scholars maintain that complex irrigation systems characteristically come into existence after the formation of the state and, thus, do not play a significant role in its formation (i.e. Robert McAdams and Michael D. Coe). Regardless of the casual relationship, large scale water control systems are found only in states.

State social structures are based upon well-defined social classes, and kinship is not the only important factor. The system includes at least two major strata: a small upper class and a large lower class, with finer gradations within these two units. The upper class may be divided into subclasses of rulers, bureaucrats, military and religious personnel, wealthy merchants, etc. The lower class may contain subclasses of merchants, agriculturalists, laborers, occupational specialists, slaves, etc.

Primitive states have a complex pattern of economic specialization with many full-time specialists engaged in manufacturing, trade, commerce, government, religion, and other fields. The arts and crafts are quite highly developed in such societies.

Population nucleation and urbanism is a common pattern in primitive states. Urban centers are restricted to state societies but not all states have urban centers. The Classic period Lowland Maya are a good example of a non-urban state.

States have marked expansive tendencies and the successful ones (empires) are able to integrate diverse ethnic, cultural, and linguistic groups into their structure.

### Archaeological Indicators of Societal Levels

#### Tribes

Several types of archaeological evidence indicate tribal organization. Most tribes practice agriculture, which can be demonstrated by the remains of cultigens or the artifacts used in their cultivation or preparation. The existence of sedentary communities is often cited as indicative of agriculture. This is true in most, but not all cases. Certain hunting and gathering societies occupy permanent communities despite the lack of agriculture, particularly in environments where resources are highly concentrated and localized. In most cases however, sedentary communities do indicate agriculture. Remains of permanent buildings and improvements upon the land, such as irrigation canals, terraces, and roads, all indicate permanent settlement. These may be detected archaeologically.

Pan-tribal sodalities are a distinguishing characteristic of tribes but these are difficult to detect archaeologically.

Agriculture and settled life are indicative not only of tribes but also of all higher organizational levels. Thus, other criteria are needed to distinguish tribes from higher levels. There are no known positive, archaeologically demonstrable traits which do this, thus tribes must be defined on the basis of negative evidence or things lacking in the archaeological remains. These things are the characteristics of chiefdoms and states. A tribally-organized society can be postulated in the absence of these characteristics.

#### Chiefdoms

Various settlement pattern arrangements are possible in chiefdoms but urban centers are never found. The possible patterns include the following:

1. Ceremonial centers surrounded by villages, hamlets, or individual households.
2. A series of small "towns".
3. A large single community which contains the majority of the population of the society.

Type three is perhaps the least common and is generally a response to endemic warfare.

Chiefdom economic structure can be demonstrated archaeologically. The elaborate exchange networks deal with both perishable and non-perishable goods. The latter are evident in archaeological remains and might include raw materials, tools, and household utensils. Trade with neighboring groups is much more important in chiefdoms than in simpler societies and the customary archaeological indicators of trade demonstrate such exchange. The presence of occupational specialists could be inferred from the superior craftsmanship of the finished products. The absence of markets, mass-produced goods and numerous full time specialists would differentiate chiefdoms from states.

Chiefdom social organization should be readily detectable in archaeological remains. The goods reserved for high ranking individuals are often durable objects. These might include personal adornment status indicators made of rare, exotic materials. Upper status burials are almost always more elaborate than those of commoners, and the offerings often include luxury goods and high status objects. Such burials are a prominent part of chiefdom archaeological remains.

Chiefdoms can marshal labor for large projects such as construction of temples, ceremonial precincts, tombs, etc. The remains of these public works indicate the presence of a group capable of directing the labor of the majority of the population and in itself indicates social stratification.

The archaeological indicators of chiefdoms which can be extracted from the foregoing are:

1. A settlement pattern which conforms to one of the three types listed and which lacks large urban centers.
2. An economy which emphasizes intergroup exchanges of many items and intragroup trade in luxury goods but which lacks markets.
3. Evidence of full or part time occupational specialists.
4. Evidence of a ranked social structure divisible into two major groups, one dominant and the other subordinate.
5. Striking intergroup differences in burial practices and mortuary offerings.
6. Remains of public works such as temples, ceremonial precincts and tombs.

### States

Urban centers are a hallmark of the state and their presence indicates a state organization. Their absence, however, does not preclude state organization. Non-urban states, though rare, have existed. A non-urban state may be postulated if urban centers are lacking but other state characteristics are present. The state social structure is perhaps the best single indicator of that level and would be verifiable in a non-urban state. This characteristic would, more than any other, distinguish a non-urban state from a chiefdom.

Remains of large-scale water control systems such as dams, canals, dikes, and terraces are sure indicators of a state organization.

State economics center on institutionalized markets, often held in special buildings whose remains can be identified archaeologically. Trade and market systems can also be shown by the distribution of certain products, such as pottery vessels, foodstuffs and utilitarian tools.

Occupational specialization is more highly developed in states than in chiefdoms and there are many more crafts and craftsmen. The products include both luxury goods and items mass-produced for the market and for lower class consumption. The latter are generally standardized and their presence in archaeological assemblages is striking.

Social structure and stratification are much more highly developed and complex in state societies than in chiefdoms. State class structures are based on a combination of social, economic and political differences and cross-cut the entire society. They include an upper class of rulers, bureaucrats, and military and religious leaders; an artisan-craftmen class; a commoner class; and frequently a class of slaves and war captives. This social structure can be determined archaeologically. Settlement pattern analysis would indicate a variety of house types which correspond to the different classes. A large series of burials and the associated mortuary offerings could perhaps be classified into groups which correspond to the several social classes.

Writing systems and highly developed mathematics are characteristic of many states. They are frequently controlled by priests, though their functions may not necessarily be religious.

States can muster much larger labor pools than chiefdoms and consequently can undertake much more grandiose public works projects. They also have tighter control over the labor source than do chiefdoms. The constructions are much larger and more numerous and the total societal expenditure is much greater.

Both chiefdoms and civilizations have expansive tendencies and organized military activities are characteristic of both. The advantages inherent in their more complex organization permit states to maintain more effective control over conquered lands than chiefdoms can. States can successfully integrate diverse ethnic and linguistic groups into their realm, but chiefdoms generally cannot. Chiefdoms which are successful in their imperialistic ventures are so because they have adopted certain organizational techniques from states. If they are successful enough, they become states. These expansive tendencies can be documented archaeologically by the diffusion of religious cults, presence of fortifications, foreign enclaves in distant cities, and by many other indicators. An important indicator of state level organization is the persistence through time of large scale political control. Under unusually able charismatic chiefs, chiefdoms may expand to include relatively large populations and areas, but such expansion rarely outlives the reign of the particular chief.

#### IV. History of Archaeological Research on the Mesoamerican Formative

##### Introduction

The archaeological data will be presented within a framework of five regions of Mesoamerica; the South Gulf Coast, Highland Mexico, the Pacific Coast of Guatemala and Chiapas, Highland Guatemala and the Maya Lowlands.

##### The South Gulf Coast

The term Olmec has been applied to the Formative cultures of this area. Though it was a poor choice, it is in common usage today and so will be used here.

The South Gulf Coast includes southern Veracruz and western Tabasco. The region is a low lying plain bisected in the center by the Tuxtla Mountain range. The Laguna de Alvarado bounds the area on the west; the eastern boundary is the Grijalva River. Average annual temperature and precipitation are high and the natural vegetation cover is high forest interspersed with savanna grasslands. Several major rivers drain the area, including the Papaloapan, the Coatzacoalcas, the Tonalá and the Grijalva. Their flood plains contain the most fertile agricultural lands of the region. The Tuxtla volcanic range is another block of fertile land.

Reliable data exists on four Formative Period sites: Tres Zapotes, La Venta, San Miguel, and San Lorenzo. Tres Zapotes, the first site to be scientifically investigated, was excavated by Mathew W. Stirling under the joint auspices of the National Geographic Society and the Smithsonian Institution. He was assisted by C.W. Weiand in 1939 and Philip Drucker in 1940. Tres Zapotes is one of many sites on the banks of the Arroyo Hueyapan, a tributary of the Papaloapan River. Stirling uncovered 22 stone monuments, including Stela C which has the oldest Long Count date yet known, 31 B.C. in the Goodman-Martinez-Thompson correlation. Two colossal stone heads are known from the site; this type of monument has become synonymous with Olmec culture.

Stirling and Drucker excavated Cerro de las Mesas, north of Tres Zapotes and outside the Olmec area, in 1941 (Stirling 1943; Drucker 1943b). This site is primarily Classic, though some Late Formative materials were uncovered.

Stirling and Drucker worked at La Venta, Tabasco, in 1942. Numerous Olmec monuments were uncovered, including colossal heads, (Stirling, 1955).

Olmec studies remained dormant from 1947 until 1955; when Drucker, Robert Heizer and Robert Squier worked at La Venta. This work produced the first radiocarbon dates for the Olmec culture (Drucker, Heizer, and Squier, 1959). Heizer, Squier and Roman Pina Chan have worked independently at La Venta since 1955 but only Heizer has published his results (Heizer, Drucker and Graham, 1968; Heizer, Graham and Napton, 1968). Alfonso Medellin Zenil excavated Laguna de los Cerros, Veracruz in 1960 but has not published the results. Howell Williams and Heizer have done a study of the sources of stone used in Olmec monuments (Williams and Heizer, 1965). Michael D. Coe initiated a program of excavation and survey in the Rio Chiquito area in 1966, concentrating on San Lorenzo (Coe, M.D., 1967, 1969).

### Highland Mexico

#### Introduction

Three Highland Mexican sub-areas can be defined: the Basin of Mexico, Morelos-Puebla and the Valley of Oaxaca.

The Basin of Mexico is a basin surrounded by mountain ranges on three sides (Sanders, 1965; West and Augelli, 1966). It is limited on the east by the Sierra Nevada, on the west by the Sierra de las Cruces and on the south by the Sierra de Ajusco. The northern boundary is a wide band of increasingly arid land. The basin floor is approximately 2200 meters above sea-level, though some mountain peaks reach almost 6,000 meters. It was a closed hydrographic unit until recently. All drainage ultimately terminated in a series of lakes on the valley floor. The lakes were at different levels, and some had fresh water, while the lowest (Lake Texcoco), was extremely saline. The lakes provided the inhabitants with fish, other aquatic foods, salt, and various water fowl. They also served as an important transportation medium for canoe traffic. Agricultural fields called chinampas were constructed in the fresh water lakes during the Post-Classic.

The present day soils are generally good, though the area is somewhat eroded. Variability of moisture rather than soil fertility per se is the crucial factor in agricultural productivity. The majority of the rain falls during the summer; this and the winter frosts limit most of the area to one crop annually.

Morelos lies directly south of the Basin of Mexico, separated from it by the Ajusco Range. Most of the state lies within tierra templada, with elevations ranging from 1800 meters in the north to 800 meters in the south. It has three main geographic provinces, crossing the state from east to west (Arroyo 1942; discussed in Grove 1968). The northern-most is the foot-hill section south of the Ajusco Range. This is tierra fria, with pine-covered hillsides and small, fertile valleys. The second province is a large alluvial-volcanic plain in the central part of the state. Fertile soils, a twelve-month growing season and an average rainfall of 30-40 inches combine to make this a very rich agricultural zone. The third province is the mountainous, semi-arid southern portion of the state, classified as tierra caliente. The entire state is drained by the Balsas River and its tributaries, the Amacusac, Yautepec, Cuauhtla and Tenango Rivers. This system played an important role in the Formative Period occupation of the area.

The Valley of Oaxaca is southeast of Morelos and the Basin of Mexico. It is a valley 100 kms long with a maximum width of 25 kms. The valley floor is approximately 1500 meters above sea-level. The Rio Atoyac, and its tributary the Tlacolula, drain the valley. Flannery and his colleagues (1967) have defined four major physiographic zones. First is the low alluvium or present-day river flood plain, which occupies a small portion of the valley. Next is a zone of high alluvium, left by the river when it flowed at a higher level. This zone is larger than the first. Third is the piedmont, the largest zone. This is bordered by the fourth zone, the mountain slopes. Each zone had a somewhat different occupational history during the Formative.

Several physiographic features of the valley seem to have been important for Formative period agriculturalists. First, it is one of the largest areas of relatively flat land in central Mexico. Secondly, the exceptionally high water table in certain parts of the valley permits an unusual form of irrigation called "pot irrigation". Third, the area is almost completely frost-free, thus maize can be grown all year round and the primitive types of maize known to have existed in the Formative could thrive.

#### Basin of Mexico

The first scientific investigation of a Formative site in the Basin of Mexico was by Manuel Gamio at Copilco. There he discovered burials with offerings of pottery and figurines under a lava flow thought to be quite ancient (Gamio, 1920). The site of Cuicuilco was excavated a few years later by Byron Cummings, sponsored by the National Geographic Society. The major structure at Cuicuilco had been partially covered by the same lava flow as Copilco and the two sites were shown to be of the same age. The Cuicuilco pyramid, a large round structure, seemed to indicate an advanced society at a very early time. The lava flow which post-dates the site could not be dated satisfactorily and the estimates ranged from 10,000 B.C. to the time of the birth of Christ.

George C. Vaillant excavated several Formative period village sites between 1928 and 1933. This provided the first secure stratigraphic sequence for the Mesoamerican Formative, and many of his conclusions are still basically valid today. Three Basin of Mexico sites were excavated: El Arbolillo, Zacatenco, and Ticoman. All were the remains of small villages occupied by subsistence agriculturalists who also exploited the resources of the nearby lakes. Vaillant also excavated Gualupita, near Cuernavaca, Morelos, where he found numerous burials with elaborate offerings and evidence of contact with the South Gulf Coast.

Vaillant divided the occupation of each site into a number of periods based upon stylistic changes in figurines and ceramics. He then proposed a general stratigraphic sequence for the entire valley (Vaillant, 1938; 1944). He defined an Early phase of the Lower Middle Cultures which included El Arbolillo I and Early Zacatenco; followed by a late phase which included Transitional Zacatenco, Copilco, Middle Zacatenco, and El Arbolillo II. In The Aztecs of Mexico, he divided the Upper Middle Cultures into two phases, Early and Late; elsewhere, he combined them into one. The Early Upper Middle Cultures included Gualupita I and Cholula I; the Late Middle Cultures included Early, Intermediate, and Late Ticoman; Cuicuilco I, II, and III; Late Zacatenco, Gualupita II and Teotihuacan I.

The famous site of Tlatilco became known after Vaillant terminated his work; there many elaborate burials were uncovered by brickmakers digging earth. The Instituto Nacional de Antropologia E Historia has excavated Tlatilco sporadically since 1942 and recently Paul Tolstoy has terminated a project at the site. Several major publications have resulted from the Tlatilco excavations, including monographs by Lorenzo (1965), Pina Chan (1958), Porter (1953), and a paper by Tolstoy and Guennette (1965).

Pina Chan separates the Tlatilco habitation area ceramics into three phases: Lower, Transitional, and Upper Tlatilco. He places the burials in the Transitional and Upper phases. He equates Lower Tlatilco with Vaillant's Intermediate and Late El Arbolillo I, and Lower Zacatenco; and Transitional Tlatilco with part of El Arbolillo II, part of Middle Zacatenco, and the earlier occupations at Copilco, Tlapacoya, Gualupita, Chalcatzingo, and Atlihuayan. Upper Tlatilco was dated as coeval with the latter part of Middle Zacatenco and the later occupation at Copilco, Tlapacoya, Gualupita, Chalcatzingo, and Atlihuayan.

Paul Tolstoy (1970) has recently conducted excavations at Tlatilco, El Arbolillo, and Ayotla which have significantly altered previously held ideas. He defined three phases at Tlatilco: Iglesia, Totolica, and Atoto. All the known habitation refuse and most of the burials are of the Totolica and Atoto phases. The Iglesia phase is represented mainly by burials with "Olmecoid" or "Olmec-like" objects among the offerings.

He has also defined three phases at El Arbolillo: El Arbolillo, La Pastora and Cuauhtepac. The El Arbolillo phase equates with Vaillant's phase with El Arbolillo II.



Two excavation projects have been conducted near Tlapacoya. One involved the excavation and restoration of a Late Formative temple platform (Barba de Pina Chan, 1956). The second centered on a near-by site called Ayotla. Here Tolstoy (1970) defines three phases; Ayotla, Justo, and Bomba. The first two share many traits with the Olmecoid burials (Iglesia phase) at Tlatilco, Las Bocas, Gualupita, and Atlihuayan, and with the ceramics of the San Lorenzo phase at San Lorenzo and the San Jose phase in the Valley of Oaxaca. Bomba, the latest phase at Ayotla, is coeval and shares many traits with the El Arbolillo phase at that site.

Several Formative Period phases have recently been defined in the Teotihuacan Valley (Millon, 1966; Sanders, 1965). The little known Altica phase is the earliest; it seems to slightly predate or is contemporary with the El Arbolillo phase. Next is the Chiconautla phase, the local equivalent of Pina Chan's Middle Formative. The Late Formative is divided into three phases: Cuanalan, Patlachique-Tezoyuca, and Tzacualli. Cuanalan is the local variant of Valliant's Ticoman occupation. Next is a rather confused period composed of two complexes; Patlachique and Tezoyuca. Tzacualli is Terminal Formative or Incipient Classic.

#### Valley of Oaxaca

Alfonso Caso and his associates conducted excavations at Monte Alban and other places in the Valley of Oaxaca during the 1930's. These resulted in the definition of a number of general chronological periods, two of which (Monte Alban I and II) are Formative. Monte Alban I was best known from the excavation in the Danzantes building, a structure faced with stone slabs upon which human figures were carved. Several scholars, including Caso, have noted similarities between the Danzante sculptures and the Olmec art style.

Recent work by Kent Flannery and his associates has considerably augmented the body of data on the Valley of Oaxaca Formative. The sequence begins with the San Jose phase (Flannery, 1968). The evidence indicates that the San Jose phase people were subsistence farmers living in small villages. There are indications of limited occupational specialization and some long distance trade. The succeeding Guadalupe phase was essentially an elaboration of these processes and developments of the San Jose phase without any major innovations. Monte Alban I, the latest Formative phase, saw the emergence of the cultural patterns which were later to characterize Classic Period Monte Alban culture.

#### Puebla

The Tehuacan Valley, Puebla, was the scene of one of the most important archaeological projects in Mesoamerica in recent decades. Here, Richard S. MacNeish and his associates uncovered a cultural sequence beginning in Terminal Pleistocene times and lasting until the time of the Conquest. One of the major contributions of the project was the elucidation and clarification of the process of agricultural invention and the domestication of many New World cultigens. This aspect of the Tehuacan Project is outside the interests of this paper and will not be discussed here. The Tehuacan Project did uncover numerous Formative Period occupations. The earliest

Formative phase is Purrón. This is the most poorly known phase in the sequence and one of the most important, for it was at this time that pottery was first used and that sedentary village life became the normal life pattern. Next is the Ajalpan phase. Ceramics of this phase show typological ties with Olmec ceramics at the same time period. No temples or ceremonial architecture were found for this period but their existence is possible. The succeeding Santa Maria phase is noted for the presence of large ceremonial centers, large villages, and irrigation features.

#### Morelos

Vaillant did the earliest work on the Morelos Formative, his excavations at Gualupita uncovered numerous burials of this period (Vaillant and Vaillant, 1935). He recognized non-local influence in the objects associated with the burials and postulated the influence was coming from the South Gulf Coast. The next major work on the Morelos Formative was Pina Chan's excavation at Chalcatzingo (Pina Chan, 1955), where he uncovered a Formative occupation which he connected with certain Olmecoid rock carvings on a nearby hill.

Recent work by David Grove (unpublished Ph.D. dissertation, UCLA, 1968) has augmented considerably the corpus of material on the Morelos Formative, but many chronological problems still remain. Grove's earliest phase is called La Juana. It is characterized by "Olmec style" pottery and figurines and is equated temporally with the San Lorenzo, San Jose and Iglesia phases. Gualupita (phase I), Chalcatzingo and Atlihuayan were also occupied at this time.

The "Olmec style" pottery and figurines disappeared in the following San Pablo phase, which equates with Upper Tlatilco, the Palangana phase at San Lorenzo, Guadalupe in the Valley of Oaxaca and Santa Maria in Tehuacan. The majority of the previously occupied sites continue to flourish in this period.

#### The Lowland Maya

The Maya Lowlands were the center of a highly developed Classic Period culture. Its antecedents are still quite obscure. Most research has concentrated on Classic Period ruins, where the Formative deposits are buried beneath massive Classic construction and where large-scale excavations are required to reach the Formative levels. Also, the Maya continually rebuilt and enlarged their ceremonial centers, thus destroying many of the earlier remains.

A considerable amount of unpublished Formative Period data has been gathered within the past ten years, particularly at Tikal, Altar de Sacrificios, Seibal and Dzibilchaltun. Progress reports, short articles and papers do provide some data.

The Maya Lowlands include the Yucatan peninsula, eastern Tabasco, western Chiapas, Peten and Izabal in Guatemala, Belize and western Honduras.

This area lies below 800 meters in altitude and is covered primarily by tropical forest. Sanders (1962) has defined a number of culturally relevant sub-areas and his presentation will be followed.

Northern Yucatan--this is a lowlying area composed of limestone bed-rock covered with a thin, scanty soil. Surface drainage is non-existent and cenotes or natural sink holes are the only source of water. Rainfall is from twenty inches to fifty inches annually and occurs primarily during the summer and early fall. Today there is scrub forest in the north and zapote forest in the east and south.

Southern Yucatan--this is an area of low lying hills interspersed with "bajos" or swamps. Soil cover is scanty. The Usumacinta River System drains most of the area. Annual rainfall is from sixty inches to one hundred fifty inches. The modern vegetation is primarily dense forest, though savannas occur sporadically.

Tabasco--this is a flat, poorly drained coastal plain crossed by the Usumacinta and Grijalva Rivers. The latter is bordered by large stretches of alluvial flood plain ideal for agriculture. Average annual rainfall is between sixty inches and eighty inches. The modern vegetation is primarily tropical jungle but savannas are common.

The first Formative Period remains to be recognized in the Maya area were certain tomb offerings at Holmul (Merwin and Vaillant, 1932). The Carnegie Institution of Washington excavations at Uaxactun produced the first sizable body of data on the Maya Formative. Two phases were defined, Mamom and Chicanel. The Mamom phase remains consisted solely of broken ceramics and habitation refuse. Structure E-VII-sub, the earliest known temple base in the Maya area belongs to the Chicanel phase.

George Brainerd studied the ceramics collected from a number of Yucatan sites by members of the Carnegie Institution of Washington staff. He defined three formative phases; Early, Middle, and Late. The only Early Formative remains came from the edge of the cenote at Mani, where water jar fragments were found in profusion. No other Early Formative remains were known to him. The Middle Formative materials came from Dzibilnocac and Santa Rosa Ixtampak, both in the Chenes region. Dzibilnocac seems to have been a large village; Santa Rosa may have contained ceremonial structures of considerable size. Late Formative sites are quite abundant in Yucatan and there are indications of large ceremonial structures and complexes.

A major research program was begun by the University of Pennsylvania at Tikal in 1956. This has produced considerable data on Formative cultures in the area, though much of it has not yet been published. The same is true of the recent Harvard University projects at Altar de Sacrificios and Seibal; and the Tulane University-National Geographic Society program at Dzibilchaltun, Yucatan.

Highland and Pacific Coast of Guatemala-Chiapas

Research in highland Guatemala has lagged behind other areas of Mesoamerica; this is particularly true of problem-oriented projects. Most archaeology in this area has been salvage work. The Carnegie Institution of Washington conducted excavations during the 1930's and 1940's at Kaminaljuyu, the major site in the area. They uncovered a long Formative sequence containing three major phases, Arevalo, Las Charcas, Miraflores. The Arevalo material consists of a handful of pot sherds found mixed together with later materials. The Las Charcas remains indicated subsistence farmers living in small hamlets and lacking marked social stratification. Bottle-shape pits excavated into the ground were an unusual feature of the period. They were probably used originally for storage or for cooking but were later used as garbage dumps. The Miraflores Period remains proved to be a complete surprise to Mesoamericanists. A large burial mound (Mound E-III-3) was excavated, it contained two tombs with extraordinarily rich offerings. These tombs indicated that Formative Period society was considerably more elaborate than had been previously thought.

The Pacific Coast of Guatemala and Chiapas is one of the poorest known archaeological areas in Mesoamerica, yet at the same time it provides some of the best data on the Formative Period.

Matthew Stirling (1943) conducted a survey of the Chiapas piedmont and coast. He discovered the large site of Izapa, now famous for its sculpture and large mounds. Phillip Drucker surveyed parts of the Chiapas coast in 1948 and located numerous Formative Period sites. Edwin Shook surveyed coastal Guatemala in 1946-47. He discovered numerous sites; among them was La Victoria, near the Mexican border. Michael D. Coe excavated La Victoria in 1958 and uncovered a long Formative sequence which probably extends back to 1500 B.C. Coe, assisted by Kent V. Flannery, returned to this area in 1962 and filled out the previously known sequence and collected considerable data on Formative subsistence patterns.

The past few years have witnessed considerable archaeological activity in this area. Members of the New World Archaeological Foundation have worked at Altamira, Izapa, and several other sites; and the Milwaukee Public Museum has recently excavated at Monte Alto and Bilbao.

### Chronology

The chronology of the Mesoamerican Formative has been debated and questioned at great length since the invention of radio-carbon dating. The scheme presented in the following pages makes the most sense to the present author. No claims are made for its long range validity but it does take all presently available data into consideration and should remain valid for at least a while.

The best starting point for the Formative stage seems to be the point at which sedentary village life, reasonably full time agriculture, and the production of ceramics are all in evidence. The earliest known occurrence of these three traits in Mesoamerica was at about 2500 BC in the Tehuacan Valley (MacNeish, 1967). The Formative stage did not terminate at one specific point in time but the evolution of the Classic States had advanced sufficiently by 1 A.D. that this date may be designated as the end of the Formative stage over most of Mesoamerica.

The Formative period is here conceived of as lasting from the earliest manifestation of the Formative stage until the earliest concrete manifestations of the Classic stage. While it is doubtful that future research will significantly alter the terminal date, the date of inception may prove to be considerably earlier than 2500 B.C.

Three phases may be defined in the Formative Period; the Early Formative (2500-1500 B.C.), the Middle Formative (1500-600 B.C.), and the Late Formative (600 B.C.-1 A.D.). The Early Formative is by far the poorest known of the three, indeed its remains have only recently been discovered. The Purron phase in the Tehuacan Valley is the best known Early Formative complex. Its pottery, the earliest in Mesoamerica, is crude and imitates earlier stone bowls in the area. Similar pottery has been reported from Puerto Marquez, Guerrero (Brush, 1965). These two complexes comprise all we know about the Early Formative at the moment.

The Middle Formative is the period of the emergence, florescence, and decline of "Olmec" culture on the South Gulf Coast and hence corresponds to what previous writers have called the Early and Middle Formative.

The Olmec site with the best known and most coherent chronology is San Lorenzo (M.C. Coe, 1969). Five Middle Formative phases have been defined; Ojochi (1450-1360 B.C.), Bajio (1350-1250 B.C.), Chicharras (1250-1150 B.C.), San Lorenzo (1150-900 B.C.) and Nacaste (900-800 B.C.). The San Lorenzo phase marks the zenith of Olmec development at San Lorenzo. All stone monuments whose final placement can be dated were purposely buried during this period or prior to it. Baby-face figurines and other Olmec artifacts such as jade batwing pendants also date from this phase.

Recent radio-carbon dates from La Venta indicate that center was occupied between 1000 and 600 B.C., not 800-400 B.C. as previously believed (Berger, Graham, and Heizer, 1967). Drucker, Heizer, and Squier (1959) defined four architectural phases at La Venta (phase I, II, III, and IV), each lasting approximately 100 years but ceramics and sculpture have not been securely tied to these phases.

The methods of analysis and the publication of the Tres Zapotes ceramics has caused considerable confusion and impedes comparisons with other sites. Two reevaluations of the Tres Zapotes materials have been attempted (M.D. Coe, 1965; Squier, 1964), both conclude that the earliest occupation is circa 300 B.C. Radio-carbon dates are lacking but the presence of colossal basalt heads similar to those of San Lorenzo and La Venta indicate the site was occupied during the Middle Formative.

The Formative chronology of highland Central Mexico has been disputed since the 1920's. These disputes will not be reviewed here; the reader is referred to publications such as M.D. Coe 1962, 1965; W.T. Sanders, 1963; Sanders and Price, 1968; and P. Tolstoy, 1970. The earliest known remains in the Basin of Mexico are Middle Formative; Early Formative remains have not been found to date. Several phases have been defined for the period from 1200 to 800 B.C.; they include the Ayotla, Justo and Bomba phases at Ayotla and the Iglesia phase at Tlatilco. The Ayotla and Tlatilco occupations show Olmec influence in the ceramics.

The period from 800 to 500 B.C. is represented by the Totolica phase at Tlatilco, the El Arbolillo and the La Pastora phases at El Arbolillo, the early part of the Zacatenco occupation, and the Altica-Chiconautla phases in the Teotihuacan Valley. The Olmec influence diminished at this time and "Olmecoid" or Olmec-derived art styles emerged.

Two Middle Formative phases have been defined in Morelos: La Juana and San Pablo (Grove, 1968). The La Juana phase (1200-800 B.C.) was marked by strong Olmec influence on the area; the remains include the Chalcatzingo rock carvings, and the Olmec burial offerings at Las Bocas, Atlihuayan, La Juana, and Gualupita. The San Pablo phase (800-500 B.C.) was a period of reduced Olmec influence and the emergence of local art and ceramic styles. The known sites include San Pablo and Gualupita. These phases have been dated through typological cross-ties with other areas. The La Juana materials related closely to the San Lorenzo, Iglesia, and Ayotla phases; while San Pablo equates with Totolica and La Pastora.

The Middle Formative in the Tehuacan Valley includes the Ajalpan phase (1500-900 B.C.) and part of the succeeding Santa Maria phase (900-200 B.C.).

Flannery (1969) has defined two Middle Formative phases in the Valley of Oaxaca: San Jose (1200-900 B.C.) and Guadalupe (900-600 B.C.). The San Jose phase was a period of sustained contact with the Olmec area; this contact was terminated at the end of phase and the Guadalupe remains indicate the evolution of local ceramic and art styles.

The Pacific coast of Guatemala and Chiapas has one of the best defined Middle Formative sequences in Mesoamerica. The earliest known materials are the Barra phase at Altamira, which may be as early as 1600 and certainly existed by 1500 B.C. This is followed by a number of phases defined in the La Victoria-Salinas La Blanca area of Guatemala (M.D. Coe and Flannery, 1967). The earliest is the Ocos phase (1300-1100 B.C.) followed by Cuadros (1000-850 B.C.), Jocotal (850-800 B.C.), and Conchas (800-500 B.C.). Middle Formative occupations have recently been discovered in the piedmont zone of Guatemala. The Algo-es-Algo phase at Bilbao is one such occupation though it has not been directly dated at that site (Parsons, 1967).

Investigations by the New World Archaeological Foundation at Chiapa de Corzo in the Central Depression of Chiapas have produced an unusually long and complete cultural sequence. Two Middle Formative phases have been defined, Cotorra (Chiapa I), and Dili (Chiapa II). The Cotorra phase seems to begin circa 1200 B.C. and possibly terminated at 900 B.C., Dili probably dates at 900 to 600 B.C.

The Las Charcas phase in Highland Guatemala is not securely dated at the moment but recent research indicates that 800-500 B.C. is a reasonable approximation, thus most, possibly all of the period belongs to the Middle Formative (W.T. Sanders, personal communication).

The Southern Maya Lowlands were occupied considerably later than most other areas of Mesoamerica. The earliest ceramic phase is the Xe phase at Seibal and Altar de Sacrificos; it lasted from 800 to 600 B.C. Despite claims to the contrary (Andrews; 1961, 1965), there is no solid evidence for occupation of the Yucatan Peninsula prior to 600 B.C.

The Late Formative is arbitrarily defined as the period from 600 B.C. to 1 A.D. It spans the gap from the disappearance of Olmec culture on the South Gulf Coast until the emergence of Classic Teotihuacan culture in Central Mexico. It is also the period during which the various regional Classic cultures began to take form.

San Lorenzo was reoccupied in the Late Formative, after being abandoned for 200 years. The Palangana phase occupation was a major one on the site and probably lasted from 600 to 400 B.C. La Venta was probably unoccupied at this time, at least no indication of such an occupation have been found to date. The bulk of the Tres Zapotes occupation probably belonged to this period though its internal phasing still is not worked out satisfactorily. Phase I at Cerro de las Mesas belongs to this period (Drucker, 1943b; M.D. Coe, 1965).

The data on the Central Mexican Late Formative is voluminous, but the phase dates are still unsettled. Vaillant defined three phases at Ticoman (I, II, III). Ticoman I probably began circa 500 B.C. The Cuanalan, Patlachique-Tezoyuca, and Tzacualli phases in the Teotihuacan Valley belong to this period; as do the Atoto phase at Tlatilco; the Cuauhtepic phase at El Arbolillo; and the pyramid complexes at Tlapacoya and Cuicuilco.

The Late Formative of Morelos includes Gualupita II and Cerro Chacaltepec II. The latter part of the Santa Maria phase in the Tehuacan Valley belongs to this period, as does the major site at Amelucan, Puebla (Fowler, 1969).

The Monte Alban I phase in the Valley of Oaxaca lasted from 600 to approximately 200 B.C. It has been divided into three phases: IA, IB, and IC, each of unknown duration. Monte Alban II and II-IIIA also belong to the Late Formative even though the latter lasted until 200 A.D.

The Pacific Coast of Guatemala and Chiapas sequence contains two Late Formative components: Conchas 2 (500-300 B.C.) and Crucero (300 B.C.-100 A.D.).

Three Late Formative phases have been defined at Chiapa de Corzo: Escalera or Chiapa III (550-450 B.C.), Francesa or Chiapa IV (450-250 B.C.), and Guanacaste or Chiapa V (250 B.C. - 1 A.D.).

Recent research shows that the Late Formative sequence at Kaminaljuyu in the Guatemala Highlands is much more complicated than previously thought. The Providencia-Sacatepequez phase probably runs from 500-200 B.C. The Miraflores phase lasted from 200 B.C. to about 300 A.D. Numerous sub-phases have been tentatively defined by various investigators (Shook, 1951; Borhegyi, 1965), but they are presently undergoing drastic revision and so will not be discussed here.

The Ilusiones phase at Bilbao is an important Late Formative component in the Pacific piedmont area of Guatemala. The near-by site of Monte Alto also was a major center at this time.

The Late Formative is extensively represented in the Southern Maya Lowlands. Mamom sphere ceramics have been found at most major Maya centers, including Uaxactun, Tikal, Seibal, and Altar de Sacrificios. The most acceptable dates for Mamom are 600-300 B.C. It is followed by the Chicanel sphere (300 B.C.-100 A.D.), which had a wide geographical spread. The Floral Park sphere is the latest Late Formative manifestation in the Maya area, it is often called Protoclassic. It has only been found in certain parts of the Southern Lowlands, specifically Altar de Sacrificios, Barton Ramie, and Holmul. At other sites, Chicanel leads directly into the Classic Period. The Floral Park sphere dates from 100 to 200 A.D.

The site of Dzibilchaltun in northern Yucatan has been extensively excavated by E. Wyllis Andrews and his colleagues for the past decade. Andrews claims to have uncovered evidence of a dense occupation beginning at 1,000 B.C. His chronology contains serious flaws and his "Formative Period" is Late Formative in the present scheme, dating from 600 B.C. to approximately 1 A.D. Other Yucatecan sites occupied at this time include Mani, Santa Rosa Xtampak, and Dzibilnocac (Brainerd, 1958).

## V. Archaeological Data

The following section will deal with the archaeological remains of the major regions. This will be followed by an analysis of the data in chapters VI and VII.

### South Gulf Coast

#### Subsistence

Direct evidence of Olmec subsistence patterns is very meager. Plant remains and organic materials are poorly preserved on Olmec sites, though animal and fish bone and turtle shell fragments have been found in midden deposits at San Lorenzo. Though direct evidence is lacking, there can be no doubt the Olmecs practiced agriculture.

Examination of contemporary natural resources and present-day agriculture provide an indication of the subsistence possibilities open to the Olmecs. The following is based upon data from the San Lorenzo area though it undoubtedly applies equally well to other parts of the region.

Two basic peasant agricultural systems are presently practiced in the Coatzacoalcos Basin. The machete is used in both but both could be practiced without it. One is the typical milpa or lowland slash-and-burn system, which is practiced in the upland areas away from the river. The land is cleared with a machete, the vegetation allowed to dry, and then it is burned. A newly cleared field is planted at the end of the dry season, in late May or June. Most milpas yield two crops a year; the second is planted in November or December. Some farmers abandon a plot after two



crops, some after three, some wait even longer; depending upon the characteristics of the specific plot, the amount of time it has rested since last used, the work habits of the individual farmer, etc. Four crops are apparently the maximum for most plots.

The second agricultural system has never been adequately reported in the anthropological literature, yet it is very important in parts of lowland Mesoamerica. This may be called flood-plain agriculture. The Coatzacoalcos River floods its banks annually, the floods begin in September and the waters recede by mid December. A tall grass known locally as parral sprouts up as the dry land emerges. Preparation of the land for cultivation involves cutting the grass at ground level with a machete. Planting is done with a digging stick and the ground is not plowed. Grass roots do not present a major problem. These annually flooded areas are extremely fertile. Crop yields are high and a plot may be cultivated year after year, without a long rest cycle. The principal crops grown in this system are maize, beans, vegetables and watermelons. One limitation on this type of agriculture is that only one crop a year may be planted because of floods.

Local farmers say a typical piece of river bottom land should yield approximately 45 cargas of maize per hectare. Average yield for the upland slash-and-burn milpas is 35 cargas of maize per hectare. Thus a hectare of milpa land, planted four times in two years then rested for six years would produce 140 cargas of maize over an eight year period, whereas a hectare of river bottom land produces 360 cargas during the same period. Clearly a hectare of river bottom land can support more people than can a hectare of upland milpa land.

Fishing is an important activity in the contemporary subsistence pattern, and the river also provides large numbers of iguana which are taken for their meat and eggs; the same was probably true in Olmec times.

Hunting was probably practiced in Olmec times, but it is doubtful that it played an important part in the overall diet. Deer, monkeys, jabali, tepesquintli, and birds are all found in abundance today, the same must have been true in Olmec times. Stone projectile points are rare in Olmec deposits but wooden spears, projectiles, snares and traps would have sufficed to bring down most game in the area.

#### Settlement Patterns

The data on Olmec settlement patterns is limited. Accurate site maps have never been prepared for La Venta or Tres Zapotes.

A detailed plane table map of San Lorenzo has been published (M.D. Coe, 1968). 217 separate recognizable mounds were plotted. The large mounds clustered in the center of the site were probably temples, cult buildings and other non-residential structures. A minimum of 54 of the 217 mounds are of this type. The remaining 167 were probably residential structures. All are less than two meters high and are quite small. Several occur in clusters of from two to four, seemingly surrounding a plaza.

Drucker excavated numerous test pits at La Venta in an attempt to locate refuse deposits (Drucker, 1952). He found very little refuse and no indications of a large population.

Known centers similar to San Lorenzo and La Venta include Laguna de los Cerros and Estero Rabon. Their settlement pattern was probably like that already described.

Little data exists on Olmec regional settlement patterns and the sustaining areas of major centers. Apart from San Lorenzo, only two San Lorenzo phase sites are known in the Rio Chiquito area. El Remolino, a flat, moundless site on the banks of the Rio Chiquito is one. River meanders have destroyed an undetermined portion of the site and its original appearance is unknown. Drucker's 1946 excavations at El Remolino uncovered two basalt columns, indicating possible civic architecture similar to that of La Venta. A refuse midden was excavated in 1966. The second site is Potrero Nuevo, near the place where Sterling found several stone monuments (Sterling, 1955). The site is much smaller than San Lorenzo.

San Miguel, Tabasco is a site apparently similar to Potrero Nuevo. Sterling found fragments of Olmec sculpture at San Miguel and Olmec related ceramics have also been reported from the site (Sterling, 1957; Pina Chan and Navarrete, 1967). Remains of small hamlets must be abundant in the South Gulf Coast area but they have not been reported.

### Ceramics

The Olmecs were accomplished potters but the highly acidic soils and the climate of the region have resulted in poor preservation of vessels and sherds. Detailed ceramic analysis is beyond the scope of this paper but the following generalizations are important.

The Middle Formative ceramics of the area have a limited range of shapes and forms. One of the most popular is a round, neckless, restricted orifice jar called a tecomate. Decoration is usually limited to the upper portion of the vessel and the techniques include incision, rocker stamping, brushing with grass, and punctuation. Many tecomate exteriors show considerable burning and the interiors occasionally contain carbonized maize dough. It has been suggested that such vessels were used for the preparation of tamales.

Another popular vessel form is a flat bottom bowl with outward slanting walls. Decoration includes punctuation, incision, zoned hachure and carving. Some vessels are decorated with well-known Olmec iconographic elements such as the "wing-paw" design and crossed bands.

Ceramic figurines are common artifacts on Olmec sites. They include both human heads, either by themselves or connected to bodies, and animal effigies. Most examples are solid but hollow ones are also known. Many have the archtypical Olmec baby face. Some may depict ballgame players, others are seated tailor fashion.

## Non-ceramic Technology

Numerous ground stone objects are known from the Olmec sites. Basalt bowls and manos and metates are known from La Venta, San Lorenzo and Tres Zapotes. The early metates lack supports but the later examples have them.

Obsidian was a basic material much used by the Olmeca. Most of it takes the form of small flakes and chips. The obsidian in the earlier levels at San Lorenzo is all grey in color but the source is unknown. Prismatic blades, scrapers, and obsidian projectile points first appear during the San Lorenzo phase. New types of obsidian began to be imported from Central Mexico during the latter part of that phase. Prismatic blades of grey obsidian have been found at La Venta and Tres Zapotes, and obsidian projectile points are known from the latter site.

Green stone objects are a hallmark of Olmec archaeology. The objects include human figurines, ear spools, "stilettos", pendants, beads, and celts. The materials used included serpentine, jadeite, andesite, and nephrite. The majority of the objects seem to have been primarily non-utilitarian in function, though some of the La Venta celts show heavy wear on their edges. This could have resulted from use in a ritual activity. Many of the jade or jadeite objects have carved or incised designs; these form the main corpus of Olmec portable art and are a major expression of the Olmec art style. Most of the known jade objects have come to light as a result of looting activities and not controlled excavation. The various green stones do not occur naturally in the South Gulf Coast area and were traded in from elsewhere. No workshop sites have ever been discovered at an Olmec site and it is possible that the finished objects were traded in, not just the raw materials.

Numerous objects of hematite, ilmanite, and magnetite have been found at La Venta and San Lorenzo. They include beads, pendants and "mirrors". The latter are parabolic and could have been used to reflect images on flat surfaces. Hematite does not occur naturally in the Olmec area and recent excavations in the Valley of Oaxaca indicate this area was a possible source of these objects.

## Architecture

The best published data on Olmec architecture deals with La Venta, where the 1955 field season was devoted to the study of architecture in Complex A.

The principle construction materials at La Venta and San Lorenzo were earth and sand. Columnar basalt was occasionally used for walls of enclosures and tombs. Residential structures were apparently made of pole and thatch with earth floors.

Complex C at La Venta is the largest known Olmec structure. This earth mound is 103 feet high and is shaped like a fluted cone (Heizer, Graham and Napton, 1968). It probably lacked a stairway, but only excavation could prove this.

Five constructions called "Massive Offerings" were uncovered at La Venta. They are large pits dug into the sterile subsoil beneath Complex A. Massive Offering number three, a typical example, was a pit that measured 77 feet square by 12 feet deep. The pit was filled with hundreds of well-cut, polished serpentine blocks separated by layers of clay. Large serpentine block mosaics, supposedly representing highly stylized jaguar masks, were placed on top of some of the Massive Offerings. The aggregate weight of the serpentine in the offerings is not known but each must contain tens or even hundreds of tons. Serpentine is not native to the Gulf Coast Region and Foshag (1957) postulates that Puebla may have been the source. Massive Offerings have not been found at San Lorenzo.

La Venta was planned with an unusual bilateral symmetry. The site center line is 8 degrees east of north. Many of the mounds and offerings occur in pairs with each component equidistant from the center line. Drucker, Heizer and Squier maintained that this symmetry existed from the period of initial construction in Complex A. W.R. Coe and R. Stuckenrath (1964) questioned this, they feel the symmetry was present only in the later building phases. This presence indicates an accurate measuring system.

The San Lorenzo construction has not yet been fully analyzed but techniques and materials were in the main similar to those of La Venta. One unique construction activity discovered at San Lorenzo is ridge building. Several ridges extend out from the San Lorenzo plateau to the south and west. The western pair of ridges are mirror images of each other and excavation has shown them to be artificial constructions. Each ridge is approximately 200 meters long by 100 meters wide and in places the artificial fill reaches a depth of eight meters. Their construction was begun in the Bajio phase and terminated in the San Lorenzo phase. The amount of fill involved is not known but the total must be considerable. The southern ridges have been tested only superficially but are probably identical to the western examples. Trenching in one of the west ridges uncovered a small stepped platform of sand and clay which may date from the Bajio phase.

The use of earth construction presented problems of erosion and drainage control. The La Venta plaza floors were built on slight grades to permit rain water runoff. Drain systems, are constructed of basalt troughs, each approximately one meter long and each has a cover. The San Lorenzo systems contain several hundred trough stones laid in lines. One San Lorenzo system had a main line fed by several feeder lines which are in turn connected to several artificial compacted gravel fill. The trough covers were laid so that each covers half of two troughs, similar to the manner in which bricks are laid today. This undoubtedly resulted in greater structural strength.

Olmec engineering skill is evident at La Venta. Buttresses and retaining walls were used to prevent cave-ins or collapses during construction. This is particularly true in areas of sandy soil because such areas would tend to collapse more readily than those with clay construction. The Olmecs recognized these potentially dangerous situations and took precautions against them but did not take precautions where they were not needed.

Olmec engineering skill is also evident in the placement of basalt columns as architectural elements. In one instance, the columns were placed so their tops formed a level line. Each column was of slightly different length and the depth of the holes into which they were inserted had to be measured with close accuracy to insure the tops would be level.

### Stone Sculpture

Olmec centers are perhaps best known for their stone monuments. Approximately 130 monuments are known from San Lorenzo, La Venta, Tres Zapotes and Laguna de los Cerros. Certain stylistic categories can be defined. Examples of these categories are similar wherever they are found. Colossal heads are one such category. Examples are known from San Lorenzo, Tres Zapotes and La Venta. Flat topped "altars" with persons seated in niches are found at San Lorenzo and La Venta. The seated person frequently holds an infant in his arms. A sculpture of this category is also reported from Chalcatzingo, Morelos (Guzman, 1934). The remaining monuments show a pronounced diversity. Almost every one is unique, though many share characteristics such as feline features, beings who combine human and animal characteristics, elaborately dressed humans standing erect, etc. Detailed study would undoubtedly result in definition of additional sculptural categories.

The monuments range in size from small, semi-portable sculptures weighing perhaps 100 pounds to large heads and "altars" which exceed 40 tons.

Most monuments have not been found in datable contexts; this is especially true at Tres Zapotes and La Venta. The oldest sculptural fragment at San Lorenzo dates from the Chicharras phase. Most of the San Lorenzo monuments were abandoned at the end of the San Lorenzo phase. They were mutilated and battered, then dragged an undetermined distance and buried, at times with offerings of pottery vessels and serpentine celts.

### Burials

The only published data on Olmec burials comes from La Venta; the Tres Zapotes burials were post-Formative and the few San Lorenzo burials have not yet been published. Two burials were uncovered in Mound A2 at La Venta. The two individuals, probably children, had been placed in a tomb constructed of basalt columns. The badly rotted skeletons were coated with red cinnabar paint. Each had a cache of elaborate jade objects (figurines, sequins, pendants and awls) placed with it. W. R. Coe and R. Stuckenrath (1964) contend these were not burials but rather an offering with bone objects as part of the cache. This is possible but cannot be proven. A sandstone coffer found near Mound A2 contained several jade objects but no indication that it had served as a burial sarcophagus. The same is true of several other offerings which might possibly have been burials; if indeed they were, all traces of bone and teeth have disappeared.

Fowler (1969) has recently excavated several Late Formative water distribution channels at Amalucan, Puebla. He feels they may not have been irrigation canals but rather a community water system; they could have served both purposes equally well. Artificial ditches or canals have been reported beneath the lava flow at Cuicuilco, possibly attesting to irrigation there. Late Formative irrigation systems have been postulated, but demonstrated only by indirect evidence, for the Teotihuacan Valley.

### Settlement Patterns

Detailed settlement pattern data is the exception rather than the rule for Highland Mexico. The Teotihuacan Valley data is unique in its depth, scope, and completeness; for this reason, it will be presented first.

Three Altica phase sites were located by the Teotihuacan Valley Project. All are on the valley hillsides and all are small, but the area is severely eroded and the present day sites may be remnants of larger settlements. The sites lack remains of civic architecture and all are approximately the same size. They were probably small hamlets occupied by agriculturalists practicing hillside cultivation. Altica phase settlements have not been found in the valley plains, though this does not necessarily mean this zone was unoccupied.

Eighteen Chiconautla phase sites were located; they were hamlets similar to the Altica phase settlements, though their populations may have been larger. All lacked ceremonial architecture and all are approximately the same size. Nearly all are located on high ground bordering the Valley.

The 29 Cuauhtlan phase sites can be classified into two settlement types: the hamlet and the village. Three villages were located; all probably had less than 500 inhabitants. The hamlets are located on the hillsides while the villages are on the valley floor. This is the earliest evidence for the agricultural use of the alluvial plain and theoretically irrigation may have been practiced at this time. The Cuauhtlan phase sites lack large mounds or ceremonial architecture.

The Patlachique-Tezoyuca phase settlements pose a problem. The Patlachique sites are hamlets and villages located in every part of the valley. All lack ceremonial architecture. The Tezoyuca sites are located on hilltops and all have large temple platforms. The major problem is whether the two ceramic complexes were contemporary or represent successive phases.

The Tzacualli phase marks the end of the Teotihuacan Valley Formative. Millon (1961) has defined a Tzacualli period urbanized zone at Teotihuacan measuring 17 square km<sup>2</sup>. This is the earliest urban center in the valley and perhaps in Mesoamerica. It includes several planned ceremonial precincts in addition to the gigantic Sun Pyramid. Approximately 90 rural Tzacualli sites have been located. Most have been found on the piedmont; the steep hillsides were apparently abandoned. The population had grown considerably over the preceding phase. The rural sites lack ceremonial architecture and the city was apparently the ceremonial focus for the entire valley.

Settlement pattern data is almost non-existent for the remainder of the Basin of Mexico and only vague inferences can be drawn. It has often been noted that Vaillant's sites are located near the lakeshore. A bias for lakeshore living during the Formative has been postulated on this basis (Lorenzo, 1961; Pina Chan, 1955). The Teotihuacan data suggests the bias was rather for settlement on the hillsides and piedmonts where long fallow agriculture was practiced (Sanders, 1965).

The Valley of Oaxaca settlement pattern data is not as complete as that for the Teotihuacan Valley, but the preliminary publications provide some data.

The San Jose phase sites are located in high water table areas where the riego a brazo system was practicable, and low water table areas were less densely populated. One village covering twenty hectares was the largest community of the period.

The Guadalupe phase sites occupy the same areas as the previous communities. Community size differences became pronounced for the first time and one community was much larger than the others.

Valley floor occupation intensified during Monte Alban I times. The tributary valleys of the Atoyac River were occupied for the first time, apparently by farmers utilizing canal irrigation combined with hillside long fallow cultivation. Some communities became internally differentiated into sacred precincts, habitation areas, cemeteries, work shop areas, etc. Hilltop ceremonial centers first came into existence, the largest being Monte Alban.

Fowler (1969) has recorded numerous Late Formative village sites of undetermined size near Amalucan, Puebla. They contained numerous large mounds and relatively dense occupational debris.

The Cruz phase settlements in the Nochixtlan area are on spurs of land extending out into the valley floor. Nothing is known of the size or extent of the sites.

## Ceramics

Ceramics are one of the best known aspects of the Highland Mexican Formative. The works of Vaillant, Pina Chan, Porter, Tolstoy, Flannery, and Grove are all important in this context. A detailed ceramic analysis is beyond the scope of this paper and the following is a very brief treatment.

The Middle Formative ceramics resemble those of the South Gulf Coast. The earlier phases (San Jose, Ayotla, Bomba, Iglesia, La Juana, and El Arbolillo) feature tecomates, flat bottomed bowls, and flat based cylindrical vessels. Decorative techniques include differential firing, red paint, excision, rocker stamping, and punctuation. The later phases (Guadalupe, Totolica, La Pastora, Zacatenco, Chiconautla, and San Pablo) are characterized by flat based bowls, composite silhouette bowls, jars, and tecomates. Decorative techniques include incision, punctuation, cross-hatching, and surface polishing.

Abundant data exists on Formative period figurines. The earlier phases included both large, hollow and small, solid figurines. The hollow figurines are large human effigies and are always associated with burial offerings. Some are very Olmecoid, others seem to be later derivations of Olmecoid examples. The Olmecoid examples portray nude, sexless infants. These have been called the "Jaguars Children" by M.D. Coe, (1965), who hypothesizes that they represent the off-spring of a feline father and a human mother. Thousands of small solid figurines have been found. All the Middle Formative examples are hand made. Some examples have heads and bodies, others are just heads. Most portray females but male examples are also found. Their function is unknown but it has been hypothesized that they were used in fertility rites, in curing ceremonies, and as toys. They were commonly used as burial offerings. The scenes portrayed included mothers with children, seated women, dancers, people wearing unusual headgear (called variously ball players or shamans), people with a variety of physical deformities, and a few animals.

Other Middle Formative ceramic objects include pottery masks worn over the lower part of the face and roller stamps and flat stamps used to apply pigment to the skin.

The Late Formative ceramics and figurines differ strikingly from those just discussed. The Late Formative occupations include Ticoman, Cuicuilco, Tlapacoya, the Teotihuacan Valley phases (Cuanalan, Patlachique-Tezoyuca), Atoto, Cuauhtepac, Gualupita II, Cerro Chacaltepec II, Santa Maria, and Monte Alban I. There is considerable ceramic variation from one area to another and one phase to another. The Ticoman ceramic forms are principally ollas, composite silhouette bowls (with or without supports), and other minor forms. Decoration includes negative painting, red on buff design, polychrome paint, white on red, incision, and punctuation.

The Late Formative figurines differ stylistically from those of the Middle Formative but their functions are just as obscure as those of the earlier examples. The large hollow figurines were no longer manufactured.

## Architecture

Architectural data is limited, particularly for residential as opposed to civic structures.



Remains of residential structures have been uncovered at Cuanalan and Tlapacoya in the Basin of Mexico. Two structures were excavated at Cuanalan; one was completely uncovered. Both were single room structures with adobe walls and packed earth floors. The walls lacked traces of whitewash or adobe plaster. A lean-to kitchen abutted the wall of one house. Several house foundations were uncovered at Tlapacoya, consisting of stone laid in mud mortar (Barba de Pina Chan, 1957). They may have supported wooden superstructures though the evidence is not conclusive.

Construction, perhaps related to residential structures, has been found at several sites. Numerous terraces or retaining walls were encountered at Zacatenco; they may have served to stabilize living areas. Thirty-two conical or bell-shaped pits were uncovered at Tlatilco, which may have served for cooking or grain storage. All were eventually filled with midden refuse including broken pottery, figurines, charcoal, and bones (Pina Chan, 1958).

The term civic structure refers to a structure which did not function as a residence. They may have had religious or political functions or a combination of both. Valliant's sites lack large mounds which might be the remains of civic structures. It is unlikely that such mounds formerly existed but have since been destroyed. Future excavations may reveal civic structures not visible on the surface but this also seems unlikely. All present evidence indicates these communities were composed entirely of residential structures.

Porter (1953) mentions earth structures with clay facings at Tlatilco. They were possibly civic structures but none have been excavated. High mounds are not visible at Tlatilco and none apparently existed within the past three decades.

Cuilcuilco has several civic structures, the largest is a round temple base which was partially covered by the lava flow. At least one earlier structure exists inside it. This earlier structure had an open air altar on its summit. Other mounds have been uncovered at Cuilcuilco (Heizer and Benneyhoff, 1958) and undoubtedly many lie beneath the lava.

A large platform mound was uncovered and partially restored at Tlapacoya. It was constructed of stones and mud, with a stucco covering. Three Late Formative building phases have been defined for the structure.

The earliest civic structures in the Teotihuacan Valley date from the Patlachique-Tezoyuca phase. All are associated with Tezoyuca pottery and all are located on hilltops. The Sun Pyramid at Teotihuacan, one of the largest civic structures of the aboriginal New World, was erected in the succeeding Tzacualli phase. Many other Tzacualli phase ceremonial structures exist at Teotihuacan (Millon and Benneyhoff, 1961).

A San Jose phase residence has been excavated at San Jose Mogote (Flannery, et al, 1967). It was rectangular with a stone foundation and wattle and daub walls covered with white plaster. A hearth and sub-floor cooking pits were found inside it along with a recessed circular area painted red, around which were found fragments of exotic figurines, pottery,

shell, and other material. This area may have been devoted to ceremonial activity.

Several Guadalupe phase houses were excavated at Huitzo and two house types have been defined (Flannery, 1968). One is a rectangular building with sand floors and pole and mud walls lacking plaster or whitewash. The second type is more elaborate than the first; it consists of four large platforms surrounding a large interior patio. Each platform had a house on its summit. The houses were large wattle and daub structures covered with white plaster and whitewash. The associated debris demonstrated that the house types were residences, not ceremonial structures.

Several Monte Alban I residential platforms were excavated at Huitzo. One was constructed of cut stone set in adobe mortar. This structure had a stonelined drain and a plaster floor. Monte Alban I wattle and daub houses were excavated at San Jose Mogote, they are apparently identical to the less elaborate Guadalupe type.

Residential structures of apparently Monte Alban I affiliation were excavated at Monte Negro in the Mixteca Alta (Paddock, 1966). They are clustered around interior courts like the elaborate Guadalupe phase structures at Huitzo.

The earliest civic structures in the Valley of Oaxaca date from the San Jose phase. A rectangular, stepped platform with an earth core and stone facing was uncovered at San Jose Mogote. A similar platform was found at Huitzo but its function is uncertain. Guadalupe phase civic structures have not been excavated though they undoubtedly exist. Ceremonial precincts became common during Monte Alban I times. The hilltop site of Monte Alban was first occupied at this time. Although the extent of the Phase I occupation is unknown it may have been considerable. The "Danzante" structure belongs to this phase, a platform covered with stone slabs upon which human beings are carved.

#### Non-ceramic Technology

The published data on non-ceramic technology is incomplete. Lorenzo (1965) has analyzed the non-ceramic artifacts from Tlatilco. The ground stone objects include abraders, polishing stones, axes, manos, metates, mortars, and pestles. All are made from volcanic rocks, presumably local material. Ground stone ornaments include beads, pendants, and a small bird effigy. Chipped stone artifacts include knives and projectile points, both of obsidian. Obsidian blades are quite common. Bone artifacts include punches and awls, needles, polishers, and musical rasps. Shell objects included perforated oyster shells, beads, and a few miscellaneous ornaments. At least two Olmec jade figurines have been found with Tlatilco burials.

The objects found at Zacatenco, El Arbolillo, and Ticoman are essentially the same as those from Tlatilco. Five jade objects were found at El Arbolillo: two ear plugs, two beads and a pendant shaped like a jaguar canine. Fragments of turquoise were also found at El Arbolillo. The Late Formative center of Tlapacoya yielded the above mentioned types of

non-ceramic artifacts plus serpentine celts, jade ear plugs, jade pendants, and some shell ornaments.

Remains of a San Jose phase workshop have been uncovered at San Jose Mogote. The excavation yielded an unusually large amount of worked and unworked magnetite, ilmenite, hematite, quartz, and various types of shells. Chert drills, burins, and polishers were associated with this debris. There can be little doubt this was a workshop area for manufacturing ornaments. The magnetite appears to be identical to that found at La Venta and San Lorenzo. It is native to the Valley of Oaxaca but does not occur naturally on the South Gulf Coast. Mineralogical analyses of magnetites from the two areas are being done presently and until results are known, the case for trade is only suggested, not proven.

### Stone Sculpture

Formative Period monumental sculpture is rare in highland Mexico. The only known examples are at Chalcatzingo, Morelos; Huamelulpan, Oaxaca; and Monte Alban, Oaxaca.

The archaeological site of Chalcatzingo is located at the foot of a small hill, Cerro de La Cantera. Nine low relief carvings are sculptured on the cliff above the site. They were published by Eulalia Guzman (1934) and more recently Cook de Leonard (1967), M.D. Coe (1965), and Grove (1968) have written about the carvings. The following is based upon the latter three sources, particularly Grove. He defines two discreet units, groups A and B. Group A consists of carvings: I, VI, VII, and VIII. Carving I depicts a person seated inside a cave or monster's mouth. Clouds, raindrops, and maize plants are shown above the cave. Guzman and Grove interpret the person as a rain diety and argue that the scene is connected with agricultural fertility. Carving VI depicts a squash vine, VII is too weathered to define, and VIII shows a reptile, a cloud, and raindrops. Taken in its entirety, group A seems to emphasize agriculture, fertility, and rain.

Group B consists of carvings II, III, IV, and V. Carving II depicts four men participating in an apparently ritual act. Carving III represents a feline. Carving IV shows two jaguars attacking two fleeing human beings. Carving V depicts a human emerging from the mouth of a serpent. Grove interprets Group B as connected with rain ceremonies and agricultural fertility but admits the interpretation is not as obvious as that of Group A. Carving IX, now in a private collection in the United States, depicts a jaguar face. Guzman (1934) illustrated a large stone human figure carved in the round, very similar to the seated figures at San Lorenzo and La Venta.

The Huamelulpa sculpture is a piece of columnar basalt upon which a human being has been carved. The crude carving is vaguely Olmec-like in certain facial features. Nothing is known about the cultural context or significance of the monument.

A unique sculptural style has been dated to phase I at Monte Alban. This is the "Danzantes" style of low relief carvings on stone slab

architectural elements. The figures are naked, grotesque males in various poses. Some appear to be dead or unconscious. The carvings exhibit great movement and dynamism. Similar sculptures are not known elsewhere. Several writers have commented on the Olmec affinities of the style and postulate a close relationship between the Olmecs and the people of Monte Alban I (Paddock, 1966; M.D. Coe, 1962). There is in reality little resemblance between the Danzantes and Olmec sculptures and the revised Olmec chronology makes the possibility of direct historical connection quite unlikely.

#### Polychrome paintings.

Polychrome paintings have recently been discovered on the walls of two caves in Guerrero (Gay, 1967; Grove, 1969). Both portray human beings and animals and both are clearly in the Olmec style. They demonstrate close stylistic resemblances with Olmec monuments from La Venta and San Lorenzo, and with the Chalcatzingo rock carvings.

#### Burials

Numerous Formative Period burials have been scientifically excavated. Some burial series have been reported in great detail; while others are known merely from preliminary notices.

Fifty-eight Formative Period burials were uncovered at El Arbolillo. Sixteen (25% of the total) were placed in stone slab cists, the remainder were placed directly in the ground. Twenty-seven burials lacked offerings while thirty-one had them. Nine of the offerings consisted of just one or two pots or infants. One adult female (Burial 129) was accompanied by four pots, several beads, a projectile point, obsidian blades, and a basket and was buried in a slab tomb. Skeleton 140, a baby, had two pots and the only jade earplugs found at El Arbolillo. Vaillant felt that one location at El Arbolillo was a true cemetery, set aside specifically for that purpose.

The fourteen Zacatenco burials lacked offerings. Some of the bodies may have been wrapped in mats or cloths. No special orientation or burial position was discernible. Several stone slab cists were found but none contained skeletons or offerings and their function is unknown.

At least 330 burials have been scientifically excavated at Tlatilco and many more have been illegally plundered to satisfy the demand for Tlatilco art objects (Coe, M.D., 1965). Pina Chan (1958) published a report on 1158 pottery vessels which had been burial offerings, but no adequate burial report has been published.

The Tlatilco burials vary greatly in the elaborateness of the offerings. Porter (1953) reports that 79% of the burials known in 1953 contained offerings. Burial number 160, a typical elaborate burial, was accompanied by numerous pottery vessels, figurines, and incised hematite plaque, painted bones, obsidian tools, and other goods totaling more than 45 objects. Porter reports a burial (number 23) accompanied by 68 figurines. Figurines were used as burial offerings more commonly

at Tlatilco than at other Basin of Mexico sites, Porter noted 53 occurrences in 203 burials. Large hollow human effigy figurines have been found with the Tlatilco burials, similar objects are known from Gualupita, Las Bocas and Tlapacoya. Some show definite Olmec characteristics and may be imports from the South Gulf Coast, others seem to be locally made and stylistically derived from Olmec prototypes. The differences between the two may be chronological or may simply be the differences between local and foreign traditions.

Tolstoy and Guenette (1965) suggest that certain differences in the Tlatilco burial offerings reflect social class differences. They postulate that Bay ware vessels were deposited with lower class individuals; Brown ware vessels with middle class burials; and certain rare ceramic types with upper class burials. There may be some validity to this proposal but these differences may be chronological rather than social.

Some authorities describe Tlatilco as a cemetery or burial ground, others contend that the burials are found beneath ancient house floors. This can only be resolved by publication of the excavation data.

Grove has recently excavated a burial mound at La Juana-San Pablo in Morelos (Grove, 1968). The structure was a circular mound 35 meters in diameter. Four burials were found, two within the mound and two cremations deposited prior to its construction. The mound had been almost completely destroyed by looters and Grove estimates that it originally contained approximately 200 burials. The two mound burials were accompanied by objects similar to those in the Tlatilco burials.

The Vaillants excavated 12 burials at Gualupita, ten with offerings (Vaillant and Vaillant, 1934). Some offerings included clay figurines; three of which were large, hollow human effigies; a trait shared with Tlatilco and San Pablo. Three burials had been painted with red hematite. One skull had carved incisor teeth.

Sixty burials were uncovered at Ticoman, 11 had been previously disturbed. Thirty-three of the 49 undisturbed burials had offerings but none were exceptional. The graves were simple pits in the earth, a few were lined with mats. One skeleton was covered with stone slabs which did not form a true cist. Two burials contained three people each; each had an adult female and two children.

Fifteen Formative burials were uncovered at Tlapacoya, 12 in the habitation zone and 3 in tombs in the main pyramid. Six habitation zone burials lacked offerings and the offerings of the other six were impressive. One male skeleton was accompanied by numerous stone tools. The burial area may have been a true cemetery set apart from the rest of the community. The tomb burials in the pyramid differed strikingly from those of the habitation zone. Tomb I contained the bones of at least two individuals piled together in one corner; they were obviously secondary burials. The 69 associated objects included pottery vessels, clay figurines, and an engraved slate plaque. Tomb II was constructed of well-prepared basalt slabs, and contained the primary burial of a male wrapped in a cloth. The 12 items in the offering included pottery vessels, obsidian knives,

serpentine tools, shell, and a piece of jade placed in the mouth of the deceased. Tomb III was near Tomb I, and both were constructed in the same manner and at the same time. The bones were in very poor condition and the number and sex of the occupants could not be determined. The offering consisted of 73 pottery vessels, 5 obsidian blades, and an undetermined number of baskets.

Two isolated offerings were found within the structural fill; they included pottery vessels, serpentine earplugs, worked shell, and a jade pendant. They lacked skeletal material and were probably dedicatory offerings deposited at the time of construction.

### The Lowland Maya

#### Subsistence

The tropical environment of the Maya lowlands is not conducive to preservation of plant and organic remains; at least very few have been found to date. Mano and metate fragments in Formative deposits indicate utilization of maize and a carbonized cacao seed has been found at Barton Ramie (Willey, et. al., 1965). It can be inferred that the Formative Maya practiced agriculture based on maize, beans, chile, and squash. Bronson (1966) has suggested that manioc and other root crops played an important role in the Classic period. His arguments lack supporting data but the possibility remains that root crops were indeed cultivated.

Animal bones in the Formative deposits at Barton Ramie included birds, deer, reptiles, peccary, tapir, rabbits, monkeys, fish, turtles, and shell fish. The scarcity of such refuse indicates hunting was a subsidiary subsistence activity.

Mayanists have long debated the possibility that intensive, agriculture was practiced during the Classic period. The arguments have centered on the Classic because some scholars doubt that swidden systems could support the complex social systems implied by the Classic period archaeological remains. Evidence of irrigation systems and terraces is completely lacking and substantial negative evidence indicates that intensive systems were not practiced. Recent studies show that present day swidden systems are capable of supporting a substantial population.

#### Settlement patterns

Maya Formative settlement pattern data is quite limited. The Belize Valley data is the best and most complete published to date. Recent work at Tikal has not yet been published.

Jenney Creek phase deposits (Mamon sphere) contained remains of several wattle and daub structures. The number of known structures increased in the succeeding Barton Creek and Mount Hope phases (Chicanel sphere) and artificial substructure mounds became common. The population increased 100% during the Floral Park phase (Floral Park sphere). Floral Park structures were constructed of various materials. Some have gravel

and plaster floors while others have plain mud floors. The walls were wattle and daub. Some structures were clustered around plazas. The basic arrangement of structures first evident in the Jenney Creek phase, scattered households occasionally found in clusters, remained the same. Tendencies toward marked nucleation are lacking. This basic settlement pattern remained unaltered even during the Floral Park phase when other aspects of culture changed dramatically.

Bullard's survey of the northeastern Peten has produced the only areal settlement pattern data for the Maya lowlands. He concentrated on Classic settlement but his data are probably equally applicable to the Formative (Bullard, 1960). He defined three settlement groupings. The smallest is a "cluster" of five to twelve houses in an area two hundred to three hundred meters square. Several "clusters" comprise a "zone", containing fifty to one hundred houses. Each "zone" has a small ceremonial center with a pyramid and ancillary structures. The "district" or third grouping was the sustaining area of a major ceremonial center, such as Uaxactun, Dos Aguadas, and Yaxha. "Districts" varied considerably in size but Bullard estimates each contained at least one hundred square kilometers of arable and habitable land.

Very little has been published about the Formative settlement patterns at Dzibilchaltun. The preliminary reports indicate a substantial population but detailed analysis must await full publication of the data. The same is true of Tikal.

### Ceramics

Several publications treat Maya Formative ceramics exhaustively, most pertinent are Smith, 1955 (Uaxactun) and Brainerd, 1958 (Northern Yucatan).

The Mamom phase ceramics at Uaxactun include flaring wall plates, round-sided bowls, and restricted neck jars with flaring mouths. All three forms seem to be utilitarian vessels used in culinary and water storage activities. Most vessels are monochrome gray, red, or black, but dichrome vessels do occur. Incision is a common decorative technique, applied in a variety of designs and patterns. Human figurines are present but rare.

The succeeding Chicanel phase was one of vessel form proliferation. The vessel inventory included storage jars, wide everted rimmed plates, round sided dishes and plates, flaring sided dishes and plates, and numerous miscellaneous forms. As with the Mamom phase, the vessels seem to be utilitarian types and no definite ceremonial wares were found. Some vessels were used as burial offerings and one jar was converted into a burial urn but none seem to have been made specifically for this function. Figurines are absent from Chicanel deposits. There is no evidence for mass production techniques such as the use of molds in any of the Formative pottery.

## Non Ceramic Technology

Several detailed descriptions of non ceramic artifacts have been published but most have only limited applicability for the present purposes. Kidder's description of the Uaxactun artifacts (Kidder 1947) deals exclusively with Classic Period objects. The same is true of W.R. Coe's analysis of the Piedras Negras artifacts (W.R. Coe, 1959). Two reports contain significant data on Formative Period artifacts, Willey *et al* (1965) on the Belize Valley, and Ricketson and Ricketson (1937) on Uaxactun.

The Formative Period chipped stone artifacts in the Belize Valley included general utility flint choppers, pebble implements, flint flake blades, and obsidian flake blades. The ground stone implements included manos, metates, hammerstones, celts, and jadeite ornaments. None of the bone, antler, or turtle shell objects uncovered belonged to the Formative Period. The shell objects included pendants, beads, and unperforated disks.

The majority of the Formative Period artifacts at Uaxcatun came from Group E (Ricketson and Ricketson, 1937). Phase designations are not given for the Group E objects and a few may be Classic, though most of the occupation at this locus is Formative. The chipped stone artifacts included flint projectile points, flint drills, and scrapers. The ground stone objects included celts, hammerstones, rubbing stones, stone balls, manos, metates, small figurines, and beads. The ground stone jadeite objects included beads, pendants, ear plugs, figurines, and polished fragments. The shell objects included unworked shells, perforated shells, beads, pendants, tinklers, lip plugs, rings, disks, figurines, and a trumpet. The bone objects included awls, needles, beads, and carved ornaments.

## Architecture

Relatively little is known about Formative Period residential structures. Wauchop (1934) excavated five Classic Period residential structures at Uaxactun. Several Formative Period residences were excavated at Barton Ramie (Willey *et al*, 1965). The latter were pole and thatch structures erected on top of low mounds. Elaborate stone masonry residences were not found at Barton Ramie. Numerous residential structures have been excavated at Tikal but the results have not yet been published.

Most Classic centers have underlying Formative Period ceremonial structures. The only Formative ceremonial structure excavated at Uaxactun is structure E-VII-Sub, a stucco covered, stepped pyramid with stairways on all four sides. The stairways are flanked by stucco serpent masks. The temple on top was probably a pole and thatch building. The structure was erected during the Chicanel Period.

At least one Chuen phase (Chicanel Ceramic Sphere) ceremonial structure is known at Tikal, a three-tiered platform built and rebuilt several times during this phase. Human burials were deposited in conjunction with some building phases. It probably supported a pole and thatch building. A complex sequence of buildings and plaza floors date from the Chuen phase. Building activity at Tikal accelerated in the succeeding



Cauac phase (Chicanel Sphere). Structure VD-Sub-I, similar to E-VII-sub at nearby Uaxactun, was constructed at this time. A Cauac phase burial chamber contained the earliest definite evidence of mural painting as an architectural element, the paintings are quite sophisticated and portray several elaborately dressed men. Fresco painting was used on the exterior of Cauac Period buildings in at least two instances. The earliest known corbelled arch is found in Cauac phase tomb and masonry superstructures also appear for the first time. These architectural features are restricted to ceremonial structures; none occur in habitation areas and debris.

Formative Period ceremonial architecture is not known in the Belize Valley, perhaps due in part to the concern of the Belize Valley Project with residential mounds rather than large ceremonial structures.

The long Formative sequence at Dzibilchaltun in northern Yucatan has been divided into four "stages" (Andrews, 1961, 1962); the earliest ceremonial structures appeared in the second stage, which is contemporaneous with the Mamom sphere in the southern lowlands. They are low platform mounds placed around small plazas. Acropolis-like complexes were erected during the third and fourth stages. Detailed reports have not yet been published on the Dzibilchaltun excavations so nothing more can be said about this crucial site.

### Monumental Sculpture

Stone sculpture, a hall-mark of Classic Maya culture, is almost completely unknown during the Formative. The only known Formative sculptures are a few fragments of carved limestone from Chuen phase deposits at Tikal. Similar fragments, possibly part of a stela, were found in Cimi phase deposits. These form the totality of known Formative sculpture.

### Burials

Numerous scientifically excavated Maya Formative burials have been reported. Of the one hundred-sixteen burials uncovered at Uaxactun, 20 were Formative (A.L. Smith, 1950, p. 88).

The five Mamom burials were simple interments placed directly in the ground. Two (E7 and E 11) lacked offerings. Burial E8 contained an adult male with filed and possibly inlaid incisor teeth, and an artificially deformed skull; the offering included a conch shell trumpet, a pottery whistle shaped like a bird, and a pair of clay ear plugs. Burial E9 contained an adult of undetermined sex who wore a necklace composed of 78 jadeite and 20 shell beads. Burial E3 contained two jadeite beads.

Fifteen burials were assigned to the Chicanel phase. Six lacked offerings and 9 of the remaining 9 had only one accompanying object. One burial had two bowls and a necklace composed of one jade bead and 91 shell beads.

Of the one hundred-twelve burials uncovered at Barton Ramie, thirteen were Formative (Willey, et al, 1965). Eight of the 13 were assigned to the combined Jenney Creek-Barton Creek Phases (Chicanel sphere). One contained two pottery vessels, the other seven lacked grave goods. Three burials belonged to the Mount Hope Phase. One had three pottery vessels and an obsidian blade; the others lacked offerings. The two Floral Park Phase burials had more lavish offerings than the earlier burials. Burial BR-123-30 was an adult male placed in a limestone slab cist with three pottery vessels, a jadeite bead, two worked shell disks, and 40 disk shell beads. Burial BR-123-31 was an adult female with filed canine teeth, who had been placed in a limestone slab cist. Her offering included three pottery vessels and a shell effigy jadeite pendant.

W.R. Coe (1965) has described some of the Tikal Formative burials in a preliminary publication. Eb Phase deposits (Mamom sphere) have yielded one complete burial and one isolated human skull, neither accompanied by offerings. The single Tzec Phase burial (Mamom sphere) contained several pottery vessels.

Six burials were found in Chuen Phase (Chicanel sphere) deposits. Three (122, 123, 126) were placed within the fill of structure Sub 14-1 and all were covered with inverted plates. Some burials were placed in pits excavated into the bedrock. They included a young adult with an elaborate shell and jadeite necklace, and a disarticulated adult accompanied by sting ray spines. Burial 164 was deposited during an enlargement of structure Sub-14-1. It contained an adult accompanied by four pottery vessels, a few jade beads and a sting ray spine.

Numerous Cauac Phase (Chicanel sphere) burials have been found. Though not specifically stated, it seems likely that Coe mentioned only the more spectacular examples. The most lavish is Burial 166, found inside structure 5D-Sub-11. This structure was probably a shrine built immediately after deposition of the burial. The burial was placed inside a rectangular, corbelled-vault chamber with plastered and painted walls. Remains of the two individuals were found inside, one (skeleton A) was fully extended, the second (skeleton B) was a disarticulated pile of bones. The offering included twenty pottery vessels, sting ray spines, and a shell carved to represent a human head. Skeleton A wore a necklace of shell and jade beads.

Burial 167 composed of three individuals, was also placed in a vaulted chamber. Skeleton A lay fully extended on his back wearing a necklace and bracelets of shell beads. A greenstone figurine was found in the pelvic region. Skeleton B, a disarticulated adult, and skeleton C, an infant, were found inside pottery bowls placed on top of skeleton A. Nine pottery vessels and two stuccoed gourds were placed in one corner of the tomb. A two-tiered platform with a small room at its summit was built over the tomb and apparently functioned as a shrine.

Burial 128, a female, had been placed inside a masonry platform. The skeleton was inside a large pottery vessel accompanied by shell and bone bracelets. Seven other pots accompanied the burial.

Burial 85, a single adult skeleton wrapped in a textile bundle, was found in a vaulted tomb. The skull and thigh bones were missing. A polished green stone mask with shell inlaid eyes and teeth was substituted for the skull. The offering included a sting ray spine and a shell. A masonry shrine was constructed on top of the tomb.

Burial 125 is the only reported Cimi Phase (Chicanel sphere) burial. The male occupant lacked an offering. The skeleton was placed in an excavated chamber roofed over with logs, over which were deposited hundreds of kilograms of specially prepared flint flakes.

### The South Coast of Guatemala-Chiapas

#### Subsistence

Coe and Flannery (1967) recovered considerable food refuse at Salinas La Blanca, enabling them to draw certain conclusions about subsistence during the Cuadros and Jocotal Phases. Maize, of the Chapalote variety, was extensively cultivated at Salinas La Blanca. The identifiable fruit remains included avocado, jocote and matasano. Deer and bird bones were abundant. Burnt and cut infant human bones indicate possible cannibalism. Remains of at least 35 genera of fish were found, as were turtle and iguana bones. Mollusk and crab remains were extremely abundant, mollusks were second in importance only to agriculture as a food source.

#### Settlement Patterns

Coe and Flannery surveyed the area between the Naranja and Suchiate Rivers. Three Ocos phase sites were located, all small non-nucleated villages. A large mound which may have been a temple base was found on one site, but it may post-date the Ocos phase. Four Cuadros phase sites were located, all larger than the earlier sites. The five Jocotal phase sites located are similar to the earlier Cuadros phase sites. All three sites are situated along estuaries and lagoons and none are found further inland. This presumably reflects the importance of aquatic resources in the diet.

The number of sites increased to twelve during the Conchas phase. Temple bases definitely occur during this period. Some Conchas phase communities are located along the previously occupied estuaries whereas others are further inland.

Only two Crucero Phases sites were located in the survey area. The demographic focus had apparently shifted further inland on the piedmont strip, away from the coastal plain.

H.D. Coe (1963) reports a Late Formative village site in the Department of Santa Rosa, Guatemala. Approximately 50 house mounds are scattered in an unorganized pattern. Several temple bases are visible. The site has not been excavated but surface sampling revealed only Late Formative pottery.

## Ceramics

This area has one of the best defined Formative ceramic sequences in Mesoamerica. The earliest phase thus far discovered is the Barra Phase at Altamira (Green and Lowe, 1967). The main Barra phase vessel forms are the tecomate, flat based out-flaring bowls, vertical walled bowls, and hemispherical bowls. All vessels are monochrome; the predominant colors are red, red-brown, and black. Decoration includes parallel grooves, fluting, zoned punctate impressions and incision.

The Ocos phase was defined at La Victoria, Guatemala (M.D. Coe, 1961) and has since been found at several other sites (Green and Lowe, 1967). The main vessel forms are tecomates and flare sided bowls. Most vessels are monochrome buff, brown, black, or red; but a few tecomates have red rims painted on a grayish tan surface. Decoration includes a variety of rocker-stamping techniques, cordmarking, fabric impressions, and polishing.

Cuadros phase ceramics demonstrate a continuation of previous trends and introduction of certain new features: Tecomates and flare sided vessels continue to dominate the assemblage but high necked jars and deep bowls are also present. The decorative techniques include finger pinching, grass brushing, raking, and punctation. Monochrome wares continue to dominate but a red-on-white dichrome appears for the first time.

The short Jocotal Phase was one during which the older types gave way to a series of new ones. The major forms are tecomates; flare sided bowls, restricted orifice jars, complex silhouette jars and convex sided bowls. The decorative techniques include brushing, punctation, fillet bands, differential rim firing to produce a white rimmed black ware, zoned red and white design, and double-line break incision. Most of these forms and techniques begin during the Jocotal Phase and become more important in the succeeding Conchas I Phase along with some new jar forms and grater bowls. Conchas 2 Phase ceramics include composite silhouette bowls, tecomates, and everted lip plates. The monochrome blacks and reds continue, along with monochrome white; red and white bichrome and a red on buff bichrome.

The Crucero Phase ceramics include composite silhouette bowls, cylindrical jars, bowls with flaring sides and deep open bowls. Decoration includes Usulután negative painting, incised scroll bands and red on orange bichrome.

Clay figurines are present but rare in the La Victoria--Salinas La Blanca deposits. They are more common at Altamira, where they include human heads and bodies.

### Non-Ceramic Technology

It is impossible to separate the Altamira non-ceramic artifacts by phase. The chipped stone artifacts include obsidian projectile points and obsidian scrapers. The ground stone objects include bowls, manos, metates, hammerstones, celts, mortars, pestles, and anvils. The La Victoria--Salinas La Blanca artifacts can be assigned to ceramic phases but these distinctions will be neglected in the interest of brevity. The chipped stone objects were all of obsidian; most were prismatic blades or flakes. The ground stone tools included manos, metates, hammerstones, abraders, and river pebbles. Personal ornaments included a jade bead, clay earplugs, pierced shells, and a bone pendant.

### Architecture

There is no published data on either domestic or ceremonial Formative architecture in this area. The recent excavations by the Milwaukee Public Museum at Monte Alto, and by the New World Archaeological Foundation at Izapa, will provide new data in the near future, but none is available at the moment.

### Stone Sculpture

Miles (1965) has summarized the available data on stone sculpture in this area and excavations have recently been conducted at some of the centers with monuments.

The best known sculptures are boulders from Monte Alto with crudely delineated pot-bellied humans carved upon them. Some show complete human beings; others represent only heads. All lack hieroglyphic inscriptions. Several writers have commented on similarities between them and the Olmec heads (M.D. Coe, 1967; Miles, 1965; Parsons and Jenson, 1965; Girard, 1968). Miles and Girard maintained that they predate the Olmec sculptures. Coe says they are post-Olmec. The latter position is the more likely.

Izapa is one of the largest ruins in the area. It was occupied from the Middle Formative until the Early Post-Classic (W.R. Coe; 1964, 1965a). Large ceremonial structures were first erected during the terminal Middle Formative (Conchas I equivalent). Izapa became the center of a widespread Late Formative art style expressed in large stone bas-reliefs or "stelae". Monuments portray the "Long-lipped God", a forerunner of the Maya rain god Chac. Some depict battle scenes. Izapa style monuments are found in the coast and piedmont of Chiapas and Guatemala and also in the Valley of Guatemala, in the highlands. There are no indications of writing and calendric inscriptions at Izapa but these do occur on Izapan style monuments at El Baul and Abaj Takalik.

## Highland Guatemala

### Subsistence

Direct evidence of Formative Period subsistence is quite limited. Shook (1950) reports finding midden material at Las Charcas containing maize cobs, fruit seeds and animal bones. Stone manos and metates are also found in Formative deposits. The basic Mesoamerican agricultural assemblage was undoubtedly present during the Formative, though nothing is known of the ecology of food production.

### Settlement Patterns

The very limited settlement pattern data indicates that small hamlets and villages without ceremonial structures were the primary community type during the Middle Formative.

The Late Formative pattern included two community types; the village or hamlet and ceremonial precincts containing temples and burial mounds. Kaminaljuyu is the largest and best known example of the latter type.

### Technology

The Formative ceramics show pronounced similarities to those of the Pacific Coast of Guatemala and Chiapas. Since the Highland Guatemala Formative chronology is not well-understood and is presently the subject of a large-scale research project, I will discuss the Formative ceramics as a unit, neglecting phase distinctions. My discussion is based primarily upon an article by R. Rands and R. Smith (1965). The Formative ceramics are primarily monochrome (red, white, black, and brown) but do include bichromes (red-on-white and red-on-buff). Vessel forms include large storage jars, everted-rim bowls, composite silhouette bowls, cylindrical vases, and 3-pronged incense burners. Decoration includes incision, modeled faces, and punctation. Clay figurines found in the Formative deposits portray both humans and animals (A.V. Kidder, 1965). The humans include males, females, and females with infants. Most human figurines consist of bodies and heads. All are solid and all are hand modeled.

The Middle Formative non-ceramic artifacts include manos, metates, pestles, celts, axes and numerous obsidian fragments. The Late Formative artifact inventory is represented primarily by the objects associated with the burials in Mound E-III-3. The objects include the Middle Formative types just mentioned, plus stone vessels, eccentric flints, long obsidian blades, and "mushroom stones". Numerous jade objects are reported; including earplugs, beads, pendants, masks, mosaic elements; and an imitation animal canine. Shell and bone objects include beads, pendants, a bone spatula and sting ray spines.

## Architecture

The few excavations conducted on Middle Formative sites have not been adequately reported and data on residential structures are almost nonexistent. Numerous clay fragments with pole depressions, presumably wall fragments from pole and thatch houses, have been recovered. Bottle-shaped pits are common in Middle Formative villages. They were presumably used for food storage though some were later converted into burial chambers. Ceremonial structures have not been associated with Middle Formative sites.

Late Formative architecture is considerably more complex than that of the previous period and ceremonial structures appear for the first time. Earth mounds covered with mud and stucco plaster were a common structural type. They had stairways leading to the summit and may have had a pole and thatch temple or sanctuary on top. These mounds contained burials placed in specially prepared tombs with elaborate offerings.

## Sculpture

Kaminaljuyu participated in the Izapa stone sculpture tradition of the piedmont and coast area. The major types of sculpture include boulders, carved into human likenesses; Izapa-style stelae (both carved and plain); small sculptures of men and animals seated on pedestals; and various in-the-round sculptures (Miles, 1965). Most of the sculptures are carved from volcanic rocks, presumably brought from nearby sources.

## VI. Analysis

This chapter contains a reconstruction of Formative period cultures based upon the archaeological data.

### South Gulf Coast

#### Subsistence

The Olmec subsistence data indicate they were agriculturalists who grew all, or nearly all, the Mesoamerican lowland cultivates and practiced hunting and fishing as a secondary activity. River levee cultivation cannot be demonstrated conclusively but seems likely. Tools for cutting the parral grass have not been found archaeologically but they may well have been manufactured of perishable materials. The combination of short fallow river levee cultivation and long fallow systems in the upland areas would have provided an ample subsistence base for a numerous and reasonably nucleated population in the area around San Lorenzo. Drucker's cursory agricultural survey of the upland interriverine area between La Venta and the Rio Uspanapa led him to conclude the area was capable of supporting a fairly numerous population (Drucker, 1961).

## Settlement Patterns

The San Lorenzo house mounds tend to occur in clusters. Assuming that such clusters represent actual patterns existing during a single occupation period and not fortuitous aggregations of non-contemporary structures, two possible explanations may be offered. First, each cluster may have housed an extended or expanded family spanning several generations. Second, each building cluster may have housed a nuclear family which occupied several structures such as sleeping quarters, kitchens, storage facilities, work shops, etc. It is possible that habitation existed between the house mounds and/or in moundless areas.

If the 167 house mounds were occupied simultaneously by nuclear families averaging five members per family, the total population of San Lorenzo would have been 835 individuals. This figure approximates Coe's estimate of 1,000 (M.D. Coe, 1968). If some of the 167 mounds were non-residential or not contemporary, the figure would have been lower and if non-mound residences existed, it would have been higher. The possibility that some houses were occupied only at certain times of the year should also be kept in mind. Certainly a regional center such as San Lorenzo must have had some provisions for temporary guests, pilgrims, visitors from the rural hinterland, and other non-permanent residents. The round figure of 1,000 is a reasonably accurate estimate for San Lorenzo at its height but extensive residential area excavations are needed to provide better data. It is clear that San Lorenzo was not a large, nucleated urban center, nor a "vacant ceremonial center" but rather a settlement which was small compared to modern communities but large compared to its nearby contemporaries.

Indications of defensive works have not been found at San Lorenzo (no one has ever looked for them) but if the ravines and edges of the plateau were kept clear of vegetation, they would have served admirably to prevent a surprise attack and would have made it difficult for foot soldiers to reach the plateau.

An adequate map of La Venta does not exist; so little can be said about its settlement pattern. Its location in a modern swamp has led some authorities to consider it "inaccessible" but it would have been eminently accessible to a people with dug-out canoes or rafts, and the Olmecs undoubtedly had both. Nothing is known of the Tres Zapotes settlement patterns.

The limited data on Olmec sites other than major ceremonial centers indicate two settlement types in addition to major ceremonial centers:

1. Intermediate sized centers with a few stone sculptures and limited ceremonial architecture, including sites such as San Miguel, Potrero Nuevo and El Remolino.
2. Hamlets lacking sculpture and civic architecture.



The intermediate size centers may have been administrative centers of districts within the larger political or territorial entity controlled by the major centers. Sites of the third category have never been reported, but this is attributable to a lack of research interest. Future investigations should amplify and modify this list.

The size of the territorial unit dependent upon each major center is unknown. The Coatzacoalcos basin contains numerous large sites. If they are contemporary with San Lorenzo, each probably controlled a relatively limited territory. If they are not contemporary, San Lorenzo may well have controlled most if not all of the basin. The latter seems the more likely at the moment.

The relationship among major centers such as San Lorenzo, La Venta and Laguna de los Cerros is unclear. They were at least partially contemporaneous. There is no evidence that one center dominated the others. Each was probably the capital of an independent, politically organized and integrated territory.

#### Trade and Commerce

No data exists on economic exchanges within the Olmec area, so this aspect of the economy must be neglected in this discussion.

The Olmecs utilized several raw materials not native to their homeland. Basalt was one such material; used for monuments, drain stones, and in architecture. Recent studies indicate most of the La Venta and San Lorenzo stones were brought from certain areas in the Tuxtla Mountains to the north, but a few La Venta monuments were carved of stone from the La Union volcano in Chiapas (Williams and Heizer, 1965). The stones were apparently selected from loose boulder rubble; not quarried from solid rock. The great size and weight of many monuments (some exceed 40 tons) argue against their being transported by land. M.D. Coe suggests they were moved by raft from their point of origin to the Gulf of Mexico, down the Gulf and up the various rivers to their present location. Nothing is known of the Formative Period cultures in the Tuxtlas and the Olmecs may have obtained the stones by trade; as tribute, or they may even have integrated the Tuxtlas into their own territory.

Huge quantities of basalt and similar materials have been found at San Lorenzo and La Venta. The San Lorenzo drain system probably contained several hundred tons of basalt and the total aggregate weight of the monuments is probably of the same magnitude. The trade network which supplied these raw materials and the social and economic mechanisms involved will remain a mystery until more is known of the archaeology of the source areas.

Numerous artifacts made of exotic materials have been found on Olmec sites. Parabolic mirrors of polished hematite, ilmanite, and magnetite have been found at La Venta, and flakes and beads of these materials occur at San Lorenzo. These ferrous ores do not occur naturally in the area and Curtis (1959) has hypothesized they were imported from Oaxaca or

Guerrero. Flannery's recent excavations in Oaxaca have uncovered quantities of hematite, ilmanite, magnetite, and mica manufacturing debris. Mirrors, beads, pendants, and other objects were apparently manufactured at the site during the San Jose phase. Flannery hypothesizes these products were traded from his area to the Olmec and suggests the San Jose elite controlled the ferrous ore sources and production of finished goods.

Many small figurines of jadeite, nephrite, and other hard green stones are known from La Venta but to date only one has been found at San Lorenzo. Many have been found in other parts of southern Mesoamerica; including Guerrero, Morelos, Oaxaca, Puebla, Chiapas, Guatemala, Yucatan, and even Costa Rica. Most have been recovered by looters and treasure hunters and nothing is known about their association. The sources of the raw materials are unknown but Puebla, Morelos, and Guerrero are possibilities. The quantity of figurines from Guerrero lead Covarrubias to believe this was the cradle of Olmec culture. The place of manufacture of these objects is not known but stylistic similarities between them, the clay figurines, and the stone monuments indicate all three were made by craftsmen trained in a common art style. This does not necessarily mean they were carved in the Olmec homeland; this could easily have been done at the quarry source. Many were treated as hieroglyphs by later peoples, and they occasionally appear in contexts which post-date the Formative. The Olmec figurines found in the Classic Period jade cache at Cerro de las Mesas are one example; the Olmec plaque with an Early Classic Maya inscription on its back reported by M.D. Coe (1966) is another. Thus, many figurines found outside the Olmec area may have been taken there in post-Olmec times. It is also possible that they were widely traded in Olmec times.

Examination of domestic refuse provides additional data on trade. Basalt was used for manos, metates, and bowls; it undoubtedly came from the same source as the monument stone. Obsidian was a primary raw material for cutting tools. The earlier phases at San Lorenzo have yielded only grey obsidian, imported from some unknown but non-local source. The San Lorenzo phase obsidians were more diverse than those of the earlier period; they included grey, green mottled red, and brown. This probably indicates increased commercial contacts with numerous highland areas, contacts which continued on into the following Nacaste phase, then ceased.

It is impossible at the moment to say which pottery types if any are trade pieces at Olmec sites. Publication of the San Lorenzo ceramics in the near future should clarify considerably this aspect of trade.

Coe (1969) has proposed that Olmec trade with central Mexico was in the hands of a professional guild of long distance merchants similar to the Aztec pochteca. He postulates that the highland "Olmec" centers were ports-of-trade or warehouse centers maintained in this area. The trade goods were jade, serpentine, ferrous ores, and other similar raw materials. The Oaxacan data seemed to indicate, rather, that trade relations were maintained by the elite of the participating societies, and not by trade specialists. Resolution of these points must await further field work designed specifically to solve them.

In summary, the data on trade indicate active commercial ties with the Tuxtla (basalt and other volcanic stones), Oaxaca (ferrous ores), Puebla

and Guerrero (green stones) and obsidian from several unspecified highland areas.

If trade was maintained with other lowland areas, no evidence has been found to date.

### Occupational Specialization

Inferences about occupational specialization can be based on the material remains.

The subsistence data are too limited to permit speculation about the existence of agricultural specialists growing "cash" crops such as cacao, avocado, tropical fruits, etc. The existence of such specialists is doubtful but cannot be proven or disproven at the moment.

Stone carving was an important craft or manufacturing specialty. The highly sophisticated and well executed Olmec sculptures cannot represent the work of amateurs or part-time specialists. The requisite skills could only have been obtained after a long apprenticeship under a master craftsman and it is doubtful the Olmecs would have entrusted valuable basalt boulders to non-professionals. Furthermore, if carving was not a professional craft, some monuments would be well executed while others would be crude and poorly done. Such is not the case.

Clewlow et. al. (1967) exhaustively studied the twelve known colossal heads, and concluded all were carved in a relatively short time span and were possibly the works of one (school) of sculptors. The same may be true of the other standardized categories of monuments (table top altars and seated persons). This indicates full-time, professional sculptors. If one compares the number of known monuments from any Olmec center to the known length of occupation, there was hardly sufficient work to occupy numerous sculptors on a full-time basis, indicating their numbers were probably quite small. The sculptors probably belonged to kin based guilds or craft unions, which would have facilitated teaching and apprenticeship. The guild members may have moved from one Olmec center to another as their services were required. The mass produced, standardized basalt drain troughs and covers may have been manufactured by apprentices in this same guild.

The lapidarian craft must have been another full-time occupation practiced by a guild. Lapidarian debris has not been found at Olmec centers or anywhere else. This may be due to an accident of sampling but it is equally possible that the work was done at the quarry sites, such as seems to be true of the Classic Teotihuacan stone figurines carved in Guerrero. The presence of Olmec quarries in Guerrero would account for the numerous jade figurines known from that state. The highly developed craftsmanship evident in the Olmec jade objects could only have resulted from long periods of training and apprenticeship. Furthermore, the raw materials were so rare and valuable that it is doubtful that a non-professional would have been entrusted with them. The relative rarity of these figurines and the skill necessary for their manufacture indicates the number of craftsmen must have been small. This, rather than a religious cult, probably accounts for the marked similarity of Olmec lapidarian

objects found throughout Mesoamerica.

Transportation of the monumental stone from its point of origin to its destination must have involved some occupational specialists; such as supervisors, overseers, and professional sailors. Direct evidence for the techniques used in moving the stone is lacking but M.D. Coe suggests they were slung between the rafts and kept below the water line to take advantage of their buoyancy below water. Shipment was probably during the height of the rainy season, when the rivers were sufficiently deep to permit passage to San Lorenzo. The sailors must have been professionals because it is doubtful that amateurs could handle a raft laden in this manner.

The architecture and large constructions indicate that certain individuals had specialized engineering knowledge and skills and the ability to plan construction projects. The totality of construction at Olmec sites is not as impressive as at latter Classic period centers, and the architects were obviously not kept continuously busy planning new constructions and buildings. They probably had other functions, skills and occupations and may well have been the societal leaders.

Coe's suggestions that external trade was controlled by a group of mercantile specialists has already been mentioned and an alternative explanation has been offered. If Coe is correct, the merchants would have formed another group of occupational specialists.

The Olmec leaders were undoubtedly full-time specialists. Some authorities called Olmec society a theocracy and the leaders "priests" (Heizer 1960). Coe (1968) sees the elite positions as primarily secular rather than sacred but attributes certain religious functions to them. The differences between these two positions are perhaps more apparent than real. Mesoamerican societal leaders generally operated in both secular and sacred spheres, even when well developed priesthoods existed.

The societal leaders presumably constituted a minute portion of the total population. Their functions probably included political, religious, and military activities.

In summary, two basic types of occupational specialization can be demonstrated for Olmec society; manufacturing or craft specialties and politico-religious elite occupations. The number of specialists must have been quite small and it is a mistake to overemphasize the importance of specialized occupations in Olmec society.

#### Social Stratification

Data bearing on this topic are scanty and subject to varying interpretations. I feel the evidence indicates three basic ranks in Olmec society; a numerically small elite, an intermediate rank of occupational specialists, and a large sub-stratum of farmers.

The evidence of an elite level include the elaborate burial or "surrogate" burial lapidarian objects and hematite mirrors; the planning and marshalling of labor evident in the civic construction; and the scenes portrayed on various Olmec monuments such as Stela Three and Monument Nineteen at La Venta.

The hierarchial position of the craftsmen and non-elite specialists is not clear but they were probably separate from and superior in rank to the subsistence farmers. The existence of the third group is not proven by the presently available data but cannot be doubted.

The societal integrating mechanisms are not evident in the archaeological remains but it seems appropriate to speculate about them at this point. Kinship must have been an important integrating factor. The nature of the kin groups beyond the nuclear and extended family is unclear but it seems reasonable to assume that the elite belonged to a single kin group, the various occupational specialists formed other groups, and the subsistence farmers formed numerous other kin groups. Residence may or may not have been functionally related to kin ties.

## Religion

Olmec iconography, as represented on stone monuments and small portable objects, emphasized certain motifs which reflect religious beliefs. The so-called Werejaguar, a human baby with feline facial features, is one such motif. It has traditionally been identified as an early form of the Rain God, later represented by Tlaloc, Chac, Cocijo and Dhazui (Covarrubias, 1957). M.D. Coe (1968) has recently identified four variations of the Werejaguar theme which he identifies with four well-known deities in later times; Xipe, the Fire Serpent, Quetzalcoatl, and the Death God. Future detailed iconographic studies should expand the contents of the Olmec pantheon considerably.

The existence of an Olmec priesthood can be accepted with little doubt, the priests were members of the elite and probably served non-religious functions in addition to their priestly activities.

The civic architecture at San Lorenzo and La Venta served certain religious as well as socio-political functions.

The relationship between religion and curing is unclear but it may be assumed that one existed.

In summary Olmec religion had a well developed pantheon, professional priests, an elaborate mythico-philosophical base, and religious architecture.

## Highland Mexico

### Subsistence

The data indicate the practice of several agricultural systems in different highland ecological zones. Some systems, such as pot irrigation, were highly localized; while others, such as hill-side cultivation and canal irrigation, were much more widespread.

The question of the relative importance of agriculture, hunting and collecting has been previously mentioned. MacNeish (1967) has attempted to calculate the amount of food bulk per excavated unit on the Tehuacan living floors. He estimates the proportion of agriculturally derived food in the diet increased from 35 to 58 percent between the early Purron and terminal Santa Maria times, while non-cultivated plant food decreased from 40 to 20 percent and that derived from animals decreased from 30 to 20 percent. He cautions that these figures may contain a large margin of error. This error would seem to overemphasize the role of wild plant and animal resources and understate the importance of agricultural products. Thus agriculture was probably more important than the calculations indicate, though this does not deny the importance of hunting and collecting as providers of certain essential dietary elements. The relative importance of these three subsistence systems in different areas of highland Mexico is difficult to assess until more data is available. One would assume (as the Tehuacan data seem to indicate) a lessening dependence upon hunting and collecting for dietary supplements as population increased and as man increasingly altered the local environments through agriculture, deforestation, drainage projects, and the like. This would have been particularly true in times of large populations; such as the Classic and Post-Classic, and less so during the Formative. It would also have varied from place to place, with marginal demographic zones supporting more hunting and collecting activities and densely populated areas supporting less.

### Settlement Patterns

Several trends are evident in the settlement pattern data. Continuous, but uneven population growth is one, best documented in the Teotihuacan Valley. The Valley had a sparse population during most of the Formative, with a gradual but increasingly rapid growth leading to a demographic explosion at the end of the Formative and inception of the Classic. Millon (1966) estimates the Tzacualli phase city had circa 30,000 inhabitants and the total valley population may have been double that figure.

A similar population growth occurred in the Valley of Oaxaca but it was not as sudden, nor did it result in the emergence of a major urban center. Future investigations at Monte Alban may disprove this latter statement.

There appears to be a general south-to-north gradient in relative population size during the Formative. That is, areas south of the Basin of Mexico such as Morelos, southern Pueblo, and Oaxaca seem to have had larger populations during the earlier phases of the Formative and the

Basin of Mexico, particularly the northern sector, lagged in total population until near the end of the Formative. The north-south position per se of these areas may not be the crucial factor, it may rather be related to altitudes (as it affects the maize growing season), nearness to centers of plant domestication, nearness to unusual resources traded to other areas, or other factors. Much additional data is needed before the above statement can be verified.

Another settlement pattern trend is the development of urban centers such as Teotihuacan; and perhaps Cuicuilco, Tlapacoya, Monte Alban, Amalucan, and Cholula. Izacualli phase Teotihuacan appears to have been the largest and most urbanized Formative center but this may be a result of our lack of data on other centers. The development of urbanism probably also involved the emergence of moderate sized towns politically and economically dependent upon the large urban centers.

#### Trade and Commerce

There have been only sporadic attempts at definition of the sources of raw materials and artifacts for the highland Mexican Formative. Flannery's San Jose excavations indicate trade in ferrous ore objects between the inhabitants of that site and the Olmec area. The recurring appearance of jadeite objects (pendants, beads, ear plugs, and figurines) at highland Mexican sites indicates trade with the same quarry workshop areas which supplied the Olmecs. These source areas have not yet been identified.

Basalt, obsidian, chalcedony, and flint presumably all came from special quarries and were traded far and wide but confirmatory data is lacking.

Vaillant recovered numerous shells and shell objects on his sites, including some from the Gulf Coast.

The ceramics have not been analyzed and published in a manner which permits positive identification of trade pieces and possible sources but M.D. Coe (1965) has suggested that white-rim-black ware, laca ware, and spouted trays at Tlatilco were imported from the Olmec area. The same may well be true of the ceramic baby-faced figurines.

Several attempts to identify trade routes in highland Mexico have been based upon site distribution and location vis-a-vis natural communication routes (M.D. Coe, 1965, 1968; Grove, 1968). Coe postulates a "Jade Route" which extended from the South Gulf Coast through Puebla, Central Mexico, Morelos, and down into the Balsas drainage in Guerrero. This route was used for trade in jade and serpentine. Way-stations or colonies were established at Las Bocas, Tlatilco, Tlapacoya and Chalcatzingo. Grove's survey of Morelos (1968) has led him to concur with Coe. Both postulate the Olmecs entered the highland in search of raw materials to bring back to their homeland rather than to establish trade relations with already present groups. Flannery's data indicate that in Oaxaca the situation was one of exchange between the Olmecs and a native group of merchant-manufacturers, not a simple extraction of the raw material by the

Olmechs. The same may well have been the case with jade and serpentine. The differences between the two types of economic activity are important because they reflect on the role of the Olmechs in the emergence of complex societies in Mesoamerica. We will return to this question in the following chapter.

### Occupational Specialization

Occupational specialization in highland Mexico was probably similar to that in the Olmec area and included a few manufacturing specialists and the societal leaders.

The manufacturing specialists produced two similar categories of objects, personal ornaments and mortuary furniture. The personal ornaments included beads, earplugs, pendants, plaques, masks, and maskettes. Many are made of hard stones such as jadeite, nephrite, and serpentine, though ceramic masks are also fairly common. These objects were placed with the dead but also used by the living, as indicated by their presence in refuse deposits. Their non-local origin is evident and most were traded in from the south. The mortuary furniture includes the hollow burial figurines of Tlatilco, Las Bocas, Tlapacoya, and Gualupita, and some of the rarer Tlatilco effigy pots. These objects are not found in domestic refuse deposits. Both classes of objects were luxury goods, as indicated by their scarcity and foreign origin.

The point of origin of most luxury goods is unknown; the only ones definitely manufactured in highland Mexico are the Valley of Oaxaca hematite objects. The possible manufacture of jade objects at the quarry sites has already been mentioned. The source of the mortuary ceramics is unknown.

The second group of occupational specialists included socio-political leaders, priests, curers or medical practitioners, and possibly merchant traders. These categories are not mutually exclusive and specify individuals may well have combined several such roles.

### Social Structure

Social ranking is evident in the highland Mexican Formative society. The data on house types, architecture, occupational specialization, and burials indicate such ranking. Rank positions formed a continuum and are not discrete, well-defined class or caste units; thus division of ranks into groups is artificial. However, two basic rank categories; elite and commoner, seem definite and a sub-division of the second is suggested.

House types are one social rank indicator. The single San Jose phase structure tells nothing of the range of house types in the Valley of Oaxaca at this time but the interior ceremonial area may prove to be the rare or unique and perhaps indicative of a high status dwelling. At least two different house types are indicated for the Guadalupe phase, implying that the occupants of the elaborate dwellings were superior in status and economic position to those of the humble dwellings. The number of elaborate dwellings is unknown, but must have been small.



Additional house types may have existed. Increasingly large differences in house types in Monte Alban I times indicate a widening gulf between social groups.

The Cuanalan houses in the Basin of Mexico correspond to the Valley of Oaxaca "humble" type; the same is probably true of the Tlapacoya examples. Elaborate residences have not been uncovered at either center; they probably did not exist at Cuanalan, but their absence at Tlapacoya may be due to insufficient excavation.

The oldest possible ceremonial structures in the Valley of Oaxaca belonged to the San Jose phase, but their function is unclear. The San Pablo burial mound in Morelos is approximately contemporaneous. Ceremonial structures may have existed at Tlatilco at this time, but the earliest definite examples in the Basin of Mexico are at Cuicuilco and Tlapacoya.

The highland Mexican Formative burials can be classified into three categories based on relative wealth of the associated offering. The categories are Class I, II, III.

Class I burials lacked offerings or have only a few utilitarian objects. They include:

- A. Fifty-six of the 58 El Arbolillo burials (all except numbers 140 and 144).
- B. All fourteen Zacatenco burials.
- C. The Tlatilco burials which lack offerings.
- D. The six Gualupita burials which lack offerings (numbers 1, 6, 7, 8, 10, and 12).
- E. All forty-nine undisturbed Ticoman burials.

Class II burial offerings are more elaborate than those of Class I but are not extraordinarily wealthy. Class II examples include:

- A. Two El Arbolillo burials (numbers 140 and 144).
- B. Four Gualupita burials (numbers 2, 3, 4, and 11).
- C. Possibly many Tlatilco burials.
- D. An unknown number of Las Bocas burials.

Class III burials contained numerous luxury objects such as pottery vessels, jade and shell ornaments, and artificially constructed chambers. They include:

- A. An unknown number of Tlatilco burials.
- B. The two mound burials at La Juana-San Pablo.
- C. Two Gualupita burials (numbers 5 and 9).
- D. The three Tlapacoya tomb burials.
- E. An unknown number of Las Bocas burials.
- F. The El Arbolillo infant with jade earplugs (number 129).

A minimum of 124 Class I burials, 6 Class II burials, and 8 Class III burials have been identified. The differences in offerings are presumed to reflect differences of rank and social standing of the individuals during life. The Class I burial occupants were commoners who lacked high status. The fact that Class I includes 90% of the classifiable burials indicates that the vast majority of the population was accorded burial of this type. In all cases higher status burials are known from either the same community or a nearby contemporaneous community. Thus the Class I burials seem to represent the agriculturalist, non-elite segment of the population.

Class II is the least well documented category. These people seemed to have enjoyed higher status than most of their neighbors and yet did not qualify for Class I burial. There is no apparent correlation between Class II burials and craft specialists.

The Class III burial occupants commanded quantities of luxury goods, in life as well as in death. The differences between these burials and the others are so pronounced that these people clearly belonged to an elite. The absence of Class III burials in communities such as El Arbolillo, Zacatenco, Ticoman, and Cuanalan may be due to insufficient excavation but more probably reflects social realities. These communities seem to have been small villages subordinate to such regional centers as Tlatilco, Tlapacoya, Las Bocas, and Chalcatzingo. The elite apparently lived in the regional centers, not in the villages.

The implications of the stone cists, which are present in 25% of the El Arbolillo burials and occur sporadically at other sites, are unclear. Most cist burials lack offerings. They may represent a response to local soil conditions or idiosyncratic beliefs rather than social differences.

The data indicates existence of two basic status levels, a small elite and a large subordinate group of commoners, and perhaps suggests a sub-group of higher status individuals at the top of the commoner category. The status levels are most probably ranks rather than social classes.

## Religion

The Formative period pantheon is not well defined. Images of Huehue-teotl, the Fire God; and Tlaloc, the Rain God, have been found at Cuicuilco and Ticoman. The Chalcatzingo rock carvings may depict various deities; including a rain deity (Tlaloc?), several felines and a reptile (Cipactli?). Olmec influence is notable in the reliefs and many common Olmec iconographic elements are found at Chalcatzingo. The emphasis on agricultural fertility, plants, and rain ceremonies is not common in the Olmec area sculptures, however, and this seems to reflect local religious traditions, not those of the Olmecs. It is possible that local leaders contracted Olmec craftsmen to do the carving but the subject matter was that of local, indigenous religion. This would cast doubt on interpretations which posited that Chalcatzingo was an Olmec colony or port-of-trade.

The numerous clay figurines have been ascribed religious functions. Female figurines have been interpreted as evidence for an agricultural fertility concept. (Vaillant, 1938). Their use as burial offerings at Tlatilco, Gualupita, and Las Bocas also implies religious significance. Certain figurines seem to portray ball players, indicating the existence of this ritual game during the Formative. These particular figurines can also be interpreted as warriors. Other aspects of the figurine art include dancers, lovers, women holding babies, and deformed people. It is probable that the figurines served a variety of secular and religious functions.

The earliest temples and platform bases date from the Guadalupe phase in the Valley of Oaxaca. Small temple platforms may possibly have existed at Tlatilco. The earliest certain temple mounds in the Basin of Mexico are those of the Late Formative at Cuicuilco and Tlapacoya. The platform bases found on many Late Formative sites probably functioned as temple bases or other religious structures.

### The Lowland Maya

The subsistence data indicate that the Formative Maya were agriculturalists practicing a long fallow swidden system. Commercial crop agriculture was probably not practiced, even in the Belize Valley, which apparently specialized in cacao cultivation at a later date. Hunting and collecting were presumably minor activities which provided dietary variety and perhaps certain low quantity dietary requirements such as salt and animal protein.

The Formative settlement patterns emphasize small household groups scattered about the landscape with a tendency toward concentrations near civic centers. The degree of nucleation at those centers should not be over emphasized and they cannot be called urban or proto-urban.

Formative building types range from simple residences to elaborate temples. Residences were primarily simple pole and thatch structures placed on low mounds, though some were more elaborate than others. It is reasonable and even predictable that masonry residential structures (the Classic "palaces" or "range buildings") will be identified in Late Formative levels at major centers, these being the elite residences. The non-residential structures identified to date include temple bases with pole and thatch superstructure and mausoleums crowned by vaulted temples.

Trade was a well developed aspect of the Formative economic system. A site by site examination of trade goods would be repetitious so an arealwide survey will be presented, based upon the following publications: W.R. Coe, 1965 (Tikal); Ricketson and Ricketson, 1937 (Uaxactun); Willey, 1965 (Altar de Sacrificios); and Willey et al, 1965 (Barton Ramie).

The non-local materials found in Formative Period deposits include obsidian, quartzite, jade and jadeite, marine shells, sting ray spines, and volcanic stones. The obsidian probably came from Highland Guatemala, though spectroscopic analysis and confirmation is lacking. Quartzite

deposits in the Maya Mountains of Belize make this a most likely source of such materials. Jade and jadeite deposits occur in the Motagua Valley of Guatemala (Foshag, 1957) but the actual Maya source is unknown. The marine shells and sting ray spines came either from the Caribbean or the Gulf of Mexico. The volcanic stones could have come either from Belize or Highland Guatemala.

The lowland Maya exports are not known but flint was an important Classic Period export and the same may have been true during the Formative.

Manufacturing specialists produced the luxury goods such as jade and shell objects. Though the jades may have been imported as finished products, the numerous shell objects at Tikal must have been manufactured by local craftsman.

Politico-religious specialists are indicated by the large civic architecture, the elaborate burial cult, the far flung trade networks, and the evidence for a social elite.

The evidence for social organization indicates two basic status levels or ranks; a small elite and a large commoners group, and a third, poorly defined group of craftsmen. This evidence includes the burials, settlement patterns, house types, and trade relations.

The Uaxactun burials indicate status differences as early as Mamom times. Some burials contain offerings while others do not. Differences in burial offerings became increasingly evidenced in the later phases culminating in an elaborate mortuary cult at Tikal. The cult's main components included:

- A. vaulted roof burial chambers surmounted by temple shrines.
- B. elaborate offerings of pottery vessels and personal ornaments.
- C. multi-occupant burials containing a principal personage and retainers sacrificed to accompany him.

The ordinary, non-spectacular burials at Tikal have not yet been published but presumably only the elite were buried with the full mortuary cult ceremony. This select group undoubtedly consisted of the rulers of Tikal.

Similar mortuary cults are not reported for other Maya lowland centers, probably because at no place have the Formative levels been tested as extensively as Tikal. The cult may have originated at Tikal and its most elaborate Formative manifestations may be restricted to that center.

The massive Late Formative architecture at Tikal implies an elite capable of marshalling and directing considerable corvee labor. The range of Floral Park phase house types at Barton Ramie reflect status differences with the higher status individuals occupying the more elaborate structures. This range did not exist prior to Floral Park times. Similar differences can be presumed to exist at Tikal but cannot be demonstrated until the data is published.

The craftsmen are difficult to place in the Formative Maya society. They presumably formed a status group separate from and superior to the mass of agriculturalists but were probably not societal leaders. In any case, their numbers must have been quite small.

The emphasis on luxury goods as trade items and the limited quantity of such items also indicates the division of society into an elite who could procure such goods and a non-elite who could not. Further societal distinctions could probably be noted in the trade goods if the data were more complete.

The foregoing paragraphs indicate the division of Late Formative Maya society into at least three groups:

- A. a small, high status group of societal leaders.
- B. an equally small group of craftsmen and artisans with specialized skills, i.e., construction and building trade specialists and ornaments manufacturers.
- C. a large group of low status agriculturalists.

#### South Coast of Guatemala and Chiapas

The agricultural techniques used in this area are not clear but presumably included a long or medium fallow swidden system. Coe and Flannery (1967) have discussed the role of non-agricultural systems at Salinas La Blanca; their conclusions apply particularly well to the lagoon estuary settlements and probably less so the inland areas.

The Middle Formative settlement pattern indicates numerous small villages and hamlets in the lagoon-estuary region. The piedmont area around Izapa was also occupied at this time. Both areas experienced a population increase toward the end of the Middle Formative; the number of villages near Ocos increased and the inland areas of the coastal zone were first occupied. The Ocos area was almost completely abandoned in the Late Formative and the piedmont became the demographic focus of the region.

Trade networks seem very poorly developed in this area until Late Formative times. The Ocos-Salinas La Blanca data shows no significant interchanges with distant areas. This is quite puzzling, in view of the marked similarities between the local ceramics and those of distant areas of Mesoamerica and additional research could radically alter this conclusion. Late Formative sculptural traditions indicate close ties between Izapa and other centers such as Kaminaljuyu and Tres Zapotes, ties which must have involved at least some trade.

The principal specialized occupations were similar to those of the lowland Maya; ornament manufacturing and societal leadership. The Late Formative monuments are evidence for a craft group of stone sculptors.

Marked status and rank differences are not evidenced in the Middle Formative though future field work may alter this conclusion. Izapa's numerous ceremonial structures, sculptures, and the personages depicted on them all indicate the existence of a social elite in the Late Formative.

The temple mounds, calendric inscriptions, and ritual scenes depicted on the monuments all bear religious themes and testify to its similarity to religion in other parts in Mesoamerica. Several Izapa style monuments portray the Long-lipped god, a forerunner of Chac, the Classic Maya rain god.

### Highland Guatemala

The subsistence data is so limited that nothing can be said beyond the fact that agriculture was practiced, presumably supplemented by hunting and gathering.

The settlement pattern data indicate a basic pattern of scattered hamlets or villages which became more nucleated with the rise of ceremonial precincts in later times. Urbanism was not characteristic of this area.

The lack of evidence for extensive trade contacts prior to Miraflores times may be due to lack of excavation rather than a reflection of historical reality. Widespread trade is certainly evidenced in the Miraflores tomb offerings. The trade goods include artifacts of jade, obsidian, flint, shell and sting ray spines. Some objects came from as far away as the Caribbean or Gulf of Mexico, others such as jade and obsidian may have come from local or relatively nearby sources. It seems doubtful that these objects were produced by local artisans; they were probably traded in as finished products. The only specialized occupation for which there is definite evidence is the societal leader position.

## VII. Levels of Political Integration in the Formative

This section will apply the archaeological data and analysis to the levels of societal integration outlined in Chapter 1.

### South Gulf Coast

The data on settlement patterns, occupational specialization, and status and rank all indicate that the Olmec culture involved groups at least representing a chiefdom level. The settlement patterns are not those of a tribe. Tribes lack hierarchies of community types such as the agricultural hamlet-Potrero Nuevo-San Lorenzo and agricultural hamlet-San Miguel-La Venta continuum and tribal communities are essentially similar in size, density, and complexity. States have hierarchies of community types but most also have urban centers, which Olmec culture lack. The small size of Olmec communities relative to those of the Classic and Post-Classic states also suggests a chiefdom level.

The Olmec specialized occupations included societal rulers, their retainers, and craftsmen; the latter two were probably directly integrated into the chief's household. Tribes have no full-time and a few part-time

specialists, certainly not as many as can be shown for the Olmecs. The state pattern of specialization with numerous full-time occupations organized into guilds and mass produced consumer goods is not indicated by the Olmec data.

Olmec society clearly had a chiefdom ranking system. Tribal societies lack well-developed status differences. Certain tribal members have higher status than others but this status is primarily achieved, not ascribed, and is not institutionalized. Tribes lack sumptuary goods which served as status indicators. The highly developed, multiple level class system of states is not evident in the Olmec remains. The evidence of such systems is best evident in residential architecture and Olmec residential architecture lacks this clear evidence of class distinctions.

### Highland Mexico

The data suggest that highland Mexico was inhabited by tribal societies which later evolved into chiefdoms with evolutionary changes occurring at different times in different places.

Tribal settlement patterns persisted in the Teotihuacan Valley until the Patlachique-Tezoyuca phase; prior to that time all the communities were small villages lacking civic architecture. The chiefdom settlement pattern, with a hierarchy of community types and civic architecture in the dominant communities, first appeared in the Patlachique-Tezoyuca phase. This pattern emerged earlier at Tlapacoya and Cuicuilco in the southern Basin of Mexico. The absence of urban centers until the very end of the Formative, combined with other data, indicates a chiefdom rather than a state level. Chiefdom settlement patterns were well established in the Valley of Oaxaca during the Guadalupe phase and may have existed in the previous San Jose Phase. Once again, urban centers were absent.

Chiefdom-type occupational specialization first appeared in the Valley of Oaxaca during the San Jose phase, the specialists included societal leaders and a few possibly full-time craftsmen. Evidence of mass production and an elaborate division of labor is lacking. Both are associated with states, not chiefdoms and their absence precludes the existence of states.

The Tlatilco burial offerings provide the earliest evidence of occupational specialization in the Basin of Mexico. Certain mortuary goods were imported but at least some pottery vessels were manufactured locally. This, combined with the evidence for status difference, indicates a chiefdom level.

Chiefdom social structure is evident in the later highland Mexican cultures. Class III burials are obviously high status interments of societal leaders. Class I burials are easily correlated with low rank individuals. The Class II examples pertain to an intermediate group, possibly minor officials and relatives of the societal leaders. The tendency for Class II burials to be concentrated at major regional centers such as Las Bocas, Tlatilco, and Gualupita reinforces this interpretation. Their occupants enjoyed higher status than those of Class I burials but were not members of the elite.

Considering all the data, it is obvious that chiefdoms emerged from tribes earlier in the Valley of Oaxaca and in Morelos than in the Basin of Mexico. Furthermore, centers in the southern Valley of Mexico (Cuicuilco and Tlapacoya) achieved a chiefdom stage earlier than those to the north (Teotihuacan).

### The Lowland Maya

Tribal societies persisted in the Maya area until almost the end of the Formative.

Chiefdom settlement patterns and civic architecture first appeared in the Belize Valley in the Floral Park phase. The Tikal Chicanel sphere architecture indicates the emergence of the chiefdom level earlier there than at Uaxactun or the Belize Valley, though the time lag may have been quite short.

The absence of occupational specialization during the Xe and Mamom spheres indicates a tribal level. Chiefdom-like occupational specialization first appeared at Tikal and Uaxactun during the Chicanel sphere and became evident somewhat later at Barton Ramie.

Marked status differences were absent during the Xe and Mamom spheres. Mamom burial offerings were limited in quantity and do not indicate marked status differences. Chicanel sphere burials at Tikal and Uaxactun indicate increased status differentiation.

The Belize Valley settlement patterns and house types indicate increased status differences during the Chicanel sphere; and chiefdom social structure is evident by the end of the Formative.

Thus, chiefdoms emerged quite late in the Maya area, possibly not until 300 to 200 B.C.

### South Coast of Guatemala

Tribal societies occupied this area until the emergence of Late Formative chiefdoms. The earlier settlement patterns and occupational specializations are those of tribes, not chiefdoms. The Naranjo settlement patterns and the Izapa civic architecture and occupational specializations indicate Late Formative chiefdoms.

### Highland Guatemala

The pre-Miraflores societies were small, tribally organized groups. All the data on settlement patterns, occupational specialization, and social structure substantiate a tribal classification. The Miraflores phase societies were considerably more complex than their predecessors. The burial mounds, ceremonial precincts, richly stocked tombs, and luxury goods are all evidence for a chiefdom society.



## Discussion

The Mesoamerican Formative chiefdoms share significant similarities with the three levels of Polynesian chiefdoms.

The San Lorenzo chiefdoms of the Olmec area were probably structurally similar to the Hawaiian (Level I) system. San Lorenzo society probably exceeded 10,000 members, particularly if it controlled the entire Coatza-coalcos Basin. The organized labor implicit in the artificial ridge construction and movement of monuments also indicates a substantial population. La Venta society was equally complex and similar chiefdoms probably existed at Laguan de Los Cerros and in the Papaloapan Basin.

The San Lorenzo and La Venta societies exhibit interesting differences. La Ventans placed great emphasis upon the massive offerings of serpentine but similar offerings are not found at San Lorenzo. Many more jade and jadeite objects are known from La Venta than from San Lorenzo. The unusual configurations of the major mound at La Venta is not duplicated at San Lorenzo. These differences may result from chronological factors but more probably represent individual emphasis and idiosyncracies of two distinct but related societies.

The steps involved in evolution of Level I chiefdoms are unknown, in fact, there is no assurance that the three levels form a valid evolutionary sequence. The Olmec data does not clarify the picture because the nature of the Pre-San Lorenzo phase societies is still obscure. Their evolution seems to have been a gradual, orderly development out of local cultures, not the result of major immigration. The San Lorenzo occupation indicates uninterrupted stability from 1500 to 900 B.C. Major shifts and changes in the ceramic sequence are lacking, indicating local cultural development. Monument carving has a long history at San Lorenzo and lacks antecedents elsewhere in Mesoamerica, the same is true of the Olmec clay figurine tradition. These facts indicate the chiefdom level was an autochthonous development in the area and not the result of outside influence or diffusion.

Substantial demographic growth must have occurred during the pre-San Lorenzo phase and probably took place concurrently with more intensive environmental exploitation through increased agricultural production. The increased production may have involved more productive, lowland-adapted maize such as Nal-tel, which we know was introduced into the Tehuacan Valley at this time (Mangelsdorf, et al, 1967) and may well have evolved in the Olmec area. If so, its evolution coincided with a period of demographic expansion. The annually flooded river bottom lands may have been cultivated more intensively than before. Their higher long range productivity and potential would have aided the demographic expansion.

The inception of marked status differences was another process operative in the emergence of Olmec chiefdoms. The sequence of events is unknown but presumably certain kin groups came to control certain crucial natural resources, the most obvious being the river bottom agricultural land. Such groups would have become larger and wealthier than those lacking the resource, and their leaders would have become

the emerging elite. Attempts to justify and regularize the leadership of the dominant groups may have led to the formulation of genealogies which emphasized or even deified the ancestors of the elite. The colossal stone heads may represent such ancestors. As status differences became more marked, the elite presumably sought means of visually expressing the differences, i.e., through sumptuary goods. Thus, they were attracted to certain substances such as jade, jadeite, and nephrite. It is often claimed that green was identified with fertility and that they were thus prized for their color. While this was true of later periods, during the Formative they were probably more prized for their scarcity rather than their color. The Olmecs actually used a variety of different colored stones, including green gray, and blue, jade, and jadeite. The color of the material came to symbolize fertility only after certain stones had acquired a value based on their scarcity.

The mechanisms by which trade networks with other societies were set up and maintained is unclear; this topic will be discussed in more detail in the section on highland Mexican cultures.

It has been shown that, despite claims to the contrary, primitive states did not evolve in the Olmec area. An explanation is demanded. Limited demographic potential must have been one cause. The interriverine areas can only be cultivated with relatively long fallow swidden systems, which limits their demographic potential. River bottom land is extremely limited and could not support a population much greater than that of a Level I chiefdom.

The highland Mexican data permits a more detailed analysis of the evolution of chiefdoms than is possible for the Olmec area. The San Jose phase chiefdoms would seem to belong to Level IIa or IIb. The succeeding Guadalupe phase chiefdoms were seemingly more complex than their predecessors and may belong to Level I. Level I chiefdoms definitely emerged in Monte Alban I times, followed shortly by the evolution of a state.

The San Jose phase chiefdoms lacked the large scale public works of their San Lorenzo phase contemporaries. Also, their territories were not as large. Several chiefdoms occupied the Valley of Oaxaca simultaneously; each probably numbered several thousand members. The Valley population increased in the succeeding periods, and the demographic limits imposed by the technology and environment were probably not reached until late in the Classic Period. This limit must have been quite high, especially with full exploitation of irrigation, terracing, and other intensive cultivation techniques. The fact that the Level I chiefdom population size was not reached until near the end of the Formative is attributable to the timing of population growth in the area, not to inherent ecological limits.

The highland Mexican chiefdoms centered at Gualupita, Chalcatzingo, Las Boca, and Tlapacoya-Ayotla were probably on the same level as the San Jose chiefdom, Level IIa or IIb. The tripartite burial classification can easily be reconciled with Level IIa rank structure. These chiefdoms coexisted side by side and undoubtedly maintained commercial contacts with each other. Evidence is lacking for the expansion of certain

chiefdoms at the expense of others but this may have happened. The numerous IIA chiefdoms were replaced by two large Level I chiefdoms, centered at Monte Alban and Cuicuilco, which were in turn replaced by the primitive state based at Classic Teotihuacan. Cuicuilco was destroyed by a volcanic eruption and abandoned. Monte Alban was apparently conquered by Teotihuacan.

In his recent examination of Olmec influences in the Valley of Oaxaca, Flannery (1967) maintained that the San Jose phase societies were chiefdoms and that they maintained regularized trade with the Olmec chiefdom. The San Jose elite imitated the dress, behavior, and status symbols of the Olmec elite, resulting in the presence of Olmec objects and decorative motifs in the Valley of Oaxaca. The contact and diffusion did not precipitate marked changes in San Jose society but did lead to the acceptance of certain visual manifestations of Olmec culture. The Olmecs were not responsible for the establishment of San Jose chiefdoms, rather they found the area occupied by chiefdoms less highly organized than themselves, which controlled resources they desired. The Olmec chiefdoms were older and more complex and their more highly developed ritual paraphenelia and status symbols were copied by the San Jose elite. Flannery maintains such diffusion is more likely to occur between societies on approximately the same level of development than between disparate societies such as a tribe and a chiefdom. I agree and maintain his model applies not only to San Jose society but to highland Mexico in general.

Grove's trade route explanation for the location of Olmec-influenced centers supports Flannery's interpretation. However, suggestions by Grove and M.D. Coe that such centers were Olmec "colonies" are not supported and the concept of "Highland Olmec" societies is not valid. The highland societies did maintain trade relations with the Olmecs and did draw cultural inspirations from them but were not Olmecs in any significant political or social sense.

Chiefdoms appeared later on the Pacific coast of Guatemala and Chiapas and in highland Guatemala than in either the Olmec area or highland Mexico. Izapa at its zenith was undoubtedly a Level I chiefdom. The same is true for Kaminaljuyu. Monte Alto, Bilbao, and Abaj Takalik were all probably chiefdoms contemporary with Izapa but their degree of development is unknown.

So little is known about the ecology, demographic potential and actual history of the Pacific Coast and highland Guatemala area that speculation concerning cultural dynamics is useless. The geographical spread of the Izapa art style seems to indicate that Izapa played a diffusion role similar to that of the earlier Olmec chiefdoms.

The historical and cultural connections between the Olmec and Izapa chiefdoms are obscure. San Lorenzo, and probably La Venta, had declined prior to Izapa's emergence as an important center, precluding direct contact between the two societies. The two cultures shared many basic characteristics. Both erected large ceremonial structures; the Olmec examples were constructed entirely of earth, while those at Izapa had cobblestone facings. Both groups carved human representations on rectangular stone monuments (stelae) but the specific art styles differed

strikingly. These examples indicate that the shared similarities can be attributed to the shared chiefdom level, not to direct historical contact. This does not mean that Izapa culture evolved in a vacuum, owing nothing to its predecessors. Many cultural forms were borrowed from antecedent Olmec and highland Mexican chiefdoms. Civic architecture is characteristic of most chiefdoms but the temple-pyramid base-plaza complex is just one of many possible civic architectural forms. Its existence at Izapa can be attributed to its prior existence in Mesoamerica which is the result of its being an Olmec invention. Erection of stone monuments is not an obvious or necessary way for chiefdoms to invest economic surpluses and public labor and its practice at Izapa is the result of an older Olmec innovation.

This explanation of Olmec "influence" indicates the inception of the chiefdom level was the result of local evolutive processes, not diffusion, messianic cults or immigration.

The most notable thing about the Maya Formative is the virtual lack of population prior to 600 B.C. The Middle Formative population was very small and only traces of it have been found to date. The explanation for this demographic vacuum is not clear. The area's isolation from centers of plant domestication, inception of village life, and evolution of chiefdoms may have been a factor but this is partially belied by its nearness to the Olmec area. When demographic growth began, it did so rapidly, resulting in a tremendous spurt of cultural growth in the Late Formative. Seen in this light the Classic Maya achievement is almost unbelievable. One is impressed not only with the lateness of the shift from tribal to chiefdom organization but also with the swiftness with which it occurred.

FIG. 1 FORMATIVE SITES IN MESOAMERICA  
EXCLUDING THE BASIN OF MEXICO

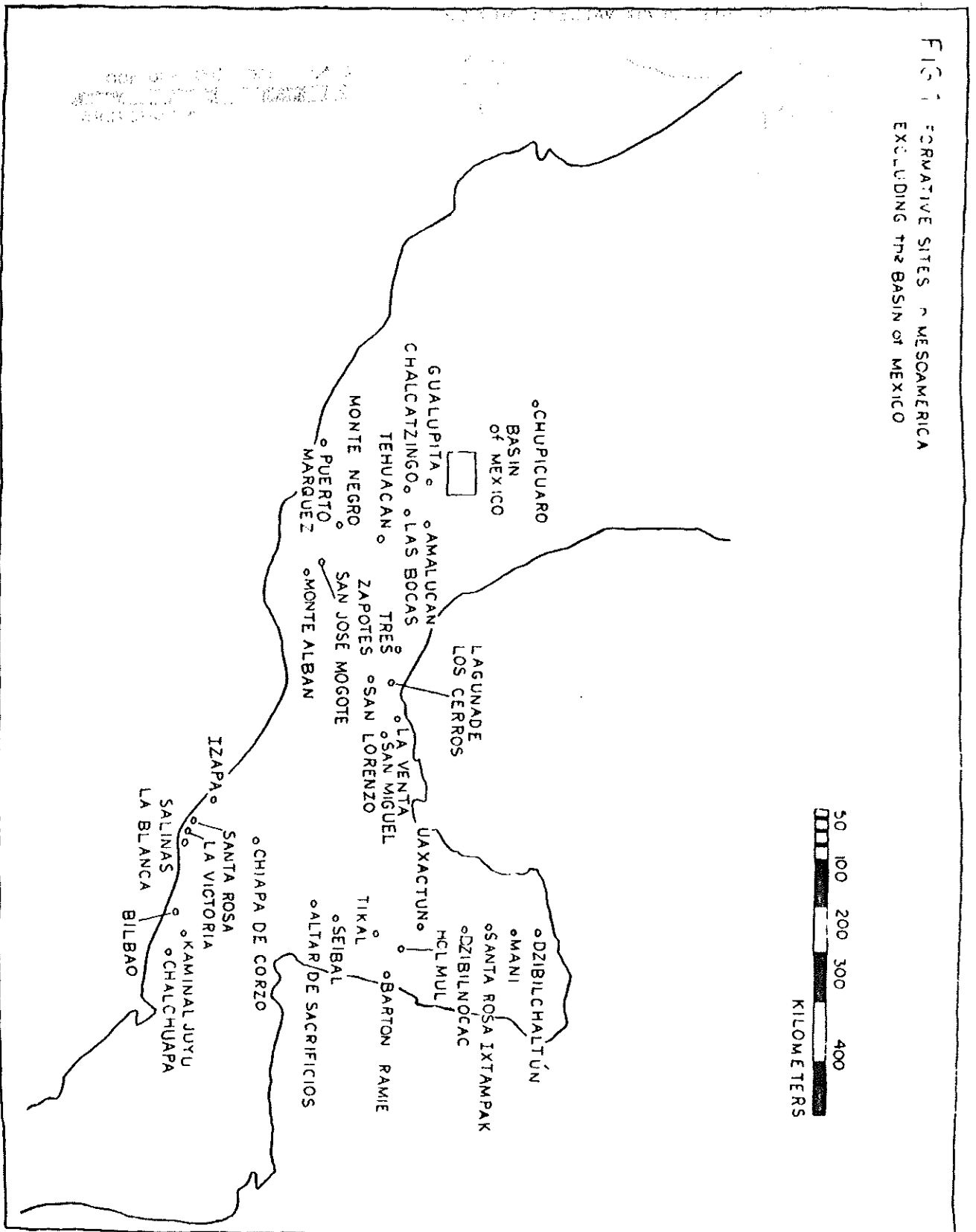


FIG 2 FORMATIVE SITES in the VALLEY of MEXICO

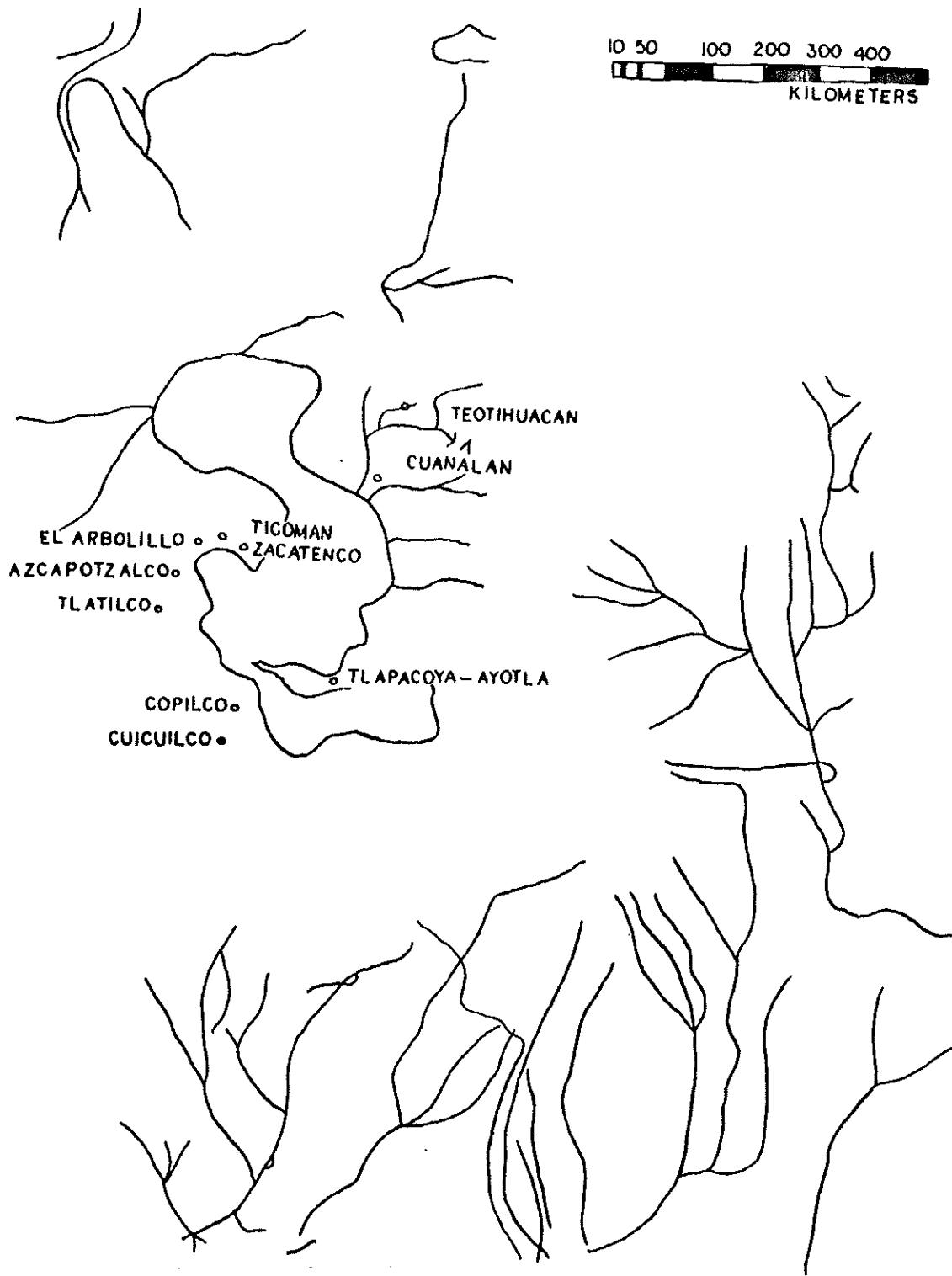


FIGURE 3--THE CHRONOLOGY OF THE MESOAMERICAN FORMATIVE

YEARS	BASIN OF MEXICO	VALLEY OF OAXACA	SOUTH GULF COAST SAN LORENZO	LA VENTA	COASTAL GUATEMALA	LOWLAND MAYA	YEARS
200	Tzacualli	Monte Alban II			Crucero	Floral Park	200
100							100
AD 0							0 AD
BC							BC
100	Patlachique-Tezoyuca	Monte Alban I	Palangana	La Venta IV	Conchas II	Chicanel	100
200							200
300	Ticomán-Cuanalan						300
400	Atoto-Cuatepec	Guadalupe		La Venta III	Conchas I	Mamón	400
500							500
600	Totollica-La Pastora						600
700		San Jose	San Lorenzo	La Venta I	Jocotal	X E	700
800							800
900	Iglesia-El Arbolillo						900
1000	I X T A P A L U C A		Chicharras		Cuadros		1000
1100							1100
1200							1200
1300							1300
1400							1400
			Bajío		Barra		
			Ojochi				





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