

**Dawn In The Land Between The Rivers:
Formative Occupation At Cahal Pech, Belize And Its
Implications For Preclassic Development In The Maya Lowlands**

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ABSTRACT

The objectives of this research were to determine the temporal limits of Formative occupation at Cahal Pech, and to ascertain the socio-political complexity of the site during the Preclassic period. Data retrieved by the investigations were subsequently employed for determining the inter-regional cultural affiliation of the site and for assessing the chronological development of complex society in the upper Belize River valley.

The investigations established that Cahal Pech was initially settled ca. 1000 B.C. The early Middle Formative, Cunil phase (1000-850 B.C.), settlers subsisted on a mixed economy based on farming and the exploitation of local plant and animal resources. They produced pottery, stone tools, and ceramic figurines, and acquired exotic goods from the Guatemalan highlands, and the Caribbean coast. Although the social organization of this early settlement was relatively simple, a system for social ranking appears to have been in operation prior to 850 B.C.

During the subsequent Kanluk phase (850-350 B.C.) there were major changes in the Cahal Pech community. The construction of special function structures, differences in burial practices, population increase, and differential distribution of figurines and exotic goods indicate that by the end of the late Middle Formative period (650-350 B.C.) this precocious community had achieved a relatively high level of social complexity.

By the Late Formative Xakal phase (350 B.C.-A.D. 250) Cahal Pech had become one of the major regional centers in the Belize Valley. Large monumental architecture, the

introduction of polychrome pottery, and a more extensive and complex system of exchange suggest that Cahal Pech was comparable to other Late Formative centers in the eastern Maya Lowlands.

In addition to enhancing the culture-history of the Belize Valley, the Cahal Pech data further indicate that there was a long history of cultural affiliation between Belize Valley settlements and sites in northern Belize. Evidence which suggest that the development of complex society in the Maya Lowlands had its origins in the Middle Formative period are also presented.

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CHAPTER 1

THE FORMATIVE PERIOD IN THE CENTRAL MAYA LOWLANDS:

PROBLEMS AND ARCHAEOLOGICAL EVIDENCE

Although archaeologists have learned a great deal about the period from 300 B.C. to A.D. 300, the years from the first Maya settlement of the lowlands to 300 B.C. remain opaque in comparison (Sabloff 1990:113).

1.1 Introduction

Even after half a century of intensive archaeological research the Formative period (2000 B.C.-A.D. 250) of Maya prehistory continues to be one of the most enigmatic and often controversial eras in the study of ancient Maya culture (Willey 1981; Hammond 1986a; Awe et al. 1990). This condition persists for three major reasons: 1) previous research biases, 2) prehistoric Maya architectural techniques, and 3) the present concerns of cultural resource management.

In the first instance, the paucity of Formative period data strongly reflects the research biases of most early projects in the Maya subarea of Mesoamerica (Fig. 1). Prior to the 1960s most studies were particularly concerned with investigating and elucidating the magnificent cultural achievements of Classic Maya civilization. This bias led Mayanists to focus on the monumental architecture of large centers, on iconography, and on the material wealth and lifestyle of Classic period (A.D. 250-900) elite. Consequently, the somewhat less glamorous pioneering efforts of the early Lowland Maya and the cultural processes associated with their seminal development in the Formative period were generally ignored. Eric

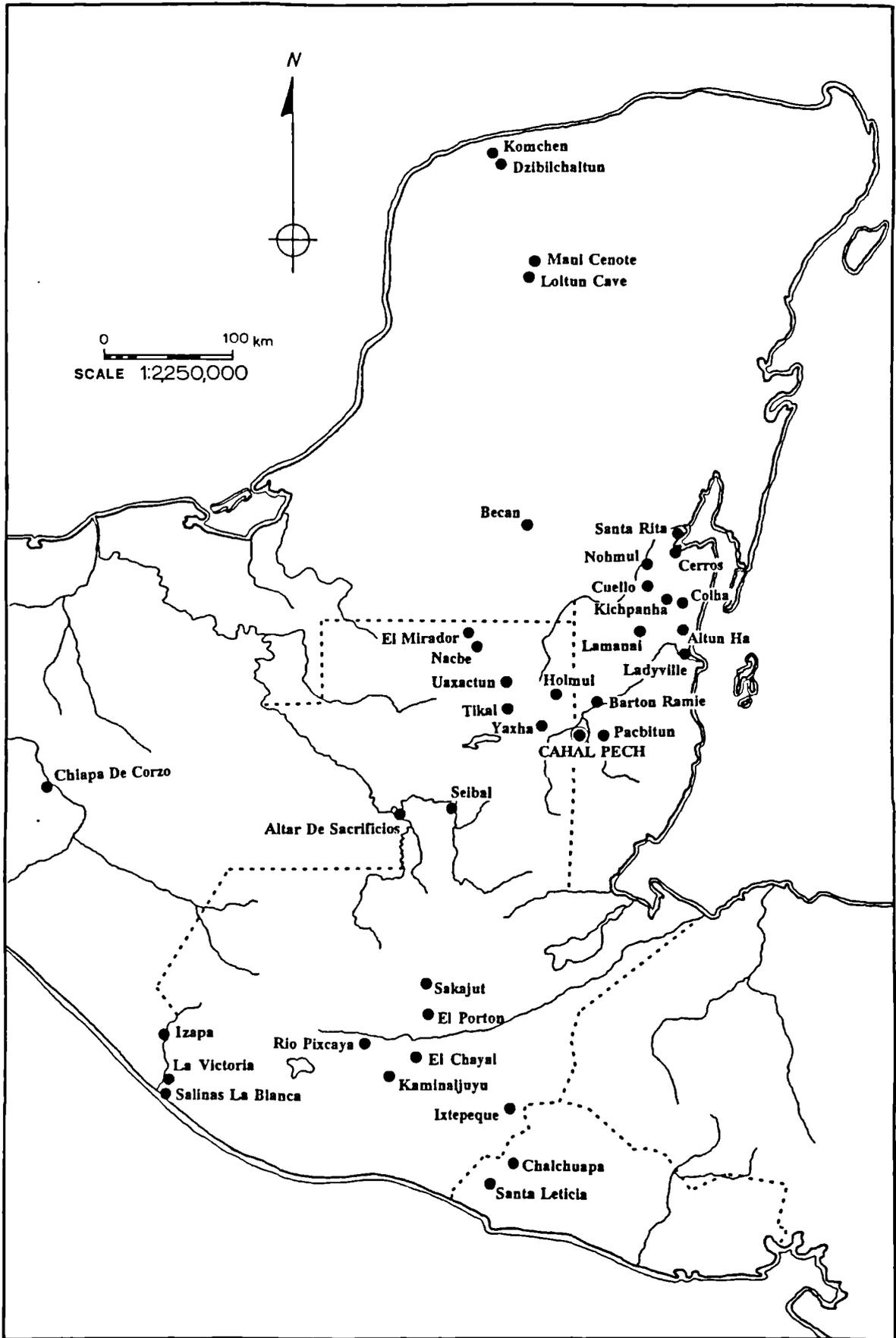


Figure 1: Map of Maya Area indicating Formative Period Sites and Obsidian Sources

Thompson's (1931, 1939) studies of settlements and small centers in the Southern Cayo District and at San Jose, plus Willey's 1950s settlement survey in the Belize Valley (see Willey et al. 1965) differed from these early and primarily descriptive approaches, but these investigations were, for the most part, exceptions to the rule.

Following the advent of the "problem oriented" period and a simultaneous decrease in the funding of large scale archaeological projects in the 1970s, the last two decades in the history of Maya archaeology have witnessed a marked change in the research interests of Mayanists. Unlike their predecessors, archaeologists in the 1970s and 1980s were encouraged to investigate more specific topics, particularly those with a strong focus on causality and cultural processes. But, while these changes have substantially increased our overall knowledge of ancient Maya society, and concomitantly have added considerably to the diachronic data base of Maya prehistory, they have generally ignored questions regarding the early developmental stages of Lowland Maya culture (Willey 1977b; Hammond 1986a; Awe et al. 1990).

Access to, and knowledge of, Formative period occupation has also been constrained due to prehistoric Maya architectural techniques. Because most Maya masonry structures were successively modified and/or completely covered (several times) by subsequent architectural activity, previous construction phases, particularly the earliest levels of occupation, are generally buried under tons of later monumental architecture (cf. von Falkenhausen 1985). The problems caused by this situation are best described by Culbert (1977:28) who, in his analysis of Formative remains from the Peten, emphasized that:

...summarizing Preclassic data for Tikal is a far less satisfying task than dealing with late levels of occupation, for most early remains, even after

fourteen years of excavation, still lie hidden and unsampled under massive levels of later construction.

In a more recent article Hester et al. (1983:13) added that:

An intensive examination of Middle Preclassic culture has rarely been achieved for several reasons. Primary among these is the unfortunate fact that Preclassic remains, in general, tend to be buried and obscured by later Classic Period construction at most sites, and therefore these deposits cannot be easily located. For the same reasons, Middle Preclassic deposits are often deeply buried, and sampling is a logistically difficult and very expensive task, limiting sampling size.

In cases where there have not been considerable architectural modifications overlying Formative occupation levels, access to the latter may also be constrained by the development goals of the cultural resource management of Central American countries. Since these goals are generally tourism oriented there is often an understandable bias towards the preservation, and minimal destruction, of the larger, more complex, but more recent phases of Maya architecture. Archaeological investigations are therefore limited by these constraints and quite often archaeologists are unable to excavate the Formative occupation levels at most Maya centers.

Fortunately, in the last few years, several sites in Belize (i.e. Cuello, Lamanai, Cerros and Colha) and in the Peten (i.e. Yaxha-Sacnab, Nacbe and El Mirador) have provided unique instances where Preclassic architecture and occupation levels have been accessible to investigation. The partial excavation of these sites has provided some information on the Formative stages of Maya development, but as the discussion that follows indicates, this new knowledge is hampered by several controversies and there still remain more questions than answers.

1.2 Culture-Historical Discussion of Formative Period

Occupation in the Central Maya Lowlands.

In the brief synthesis that follows it will be evident that most interpretations of the earlier segments of the Formative period are primarily derived from ceramic data. As Andrews (1990:3-4) recently acknowledged:

The broken and discarded ceramics of a human society create a poor window through which to glimpse its history or to fathom the reasons for its change. They are, however, a large part of what we have...

Consequently, most reconstructions of the seminal period of Maya prehistory, including this one, "are based almost entirely upon them" (Andrews 1990:4).

It should also be noted that the area of particular interest to this study is that which is defined as the Central Zone by Adams and Culbert (1977, Figure 1). However, since the Pasion Zone sites of Altar de Sacrificios and Seibal play an integral role in any discussion, or reconstruction, of Formative development in the Maya subarea I have decided to include both zones in this study of the central Lowlands (Fig. 2).

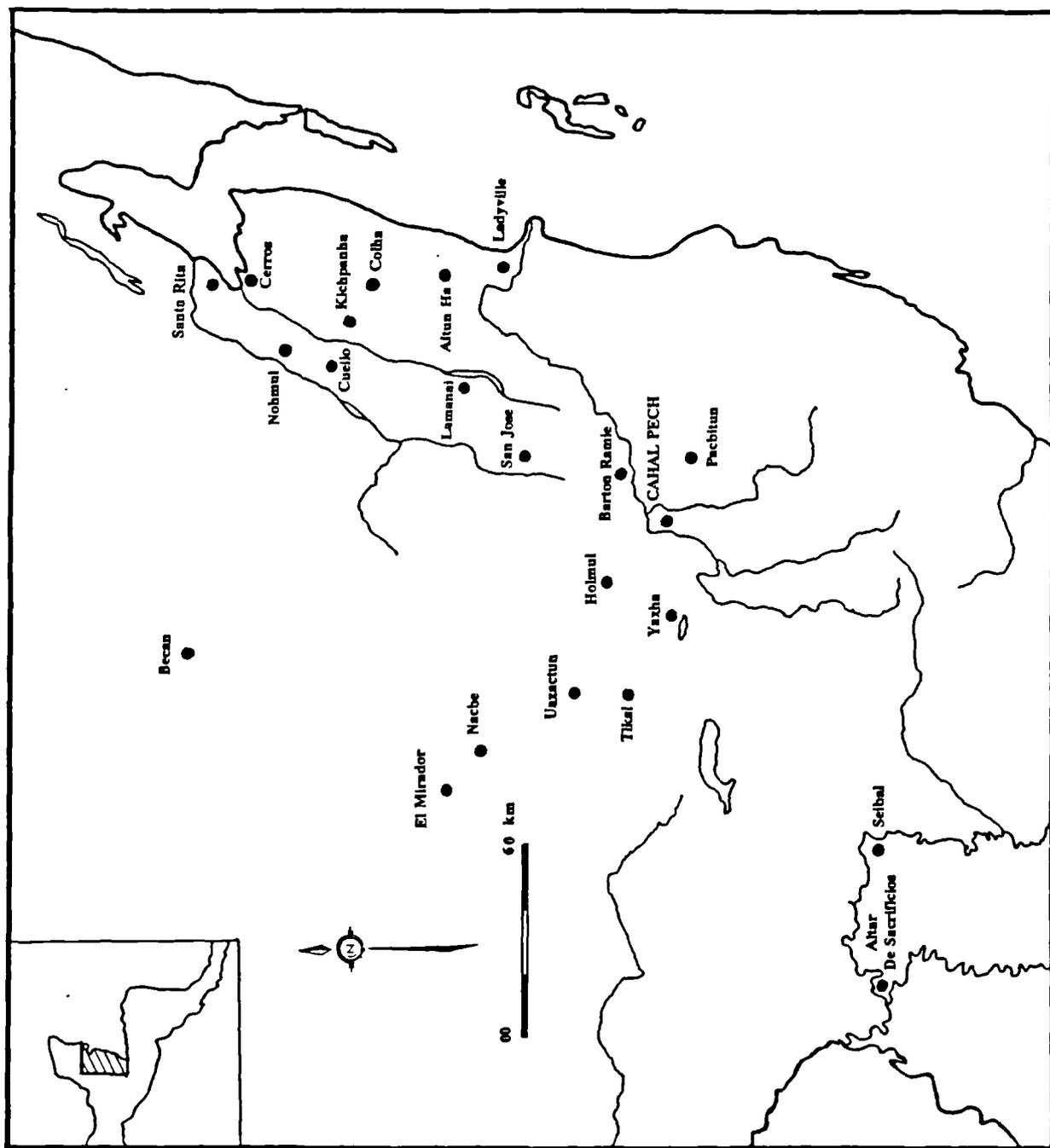


Figure 2: Map of the central Maya Lowlands with Formative period sites.

The Early Formative Period (2000-1000 B.C.)

In his summary of the 1974 Santa Fe conference on the Origins of Maya Civilization, Willey remarked that:

There is, as yet, no clearly defined cultural horizon for the Maya Lowlands prior to or during the Early Preclassic Period...(Willey 1977b:384-385).

In the mid 1970s Willey's statement accurately reflected the nature of the data then available for the region. Prior to this date indications of Archaic and Early Formative occupation in the Central Lowlands, and the Maya subarea in general, had been rare and largely questionable. These claims included Brainerd's (1951, 1958) Early Preclassic assignation for ceramics from the Mani Cenote in Yucatan; Puleston's (1974, 1975) aceramic dating of lithic tools from Richmond Hill in northern Belize; plus Cowgill and Hutchinson's (1966) and Brooks' et al. (1973) suggestion of environmental disturbance and the domestication of *Zea mays* between 3000 to 2000 B.C. (based on sediments and pollen cores taken from Lakes Petenxil and Quexil) in the central Peten region.

By the mid-1970s, ceramicists working in the Yucatan had dispelled Brainerd's temporal assignment of the Mani ceramics (Ball 1977), and Puleston's claim for an aceramic date for Richmond Hill was, at best, considered tenuous (Hammond 1974). Conversely, the pollen data from the Peten lakes had not been refuted, but as Willey (1977b) pointed out, data regarding the cultural context in which these environmental changes had occurred was still lacking.

In the decade following the Santa Fe conference a number of projects recovered data

which, for the first time, produced evidence supporting the tentative establishment of an Early Formative and Archaic period in the area's chronological sequence. Primary among these discoveries were the location of several Paleo-indian or Archaic sites and artefacts in Highland Guatemala (Gruhn and Bryan 1977; Bray 1978; Brown 1980), the discovery of a fluted projectile point at Ladyville in Belize (Hester et al. 1981), and the recovery of an interesting assemblage of stone tools associated with extinct fauna at Loltun Cave in the Yucatan (Velasquez V. 1980; Alvarez 1982). Along the coastal plains of Belize, MacNeish and others (MacNeish et al. 1980; MacNeish 1982; Zeitlin 1984) also located several sites with an artefactual assemblage which was subsequently seriated into a six phase sequence that spanned the entire Archaic period (9000-2000 B.C.). Since a large part of MacNeish's data were not isolated stratigraphically, the validity of his Archaic sequence was, and still is, treated with some scepticism (Hammond 1986a:401). The more accurately dated sites, and the discovery of several fluted points, nonetheless provided convincing evidence that the Maya Lowlands were occupied prior to 2000 B.C.

In the latter half of the 1970s, new discoveries in northern Belize also challenged Willey's (1977b) statement regarding the absence of Early Formative occupation in the Central Maya Lowlands. Between 1974 and 1980, Hammond (1974, 1977a, 1977b; Hammond et al. 1976, 1979) uncovered several levels of occupation at the small site of Cuello which, he suggested, spanned the entire Formative period. More important, it was argued that:

A series of stratified and internally consistent radiocarbon dates from structural deposits at the base of a Late Formative ceremonial platform (Platform 34) suggested that the earliest ceramic complex, called Swasey, dated to the Early Formative period, a span previously unidentified in the Maya Lowlands (Hammond 1975, 1977b, 1984; Pring 1975, 1977a; Hammond et al. 1979; Pring and Hammond 1982). These dates placed the beginning of the Swasey phase before 2000 B.C., possibly not long after 2500 B.C., about a thousand

years before the first excavated settlements in the Peten and almost that much earlier than the earliest known settlement at Chalchuapa, in the southern Maya highlands. The Swasey Maya at Cuello lived in a village of perhaps several dozen houses, built pole-and-thatch structures on low, lime-plastered platforms that because of their large size may have served a community ritual or administrative purpose, and grew maize and other crops (Andrews 1990:10).

Finally, it appeared, a site (Cuello) had produced conclusive evidence for Early Formative occupation in the Central Lowlands. But euphoria over the new, early data was to be short-lived. From the onset, the Early Formative dating of the Cuello material was "shrouded in controversy" (Marcus 1983:459) and Hammond's (1977b; Hammond et al. 1979) definition of the Swasey phase "disturbed archaeologists" (Andrews 1990:11). The calibrated dates of 2000-2500 B.C. seemed much too early for a ceramic and cultural tradition whose complexity far surpassed any of the other early pottery making cultures of Mesoamerica (Coe 1980:34-35). The Swasey phase was also too long (1000 years) and lacked the types of "internal changes" normally observed in other Mesoamerican ceramic complexes (Pring 1979; Marcus 1983:459-460). Even more "disturbing" was the fact that Swasey-like ceramics from several nearby sites did not concur with Hammond's temporal assignation at Cuello. At Colha, for example, radiocarbon determinations dated the Swasey-like Bolay complex to the early Middle Formative period (Hester 1982; Potter et al. 1984; Valdez 1987). A coeval date (1000-600 B.C.) was assigned to similar pottery at Kichpanha (Reese and Valdez 1987) and at Santa Rita (Chase and Chase 1987).

In an attempt to address these intra-regional differences, Kosakowsky (1983, 1987) reanalysed the Cuello ceramics and subsequently subdivided the Swasey pottery into two complexes: Swasey and Bladen. In contrast to Pring and Hammond's (1982) earlier report, she argued that the Swasey complex spanned the period between 2500 and 1200 B.C. and the

Bladen complex ranged from 1200 to 700 B.C. Despite Kosakowsky's (1983, 1987) modifications, Maya ceramicists were still not convinced of the proposed antiquity of the Cuello pottery. As Andrews states:

...the early date of the Swasey phase must be reassessed. Compelling evidence indicates that the Swasey phase dates to the Middle Formative and that the Early Formative period in the Maya Lowlands, therefore, remains to be identified. Eight La Jolla radiocarbon determinations from charcoal samples collected during the 1979 excavations at Cuello, published in Radiocarbon in 1984 (Linnick 1984:93-94) but neglected until now, conflict with the 1975 and 1976 samples. Three of these runs, from Chicanel and Mamom deposits, are consistent with dates for these phases from other Lowland sites. The other five came from Swasey phase excavations units (Construction Phase II and III). The central uncalibrated radiocarbon ages of these five range between 570 and 470 b.c., and the 1-sigma ranges for the calibrated dates fall between 799 and 402 B.C. Norman Hammond (personal communication 1987-1988; Linnick 1984:93) states that a similar series of 1979 dates from the same excavation area submitted to Cambridge University produced duplicate results. About ten determinations from 1979, then, date the Swasey and Bladen phases to the Middle Formative period...(Andrews 1990:12-13).

In view of these and other observations Andrews argues that:

We should reject the Early Formative dates for the Swasey and Bladen phases at Cuello and should accept the dates that range between about 800 and 500 or 450 B.C. The ceramics are more at home in the Middle Formative, and similar materials have been dated between about 850 and 600 B.C. at nearby Colha. Other complexes with general modal similarities to Swasey and Bladen, such as early Eb at Tikal, early Jenney Creek at Barton Ramie, and Xe at Altar de Sacrificios and Seibal, date to the Middle Formative (Andrews 1990:15).

In a recent Master's thesis which focuses on the Formative architecture at Cuello, Gerhardt (1988) states that Hammond has accepted Andrews' suggestion. In the "Foreward" section of her thesis she reports that, "Andrews and Hammond (personal communication, Hammond 1988) concur that the Swasey and Bladen phases should be placed in the Early Middle Formative and not the Early Formative" as referred to in previous publications (Gerhardt 1988:iii). Even more recently, Hammond and Gerhardt (1990), and Andrews and Hammond (1990) reiterated this position. In the former article, Hammond and Gerhardt

(1990:461) state that "the small site of Cuello in northern Belize" has produced a "continuous stratigraphic sequence of architectural construction beginning c. 1000 BC and ending c. AD 400." In the second paper Andrews and Hammond (1990:579) explicitly "...recommend a reassignment of the Swasey and Bladen phases to the early Middle Formative." They point out that:

Calibrated radiocarbon dates of 19 samples excavated since 1976 at the site of Cuello, in northern Belize, place the Swasey phase (11 dates) and Bladen phase (8 dates) in the Middle Formative period, rather than in the Early Formative, as 10 dates on charcoal excavated in 1975 and 1976 indicated (Andrews and Hammond 1990:570).

The change to the Cuello chronology consequently:

...places the north Belizean ceramic tradition within the same general time frame as the earliest pottery elsewhere in the southern lowlands, such as Early Jenney Creek at Barton Ramie ..., Eb at Tikal ..., Ah Pam in the Lake Yaxha-Sacnab basin ..., and Xe at Altar de Sacrificios and Seibal (Andrews and Hammond 1990:580).

More important, the redefinition of the Swasey phase at Cuello emphasizes that the Early Formative period continues to be as enigmatic as ever, and implies that this early stage of development remains a relatively blank page in Lowland Maya prehistory.

The Early Middle Formative (1000-600 B.C.)

The early Middle Formative is the earliest period for which archaeologists have conclusive, yet limited, evidence for Maya occupation in the Central Lowlands. Most of this data comes from relatively few sites in four geographically dispersed regions. Two of these regions are in Belize and the other two include the northeastern Peten and the Pasion zone of Guatemala.

The Pasion Zone

In the Pasion zone evidence for early Middle Formative occupation has been discovered at Altar de Sacrificios (Adams 1971:153-156; Willey 1973:22-27) and at Seibal (Willey 1970, 1977a). Radiocarbon dates (Table 1) at these sites suggest that they were initially occupied in the early part of the first millennium B.C. (Willey 1973; Sabloff 1975). Culturally, this pioneering phase is primarily represented by Xe ceramics from Altar, and Real Xe from Seibal. Since the pottery from both complexes is very similar the complexes are traditionally combined to form the Xe ceramic sphere, dating between 900 and 600 B.C. (Willey et al. 1967).

Contextually, Xe ceramics were found within the lowest excavation levels in Group B at Altar, and in midden material above the "old ground surface" at Seibal (Willey 1973:22-23). The riverine location of the two sites, plus the discovery of jack beans (*Canavalia ensiformis*) at Altar, suggest that the Xe people practised a mode of subsistence based on "simple farming" and the exploitation of riverine resources (Willey 1977b:386). They lived in "small village communities" and built "perishable houses" which probably clustered around "little plazas" (Willey 1977a:137, 1977b:386). The presence of obsidian and grinding stones of igneous rocks are also indicative of inter-regional contact and exchange. Some form of ceremonialism is indicated by the discovery of a sandstone altar and a pottery stand in the form of a mushroom at Altar de Sacrificios, and by an "Olmec-like" cache containing several jade celts and an ice-pick-type bloodletter from Seibal (Willey 1977a:138).

Although Willey (1977a:136-137) previously suggested that the ethnic identity of the Xe people was probably Maya, their place of origin remains "a matter of speculation" (Rice

1976:429). Initially, arguments were made favouring an origin in either the Gulf coast Olmec region, or the northwestern Maya Highlands (Willey 1977a:137, 1977b:386). The subsequent discovery of Early Preclassic ceramics at sites in the Salama Valley of Guatemala (Sharer and Sedat 1987) indicated that the northern Maya Highlands was also a likely source. More recently Andrews (1990) has presented a strong case in favour of Chiapas and the northern highlands. He argues that while Xe pottery is distinct from, and unrelated to, other early Middle Formative ceramics from the central or eastern Maya Lowlands, it shares considerable modal and stylistic attributes with material from highland Chiapas (Andrews 1990:18-23). Whatever the case may be, these contrasting hypotheses demonstrate that the origins of the Xe people continue to be a highly debatable issue.

The Northeastern Peten

Evidence for early Middle Formative occupation in the northeastern Peten has been recovered at Tikal and the Yaxha-Sacnab Lakes basin. At Tikal, the early Middle Formative phase is represented solely by ceramics from the early facet of the Eb complex, and dates approximately between 700 and 500 B.C. Since none of the early facet Eb pottery was recovered from primary stratigraphic contexts, the division of early and late facet ceramic types was determined by seriation (Rice 1976; Culbert 1977). Culbert (1977:29) adds that, "The starting date of 700 B.C. for the Eb complex is based upon sheer guesswork, since the only radiocarbon date available for the complex is 588 ± 53 B.C. for an early facet Eb sample." Apart from this ceramic data, 20 years of investigations at Tikal have failed to uncover pure, early Middle Formative occupation levels. Consequently, we know little about the cultural morphology of the people who produced early Eb ceramics at this important site.

The early Middle Preclassic data for the Yaxha-Sacnab basin are more extensive than at Tikal. At Yaxha-Sacnab, Middle Formative pottery was discovered in diverse contexts on several of "the higher ridges around the lakes" (Rice 1976:434-435). This pottery, which is related to Eb material from Tikal, is grouped together in the Ah Pam ceramic complex. Like Eb at Tikal, Ah Pam pottery is also subdivided into early and late facets (Rice 1979). Early facet Ah Pam material, which dates to the early Middle Formative period, was discovered in refuse deposits and in construction fill within Str. 340 at a minor center known as Yaxha Hill (Rice 1976). Four floors in the lowest levels of this structure "...yielded the first known stratigraphic evidence for the chronological phasing of early facet Ah Pam, late facet Ah Pam (which corresponds to the late Middle Formative) and terminal Middle Preclassic Yancotil" ceramics (Rice 1979:14).

Because other excavations did not locate further evidence for early facet Ah Pam occupation, D. Rice suggested that "either there was a wide spacing of Middle Preclassic residences in the area or that Ah Pam occupation was ephemeral" (Rice 1976:436). He added that the occurrence of *Zea mays* pollen in the sedimentary profile of the lakes, and the presence of shells from lacustrine molluscs in Ah Pam levels, suggested that the early Middle Formative settlers subsisted on a mixed economy based on farming and the exploitation of aquatic resources.

The origin of the early Yaxha-Sacnab settlers is more difficult to determine. D. Rice (1976:441) posits that although "the undocumented in situ growth of earlier groups cannot be refuted" it is more likely that the first settlers in the area came from the Xesi in the Pasion region. This inference is based on what are perceived to be close similarities between early

Ah Pam ceramics and those from the Xe complex at Altar and Seibal. Interestingly, both Culbert (1977:36) and Andrews (1990:18-23) disagree with this interpretation for they detect "little or no relationship between Eb/Ah Pam and Xe." Culbert (1977:35-36) further argues that the apparent differences between these ceramic complexes provide, instead, a strong argument in favour of multiple early migrations from different regions into the Maya Lowlands.

The Belize Valley

In Belize, the first evidence for early Middle Formative occupation was recovered at the site of Barton Ramie, in the upper Belize River Valley region (Willey et al. 1965). According to Willey, the first settlers in the valley were egalitarian farmers who erected "simple" houses of wattle and daub along the "edges of old river channels" (Willey et al. 1965:562). The early Barton Ramie settlers also produced "unslipped pottery with fillet applique decorations called Jocote Orange-brown..." (Gifford 1976:61). This pottery, and a few other ceramic types (e.g. Savana Orange), were assigned to an early facet of the Jenney Creek ceramic complex which Willey et al. (1965:562-563) considered representative of the early Middle Formative tradition in the Belize Valley.

Although early facet Jenney Creek pottery was not defined stratigraphically at Barton Ramie, Gifford (1976:61) argued that, typologically, it constituted a pre-Mamom (or pre-late Middle Formative) component. Gifford (1970), and Sharer and Gifford (1970), also postulated that while early facet Jenney Creek material shared modal similarities with Xe ceramics from the Pasion zone, they were practically indistinguishable from pottery of the Jocote and Savana ceramic groups at the highland site of Chalchuapa. They argued that:

This fascinating situation cannot be explained as the result of trade or ceramic diffusion alone. The ceramic types are approximately contemporary insofar as we can presently estimate. In the case of the Jocote ceramic group, they also seem to be domestic, utilitarian potteries unlikely to have been traded. The only reasonable explanation for a set of close and significant ceramic connections of this kind would seem to be that originally they were the products of a single related population group (Sharer and Gifford 1970:450-452).

On the basis of this interpretation they suggested that the early Middle Formative Belize Valley inhabitants most likely immigrated from the southeastern Maya highlands. Only this, they argued, could explain the close similarities between the utilitarian ceramics from the two regions.

While many Mayanists (cf. Willey 1977b:418) initially accepted this interpretation, Sharer and Gifford's (1970) hypothesis was eventually rejected in the mid 1980s. After an in-depth study of southern Maya Highland ceramics, Demarest (1986:148-164) demonstrated that instead of sharing many similarities the relationship between highland and lowland Jocote ceramics were rather weak and spurious. The origin of the early Middle Formative settlers of the Belize Valley therefore remains unsolved and continues to be the subject of interpretation.

The only other report of early Middle Formative occupation in the Belize Valley region comes from the site of Pacbitun. In a recent publication which describes his investigations at that center, Healy (1990:256) reported that:

The earliest ceramics from Pacbitun belong to the Mai Complex (about 900-300 B.C.), part of the Mamom ceramic sphere. Mai ceramics were consistently recovered in black, organic, and midden-like deposits identified in some of the deepest trenches of the site. The multiple occurrences of the

pottery, always just above limestone bedrock of the site, reinforces the primacy of the Mai complex as the earliest at Pacbitun.

This initial phase is dated by close typological comparisons with the Jenny Creek complex of Barton Ramie and by a pair of radiocarbon dates: 800 B.C. \pm 100 and 770 B.C. \pm 170. These samples were recovered from two separate spots in similar deposits, and are consistent with intersite ceramic comparisons and with one another. Habitation at Pacbitun, therefore, may have begun as early as 900 B.C.

Unfortunately, like most other sites in the Central Lowlands, the Mai complex at Pacbitun is represented by little more than ceramic remains. As a result, the cultural morphology of the early Middle Formative inhabitants of the Belize Valley region continues to be fairly obscure.

Northern Belize

In comparison with other regions of the Maya Lowlands, northern Belize has produced the largest number of sites with early Middle Formative occupation. This situation, however, probably reflects the recent concentration of archaeological research here rather than an actual pre-eminent concentration of early Middle Formative settlements. It should also be noted that although a large part of the Formative data in northern Belize derives from investigations at Cuello and Colha, other sites such as Nohmul, Kichpanha, El Pozito, San Estevan and Santa Rita have all contributed to our knowledge of the early prehistory of this area (Hammond 1974, 1986a; 1986b; Pring 1977a; Kosakowsky 1987; Reese and Valdez 1987; Valdez 1987).

Following Andrews' (1990) reassessment of the Cuello occupation dates, it is now understood that the Swasey and Bladen complexes reflect the early Middle Formative, rather than the Early Formative, period at that site. According to Hammond and Gerhardt (1990) the early Middle Formative inhabitants at Cuello lived in apsidal-shaped houses constructed

of poles, lime-plaster and thatch, perched on low limestone platforms. They practised maize agriculture, and buried their dead with simple grave goods beneath the floors of their houses. The presence of obsidian from highland Guatemala, plus fragments of manos and metates made from granitic rock originating in the Maya Mountains, suggest that the early Cuello inhabitants were involved with inter-regional exchange and trade (Hammond 1986a). These first Cuello villagers also produced the aforementioned Swasey and Bladen ceramics which are characterised by glossy red and orange slipped pottery with simple forms (Pring 1977a, 1977b; Kosakowsky 1983, 1987).

At Colha, the artefactual assemblage of the early Middle Formative Period displays a similar degree of cultural complexity with that of Cuello (Hester et al. 1983; Valdez 1987). Valdez (1987:255) states that, "The earliest settlement is represented by low simple house platforms, a wide range of ceramic material, and a series of formal lithic tools." Unlike Cuello, the early Middle Formative ceramics from Colha (Valdez and Adams 1982), and more recently from Kichpanha (Reese and Valdez 1987), are grouped under the Bolay ceramic complex. This pottery shares many modal and stylistic attributes with Swasey/Bladen at Cuello, which is understandable considering the proximity of the two sites. Conversely, the Swasey/Bladen and Bolay ceramics appear to share little more than modal similarities with pottery from other Lowland regions. According to Andrews (1990:17), "The northern Belize tradition of glossy reds and blacks and of pale, thin orange-buffs is sufficiently different from the Xe and Real complex matte, glittery, and micaceous reds and whites that I consider it likely they derive from different ceramic traditions." Andrews (1990) adds that the stylistic differences between the early ceramic complexes from northern Belize, the Pasion zone and the central Peten strongly suggest that the first settlers in these separate sub-regions

immigrated to the Lowlands from different places of origin.

In summary, the evidence for early Middle Formative occupation in the central Maya Lowlands can be described as quantitatively and geographically limited. The repertoire of material culture is equally poor. Artefact assemblages are dominated by relatively simple pottery, a few stone tools, and a scattering of ceramic figurines. In many cases a large percentage of these artefacts have not been recovered from stratigraphically sealed, early Middle Formative contexts. Consequently, dating relies heavily on seriation and comparative analogy. If we are to improve our current understanding of early Middle Formative occupation in the Central Lowlands, future investigators will have to expend considerably more effort in their search for evidence on this presently obscure period of early Maya prehistory.

Late Middle Formative Period (600-300 B.C.)

Mayanists now unanimously accept that by the beginning of the late Middle Formative period most of the Central Lowlands was occupied (Willey 1977b:388-390). Investigations within Belize, the Peten, and adjacent regions have demonstrated that a large number of sites in this area were either first settled, or already established, by 600 B.C. (Hammond 1988:122-123). The Pulestons (Puleston and Puleston 1974), and more recently Ball (1977), argue that: 1) a rapid colonization into previously unoccupied areas occurred because of population pressure within other regions first settled in the early Middle Formative, and 2) that colonization initially followed a riverine orientation then later spread into the Maya hinterland. The most readily observable consequences of this fairly rapid increase in population and

migration were: a) the development of relatively greater cultural homogeneity than was previously evident in the subarea, b) an increase in trade and inter-regional exchange, and c) greater cultural complexity.

An increase in the level of cultural uniformity is best represented by the ubiquitous Mamom ceramic tradition which replaced the previous unrelated ceramic complexes present at early Middle Formative sites (Willey et al. 1967; Willey 1977b). Throughout the central Maya Lowlands, and in the northern, southern and eastern Lowland regions in general, most sites with late Middle Formative occupation have produced Mamom, or Mamom-related, ceramics. Indeed, with the exception of paste and temper characteristics, the late Middle Formative ceramic complexes at Lowland sites practically all share similar diagnostic and stylistic traits (Andrews 1990).

Although Mamom pottery probably represents the first pan-Lowland Maya ceramic sphere, it should be noted that regionally-specific style differences still existed from one zone to the other (Ball 1977:103). Furthermore, while Mamom ceramics were first identified at Uaxactun (Smith 1955) most Mayanists tacitly accepted the suggestion posited at the Guatemala City Ceramic Conference (cf. Willey et al. 1967), that Mamom pottery developed out of Xe then spread to the rest of the Maya Lowlands (Willey 1977b). After conducting a comprehensive study of Formative period Maya ceramics, Andrews (1990) challenged the latter position. Citing several ceramic reports from Central Lowland sites he argued that few ceramicists in the Pasion zone had detected strong "genetic" links between Xe and Mamom. Conversely, most ceramic analyses in the eastern Lowlands, particularly those from northern Belize, had recorded the gradual transition of previous ceramic types into Mamom.

According to Andrews (1990), this pattern provides convincing evidence that Mamom pottery more likely developed in the eastern section of the Central Lowlands, and was subsequently introduced to sites in the west and north.

Other developments during the late Middle Formative included a gradual increase in communication and exchange at the inter-regional level. Sites, such as Cuello, began importing greenstone or jade objects from the Motagua Valley (Hammond 1986a), while Altar, Seibal, Barton Ramie, and several other centers, were obtaining obsidian that originated from the San Martin Jilotepeque source in Highland Guatemala (McKillop and Jackson 1989).

Toward the latter half of the period (450-300 B.C.), changes in the social structure of some of the larger communities also become more evident. These trends are suggested by an increase in the complexity of the architectural and spatial configuration of sites in the Pasion and Belize Zones. At Altar de Sacrificios, for example, a large, four meter high platform, "in a modest ceremonial-center-type setting of a plaza arrangement with other, smaller mounds", was constructed (Willey 1977b:388) at this time. At Nohoch Ek in the Belize Valley, Coe and Coe (1956) discovered a platform of cut-stone masonry and lime plaster "larger than would seem necessary for an ordinary house foundation." In northern Belize, an early courtyard group at Cuello:

...was succeeded in the late Middle Formative period by a slightly expanded patio, on the north side of which stood a rectangular building with stone walls built of limestone cobbles and covered with plaster. A foundation burial beneath the threshold, and the ceremonial pattern of demolition of the building, ca. 400 B.C., detected by the excavators, both suggest that its function may have been public rather than domestic (Hammond 1988:121).

The late Middle Formative was, therefore, a period marked by population growth,

geographical expansion, and increased cultural complexity. Combined with greater interaction at the inter-regional level, these developments triggered movement towards an increased level of cultural homogeneity than had previously been evident in the Maya Lowlands.

The Late Formative And Protoclassic Periods (300 B.C.-A.D. 250)

In comparison with the preceding phases, there is a wealth of data and information on the Late Formative period. Contrary to previous opinion (cf. Hay et al. 1940) recent research now indicates that it was during the Late Preclassic that the Maya of the Central Lowlands developed most of the advanced and complex features traditionally associated with their Classic period civilization. Sites throughout the region provide substantial evidence for a greater, than hitherto evident, increase in: a) the complexity of politico-religious institutions, b) population, c) interregional exchange, and d) the development of intensive systems of agriculture.

A stratified and socio-politically complex society is unquestionably manifested in the architecture and settlement patterns of centers throughout the Lowlands at this time. In northern Belize a large number of sites, previously settled in the Middle Formative period, developed into relatively large communities. These transformations are most striking at Cerros where the entire "ceremonial" precinct of the center dates to the Late Preclassic (Freidel 1979). Several kilometres to the southwest, evidence of truly large scale monumental architecture is amply provided by a 30 meter high pyramid known as N10-43 at the site of Lamanai (Pendergast 1981).

In the Peten, contemporaneous developments "on an even more colossal scale" have recently been documented at El Mirador (Hammond 1986a:408). Investigations by the New World Archaeological Foundation indicate that the two large architectural complexes in the one kilometre long by 800 meter wide site core were initially constructed during the Late Formative (Matheny 1980, 1986; Demarest 1984; Dahlin 1984). The most massive structure in this group, known as the El Tigre pyramid, is 55 meters tall and contains approximately "428,000 cubic meters of construction fill" (Hammond 1986a). Elsewhere, considerable Late Formative construction has been recorded at Tikal, Plaza E at Uaxactun, and at Nacbe, Holmul, Seibal, Nohmul and Colha.

The architecture and monuments at many of these sites also provide some of the best evidence for the formalization of religious and political institutions. Large stuccoed masks representing the sun god "Kinich Ahau", plus other iconographic symbols, flank the stairways of Late Preclassic buildings at Uaxactun (E-VII-Sub), Lamanai (N10-43) and Cerros (Str. 6b). Other iconographic evidence indicative of the rise of religious institutions, and even the development of calendrical and hieroglyphic inscriptions, include the glyphs on the Pomona jade ear-flare (Kidder and Ekholm 1951), Stela 2 at El Mirador, the "Hauberg" Stela in Seattle, Stela 1 from Cuello, and Altar 1 from Polol in the Peten (Hammond 1982, 1986a). Excavations and settlement pattern studies at several of these centers have, in addition, demonstrated the existence of a highly sophisticated and stratified society (Scarborough and Robertson 1986).

During the Late Preclassic period trade between the rising Maya polities of the Lowlands and those of the Highlands became more intensive and extensive. This rise in commercial

activity resulted in the regional and inter-regional exchange of a wide variety of local and exotic goods that included such items as salt, ceramics, jade, obsidian and other rocks of volcanic origin. Several sites, like Komchen in the Yucatan (Andrews et al. 1984), and Cerros, Moho Caye and Wild Cane Caye in Belize (McKillop and Jackson 1989), flourished as important ports of trade, and as centers for the distribution of much of the exotica that found its way into the graves of the elite. Other centers, like Colha, have provided convincing evidence of manufacturing specialization and surplus production of lithic tools for export to neighbouring centers in the region (Shafer and Hester 1983; Hester and Shafer 1984; Hester 1985).

Concomitant with these changes was the introduction and development of wetland drained-field systems of agriculture. Large expanses of these relic systems have been discovered throughout northern Belize, and in the southern regions of Quintana Roo and Campeche, Mexico. The excavations of raised fields at San Antonio Albion Island, at Cerros, and at Pulltrouser Swamp in Belize have all yielded radiocarbon dates that place the initial construction of these relic systems within the Late Preclassic period (Bloom et al 1983; Scarborough 1983; Turner and Harrison 1983).

The Late Formative is also marked by the introduction of a new Lowland Maya pottery tradition whose diagnostic types are grouped together in the Chicanel ceramic sphere. According to Ball (1977:113):

Local ceramic assemblages of the Late Preclassic Chicanel sphere are remarkably alike in vessel forms, surface finishes, and decorative treatments from the northeastern tip of Yucatan to the southern edge of the Peten. The relative intensity of this similarity is significantly greater than that existing among the complexes of the Mamom sphere. Whereas the latter is characterized by extensive local diversity with an apparent areal similitude,

Chicanel seems to represent genuine areal homogeneity locally differentiated by minor variations.

Most Mayanists agree that Chicanel pottery shares strong genetic ties to the previous Mamom ceramics from which it clearly developed (Willey 1977b:388). The presence and frequency of Chicanel pottery at most sites in the Central Lowlands further indicate that most centers were occupied at this time, probably as a result of a marked increase in population over the preceding Middle Formative period.

For most of the central Peten, Chicanel ceramics persisted as the major diagnostic pottery of the Late Formative. To the east, and to a lesser degree along the Pasion River, however, a new ceramic assemblage classified as the Floral Park complex makes its appearance in the first century A.D. This pottery was first identified by Merwin and Vaillant (1932) at the eastern Peten site of Holmul, and subsequently at Barton Ramie, Nohmul, Cerros and Colha in Belize, and at Altar de Sacrificios in the Pasion zone (Pring 1977b).

The diagnostic types within the Floral Park complex are Usulután-like ceramics and Aguacate Orange. Since Usulután ceramics were known to occur in Middle Formative contexts in the southeastern highlands, and since no "specific developmental precursors" for Usulután and Aguacate Orange had been identified in the Late Preclassic Barton Ramie ceramics, Sharer and Gifford (1970:456; also Gifford 1970 and Willey et al. 1967:309) initially argued that the Floral Park complex probably constituted a "site unit intrusion". Sharer and Gifford (1970) also proposed the Chalchuapa region of El Salvador as the most likely source of origin for this "intrusion". They, and later Sheets (1971, 1976), suggested that the Floral Park ceramic tradition was introduced by either highland immigrants or

invaders who moved into the eastern Lowlands with a more advanced level of cultural complexity than was previously present. Thus was born the idea that Lowland Maya civilization was introduced, or profoundly stimulated, by foreign Highland Maya groups (Gifford 1970; Sharer and Gifford 1970; Ball 1977), and that the span of time between the start of the Christian era and 250 A.D. be classified as the Protoclassic period (Willey et al. 1965:309-310, 1967, Gifford 1976:326-327).

The Protoclassic intrusion hypothesis prevailed for well over a decade until it was eventually challenged by Pring (1977b) and Robertson-Freidel (1980:337-341). In an extensive analysis of Lowland Maya Protoclassic ceramics Pring (1977b) argued that: a) local precursors to Aguacate Orange were indeed present in the Lowlands; b) that the pottery could have been developed in the Belize Valley then introduced to the north and west, and; c) that the characteristic features of Floral Park pottery, particularly the Usulután material, more likely constituted cross-cultural influence rather than population intrusion. Pring's conclusions were supported by Robertson-Freidel's (1980) subsequent analysis of the pottery from Cerros which demonstrated that many of the diagnostic attributes of the Floral Park ceramics were introduced prior to the Protoclassic period.

Several years later, the Protoclassic intrusion theory was invalidated following an extensive comparative analysis of highland and lowland Usulután and Aguacate Orange ceramics by Demarest (1986:176-180). In his reassessment of this data, Demarest (1986) supported Pring's earlier observations and noted that inter-regional similarities between these ceramic types were either nonexistent or extremely limited. He concluded that "there is little basis for theories of a Salvadoran or southeast highland origin for the Floral Park complex

or for any other Protoclassic components in the Maya Lowlands' (Demarest 1986:177). The recent discovery of possible precursors for Aguacate Orange and other Protoclassic ceramic types at Naj Tunich Cave in the Peten (Brady 1987) provides additional evidence for Pring's (1977b) and Demarest's (1986) conclusions. These studies therefore suggested "continual interaction with the highlands rather than any single event or period of intense influence" (Demarest 1986:178).

These studies, plus a growing interest in the cultural processes of the Formative period, are gradually providing evidence for the in situ development of many of the great achievements of Lowland Maya civilization. Hopefully, future investigations will continue to search for answers to the many other enigmatic problems that beset this important, early stage of Maya development. Presently, however, there is no longer any doubt that in the first few centuries before and after zero A.D., the Maya of the central Lowlands established one of the pre-eminent and most innovative cultures in all of Mesoamerica.

1.3 Summary

As the previous review indicates, our knowledge of a large part of the Formative period of Maya prehistory is relatively limited, sometimes controversial, and generally obscure. Following the reassessment of the Swasey phase at Cuello scholars are once again confronted with the same situation faced by the Santa Fe conferees in 1974; that is, a lack of substantial evidence for occupation during the Early Formative period. That people were present in the region before this time is, nevertheless, a certainty; the presence of preceramic sites and artefacts support this argument. Early Preclassic sites should therefore be present but,

considering the lack of concerted research effort to locate them, it will probably be some time before these are actually discovered.

The earliest period for which there is conclusive evidence of occupation in the central Maya Lowlands dates to the early Middle Formative (1000-600 B.C.). The number of sites and the data available for this period are, nevertheless, limited and sporadic in distribution. Furthermore, the origins of these pioneering people has always been, and continues to be, a highly debateable topic. The origin of the Xe culture bearers is a particular case in point. Arguments favouring a source in the Olmec sub-area, the southern Highlands and, more recently, the Chiapas region have each been proposed.

A similar level of controversy exists with other contemporaneous cultural traditions in the region. This is particularly true with pottery. Since the Xe ceramic complex was historically the first early Middle Formative complex to be established, most ceramicists at other sites subsequently attempted to establish links between their pottery and that of the Xe sphere. Only recently have researchers accepted that Xe ceramics are distinct from other Lowland Maya pottery and that, alternatively, these differences probably argue for multiple places of origin for the first immigrants, or for the multi-regional evolution of early ceramic traditions in the area. Unfortunately, with the exception of MacNeish and his colleagues (1980), most archaeologists have ignored the role that preceramic people may have played in this early stage of Lowland Maya development. Whether this sin of omission stems simply from a lack of evidence, or whether it reflects a traditional preference for less problematic explanatory paradigms (i.e. diffusion), is difficult to ascertain. Future studies should investigate this issue, for if researchers continue to ignore the possible developmental role of preceramic cultures,

future students may yet be confounded by our lack of insight and amazed by our ignorance.

More is known about the late Middle Formative than the preceding period. Few areas of the Central Lowlands remained unoccupied at this time. According to the Pulestons (1974) and Ball (1977), Middle Formative colonizers gradually moved into the hinterland via several of the major river systems in the area. Subsequently, there was a marked increase in population, cultural complexity, and inter-regional and regional communication. Evidence for the latter is provided by a pan-Lowland membership in the Mamom ceramic sphere, and by the discovery of local variants of this diagnostic pottery throughout the central Maya Lowlands.

Although most Mayanists initially accepted that Mamom pottery "developed out of Xe" in the Pasion zone (Willey 1977b:387), this position was recently challenged by Andrews (1990). Rejecting the existence of genetic links between the two ceramic complexes, he argued that Mamom pottery developed in the eastern section of the Lowlands, then was introduced to the west and north. These debates indicate that although our data base for the Middle Formative is steadily improving, there is still a great lack of information on this stage of Maya development. This situation is accurately described by Hammond who states that:

...the latter part of the Middle Preclassic, is however still obscure, although from what we now know of the Early (Middle) and Late Preclassic it was in these centuries that the cultural development of the Maya began to accelerate. Archaeological deposits of this period are in most cases that we know buried beneath the constructions of the Late Preclassic, with or without a further increment of Classic period activity, and will be difficult to investigate on any reasonable scale. Nevertheless, what happened in the late Middle Preclassic, and why, is one of the most crucial research topics in Maya archaeology today: here lies the key to the genesis of Maya civilization (Hammond 1986:402).

The Late Formative, which begins about 300 B.C., is heralded by the introduction of Chicanel ceramics. This diagnostic pottery has been found at almost every site excavated in the Central Lowlands, and it provides the first genuine expression of cultural homogeneity in the region (Ball 1977). In the first few centuries before and after the start of the Christian era the Maya had also developed one of the most advanced and complex cultures in Mesoamerica. The discovery and investigation of Cerros, El Mirador, Lamanai, Nacbe, and other large and complex Late Preclassic centers provide tangible testimony for this phenomena. In addition, these sites have yielded convincing evidence for the in situ development of Maya civilization and have refuted arguments for its introduction by a Highland Protoclassic intrusion. Questions regarding the development and function of the Floral Park ceramics nevertheless remain with us, and unless future research continues to investigate this and a host of other enigmatic topics, given these historical conditions, it likely will be some time before Mayanists can grasp and fully understand the cultural processes that transpired during the Formative period of Lowland Maya prehistory.

CHAPTER 2

THE CAHAL PECH PROJECT (1988-1991):

OBJECTIVES AND RESEARCH ORIENTATION

The site of Cahal Pech is located on the outskirts of San Ignacio, capital of the Cayo District of Belize, Central America. During the 1970s and early part of the 1980s the rapid expansion of the town, plus a simultaneous increase in the frequency of looting, posed a serious threat to the preservation of the center. By 1985 the southern limits of the town were within 50 meters of the central precinct and many of the structures at the site had been vandalized or partially destroyed. The damage caused by these activities became a major concern to members of the Cayo Branch of the Belize Tourism Industry Association (B.T.I.A.) who were interested in developing the center for its cultural and tourism potential. As the situation exacerbated, members of the B.T.I.A. approached the author in the summer of 1987 requesting that archaeological investigations be initiated at Cahal Pech, and for assistance in developing the site as a National Park. One year later, and with financial support from the Canadian Commission for UNESCO and Trent University, the first season of the Cahal Pech Project was launched in the summer of 1988.

Initially, the reasons for investigating Cahal Pech were developmental and research oriented (Awe and Campbell 1988). The developmental objectives were: 1) to halt further destruction of the center, 2) to produce a map of the site demarcating an area to be established as a national park, 3) to develop the site for tourism, and 4) to obtain the data for

publishing a preliminary guide book which could be sold to tourists and help to increase local cultural awareness (Awe and Campbell 1989).

The research objectives were concerned with the site's diachronic development, and with a study of the architectural, stylistic, and socio-political relationship between Cahal Pech and sites in the upper Belize River Valley. Although several scholars (Satterthwaite 1951; Willey et al. 1965; Ball and Taschek 1986; Schmidt n.d.) had conducted limited and sporadic studies of Cahal Pech the chronology of the site was still undetermined. Since several ongoing projects (Ford 1985; Ball and Taschek 1986) were investigating the prehistoric regional development of the Belize Valley it was imperative to ascertain the diachronic history of this relatively large and important site in order to achieve any meaningful regional reconstruction.

In a recent publication on Maya settlement patterns Hammond (1981:162) also stated that most research in Belize has concentrated:

on small sites, on residential as well as ceremonial structures, and on the relationships between settlement and environment. Some emphasis on the architectural, artistic and intellectual superstructure of Classic civilization, the traditional focus of Maya archaeology, remains, however, and these objectives are still worthy of attention.

The first season of research at Cahal Pech therefore focused on these problems, and attempted to provide the type of information Hammond suggested was lacking in the upper Belize Valley region.

By the end of the first field season it was noted that there was extensive Formative period occupation at the site. Cultural remains in secure stratigraphic sequence suggested that this occupation spanned from early Middle Formative times (900 B.C.) to the Late Classic (A.D.

900) period (Awe et al. 1990a, 1990b). In view of the paucity of data on Formative occupation in the Maya sub-area, and particularly because the sample of Middle Preclassic sites in the central Lowlands "is pitiful small" (Willey 1981:414), the research goals and focus of the project were re-oriented in the summer of 1989 (Awe et al. 1990a).

The research objectives from the second field season onwards (1989-1991), and particularly those with which this dissertation is concerned, thus focused primarily on the Formative period of occupation at Cahal Pech. The major goals of this investigation were: 1) to determine the temporal limits of Formative occupation, and 2) to ascertain the socio-political morphology and complexity of Cahal Pech during the Preclassic period.

The data procured by these investigations would subsequently enable us to address several of the other enigmatic problems that beset an understanding of lowland Maya culture during the Formative period. At the regional level, for example, early Middle Formative occupation is currently represented by little more than ceramics belonging to the Jenney Creek Complex (Willey et al. 1965; Gifford 1976; Ball and Taschek 1986; Healy 1990). This earliest known Belize Valley pottery has also never been documented stratigraphically, and its early Middle Formative date is still based on Gifford's (1976) ceramic seriation at Barton Ramie. In his discussion of early facet Jenney Creek pottery Sharer (1976:61) acknowledged this problem by noting that:

It should be stressed that the following facet definitions are minimal, that is, further excavations in the Belize Valley area should add to and refine this picture of the initial pottery tradition in the eastern Maya Lowlands.

The recovery of Jenney Creek related cultural remains in primary stratigraphic contexts at

Cahal Pech would enable amplification of the Formative period data base for the Belize Valley, and help to verify and/or modify the typological sequence established by Gifford at Barton Ramie.

At the inter-regional level there was an interest in determining the cultural relationship between Cahal Pech and sites in northern Belize, the northeastern Peten and the Pasion Zone. In his recent study of Middle Formative ceramics, Andrews (1990) argued that there was little, if any, relationship between the early Middle Formative pottery from the Xe, Ah Pam/Eb, Swasey/Bladen/Bolay and Jenney Creek complexes. Pring (1977a:364), and Andrews and Hammond (1990:580) previously added that there was a lack of similarity between the pre-Mamom complexes of northern Belize and the Belize Valley. By studying the characteristic attributes of the artefacts from Cahal Pech we hoped to determine whether the site was culturally affiliated with Middle Formative centers in the Peten, the Pasion zone, or northern Belize.

Finally, and as the preceding summary in Chapter 1 indicated, the sheer lack of information on Early and Middle Formative occupation in the Maya Lowlands makes any investigation focusing on this topic worthwhile. Unless greater research effort is directed toward the explanation of this pioneering stage of Maya culture, the appellatives of "enigmatic" and "obscure" will continue to characterize this developmental phase of Maya prehistory. The study that follows, therefore, is a step, albeit a small one, in the search for more evidence of Middle Formative occupation in the central Maya Lowlands.

CHAPTER 3

CULTURAL AND ENVIRONMENTAL SETTING OF CAHAL PECH

3.1 Site Location and Environmental Setting

Location

Cahal Pech is located on the southern outskirts of San Ignacio Town, in the upper Belize Valley region of western Belize (Figs. 3 and 4). The site core sits on the crest of a steep hill on the west bank of the Macal River, two kilometres upstream from the latter's confluence with the Mopan, and some 200 river kilometres from the Caribbean coast. The central acropolis is approximately 270 meters above sea level and provides a commanding view of the Maya Mountains to the south, and the interfluvial bottomlands between the Macal and Mopan Rivers to the north.

Hydrography

The Macal and Mopan are the principal tributaries of the Belize River and together they represent the most prominent hydrographical features in the region. The Macal originates in the central Maya Mountains and flows in a northerly direction along the western edge of the Mountain Pine Ridge. Throughout most of its length this river flows swiftly through the Macal Gorge which ends approximately 800 meters east of Cahal Pech's central precinct. North of the site the river flows through a relatively flat alluvial valley before joining the Mopan River two kilometres downstream. The Mopan is the major drainage for the southwestern Maya Mountains and a series of swamps in the eastern section of the

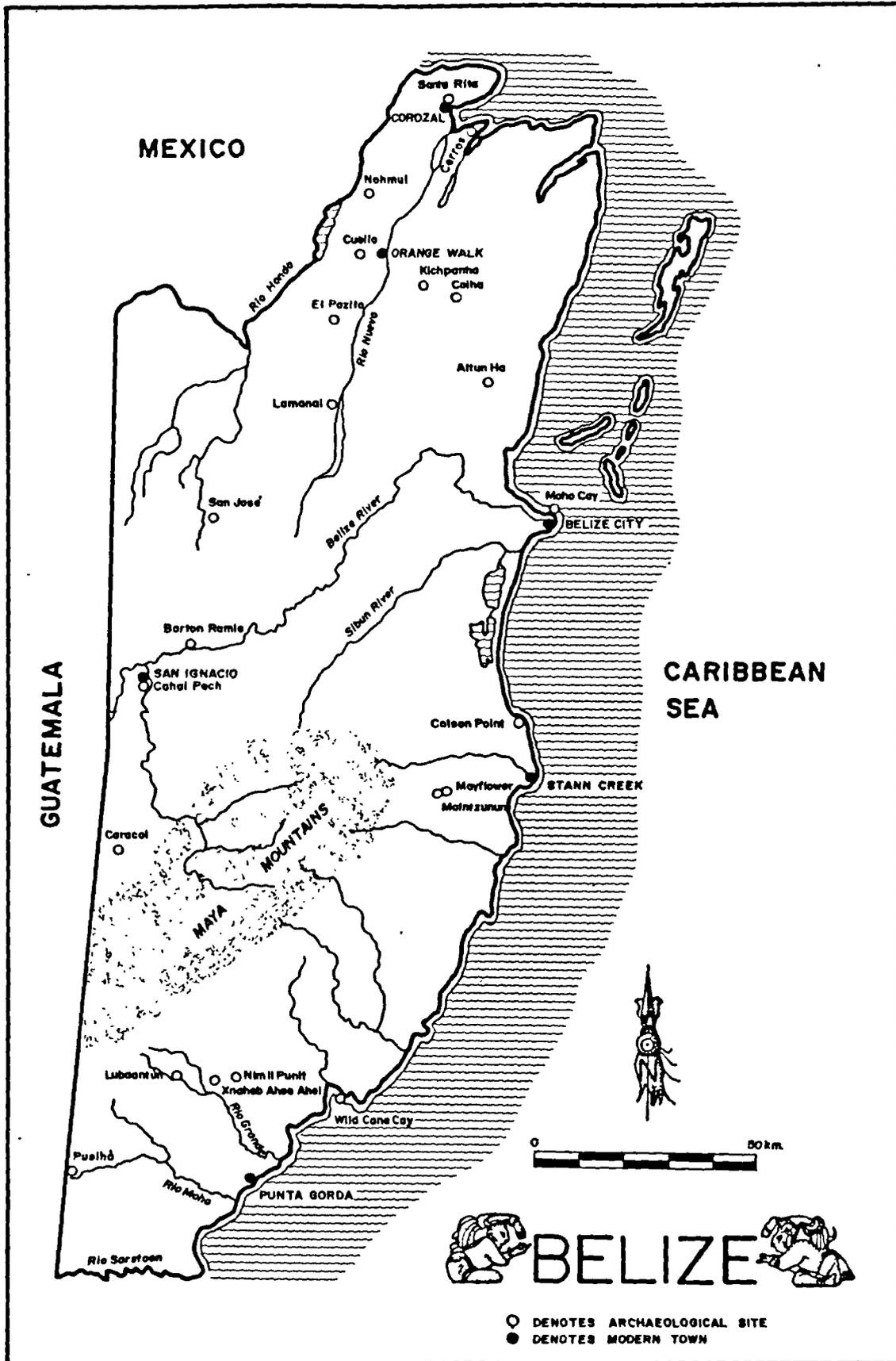


Figure 3: Map of Belize

Department of Peten, Guatemala. For several miles the Mopan flows fairly parallel to the Macal then turns east to meet the latter just north of Cahal Pech. From this juncture the Belize River subsequently meanders in an east-northeasterly direction to the Caribbean coast of Belize.

Both the Macal and Mopan are subject to seasonal flooding and have been known to rise as much as 10 meters (e.g. during Hurricane Hattie in 1960) above their normal level. These seasonal changes in water level often result in flooding over the lower river terraces, particularly in the interfluvial bottomland in the northern periphery of Cahal Pech. While this flooding can be fairly destructive its periodic deposition of river silt helps to maintain the fertility of soils in the interfluvial plain (Wright et al. 1959; Jenkin et al. 1978; Birchall and Jenkin 1979).

Climate

The climate for this region of Belize is best described as tropical to sub-tropical (Wright et. al. 1959). The average rainfall recorded in the last few decades ranges between 50 to 70 inches per annum (Birchall and Jenkin 1979). Most of this precipitation occurs between May and February with the wettest periods falling in July and September. The rest of the year, particularly March and April, is very hot and dry. Average annual temperatures fluctuate between 24 and 26 degrees Celcius. Occasionally, cold northeasterly winds moving down the gulf coast of Mexico may cause the temperature to drop to about 12 degrees Celcius during January and early February. In the height of the dry season heavy fogs are also known to blanket the river valleys in the early hours of the morning. While the amount of precipitation provided by these fogs is unknown, "their moisture contribution to growing plants is by no

means inconsiderable" (Wright et al. 1959:18).

Environment

The sustaining area of Cahal Pech encompasses two major environmental zones: relatively flat alluvial bottomlands, and hilly limestone country. As indicated above, the alluvial bottomlands are located on the northern and northeastern peripheries of the site. They cover the interfluvial valley between the Macal and Mopan Rivers and a narrow strip beyond the eastern banks of the Macal. The only relief in this area is a series of terraces which were formed by the previous meander channels of the river (Jenkin et al. 1978). Since "no geological studies have been undertaken to determine the... history of these terraces and the rate of shift of the rivers" (Willey et al. 1965:23), the actual prehistoric channels of these streams are unknown. It should be noted, however, that the higher terraces on which prehistoric settlements are located are seldom inundated today. It is therefore possible that these settlements may have been safe from flooding during ancient Maya occupation as well.

While relatively limited in their distribution, the well-drained alluvial soils of the river valley are among the deepest and most fertile in the region (Birchall and Jenkin 1979; Fedick and Ford 1990). Under normal conditions they support a tall broadleaf forest which, although fairly similar to the vegetation on the hilly slopes, contains several environmentally specific species. This is particularly true of the river banks and lower terraces. These two niches support several water-loving and economically viable trees, including such species as cacao (*Theobroma cacao*), bribri (*Inga edulis*), and fig (*Ficus radula*). The valley is also the habitat of a rich and varied terrestrial and aquatic animal population. The rivers contain several small and large edible fish, freshwater molluscs and crustacea, iguanas (*Iguana iguana rhinolopha*),

turtles (several species) and crocodiles (*Crocodylus moreletii*). Terrestrial fauna that prefer this habitat include the howler monkey (*Alouatta villosa*), the tapir (*Tapirella bairdi*) and several species of waterfowl.

The hilly section of Cahal Pech begins at the site core and extends to the south and southeast towards the Maya Mountains. This area is characterised by rolling hills and ridges which are bisected by a few seasonal and perennial creeks and streams. The pedology of these foothills consists primarily of Upper Cretaceous limestones capped by shallow but fertile soils (Fedick and Ford 1990). Like the river valley, the well-drained upland soils are primarily represented by mollisols. These mollisols have a "high productive capacity under hand cultivation systems" and are considered to be among the most fertile soils in the world (Fedick and Ford 1990:6).

Under natural conditions the uplands are dominated by a closed canopy, broad-leaf forest with an average height ranging from 30 to 50 meters. Within this flora there are many species that were domesticated or exploited by the ancient Maya. Most prominent among these species are the cohune palm (*Orbignya cohune*), avocado (*Persea americana*), sapodilla (*Achras sapota*), allspice (*Pimenta officinalis*), copal (*Protium copal*), ramon (*Brosimum alcastrum*) and the cedar (*Cedrela mexicana*). A recent survey conducted by members of the Cahal Pech Project noted that many of these trees are particularly common in and around the site core. This distribution suggests that these trees either thrive in anthropogenically modified environments, or that their frequency has been influenced by anthropogenic selection.

The fauna of the hilly limestone country is as rich as its flora. It contains many large and small mammals, plus a variety of colourful and edible birds. Some of the larger mammals include deer (*Odocoileus truei*), brocket (*Mazama americana*), several cats (i.e. *Felis jaguarondi*, *Felis onca*, *Felis concolor*, *Felis pardales*) the peccary (*Dicotyles tajacu*), armadillo (*Tatusia novemcincta*), gibbon (*Coelogenys paca*) and a variety of large edible rodents. Many parrots, the ocellated turkey (*Agriocharis ocellata*) and chachalaca (*Ortalis vetula*) also make this forest their home. Iconographic and archaeological evidence indicates that most of these animals were exploited for their feathers pelts, or food value by the ancient Maya.

3.2 Cultural Setting

In comparison with other subregions of the central Maya Lowlands the upper Belize River Valley "exhibits relatively high settlement density" (Ford 1990a:7). Within the valley there are several known medium-size and small centers with continuous settlements interspersed between them (see Fig. 4). From east to west the larger centers include Black Man Eddy, Baking Pot, Pacbitun, Cahal Pech, El Pilar, Buena Vista and Xunantunich. Some of the minor centers include Floral Park, Barton Ramie, Yaxox, Bacab Na, Cayo Y (Xualcanil), Nohoch Ek, and Negroman (Tipu).

Except for El Pilar, which is possibly the largest center in the region, most of the major sites in the upper Belize Valley are relatively similar in size. They generally consist of multi-plaza groups with large non-domestic structures and range-type buildings, and several sites contain carved or plain monuments. Linear distances between centers range between six and

12 kilometres. Differences in the proximity to major rivers also exist from site to site. Pacbitun and El Pilar, for example, are situated six and 10 kilometres from the Macal and Mopan Rivers respectively, while Buena Vista and Baking Pot lie directly on the banks of the two rivers. The other major centers are all located on foothills overlooking the river valleys.

Geographically, the nearest large centers to Cahal Pech are Buena Vista and Xunantunich. These sites are located along the Mopan River to the west, and are approximately six and 10 linear kilometres respectively from Cahal Pech. If communication between centers relied on water transportation during ancient times, however, the "real" distance between them would have been much greater. It would also place Baking Pot, which is 12 kilometres downstream - or 10 linear kilometres to the northeast - much closer to Cahal Pech. The distance between Cahal Pech and Pacbitun to the southeast is also about 10 linear kilometres, but since Pacbitun lies some six kilometres east of the Macal River it is possible that communication between that site and Cahal Pech depended on a combination of overland and riverine travel.

Within the last 50 years there have been sporadic and intensive investigations at most sites in the upper Belize River Valley area. These studies indicate that all the major, and many of the minor, centers were first occupied sometime during the Formative Period. It should be noted, however, that although Coe and Coe (1956) previously suggested that Nohoch Ek contained Early Preclassic material, the present consensus is that the earliest occupation for the region actually dates to the Middle Formative period. Evidence for this phase of occupation was previously found only at Barton Ramie (Willey et al. 1965:562; Gifford 1976:61), but recently Healy (1990:256-257) also recorded occupation levels which date to this period at Pacbitun. Other sites, such as Xunantunich (Thompson 1940) and Buena

Vista (Ball and Taschek 1986) have produced tentative sequences commencing in the late Middle Formative, and all have yielded Late Formative and Classic period deposits (Ricketson 1929; Thompson 1940; Willey et al. 1965; Bullard and Bullard 1965; Ford 1985; Ball and Taschek 1986; Healy 1990; Jones 1989; E. Graham personal communication, 1991).

3.3 History of Archaeological Research

Although the actual date that Cahal Pech was discovered is unknown, the first published record of the site dates to the late 1930s. In his map and "Index of Maya sites in British Honduras", Thompson (1939:278-282) listed Cahal Pech, under the name of El Cayo, and reported that references to the center had been made by St. George Gray (1916), Gann (1918), and Mason (1928). After reviewing the above publications it is my opinion that none of these early explorers actually referred to the site of Cahal Pech.

In the St. George Gray article (1916:155) the author simply remarks that:

Another stone implement having serrations, labelled
El Cayo, British Honduras may be seen in the Bristol
Museum.

Nowhere in the article does St. George Gray report that he actually visited Cahal Pech. Furthermore, the artefact he refers to could have come from any of the hundreds of mounds in the vicinity of El Cayo (which was the previous name for San Ignacio), or from anywhere in the Cayo District.

In Gann's report there is no doubt that he was referring to a different site from Cahal Pech. He (Gann 1918:133) states that:

Mound No.35 was situated near the Cayo, on the Mopan River; it forms one of a group of 30 mounds scattered over a considerable area. It was 12 feet in height and seemingly had been about 30 feet in diameter, but situated as it was, immediately on the river bank, nearly half of it had been washed away by the floods of successive rainy seasons...

Cahal Pech is not located on the Mopan River, and neither is it situated "immediately on the river bank". Alternatively, Gann's geographical references are a perfect description of the location of Buena Vista. That site is located directly on the banks of the Mopan River and, coincidentally, its full name is Buena Vista del Cayo.

In Mason's case there is no question that he is referring to either one of the five Rio Frio caves in the Mountain Pine Ridge, or to a small site he refers to as "San Felipe" which is located several kilometres south of Cahal Pech. In his description of these sites, Mason consistently reports their location as being near to El Cayo. Like previous investigators, Mason was in effect referring to the town of San Ignacio, not to Cahal Pech. Since most early explorers used San Ignacio (or El Cayo) town as a base for their expeditions into the interior, the location of many sites were generally calculated in distances from the town.

Following Thompson's (1939) report the next accurate reference to Cahal Pech dates to the 1950s. At this time Linton Satterthwaite from the University Museum of the University of Pennsylvania conducted preliminary mapping and excavations within the site core. Except for two brief paragraphs in a 1951 publication, Satterthwaite (1951:22) never produced a detailed report of this work. Fortunately, a copy of his notes were subsequently retrieved from the University Museum and are presently stored in the library of the Belize Department of Archaeology. These notes and Satterthwaite's brief publication indicate that his investigations had focused on several mounds in Plazas B and C in the site core (see Figs. 6 and 7). In

Plaza B, which he called the Central Plaza, Satterthwaite discovered three plain stelae and an uncarved altar, and he excavated several small units in Structures B-1, B-5, B-6 and B-7. In Plaza C he excavated the ballcourt (Strs. C-4 and C-5) and Structure C-1, and found two other plain stelae between Strs. C-5 and C-6. In his brief summary of this research Satterthwaite concluded:

Cahal Pech is a site with an unpropitious Maya name meaning "Place of the Ticks", but it seems to meet the requirements perfectly. This ceremonial center measures only about 150 by 250 yards, yet includes pyramid temples, palaces, and a ball court. Five stelae and an altar (plain) show presence of the stela cult. Some major buildings were roofed with the Maya vault, some apparently not. There was a gradual architectural growth, the occupation probably running through the entire Classic Period, and we have ceramic hints of a longer occupation. Though previously unknown to Archaeologists, it is only about a mile from the suspension bridge at El Cayo (Plate X, Fig.1). Finally, it is on the lands of Mr. Henry Melhado of Belize, an extremely kind gentleman who permits us to dig it (Satterthwaite 1951:22).

Between 1953 and 1955 Gordon Willey of Harvard University visited Cahal Pech during his settlement survey of the middle Belize River Valley region. Although Willey and his colleagues did not conduct investigations in the site core, they subsequently wrote a brief description of Cahal Pech and incorporated the center in their discussion of settlement hierarchy in the Belize River Valley. Willey et al. (1965:313) stated that:

The ruins of the ceremonial center known as Cahal Pech occupy a commanding position on a hilltop about one kilometer south of the town of El Cayo. Unknown to archaeologists until recently, the ruins were named and briefly tested by Linton Satterthwaite in 1950 (Satterthwaite 1951, p.22)... In terms of relative size Cahal Pech is roughly comparable to the Baking Pot ceremonial center (Willey et al. 1965:313).

In their settlement hierarchy, Willey et al. (1965:577-579) classified Cahal Pech as a major ceremonial center and capital of one of the four (Benque Viejo [Xunantunich], Cahal Pech, Baking Pot and Cocos Bank) districts they identified in the upper Belize Valley region.

They (Willey et al. 1965:577-579) also indicated that the Cahal Pech district probably covered an area of about "150 sq. km.", and that it drew support from settlements along the Macal River "as well as from the upper Belize River proper and the lower Mopan branch."

In 1953, Willey and Bullard (1956) actually investigated a small group of mounds in the northern periphery of Cahal Pech. These mounds, which Willey and Bullard called the Melhado Site (and which will henceforth be referred to as the Melhado Group), are located approximately one kilometer north of the Cahal Pech site core, within the interfluvial bottomland between the Macal and Mopan Rivers. Willey and Bullard (1956:313-315) reported that similar groups of mounds occurred "along the entire distance" between the Melhado Group and the central precinct of Cahal Pech. They further suggested that these settlements were part of the larger site's sustaining area, and therefore under its control.

During the 1960s, A.H. Anderson, Belize's first archaeological commissioner, made several visits to Cahal Pech. Because of its easy access and location Anderson recommended to the government that: a) the site be left unaffected by private lands, and b) that the center and its immediate periphery be developed as a National Park. Due to financial constraints Anderson's recommendations were, unfortunately, never implemented.

Following Anderson's death in 1968, Peter Schmidt became Belize's second archaeological commissioner. A year later (in 1969) he visited Cahal Pech to appraise the damage caused by looters, and to conduct small-scale salvage operations within the site core. His work concentrated on a simple burial and an elite tomb within a building at the summit of Structure B-1. Unfortunately, Schmidt, like Satterthwaite, never published a report of his

investigations, but some of his notes and the artefacts recovered from the tomb are still available in the Belize Department of Archaeology. The grave goods which Schmidt recovered from the two burials indicate that both interments were deposited during the Late Classic period.

During the 1970s the site was pillaged on numerous occasions by looters. In 1978, several of these vandals were caught and arrested by the author and members of the local police force. The looters were tried in court and subsequently convicted under the Belize antiquities legislation.

Except for brief visits by Joseph Ball and Jennifer Taschek in 1986-87, no scientific investigations were conducted at Cahal Pech in the first half of the 1980s. During this time looting continued unabated. The destruction by these vandals, and by the gradual encroachment of the site by an expanding San Ignacio Town, eventually prompted members of the Cayo Branch of the Belize Tourism Industry Association to seek assistance for the preservation of the site. After several requests for help from the latter group I eventually organized the first major archaeological investigation of Cahal Pech in the summer of 1988. Since then I directed four seasons of excavation at the site, and Ball and Taschek tested several structures in the site core. This dissertation is, in part, a report of the investigations conducted under my supervision between 1988 and 1991.

3.4 Site Description

Settlement survey and investigations at Cahal Pech indicate that during the Classic period the site and its sustaining area may have encompassed a realm of approximately 16 square kilometres. At the nucleus of this territory was the central precinct or site core. This area consists of some 34 large structures which are densely compacted on an imposing acropolis slightly larger than one hectare in size (Figs. 5, 6 and 7). The architecture of the central precinct includes several tall non-domestic structures, a number of large range-type buildings, two ballcourts, and possibly a sweathouse (Awe and Campbell 1988, 1989).

Most of the structures in the site core are located around seven plazas. The largest of these is Plaza B, or what Satterthwaite (1951:22) previously referred to as the Central Plaza. The principal Classic period courtyard, however, is Plaza A. Together with Plazas D and E, it is located on the western half of the acropolis. All of the structures bordering Plazas A, D and E are tightly clustered, they completely enclose their courtyards, and they provide limited access to and from the other plazas within the central precinct. The other courtyards (Plazas B,C,F, and G) are relatively more open and mounds are less clustered, but the structures are located in a position that would have provided limited access to the site core in general. There are, in fact, only two areas which provide access into the site core. These are located to the north and south of the juncture between Plazas B and C. This configuration, plus the acropoline nature of the central precinct, suggests that during the Classic period the site core may have served for defence in times of conflict, or for limiting public access into areas that had been exclusively set aside by and for the elite (Awe, Campbell and Conlon 1991). (A detailed description of the individual plazas is provided in Chapter 4 under the subheading: Plaza Description and Excavations).

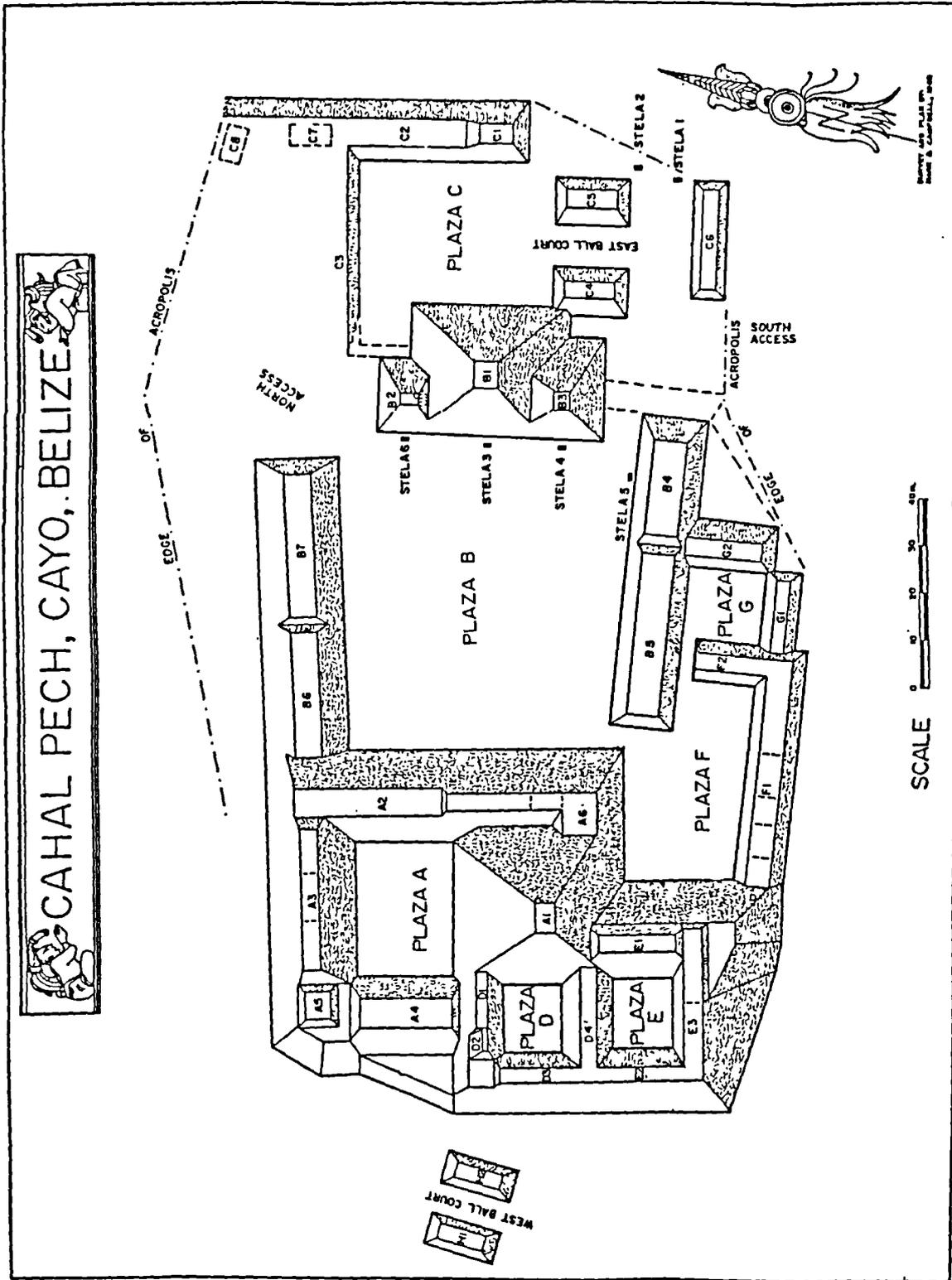


Figure 6: Rectified plan of Cahal Pech site core



Cahal Pech 1990
Cayo, Belize

© MDC 1991

Trent University Archaeological Project

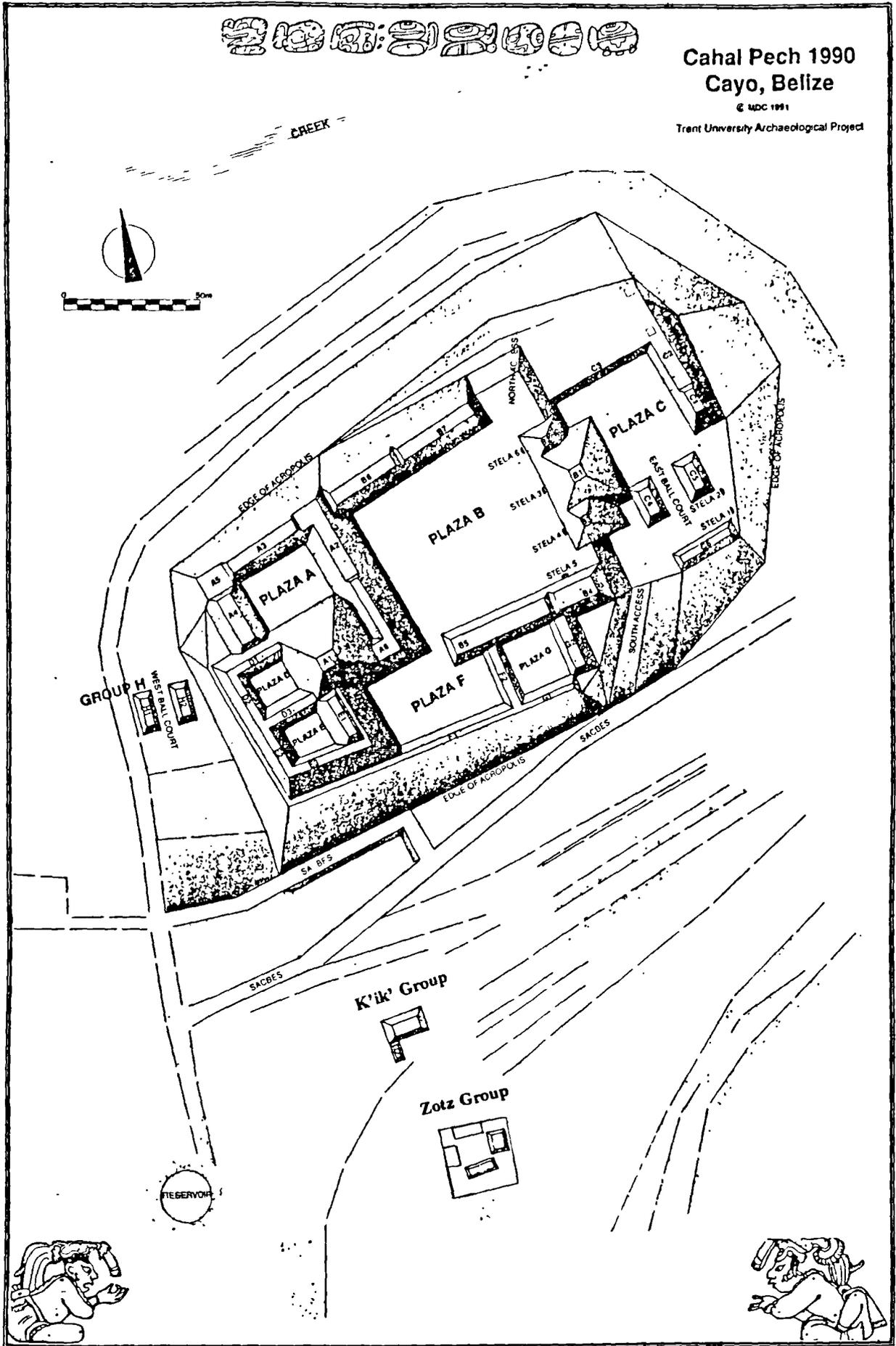


Figure 7: Plan of Cahal Pech site core and immediate periphery

Just below the southern base of the acropolis there is a large spring that flows eastward to the Macal River. Presently this stream is seasonal, but it may have been a perennial source of water during ancient times. The site core also includes two large reservoirs. The first lies about 300 meters southwest of the central precinct, and the other is approximately 60 m to the west of the acropolis. Both of these reservoirs still hold water all through the year.

The density of prehistoric settlements around the southern reservoir, and within the southern periphery in general, is relatively high. These settlements are located on top of knolls and well-drained terrain, and are particularly concentrated along the crest of a ridge that extends for several kilometres to the south of the site core. They generally consist of mound clusters that vary in their overall size, morphology and configuration. The settlement with the largest architecture in the southern periphery is known as the Zopilote Group. It contains an 11.5 m high structure, and is connected to the site core by a raised causeway which runs approximately 750 meters. About 1000 meters south of Zopilote is the Tzubin Group. This patio-focused settlement cluster consists of two centralized courtyards (see Fig. 51) and more than a dozen other plazuela groups.

The second largest mound cluster, the Tzinic Group, is situated approximately 500 meters south of the site core. It contains two large terraced platforms (one with a vaulted superstructure), several long mounds, a small reservoir, and an uncarved stela (see Fig. 46). Approximately 100 meters southwest of the main reservoir there is another cluster of mounds labelled the Figueroa Group. The latter contains several mounds and patios dispersed around the sacbe which leads to the Zopilote Group. A smaller causeway may connect the southern access into the site core with either the southwestern reservoir, or with two small plazuelas

(the K'ik' and Zotz Groups) which lie about 70-100 meters south of the acropolis. Several smaller patio groups have been noted in the southern periphery, particularly along the western highway and on the banks of the Macal River.

To the east of the central precinct prehistoric settlements are fewer and more dispersed than to the south. This pattern is probably due to the sharp relief and uneven terrain that predominates on both sides of the Macal gorge. Most of the settlements recorded in this peripheral zone are located on the higher river terraces to the northeast, or along the crests of hills and small river valleys east and southeast of the site core. The largest settlements presently known in this area are the Tolok Group, the Cristo Rey Group, and a major patio group often referred to as "Cayo Y" in the literature (Willey et al. 1965:313), but more appropriately renamed Xualcanil by Schmidt in 1970 (Belize Department of Archaeology files).

The Tolok Group is comprised of 11 mounds clustered on a small hill about 350 meters southeast of the site core (see Fig. 52). The group contains four chultuns, and its structures range from 0.4 to 5.0 m in height. The Cristo Rey mounds include several patio groups on a small alluvial valley on the eastern bank of the Macal River. These mounds are approximately 1.5 km southeast of the Cahal Pech site core and are similar in size to the structures at Tolok.

Unlike the more dispersed Cristo Rey mounds, Xualcanil is composed of four large structures which enclose a spacious courtyard. The tallest mound is a 10 meter high non-domestic structure from whose summit the central precinct at Cahal Pech is clearly visible

some two kilometres due west. Volumetrically, the largest mound is represented by a 4.0 m tall by 15 m long vaulted, range-type building. The size of the architecture at Xualcanil led Willey et al. (1965:313) to describe the settlement as a "small ceremonial ruin." Alternatively, this group of mounds may have served as residence for a wealthy elite family who were semi-autonomous from, but related to, the elite residents of the Cahal Pech site core.

The configuration of settlements on the northern periphery of Cahal Pech is, and has been, very difficult to determine due to the location of San Ignacio Town in this area. Previous archaeological reports, the nature of the topography, and personal familiarity with this region nevertheless indicate that the density of settlement in this zone was considerably lower than that of the southern and eastern peripheries. There are two possible reasons for this deduced settlement pattern. First of all, a large part of this area is situated in the bottomlands between the Macal and Mopan Rivers and therefore is susceptible to periodic flooding. Secondly, the interfluvial terraces between the rivers contain some of the most fertile soils in the region. Consequently, this area may have been used for agricultural pursuits rather than for residential purposes. The majority of settlements that do occur in the northern periphery are generally located on the higher, but flat, eastern bank of the Macal, and on the uppermost terraces of the interfluvial valley between the Macal and Mopan Rivers.

Within the interfluvial bottomlands Willey and Bullard investigated the Melhado Group in 1953. They (Willey and Bullard 1956) reported that this settlement consisted of 13 mounds situated on the "second (highest) river terrace." The mounds included a "small pyramidal temple" and several "low house platforms." A few years later Willey and his

colleagues (1965:313-314) added that:

The river-terrace edge on which the site is located continues south through the town of El Cayo, and mounds occur along the entire distance, specifically in the grounds of the Cayo Hospital, around the Catholic church buildings, and among the modern houses near the base of the hills which rise up to the ruin of Cahal Pech. The Melhado Site may be merely part of a continuum of mounds strung along this terrace edge.

Unfortunately, many of the mounds reported by Willey and Bullard (1956) no longer exist. Those near the hospital were bulldozed to make way for modern buildings in the 1960s. The same fate befell the mounds near the Catholic church.

The settlement pattern to the west of the site core resembles, to a large degree, that of the southern periphery. Most of the mounds in this area cluster in small groups on top of low hills and on the crest of an east\west ridge overlooking the river bottomlands to the north. One of largest groups in this area is located in Graceland farm, about a kilometer and a half west of the central precinct. Another large cluster, the Cas Pek Group, is located just west of the site core along the perimeter of the western reservoir (see Fig. 53). Several of the mounds at Cas Pek were salvaged in 1991 just prior to their destruction by land development activities. Plans and detailed descriptions of the peripheral groups which were investigated are provided in Chapter Four.

CHAPTER 4

RESEARCH METHODS AND INVESTIGATIONS

4.1 Mapping: Objectives and Procedures

At the start of the Cahal Pech Project the only map of the center was an unpublished tape and compass plan of the site core that had been drafted by Ball and Taschek in 1986-87. Since this map was preliminary in nature we decided to conduct a more accurate survey of the central precinct and its topography, and to reconnoitre and plot settlements and cultural features within the site's immediate periphery. The major objectives of this survey were: a) to determine the configuration of the plazas and structures within the site core, b) to ascertain the relationship between these courtyards, and c) to record the density and pattern of settlement within the center and its sustaining area. This information would subsequently be used to draft a more accurate plan of Cahal Pech and, when combined with artefactual data, would help to determine the temporal changes in the patterns of settlement within the central precinct and the periphery.

During the first season of investigation the site survey focused on the mapping of the central acropolis. After clearing the underbrush within the core area, several stations and permanent datums were established along an east\west transect which cut across the entire long axis of the acropolis. All structures within the central precinct were then plotted from the datums, and a larger zone encompassing the site core was mapped and demarcated for reservation as a National Park. The boundaries of the reserve were "tied in" with permanent stations laid out by the Belize Survey Department. This provided considerable help for

determining the positional accuracy of the site plan, and for measuring the altitude of the site.

All measurements for the reserve and the site plan were conducted with a standard transit and stadia. Topographic features and contours were also taken at one meter intervals.

During the next three seasons (1989-1991) of research the survey concentrated on the plotting of settlements and other cultural features in the site's immediate periphery. In order to conduct this survey with a high degree of accuracy the surveyors established several new (500 m long) transects that originated from the datums along the original east\west baseline. Two of these new transects had a north\south orientation and the others extended to the east and west of the central precinct. Once these transects were completed all the mounds and cultural features between them were plotted from stations established along the lines. Since the site of Cahal Pech covers a fairly extensive area, the peripheral survey is still ongoing and it will be sometime before it is fully completed. The site plans provided herein will nevertheless remain unchanged, and new data will only provide a more extensive coverage of the site's sustaining area.

4.2 Excavations: Sampling Techniques and Procedures

Between the 1988-1991 field seasons 12 structures in the site core (at least one in every plaza) were excavated, test units were placed in each of the seven courtyards, and 24 mounds in the periphery were investigated. Mounds were selected for excavation based on several factors: the presence or absence of looting, location, size, and chronological considerations.

In the first instance some looted mounds were selected for testing because the large looter's tunnels provided a quick and relatively inexpensive way for obtaining stratigraphic

data deep within massive monumental architecture. The reason for selecting at least one mound in each courtyard, and for excavating a unit in all of the plazas within the site core, was to obtain a large sample (33%) of the architecture and construction sequence in the central precinct. Other structures were selected for investigation primarily because they could be excavated with the time and money available to the project, and because ceramics collected from looter's tunnels and surface collections indicated that they were occupied during the Formative period.

The excavations generally consisted of either: a) axial trenches placed across the frontal section of mounds, or b) units of various dimensions into the summit of structures and at plaza level. On several mounds large sections of preserved architecture were exposed in order to consolidate the building for tourism, and in order to determine the morphology and possible function of the structure. In these cases smaller units were subsequently excavated within the buildings so as to enable us to test and date previous phases of construction. Because the majority of the excavations were located on some form of architecture, stratigraphic control was based on cultural levels rather than arbitrary ones. The advantage of the former over the latter is that it provides a more realistic sequence of culture change, and it is a more accurate method for determining the diachronic changes of attributes within different artefact types.

4.3 Excavations in the Site Core

Plaza A: Description, Excavations, and Construction History

Description of Plaza A

Plaza A is the principal courtyard within the site core (Figs. 6 and 7). It is rectangular in shape, measures about 20 m by 30 m, and is enclosed by some of the largest architecture

at the center. To the south the plaza is bordered by a massive non-domestic structure designated as Structure (henceforth Str.) A-1. To the east, north, and west are three range-type buildings (A-2, A-3, and A-4). Two other small mounds (A-5 and A-6), one on the northwestern corner of the courtyard and another which joins Strs. A-2 and A-1 at the southeastern base of the latter, add to the complement of structures around the plaza. Three of the mounds in Plaza A were excavated in 1988 (Strs. A-1, A-2, and A-4), and the courtyard was tested in 1990.

Structure A-1

Standing approximately 24 m tall, Str. A-1 is the most prominent mound in the site core. Its large size also made it the choice target of vandals. Prior to the Cahal Pech Project, a large east\west looter's trench had partially bisected the structure from its summit to its eastern base. Several other tunnels penetrated the mound to depths that ranged between 1-3.5 m. In 1988, four units were excavated in Structure A-1. The first two units were located at the summit of the mound (Operation A-1:1 and A-1:2), and the second and third units (Operation A-1:3 and A-1:4) were placed along the northern midsection of the structure.

Operation A-1:1

This 2.0 m X 1.5 m unit was placed in the center of an abandoned looters trench at the summit of the mound (Fig. 8). The excavation descended 4.0 m below surface then had to be terminated due to the instability of the destroyed architecture and the danger posed by falling rocks.

The only architectural feature recorded in this deep unit was a small section of a plaster

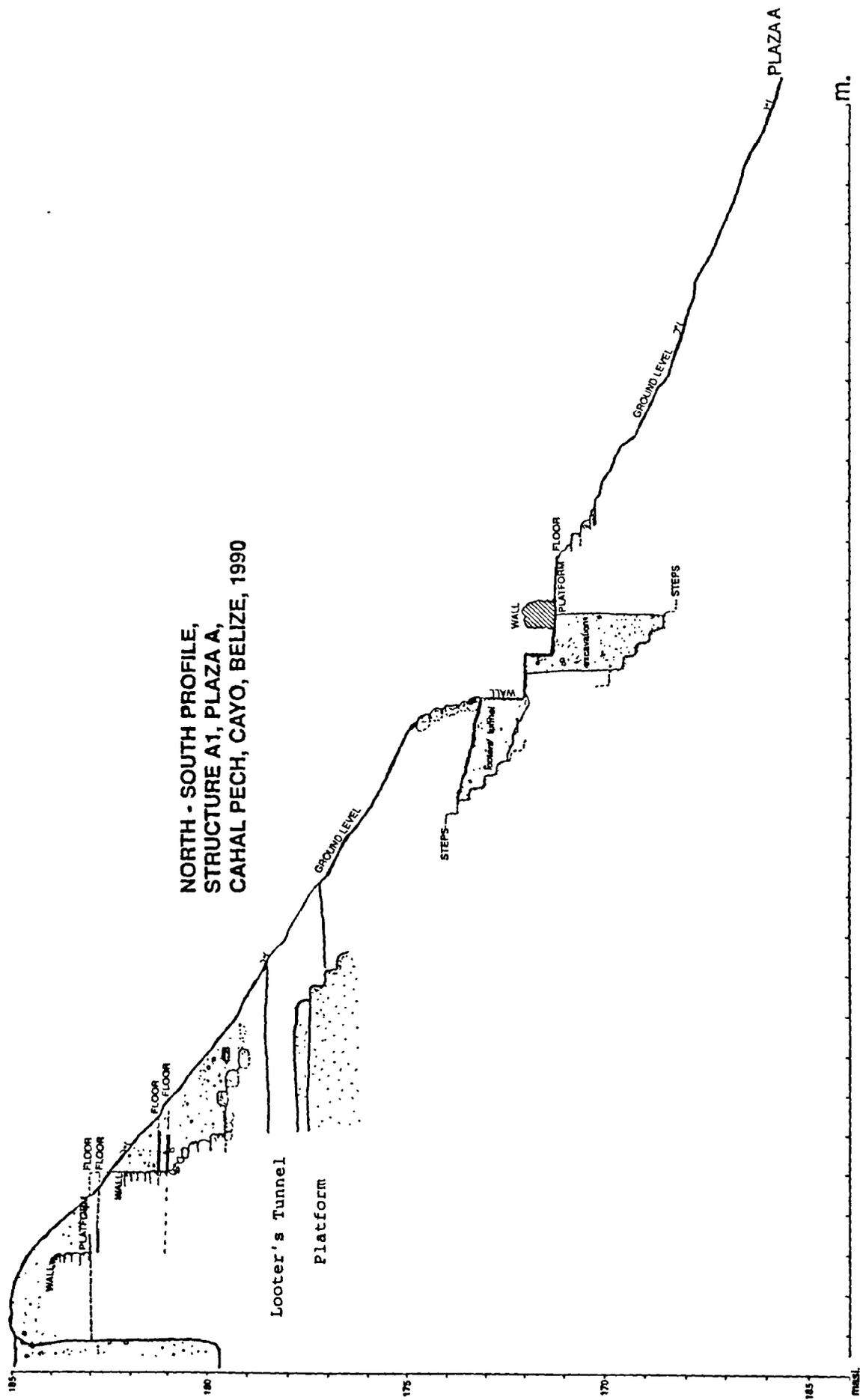


Figure 8: Cross-sectional profile of Str. A-1

floor, 0.33 m below surface. It is possible that this floor originally spanned the entire summit of Str. A-1, but most of it had been destroyed by the careless excavation of the looters. Pottery recovered below the level of destroyed architecture consisted primarily of Middle and Late Formative types, plus a smaller quantity of Classic period ceramics. Artefacts from above the floor were minimal, and included five potsherds. Two of these were non-diagnostic and the other three were Late Classic in date.

Operation A-1:2

This 4.5 m X 1.0 m axial trench was excavated along the upper northface of Str. A-1. The goals of the excavation were: a) to search for, and define, any architecture that may have been associated with the small section of preserved floor in Operation A-1/1; and b) to determine whether the architecture could be consolidated.

Directly below the humus layer there were several cut-stones associated with the collapsed terminal phase structure. Beneath this architectural debris there were remnants of a wall pertaining to the building platform, plus a small section of a collapsed stairway. Both features had been destroyed by tree roots and by the gradual deterioration of the structure. Artefacts below the two features consisted primarily of potsherds and a few chert flakes. The pottery included both Formative and Classic period material, but, unlike the case in Operation A-1\1, Late Classic ceramics outnumbered those of the Formative period.

Operation A-1:3

This excavation was placed along the north face of Str. A-1, approximately 5.0 m above the present plaza level. A large section of the area covered by this unit had been damaged

by looters. In their careless excavation the looters had exposed a section of a vaulted room which was associated with the terminal phase of construction. They subsequently tunneled through this building and exposed part of a well preserved stairway associated with an earlier substructure (see Fig.9).

Investigation in this area had two main purposes: a) to define the morphology of the terminal phase vaulted room, and b) to locate and penetrate the stairway of the penultimate phase of construction. The latter was particularly interesting because the architecture appeared to be Preclassic in style.

The operation initially consisted of a 7.0 m X 3.5 m excavation that stripped the humus, collapsed construction debris, and looters backdirt, from off the terminal phase building. Subsequently, a smaller 1.5 m X 1.5 m unit probed below the floor of this building to search for the penultimate phase stairway. Four steps belonging to the latter were discovered between 2-2.5 m below the floor of the vaulted room. The alignment of these steps matched that of the steps exposed by the looter's tunnel above, suggesting that they were both associated with the penultimate phase of construction. Pottery below the stairs were solidly Formative period in date thereby conforming the previously assumed date of construction for this architecture.

The larger excavation unit cleared the remains of the vaulted room that had been damaged by the looters, and it partially exposed a second similar room to the east. Although the western room was heavily damaged by the gradual deterioration of the building, and particularly by the aimless destruction of the vandals, the form of the building was still

discernible. A description of the latter is provided below under the section entitled "Construction History".

Operation A-1:4

Operation A-1:4 consisted of a 1.0 m X 1.0 m unit that was placed within a looter's tunnel on the upper north face of Str. A-1. The tunnel had penetrated both the final and second last construction phases of the structure. The primary reason for placing this excavation within the tunnel was to recover cultural data which could help to determine the date of the penultimate construction phase.

The unit descended 1.5 m below the platform of the penultimate structure then had to be discontinued due to the unstable nature of the tunnel. The operation nevertheless indicated that the penultimate construction phase was very well preserved. At its summit this structure had two thick plaster floors which had consecutively served as the surfaces of a fairly wide platform. The platform was approximately 15 m above the present Plaza A surface. A relatively wide stairway provided access from the plaza to the top of the platform. The descending angle of the stairway also suggested that it was connected to the steps exposed in the small sub-unit described in Operation A-1:3. These steps had rounded contours, they were constructed of large limestone blocks, and were covered with a thick layer of plaster. Below the steps and platform the fill was composed of marl, small nodules of limestone, and the occasional large boulder. Cultural remains within this matrix consisted of a few chert flakes and pottery. The latter included ceramic types of both the Middle and Late Formative periods.

Construction History of Str. A-1

Although the excavations on Str. A-1 did not reach sterile level they partially uncovered and penetrated two major construction phases.

The penultimate phase (A-1 Sub 1) was a relatively large non-domestic structure. It stood approximately 15 m tall and had a wide stairway that ascended from Plaza A to a large building platform. No postholes were recorded in the small area exposed by Operation A-1:4, but it is possible that the platform supported a perishable superstructure. Pottery within the construction fill of the platform consisted of Middle and Late Formative ceramics, including such types as Jocote Orange-brown, Savana Orange, Pital Cream, Iguana Creek White, Polvero Black and Sierra Red. This ceramic data indicates that A-1 Sub 1 dates to the Late Formative period.

Because of the large size of A-1 Sub 1, it is quite possible that several earlier construction phases may lie below this Late Formative structure. However, the massive size of this architecture, and the financial and temporal costs of excavating this mound, made it impossible to investigate and expose these earlier substructures.

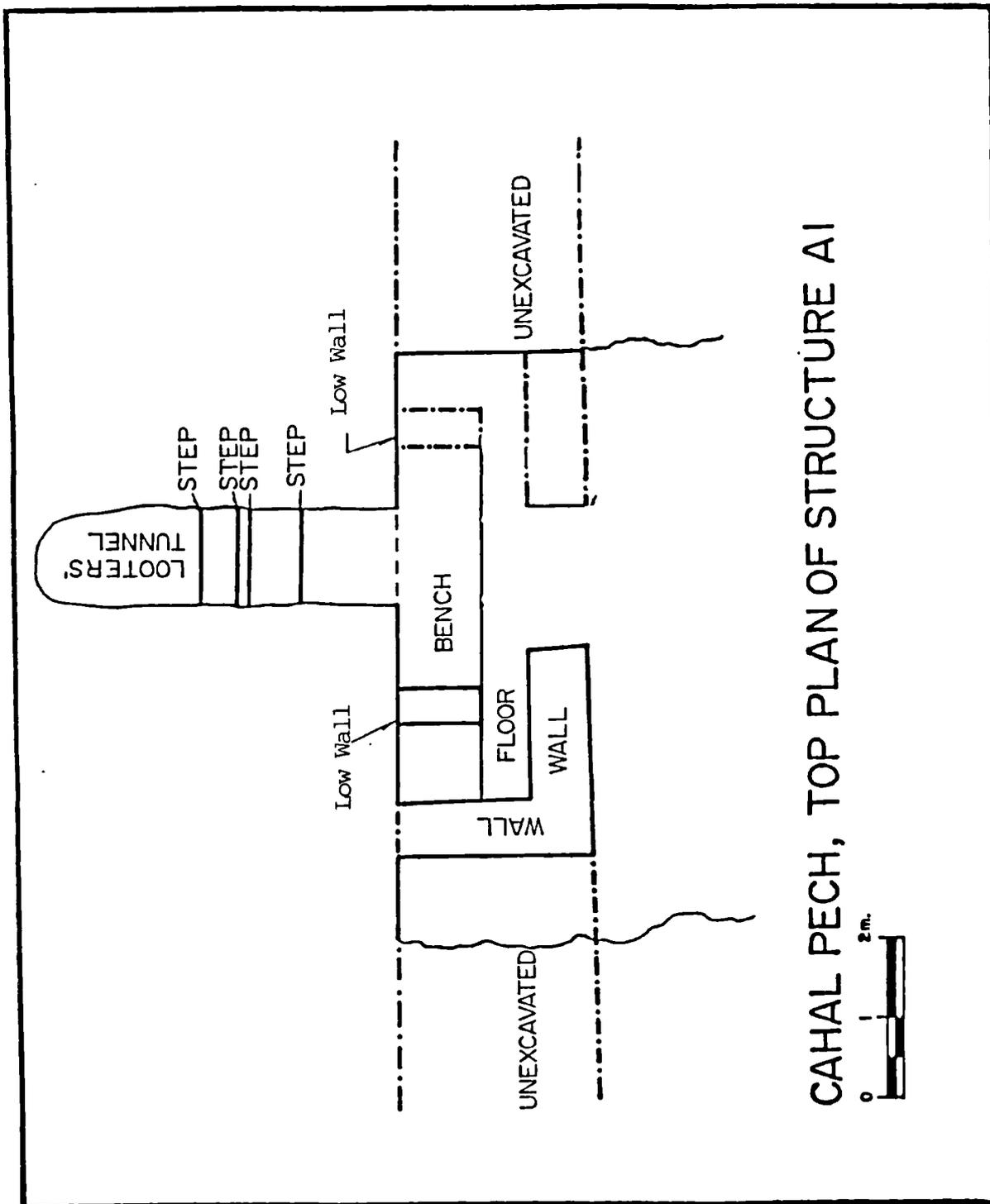
The terminal phase of A-1 completely altered the previous Late Formative construction. The end result was a much larger pyramidal structure that may have stood approximately 20 m above Plaza A. Unlike its predecessor, terminal phase A-1 did not appear to have a building at its summit. Instead, the building platform was crowned by a small cross-shaped altar or platform. Directly in front, and to the north, of this feature a wide stairway descended to a second platform or landing which was approximately 5.0 m above plaza level.

The lower platform supported a vaulted, range-type building.

The range-type building had three vaulted rooms with central doorways facing Plaza A. The middle room (Fig.9), which was tested by unit 3, measured 1.8 m in width, 5.8 m in length, and was approximately 3.5 m high. A 1.15 m wide by 0.70 m high bench spanned the rear section of the room. At the top of the bench, and just east of the central axis, there was a low wall which curved upward to a height of approximately 0.45 m. A second similar wall may have been located to the west of the central axis, but most of this area had been destroyed by looters and the feature was no longer preserved. The low height (.45 m) of the out-curving wall, the fact that it does not support any architecture, plus its axial location atop of the bench, strongly suggest that this feature represents a throne akin to those described by Satterthwaite (1937) at Piedras Negras.

On the spinewall of the room, directly behind the bench or possible throne, a small section of a poorly preserved hieroglyphic text or graffiti (Fig. 10) was discovered. The glyphs had been incised, or carved, in low relief on the plaster surface of the wall prior to the room being painted in bright red. According to Peter Mathews (personal communication 1989) one, and possibly two, of the figures on the preserved text may represent a seating glyph. If the axial located bench is indeed a throne, the glyphs may have been intentionally carved in this location to record the accession of a Classic Period ruler at Cahal Pech.

The architectural style of terminal phase A-1 (Fig. 11) is reminiscent of the Lamanai Type Building identified by Pendergast (1981:41) at Altun Ha (Str. B4 2nd A) and at Lamanai



CAHAL PECH, TOP PLAN OF STRUCTURE A1

Figure 9: Plan of building on Str. A-1, Cahal Pech, Belize



Figure 10: Preserved section of graffiti on Str. A-1 wall

(N10-43). This similarity suggests that the final phase of A-1 may be coeval in date with both the Altun Ha and Lamanai structures. The latter were assigned a construction date between the sixth and seventh centuries A.D. by Pendergast (1981, 1982). It is important to note that a fragment of pyrite and an ear-plug of hard limestone were recovered in the looter's backdirt at the summit of Str. A-1. The presence of these items indicate that the looters may have discovered a burial in this area. Interestingly, the San Ignacio police recovered a black-slipped, Teotihuacan-style, cylinder vase from looters who were caught on the mound in 1978. If this vessel actually came from a burial at the summit of the structure, it would support a sixth to seventh century date for the construction of terminal phase A-1.

Structure A-2

Structure A-2 is a large range-type building which separates Plaza A from Plaza B. The mound is approximately 50 m long by 20 m wide and 6.0 m high. Prior to excavation, looters had trenched through the upper midsection of the mound exposing part of the terminal construction phase. Since the exposed architecture was in a fairly good state of preservation we decided to investigate the mound in 1988. During this initial season, eight units were excavated in A-2. The first six units focused on the terminal phase of construction, and the last two units tested two earlier substructures. This approach was selected because the terminal phase building was slated for consolidation.

Operation A-2:1

This major operation was designed to remove the humus cover and collapsed architectural debris overlying the northern half of the terminal construction phase of A-2. The excavation measured 10.5 m from north to south, and 3 m to the east and 3 m to the west of a central

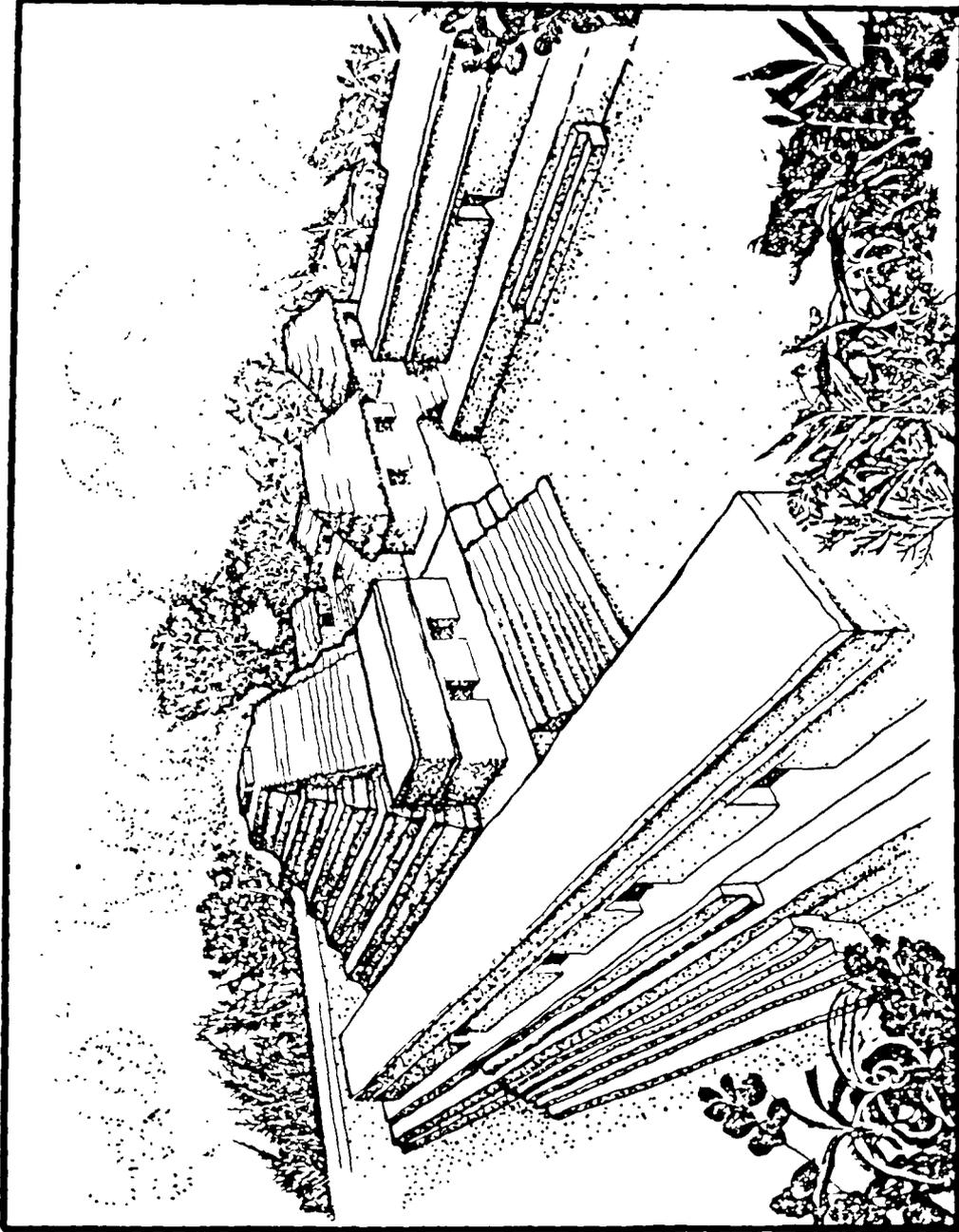


Figure 11: Artistic reconstruction of Plaza A, Cahal Pech, Belize

spinewall that had been exposed by looters.

Excavation on the eastern side of the building uncovered three rooms with central doorways facing Plaza B. The two southernmost rooms were also connected by a narrow doorway through the transverse wall that divided them. The northern room was not directly connected to the others. In contrast, it had a vaulted doorway which penetrated the spinewall, and which provided access between the rooms facing Plaza A and those facing Plaza B. All three eastern rooms contained benches.

Excavations on the western side of the building completely uncovered one room and partially exposed a second. The two rooms were separated by two rectangular pillars with an unusually high bench between them. These pillars marked the center of Str. A-2. Both of the western rooms had central doorways facing Plaza A, and both contained benches. Above the bench of the southwestern room, fragments of several pottery vessels were recovered. Most of the pottery were jar sherds, and their location above the bench probably represents post-abandonment activity at the site.

Operation A-2:2

This 0.5 m by 0.5 m unit was placed on the bench between the two centrally located pillars on the west side of Str. A-2. The purpose of the excavation was to determine whether the bench was a later addition to the room, and to search for enclosed caches or burials. According to Bill (1987), the presence or absence of burials within the benches of range-type buildings may be indicative of the domestic, or non-domestic, function of these multi-room structures.

At 0.68 m below the top of the bench the excavation exposed the plaster floor of the room. This indicates that the bench was added sometime after the room had been constructed. No cache or burial was recovered, but pottery within the fill suggests that the bench was constructed during the first half of the Late Classic period.

Operation A-2:3

Operation A-2:3 was placed on the bench in the northwestern room of Str. A-2. This bench is one of the largest in the building and, unlike most of the others which are long and narrow, it is practically square in shape. The purpose for this excavation was to explore whether there were any burials in the bench, and to determine its date of construction.

Data recovered from the excavation indicates that the bench had been constructed in two segments. The earliest segment was similar to most of the other benches found within the building. It was long and narrow, and had been constructed against the spinewall that divided the Str. A-2 building. The subsequent modification changed this pattern by extending the width of the earlier bench across the entire northern end of the room. The presence of a plaster floor beneath both benches indicates that the latter were added to the room sometime after the building had been constructed. Dating of pottery recovered in the excavation suggests that both benches were constructed during the Late Classic period (A.D. 700-800).

Excavation below the first floor uncovered a second floor and the verge of a well preserved apron. The latter was part of an earlier substructure but it could not be investigated more thoroughly due to the small size of the unit, and because a large section of the preserved architecture of terminal phase A-2 would have been destroyed. (The substructure was

eventually investigated by Operations A-2:7 and A-2:8).

Operation A-2:4

This small (0.5 m X 0.5 m) unit was excavated in the bench between the narrow doorway connecting the two rooms on the east side of Str. A-2. Its purpose, like that of the previous bench excavations, was to search for possible burials or dedicatory caches, and to recover evidence suitable for dating the benches.

The unit descended 0.48 m from the top of the bench and was terminated when the floor of the terminal construction phase was discovered below. The presence of the floor indicated that this bench, like others on the west side of the structure, was a later addition to the building. No cache or burial was found, and pottery recovered in the unit consisted mostly of Late Classic types.

Operation A-2:5

This excavation was placed at the center of a large bench that covered the entire floor space within the northeastern room of Str. A-2. The purpose of the operation was similar to that of the other bench excavations in the building. Initially the unit began as a 1 m X 1 m square, but it was eventually expanded in order to investigate the sequential construction of the large bench.

Data from this operation indicates that the northeastern room of Str. A-2 underwent four sequential modifications. During the first stage the room did not contain a bench, but it had a doorway which penetrated the spinewall of the building. This, and possibly two other

doorways, provided the only access between the east and west sides of the building, and between Plazas A and B. In the second stage the doorway was sealed off and a long narrow bench was constructed along the base of the spinewall. The third modification converted the shape of the bench from a linear to an L-shaped form. Within the new extension there was a simple burial of an adult persona with no grave goods. The position of the skeletal remains suggests that the individual had been placed on its side in fetal position. It is also possible that the original bench had been purposely extended to contain the burial.

The last modification extended the bench over the remaining floor space. In its final stage the room then had a central doorway facing Plaza B, and a single step provided access from the doorway to the top of the large bench. Cultural remains recovered in the fill of these construction phases indicate that all modifications to the room were conducted during the Late Classic period.

Operation A-2:6

Operation A-2:6 was a 1 m X 1 m unit placed in the center of the doorway of the northeastern room of Str. A-2. The purpose of this excavation was to penetrate the terminal phase architecture in an effort to determine its date of construction.

Approximately 22 cm below the floor of the terminal phase building the excavation exposed a second plaster floor. This sequence of floors is similar to that observed on the west side of the structure (in Operations A-2:7 and A-2:8), and indicates that the original floor of the building platform was resurfaced during the final stage of occupation. About 12 cm below the penultimate floor there was a cache containing two ceramic vessels. The latter

included a small plain jar which was standing upright, and an unslipped miniature dish which had been placed over the mouth of the jar. Both vessels are Late Classic in date and may have been deposited as part of a dedicatory ritual commemorating the completion of terminal phase A-2. Below the cache the matrix changed from ballast to large core fill. Due to the small size of the unit it was very difficult to extract the large boulders from this core, thus the excavation was terminated 80 cm below the terminal floor.

Operation A-2:7

This excavation was essentially an expansion and continuation of Operation A-2:2. It began by extending the latter unit across the bench between the pillars on the west side of the building, then descended below the terminal phase of architecture.

At 14 cm below the floor of terminal phase A-2 the excavation uncovered a section of the penultimate construction phase. The excavation followed the contours of this substructure for 3.60 m below the first floor, then had to be terminated due to the difficulties and hazards involved with the extraction of large core fill. The operation nevertheless provided considerable information on the form and size of penultimate phase A-2. This substructure was between 5.0-6.0 m tall. Below a relatively large building platform, the structure had at least two terraces with aprons and subaprons (Fig. 12) similar in style to those found on monumental architecture in the central Peten. The building platform probably served as the base for either a perishable or masonry building, but no evidence for the latter was recovered.

Operation A-2:8

This unit was excavated in the center of the large, northwestern, room of Str. A-2. Its

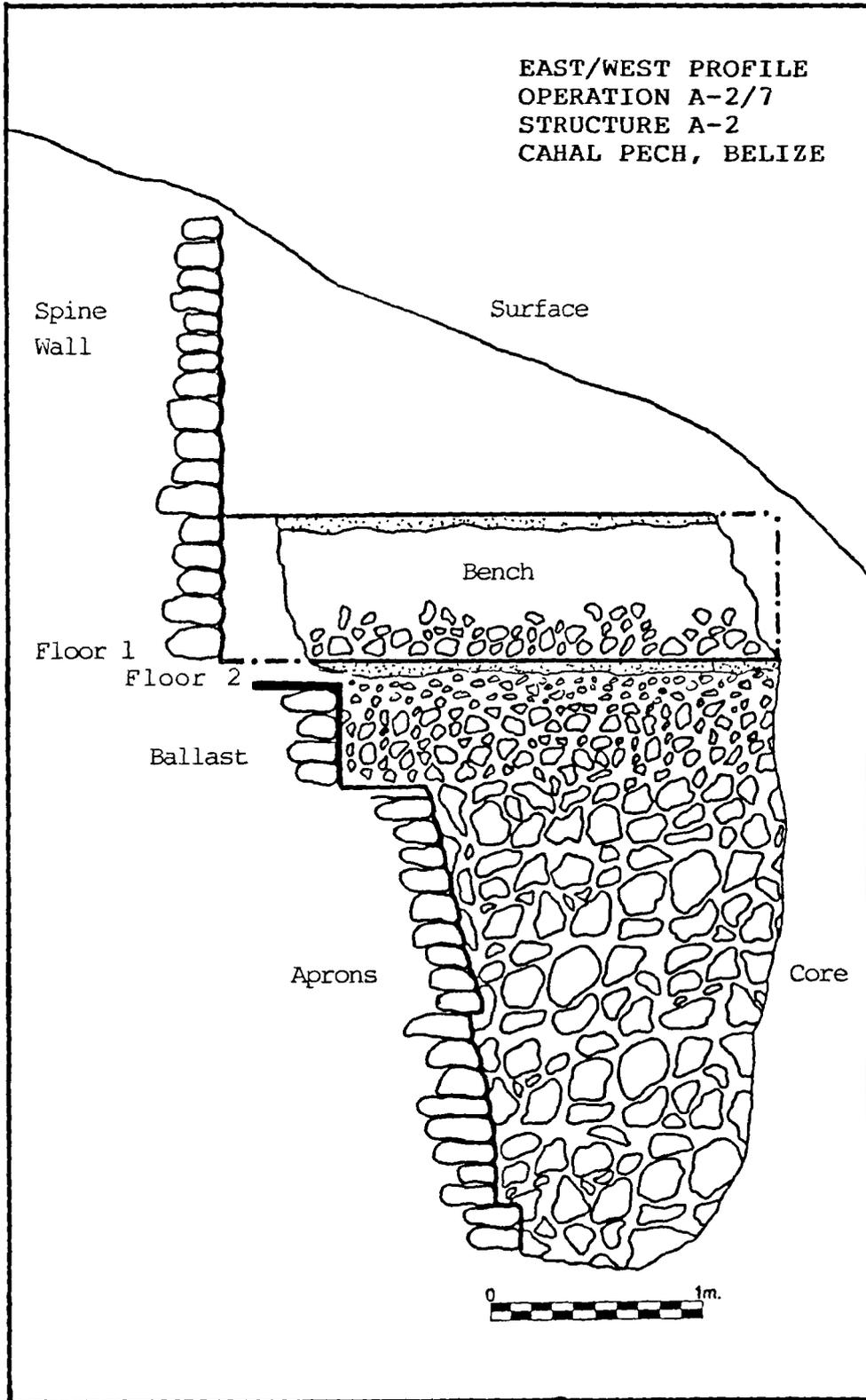


Figure 12: Cross-sectional profile of Operation A-2:7

purpose was to penetrate and determine the date of the final and penultimate phases of architecture, and to search for earlier substructures.

The surface of the penultimate building platform (A-2 Sub 1) was discovered 15 cm below the floor of terminal phase A-2. Beneath this floor there was a layer of ballast followed by a deeper layer of core (Fig. 13). Below the core the excavation exposed five steps of a well preserved stairway. The stairway was associated with the large terraces (of the penultimate structure) exposed in Operation A-2:7. Pottery within the fill of this architecture consisted primarily of Classic period types.

Beneath the stairs of the A-2 substructure the excavation exposed part of another stairway and building platform (A-2 Sub 2). The steps of this earlier stairway were both lower and smaller than those of A-2 Sub 1, and its associated platform was 1.65 m below the floor of the terminal phase structure. Because the season of investigation was coming to a close, excavation below the steps of A-2 Sub 2 did not descend to sterile level. The excavation nevertheless recovered pottery which indicated that A-2 Sub 2 was erected between the Late Formative and Early Classic periods.

Construction History of Str. A-2

Due to the small size of Operation A-2:8 it is difficult to provide an accurate description of the architectural style and form of A-2 Sub 2. The data presently indicates that this substructure consisted of a low platform, approximately 2.20 m in height. A short flight of steps provided access from Plaza A to the top of the platform. The latter may have supported a perishable building, but no evidence of this superstructure was recorded by the excavation.

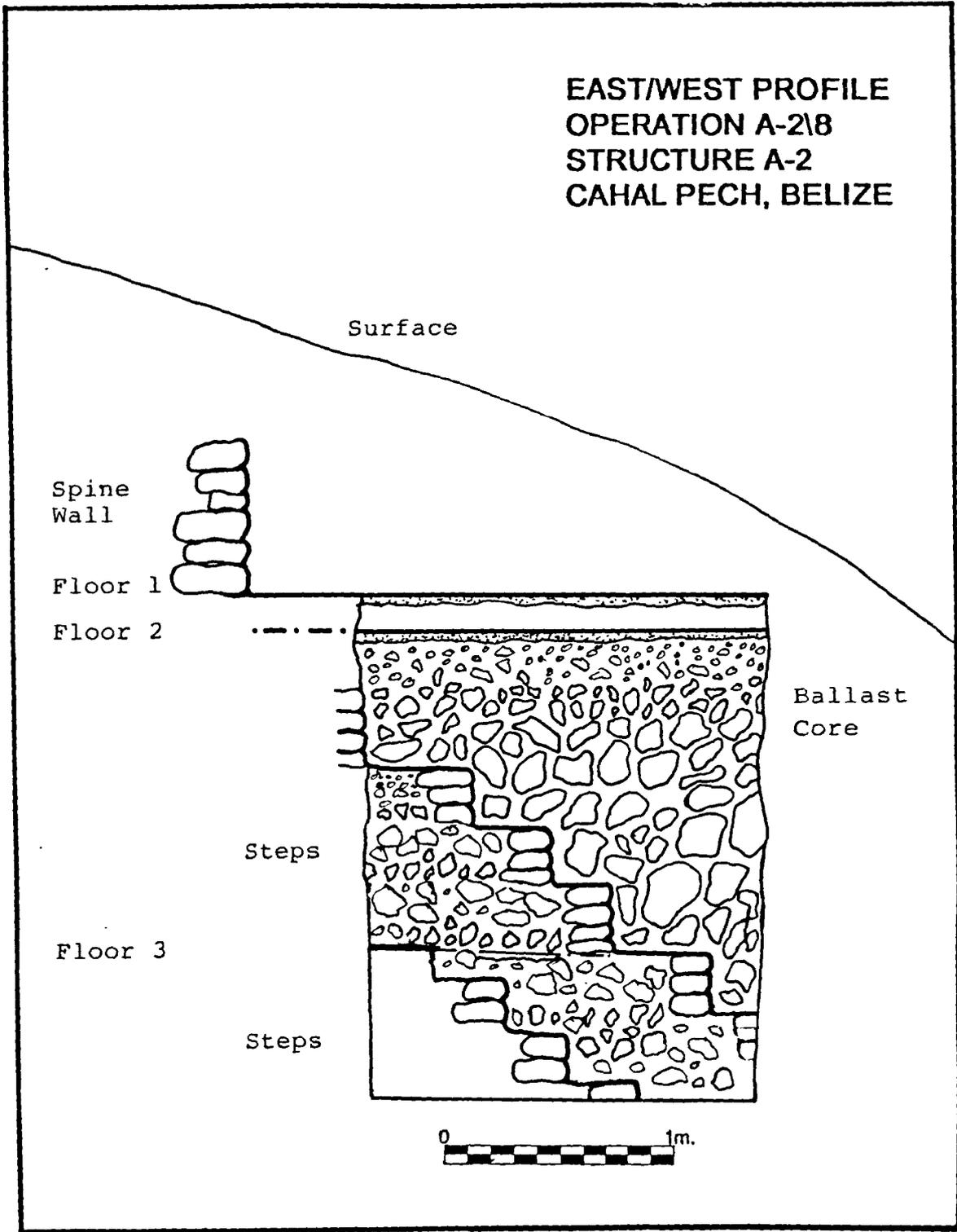


Figure 13: Cross-sectional profile of Operation A-2:8

Cultural remains recovered below the stairway suggests that A-2 Sub 2 was built between the Late Formative and Early Classic Periods (150-350 A.D.).

The subsequent construction in the A-2 sequence (A-2 Sub 1) completely altered the previous structure (A-2 Sub 2). This penultimate phase consisted of a raised platform with a central stairway that led down to Plaza A. Although no excavations penetrated the eastern side of this substructure, it is possible that a similar stairway on the eastern face provided access to Plaza B. Flanking the western stairway there were two terraces with sub-aprons and basal moulding similar in style to those on B4 2nd A at Altun Ha (Pendergast 1982), and to those on the structures within the central plaza at Tikal (Coe 1988). These architectural parallels, and the predominance of Middle Classic pottery in the associated stratigraphy, suggest that the penultimate phase of A-2 was constructed between 500-700 A.D. This date is contemporaneous with that of the terminal construction phase on Str. A-1.

The final construction on A-2 is represented by a large, range-type, structure. The structure spanned the entire length of Plaza A, and supported a long double-vaulted building with multiple rooms (Fig. 14). Although excavations only uncovered one doorway through the spinewall separating the eastern and western sections of the building, it is possible that two other doorways provided access between the rooms facing Plaza A and Plaza B.

Most of the rooms in the final phase of A-2 contained one or more benches. The majority of these were added to the rooms after the building had been constructed. During the first field season four of the benches were excavated, but only one contained a simple burial in fetal position. The absence of grave goods within the burial makes it difficult to

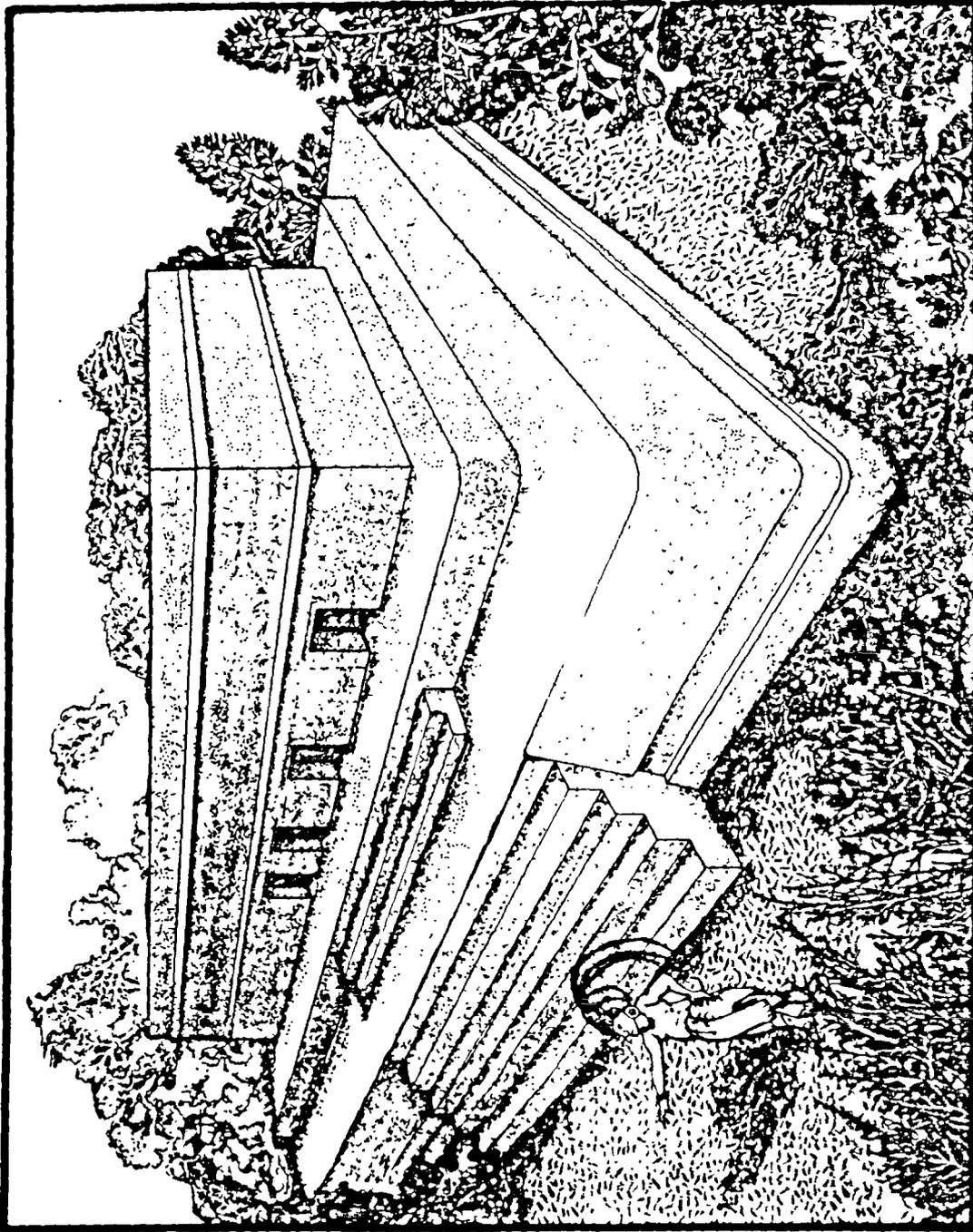


Figure 14: Artistic reconstruction of Str. A-2, Cahal Pech, Belize

ascertain the date of interment. The two pottery vessels recovered in the cache in Operation A-2:5, nevertheless, indicate that the terminal phase of A-2 was constructed during the eighth century A.D.

Structure A-4

Structure A-4 is a long, range-type building which borders Plaza A to the west. Prior to the 1988 season, looters had damaged several sections of the mound. Since these haphazard excavations indicated that the architecture was well preserved, we decided to strip most of the southern half of the building and to probe the terminal phase of architecture.

Operation A-4:1

Operation A-4:1 removed the humus and collapsed construction debris over the southern half of Str. A-4. At the close of the 1988 field season this excavation had completely exposed two rooms and uncovered most of a third room within the terminal phase building. A description of these rooms, and the final architectural phase, is provided below (see Construction History of Str. A-4).

Operation A-4:2

This small 1.0 m X 0.80 m unit was placed on a bench in Room 2 of Str. A-4. No burial or cache were discovered and the floor of the building platform was exposed 82 cm below the surface of the bench. Interestingly, the floor beneath the bench was 10 cm lower than the level of the floor in front of the bench. This indicates that sometime after the original floor, room, and bench had been constructed, the section of floor in front of the bench was resurfaced. Pottery recovered during the excavation suggests that these minor alterations were

all conducted between the eighth and ninth century A.D.

Operation A-4:3

This 1 m X 1 m unit was excavated in front of a blocked doorway in the central room of Str. A-4. Its purpose was to determine the construction date of terminal phase A-4, and to search for evidence of earlier occupation.

Four floors were uncovered in the 1.75 m deep unit. The first three floors were no more than 10 cm apart, and they were clustered just below the terminal phase building (Fig. 15). The fourth floor was 1.19 m below the base of the doorway. The position and distance between the top three floors indicate that they were all associated with the terminal structure, and that the two topmost floors represent a replastering of the original floor. Conversely, the fourth floor is associated with an earlier building platform. Pottery from beneath the floor of this earlier construction phase suggests that this structure was built between Late Formative and Early Classic times.

Construction History of Str. A-4

Because Str. A-4 was not excavated to sterile level the entire construction sequence of this structure is presently unknown. The traditional Maya practice of erecting buildings along the four sides of courtyards, and the presence of the large Late Preclassic substructure beneath A-1, indicate that there may be an undiscovered Late Formative structure below the predominantly Classic period architecture of A-4.

The earliest structure exposed by the A-4 operations dates to the Late Formative/Early

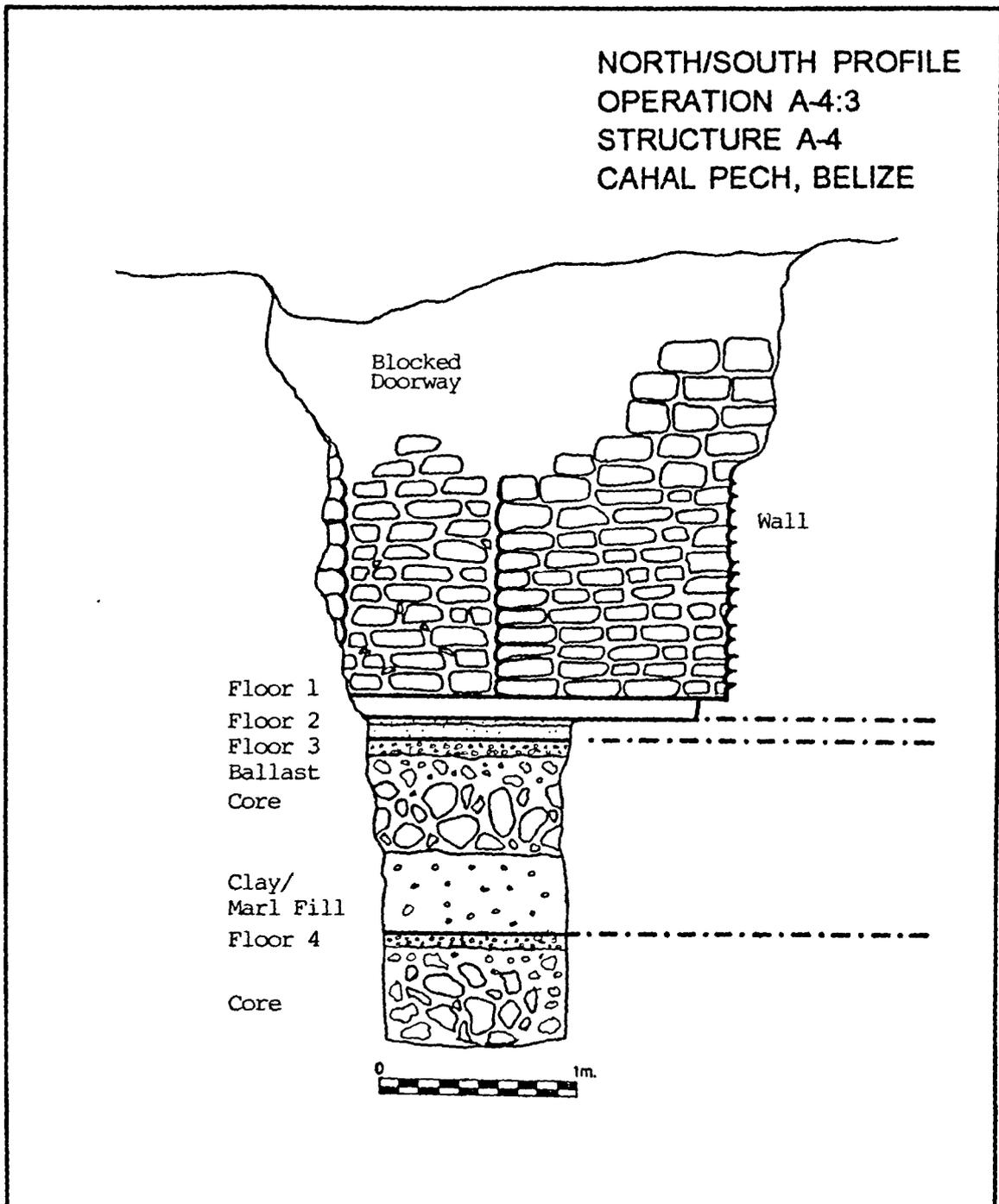


Figure 15: Cross-sectional profile of Operation A-4:3

Classic transition. This penultimate construction phase probably consisted of a raised platform with a perishable building, and it may have had a central stairway that ascended from Plaza A to the summit of the structure.

Terminal phase A-4 completely modified the earlier structure. This last construction phase is represented by a large raised platform with a vaulted masonry superstructure (see Fig. 11). The vaulted building contains four, and possibly five, interconnected and modally different rooms and has a central outset stairway leading down to Plaza A.

The southeastern room (Room 1) is rectangular in shape and was originally connected to Room 2 via a low vaulted doorway. This doorway was subsequently sealed off and benches were constructed in both rooms. The bench in Room 1 practically covers the entire floor space. It has a small rectangular niche in its center, and a step on the southwestern corner provides access to the top of the bench.

Room 2 has two benches which join together in an L-shape. Excavation into the southern bench indicates that it was constructed after the eastern bench. Room 2 is also connected to Room 3, and possibly to Room 4, via a narrow passageway along the western wall of the building.

Room 3 is the central room. It does not contain any benches, but has a basal moulding along the entire perimeter of the room. Originally, Room 3 had a central doorway facing Plaza A to the east. This door was subsequently sealed, probably at the same time that the doorway between Rooms 1 and 2 was blocked off and the benches in those rooms were

constructed.

Ceramics from structural fill indicate that terminal phase A-4 was constructed during the early part of the Late Classic period. Above the floor of Room 3 there were also fragments of several pottery vessels which may have been purposely smashed during abandonment of the site. Comparative analysis of this material suggests an eighth century date for this event.

Plaza A Operation

This 1.5 m X 1.5 m unit was one of several excavations placed within the seven courtyards in the central precinct of Cahal Pech. The major goal of these units was to penetrate the plazas from surface to sterile level. This would provide the data necessary for determining the construction history of each courtyard, and it would yield information that could be used to plot the diachronic growth and expansion of the site core.

The Plaza A unit descended 3.0 m below surface (Fig. 16). Sterile level was reached at 2.77 m down, and five floors were recorded in the unit. Floor 5 was located at 1.93 m below the present plaza level. Instead of the typical Classic period lime-plaster, the floor consisted of a tamped clay/marl surface placed over a thick layer of black organic dirt. Cultural remains below Floor 5 included several jute shells (*Pachychilus* sp.) and a variety of Middle Formative pottery.

Unlike the earlier floor, Floor 4 consisted of a 6 cm thick lime-plastered surface. Cultural remains below Floor 4 were more diverse and numerous than below Floor 5. They consisted of two types of freshwater snails (*Pomacea flagellata* and *Pachychilus* sp), chert flakes, and

PLAZA A, EAST PROFILE, UNIT 1, 1990 CMB

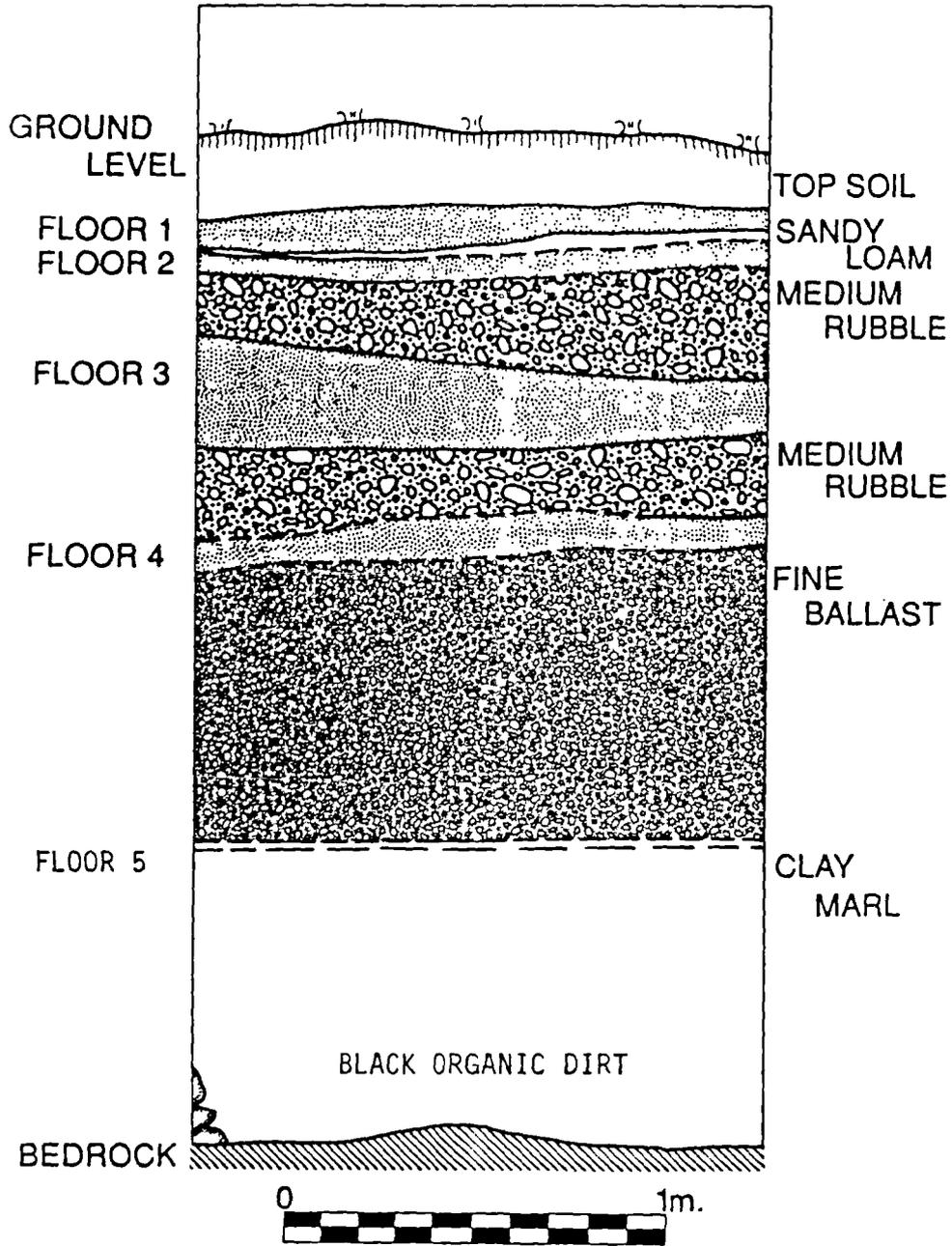


Figure 16: Cross-sectional profile of Plaza A

pottery which was predominantly from the Late Formative period. The latter date indicates that Plaza Floor 4 is contemporaneous with the penultimate phase of Str. A-1 and with A-2 Sub 2.

The plaster surface of Floor 3 was better preserved and thicker than that of Floor 4. Pottery below Floor 3 included both Early Classic and Late Formative types, indicating that Floor 3 is coeval in date with A-2 Sub 1 and A-4 Sub 3. Floors 1 and 2, like terminal phase A-1, A-2, and A-4, date to the Late Classic period.

Plaza B: Description, Excavations, and Construction History

Description of Plaza B

Plaza B is the largest courtyard within the site core. It is about 3.0 m lower in elevation than Plaza A, and measures approximately 50 m from north to south and 60 m from east to west. The courtyard is bordered on the north by Structures B-6 and B-7, to the south by B-4 and B-5, to the east by B-1, B-2 and B-3, and by Structure A-2 to the west. In 1950, Satterthwaite discovered three stelae and one altar in Plaza B. These monuments were located in front of Structures B-1 (Stela 3), B-3 (Stela 4 and Altar 1), and B-4 (Stela 5). In 1988 we found a large fragment of a sixth stela (Stela 6) in front of Str. B-2, but like the other monuments at the site this stela had a plain surface. The mounds selected for excavation in Plaza B included Structures B-2, B-4, and B-5.

Structure B-1

Located on the east side of Plaza B, Str. B-1 is a large (12 m high) pyramidal mound which is flanked by two smaller structures (B-2 and B-3). During the 1988 season, two old

excavation units were discovered on B-1. The first unit, which was axially located at the eastern base of the mound, had been excavated by Satterthwaite in the 1950s. Satterthwaite never produced a report of this work. Therefore, there is no information regarding the results of his investigations. The second unit was discovered at the summit of the structure and represents the salvage excavation conducted by Peter Schmidt in 1969. Information on file in the Belize Department of Archaeology indicates that Schmidt uncovered two burials in his excavation. The first contained the remains of an adult female with teeth that had been filed and inlaid with jade. According to Schmidt's notes, this terminal Classic burial was intrusive and "effected sometime after major construction activity had ceased" at the site (Schmidt n.d.). The second burial contained the remains of an elite male with sumptuary grave goods in a poorly preserved tomb. Comparative dating of the ceramics within the grave suggests that the burial, and the terminal construction phase of B-1, date between 600 and 800 A.D.

During the summer of 1989 Joseph Ball of the University of California at San Diego also conducted an axial excavation on Str. B-1. According to Ball (personal communication, 1990) these investigations located an early Late Formative (400-200 B.C.) substructure below two Classic period construction levels. Within the Late Formative structure, Ball recovered a center line cache containing several stingray spines. Ball indicated that the stingray spines represent one of the earliest "shaman outfits" ever discovered in the Maya subarea.

Structure B-2

Structure B-2 was selected for investigation because, unlike most of the pyramidal mounds at the site, it had not been vandalized or previously excavated. Furthermore, the excavation of B-2 could help to determine the architectural relationship of B-1, and its two

flanking structures (B-2 and B-3).

Operation B-2:1

This operation consisted of an axial trench placed on the west face of Str. B-2. Its chief purpose was to expose the terminal phase of construction and to record information on the form, style, and date of the architecture. The trench was 1.5 m in width and it extended from Plaza B to the summit of the mound.

The excavation revealed that the terminal phase of B-2 did not have a central stairway on the west face of the structure (Fig. 17). Instead, the unit exposed a series of at least three aprons which ascended from Plaza B to a small platform at the summit of the mound. There was no masonry superstructure above the platform and the poorly preserved floor retained no evidence of postholes or other features associated with perishable buildings. Ceramic artefacts placed the date of this terminal construction phase to the Late Classic period.

Operation B-2:2

This 1.25 m X 1.5 m unit was excavated just west of the building platform at the summit of Str. B-2. Its purpose was to penetrate the topmost apron or terrace in an effort to test and expose earlier phases of architecture.

The excavation descended 3.0 m then was discontinued due to the instability of one of the excavation walls. Five plaster floors were recorded in the unit. The lowermost floor was 2.05 m below that of the terminal phase of construction. It was also aligned with Floor 8 in Operation B-2:3, suggesting that the two floors are part of the same construction phase. Ceramics below the floor indicate a Late Formative to Early Classic date for this architecture.

**EAST - WEST PROFILE,
STRUCTURE B2, PLAZA B,
CAHAL PECH, CAYO, BELIZE, 1990**

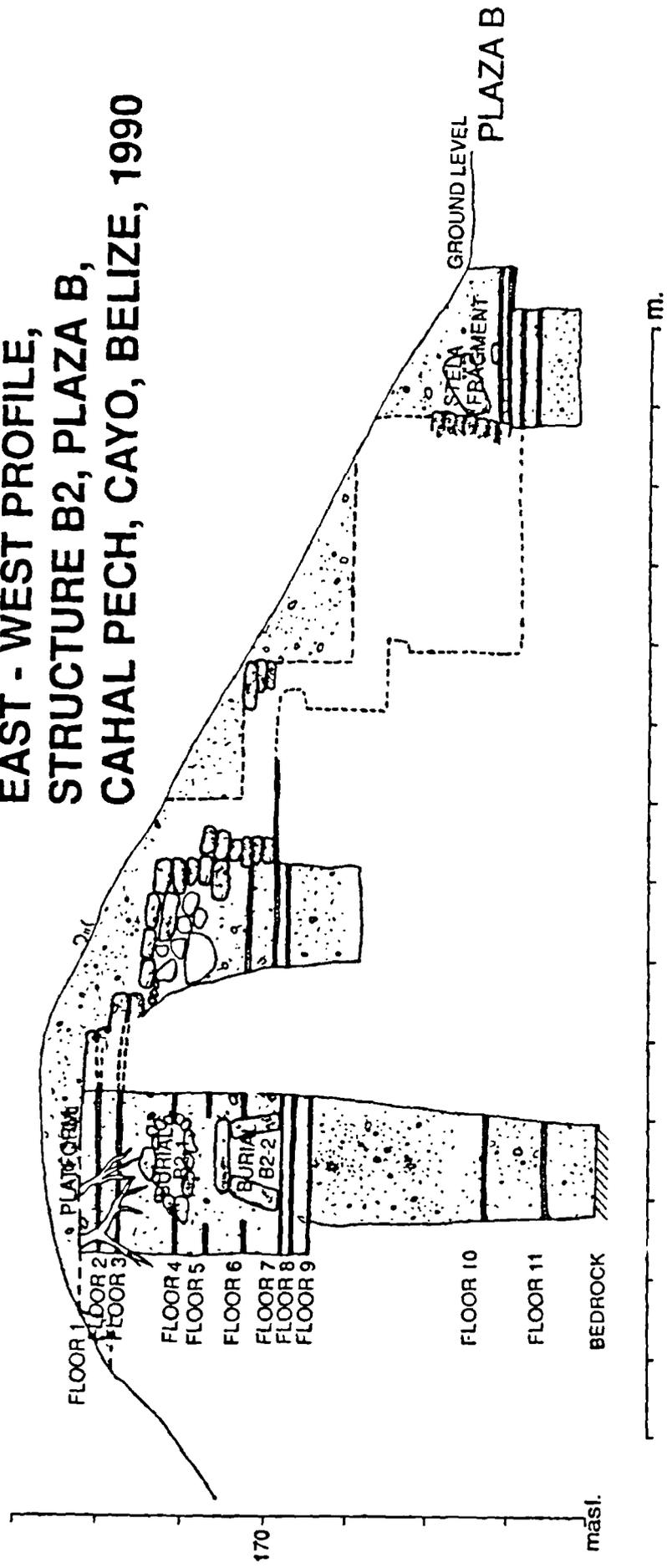


Figure 17: Cross-sectional profile of Str. B-2

The stratigraphic position of the two overlying floors parallels that of Floors 7 and 6 in Operation B-2:3. Both of these construction phases date to the middle part of the Classic period. The penultimate floor uncovered in Operation B-2:2 has no equivalent in Operation B-2:3, but the stratigraphy indicates that it may represent the surface of the topmost apron of Str. B-2. This apron and the final floor are both associated with the last phases of construction on B-2, and they both date to the Late Classic period.

Operation B-2:3

Operation B-2:3 was located in the center of the terminal phase platform at the summit of Str. B-2. The operation began as a 2 m X 2 m unit, but was subsequently decreased in size to facilitate moving in and out of this 7.0 m deep excavation. The purpose of the operation was to penetrate Str. B-2 (from top to sterile level) in an effort to search for Formative occupation levels, and to ascertain the structure's full architectural sequence.

As indicated above, the unit descended 7 m below surface. Sterile level was reached just above this point at 6.78 m down. Sections of 11 floors, plus two burials, were uncovered in the excavation. The earliest platform (Floor 11 or B-2\1st) was 4.0 cm thick, it was constructed of lime plaster, and was 5.72 m below the surface of the terminal phase platform. Cultural remains within this first architectural level included pottery, ceramic figurine fragments, chert flakes, a fragment of a grinding stone, plus shells of the fresh-water snail *Pachychilus* sp., and the fresh-water mussel *Nephronaias ortmanni*. Comparative cross-dating of the ceramic artefacts places the initial construction on Str. B-2\1st in the late Middle Formative period.

The second earliest construction phase (B-2\2nd) was again only represented by a well preserved plaster floor (Floor 10) and its associated fill. Cultural remains in this strata duplicated that of the previous level, but the ceramics were more typical of material dating between the late Middle Formative and Late Formative periods.

The third construction phase (Floor 9) increased the height of B-2 by 2.30 m, and raised the overall height of the structure to approximately 3.55 m above natural ground level. Within the fill of B-2\3rd there were a few figurine fragments, and a large collection of pottery which was predominantly of Late Formative date. The next construction phase (B-2\4th [Floor 8]) slightly increased the overall size of Str. B-2, and probably dates between Late Formative and Early Classic times.

During the Early Classic period B-2 was modified twice (B-2\5th and B-2\6th). In Unit 3, B-2\5th is represented by the surface (Floor 7) of a raised structure and the floor (Floor 6) of a building platform. The latter was partially destroyed during the subsequent construction of a large cist associated with the B-2\6th (Floor 5) substructure. The cist was lined and capped with cut limestone blocks, and was sealed by the B-2\6 building platform (see Fig. 17). Within the cist there was the skeletal remains of one individual, a fragmented stingray spine, several jade artefacts, shell beads, a bone tube, and a late Early Classic polychrome dish. A second brown-slipped vessel was found just outside of the grave at the north end of the cist.

The last three architectural phases all date to the Late Classic period. Below the penultimate phase (B-2\8th [Floor 3]), and cutting into B-2\7th (Floor 4), a second burial was discovered. This grave contained the poorly preserved remains of a single individual who had

been interred within structural fill. The grave goods associated with this burial included three fragmented pottery vessels, two large pieces of conch shell, two modified marine shell artefacts, and two obsidian blades. All three ceramic vessels, and the burial, are Late Classic in date.

Construction History of Str. B-2

Investigations on Str. B-2 revealed a construction sequence that spans from the late Middle Formative to the Late Classic period. The presence of ceramic types such as Jocote Orange-brown, Joventud Red, Chacchinic Red, and Savana Orange, plus hand-modeled figurine fragments with affinities to Middle Formative material from Uaxactun and the Tok complex at Chalchuapa, suggest that the first construction phase of B-2 dates between 650 and 350 B.C. Unfortunately, the size of the unit and the depth at which the floor of B-2\1st was discovered inhibits conclusive statements regarding the architectural style of this Middle Formative structure. The recovery of a few pole-impressed briquette fragments just above floor level nonetheless suggests that the platform may have supported a wattle and daub building.

During the Late Formative, B-2 was renovated at least twice (B-2\2nd and B-2\3rd), but once again the small size of the excavation makes it difficult to provide any extensive description of the architecture. Artefacts below the platforms of B-2\2nd and B-2\3rd were predominantly represented by Middle and Late Formative pottery, and also included a few ceramic figurine fragments, fresh-water snail shells, and several chert flakes.

Between the Late Formative and the Early Classic period, Str. B-2 was modified twice.

These construction phases are represented by the floors of B-2\4th (Floor 8), and the structure floor (Floor 7) and building platform (Floor 6) of B-2\5th. The latter structure probably had two aprons on its west face, and a fairly large building platform at its summit. Except for size, this architecture resembles the basic form of the final construction phase (see below).

Built during the first half of the Late Classic period, the next two construction phases (B-2\6th & B-2\7th) primarily modified the summit of B-2. During this time two new building platforms (Floors 5 and 4) were constructed at the summit of B-2. Below the floor of B-2\6th, and intruding into B-2\5th, there was a large cist burial which contained the remains of a single individual with elite related grave goods.

At the construction of the penultimate phase (B-2\8th [Floor 3]) another apron was added to the raised structure of 5th and a small building platform crowned its summit. These changes increased the height of B-2 by approximately 1.5 m. Below the floor of 8th there was a simple cist burial with few grave goods and the poorly preserved remains of one adult individual.

The final construction phase (B-2\9th [Floors 2 and 1]) resembled the architecture of 5th and 8th. At the summit of this 6.0 m high, Late Classic structure there was a small building platform (Floor 1) which may have supported a perishable superstructure. B-2\9th also had no central stairway. Instead, there were three terraced aprons which descended from the summit to the base of the structure. The summit of B-2 may have therefore been accessed via B-1. This architectural style, and the connection of B-1 to B-2 and B-3 is similar to the form of Strs. A-1, A-4 and A-5 at Pacbitun (Healy 1990), to A-1, A-2 and A-4 at Black Man Eddy

(Garber et al. 1991), and Str. E at Baking Pot (Ricketson 1931). The frequency of this configuration at other Belize Valley sites suggests that these structures probably represent a regional architectural style. The position, location, and orientation of the three adjoining structures may also be a variant of the "E Group" complex which has been identified at Uaxactun and several other sites in the central Maya lowlands (Ruppert 1940).

Structure B-4

Structure B-4 is a relatively small (5.5 m high) mound on the southeastern corner of Plaza B, yet it provided some of the most important and early data recorded at Cahal Pech. Prior to the 1988 season, looters had excavated a pit at the summit of the structure (see Figs. 18 and 31), and another at plaza level (between the northern base of the mound and Stela 5). The first pit had mostly caused superficial damage and had exposed part of the wall of a Classic period building. The second looter's excavation exposed part of the stairway of the terminal phase structure and three plaza floors. During their excavation the looters also broke Stela 5 into several fragments. The only reasonable explanation for this act of vandalism is that the stela was destroyed in order to facilitate excavation at the base of the monument.

Investigations on B-4 initially consisted of a wide axial trench on the north face of the mound. Two large, and three small, units were subsequently placed into the platform and stairway of an earlier sub-phase (B-4\10th) of the structure. As indicated below, these investigations produced a large collection of Formative cultural remains, and they provided the most comprehensive evidence of early Middle Formative occupation at the site.

Operation B-4: Axial Trench

During the 1988 field season the axial trench on Str. B-4 measured 2 m wide and it extended from the summit to the northern base of the mound (Fig. 18). In subsequent years this large excavation was widened at several locations, but its depth was generally maintained at the level of the of B-4\10th construction phase (Floor 3). The latter is a well preserved Late Formative substructure that was consolidated in 1991 (see Fig. 32).

During the first season of investigation two construction phases (11th and 12th) and a burial were uncovered by the axial trench. The final construction phase was represented by the poorly preserved stairway, platform floor (Floor 1), and collapsed masonry building, of a small non-domestic structure. The burial was located along the primary axis of this construction phase (B-4\12th), directly below Floor 1. It contained the remains of a single male individual, in extended position, with head to the south. The only grave good associated with the interment was a tall polychrome vase with a poorly preserved anthropomorphic design.

Like the terminal construction phase, B-4\11th (Floor 2) was not very well preserved or defined. The only conspicuous architectural feature of this substructure was a small section of the floor of the building platform and two steps. It is possible that these steps were part of a stairway which was later incorporated in the architecture of 12th, but very little of this architecture remained preserved. Artefacts recovered below Floor 2 were numerous and varied. They included fragments of two metates and one mano, several hand-modelled figurine fragments, some chert flakes, and a large collection of pottery. The latter included both Middle and Late Formative types.

TOP PLAN, STRUCTURE B4,
CAHAL PECH 1990

MDC 1991



LEGEND	
	INTRUSIVE EXCAVATION
	PLASTER SURFACE
	POST HOLE
	ASSUMED PROJECTION

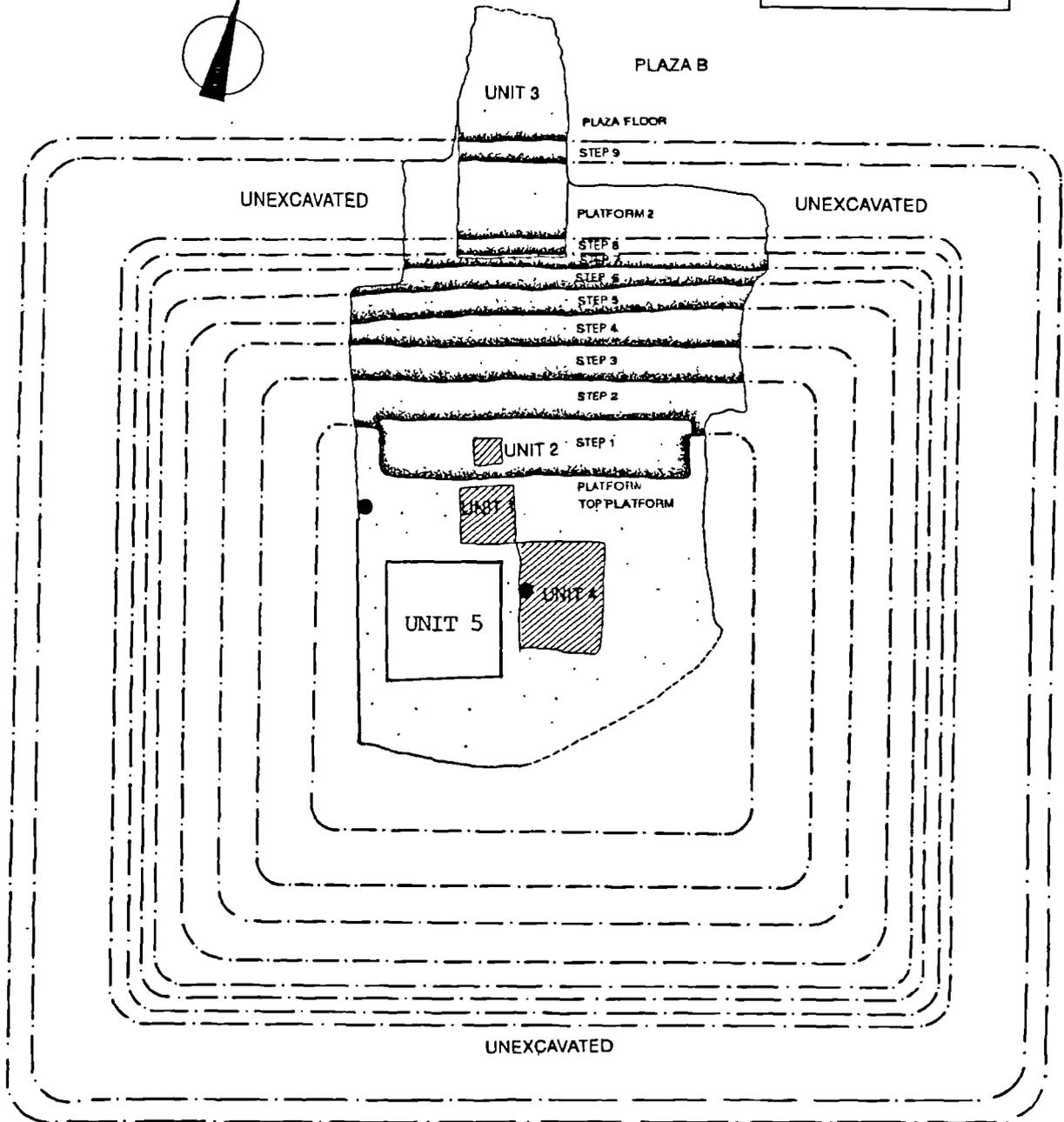


Figure 18: Plan of Str. B4/10th-11th indicating location of excavation units

Unlike the aforementioned construction phases, B-4\10th (Floors 3 and 4) was in excellent condition (see Fig. 18). The axial trench exposed part of the structure's northern stairway, and a large section of the building platform (Floor 3). A second small platform, or landing, was uncovered on the north face of the structure, about 1.2 m above the final Plaza B floor. Six steps rise from the landing to the building platform at the summit. In 1988, two postholes were uncovered atop of the building platform (see Fig. 18). One of these was axially located at the center of the structure, and the second was in the northwestern section of the platform, just south of the first step. When the last two phases of construction were stripped off in 1991 it was also noted that the stairway of B-4\10th was flanked by two balustrades. Each balustrade had a pair of masks facing Plaza B, but the masks were in such a poor state of preservation that it was impossible to accurately identify their iconographic significance.

Operation B-4: Unit 1

This 1 X 1 m unit was excavated into the building platform (Floor 3) of B-4\10. Because the operation began near the end of the 1988 season, it was realized that the unit would have to be terminated before reaching sterile level. The objective of the excavation was therefore to ascertain the construction date of B-4\10th, and to provide preliminary data on earlier construction phases.

The unit descended 2.0 m and exposed two earlier floors (Floors 4 and 5). Floor 4 extended across the entire area exposed by Unit 1 and, as Unit 2 subsequently indicated, it was aligned with the base of the topmost B-4\10th step. This position suggests that Floor 4 represents the summit of the B-4\10th structure, while Floor 3 represents the surface of the building platform.

Floor 5 was located 45 cm below Floor 4, and represents the building platform of the 9th construction phase. Two, low, cut-stone walls above the floor may have served as the base of a rectangular superstructure. Since the western wall was only one course high and the southern wall contained two courses of cut-stones, it is possible that the superstructure had been destroyed during the construction of B-4\10th. Both walls also extended beyond the limit of the unit, thus it was impossible to determine the exact size of the B-4\9th building.

Pottery below Floors 3 and 4 was predominantly Late Formative in date. Conversely, the ceramics below Floor 5 consisted primarily of Middle Formative types.

Operation B-4: Unit 2

Unit 2 was a 0.5 X 0.5 m excavation that was placed on the frontal inset of the B-4\10th building platform (Fig. 19). The purpose of the unit was to explore whether there were any axial caches in this section of the structure.

Although no cache was discovered, the unit produced additional information on Floors 4 and 5, and it increased the sample of cultural remains from these levels. In regards to Floor 4, the excavation confirmed that this plastered surface was aligned with the topmost step of the B-4\10th stairway, and that Floors 3 and 4 are part of the same construction phase. Floor 5 in Unit 2 was also aligned with the fifth floor in Units 1 and 4 and represents the surface of a late Middle Formative platform.

Operation B-4: Unit 3

This 1.0 X 1.5 m unit was placed on the small basal platform or landing of the B-4\10th

**NORTH - SOUTH PROFILE,
STRUCTURE B4, PLAZA B,
CAHAL PECH, CAYO, BELIZE,
1990**

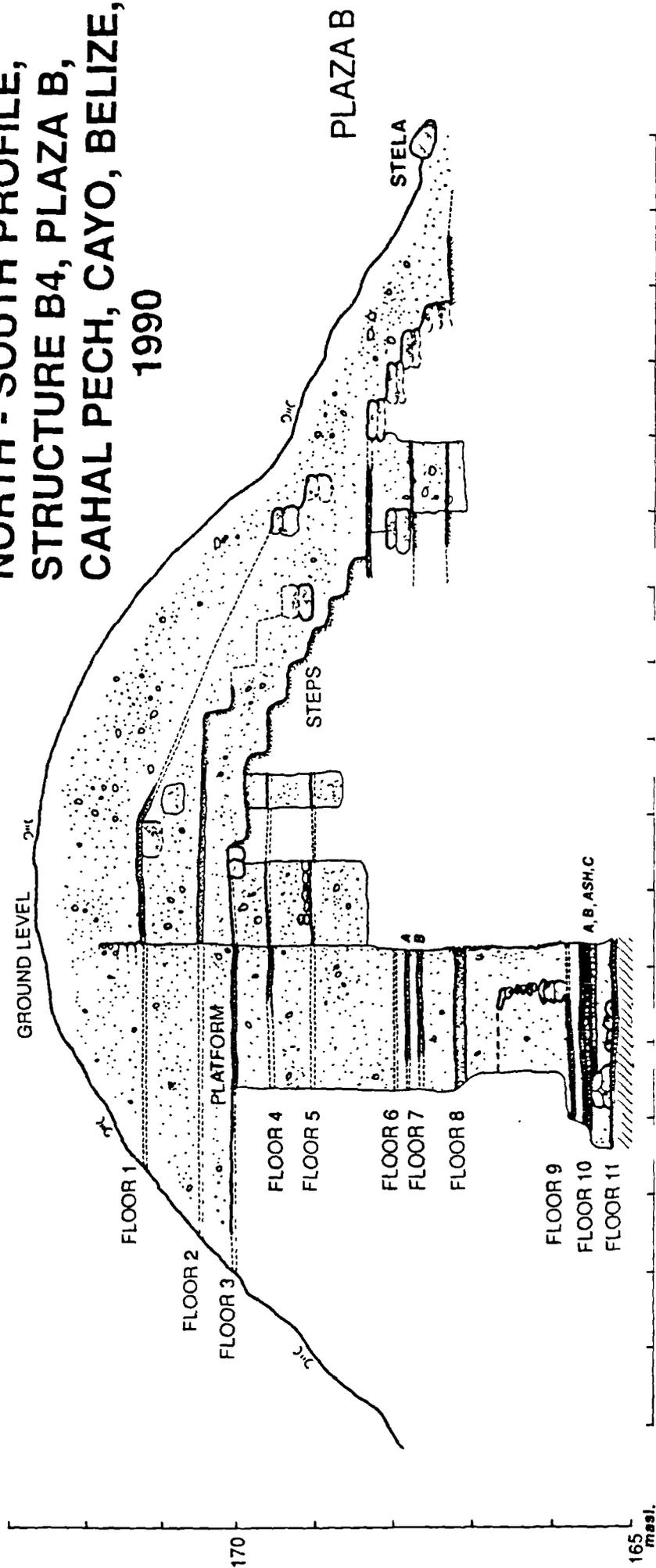


Figure 19: Cross-sectional profile of Str. B-4

substructure. The main purpose of the unit was to determine if the landing was contemporaneous with the upper stairway, or if it was a later addition to the structure. Pottery from this excavation would also help to confirm, or negate, the assumed Late Formative date of B-4\10th.

Like Unit 1, excavation in Unit 3 commenced toward the end of the 1988 season and had to be closed before reaching sterile level. The operation exposed two floors below the surface of the landing (see Fig. 19). The earliest floor was 1.5 m below the surface of B-4\10th and was associated with an earlier subphase that predated those exposed in Units 1 and 2. Pottery from the fill below this floor was purely Middle Formative in date. The subsequent floor was associated with the upper stairway of B-4\10th and was connected to two other steps which dropped towards Plaza B. This association suggests that the landing, or basal platform, may have been a later modification of the original B-4\10th structure. Why such a modification, which did little to alter the form of the original structure, was erected is difficult to ascertain. It could have been built in order to expand the size of the original landing, or as an aesthetic modification.

Operation B-4: Unit 4

Unit 4 was a large 1.5 X 2.0 m excavation that was begun in 1989 and completed during the 1990 field season. The objective of this excavation was to penetrate Str. B-4 from surface to sterile level in order to determine the construction sequence of the mound, and to recover information on Formative period occupation at the site.

The excavation descended 7.2 m below surface and exposed sections of 13 floors which

were associated with 10 construction phases (Fig. 20). This architectural sequence spans from the early Middle Formative to the Late Classic period (1000 B.C. - A.D. 750).

The southern extensions of Floor 1 and Floor 2 were the most recent architecture recorded by the excavation. These floors were poorly preserved in Unit 4, and no additional evidence of the collapsed terminal phase building (previously noted in the axial trench) was recorded in the unit.

Floor 3 was approximately 2.2 m below surface and in direct alignment with the well-preserved surface of the third floor exposed in the axial trench. Artefacts within the levels above Floor 3 were also typologically and chronologically similar in the two excavations (axial trench and Unit 4). This confirmed the Classic period dating of the terminal construction phase (B-4\12th), and supported the terminal Late Formative assignment of Floor 2 (B-4\11th).

Excavation below Floor 3 produced a large number of shells of the fresh-water snail *Pachychilus* sp., several chert flakes, and numerous potsherds. The pottery contained both Middle and Late Formative types, including Chunhinta Black, Flor Cream, Consejo Red, Reforma and Laguna Verde Incised, and a local variety of Tower Hill Red-on-cream. Together with the pottery from previously excavated units, these ceramics indicated that Floor 3 was constructed during the early part of the Late Formative period (300-100 B.C.).

Floor 4 was approximately 45 cm below Floor 3 and aligned with the fourth floor exposed in Units 1 and 2. The fill below Floor 4 also contained a mix of Middle and Late

WEST PROFILE OF UNIT 4, STRUCTURE B4, CAHAL PECH 1990

MDC 1991

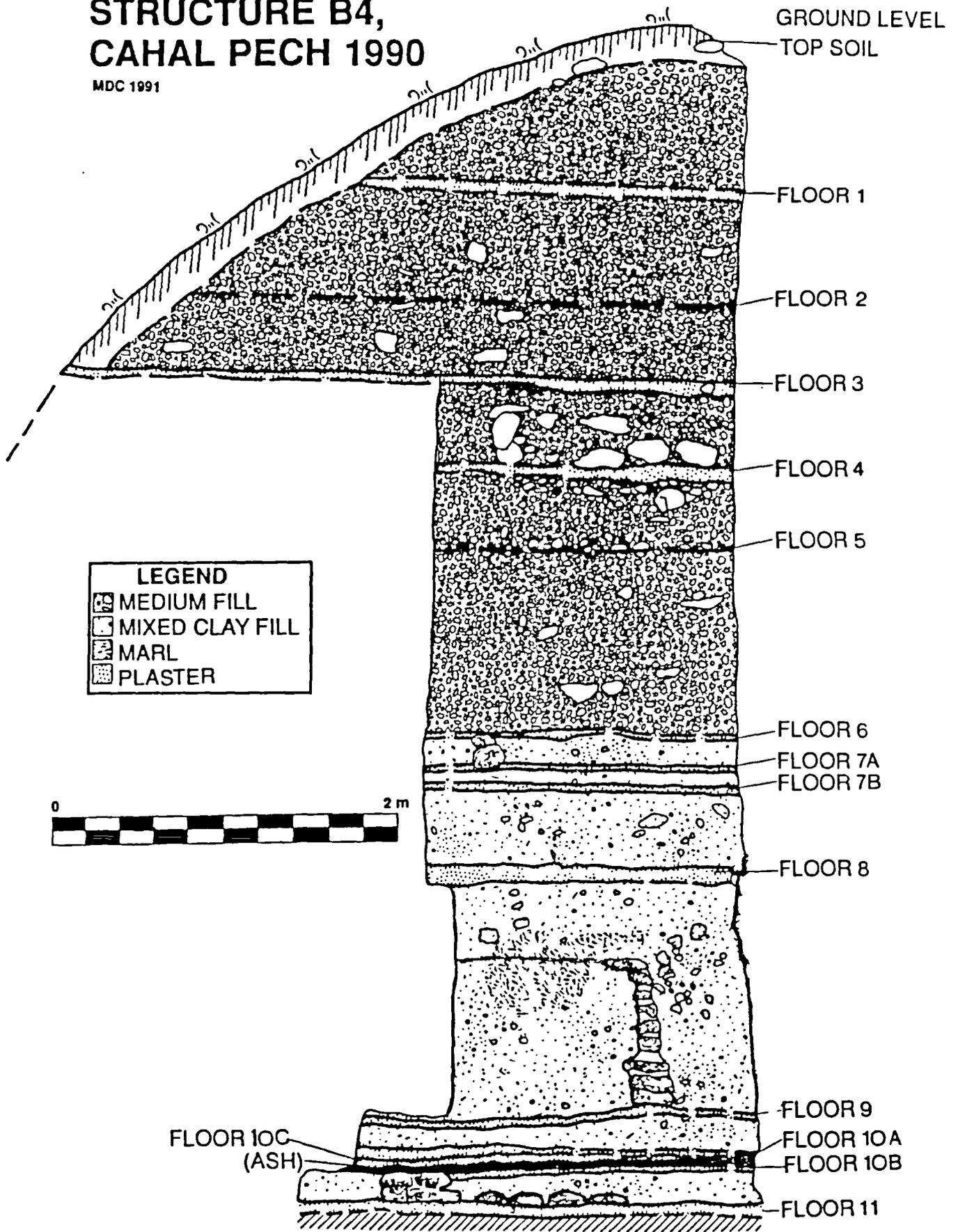


Figure 20: Cross-sectional profile of Unit 4, Str. B-4

Formative pottery, but there was a slight increase in the frequency of Middle Formative Savana and Jocote group types. Non-ceramic artefacts included several chert flakes, fresh-water snail shells, and an obsidian blade fragment.

Unlike in Units 1 and 2, Floor 5 was poorly defined in Unit 4. This is interesting, particularly when we consider that in Unit 1, Floor 5 was represented by a well-preserved plaster floor, and two low walls of a small building. The most plausible explanation for the divergence in the two units is that since the area investigated by Unit 4 lies at the rear of the building, the excavation may have either missed Floor 5, or the floor may have been partially destroyed during the construction of the subsequent architectural phase.

Ceramic remains below Floor 5 were plentiful and primarily Middle Formative in date. They included pottery common to the Belize Valley, a few types that are more typical of the early Middle Formative period in northern Belize (i.e. Tower Hill Red-on-cream, and possibly Chicago Orange, and Ramgoat Red), plus a small sample of sherds (with a vitrified greenish slip) which may be anomalous to the area. The fill below Floor 5 also yielded a few burnt fragments of human bone, several chert flakes, and a number of hand-modeled figurine fragments. Together with the pottery, these artefacts suggest a late Middle Formative date for Floor 5.

Floor 6 was slightly better preserved than Floor 5. In several areas the plaster surface was fire-clouded, but there was no evidence of any building above the section of floor exposed by the unit. The artefact assemblage below Floor 6 duplicated that from previous levels. The major difference was the temporal placement of the ceramics. Whereas pottery from below

Floor 5 contained a few Late Formative sherds amidst a predominantly Middle Formative collection, those below Floor 6 were exclusively Middle Formative in date.

The surface of Floor 7A was plastered, well-preserved and almost entirely fire-clouded. Along the southern limit of the excavation, the floor abutted a low wall of roughly-shaped limestone blocks. The wall was two to three courses high, and the blocks were cemented together with mortar. At the base of the wall, and along the eastern edge of the unit, there was a single posthole. On the northern perimeter of the excavation the burnt plaster floor ended abruptly along a broken edge. In order to investigate whether there were any associated architectural features in this area, a 25 cm deep undercut was excavated into the north face of the unit. The undercut exposed the topmost steps of a low stairway that dropped towards Plaza B (Fig. 21). After exposing two of the steps the undercut was discontinued and excavation proceeded below Floor 7A. This exposed another plaster floor 20 cm below 7A. The floor extended across the entire length of the unit and ended at the base of the topmost step leading up to the 7A platform. Since this floor obviously represented the surface of the structure on which the 7A building platform had been constructed it was labelled as Floor 7B. Artefacts recovered below the two floors were primarily ceramic and included a mixture of both early and late Middle Formative types. This indicated that the small structure above Floor 7A was constructed between 600-300 B.C. A single Radiocarbon date ([Beta-40863] 2470 ± 90 B.P. which calibrates to 791 (757, 689, 656, 645, 590, 577, 545, 458, 452) 407 B.C.), obtained from a large charcoal sample below Floor 7B, supports this temporal assignation.

Floor 8 was 0.5 m below Floor 7B, and 2.86 m below Floor 3. Most of the floor was

covered with lime plaster, but in several sections the surface was rough and uneven. Directly above the floor, particularly in the northeastern section of the unit, there were several roughly-shaped limestone blocks in a curvilinear pattern (Fig. 22). This alignment, plus the presence of two postholes along the southern edge of the cut-stones, suggest that the wall was part of an apsidal building. A break in the wall near the north face of the unit may have also served as the doorway of this building.

Excavation below Floor 8 produced a relatively large collection of early Middle Formative artefacts and animal remains, and it exposed a ninth floor with a masonry structure. Most of the pottery from this level displayed affinities with Jenney Creek material from the Belize Valley and with contemporaneous types from sites in northern Belize. Non-ceramic artefacts included two pieces of obsidian, a fragment of a metate, three pieces of slate, lithic debitage, a few shell beads and discs, plus several hand-modeled figurine fragments. The animal remains consisted primarily of fresh water shellfish and a small number of mammalian bones. The only human remains present were small fragments of burnt long bones.

The wall of the structure above Floor 9 had an average height of 70 cm high and was oriented in an east/west direction. It was nine courses high and had been constructed of roughly-shaped limestone blocks that were mortared together. During excavation it was noted that the section of wall abutting the east face of the unit was poorly preserved and slumped. Upon removing the cut-stones in this section a large burnt oval area was discovered just below floor level. This burnt oval feature was bordered by several stones. Within the area encircled by the stones the feature contained soft loose soil mixed with ashes and a large concentration of charcoal flecks. The concentration of charcoal and ash, and the fact that the

**NORTH/SOUTH PROFILE
STR. B-4/7TH, UNIT 5
CAHAL PECH, BELIZE**

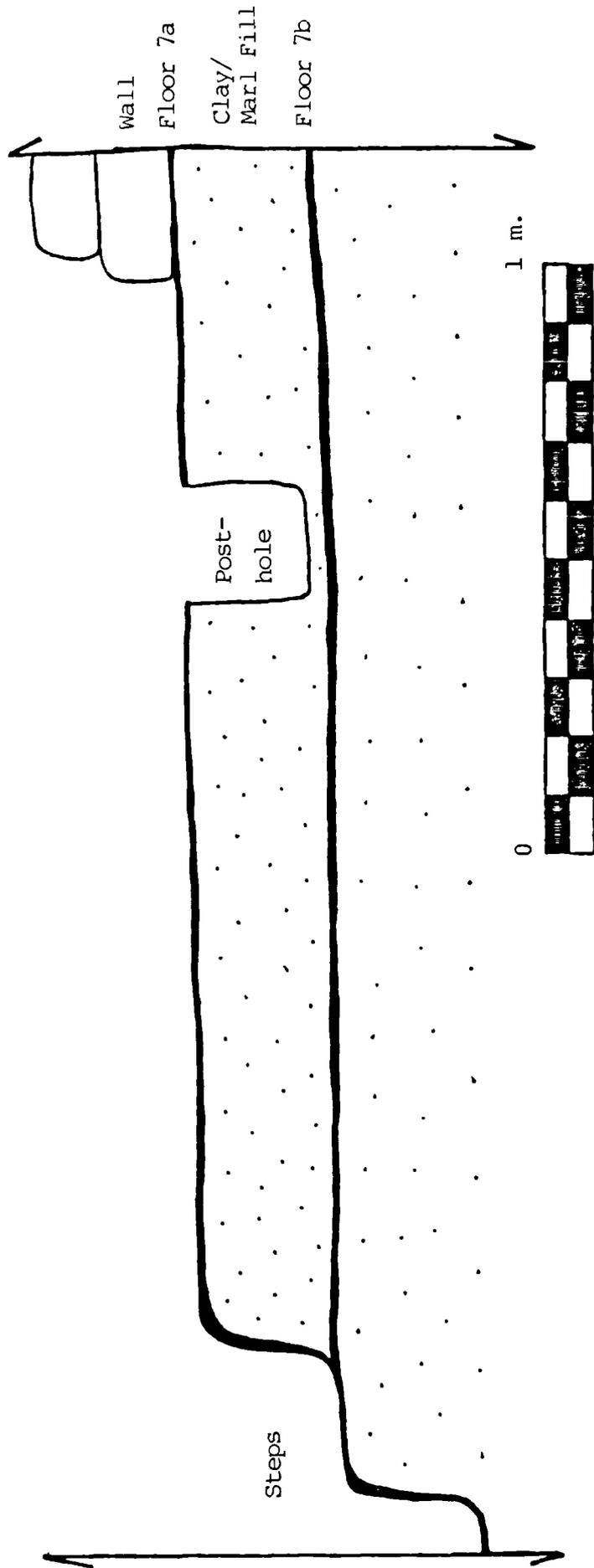


Figure 21: Cross-sectional profile of Floors 7a and 7b, Unit 5, Str. B-4

**PLAN OF FLOOR 8
UNIT 4, STRUCTURE B-4
CAHAL PECH, BELIZE**

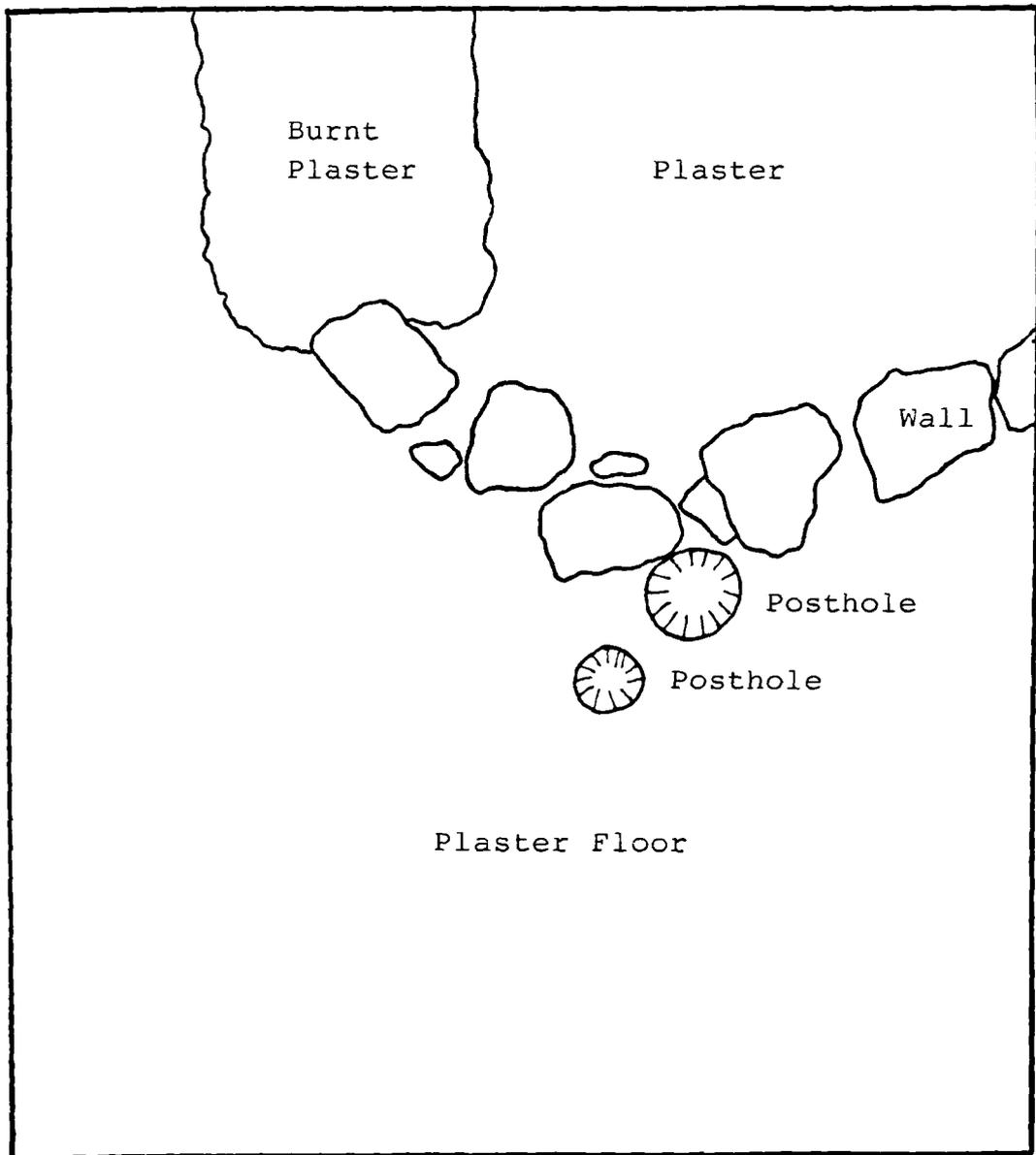


Figure 22: Plan of Floor 8, Unit 4, Str. B-4

oval area was substantially greater than that of the postholes identified at the site, indicate that the feature may have functioned as a hearth. (Similar hearths have been reported in northern Belize and the central Maya Lowlands [Pyburn 1989]).

At the base of the wall there were several briquettes with pole impressions. These briquettes may have either been part of a building that had been constructed above or below the raised wall, or they could have been brought from elsewhere and used as fill during the construction of the platform.

Excavation below Floor 9 uncovered many more daub (or briquette) fragments. The flat outer face of several of these briquettes had wide vertical bands of dull red paint on a dull white plaster background. It is possible that the briquettes were part of a building with walls that had been painted in red and white (candy cane fashion). Other finds below Floor 9 included several chert flakes and a small quantity of pottery. The most striking characteristics of the pottery was the complete absence of Mars Orange ware. A charcoal sample collected below Floor 9, and next to the hearth, produced a date of (Beta-40864) 2720 ± 60 B.P. which calibrates to 970 (893, 878, 835) 816 B.C. This date is firmly within the early Middle Formative period (1000-600 B.C.) and correlates chronologically with the pottery from this level.

Below Floor 9 there were three successive floors with very little fill between them. Because of this stratigraphy the floors were labelled as 10A, 10B, and 10C. Floors 10A and 10B were 28 cm and 33 cm respectively below Floor 9. Both floors extended (from west to east) about 3/4 of the way across Unit 4, then curved upward to a building platform which

was practically at the same level as Floor 9. Directly below Floor 10B, and just above Floor 10C, there was a thick lens of ash and carbonized material mixed with a large concentration of broken and burnt briquettes with pole impressions (Fig. 23). Two of the briquette fragments had vertical bands painted in red and cream. Along the southern border of the unit, at the base of the building platform, lay a large carbonized fragment of a wooden post which may have been part of a support beam for a wattle and daub structure. (A fragment of the burnt beam produced a radiocarbon date of (Beta 40865) 2740 ± 70 B.P which calibrates to 999 (898, 858, 850) 827 B.C. Within the ash lens we recovered several fragments of burnt Tower Hill Red-on-cream pottery, some buff-coloured and cream-slipped sherds, several pieces of lithic debitage, and a few charred mammalian bones.

Although there was no standing architecture above Floor 10C, the large concentration of pole-impressed briquettes, the fragment of the support beam, and the thick lens of charred and carbonized material, suggest that a wattle and daub building may have stood above the floor, and that the building was subsequently destroyed by fire.

Excavation below Floor 10C exposed an eleventh and final floor in Unit 4. Floor 11 consisted of a tamped layer of marl that had been laid directly over a sterile layer of clay and soft limestone. Within the original limits of the unit there were two postholes and three roughly-shaped blocks of limestone along the western edge of the excavation. Since the latter appeared to be of architectural significance, an undercut was excavated (40 cm and 50 cm respectively) into the western and southern walls of the unit in order to determine the form and function of the feature. (The depth of the undercut was not increased because of concern for the excavators who were working 7 m below surface).

**TWO DIMENSIONAL PLAN OF
FLOOR 10C, UNIT 4, STR. B-4
CAHAL PECH, BELIZE**

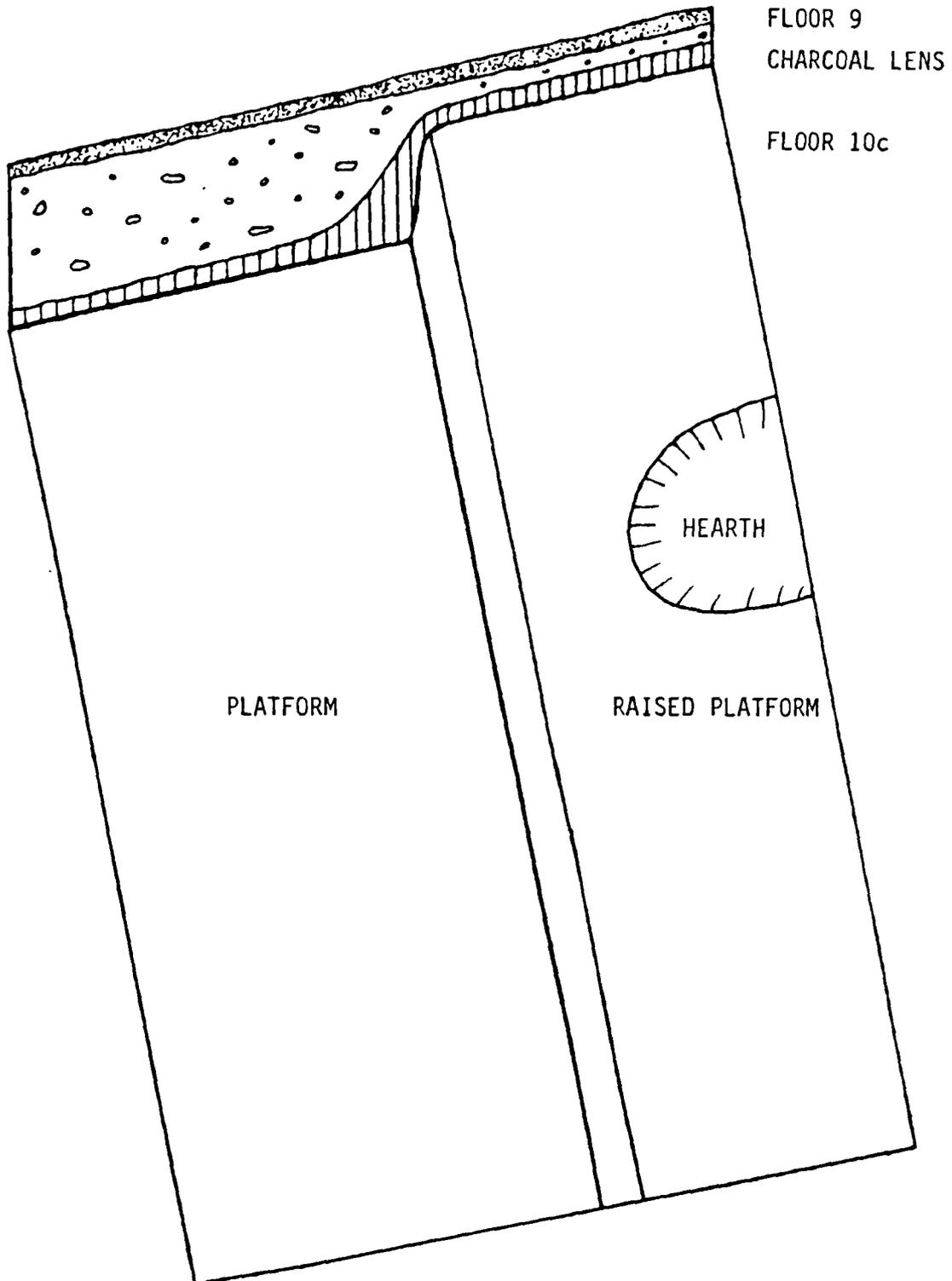


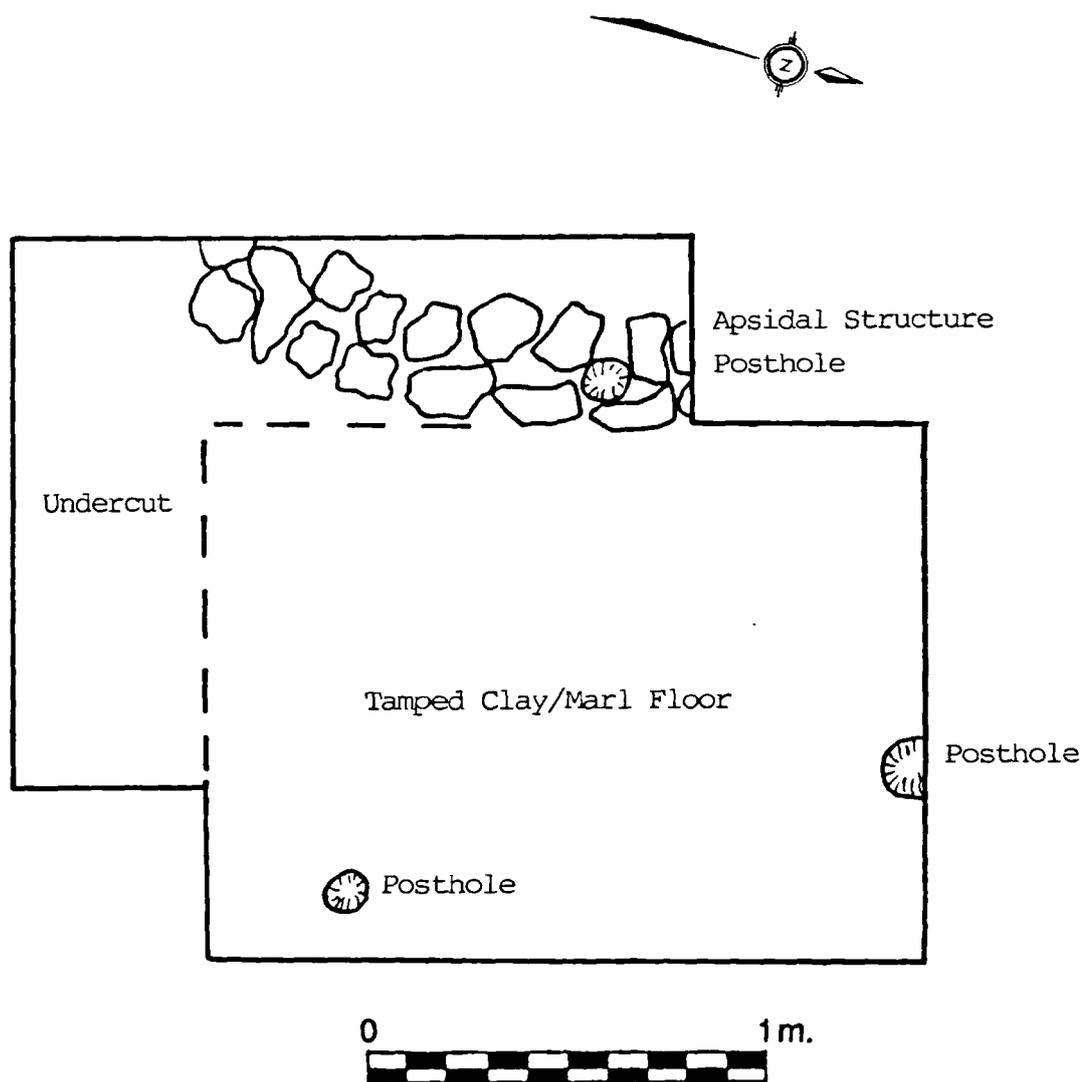
Figure 23: Two-dimensional plan of Floor 10, Unit 4,
Str. B-4

The undercut revealed that Floor 11 continued towards the south. To the west it exposed a double row of roughly-shaped stones in an oval alignment (Fig. 24). Between two of the boulders there was a single posthole. Several briquette fragments were also recovered along the outer base of the wall. The position of the limestone boulders, and the location of the postholes, suggest that this construction phase may have included an apsidal wattle and daub building and possibly a second pole and thatch structure above Floor 11.

Along the east face of the low apsidal wall a variety of animal remains, several fragments of burnt human bone, and a cache (Cache 1) containing a diverse collection of artefacts were recovered. The cache included a smashed (Chitam Zoned Incised) pottery vessel, 18 marine shell disks, an oval-shaped mano or mortar, 77 chert flakes, a canine tooth pendant, 27 chips of obsidian, a small spherical red stone, one piece of slate and three, jadeite, mosaic fragments. The form of one of the jade pieces (see Fig. 91o) resembles that of a "flaming eyebrow" motif. The pottery vessel was represented by the broken fragments of a Chitam Zoned-Incised, flat-base dish with out-sloping walls and wide everted rim (see Fig. 56). While few similarities exist between this pottery and other contemporaneous types in the central Maya Lowlands, similar forms have been reported in Early Formative contexts in the southern and northwestern highlands (Peterson 1963:30-32; Sharer 1978:11; Sharer and Sedat 1987:305).

Because of the absence of dateable charcoal samples, it was not possible to obtain an absolute date for the construction of Floor 11. The pottery recovered above the floor, plus the radiocarbon dates for Floors 9 and 10, nevertheless suggest that Floor 11 was constructed and used during the early Middle Formative period.

**PLAN OF FLOOR 11
UNIT 4, STRUCTURE B-4
CAHAL PECH, BELIZE**



**Figure 24: Plan of Floor 11 with apsidal structure,
Unit 4, Str. B-4**

Operation B-4: Unit 5

Unit 5 was excavated into Str. B-4 during the 1991 season. Like Unit 4, the excavation was designed to penetrate B-4 to sterile level in order to increase the sample of Formative period data. The operation was placed just west of Unit 4, it measured 2 m by 2 m and descended 8.27 m from surface.

Unit 5 confirmed the diachronic sequence recorded in Unit 4. As in the latter unit, the strata directly below the terminal phase of construction in Unit 5 contained artefacts that were primarily Classic period in date. Thereafter the cultural levels produced material that ranged from the Late Formative/Early Classic transition to the early Middle Formative period.

The architectural record in Unit 5 was, for the most part, also similar to that of Unit 4 (Fig. 25). Floors 1 to 6 were identical in the two units. On Floor 7 the excavation uncovered two more post holes and a large, burnt, circular area above this late Middle Formative platform (see Fig. 30). The cut-stone base of the apsidal structure recorded above Floor 8 in Unit 4 did not extend into Unit 5. Instead, there was a second building which was bordered with cut-stones along its base.

The large wall above Floor 9 was present in both units. Unlike in Unit 4, however, a plaster floor extended from the top of the wall to the southern limit of Unit 5 (Fig. 26). On the small section of floor exposed by the excavation there was a single post hole which may have been associated with a perishable superstructure (Fig. 27). These features confirmed that the wall was part of a raised structure above Floor 9. From the base of the wall, Floor 9 extended to the north, south and east. A large post hole, approximately 40 cm in diameter,

**NORTH/SOUTH PROFILE
UNIT 5, STRUCTURE B-4
CAHAL PECH, BELIZE**

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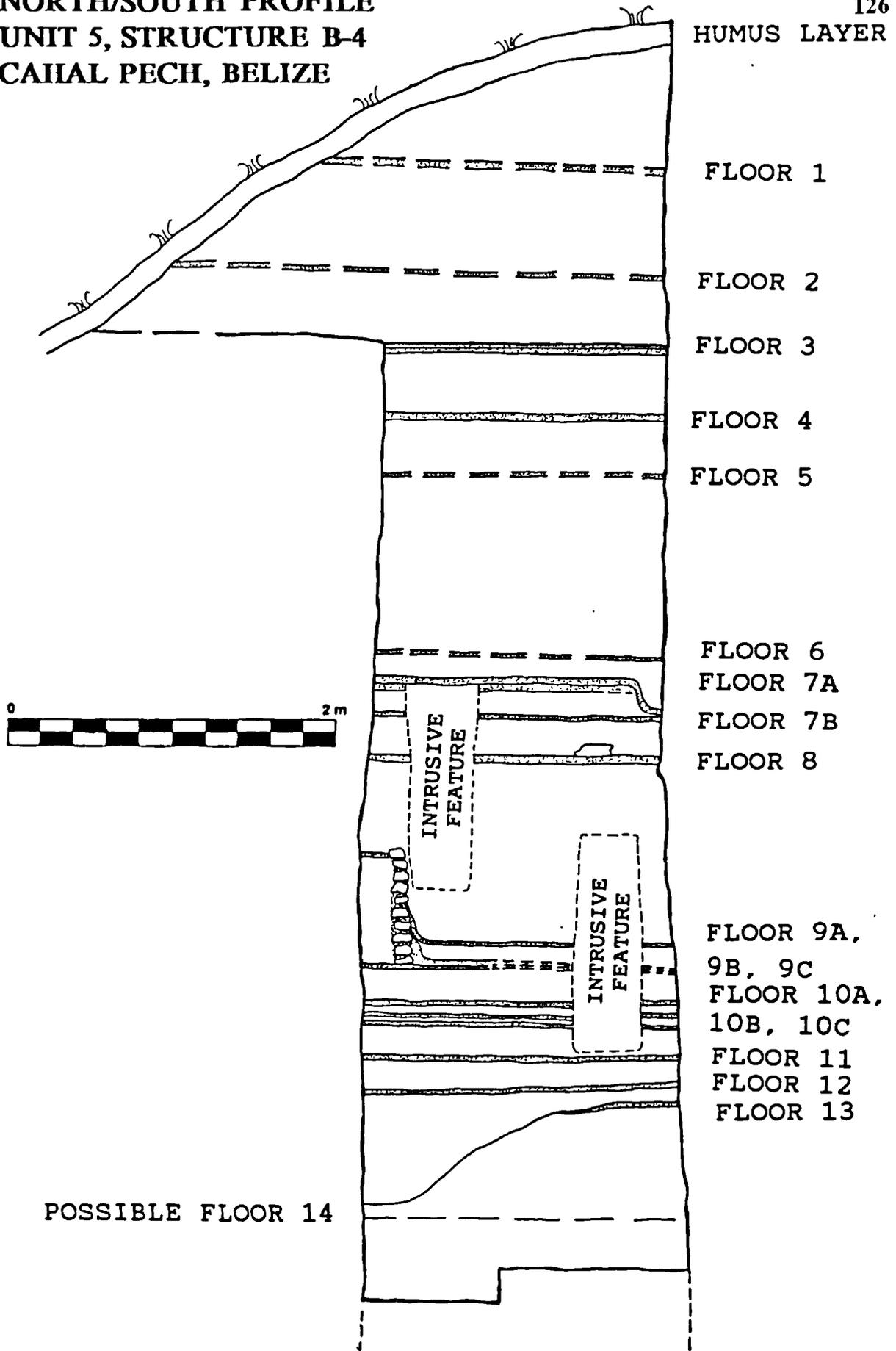


Figure 25: Cross-sectional profile of Unit 5, Str. B-4

was uncovered on the northwestern corner of this floor. At the base of the wall, we also discovered a cache (Cache 2) containing two greenstone beads, three perforated shell discs, and one irregular-shaped, shell pendant.

Immediately below Floor 9 there were two, previously unrecorded, plaster floors. Because the stratigraphic position of these floors suggested that the original Floor 9 (Floor 9C) was sequentially replastered, the three surfaces were labelled as Floors 9A, 9B, and 9C. Unlike 9A, which was preserved from the base of the wall to the north face of Unit 5, Floor 9B was only preserved along the base of the wall. The same was true for Floor 9C, but unlike 9A and 9B, this floor extended below and to the south of the wall. This association suggests that the wall, or raised structure, was constructed above Floor 9C, and that the latter (Floor 9C) represents the surface of a building platform. Directly beneath Floor 9C, and just north of the base of the wall, a cache (Cache 2) containing nine perforated shell discs and a large torso of an anthropomorphic figurine were discovered. The shell discs were spread over an area covering approximately 0.5 m X 0.5 m and probably represent a dedicatory cache.

Floors 10A, 10B, and 10C varied little between the two units. The one minor difference was that there was less burnt debris in Unit 5 than in Unit 4. Differences in the two units were also noted with Floor 11 and its associated architecture. Whereas in Unit 4 part of the wall of an apsidal building had been recorded at this level, this feature was not observed in Unit 5. The reason for this was that Unit 5 had been placed within the confines of the walled building exposed in Unit 4. This explains why the wall is absent in Unit 5, but present on the western border of Unit 4.

**NORTH/SOUTH PROFILE,
STR. B-4/5TH, UNIT 5
(RAISED STRUCTURE ON FL.9)
CAHAL PECH, BELIZE**

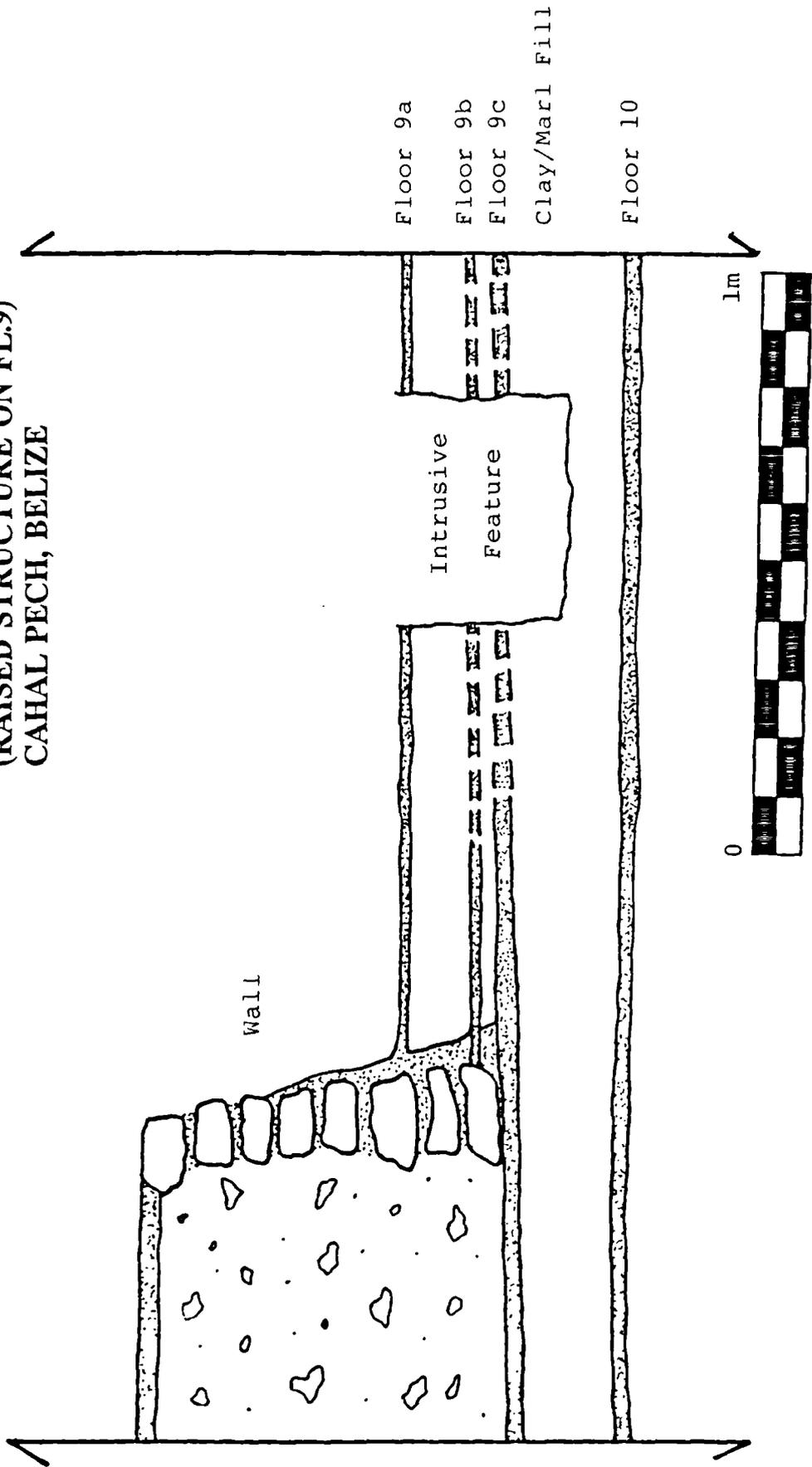


Figure 26: Cross-sectional profile of Floors 9 and 10, Unit 5, Str. B-4

**PLAN OF FLOOR 9
UNIT 5, STRUCTURE B-4
CAHAL PECH, BELIZE**

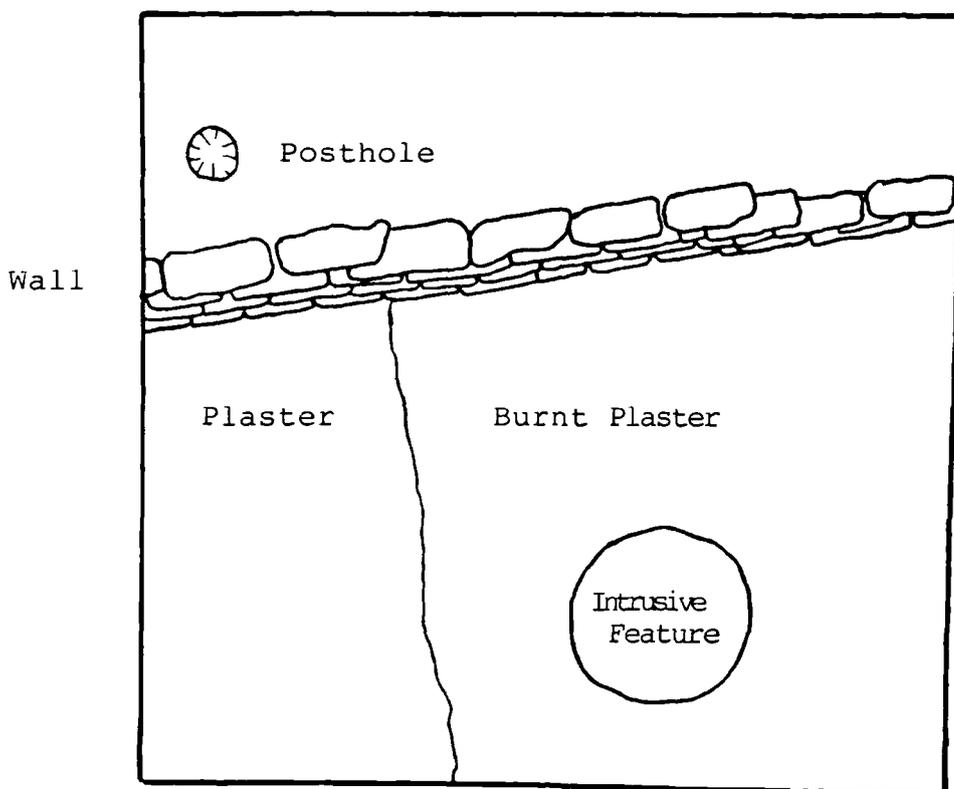


Figure 27: Plan of Floor 9, Unit 5, Str. B-4

The stratigraphy below Floor 11 produced the greatest divergence between the two units. Floor 11, for example, represented the earliest architectural level recorded in Unit 4. On the contrary, two earlier floors (Floors 12 and 13) were recorded in Unit 5. The earliest of the two floors, Floor 13, represents the surface of the first platform in the Str. B-4 sequence. This platform had been constructed on the edge of a small sloping hill with a view of the creek and hilly terrain on the southern periphery of the site core. Two roughly-carved steps on the incline suggest that a crude stairway may have provided access from the living area around the platform to the bottom of the hill (Fig. 28). (Interestingly, people living near high riverbanks and in hilly areas of Belize today still carve these crude steps on slopes to facilitate access.) At the top of the stairs the old ground surface had been scraped and levelled, and marl and clay had been tamped down to form the surface of a crude building platform. Four postholes above the platform provided the only evidence of a building. Artefactual remains were also limited in this level. They included a few jute shells and a small number of early Middle Formative sherds.

At the construction of Floor 12 the previous platform was covered with marl, dirt and clay, and part of the slope was filled to the level of the new floor. With the exception of a single posthole no other architectural feature was recorded above Floor 12 (Fig. 29). Cultural remains within the underlying fill of Floor 12 included pottery of early Middle Formative date (Chitam zoned-incised dichrome), several chert flakes, a cream-slipped figurine fragment, a crocodile mandible, and a single obsidian flake which is reminiscent of those found in Level 11 of Unit 4. (A crocodile mandible, similar to the Cahal Pech specimen, was recovered in Middle Formative contexts at Fabrica San Jose, Oaxaca by Flannery [1976, Fig.11.6])

**PLAN OF FLOOR 13
UNIT 5, STRUCTURE B-4
CAHAL PECH, BELIZE**

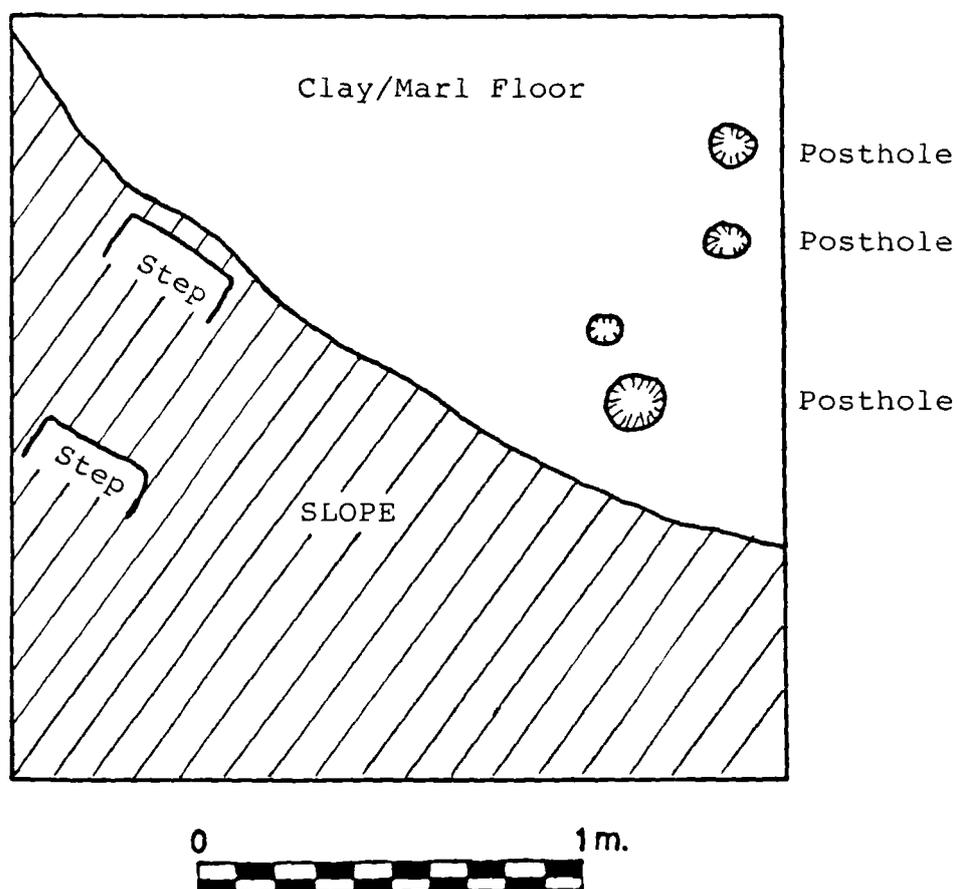


Figure 28: Plan of Floor 13, Unit 5, Str. B-4

PLAN OF FLOOR 12
UNIT 4, STR. B-4
CAHAL PECH, BELIZE

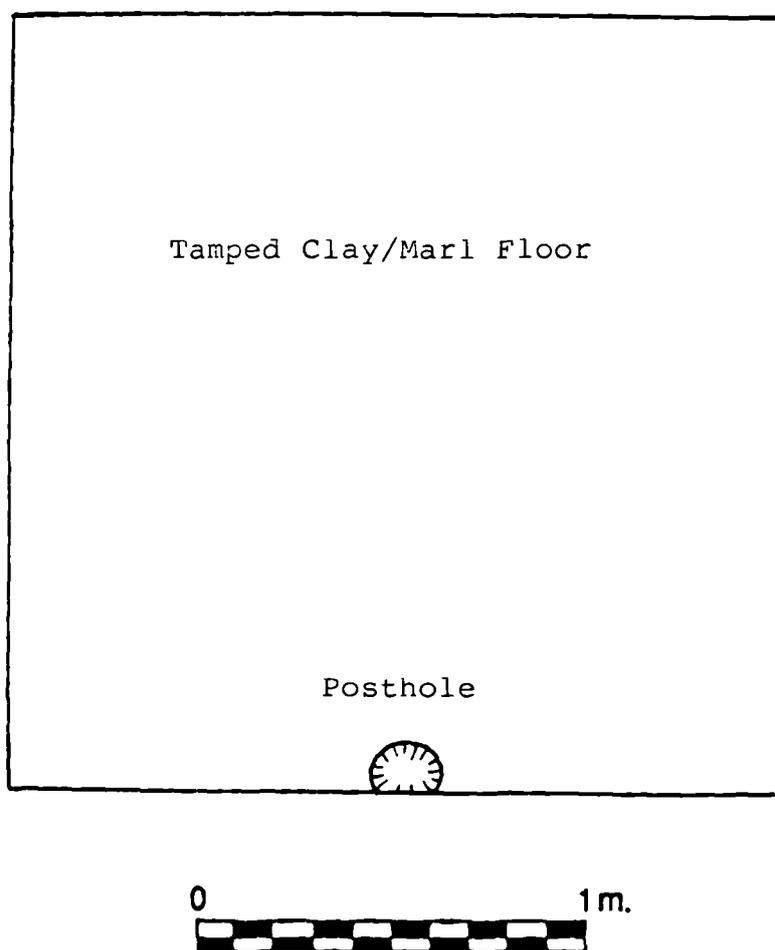
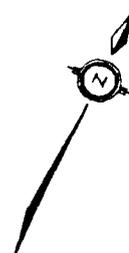


Figure 29: Plan of Floor 12, Unit 4, Str. B-4

Construction History of Str. B-4

Structure B-4 produced the longest construction sequence and history of occupation at Cahal Pech. Due to the limited size of the units which tested the earlier levels of occupation, the description of most architectural phases is, nevertheless, based on partial rather than complete data. Therefore, wherever applicable, any reconstruction that is speculative or based primarily on conjectural evidence will be acknowledged. Despite these limitations the information recorded in Units 4 and 5 provide a rare example from the Maya Lowlands of the stratigraphic documentation of an architectural sequence that spans from the early Middle Formative to the Late Classic period. With the exception of Cuello, Colha and Yaxha, few other sites in the central Maya Lowlands have produced stratigraphic sequences with as refined and lengthy a chronology as that of Str. B-4 at Cahal Pech

B-4\1st (Floor 13):

The earliest construction phase in the B-4 sequence was probably built ca. 1000 B.C. The absence of ballast and cultural remains below the tamped clay/marl surface of Floor 13 suggest that the original ground surface of the site was scraped and levelled prior to the construction of the first building. Drawing from analogy with sites in the greater Mesoamerican area, it is logical to assume that this superstructure was represented by a simple perishable building constructed of thatch, wattle and daub. Its location at the top of a slope, and within short walking distance from a creek, further indicate that early homesteads were constructed in areas with good drainage, access to nearby sources of water, and with a good view of the surrounding terrain.

B-4\2nd (Floor 12):

As with 1st, the only architectural features recorded for B-4\2nd were the tamped surface of a building platform (Floor 12) and a few postholes. These similarities suggest that there were no changes in the form or function of B-4, but it does indicate that the tradition of superimposing old architecture with new structures was already established by the first millennium B.C.

B-4\3rd (Floor 11):

At the construction of B-4\3rd a layer of marl, clay and dirt was deposited over the surface of 2nd and the fill was capped by a layer of tamped marl. After the completion of this building platform, a small apsidal structure, made of poles, mud, and thatch, was constructed above the floor (Floor 11). The base of this building was lined with two parallel rows of roughly-shaped stones, one to two courses in height (see Fig. 24). A second wattle and daub building may have been located near the apsidal structure, but the only evidence recorded for this architecture were two postholes along the northeastern and eastern boundary of Unit 4. Superstructures similar to the B-4\3rd building have been reported from early Jenney Creek levels at Barton Ramie (Willey et. al. 1965) and from Swasey levels at Cuello (Hammond 1977b; Gerhardt 1988). As at Cahal Pech, the excavation of the Barton Ramie buildings produced a quantity of pole impressed briquettes. A radiocarbon date from charcoal collected below the floor of 3rd produced a date of (Beta-56765) 2730 \pm 140 B.P. which calibrates between 1070 - 800 B.C. in the one sigma range (Table 1).

B-4\4th (Floor 10 A,B,C):

During the construction of 4th, the earlier B-4\3rd building, or buildings, were levelled,

covered with a layer of well-packed marl, then capped with a rough and uneven lime-plaster floor (Floor 10C). To the east, the floor of this substructure curved upward to a raised platform on which there was an oval-shaped hearth lined with stones (see Fig. 22). This hearth is similar to those recorded in Swasey levels at Cuello (Hammond 1977b:83).

Although no evidence of a superstructure was noted above Floor 10C, it is possible that a wattle and daub building, similar to that of the previous phase, was erected above the floor. Sometime after its construction this building was destroyed by fire. Evidence for this destruction is provided by the carbonized fragment of a support beam which was discovered amidst a large concentration of burnt briquettes and a thick layer of ash and charcoal above Floor 10C. A fragment of the support beam produced a radiocarbon date (Beta-40865) of 2740 ± 70 B.P., which calibrates to 999 (898, 868, 850) 827 B.C. This date places the construction of Floor 10C firmly within the early Middle Formative period.

Following the destruction of the building above Floor 10C, a new platform (Floor 10B) was constructed over the debris of the burnt superstructure. The 10B platform was later resurfaced with the addition of Floor 10A, but no evidence of a superstructure was found above any of the two floors. It is possible, however, that buildings associated with this phase may still be present in the unexcavated sections of B-4.

B-4\5th (Floors 9A, 9B, 9C):

The fifth construction phase was distinctly different from its predecessors. It consisted of a wide platform which supported a relatively large, raised structure. Postholes on the floors of the building platform and raised structure suggest that perishable buildings had been

erected on both surfaces. The function of the raised structure was difficult to ascertain, but the height (.70 m), large size, and morphology of this architecture probably reflect non-domestic purposes. Radiometric dating of a charcoal sample recovered at the base of the raised structure produced a date (Beta-40864) of 2720 ± 60 B.P. This calibrates in the 1 sigma range to 970 (893, 878, 835) 816 B.C. Both this date, and the associated pottery, place the construction of B-4\5th during the early Middle Formative period.

B-4\6th (Floor 8):

Between ca. 850-650 B.C. the platform and raised structure of 5th were replaced by B-4\6th. The latter is represented by a large platform (Floor 8) with two buildings. The eastern building had an apsidal shape and was lined with a single row of roughly-cut limestone blocks along its base (see Fig. 22). This eastern building may have also had a doorway facing west.

Due to the location of the excavation units, the form of the western building was more difficult to determine. The presence of several cut-stone blocks, plus three postholes, suggest that like the adjacent apsidal structure, this second building was probably constructed of wattle, daub and other perishable material.

B-4\7th (Floor 7A,B):

Constructed during the late Middle Formative period (600-300 B.C.), B-4\7th is represented by a structure (Floor 7B) which was slightly over 3.0 m above ground level. A low building platform (Floor 7A) at the summit of the structure supported a small circular building (Fig. 30). The walls of this superstructure were made of well-cut limestone blocks

which had been mortared together.

On the north face of the structure, a stairway provided access from Plaza level to the building platform. Two of the steps exposed by Units 4 and 5 exhibited the rounded contours typical of Formative period architecture in the Maya Lowlands (see Fig. 21). Charcoal recovered from the fill below Floor 7B produced a radiocarbon date (Beta-40863) of 2470 ± 90 B.P. This calibrates in the 1 sigma range to 791 (757, 689, 656, 645, 590, 577, 545, 458, 452) 407 B.C. This date confirms the late Middle Formative placement of B-4\7th. Along with the previous B-4 construction phases it also represents another rare example of Middle Formative architecture in the central Maya Lowlands.

B-4\8th (Floor 6):

Far less architectural data was recovered for B-4\8th than for most of the preceding construction phases. Floor 6, in fact, provides the only evidence that 7th was replaced by a new structure. The floor (Floor 6) of this platform was fairly thick, but the plastered surface was poorly preserved. There was also no discernible architectural feature above the floor, thus it is impossible to say whether the structure supported a building. Ceramic remains below Floor 6 suggest that like 7th, B-4\8th was constructed during the late Middle Formative period (650-350 B.C.).

B-4\9th (Floor 5):

B-4\8th was replaced by 9th during the transition from the late Middle Formative to the Late Formative period (450-250 B.C.). The platform (Floor 5) at the summit of 9th was approximately 2.5 m above Plaza B, and a stairway on the north face of the structure

**PLAN OF FLOOR 7A
 UNITS 4 & 5, STR. B-4
 CAHAL PECH, BELIZE**

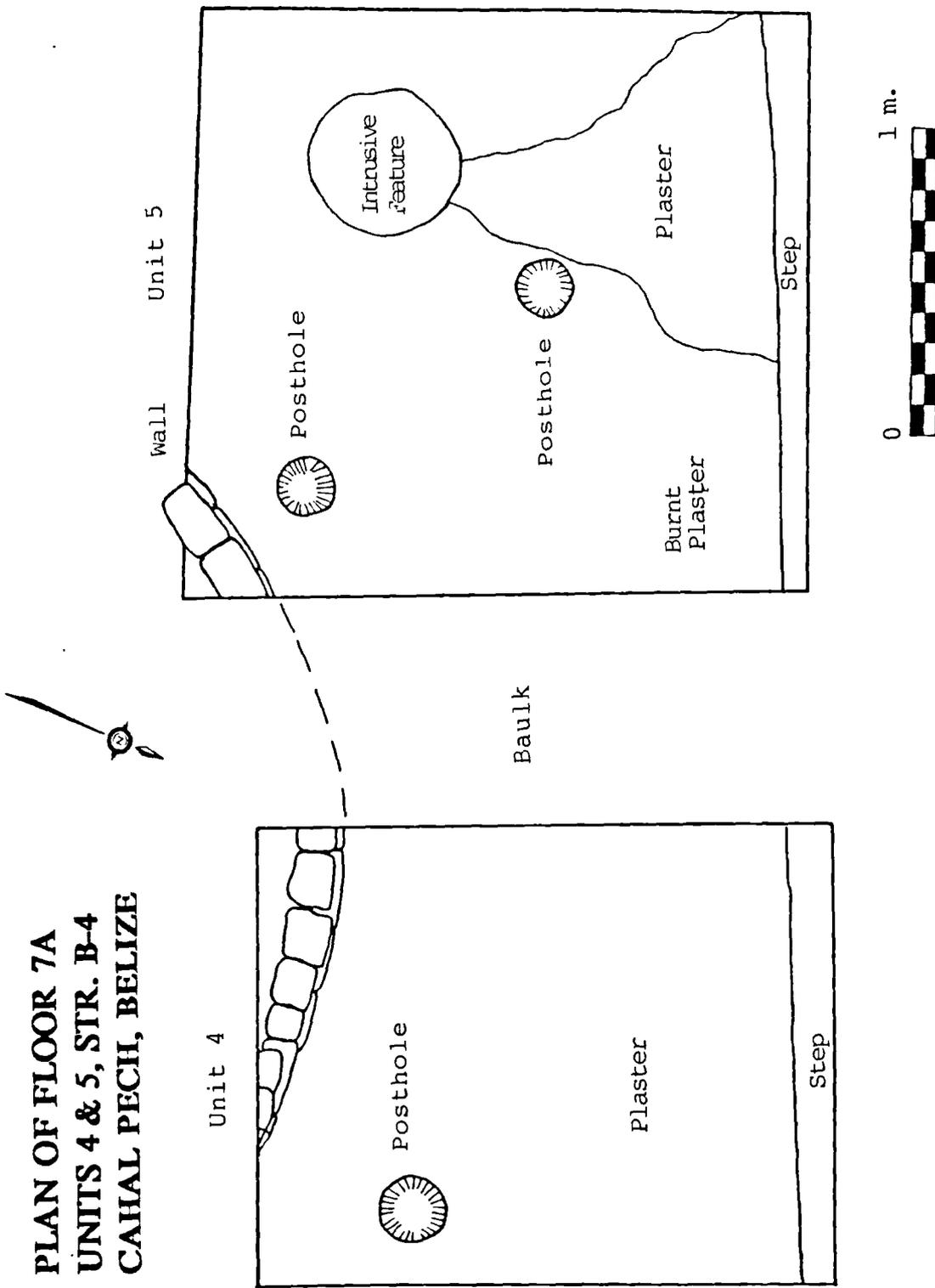


Figure 30: Plan of Floor 7a, Units 4 and 5, Str. B-4

provided access from the courtyard to the top of the platform. During the excavation of Unit 1, two perpendicular walls pertaining to a rectangular building above B-4\9th were uncovered. Due to the small size of this unit, however, it was not possible to determine the full dimensions of this building. The quality of the preserved sections of plaster floor, and the cut-stone blocks used for the B-4\9th building, nevertheless display improvements in construction techniques and the quality of material used for construction.

B-4\10th (Floor 4 & 3: Built between 250 B.C. and 150 A.D., B-4\10th (Figs. 31 and 32) is a unique example of Late Formative architecture in the Belize Valley. The structure has a wide central stairway that first ascends from plaza level to a narrow basal platform or landing, then rises six steps to a building platform (Floor 3). The latter is over three meters above the present surface of Plaza B. Flanking the stairway there are two stair-side outsets, each with a pair of masks. Due to the poor preservation of the masks it was impossible to accurately determine their iconographic representation. It is possible, however, that they may have depicted sun gods.

The building platform (Floor 3) at the summit of B-4\10th is relatively wide and has an inset step to the north. Three postholes which penetrated the floor, plus the inset step, suggest that some type of perishable superstructure stood above the platform. Like other Late Formative buildings at Cuello, Cerros and Uaxactun (c.f. Gerhardt 1990, Loten 1990), the



Figure 31: Structure B-4 prior to excavation in 1988

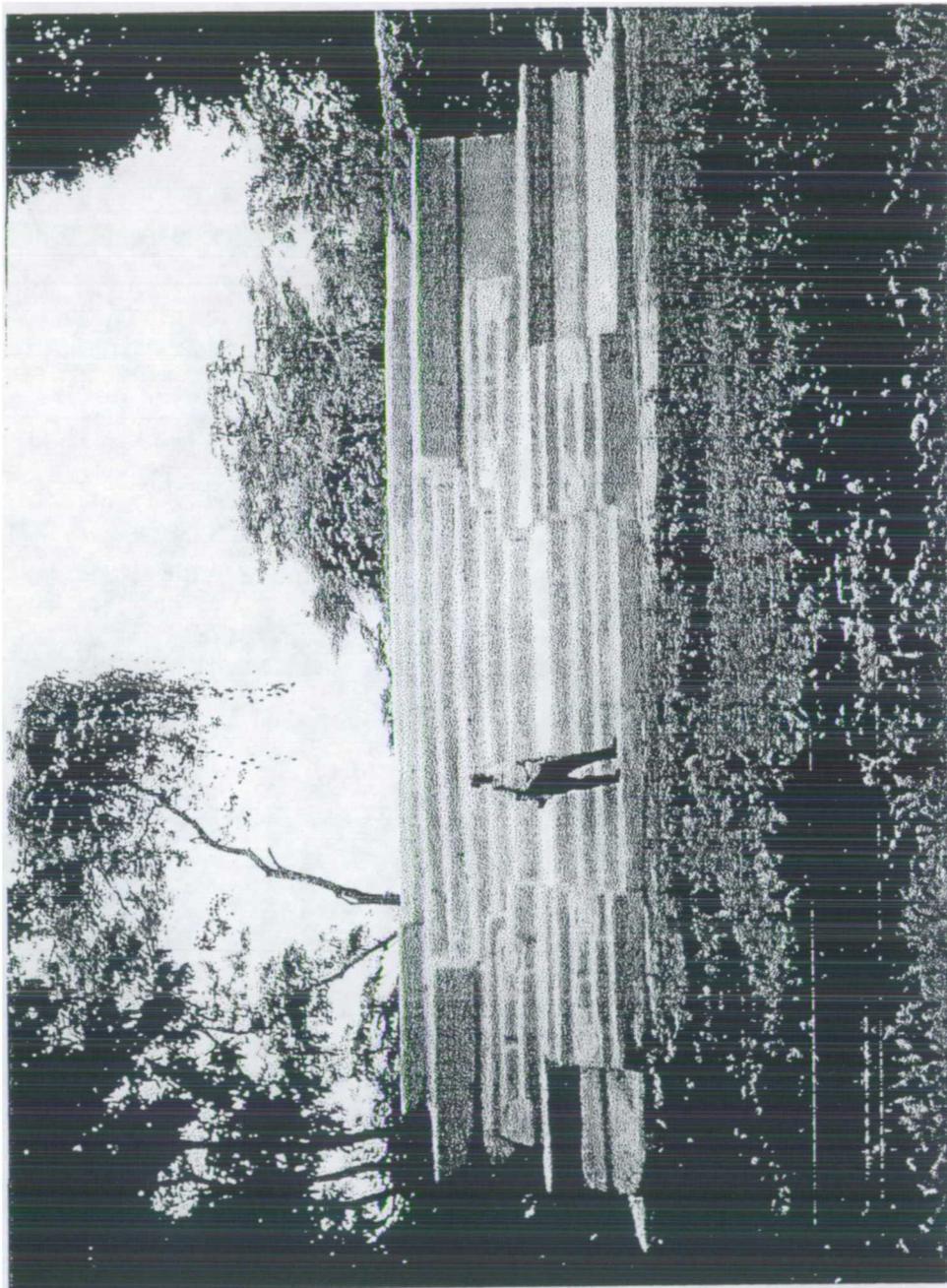


Figure 32: Str. B-4/10th-11th after consolidation and reconstruction

corners and edges of the platform and steps of B-4\10th have rounded rather than sharp contours. The cut-stones used in construction are also much larger than those generally used in Classic period architecture.

B-4\11th (Floor 2):

The construction of B-4\11th only made minor modifications to the form and style of 10th. Most of these changes were concentrated on the north face of the structure. In this area, a new stairway, which incorporated the first four steps of the previous phase, was constructed over the basal platform and upper stairway of B-4\10th. A larger building platform, about 52 cm above that of 10th, was then constructed at the top of the structure. No evidence of postholes or cut-stone walls were found above this platform, thus there may have been no building at the summit of B-4\11th. The large limestone blocks used in the construction, the rounded contours of the steps, plus the ceramics recovered in the fill indicate that B-4\11th was erected between the second and third centuries A.D.

B-4\12th (Floor 1):

Although this final construction phase was in a relatively poor state of preservation, there was enough evidence to suggest that it completely altered the form and style of the previous architecture. The terminal structure had a central stairway leading up from Plaza B to a large platform. Preserved sections of two cut-stone walls above the platform indicate that the latter supported a masonry superstructure which probably enclosed a relatively large vaulted room. The limestone blocks used in the construction of the vaulted building were much smaller than those used in the earlier sub-phases of B-4, but similar to those employed in Classic period architecture at the site. This architectural parallel, plus a tall polychrome vase found in Burial

B-4:1 (described in the axial trench excavation) suggest that the terminal phase of B-4 was constructed during the early part of the Late Classic period. Stela 5, which is located at the base of the structure, may have also been erected during this time.

Structure B-5

Structure B-5 is a long, range-type, mound that sits on the southeastern corner of Plaza B. Prior to excavation it had a deep T-shaped looter's tunnel that entered the mound from its southern side then veered east (at midsection) into the long axis of the structure. In the process of tunnelling into the mound the looters exposed part of a masonry wall and doorway of the penultimate phase building. In 1988 we cleared the looter's excavation then penetrated the building platform. These operations were conducted in order to ascertain the form of the penultimate structure, and to determine the construction sequence of B-5.

Operation B-5:1

This operation removed most of the debris left behind by the looters, and it exposed the southern end of the penultimate architectural phase. The latter consisted of a masonry building with a very wide (6.10 m) vaulted room (Fig. 33). It is possible that the roof of the building had collapsed partly due to the stress caused by the vaulting of such a wide chamber. A narrow and low doorway, facing Plaza F to the south, provided the only access into the room. Within the room there were three very high (1.10 m) benches that covered most of the available space. The top of these benches was only 70 cm lower than the top of the doorway. Pottery recovered from the fill of the terminal phase structure included a mix of Formative and Classic period material.

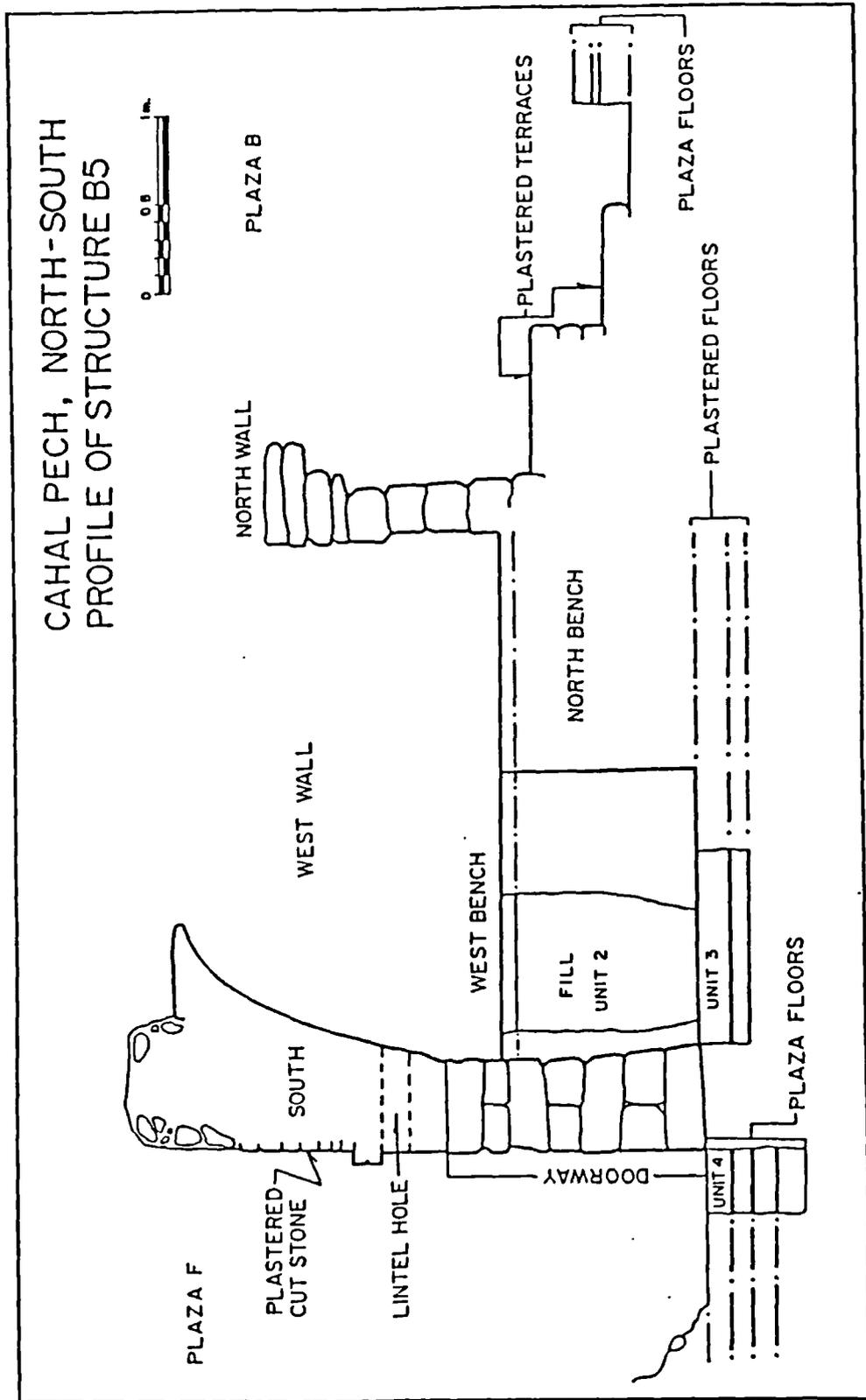


Figure 33: Cross-sectional profile of Str. B-5

Operation B-5:2

Operation B-5:2 was a 1.0 X 1.0 m unit which was placed on the west bench of the room. Its two objectives were to determine the date of construction of the bench, and to investigate whether the latter contained any burial. The unit descended from the surface of the bench to the floor of the penultimate phase platform. No burial was found, and pottery recovered in the excavation indicated that the bench had been constructed between the terminal Formative and Early Classic period.

Operation B-5:3

This small (0.50 X 1.25 m) unit was excavated in the narrow passageway between the three benches of the penultimate (B-5\3rd) building. Its main purpose was to determine the date of the second last construction phase. The unit descended 40 cm and exposed two floors beneath that of the penultimate phase. The ceramic remains beneath the two lowermost floors were primarily Late Formative in date. Those below the penultimate construction phase were predominantly Late Formative mixed with a small number of Early Classic types.

Operation B-5:4

This 0.5 X 0.5 m unit was excavated directly in front of the doorway of the vaulted building. The purpose of the unit was to search for cultural material that would confirm the Late Formative/Early Classic date of the penultimate phase of construction, and to investigate the earlier substructures recorded in Unit 3. The excavation descended 0.70 m below the floor of the penultimate phase building and exposed two earlier floors. No evidence of buildings were recorded above these floors, but pottery in the fill below both surfaces was predominantly Late Formative in date. This material confirmed that B-5\1st and 2nd were

constructed during the Late Formative and that B-5\3rd was erected between the Late Formative and Early Classic period.

Construction History of Str. B-5

The two Late Formative floors recorded in Unit 4 represent the earliest architecture exposed by the B-5 operations. These floors probably functioned as the surfaces of building platforms which may have originally supported perishable buildings. However, no evidence of these superstructures were noted during excavation.

The penultimate phase of B-5 was constructed between the Late Formative and Early Classic periods. This construction (B-5\3rd) consisted of a vaulted, range-type building atop a low platform (Fig. 34). Within the building there were two, and possibly three, rooms. The southeastern room, which had been tunnelled into by looters and which was partially exposed by Operation B-5:1, was quite different from other vaulted rooms uncovered at the site. It had an unusually narrow (56 cm) and low (1.50 m) doorway, and three very high (1.10 m) benches which were two-thirds the height of the doorway. The benches bordered a short (1.6 m) and narrow (0.56 m) passageway and provided limited space to manoeuvre inside. These characteristics suggest that this room may have served some special function other than civic or domestic. The extended width of the room must have also caused severe stress on the corbelled vault, thus it is possible that the narrower rooms of later architecture reflect a conscious effort to address this structural problem.

Due to poor preservation and the looters destructive excavations, very little can be said about the final construction phase. The data recovered by the B-5 Operations nevertheless

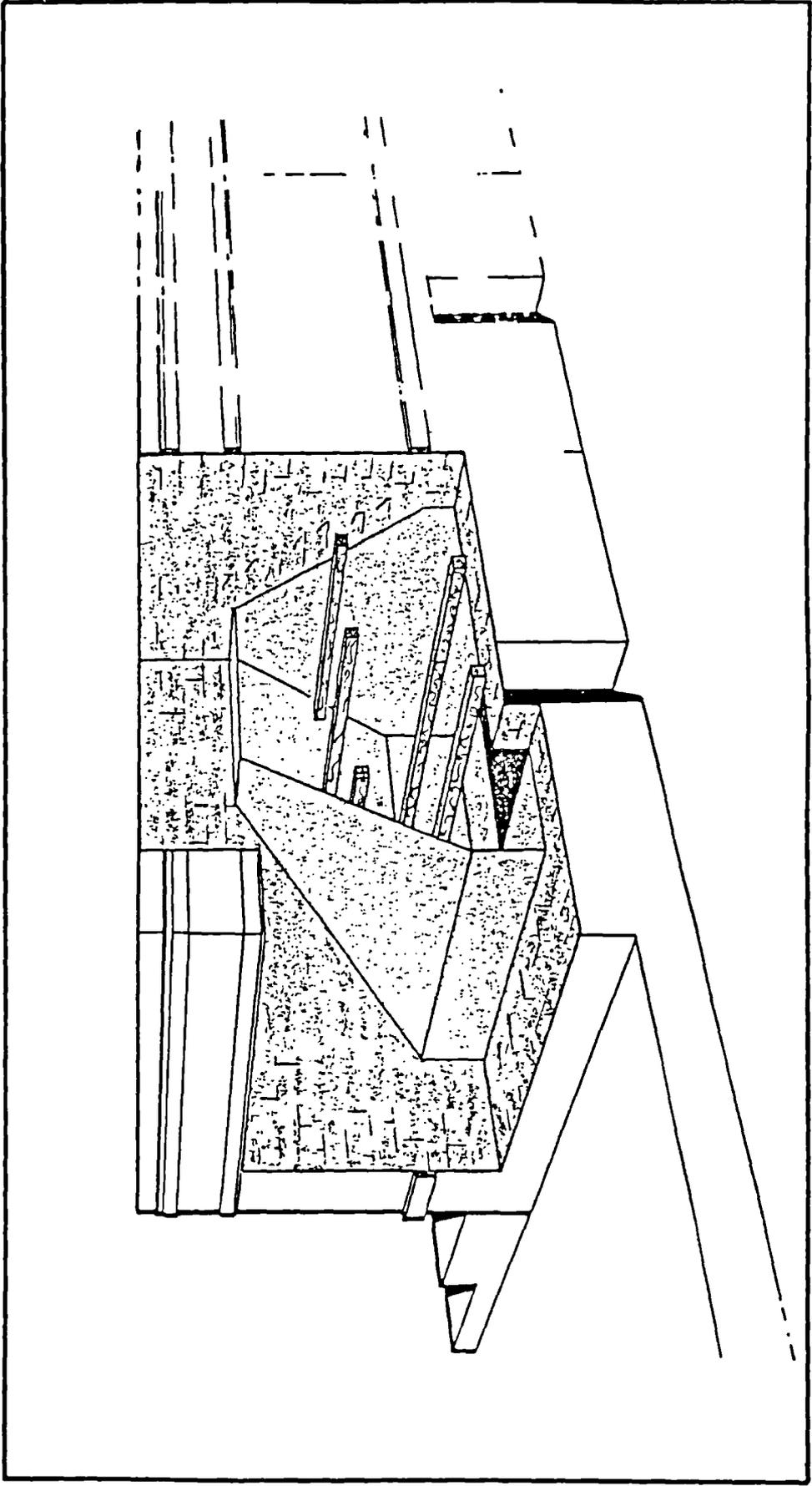


Figure 34: Artistic reconstruction of Str. B-5, Cahal Pech, Belize

indicate that the structure was erected during the Late Classic period. It also suggests that the architecture may have consisted of a stepped platform with a perishable superstructure. This interpretation, however, is tentative and confirmation must await further investigations.

Plaza B Operation

The Plaza B excavation was placed 6.0 m north of Str. B-4. The unit measured 1.5 m X 1.5 m, it descended 1.96 m to sterile level, and exposed five plaza floors (Fig. 35). Floor 5 probably dates between the fourth and third century B.C., and may be contemporaneous with the 8th construction phase of Str. B-4. Floor 4 was laid down during the first half of the Late Formative period and is coeval with Str. B-4\9th. Floor 3C was resurfaced twice and these replasterings are represented by Floors 3A and 3B. These three Late Formative plaza floors may be associated with the 10th construction phase of B-4. Floor 2 correlates with terminal Late Formative B-4\11th, while Floor 1, like B-4\12th and B-2\9th, dates to the Late Classic period. It is also possible that Floor 1 may have been resurfaced at least once, but due to poor preservation this was difficult to verify.

Plaza C: Description, Excavations and Construction History

Description of Plaza C

Plaza C is located at the eastern end of the site core. It is approximately 2.0 m lower in elevation than Plaza B and contains seven structures. To the east, the courtyard is bordered by a small mound (Str. C-1) which abuts a long, low platform (C-2) with a north/south axis. To the west are B-1, B-2, and B-3. On the north side there is a raised platform (C-3) that may have supported one or more perishable superstructures. Northeast of C-3 there are two low-lying mounds which, although not facing towards Plaza C, were also included within the

**PLAZA B, EAST PROFILE,
UNIT 1, 1990 CMB**

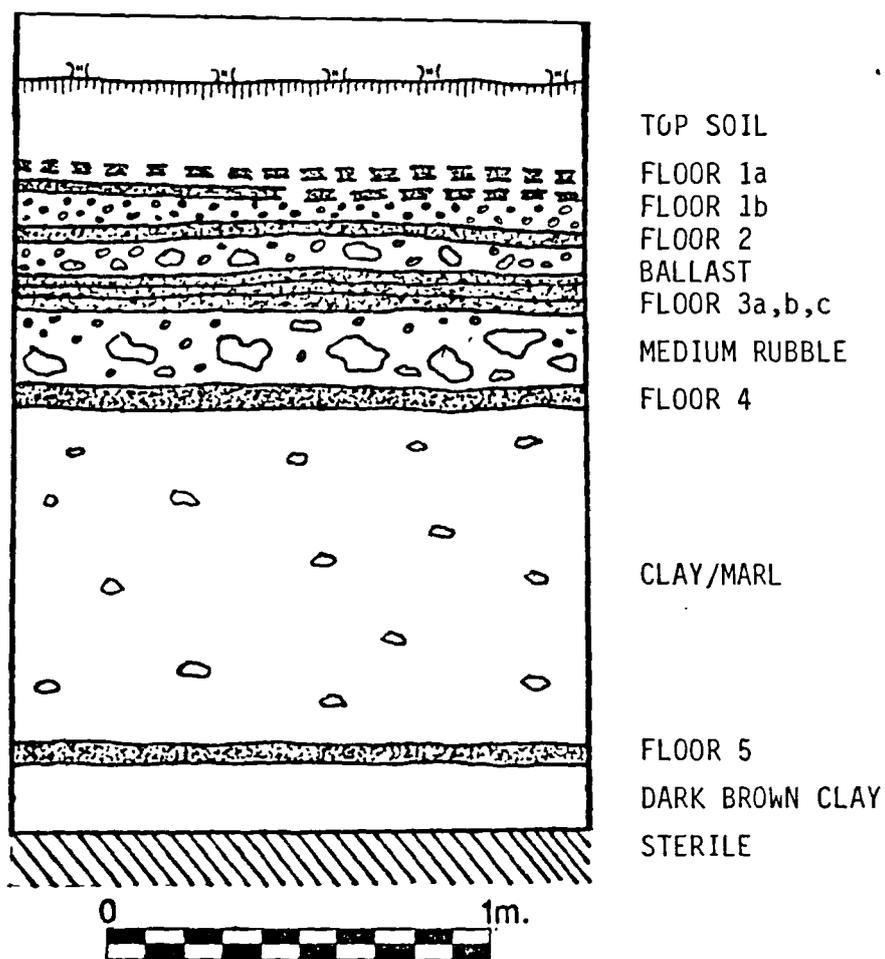


Figure 35: Cross-sectional profile of Plaza B

group. The southern border of the courtyard is delineated by Str. C-6. Within the plaza, and just north of C-6, two identical and parallel structures (C-4 and C-5) form the eastern ballcourt.

In 1950, Satterthwaite discovered two stelae within Plaza C. Stela 1 was found at the northeastern base of Str. C-6, and Stela 2 was located a few meters to the north, next to the southeastern base of Str. C-5. During the 1988 season several of Satterthwaite's old excavation units were discovered in Plaza C. The excavations were located on Strs. C-1, C-4, C-5, and C-6. More recently, looters had tunnelled into the eastern side of C-5, and they had dug a small pit at the summit of C-6. Operations of the current project in Plaza C investigated Str. C-5 and C-6, and they included a plaza unit to the north of C-6.

Structure C-5

As previously indicated, C-5 is one of the two structures which form the eastern ballcourt. The mound is approximately 4.5 m tall, 12 m wide, and 15 m long. In 1950 Satterthwaite excavated several units on C-5 in order to determine the size and form of the structure.

Operation C-5:1

Excavation on Str. C-5 consisted of a shallow (0.50 m deep) 1.0 X 4.0 m unit which stripped a narrow section off the west face of the mound. The operation was conducted in order to confirm the accuracy of Satterthwaite's profile, and to determine the date and architectural style of the ballcourt.

Results of the excavation indicated that Satterthwaite's reconstruction was accurate, and

that the Classic period ballcourt (Fig. 36) is similar in style to contemporaneous ballcourts at Pacbitun (Healy 1992) and Tikal (Coe 1988).

Structure C-6

Structure C-6 is located on the southern border of Plaza C. It is approximately 15 m in length, 7 m in width, and 2.30 m in height. Prior to our research the mound had been tested by Satterthwaite in 1950, and vandalized by looters during the last 10 years. The looters did minor damage to the summit of the structure, and there is no information regarding the results of Satterthwaite's investigation.

Operation C-6:1

This 2.5 X 6.0 m trench was placed across the central north face of Str. C-6. Its purpose was to determine the morphology and date of construction of the architecture.

After stripping the humus and collapsed debris off the terminal phase structure the excavation penetrated 2.5 m into the center of the mound. A subsequent extension on the north side of the trench descended 1 m below surface (Fig. 37). These operations partially exposed the two last phases of construction and penetrated two plaza floors. Sterile level was not reached due to the closure of the excavation season. Below the first plaza floor, at the southeastern corner of a stair side associated with the terminal phase structure, a cache containing two Late Classic ceramic dishes was discovered. At the center of the mound the excavation also exposed an apron which was associated with the penultimate structure (C-6\Sub 1). Since this architectural feature only extended toward the west it was decided to expand the unit by 2 m in that direction. This exposed two more aprons and indicated that

**EAST/WEST PROFILE
OF EAST BALLCOURT
CAHAL PECH, BELIZE**

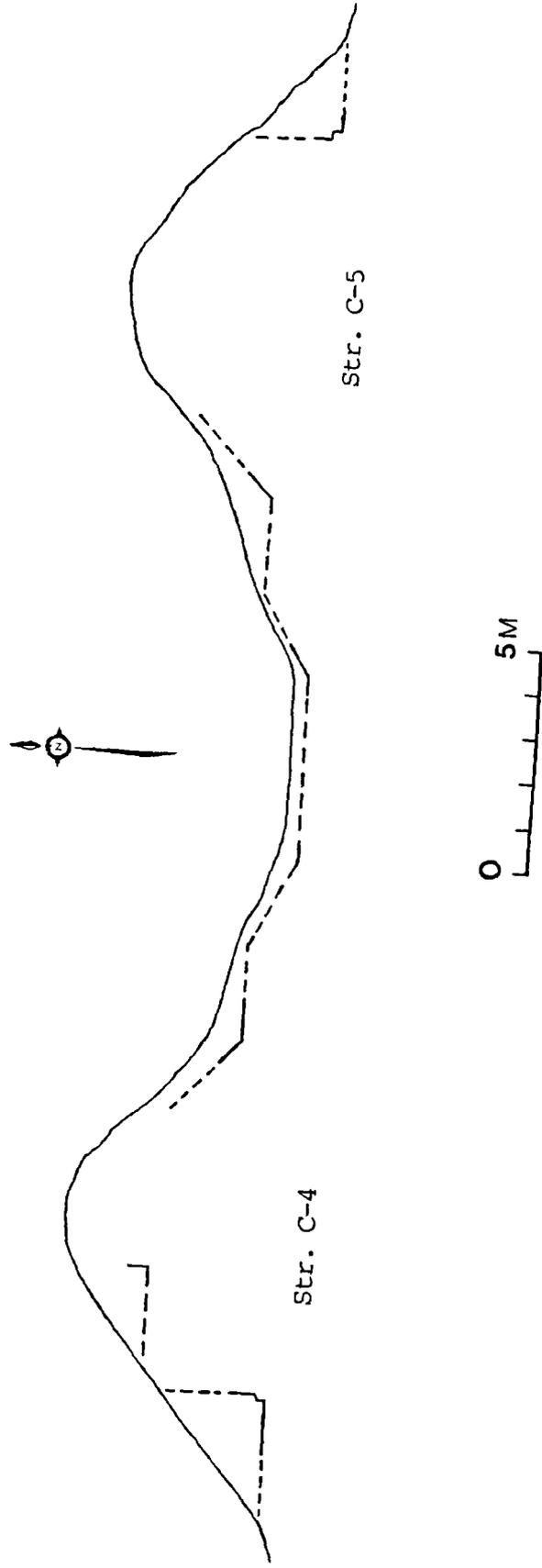


Figure 36: East/west profile of east ballcourt

**NORTH/SOUTH PROFILE
STRUCTURE C-6
CAHAL PECH, BELIZE**

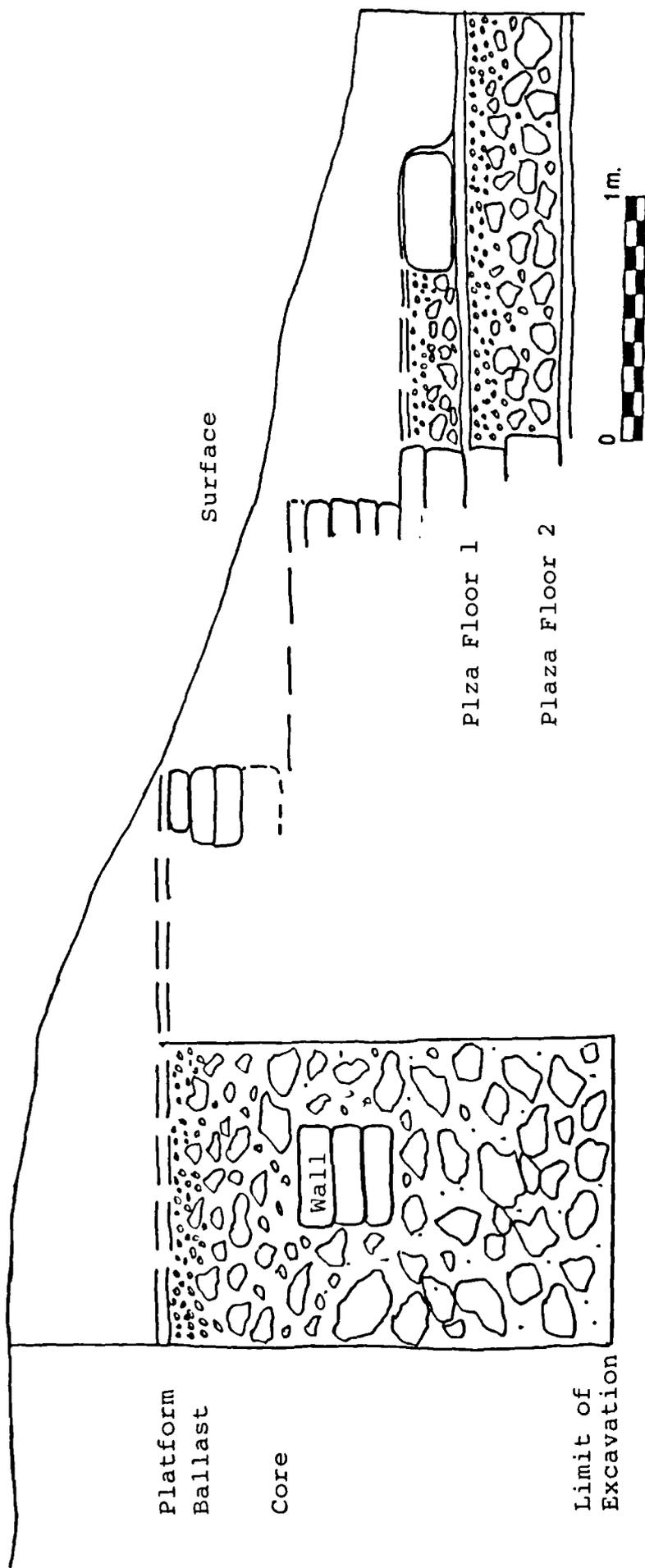


Figure 37: Cross-sectional profile of Str. C-6

C-6\Sub 1 was either half the size of the terminal phase structure, or that prior to the last construction phase there were two (instead of only one) small platforms on the southern border of the plaza.

Construction History of Str. C-6

The penultimate structure (C-6\Sub 1) is the earliest architecture exposed by Operation C-6:1. An earlier construction phase (dating to the Early Classic period) may lie below this sub-structure, but since Unit 1 had to be terminated before reaching sterile level there was no time to investigate this architecture.

The limited data produced by Operation C-6:1 also makes it difficult to provide an accurate description of the style and form of the penultimate structure. As indicated above, this subphase may have been approximately half the size of the terminal phase, or there may be two morphologically similar platforms beneath the architecture of terminal phase C-6. In regard to function, C-6\Sub 1 may have served as the original end-zone building of the ballcourt. This is suggested by its location, and by its contemporaneity with the early Late Classic ballcourt buildings.

Terminal phase C-6 completely modified the earlier structure or structures. This terraced platform was approximately 1.50 m high, and it had an outset stairway on the central north face of the structure. In conjunction with these architectural modifications, Plaza C was resurfaced and a dedicatory cache containing two vessels was deposited at the southeastern corner of the stairside. The date of the two cache vessels suggests that these final modifications to C-6 were conducted between 600 and 700 A.D.

Plaza C Operation

The operation in Plaza C measured 1.0 m X 1.0 m, and was located just north of Str. C-6. The purpose of the excavation was to penetrate the plaza to sterile level in order to determine whether there was any Formative period construction in the courtyard.

The unit descended 1.46 m from surface to sterile level and uncovered three plaza floors (Fig. 38a). The earliest floor was 1.18 m from surface and dates to the latter half of the Early Classic period. The two subsequent floors (Floors 2 and 1), which were also exposed in Operation C-6:1, are Late Classic in date and were constructed during the seventh and eighth centuries A.D. No evidence of occupation during the Formative period was recorded.

Plaza D: Description, Excavations and Construction History

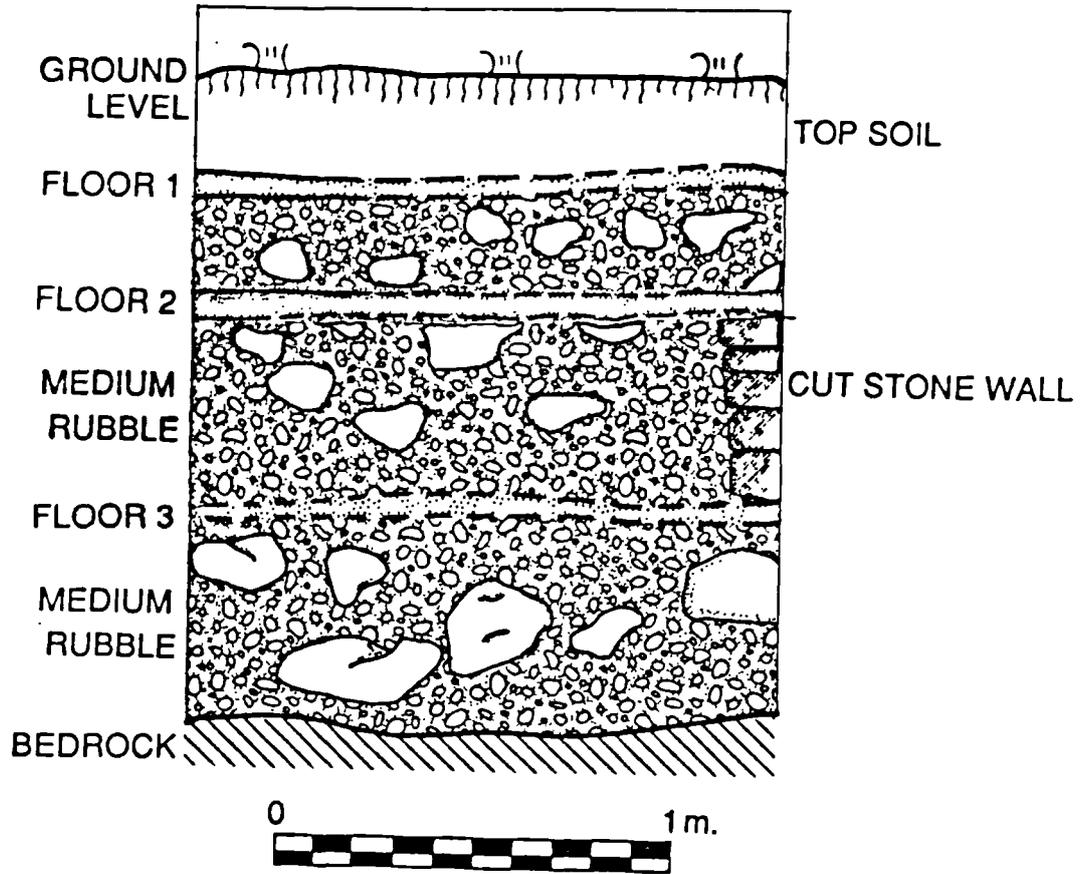
Description of Plaza D

Plaza D is located to the southwest of Plaza A, and is one of the smallest courtyards in the site core. The plaza measures approximately 12 m by 14 m and is bordered on the north by Strs. D-1 and D-2, to the west by D-3, to the south by D-4, and by A-1 to the east. Like Plazas A and E, access into Plaza D is restricted and limited to a few narrow doorways and/or passageways within its perimeter structures. Between 1988 and 1990, two units were excavated in Plaza D, but neither produced evidence of Formative period occupation.

Plaza D Operation 1

The main purpose of this 1.5 X 1.5 m unit was to search for evidence of Formative period occupation in Plaza D. The excavation descended 3.68 meters from surface to sterile level, and penetrated three plaza floors (Fig. 39). Pottery recovered below the three floors

**PLAZA C, SOUTH PROFILE,
UNIT 1, 1990 CMB**



**PLAZA F, NORTH PROFILE,
UNIT 1, 1990 CMB**

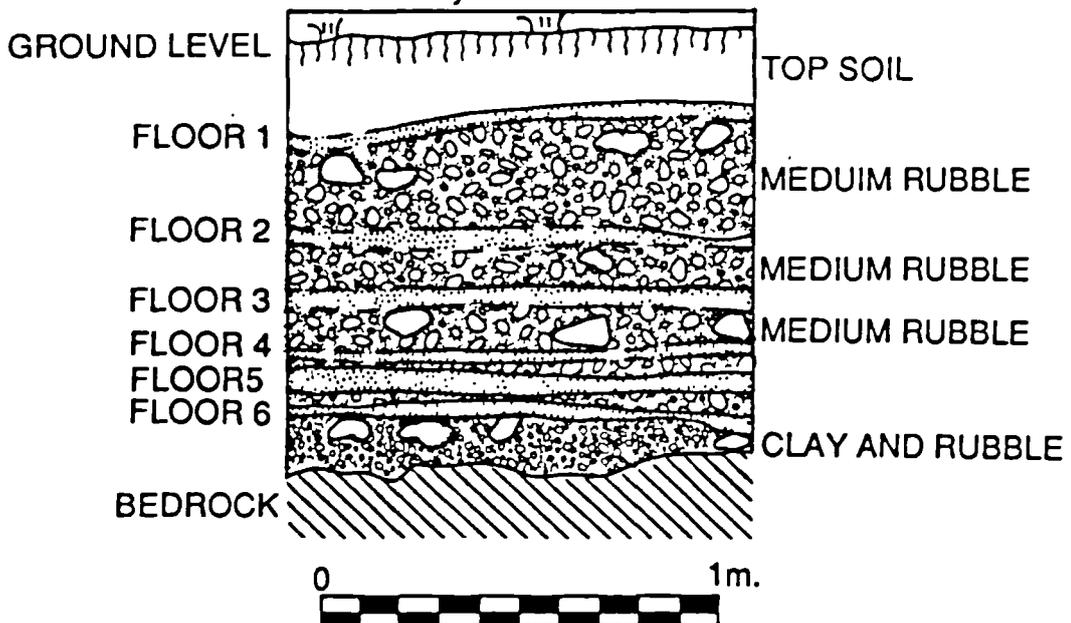


Figure 38: Cross-sectional profile of Plazas C and F

PLAZA D, WEST PROFILE, UNIT 1, 1990 CMB

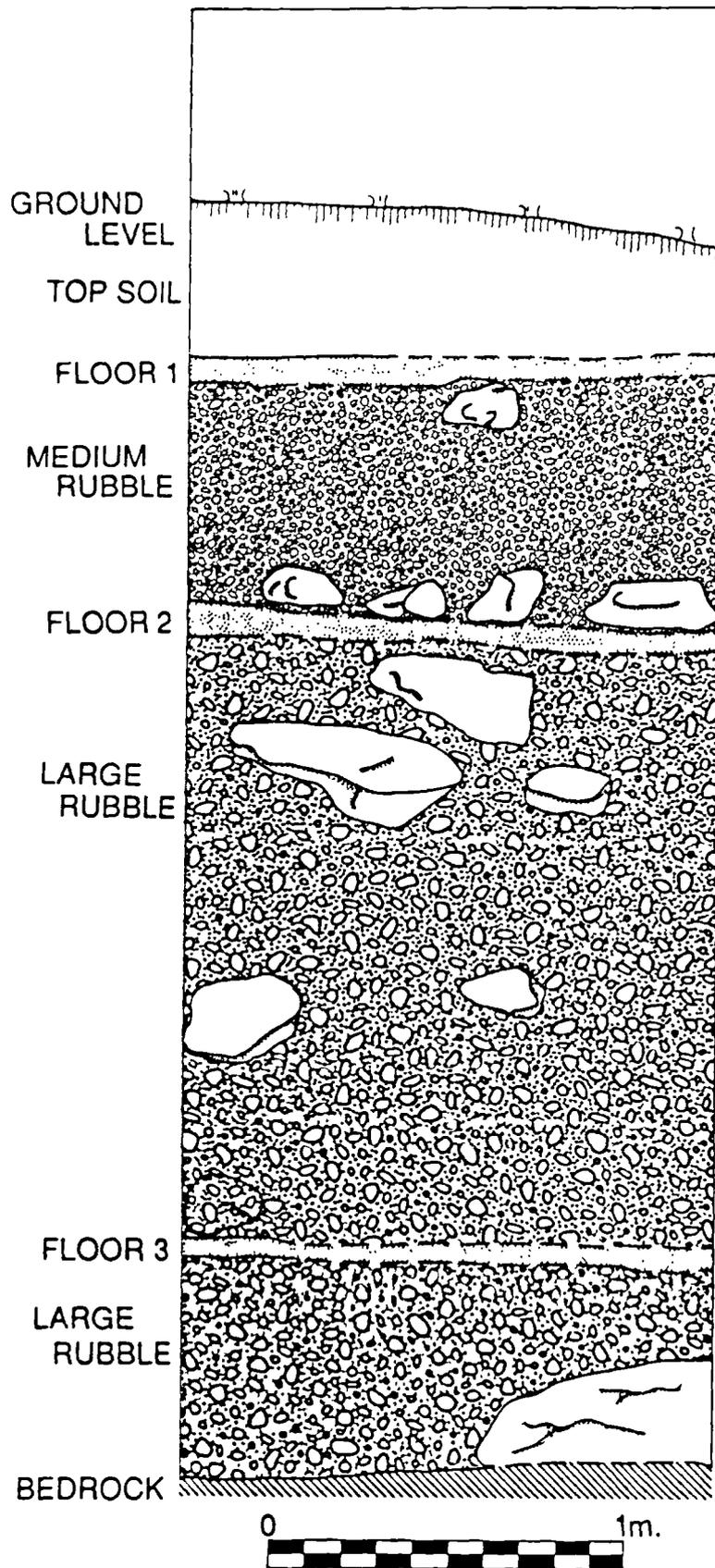


Figure 39: Cross-sectional profile of Plaza D

suggests that they were all constructed during the Classic period.

Plaza D Operation 2

Operation 2 in Plaza D was conducted for tourism related reasons rather than for research interests. The purpose of the 1.0 X 1.0 m unit was to ascertain the level of preservation of the terminal phase structure.

The operation revealed that D-2 was in an average state of preservation. The unit also produced a large amount of Late Classic pottery which indicated that the structure was still in use between the eighth and ninth centuries A.D.

Plaza E: Description, Excavations and Construction History

Description of Plaza E

Plaza E is located just south of Plaza D, and is approximately similar in size to the latter. The courtyard is enclosed by Str. D-4 to the north, by E-1 to the east, E-2 to the south, and E-3 to the west. Like Plazas A and D, access into Plaza E is restricted and limited to doorways within the perimeter buildings. During the 1988 season it was noted that both E-1 and E-2 had been vandalized by looters. Partly because of the damage to the mound, and because the structure differed in size and form from other mounds in the courtyard, E-1 was selected for investigation towards the end of the field season. A second unit was excavated in the center of the plaza during the summer of 1990.

Structure E-1

Structure E-1 lies on the eastern perimeter of Plaza E and overlooks Plaza G

approximately 12 meters below. To the west, the summit of E-1 stands 5.0 m above Plaza E, and the mound extends from the southwestern corner of A-1 to the northeastern edge of E-3. On the primary axis of the structure there was a wide looter's pit which had exposed a small section of a vault spring. In 1988 this excavation was cleared in order to assess the damage done by the looters, and in order to expose the terminal phase architecture for reconstruction.

Operation E-1:1

This 1.5 m wide by 8 m long trench was placed across the western primary axis of Str. E-1. The purpose of the unit was to assess the level of preservation of the structure, and to determine its date of construction.

Due to the size of the mound, and the mid-season start of the operation, the excavation only exposed two phases of construction (Fig. 40) before being terminated. The penultimate phase consisted of a raised building platform with a stairway leading down to Plaza E. The platform may have supported a building, but no evidence of this superstructure was recorded. Pottery within the fill of the platform suggests that it was constructed during the early part of the Late Classic period.

The terminal phase structure consists of a relatively large platform with a long vaulted building. The building has three rooms with central doorways facing Plaza E. The central room, which was exposed by Operation E-1:1, has a wall to wall bench with an moulding along the top. The bench, floor and the lower section of the rear wall were originally painted in red. A low vaulted doorway provided access from the platform into the room. Ceramics

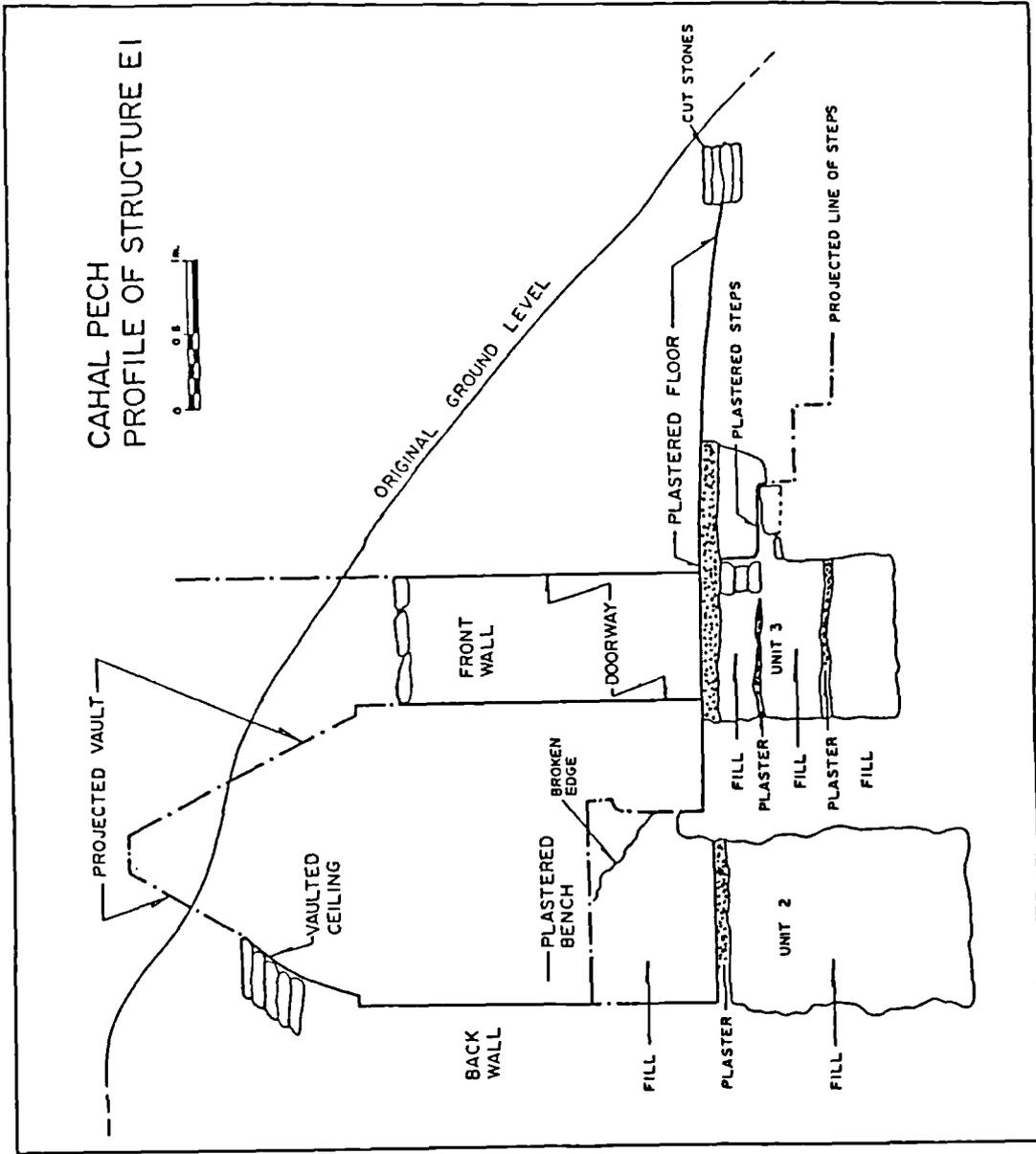


Figure 40: Cross-sectional profile of Str. E-1

recovered below the floor and bench indicate that the terminal phase structure was erected during the eighth century A.D.

Plaza E Operation

The Plaza E unit was excavated in the center of the courtyard. After descending nearly 6 m below surface the excavation was discontinued due to the difficulties and danger involved with the extraction of large core fill. The operation exposed five plaster floors and sections of two earlier buildings associated with Plaza Floors 3 and 4 (Fig. 41). Ceramics recovered below the five floors were predominantly Late Classic in date. This indicates that an enormous amount of architectural energy was expended on Plaza E during a relatively short period of time (650-900 A.D.), and that the courtyard was unoccupied during the Formative period.

Plaza F: Description, Excavations and Construction History

Description of Plaza F

Plaza F is located several meters below and to the east of Plaza E, and south of Strs. A-1, A-2, and B-5. An open space between the latter two structures provides the only access to Plaza F from Plaza B in the north. A similar, but narrower, passage between Strs. B-5 and F-2 also connects Plaza F to Plaza G. Str. F-1 was excavated during the summer of 1988, and a second operation tested the plaza during the 1989 season.

Structure F-1

Structure F-1 is a long, low mound which borders Plaza F to the south. The mound is approximately 12 m wide, 36 m long, and 1.95 m high. To the west the mound abuts the

PLAZA E, SOUTH PROFILE,
UNIT 1, 1990 CMB

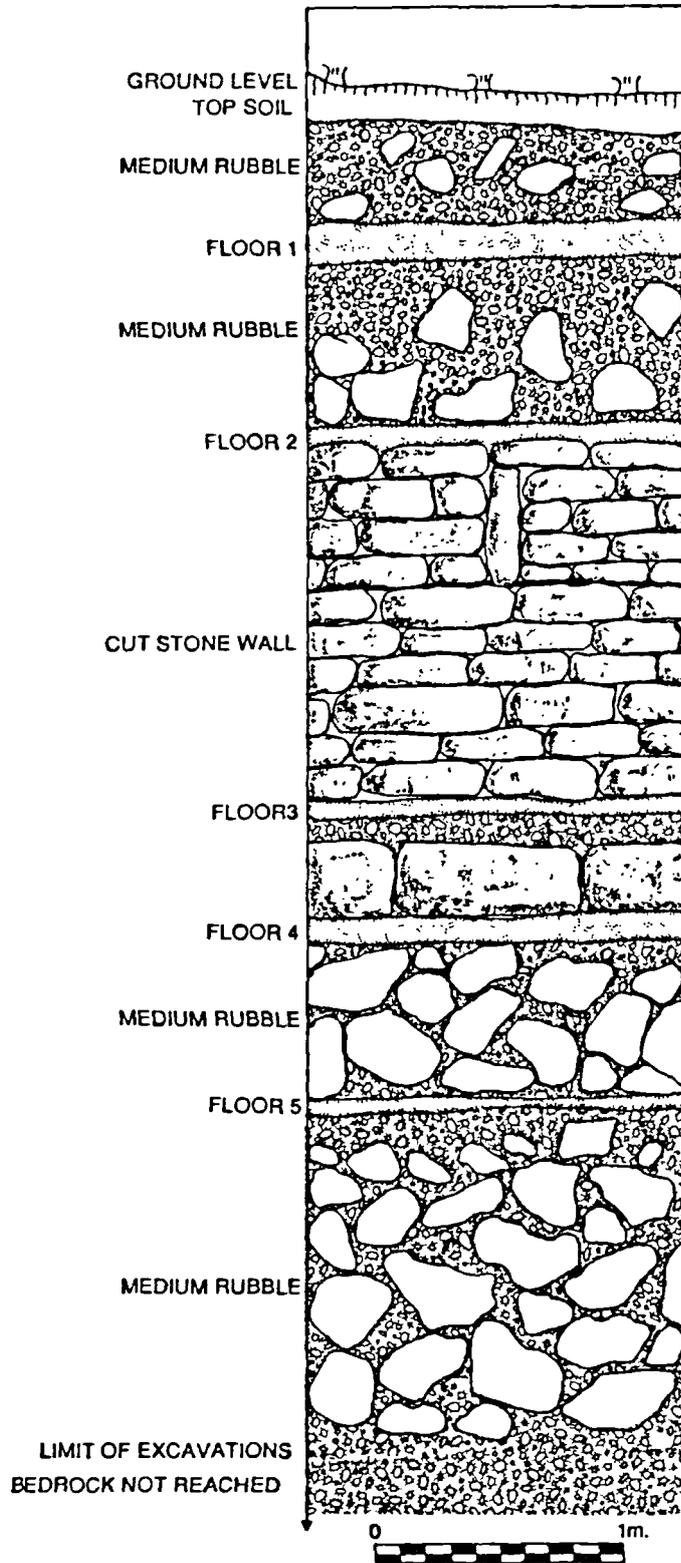


Figure 41: Cross-sectional profile of Plaza E Unit

southeastern corner of Str. E-1, and to the east it is connected to both Strs. F-2 and G-1.

Operation F-1:1

Operation F-1:1 began as a 2.0 m by 6.0 m trench across the center of the mound. After clearing the final phase of architecture, the trench was extended 3.0 m to the south, and a smaller excavation penetrated the center of the mound. These investigations exposed four floors and a large section of the terminal phase building (Fig. 42).

Construction History of Str. F-1

The original F-1 platform (Floor 4) was constructed during the late part of the Late Formative period. This structure (F-1\1st) was represented by a relatively small building platform which probably supported a pole and thatch building. The construction of F-1\2nd, during the Early Classic period, increased the height of the previous platform but did not significantly alter the style of the original architecture.

In the Late Classic period two more platforms (F-1\3rd and F-1\4th) were constructed above the Early Classic structure. It is possible that 3rd may have again duplicated the architecture of the previous two phases. On the contrary, the construction of F-1\4th made several modifications to the architecture. This final structure supported four single-room buildings, each with a central doorway facing north and a short outset stairway leading down to plaza level. The building exposed by Operation F-1:1 was bordered by a low wall of cut masonry blocks, and it may have been roofed with perishable material. Within the room of the building, a wide bench originally spanned from the eastern to the western wall. Unfortunately, most of this bench, plus the rear wall of the room, had collapsed down the

**NORTH/SOUTH PROFILE
STRUCTURE F-1
CAHAL PECH, BELIZE**

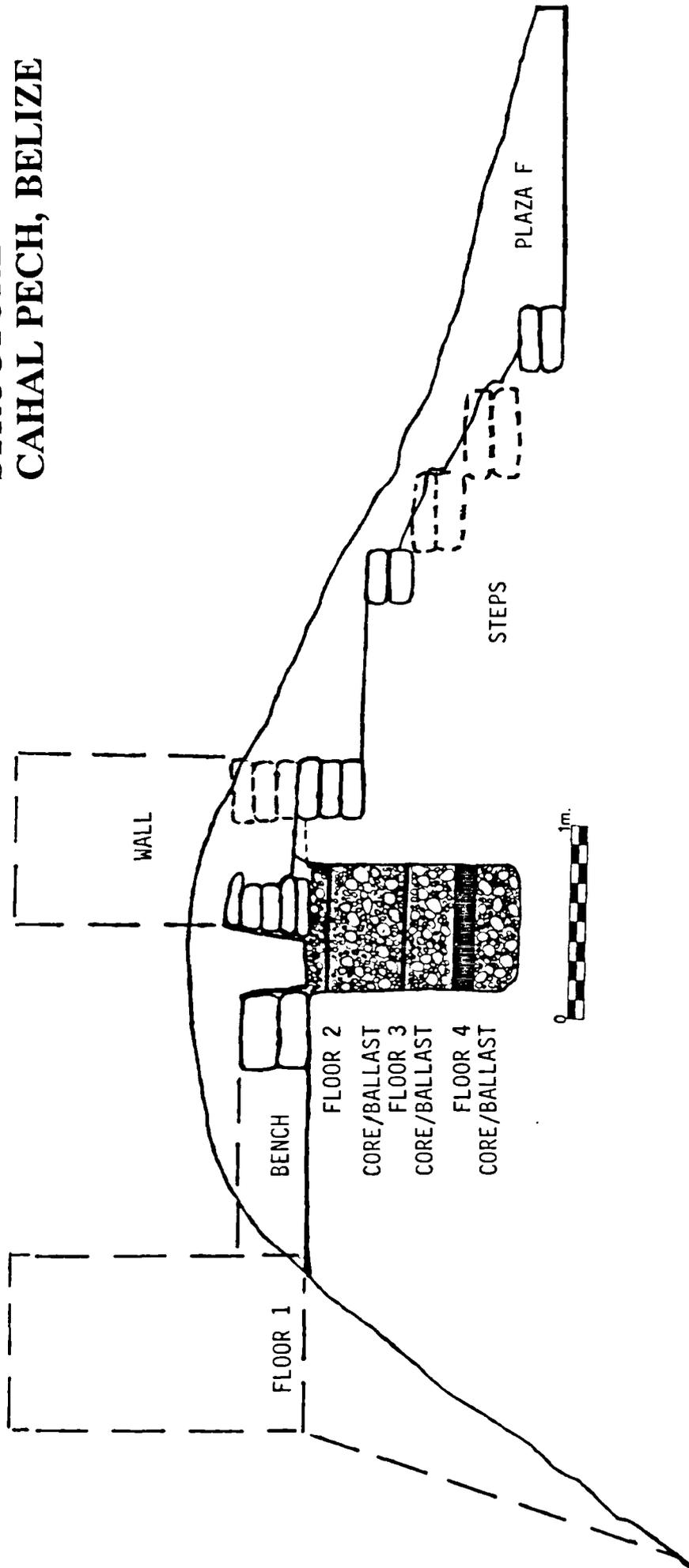


Figure 42: Cross-sectional profile of Str. F-1

southern edge of the acropolis. With regard to function, it is possible that F-1 may have served as a residence for lower status elite, or for elite attendants. This is suggested by the size of the structure *vis a vis* other structures in the site core, and by the form and style of the architecture.

Plaza F Operation

The excavation on Plaza F measured 1.0 m X 1.0 m and was located just north of Str. F-1. The unit descended 1.24 m from surface to bedrock, and the excavation exposed six floors (Fig. 38b). Floors 6, 5 and 4 were only separated by a thin layer of fill, thus Floors 5 and 4 probably represent subsequent replastering of the original Floor 6 surface. The pottery below these three floors was consistently Late Formative in date. Conversely, the ceramics recovered below Floors 3, 2 and 1 consisted primarily of Classic period types.

Plaza G: Description, Excavations, and Construction History

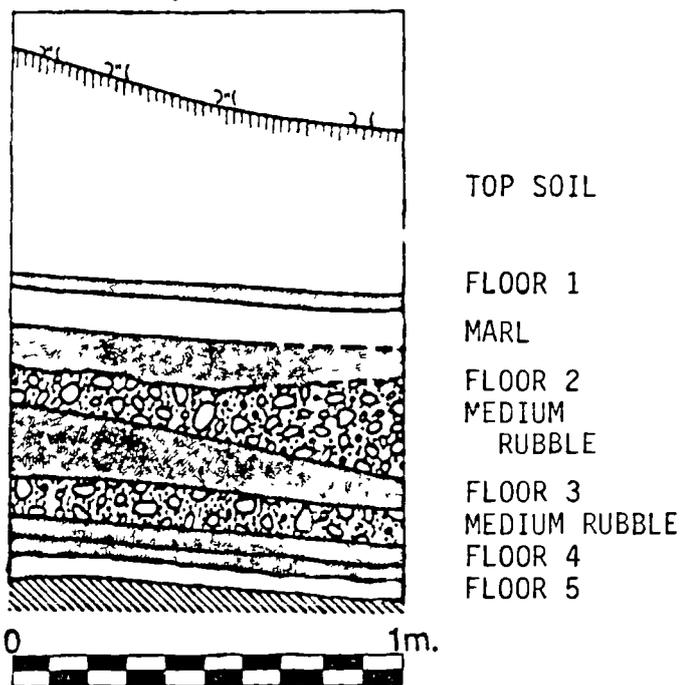
Description of Plaza G

Plaza G is located just east of Plaza F. It is bordered by Str. B-5 to the north, F-1 to the west, G-1 to the east, and G-2 to the south. The area covered by the courtyard is approximately 15 m square. In 1989 both Strs. G-1 and G-2 were tested, and a small unit was excavated in the plaza.

Plaza G Operation

This 1.0 X 1.0 m unit was placed at the base of Str. G-1. Sterile level was reached at 1.65 meters below surface, and the unit uncovered five plaza floors (Fig. 43a). Floors 4 and 5, which are one on top of the other, date between the Late Formative and Early Classic

**PLAZA G, NORTH PROFILE,
UNIT 1, 1990 CMB**



**EAST/WEST PROFILE
NORTHERN PERIPHERY
SALVAGE OPERATION 3
CAHAL PECH, BELIZE**

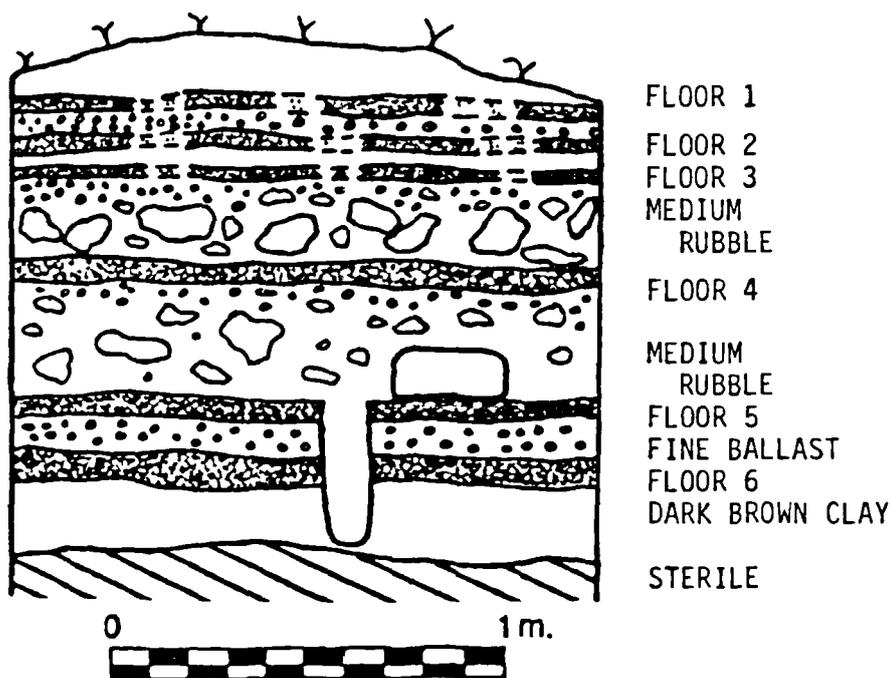


Figure 43: Profile of Plaza G and north periphery Operation 3

periods. The other three floors were all constructed during the Classic period: Floor 3 during the Early Classic, Floor 2 between the Early and Late Classic, and Floor 1 during the Late Classic.

Artefacts recovered in the fill below the floors consisted primarily of broken utilitarian pottery and chert flakes. The most interesting find was a small projectile point recovered below Floor 2. The point is 3.0 cm long, it is bifacially flaked, and is notched on the sides. Similar points have been found at sites in Belize and the Peten, but most of them date to the Terminal Classic and Postclassic periods (Willey et. al. 1965, Fig.267 a-e; Shafer and Hester 1988; Hester, personal communication 1990). The Middle Classic Cahal Pech specimen, therefore, may represent one of the earliest examples of this type of projectile point to be discovered in the central Lowlands.

Description of Str. G-1

Structure G-1 lies on the southern perimeter of Plaza G. The mound is approximately 15 m long, 6.0 m wide, and 1.20 m high. Prior to excavation most of the rear edge of the structure had collapsed down the southern embankment of the acropolis.

Operation G-1:1

Operation G-1:1 was a 1.0 m by 3.5 m trench placed across the central north face of Str. G-1. The excavation initially exposed the terminal phase of architecture, then penetrated 1.30 m into the center of the mound. Although the excavation failed to reach sterile level the investigation revealed that the structure had undergone at least three phases of construction (Fig. 44).

**NORTH/SOUTH PROFILE
STRUCTURE G-1
CAHAL PECH, BELIZE**

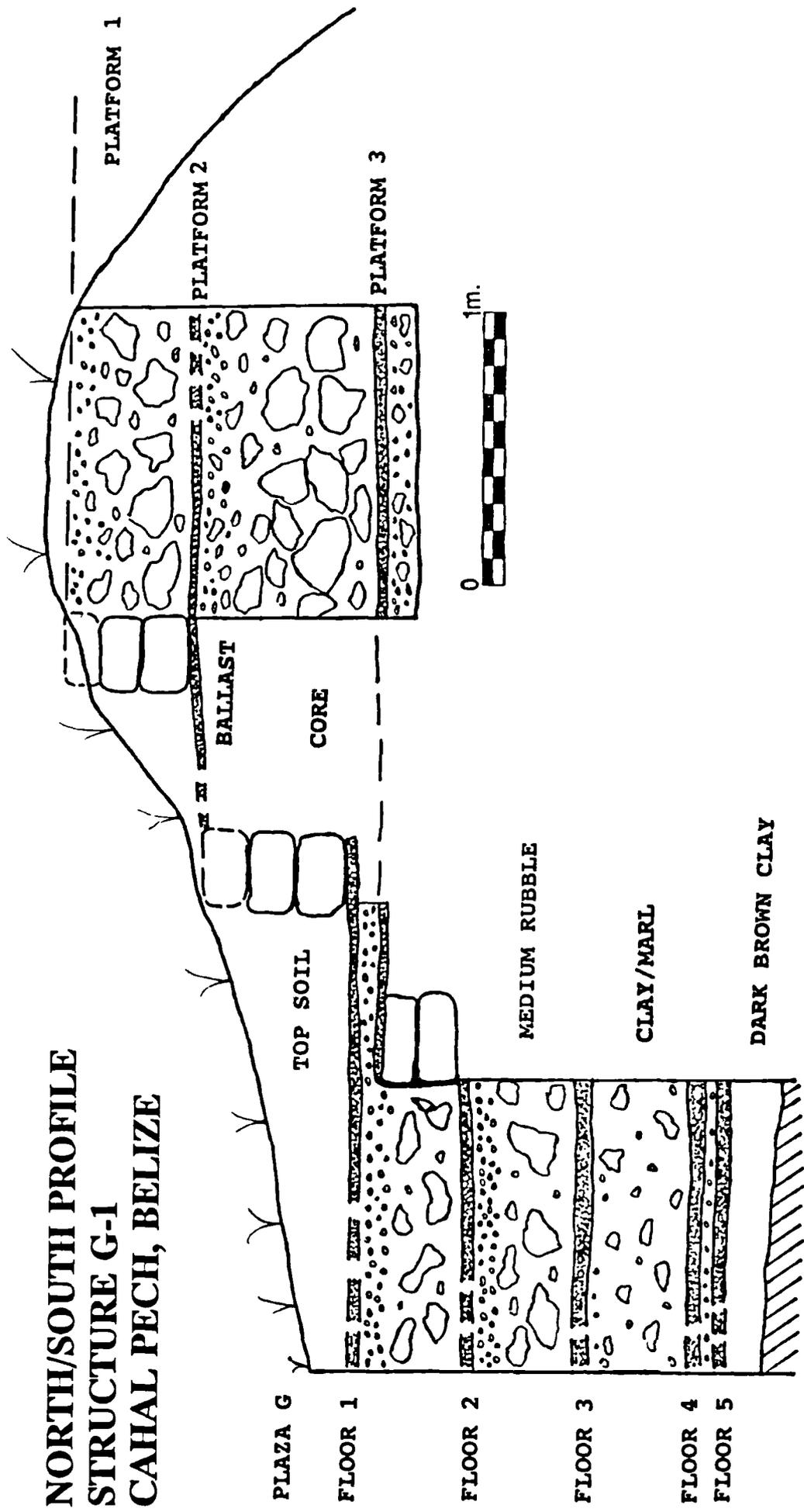


Figure 44: Cross-sectional profile of Str. G-1

Construction History of Str. G-1

Data recovered by the plaza unit and Operation G-1:1 suggest that the first two construction phases in Plaza G date to the terminal Late Formative and Early Classic periods (A.D. 200-500). The only architectural evidence for these phases, however, are the plastered surfaces of Floors 5, 4, and 3 in the Plaza.

The earliest architecture recorded in Str. G-1 dates between the Early and Late Classic periods. This structure consisted of a low platform with a single step leading down to plaza level (Fig. 44). The platform probably supported a pole and thatch building which, like Str. F-1, may have functioned as a residence for low status elite, or for elite attendants.

During the penultimate phase of construction another floor was added to the courtyard, and a new platform was constructed above G-1\1st. Although no postholes were recorded on the floor of this platform it is possible that, like the previous structure, this platform supported a perishable building.

The final construction phase differed little from its precursor. A new building platform was constructed directly above that of G-1\2nd, and the northern wall of the previous structure was converted into a step that provided access down to the courtyard. This final platform may have also supported a pole and thatch building which served as a residence for lower status elite during the Late Classic period.

Description of Str. G-2

Structure G-2 is located on the eastern perimeter of Plaza G and overlooks the southern

access into the site core. The mound is 15 m long, 10 m wide, and approximately 2.0 m high. Noting that G-2 abuts B-4, one of the earliest structures at the site, it was assumed that the G-2 contained evidence of Formative period occupation. In an effort to test this hypothesis Str. G-2 was excavated during the 1989 season.

Operation G-2:1

Operation G-2:1 began as a T-shaped trench placed across the medial and primary axes of Str. G-2. After exposing the terminal phase architecture, a smaller sub-unit (1.0 m X 1.0 m) was excavated into the center of the mound. These investigation revealed three phases of construction (Fig. 45). Below the floor (Floor 3) of the earliest phase (G-2\1st) we discovered a cache containing five pottery vessels nested on each other. Except for a slight variation in size, the unslipped vessels were practically identical, and their Early Classic date suggested that G-2 contained no evidence of Formative period occupation. The last two construction phases (G-2\2nd and G-2\3rd) were both constructed during the Late Classic period.

Construction History of Str. G-2

The earliest construction on G-2 dates between 300-500 A.D. The limited evidence produced by Operation G-2:1 suggests that this construction phase (G-2\1st) consisted of a raised platform which probably supported a masonry building. The building contained at least one room, but it was not vaulted.

During the early part of the Late Classic period (600-700 A.D.), the upper section of the G-2\1st building was partially demolished in order to facilitate construction of G-2\2nd. This

EASTWEST PROFILE
 STRUCTURE G-2
 CAHAL PECH, BELIZE

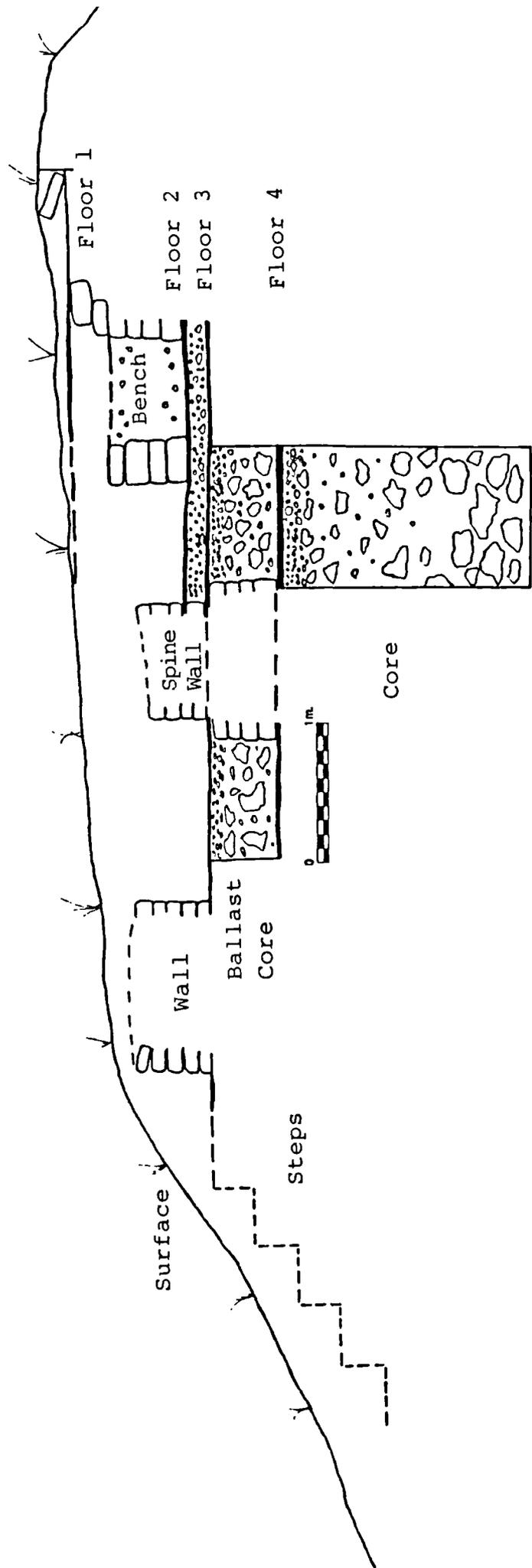


Figure 45: Cross-Sectional Profile of Str. G-2

penultimate phase (G-2\2) was represented by a double-vaulted building set above a raised structure with a stairway that led down to Plaza G. Doorways through the walls of the rooms provided access from the western to the eastern side of the building. Sometime after the construction of the building a second floor and a large bench were also added to the eastern chamber.

The final construction phase on G-2 was again preceded by the partial demolition of the previous building. Unlike its precursors, however, G-2\3rd did not include a masonry superstructure. In contrast, the architecture consisted of a large building platform which was probably crowned with a perishable building. Very little of the G-2\3rd architecture remained preserved and pottery from below its fragmented floor indicated that it was constructed between 750 and 900 A.D.

It should also be noted that two United States coins, which date to the first decade of the twentieth century (1913, 1919), were discovered in the humus layer on the summit of G-2. These coins, plus a bowl of an early twentieth century ceramic pipe (recovered in the playing alley of the ballcourt), suggest that there may have been modern human activity at the site during the turn of the century. During discussions with elderly citizens of San Ignacio Town we were informed that the British West India Regiment often camped in the vicinity of the site during the early 1900s. If this was indeed the case, it is possible that the historic artefacts may have been lost by members of this regiment.

4.4 Excavations in the Periphery

Introduction

It was noted in Chapter 3 (see Site Description) that settlements in the immediate periphery of Cahal Pech are not evenly distributed over the landscape. On the alluvial valley to the north, they are primarily located on a ridge which ascends from the Melhado Group to the site core. On the uneven and hilly terrain to the south, east, and west of the central precinct they tend to cluster, in groups of various sizes, on the crest of the small knolls and ridges that predominate in these zones. Because of this settlement pattern it was decided that research in the eastern, southern, and western periphery would focus on diachronic development at the group level rather than on the histories of randomly selected structures. On the northern periphery, the continuous growth and expansion of San Ignacio Town dictated a different research approach. Investigations in this zone were essentially salvage operations which focused on mounds that were partly destroyed, or on the verge of destruction.

Investigation of the settlement groups in the southern, eastern and western periphery were conducted by several graduate students as part of their dissertation or thesis research. Since these individuals will be providing detailed reports of their operations, this monograph will present a brief description of these investigations, and will focus on evidence relating to the Formative period of occupation. The salvage excavations in the northern periphery were conducted under my direct supervision and these will be described in a similar fashion to the operations in the site core.

Excavations in the Southern Periphery

The southern periphery has the largest concentration of prehistoric settlements at Cahal Pech. Because of this spatial distribution, three settlement clusters (the Tzinic, Zotz, and K'ik' Groups) were investigated in this zone between 1989 and 1991.

The Tzinic Group

The Tzinic Group is a major, patio-focused, settlement cluster which is located on a ridge approximately 450 meters south of the acropoline precinct of Cahal Pech (Conlon and Awe 1991). The core area of this group contains seven mounds (Fig. 46). Five of these mounds (Strs. 1-5) enclose a large courtyard (21 m X 28 m) with an uncarved stela. Structures 6 and 7 are located to the southwest of the courtyard, and are connected to the latter via a short sacbe. At the northern base of the primary structure (Str.1) there is a small reservoir which is presently dry, and there are several other mounds, and possibly some agricultural terraces, dispersed around the perimeter of the courtyard.

The Tzinic Group was investigated by James Conlon of the Institute of Archaeology at the University of London. Between 1990 and 1991, Conlon (1992; Conlon and Awe 1991) excavated six of the structures at Tzinic, and placed test units at the base of the stela, within the dry reservoir, and on a possible agricultural terrace. These investigations revealed that the Tzinic Group was occupied from late Middle Formative times to the Late Classic period.

Architectural evidence for initial occupation during the late Middle Formative was recorded in the earliest phase of construction in Str. 6. This construction phase was

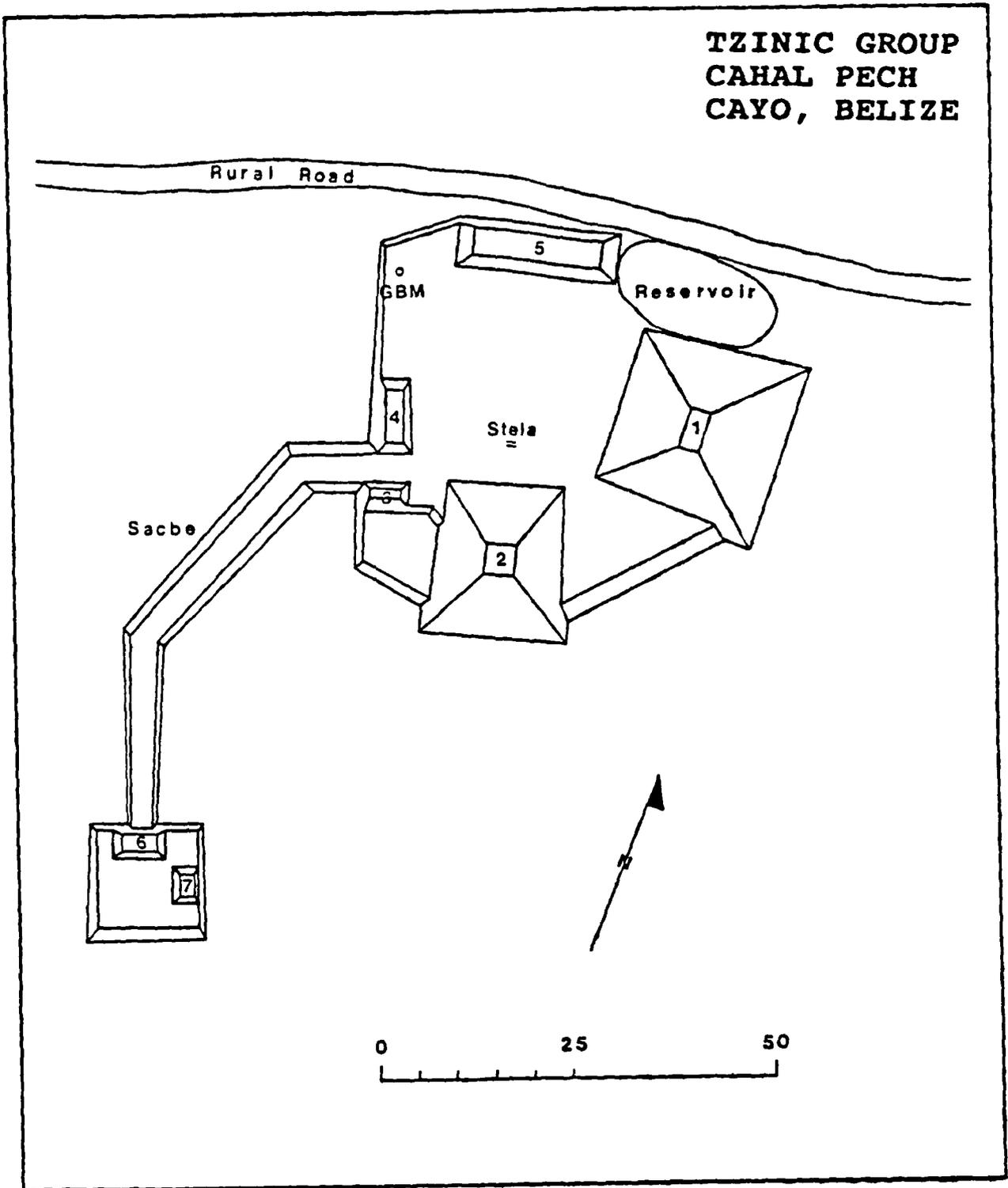


Figure 46: Site plan of the Tzinic Group, Cahal Pech, Belize

represented by part of a thickly-plastered building platform that was approximately 2.0 m below surface. Conlon (1992) reports that Middle Formative construction may also be present beneath the massive architecture of Strs. 1 and 2 (8.0 m and 5.6 m tall respectively). Due to structural instability, however, these mounds have not been excavated to sterile level.

Artefactual evidence for Middle Formative (800-350 B.C.) occupation is based on the presence of Jenney Creek and Mamom related ceramics, and on the recovery of several hand-modeled figurine fragments. The pottery, which includes representative samples of the Jocote, Savana, Joventud and Sayab ceramic groups, were found in the construction fill of the six structures excavated.

The figurines were recovered from construction fill in Str. 2, and in a cache at the base of the stela. The pastes of most figurines are similar to that of Mars Orange ware. The figurine fragment from the stela cache is the most complete specimen found, and consists of the headless and armless torso of an anthropomorph (see Fig. 77c). Conlon and Awe (1991:11) also report that eyes and a mouth "had been incised on the upper torso in order to represent a face. Since these modifications were undoubtedly executed sometime after the figurine had been made", this artefact probably represents an heirloom whose date of production predates that of the stela.

Late Formative architecture was represented by the second construction phase in Str. 6, and by a plaster floor deep within Str. 2 (Conlon 1992). The floors in both structures were well preserved, and probably functioned as the surfaces of small building platforms. Ceramics recovered beneath the two platforms were solely Formative period types. They

included material from the Sierra, Flor, Polvero, Iguana Creek, Sapote and Paila Groups. A similar range of Late Formative ceramics were recovered in other excavations (particularly in Strs. 1 and 5), but none of this pottery was sealed by Preclassic architecture.

With the exception of Strs. 3 and 4, all the mounds produced evidence of architectural activity during the second half of the Early Classic period. The first plaza floor, and possibly the stela, may have also been erected at this time.

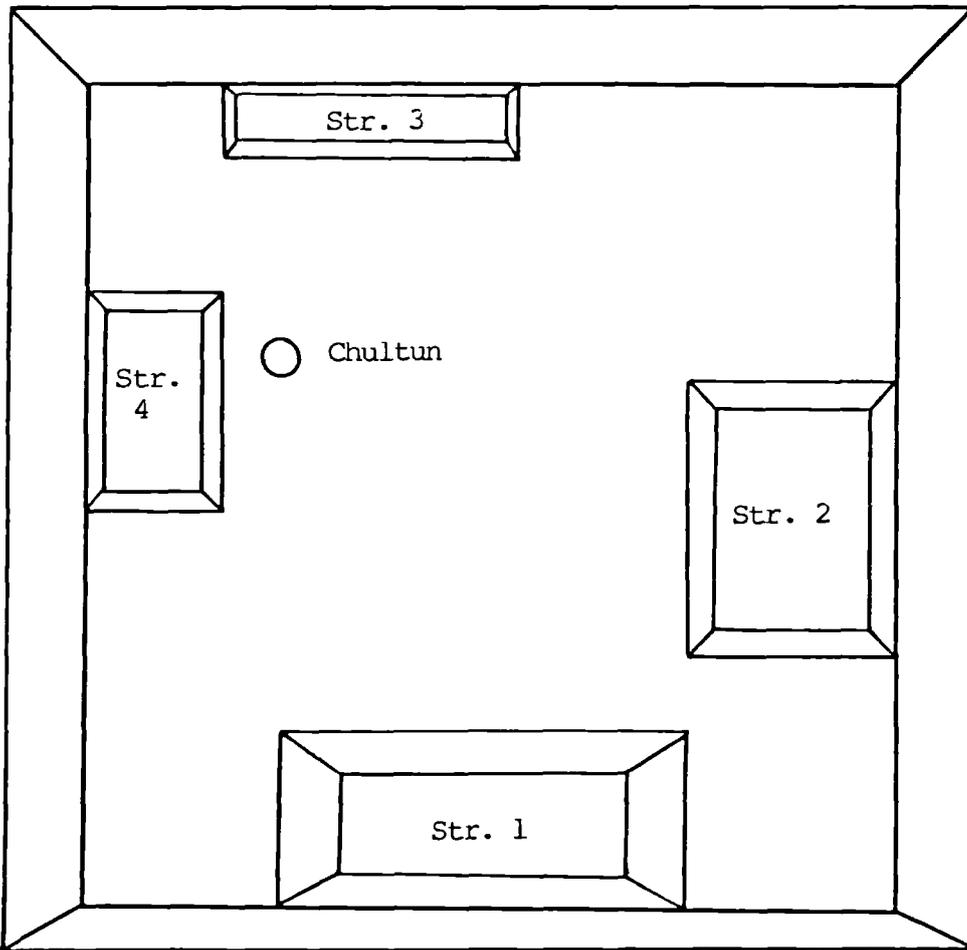
During the Late Classic, Strs. 3 and 4 were added to the courtyard, the reservoir and terraces were constructed, and all other structures around the plaza underwent some form of modification. Changes on Str. 2 included the construction of a large vaulted tomb which served as the grave for an elite member of the Tzinic population. To the east, Str. 1 was enlarged and a multi-room vaulted building was constructed at its summit. Following the collapse of the center, the Tzinic Group was eventually abandoned around 900 A.D.

The Zotz Group

The Zotz Group is a formal patio cluster located approximately 100 m south of the site core. The four mounds of the patio are situated on top of a raised platform (Fig. 47) which is 22 m long by 21 m wide. The largest mounds at Zotz are Strs. 1 and 2. The former lies on the southern perimeter of the courtyard, and is 2.5 m high, 10 m long and 5.0 m wide. Structure 2 lies on the eastern perimeter of the patio and is 2.0 m high, 7.0 m long, and 5.5 m wide. Structures 3 and 4, are low-lying mounds (approximately 0.5 m in height) which sit on the northern and western boundary of the plaza. About two meters east of Str. 4 there is also a large, single-chamber chultun.

ZOTZ GROUP
CAHAL PECH
CAYO, BELIZE

PLAN AND SURVEY BY S.M. BRISBIN



0 5 10



Scale 1:200

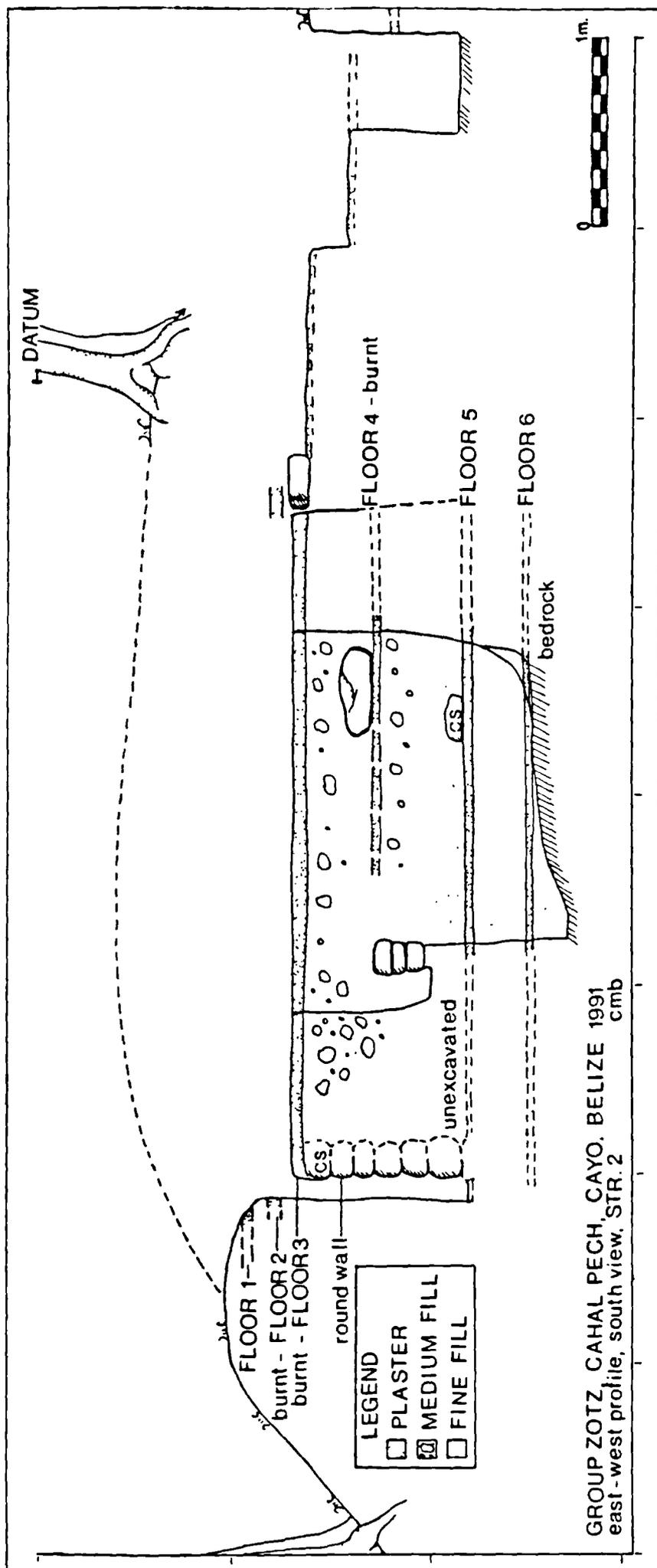
Figure 47: Site plan of the Zotz Group, Cahal Pech, Belize

The Zotz Group was first tested in 1989, and more thoroughly investigated in 1991 by University of Toronto graduate student Katherine Blanchard. During these two seasons of research all four structures were excavated. Artefacts and architectural data from these investigations revealed that the Zotz Group was continuously occupied from the terminal Middle Formative to the Late Classic period.

Evidence of Formative period occupation was recorded in Strs. 1 and 2. In Str. 1 this initial phase of occupation was represented by two floors which served as consecutive surfaces of a small building platform. No evidence of a superstructure was found above the small section of floor exposed in the excavation, but it is possible that the platform may have supported a perishable building. Artefacts recovered below the floors of the platform consisted of pottery and lithics. The pottery included material from the Aguacate, Sierra, San Felipe, Vaquero Creek, Monkey Falls, and Chan Pond ceramic groups. The lithic remains were predominantly tertiary flakes and fragments of debitage.

Formative levels in Str. 2 were represented by two building platforms. The earliest platform was constructed of lime plaster, clay and marl, and had been laid directly over the old ground surface. No evidence of a building was noted on the small area exposed by the excavation. The second platform was 40 cm above the surface of the first platform, and it supported a small circular structure. Pottery within the fill separating the two floors was predominantly Middle Formative in date with a few Late Formative types.

Investigation of the round structure (Figs. 48-49) revealed that it had an average height of 1.20 m, and an upper diameter of 3.60 m. The circular walls had been constructed of cut



GROUP ZOTZ, CAHAL PECH, CAYO, BELIZE 1991
 east-west profile, south view, STR. 2 cmb

Figure 48: East/West profile of Str. 2, Zotz Group, Cahal Pech, Belize

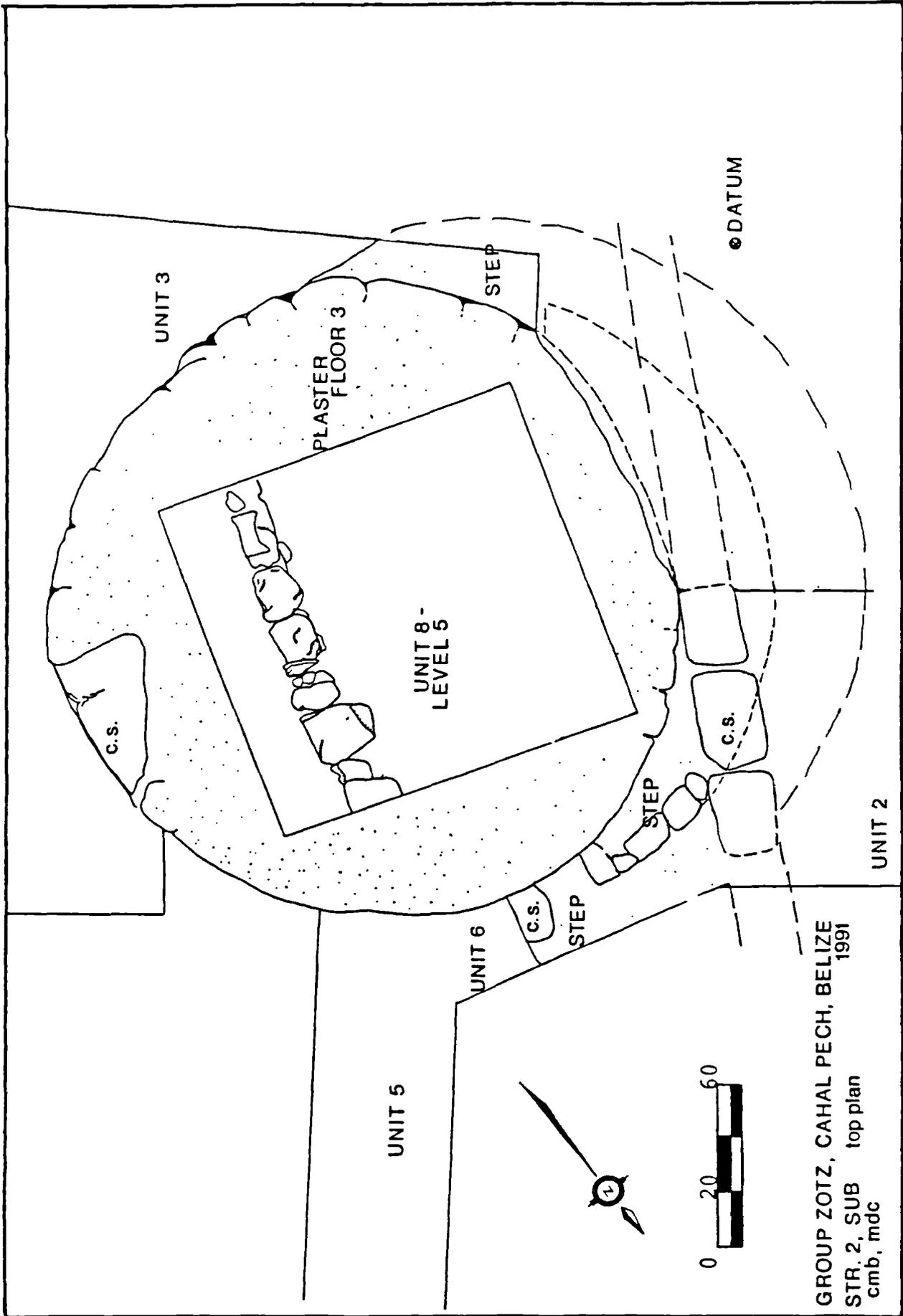


Figure 49: Plan of Str. 2/2nd, Zotz Group, Cahal Pech, Belize

limestone blocks set in mortar, then they were stuccoed with a thick layer of plaster on the outside face. On the west side, the structure had an outset stairway which was elliptical in form (Fig. 49). At the summit, the platform was capped by a thick plaster floor. A large part of this floor had been destroyed by subsequent architectural activities and by two intrusive Classic period burials. No postholes were recorded above the floor.

Excavation into the round structure exposed a cut-stone wall and two burials (see Fig. 48). The wall was 45 cm below the surface of the round structure, and 85 cm west of the eastern wall. It was also three courses high, and oriented in a north/south alignment. A thin plaster floor extended from the top of the wall to the western limit of the excavation. At the base of the wall there was a tamped layer of sascab overlaying a layer of core. The core had been deposited above the floor of the building platform.

The first of the two burials was located between the curved eastern wall of the round structure and the north/south wall within. The burial was poorly preserved, extended, with head to the south and in a supine position. Next to the feet there was a complete jar of the Middle Formative, Jocote Orange-brown type.

The second burial was discovered approximately 25 cm west of the north/south wall. It was in a much poorer state of preservation than Zotz Burial 1, it had no grave goods, and it contained only a few long bones and cranial fragments. The location of this burial (25 cm. from the wall) and the quantity and quality of the skeletal remains suggest that this interment was either secondary, or that it was part of an offering. Potsherds collected from the fill around the burial were typologically similar to those recovered below the building platform

and included a mix of late Middle Formative and Late Formative types.

During the Early Classic period the round structure and the initial building platform were capped with core and ballast and a new platform (Str. 2\3rd) was constructed above them. Unlike its predecessor, the Classic period structure was rectangular in shape and was crowned with a perishable building. In the area directly above the stairway of the round structure, two burials associated with this architectural modification were found.

In Late Classic times a final platform was erected over Str. 2\3rd, and 12 cist burials were deposited into the structure. Several of the burials intruded into previous construction phases and a few were intermixed with earlier interments. The contexts of these burials and the nature of their deposition indicate that they represent sequential interments. The round substructure and the large number of burials in the mound also suggest that Str. 2 may have functioned as a family shrine from its initial construction in the Late Middle Formative to its abandonment during the Late Classic period (Awe, Aimers and Blanchard 1992).

The K'ik' Group

The K'ik' Group lies 25 m north of Zotz and 75 m south of the site core. It consists of two mounds on top of a raised, rectangular platform (Fig. 50). Str. 1, which lies to the north, is 13 m long, 5.0 m wide and 2.0 m high. Str. 2 is on the west side of the platform and is 11 m long, 4.3 m wide and 0.50 m high.

During the 1991 season the two mounds and the platform of the K'ik' Group were excavated by Sean Goldsmith of the University of Calgary. Goldsmith's (1992) investigations

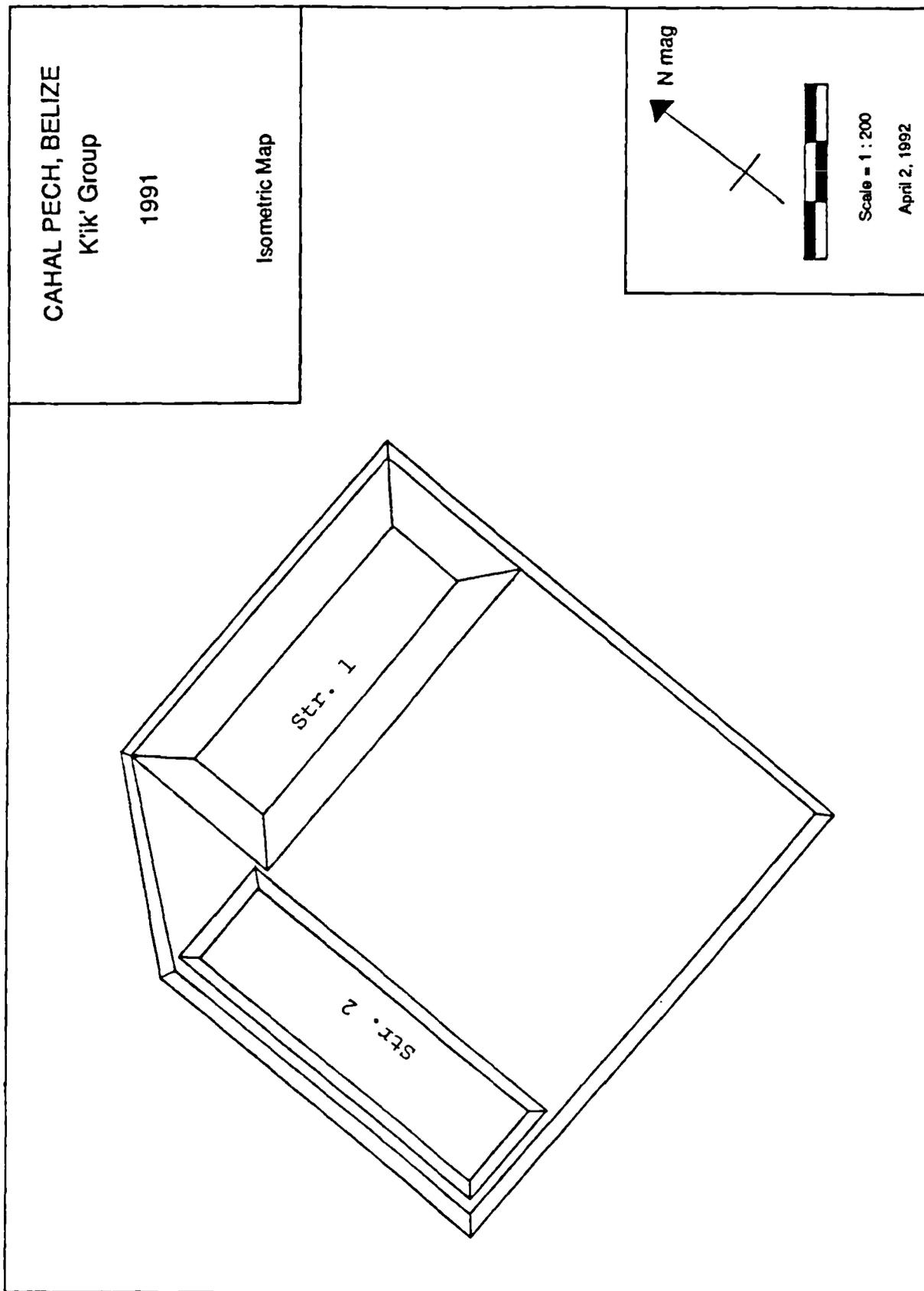


Figure 50: Site plan of the K'ik' Group, Cahal Pech, Belize

revealed a sequence of construction and occupation that was entirely Late Classic in date. Because of this late history of occupation, and because of the proximity between the Zotz and K'ik' Groups, Goldsmith (1992) suggested that the residents of these settlements were probably related, and that the occupants at K'ik' may have fissioned from Zotz to form their own residential compound during the Late Classic period.

Recent Investigations in the Southern Periphery

In 1992, and just before the completion of this report, two other peripheral groups were found to the south of the site core. The first, which was designated as the Zopilote Group, lies approximately 700 m south of the central acropolis. The settlement contains several small mounds dispersed around a bi-levelled platform with two large pyramidal structures. The largest of the two mounds (Str. 1) is 11.5 m tall and has several looters tunnels which penetrate the structure at different levels and angles. The second pyramidal mound (Str. 2) is approximately 5.0 m high and has also been severely destroyed by looters. At the northern base of Str.2 there is a wide causeway which extends all the way to the site core.

During the summer of 1992, preliminary excavations at the Zopilote Group tested Str. 1, Str. 2, and the causeway. Initial results of these investigations suggest that Str. 2 and the causeway are primarily Classic period constructions. In contrast, Str. 1 contains substantial Formative period architecture. Samples of pottery collected in a deep looters tunnel indicate that the earliest construction phases date to the Middle Formative period. Subsequent Late Formative architecture is considerably more impressive than its earlier precursors. The largest of these Late Formative construction phases reached approximately 8.0 m in height, and is probably similar in style to B-4\10th in the site core.

The second, recently discovered, settlement in the southern periphery has been designated as the Tzubin Group. This patio-focused settlement cluster is located on a large hill approximately two kilometres south of the site core. It comprises more than 30 mounds which are dispersed around two central courtyards (Fig. 51). Preliminary investigations in 1992 indicated that the principal courtyard (Plaza A) was initially occupied during the late Middle Formative period (G. Iannone, personal communication 1992). Most of the outlying settlements, however, date to the Classic period.

Excavations in the Eastern Periphery

Excavations in the eastern periphery began during the fourth season of research (1991), and focused on the Tolok Group. Prior to the Cahal Pech Project (1981-83), and under the auspices of the Belize Department of Archaeology, the author investigated two chultuns and a mound in the property of Mr. Escander Bedran of San Ignacio, and two mounds and a chultun in the present location of Buena Vista park in Santa Elena.

The Bedran mound was located 0.75 km northeast of the site core, and was on the verge of being destroyed to make way for a modern house. In view of the situation a small unit was excavated into the mound in order to retrieve some information before the structure was destroyed. The excavation exposed five platform floors which dated between the Late Formative and the Late Classic period.

The Buena Vista mounds, which were also being bulldozed during construction of a park, were located 1.5 km from the site core. Investigation of these mounds recovered data which indicated initial occupation in the Early Classic and abandonment during the Late Classic.

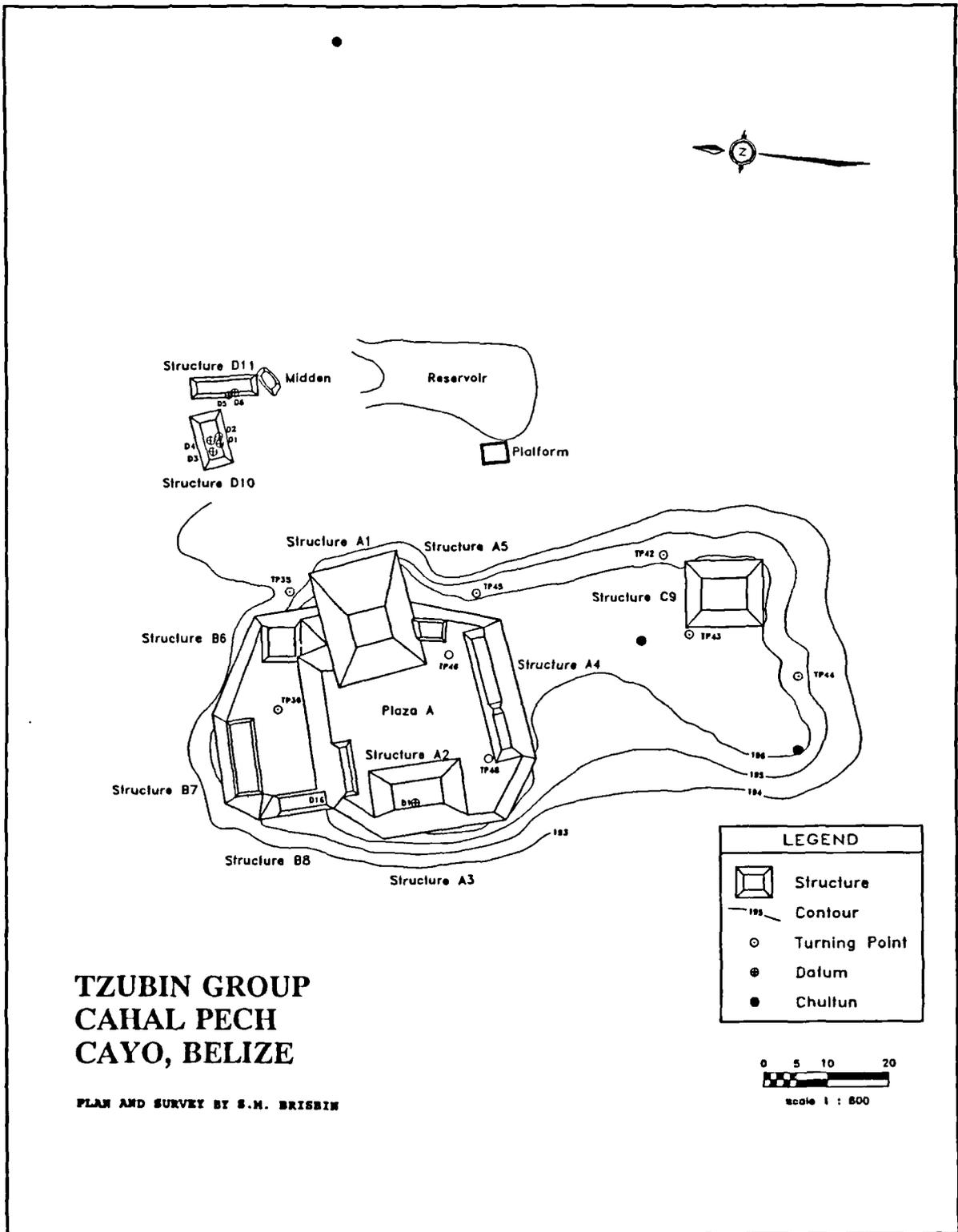


Figure 51: Site plan of the Tzubin Group, Cahal Pech, Belize

The Tolok Group

The Tolok Group is a structure focused settlement cluster which is located on the crest of an asymmetrically-shaped hill approximately 300 m southeast of the site core. The settlement contains 11 mounds of varying size and four chultuns (Fig. 52). Str. 1, which is the largest mound in the cluster, is situated in the center of the group. All the other mounds are located within 50 m of this 20 m long by 12 m wide and 5 m high structure.

During the 1991 field season, T. Powis (1992) excavated four of the mounds and two of the chultuns at Tolok. These investigations revealed that the settlement was continuously occupied from late Middle Formative times to the Late Classic period. Occupation levels pertaining to the late Middle Formative were exposed in Str. 1 and Str. 4, and in the earliest construction phase of Str. 2.

In Str. 1, evidence of late Middle Formative occupation was recorded within the lowest levels of the mound. The initial construction phase was represented by a building platform with an associated midden and a small chultun. The floor of the platform was constructed of fine ballast capped with lime plaster, and lay directly over the old ground surface. Most of the platform had been destroyed by a large looters trench which had gutted the structure.

The midden associated with Str. 1 contained bones of several mammals (60 fragments including white-tail deer, brocket, and rodents), 269 bivalves of the fresh-water mussel *Nephronaias ortmanni*, 29 "jute" (22 *P. glaphyrus* and 7 *P. indiorum*), five pieces of conch, 11 Pomacea shells, 87 fragments of bony fish, three crab elements, two pieces of coral, three metate and one mano fragments, 38 chert flakes, two figurine fragments, and a large

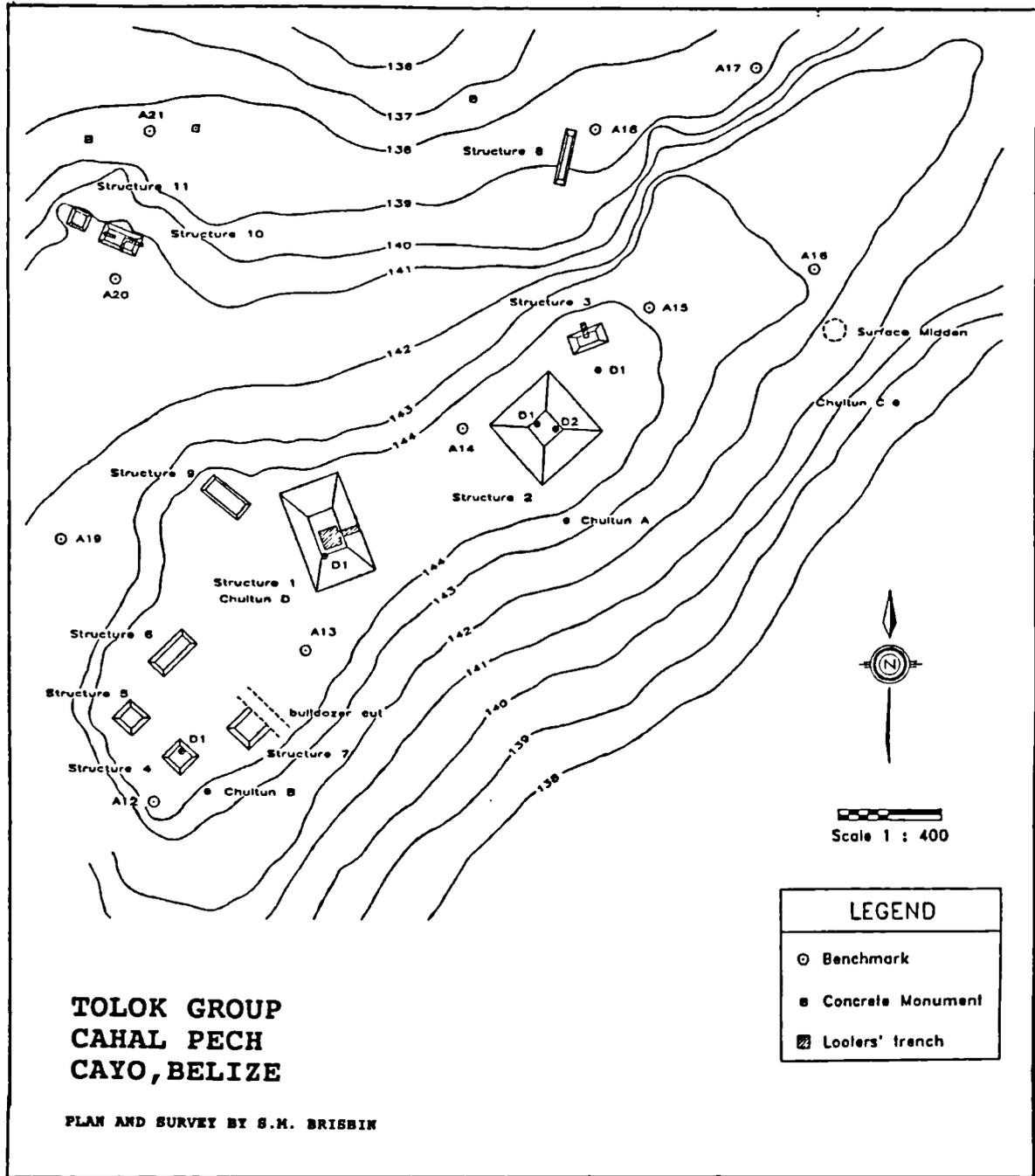


Figure 52: Site plan of the Tolok Group, Cahal Pech, Belize

collection of potsherds (Powis, personal communication, 1991). The pottery included specimens of the Savana, Joventud, Jocote, Sayab, Pital and Chunhinta Ceramic Groups. The types Savana Orange and Reforma Incised had the highest frequencies and were represented by several vessel forms, including flat-base dishes and spouted chocolate pots with lip to lip handles.

The late Middle Formative level in Str. 4 was exposed by a small excavation unit. This construction phase was represented by part of a building platform that was located 1.5 m below surface. Like Str. 1\1st, this platform had been constructed above the original ground surface of the hill. In the fill below the platform, Powis (1992) recovered five chert flakes and a small collection of pottery. The latter included samples of Joventud Red, Savana Orange and Achiotes unslipped.

The transitional late Middle to early Late Formative level in Str. 2 was represented by the earliest building platform in the mound. Like other early construction phases, this platform was not completely exposed by excavations, thus there is no knowledge of its overall size. Cultural remains below the platform were also limited to a few chert flakes, five jute shells, one *Nephronaias* bivalve and several potsherds. The pottery consisted of both Middle and Late Formative types and included specimens of Joventud Red, Sampopero Red, Reforma Incised, Sierra Red, Flor Cream, and Sapote Striated.

During the Late Formative, new platforms were erected on Strs. 1, 2, and 4, and the first platform of Str. 3 was constructed. The small sections of architecture exposed by the excavations once again makes it difficult to describe these renovations in great detail or with

a high degree of accuracy.

Cultural remains recovered within the fill of Late Formative levels were as varied as those associated with the preceding Middle Formative phase. They included pottery which is typologically similar to the entire range of Late Preclassic ceramics from the Belize Valley, several figurine fragments, lithic debitage, grinding stones, obsidian, and a variety of animal remains.

All of the structures tested in the Tolok Group produced evidence of sequential construction during the Early and Late Classic periods. In Strs. 1 and 2 these changes were greater in scale than in Strs. 3 and 4, but in every mound these modifications increased the size of previous structures. Chultun 2 also dates to the Late Classic period, and pottery collected from the surface of the 11 mounds suggests that all the structures at Tolok were occupied until about 900 A.D.

During the summer of 1992, Powis sampled the other mounds at Tolok and found that the majority were initially constructed during the Formative Period. An excavation in the courtyard bordered by Strs. 4, 5, 6, and 7 also revealed a large, Formative period, round structure with a ramp similar to that of BR-1 at Barton Ramie (Willey et al. 1965).

Excavations in the Western Periphery

Investigations in the western periphery were conducted in 1991 by Julian Vinales of the Institute of Archaeology, University of London. Vinales' research (cf. Awe et al. 1992) concentrated on a large settlement cluster designated as the Cas Pek Group. This group was

selected for investigation because a large number of mounds were on the verge of being destroyed by modern housing development.

The Cas Pek Group

Cas Pek is a patio-focused settlement cluster located about 150 m west of the site core. At the center of the group there is a large raised platform with four mounds spaced in an informal configuration (Fig. 53). Around the central platform there are at least eight other mounds of varying sizes, and the large western reservoir lies 50 m east of the raised platform.

Prior to the 1991 season, two of the mounds (Strs. 2 and 3) on the central platform had been looted, and Structures 10, 11, and 12 had practically been levelled by land development activities. Consultation with the landowner indicated that the reservoir was to be filled in, and that Strs. 5, 6, and 7, plus a large part of the raised platform were to be destroyed by the construction of roads into the housing subdivision. In response to this development plan it was agreed (with the landowner) that Vinuales would investigate Structures 1, 4, 5, 6 and 7, and oversee the careful bulldozing of the structures slated for destruction. These investigations revealed that the Cas Pek Group was continuously occupied from the Late Middle Formative through to the Late Classic period.

Evidence of Middle Formative occupation was mostly recovered in the centrally located raised platform. Excavations and the bulldozer cut on this large structure exposed a sequence of seven platform floors and uncovered six cist burials (Awe et al. 1992). The earliest floor (Floor 7) was 3.8 m below surface. It was constructed of lime plaster and contained ceramics that were typical of the Middle Formative, Jenney Creek complex at Barton Ramie.

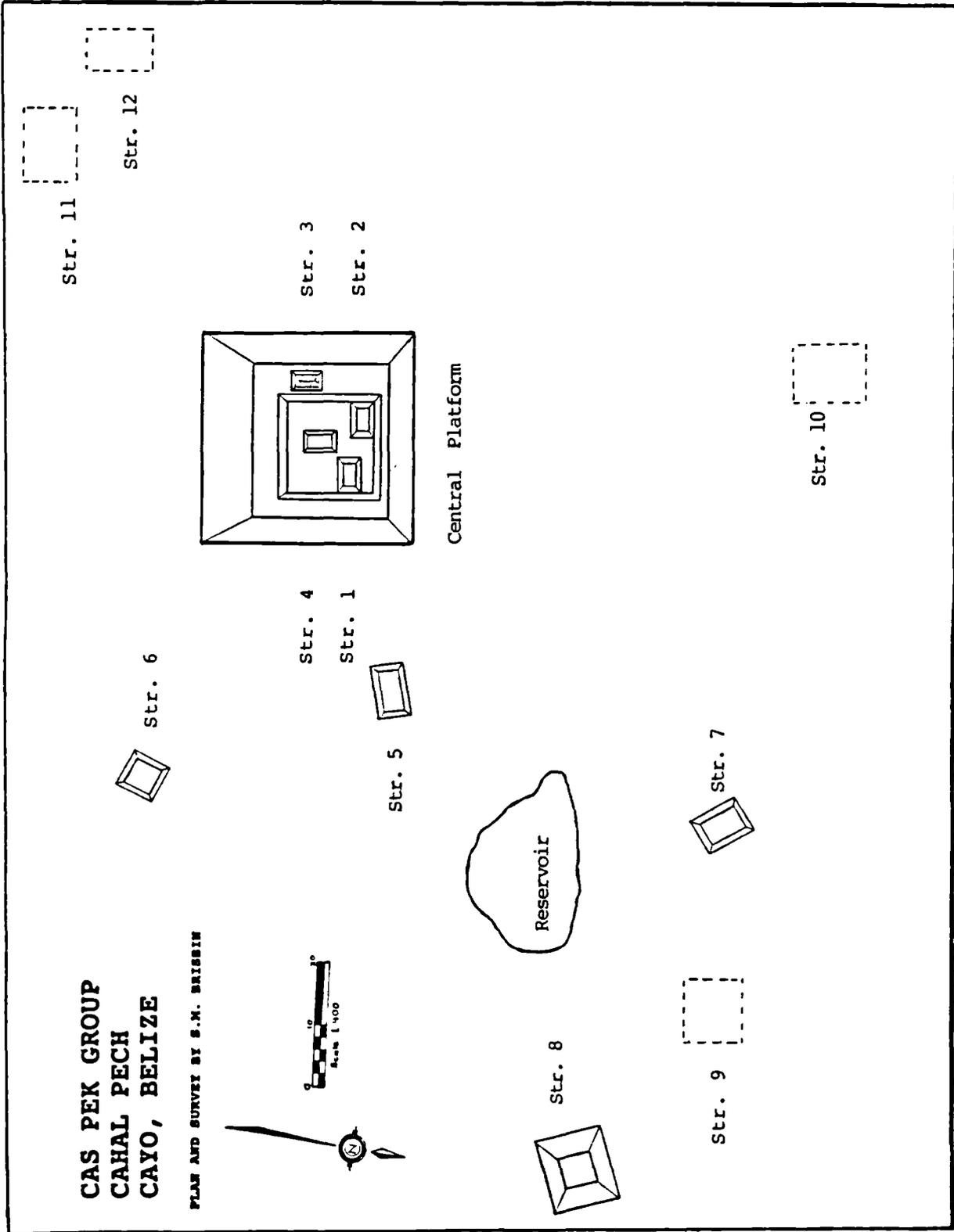


Figure 53: Site plan of the Cas Pek Group, Cahal Pech, Belize

During the Late Formative, three consecutive floors (Floors 6, 5, and 4) were constructed above the initial platform and four burials associated with these modifications were uncovered. The earliest burial, which intruded into Floor 7 but was associated with Floor 6, contained a red-slipped jar with vertical grooves and a flat base (see Fig. 64). According to Ball (personal communication, 1991) this vessel shares characteristics with specimens from both the Joventud and Sierra ceramic groups, therefore suggesting that the burial may have been deposited during the terminal late Middle Formative. The second burial was located below Floor 5 and contained a single, Sierra Red, flaring-side dish. The other two Formative period burials were deposited next to each other and capped by Floor 4. Between these two interments there were two (one complete and one severely fragmented) ceramic vessels, three spindle whorls, four bone pins, and six obsidian prismatic blades. The complete vessel consisted of a small jar (see Fig. 68) with affinities to Late Preclassic Chan Pond Unslipped specimens from Barton Ramie. The poorly preserved vessel has similarities to both the Polvero and Balanza ceramic groups.

The last three platforms of the central patio were all constructed during the Classic period - Platform 3 during the Early Classic, and Platforms 1 and 2 during the Late Classic. There were also two burials below Platform 3, but none contained grave goods.

Beside the raised platform, only Strs. 9 and 10 have so far produced evidence of Formative period occupation at Cas Pek. Interestingly, at the start of the investigations the research team was completely unaware of Structure 9, and this "hidden" structure would have been missed had it not been exposed during the construction of a roadway by the bulldozer. The structure was completely concealed under a level section of land about 12 m northeast

of the reservoir. It consisted of two large platforms which were constructed, occupied, and abandoned during the Late Formative period. This short history of occupation is unusual at Cahal Pech and there are no clues as to why the platform was only used for such an abrupt period of time.

Excavations on the largely destroyed Str. 10 exposed sections of three fragmented floors. Pottery below the earliest floor included material which was typical of the Savana, Sierra, Aguacate, Paila, Chan Pond and Monkey Falls ceramic groups. These types fall within the Middle and Late Formative periods thus indicating that the initial architecture in Str. 10 dates to the Late Preclassic period. Pottery below the two uppermost floors were predominantly Classic period types. They suggested that the penultimate phase of Str. 10 dated to the end of the Early Classic, and that the terminal phase was constructed during the Late Classic.

Excavations within Structures 5, 6, and 7 produced no evidence of Formative occupation, and only Str. 7 contained an Early Classic level of construction. All the other cultural levels within these mounds date to the Late Classic period.

Excavations in the Northern Periphery

Prior to the Trent University/Institute of Archaeology project, the only known investigations in the northern periphery of Cahal Pech were that of Willey and Bullard (1956) at the Melhado Group, and Joseph Palacio's (n.d.) brief examination of a chultun near the San Ignacio Hospital.

The Melhado Group

Located on the northern outskirts of San Ignacio Town, the Melhado Group was briefly investigated by Willey and Bullard during their preliminary reconnaissance of the Belize Valley in 1953. In a subsequent report, Willey and Bullard (1956) indicated that this structure-focused settlement cluster was comprised of 13 mounds dispersed on the second terrace above the Macal River. They (Willey and Bullard 1956:43) added that:

The limits of the site are not fully known. To the north and south the second terrace is covered with dense bush, and it is possible, or even probable, that more mounds of the same appearance and size lie in these directions. About 1 mile to the south of the Melhado group, on the hills overlooking the river valley, is the prehistoric Maya ceremonial center of Cahal Pech. It seems likely that the Melhado site was a village, hamlet, or residential unit related to this center; and it is probable that other similar residential groups exist for several miles up and down the valley.

In 1953, Willey and Bullard excavated two mounds (Strs. 1 and 5) in the Melhado Group. Their investigations in Str. 5 revealed that this mound contained the remains of a low "earth and rock platform" which may have supported a "small domestic building" which "was occupied most intensively in the Late Classic" (Willey and Bullard 1956:43).

On Str. 1, the largest mound in the group, they exposed "two principal constructional levels" and recovered pottery which was predominantly Late Formative in date. Because of the presence of Mamom and Tepeu related ceramics, Willey and Bullard concluded that the Melhado Group was continuously occupied from the Late Middle Formative to the Late Classic period. They also speculated that:

"The small cluster of little mounds (presumably of a domestic nature) grouped around the single pyramid mound suggests a village or hamlet unit in which certain religious and/or political functions were maintained on this local level" (Willey and Bullard 1956:44).

The Hospital Group

The Hospital Group originally consisted of a patio-focused settlement cluster dispersed around the present location of the San Ignacio Hospital compound. During the construction of the Medical Officer's residence in 1966 several of these mounds were destroyed, two complete ceramic vessels were found, and a multi-chambered chultun was uncovered (personal observation). After being alerted of the discovery, Commissioner of Archaeology Mr. Joseph Palacio paid a brief visit to the site. Palacio subsequently reported (in a Department of Archaeology file card) that the ceramic vessels dated to the Classic period and that the chultun had three interconnected rectangular chambers. During the last four years the author has also collected a small sample of pottery from the area. This material includes a wide range of Classic period ceramics, plus Formative period specimens of the Savana, Paila, Sierra, Aguacate, San Felipe and Monkey Falls ceramic groups. This ceramic data suggests that the Hospital Group was occupied from the Late Middle Formative to the Late Classic period.

Northern Periphery Salvage Operations

During the 1989 season there was a marked increase in the construction of modern houses in the immediate northern periphery of Cahal Pech. In several cases these new homes were being constructed directly over prehistoric mounds. On three occasions members of the Cahal Pech Project were alerted of this situation and salvage operations were mounted in order to retrieve some data before the mounds were completely destroyed. The information recovered by these investigations is described below.

Northern Periphery Salvage Operation 1

This 1.5 m X 1.5 m unit was excavated into the remaining section of a small mound which was located approximately 50 m due north of Plaza C. The mound was in the property of a Mr. Andy Quan and was in the process of being destroyed to make way for the construction of a new home.

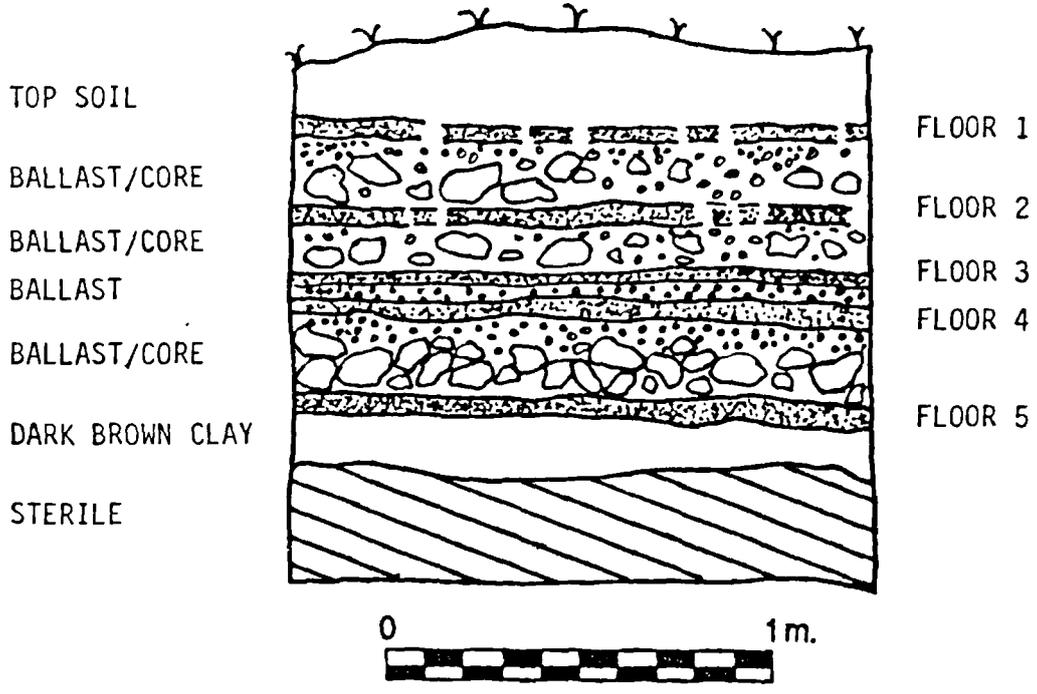
The excavation descended 1.48 m below surface and exposed five platform floors (Fig. 54a). The earliest floor (Floor 5) was well preserved and had been constructed above the original ground surface. Below the floor, excavators recovered a few potsherds, some jute shells and a handful of lithic debitage. Except for a few Middle Formative types, the pottery was predominantly Late Formative in date.

Floors 4 and 3 were 20 and 26 cm respectively above Floor 5. The proximity and relative contemporaneity of these floors suggest that the Floor 3 represents a resurfacing of the slightly earlier Floor 4. Pottery below the two floors was predominantly Early Classic in date.

Floors 2 and 1 represent the penultimate and final construction phases on the Quan mound. Both platforms were poorly preserved and had been constructed of dry fill ballast capped by a layer of lime plaster. Pottery recovered below the two floors consisted primarily of Late Classic types. A few of the sherds from below Floor 1 were also identical to material from the Belize ceramic group (e.g. Platon Punctated and McRae Impressed) at Barton Ramie.

In summary, the salvage operation at the Quan mound indicates that the initial platform

EAST/WEST PROFILE NORTHERN PERIPHERY SALVAGE OPERATION 1 CAHAL PECH, BELIZE



NORTH/SOUTH PROFILE NORTHERN PERIPHERY SALVAGE OPERATION 2 CAHAL PECH, BELIZE

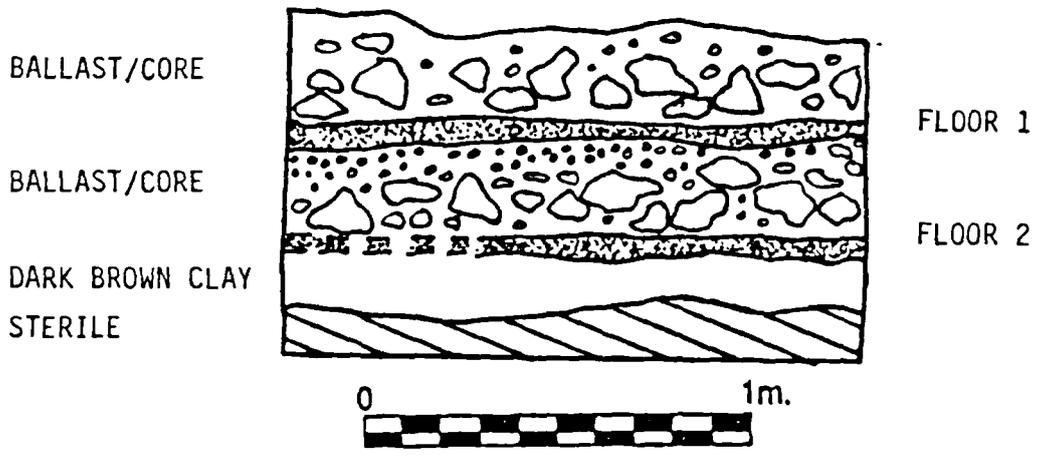


Figure 54: Profile of north periphery Operations 1 and 2

was constructed during the Late Formative, that it was modified and resurfaced during the Early Classic, and replaced twice in the Late Classic period.

Northern Periphery Salvage Operation 2

This salvage operation was conducted about 80 m north of the site core, in an area now occupied by a new water tower belonging to the San Ignacio Town Board. Members of the Cahal Pech Project were informed of the mound in July of 1989 after a bulldozer had levelled the land around the tower and exposed several fragments of human bone. When project staff visited the location, all of the bones had been unearthed by the local workmen. Since these remains were no longer in situ, we decided to excavate a small unit in the area where the bones had been discovered in order to determine their general context and date.

The unit measured 1.5 X 1.5 m and it descended 0.75 m from the bulldozed surface to sterile level (Fig. 54b). This operation recovered three phalanges, and uncovered two platform floors.

The phalanges were found just below surface in a loose layer of ballast. Apart from these foot bones no other skeletal remains were recovered. Fragments of pottery in the matrix suggested that the burial dated to the Late Classic period. Since the layer of ballast is similar to the type of fill generally found below the lime-plastered surfaces of building platforms, the interment may have been deposited beneath the floor of a destroyed, Late Classic, structure.

The first preserved floor (Floor 1) was located immediately below the layer of ballast, and 26 cm below surface. No evidence of a building was detected above this floor, but the

platform may have supported a perishable building. Only a small number of potsherds were found below the floor, and these were predominantly Early Classic types.

The second building platform (Floor 2) was 24 cm below Floor 1. It was constructed of lime plaster and a gritty, dark grey, layer of soil which had been deposited above sterile limestone. In the southeastern section of the unit the floor ended at a slight depression which contained a mixture of dirt, ash, and flecks of charcoal. The section of floor bordering the depression was burnt, and suggested that the latter may have been a fire hearth. Cultural remains below the floor included part of a mano, an obsidian blade fragment, some jute shells, and a mixture of Middle and Late Formative pottery.

In summary, Salvage Operation 2 in the northern periphery revealed that this severely destroyed mound contained at least three phases of construction. The architecture of these construction phases were represented by three building platforms which were constructed during the Late Formative, Early Classic and Late Classic periods respectively. The presence of a fire hearth on the initial building platform, the predominance of utilitarian pottery, a mano fragment, and the simple burial of an adult individual, indicate that the mound probably functioned as a residence for non-elite members of the Cahal Pech community.

Northern Periphery Salvage Operation 3

Salvage operation 3 was conducted on a partially destroyed mound located about 800 m northwest of the site core. During the 1989 reconnaissance of this new housing area it was noted that three mounds of a small patio group had been completely levelled, and most of a fourth mound had been destroyed by a bulldozer. Since some of the scattered pottery

included several Formative period types, it was decided to test the preserved section of the fourth mound in order to ascertain the occupation sequence of the small patio group.

The unit measured 1.5 X 1.5 m and descended 1.65 m below surface (Fig. 43b). The excavation exposed sections of six plaster floors. The first three floors (Floors 1, 2 and 3) were all within 40 cm below surface, and approximately 5.0 cm apart. Only a small number of potsherds were recovered in the fill separating the three floors and most of the pottery dated to the Late Classic period.

Floor 4 was in a fairly good state of preservation, but it contained no evidence of a superstructure. Pottery below this platform was a mixture of Late Formative and Early Classic types.

Floor 5 was 32 cm below Floor 4 and was fire-clouded in most of the area exposed by the excavation. Along the eastern limit of the unit, and above the floor, there was a single row of cut-stones with a north/south alignment. To the west of this possible wall there were six postholes with an average diameter of 15 cm, and an average depth of 0.45 m. The postholes and wall suggest that Floor 5 represented a building platform which at one time supported a pole and thatch superstructure. The presence of Middle and Late Formative pottery beneath the floor indicates that the building was constructed and occupied during the Late Preclassic period.

Floor 6 (the earliest floor) was approximately 10 cm thick and had been constructed above a layer of dark brown dirt which overlay sterile limestone. The postholes associated with the

Floor 5 building had penetrated through Floor 6, ending just above sterile level. Artefacts recovered below Floor 6 included several fragments of late Middle Formative pottery (i.e. Savana Orange and Paila Unslipped) and five jute shells. This cultural material suggests that Floor 6 had been constructed during the late Middle Formative period.

In conclusion, Salvage Operation 3 indicated that this small patio group was continuously occupied from the late Middle Formative to the Late Classic period.

CHAPTER 5

THE DEVELOPMENT OF FORMATIVE PERIOD ARCHITECTURE AT CAHAL PECH

5.1 Introduction

The data on Formative period architecture at Cahal Pech, like that of most excavated sites in the Maya Lowlands, is incomplete. The reason for this situation is that Formative construction phases were generally buried deep below massive layers of sequential Classic period construction. Furthermore, the excavations that probed these earlier levels of occupation were limited in size due to a requirement to preserve monumental architecture, and by the temporal and financial limitations of the project. Because of these concerns it was not possible to completely test and expose all Formative phases of construction. A large part of our information therefore derives from a relatively small number of mounds, and this data was often recorded through the lens of a 2 m X 2 m unit.

Chapter 5 will briefly describe the development of architecture during the Formative period at Cahal Pech. It will highlight the location and morphology of Preclassic architecture, describe structural features and the materials used for construction, and comment on the possible function of structures. This information is summarized in Table 2, and a detailed description of the construction history of individual mounds has been presented in Chapter Four. Architectural definitions also follow those established by Loten and Pendergast (1984)

5.2 Architecture of the Early Middle Formative Period

Phase 1: Cunil Ceramic Complex (ca. 1000-850 B.C.)

Evidence for construction during the first half of the early Middle Formative period (1000-850 B.C.) has only been recorded in the site core (Tables 1 and 2). This architecture is represented by the first four construction phases in Str. B-4 (Floors 13 through 10), and has been dated by two radiocarbon dates (Beta-40865) 2740 ± 70 B.P.; Beta-56765 2730 ± 140 B.P.), and by the presence of sealed deposits of pottery belonging to the Cunil ceramic complex.

The low building platform was the most common type of architecture during the Cunil phase (see Figs. 24, 28 and 29). These platforms were constructed out of marl, clay, and dirt, and were either built above the old ground surface of the site or, as in the case of B-4\1st, the old ground surface was scraped and levelled prior to the construction of the platform. The floors of the first platforms (i.e. B-4\1st, B-4\2nd and B-4\3rd) were initially constructed of marl which was tamped down and crudely levelled. Towards the end of the Cunil phase, particularly during the construction of B-4\4th, the quality of platform floors was eventually improved by the use of lime plaster (see Fig. 23). The well-preserved and thicker surfaces of these later platforms indicate a gradual enhancement of architectural skills, and a preference for the construction of more durable, burnt, plastered surfaces.

The first Cunil phase platforms all supported perishable superstructures. This is indicated by the presence of several postholes on B-4\1st and B-4\2nd. In comparison to subsequent

Table 1: Early Radiocarbon Dates from Selected Sites in the Maya Lowlands

SITE	CONTEXT	LAB NUMBER	RADIOCARBON AGE	CALIBRATED DATE
Altar	San Felix	GX-165	500 ± 120 b.c.	800 (752, 709, 530) 400 B.C.
	Xe	GX-172	745 ± 185 b.c.	1040 (836) 770 B.C.
	Xe	GX-163	880 ± 130 b.c.	1253 (998) 840 B.C.
Seibal	Real Xe	UCLA-1437d	660 ± 75 b.c.	831 (803) 781 B.C.
Colha	Bolay	TX-4060	730 ± 50 b.c.	897 (828) 807 B.C.
	Bolay	TX-4061	580 ± 70 b.c.	801 (777) 536 B.C.
	Bolay	TX-4062	710 ± 50 b.c.	844 (818) 803 B.C.
	Bolay	TX-4152	570 ± 80 b.c.	801 (770) 522 B.C.
Cuellar*	Swasey	Q-1917	770 ± 50 b.c.	916 (892, 882, 848) 823 B.C.
	Swasey	AA-458	700 ± 130 b.c.	920 (813) 770 B.C.
	Swasey	Q-1916	945 ± 200 b.c.	1400 (1065) 840 B.C.
	Swasey	LJ-4917	470 ± 60 b.c.	760 (484, 437, 424) 402 B.C.
	Bladen	LJ-4918	520 ± 70 b.c.	787 (757, 689, 651, 648, 543) 408 B.C.
	Bladen	LJ-4919	540 ± 70 b.c.	793 (762, 678, 662, 627, 600) 422 B.C.
	Bladen	LJ-4923	560 ± 60 b.c.	795 (767) 529 B.C.
	Bladen	LJ-4922	570 ± 70 b.c.	799 (770) 529 B.C.
Cahal Pech	Late Kanluk	Beta-40863	520 ± 90 b.c.	791 (757,689,656,645,590,577,545,458,454) 407 B.C.
	Early Kanluk	Beta-40864	770 ± 60 b.c.	970 (893, 878, 835) 816 B.C.
	Cunil	Beta-40865	790 ± 70 b.c.	999 (898, 858, 850) 827 B.C.
	Cunil	Beta-56765	780 ± 140 b.c.	
Pacbitun	Mai	Beta-25378	520 ± 100 b.c.	
	Mai	Beta-25372	770 ± 170 b.c.	
	Mai	Beta-25377	800 ± 100 b.c.	

*(Cuellar dates are from charcoal collected during the 1979 Season (cf. Andrews and Hammond 1990).

buildings, these superstructures were relatively simple, apsidal in plan, and probably constructed of poles and thatch. By the construction of B-4\3rd and B-4\4th the Cunil phase superstructures, like the floors of the building platforms, demonstrate a slight improvement over previous buildings. This is manifested by the placement of low retaining walls and/or mouldings, made of course and roughly-shaped limestone blocks, around the perimeter of superstructures (see Fig. 24), and by the use of daub for veneering the walls of the apsidal buildings. Measurements of pole impressions on daub fragments suggest that most of the poles used for the walls of buildings were between 2.0-8.0 cm in diameter. The presence of wide vertical bands of dull red paint on the white plaster background of several briquettes (or daub fragments) is also indicative of the first use of wall surface decoration on the buildings at the site.

The predominance of the building platform, the presence of fire hearths, and the associated cultural remains, suggest that most of the Cunil phase architecture probably served as dwellings and/or ancillary buildings (i.e. kitchens or storage facilities). The sequential construction over the first B-4 platform (B-4\1st) further indicates that the practice of rebuilding over previous structures is a very ancient Maya tradition, and the Cahal Pech data demonstrates that this practice was established by 1000 B.C.

Phase 2: Kanluk Ceramic Complex, Early Facet (ca. 850-650 B.C.)

Architecture dating to the second half of the early Middle Formative period is represented by the fifth and sixth construction phases in the Str. B-4 sequence (B-4\5th and 6th), and by the first platform in Str. B-2 (B-2 Floor 11). The structural features of this architecture are

similar to those previously established in the Cunil phase, but there is an overall increase in the height of most structures (i.e. B-4\5th), particularly those erected over previous construction phases. The building platform also continued as the most common form of architecture, but there were some changes in architectural styles, the quality of material used, and the overall size of structures.

Changes in architectural styles are particularly evident in the fifth construction phase of B-4 (Floor 9) which has been radiocarbon dated to (Beta-40864) 2720 ± 60 B.P. This construction phase consists of a large raised structure above a building platform (see Fig. 26). The summit of the raised structure was 0.7 m above the platform, and its retaining wall was constructed of roughly-shaped limestone blocks which were mortared together then veneered with plaster. The building platform had a thick plaster floor which had been resurfaced twice after its initial construction, and a large fire hearth had been constructed at the base of the raised structure. Postholes on the floor of the raised structure and on the platform, plus several daub fragments, indicate that both levels of architecture supported perishable buildings. Judging from the height (0.70 m) of B-4\5th, it is also possible that somewhere along the unexcavated perimeter of the structure there should be a stairway which provided access to the top of the platform.

The major difference which distinguishes early Kanluk phase architecture from that of the Cunil phase is in the quality of the materials used for construction. Whereas the use of lime-plaster for the surfaces of floors was a late introduction to Cunil phase architecture, it becomes a standard feature during early Kanluk times. The blocks of limestone, used in retaining walls and for the basal moulding encircling apsidal buildings, are better dressed and

are more rectilinear during early Kanluk than they were during the Cunil phase.

While most of early Kanluk phase architecture served domestic purposes, it is possible that B-4\5th may have functioned as a family shrine. This is suggested by its large size, relative complexity, and the presence of figurines within its fill. An increase in the frequency of figurine fragments was also noted within the fill of B-4\6th, but it is difficult to say whether the presence of these figurines provide conclusive evidence for classifying B-4\6th as a non-domestic structure. According to Coe (1961), Willey (1972, 1978), and Hammond (1989), figurines may have been part of the paraphernalia used in fertility cults and fetishes, or they represent tangible symbols of the developmental stages of household ancestor worship. If these interpretations are valid, it is then important to note that of the 187 figurine fragments recovered at Cahal Pech, 145 were found within Str. B-4 (see Table 3). This concentration is probably significant and suggests that from quite early Str. B-4 played a prominent role in ceremonies associated with fertility cults or ancestor worship.

Buildings erected during the early Kanluk phase duplicate the style of the superstructures from the preceding Cunil phase. The apsidal building with wattle and daub walls, basal moulding, and probably thatch roof, continued to be constructed in the location of Str. B-4 (as indicated by B-4\6th), while the use of the relatively more simple pole and thatch superstructure persisted in B-2\1st and as ancillary buildings next to B-4\5th and 6th.

5.3 Architecture of the Late Middle Formative Period

Phase 3: Kanluk Ceramic Complex, Late Facet (ca. 650-350 B.C.)

At the onset of the late Middle Formative period there is a gradual increase in construction activity at Cahal Pech. This is evident within the site core and also in the periphery where structures dating to the second half of the Kanluk phase have been recorded in Str. B-4 (B-4\7th and B-4\8th), Str. B-2 (B2\2nd), Str. 6 in the Tzinic Group, Strs. 1, 2, and 4 at Tolok, the large central platform at Cas Pek, Str. 1 in the Zopilote Group and in Str. 1 in the Melhado Group.

As in the preceding phases the building platform is the predominant type of late Middle Formative architecture at Cahal Pech. It is represented by the initial construction phases of several of the mounds in the peripheral groups tested (see previous paragraph for structure numbers), and in the second construction phase of Str. B-2 (B-2 Floor 10) in the site core. B-4\7th is the only structure which differs from this pattern. Here we have the earliest recorded ([Beta-40863] 2470 \pm 90 B.P.) evidence for the construction of a "specialized" round (or circular) structure at Cahal Pech (see Figs. 21 and 30).

This round structure was erected above a raised, lime-plastered, building platform which was accessed by a stairway on its north face. The stairway, which probably dropped 2-3 m from the summit of the platform to ground level, had rounded contours and was constructed of large (20 cm X 24 cm X 48 cm) cut stones which were subsequently covered by a thick layer of plaster. Since the retaining wall of the round structure had been partially demolished prior to the construction of B-4\8th (B-4 Floor 6), it was not possible to determine the height

of this superstructure. The partial destruction of the architecture also made it impossible to ascertain whether the round structure supported a perishable building, but it was noted that the retaining wall was made of several courses of cut limestone blocks which were mortared together.

Toward the end of the late Kanluk phase the round structure was largely demolished and a large, flat, lime-plastered platform (B-4\8th) replaced B-4\7th. Unfortunately, the floor of this new platform (Floor 6) was poorly preserved and no evidence of an associated superstructure was observed.

Elsewhere, excavations in Plazas A and B indicate that the first lime-plastered courtyard was constructed during late Kanluk times. This large, late Middle Formative courtyard is represented by the first floors in the Plaza A (Floor 5) and Plaza B (Floor 5) construction sequences, and they are contemporaneous with B-2\2nd and B-4\8th. It is also possible that a relatively large, late Kanluk, non-domestic structure may lie below the unexcavated stratigraphy of the 15 m tall penultimate construction phase of A-1. However, due to the monumentality of the overlying architecture we were unable to investigate this possible substructure.

Artefacts associated with domestic activity, plus the structural and associated features of the building platforms, suggest a residential role for most of the late Kanluk phase architecture at Cahal Pech. B-4\7th and B-4 8th are the only two structures whose function likely differed from that of the others. Their relatively large size, greater height, central stairways, and the round structure above B-4\7th are all indicative of non-domestic functions.

This is particularly true of the latter for round structures are conspicuously different from contemporary Formative period architecture. Furthermore, Mayanists (Pollock 1936; Sidrys and Andresen 1978:649; and Pendergast 1982:187) have traditionally suggested that these raised, round platforms probably served "ritual" and/or "ceremonial" purposes.

5.4 Architecture of the Late Formative Period

Phase 4: Xakal Ceramic Complex, Early Facet (ca. 350-100 B.C.)

Architectural activity at Cahal Pech reaches one of its two highest levels of intensity during the Late Formative period (the other peak period occurs during the Late Classic). Approximately 50 percent of the structures investigated at Cahal Pech were either initially constructed, renovated, or modified at this time (Table 2). Among the early Xakal phase constructions, four architectural types were recorded: the building platform, the raised plaza, the round structure, and the terraced platform.

The early facet Xakal phase building platforms were constructed in the same general style of their immediate precursors. They tend to be rectangular in form, have thick plaster floors, and generally support perishable buildings. There are also few changes in the materials used in their construction, but there is a general increase in the height and size of the platforms within the site core.

The raised plaza, which was first introduced toward the end of the late Middle Formative period, is represented by Floor 4 of Plaza A and Plaza B. Like their predecessor, Plaza A

Floor 4 and Plaza B Floor 4 represent a single large courtyard which spanned most of the area subsequently subdivided into Plaza A and Plaza B in the site core. During the construction of this second courtyard the first Plaza A/Plaza B floor was covered with about an 80 cm layer of fill (consisting of marl, clay, and fine ballast) then was solidly capped with a lime-mortared floor approximately 6.0 cm thick. Four of the mounds which we investigated were situated on the perimeter of this courtyard. These structures include the penultimate phase of A-1, B-1\Sub 2 (tested by J. Ball), B-2\3rd, and B-4\9th.

Toward the end of the early Xakal phase another Plaza floor (Plaza B Floor 3a, 3b, and 3c) replaced the Plaza B section of the large courtyard, and Plaza F (Floor 6) was added to the site core. The building of A-2\Sub 2 at the end of this phase also marks the first time that Plazas A and B were divided into two separate courtyards. Along with the construction of the new floors in Plaza B several of the structures within that courtyard were either renovated or constructed. One of the most prominent new structures in Plaza B was B-4\10th and its coeval building platform B-4\11th (see Fig. 32). Together with the penultimate phase of A-1 (A-1 Sub 1) in Plaza A, this structure represents one of the first of two examples of monumental architecture at Cahal Pech.

The third architectural type, the round structure, is herein considered a separate type of architecture from that of the low round or circular building platform. The major distinctions between the two is that the height of the former is generally greater than .50 m, and the summit of the structure is accessed by a stairway. At Cahal Pech the round structure is represented by the second construction phase of Str. 2 in the Zotz Group and possibly by the earlier round structure above B-4 7th. The Zotz Group round structure (see Figs. 48-49) is

1.2 m high and has an upper diameter of 3.6 m. The walls are made of cut limestone blocks set in mortar and they are veneered on the outside face with a thick layer of plaster. The sides of the structure also taper slightly from base to summit and the top is capped by a thick plaster floor. On its western face an outset stairway, elliptical in shape, provides access from plaza level to the summit of the structure. A Jocote Orange-brown vessel recovered from Burial 1 in this structure suggests that the round platform probably dates to the late Middle Formative period. Due to the absence of contemporaneous construction within the Zotz Group, however, we believe that the structure was actually erected during the transition from the late Middle to the Late Formative period, and have tentatively included it in the early Xakal phase.

Although Formative period round structures were previously regarded as rare forms of architecture in the central Maya Lowlands (Pollock 1936), several of these large round masonry platforms have been reported in Belize and adjacent areas of southern Mexico. The closest parallels to the Cahal Pech type were discovered at Altun Ha (Pendergast 1982:186), Chan Chen (Sidrys and Andresen 1978), and Louisville (Haberland 1958) in northern Belize, and at Barton Ramie (Willey et al. 1965:46-48) in the Belize Valley. The Chan Chen example (Str. F) has an elliptical-shaped stairway which is similar to that of Str. 2\2nd in the Zotz Group at Cahal Pech, but unlike the Cahal Pech and Altun Ha structures the round platform at Chan Chen supported a perishable building. With the exception of the terminal Late Formative/Early Classic Barton Ramie structure (BR-1.Str. F), the stairways of Formative period round platforms in Belize are also consistently located on the west face of the structures. Pendergast (1982:187), and Sidrys and Andresen (1978), have also suggested that round structures primarily served non-domestic functions.

In southern Mexico, round structures have been reported at Tanchah and Katunil Kin in Quintana Roo (Sanders 1960:167, 169), and near Becan in Campeche (Adams 1977:82). These round structures, however, generally postdate those from the Belize sub-region and tend to be slightly more complex in their overall configuration.

The fourth architectural type present during the first half of the Xakal phase, the terraced structure, is similar to what Hammond and Gerhardt (1990:472) refer to as the terraced pyramid, and which they define as a "type of substructure with steep, often tiered, sides rising from a broad, usually square base to a small platform". Three Late Formative terraced structures were identified at Cahal Pech: Str. A-1\ Sub 1, B-4\10th-B-4\11th, and Str. 1\3rd in the Zopilote Group. Since the latter was only discovered in July of 1992 we presently have limited data on its architecture. We do know that the structure is approximately 7.0 m tall, and believe that the north face has a central stairway which is probably flanked by masks. Str. A-1\Sub 1 is approximately 15 m tall and has a wide stairway with rounded steps leading down to Plaza A (see Fig. 8). At the summit of the structure there is also a rectangular platform which may have supported a perishable building. B-4\10th and its building platform (B-4\11th) is slightly less than 4 m in height. The structure has a wide, inset, central stairway which descends from a rectangular building platform at its summit to a narrow landing or basal platform, then leads down three more steps to plaza level (see Figs. 18, 32). Flanking the stairway are parallel stair-side outsets, each with a pair of poorly preserved and unidentifiable masks. Several postholes on the floor of the building platform suggest that the structure was crowned by a perishable building. Stylistically, B-4\10th-11th displays minor similarities with E-VII-Sub at Uaxactun, Str. 350 at Cuello, and Str. 450 at Dzibilchaltun (Andrews and Andrews 1980:Fig. 27). As a whole, however, the structure is quite different

from contemporary architecture in the region.

Phase 4: Xacal Ceramic Complex, Late Facet (ca. 100-350 A.D.)

With the exception of the round structure, most of the architectural types and structural features of the previous two phases continue to predominate the architecture of the late Xakal phase. There are, however, several minor and major changes which were introduced during the terminal Late Formative. Primary among these changes was a trend for the construction of larger, raised, building platforms, possibly with outset stairways flanked by terraced aprons (e.g. A-2\ Sub 2). Throughout the site there is, as well, a preference for the construction of rectangular and rectilinear buildings and platforms over circular and apsidal ones.

Changes in the materials used for construction are also evident during the terminal Late Formative. There is a gradual decrease in the size of cut stones used for construction, and a conspicuous increase in the use of large boulders for constructing the core of structures.

Late Xakal phase structures served the same general purposes as the architecture of the previous phase, and domestic structures greatly outnumber civic and "ceremonial" buildings. At the same time there is an overall increase in structure size, particularly in the site core, and this monumental architecture was undoubtedly the product of communal labour under the control and direction of a well-established and powerful elite group.

5.5 Summary

The analysis of Formative period architecture at Cahal Pech indicates that during the early Middle Formative Cunil phase the building platform was the typical form of architecture constructed at the site. Initially these platforms were primarily low and apsidal in shape. By the end of the Cunil phase, however, larger rectilinear structures came into vogue. The majority of platforms supported perishable buildings. The first of these superstructures were relatively simple and they were mostly constructed of poles and thatch. Later in the period the buildings became more impressive with the addition of painted daubed walls and basal mouldings.

Ancillary features to the platforms of the Cunil phase included firehearths, and steps carved into natural bedrock along the sides of small hills (B-4\1st), or at the base of low building platforms. The materials used for construction included small rocks, marl, clay, dirt, and limestone boulders, plus several species of trees, thatch and lime plaster. These building materials were all available within the vicinity of the site.

During the second half of the early Middle Formative period (early facet Kanluk) there are minor changes in the structural features of the architecture at Cahal Pech. There is an overall increase in the height of structures (i.e. B-4\5th), but the building platform continues its predominance over other forms of architecture. Superstructures also remain largely unchanged and apsidal wattle and daub buildings with basal moulding may have been the typical style of most dwellings.

While the same types of material continued to be used for construction, it is possible to distinguish early Kanluk phase architecture from that of the Cunil phase by improvements in the overall quality of the architecture. For example, the floors of Cunil phase platforms were predominantly constructed of tamped marl and clay, and the retaining walls of structures were generally built of uncut or roughly-shaped boulders. In contrast, the floors of early Kanluk phase architecture are primarily constructed of lime plaster and the limestone blocks in the retaining walls of structures are better dressed and more rectilinear. The first non-domestic structures at the site may also date to the early Kanluk phase (B-4\5th and 6th), but due to our limited sample of the architecture of this period this interpretation must remain tentative.

During the late Middle Formative period (late facet Kanluk) there is evidence of a gradual increase in construction within the site core and periphery of Cahal Pech. This acceleration of architectural activity may be the result of an increase in the population of the site, and of the Belize Valley in general. A rise in the frequency of late Middle Formative settlements in the Belize Valley has been recorded at Barton Ramie (Willey et al. 1965:564), the northern banks and adjacent foothills of the Mopan and Belize River (Ford 1985:14, 1990b:171; Fedick 1989:240-241), at Pacbitun (Healy 1990:256), and around the Blackman Eddy site area (Garber, personal communication 1992).

As in the preceding phases, the building platform was the most common form of architecture constructed during the late Kanluk phase at Cahal Pech. These rectangular platforms generally served as substructures for perishable buildings whose primary function was domestic in nature. The only late Middle Formative architecture which may have served ritual or non-domestic purposes was the round B-4\7th structure and its subsequent

replacement, B-4\8th.

The formal, lime-plastered, courtyard is also the product of late Middle Formative architectural developments at Cahal Pech. This first formal courtyard covered most of the area subsequently enclosed by Plazas A and B, and it was bordered by several small structures dispersed around its perimeter.

The increase in construction activity, which began in the late Middle Formative, continued unabated throughout the Late Formative period at Cahal Pech. During the early facet of the Xakal phase there were at least four different forms of architecture constructed at the site: the building platform, the raised plaza, the round structure, and the terraced structure.

Except for increases in the height and size of the platforms, and the height of the plaza, these two architectural types may have undergone little change from late Middle to Late Formative times.

The early facet Xakal phase round structure also has a precursor (B-4\7th) in the Late Middle Formative period, but the more recent structure displays improvements in construction and architectural skills.

The most impressive architecture of the early facet Xakal phase was the terraced structure. Three of these early Late Formative structures were recorded by our investigations: A-1\Sub 1 and B-4\10th-11th, and Str. 1\3rd in the Zopilote Group. These terraced structures have central stairways on their north face, and rectangular building platforms at their summits may

have once supported perishable architecture. The sheer size of A-1\Sub 1 (15 m) also indicates that some of the structures within the site core were constructed by communal labour that was probably organized by a ruling elite.

During the terminal Late Formative period (late facet Xakal) there are minor changes in the materials used for construction, and there is an increase in the frequency of rectangular platforms over apsidal ones. The ubiquity of Late Formative architecture throughout the sustaining area of the site also indicates that settlements and population continued to increase at Cahal Pech during this time frame.

The analysis of the architectural data at Cahal Pech detected several differences between Formative and Classic period architecture at the site. For example, there is very little use of ballast and an absence of large boulders in the core of platforms constructed during the Middle Formative. Ballast, in fact, does not become standard until the Late Formative period, and while large boulders for use in core is introduced during the Late Formative, it only becomes a standard feature of construction in the Classic period.

Unlike Classic period architecture, Formative period structures at Cahal Pech generally have rounded rather than angular contours. During the Formative, plaster also seems to have been applied more generously to surfaces (i.e. floors and stairways), than it was in Classic period construction. According to Loten (1990) these features are characteristic of Formative period structures in the Maya Lowlands, and often serve to differentiate between Classic and Preclassic architecture.

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CHAPTER 6

ANALYSIS OF FORMATIVE PERIOD ARTEFACTS AND DESCRIPTION OF FORMATIVE PERIOD BURIALS AND CACHES

6.1 Introduction

The objectives of the artefact analysis are: 1) to provide descriptions of the Formative period artefacts from Cahal Pech; 2) to conduct regional comparisons of the assemblage; and 3) to determine which materials represent trade items. This information is subsequently used (in Chapter 7) to document diachronic changes at the site, and to ascertain the cultural relationship between Cahal Pech and other sites in the region.

The system used to analyze the artefacts closely follows the format employed by Garber (1989) and Sheets (1978). In this methodological approach the artefacts are first organized into several categories on the basis of their raw material. The major categories identified by this study include clay, stone, shell, and bone. These raw material categories are subsequently subdivided according to the industry (or technology) used for the production of the artefact and, with the exception of ceramics, they are then classified according to form. Information regarding frequency, dating, and context, are listed for each artefact form or sub-form, and comparisons and possible functions are presented under comments.

The industries represented in the artefact assemblage from Cahal Pech include: ceramic,

modified ceramic sherd, modeled clay, ground stone, polished stone, chipped stone, worked shell, and worked bone. Because the ceramic industry, the modeled clay industry, and the chipped stone industry are the subject of separate research, detailed analytical reports of these industries are not provided in this monograph. In lieu of this information, summaries of the analysis of these artefacts and illustrations of some specimens are provided below.

Dating of the artefacts is based primarily on the chronological placement of their context. The age of the latter was determined by combining dates derived from radiocarbon determinations and associated ceramics. In cases where comparative analysis suggested that certain artefacts represented heirlooms, or that they may have been redeposited in later contexts, both contextual and comparative dates are provided.

6.2 The Ceramic Industry

The ceramic industry includes all pottery vessels produced by firing. During the first three years of the Cahal Pech Project these artefacts (approximately 10,000 sherds) were grouped and sorted according to their stratigraphic context, and they were tentatively classified on the basis of their stylistic attributes. Following the fourth season of investigations, the ceramics were then analyzed by the author and by Joseph Ball of San Diego State University. During this analysis we employed the Type:variety/mode method of classification. This system closely follows the conceptual framework used by Sabloff (1975) at Seibal and by Gifford (1976) at Barton Ramie.

The Formative period ceramics from Cahal Pech have been tentatively divided into three complexes: Cunil, Kanluk, and Xakal (Fig. 55). The Cunil complex represents the first half

Radiocarbon Years 11.16.0.0.0 Correlation	Major Periods	Cabal Pech	Barton Ramie	Cuello	Colba	Yaxha Sacnab	Tikal	Uaxactun	Seibal	Altar
400	Classic	Ahcabnal	Hermitage	Nuevo	Cobweb	Early Tsutsuy	Manik	Tzakol	Junco	Salinas
300		Late Ixkal	Floral Park	Fresh water			Cimi			
200	Proto-Classic		Mount Hope	Cocos	Blossom Bank	Late Kuxtun	Cauac	Chicanel		Plancha
100										
A.D. 0										
B.C. 100	Late Formative	Early Ixkal	Barton Creek		Onecimo	Early Kuxtun	Chuen			
200										
300										
400	Late Middle Formative	Late Kanluk	Late Jenney Creek	Lopez	Chiwa	Late Yancotil	Tzec	Mamon		San Felix
500										
600										
700			Early Jenney Creek	Bladen		Late Ah Pan	Eb			
800	Early Middle Formative	Early Kanluk			Bolay	Early Ah Pan			Real	Xe
900		Cunil		Swasey						
1000										
1100										
1200	Early Formative									
-										
2000										

Figure 55: Formative Period Ceramic Sequences in the Maya Lowlands

of the early Middle Formative period (1000-850 B.C.). The Kanluk and Xakal complexes are subdivided into early and late facets. Early facet Kanluk represents the second half of the early Middle Formative period (850-650 B.C.), and late facet Kanluk is coeval with the late Middle Formative (650-350 B.C.). The two facets of the Xakal complex span the first (350-100 B.C.) and second half (100 B.C. to A.D. 350) of the Late Formative period. A summary of this sequence is provided below, and a detailed report of the Type:variety/mode designations, descriptions and illustrations of the Formative period ceramics from Cahal Pech is presently being prepared by J.Awe and J.Ball.

The Cunil Ceramic Complex.

Cunil is the earliest ceramic complex in the Cahal Pech sequence. Its chronological placement in the first half of the early Middle Formative period (ca 1000-850 B.C.) is based on comparative analysis of the ceramics, and on two radiocarbon dates (Beta-56765) of 2730 ± 140 B.P. which calibrates between 1070 -800 B.C. (1 sigma), and (Beta-40865) of 2740 ± 70 B.P. which calibrates between 999 - 827 B.C. (1 sigma).

Cunil pottery, represented by two fragmented vessels and approximately 250 sherds, was stratigraphically isolated in the earliest levels (construction phase 1st-4th) of Str. B-4, and also recovered in mixed deposits at the Tolok and Tzinik Groups, and in the site core. Although technologically developed, Cunil pottery has relatively simple modal and stylistic attributes. The form repertoire consists of flat-base dishes with out-sloping walls and bolstered or wide everted rims; simple bowls with flat bases and rounded sides; and low to medium-high necked jars. Stylistic attributes include monochrome slips, burnishing, zoning, and post-slip grooving and incising.

Typologically the Cunil pottery includes specimens which may be anomalous to the central Maya lowlands, and types which share similarities to Swasey/Bladen and Bolay material from northern Belize. Among the possible, regionally anomalous Cunil complex pottery are White-clouded blackware ceramics and possibly Chitam Zoned-Incised dichromes. The White-clouded blackware pottery is predominantly in jar forms (see Fig. 58d) and its surface treatment is reminiscent of an Early Formative Zoquean (White-rimmed blackware) tradition (Ball, personal communication 1990). Chitam Zoned-Incised dichromes are represented by flat-base dishes with outsloping walls and wide everted rims (Figs. 56-57). Surface decorations include zoning in brown and red, or brown and cream, and post-slip grooving and incising on the upper surface of everted rims and on the walls of bowls. Modally, Chitam Zoned-Incised shares parallels with Pico de Oro Incised (Sabloff 1975:49-51, Fig.35) and Comistun Incised (Sabloff 1975, Figs. 55n-o, 59, 60) specimens from the Xe complex at Seibal, and with Early Formative Chanmico Incised from Chalchuapa (Sharer 1978:11). Dichromes with zoned post-slipped incisions are also present in Early and Middle Formative contexts in the Maya Highlands, the Pacific coast, and in the Chiapas area (Coe 1961:49, 60-62; Peterson 1963:30-32; Sharer 1978:11; Sharer and Sedat 1987:305)

Among the Cunil pottery with modal and stylistic ties to Swasey/Bladen and Bolay ceramics from northern Belize are types which have been tentatively placed in the Consejo Group, and pottery with a cream-coloured wash or thin slip. The latter have been designated as the Cocoyol group, and appear to be in the general tradition of the Zoned-Incised dichromes at Cahal Pech (Fig. 58c). The cream-coloured pottery, and possibly the Chitam Zoned-Incised dichromes, may also be precursors of, or related to, the slightly later Quamina Cream and Tower Hill Red-on-cream. The Consejo Group is represented by a small sample

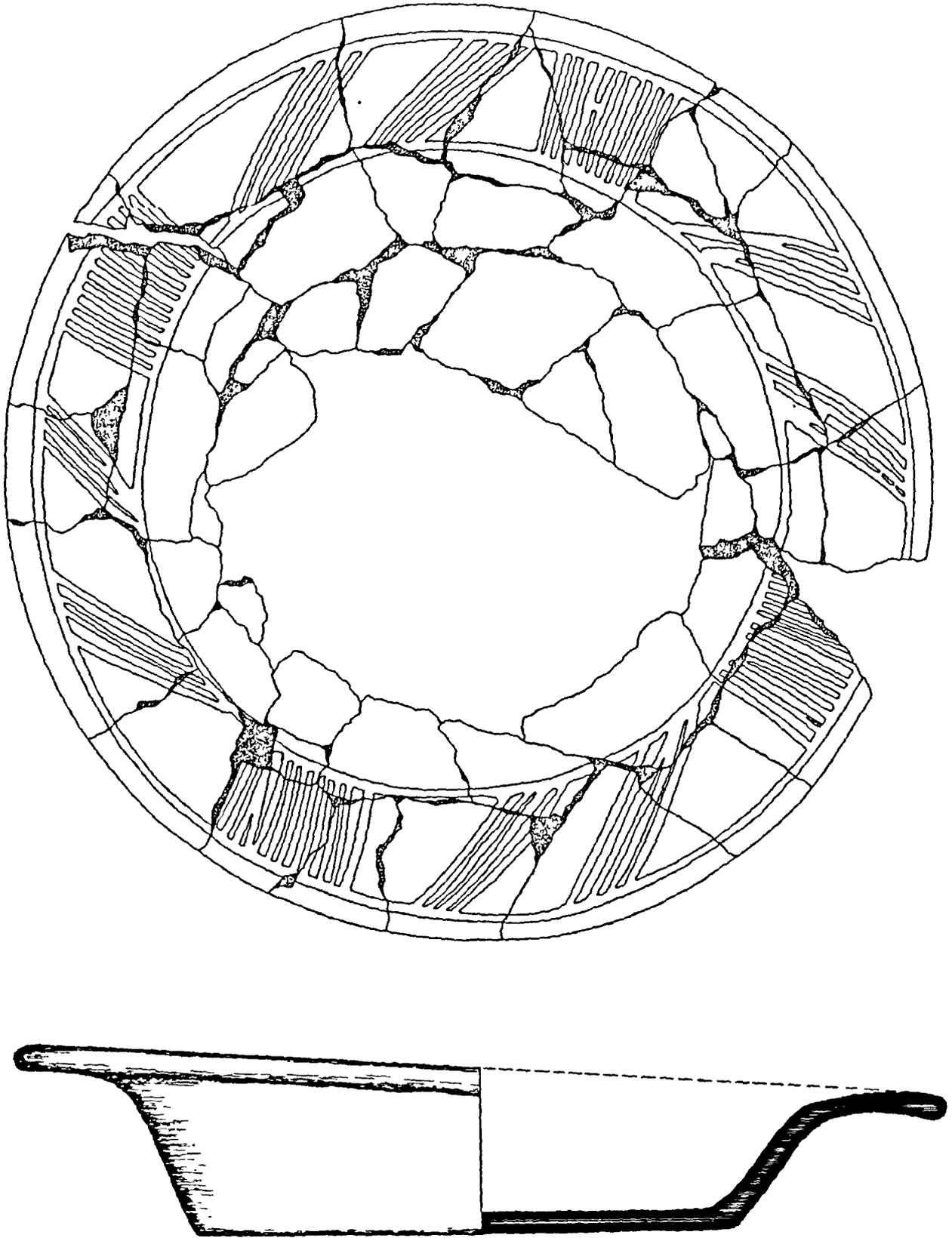


Figure 56: Chitam Zoned-Incised vessel
(50% actual size)

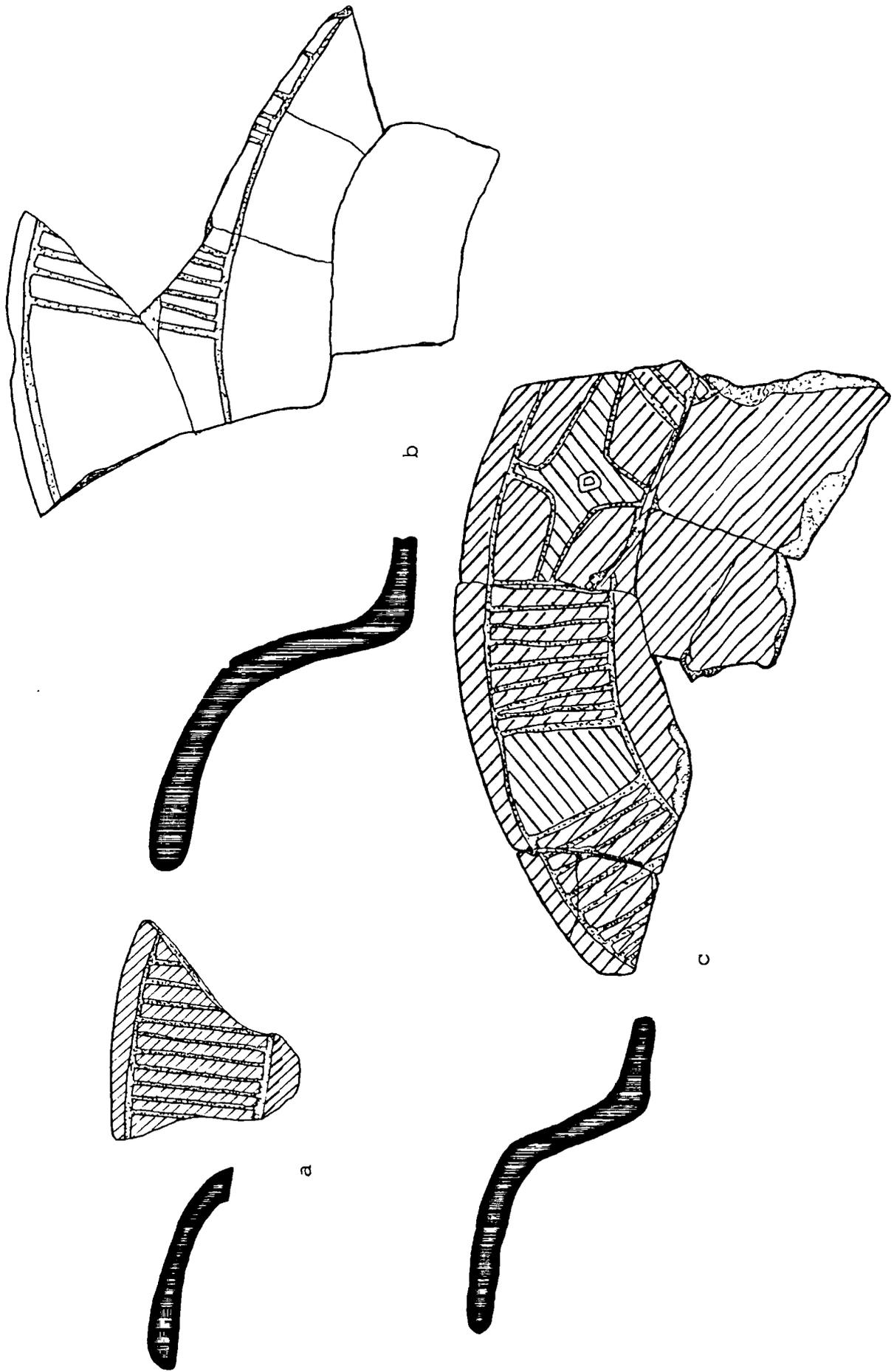


Figure 57: Chitam Zoned-Incised pottery (65% actual size)

of Consejo Red: Variety Unspecified (Fig. 58a-b). Once again this pottery is modally similar to its northern Belize counterpart and slight differences in surface treatment may essentially reflect the use of local clays and pastes.

Two other groups complement the ceramics from the Cunil complex. They include the plain unslipped Sikiya group, and the plain burnished Tuki group. The plain unslipped Sikiya group is predominantly found in jar forms (Fig. 58e), and has direct modal ties to the later Jocote Orange-brown pottery from the Jenney Creek complex at Barton Ramie, and with Honey Camp Orange-brown from northern Belize. Except for differences in decoration (i.e. the presence of "stick burnishing", the unslipped burnished Sikiya group (Fig. 58f) is modally and technologically similar to the ceramics from the Tuki group.

In summary, the most striking features of Cunil pottery are that it is very unlike ceramics from the Mamom complex, that it is typologically and stratigraphically a predecessor of the Jenney Creek complex, and that it shares some ties with pottery from the Swasey/Bladen and Bolay complexes from northern Belize. Differences between Cunil and Mamom related pottery, and the ancestral ties of Cunil to Jenney Creek is indicated by: 1) the absence of pottery from the Savana, Joventud, and Chunhinta ceramic groups, 2) the conspicuous absence of Mars Orange Ware, and 3) the relationship of the unslipped Tuki and Sikiya groups to Jocote Orange-brown. Similarities with Swasey/Bladen and Bolay ceramics is indicated by the presence of material with ties to the Quamina and Consejo Groups. Finally, the Cunil ceramic complex consists of pottery which is relatively simple in form and design. This pottery, however, is by no means experimental, and it represents a ceramic tradition that had been developed for some time.

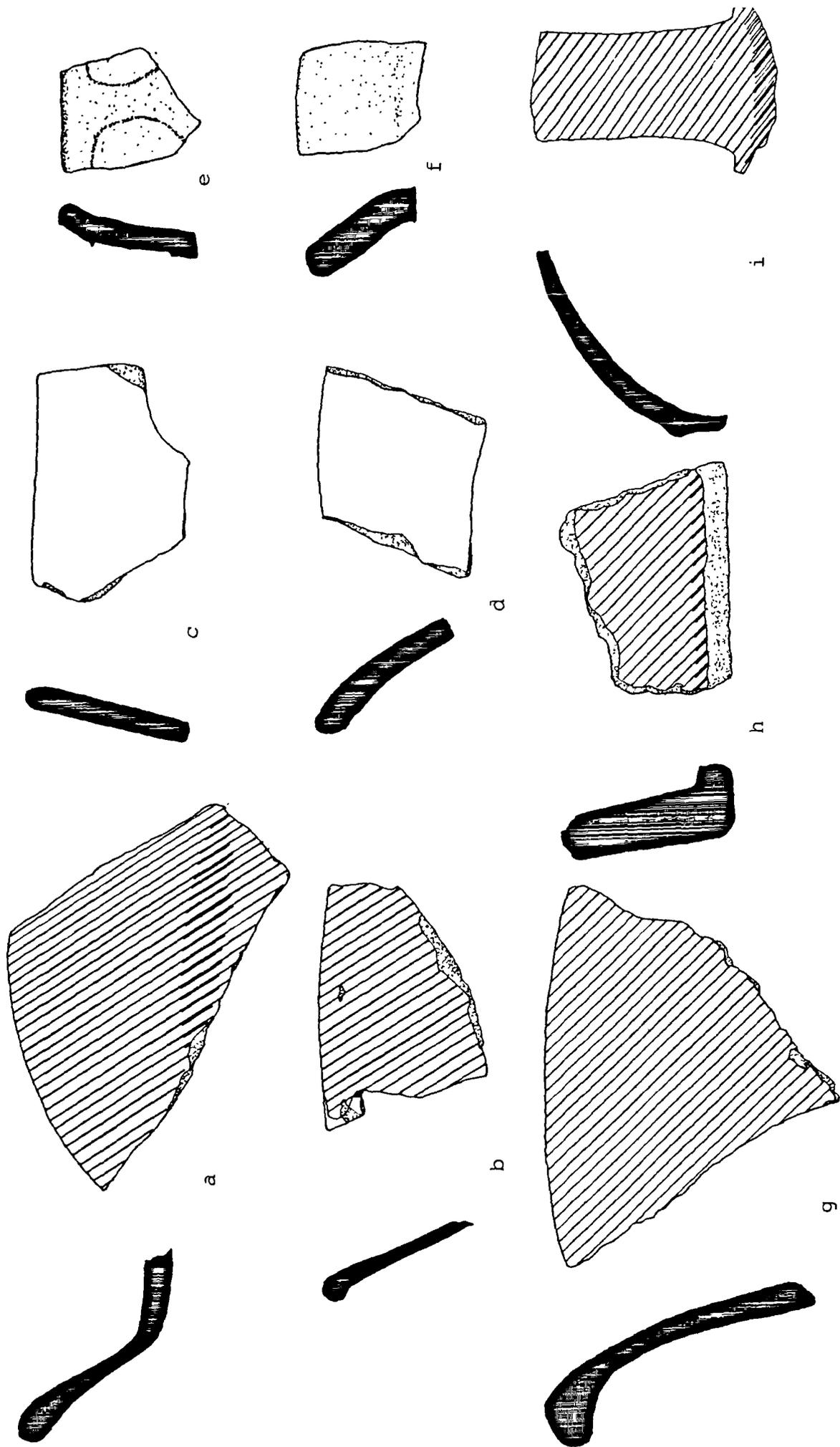


Figure 58: a-b -Consejo Red; c -Cocoyol Cream; d -White-clouded blackware; e -Sikiya Unslipped; f -Tuki Unslipped; g-i -Joventud Red (65% actual size)

The Kanluk Ceramic Complex: Early Facet

Early facet Kanluk succeeds the Cunil complex at Cahal Pech and is coeval with the Jenney Creek complex (early facet) at Barton Ramie and the Bladen complex at Cuello. The complex was placed in the second half of the early Middle Formative period (850-650 B.C.) on the basis of ceramic analogy, and by a radiocarbon date (Beta-40864) of 2720 ± 60 B.P. which calibrates in the 1 sigma range to 970 (893, 878, 835) 816 B.C. Stratigraphically, early Kanluk pottery was found in construction phases 5 and 6 in the Str. B-4 sequence, and in mixed deposits in early occupation levels throughout the site.

Early facet Kanluk pottery consist of types which derive from the earlier ceramics of the Cunil complex at Cahal Pech, to types which are directly related to the Bladen complex at Cuello, and by pottery which represent new ceramic traditions. Ceramic continuities and relationships with northern Belize are represented by pottery with ties to the Quamina and Consejo Groups, and by a small number of bottle fragments with affinities to the Ramgoat Group at Colha. The Quamina group material at Cahal Pech includes two varieties of Tower Hill Red-on-cream (Figs. 59-60). One of these, tentatively classified as Variety Unspecified, is indistinguishable from the northern Belize Tower Hill variety. The second is a local Belize Valley variety which can be distinguished from the former primarily by differences in paste. The Consejo group continues to be represented by the Variety Unspecified and a local incised type of Consejo Red. Affinities with the Ramgoat group are indicated by modeled bottle fragments with marked similarities to Unnamed Red-modeled bottles from the Ramgoat group at Colha (see Fig. 69g). The new traditions are marked by the appearance of true Jocote Orange-brown (Fig. 61) and Mars Orange ware, and by the late (600-650 B.C.) introduction of ceramics related to Flores Waxy Ware (i.e. Joventud groups). Mars Orange Ware is

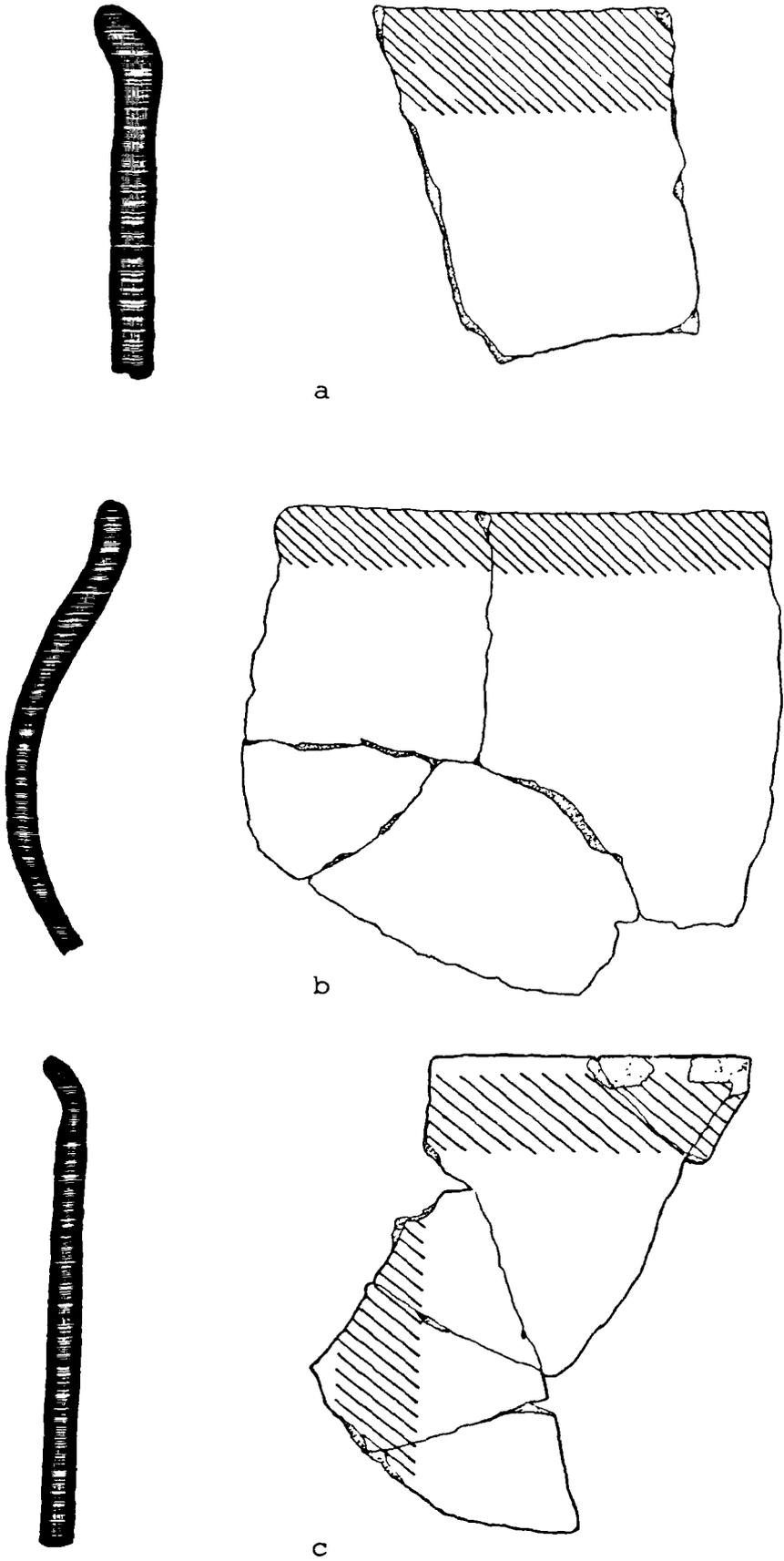


Figure 59: Tower Hill Red-on-cream (65% actual size)

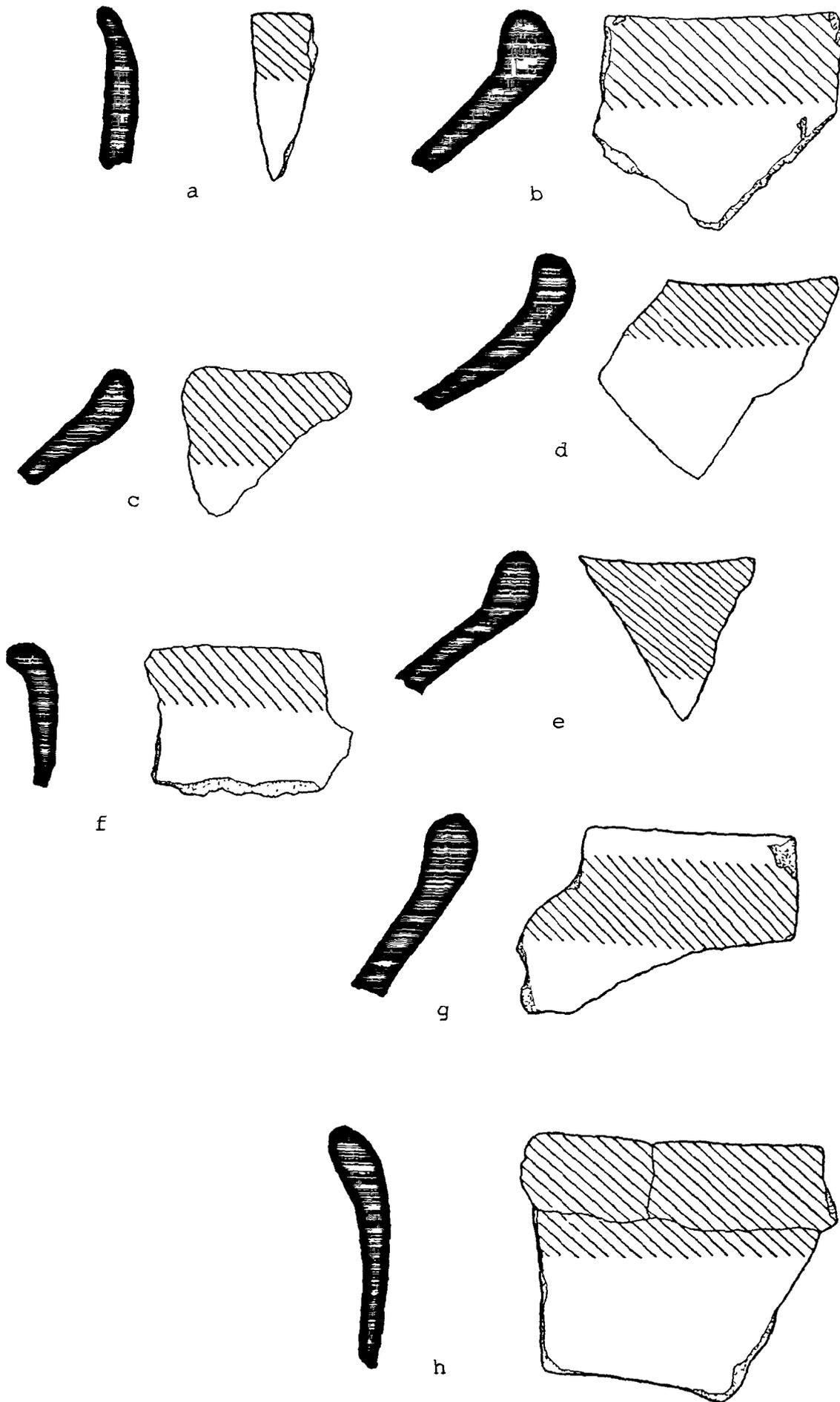


Figure 60: Tower Hill Red-on-cream (65% actual size)

represented by several varieties of Reforma Incised and Savana Orange (Figs. 62-63), while the Jocote group is present in the Unspecified and Jocote varieties of Jocote Orange-brown (Fig. 61).

Flores Waxy Ware pottery is found in limited quantities in early facet Kanluk contexts. Thus, they probably reflect trade items. They are represented by small samples of the Joventud and Sampopero Red (Fig. 58g-i) and the Pinola Creek Incised types of the Joventud group.

A cream-slipped group rounds off the pottery of the early Kanluk complex. Like Flores Waxy Wares, however, the frequency of creamed slipped ceramics is low and this pottery is either equivalent to Quamina Cream, or probably transitional between the Cunil Cocoyol Cream and the late Middle Formative Pital Cream.

During early facet Kanluk there is a broadening of the form repertoire. Vessel forms include jars with outcurving necks, thickened rims and strap handles; bowls and dishes with flat bases, slightly flaring or recurved sides, and rounded lips; tecomates with restricted orifices and thickened rims; and cuspidor-shaped bowls. Decorations are limited to pre-slip and post-slipped groove/incised geometric patterns, and impressed filleting. Except for the insignificant number of Joventud specimens, the slip texture and colour of early Kanluk pottery is predominantly glossy rather than waxy.

In general, early facet Kanluk pottery demonstrates a gradual development from, and expansion of, the initial ceramic tradition at Cahal Pech and the Belize Valley. While sharing

ties with the earlier Cunil complex it is marked by the introduction of new ceramic wares.

Towards the end of the early Middle Formative period, pottery from the Savana and Jocote groups begin to represent the predominant types in the early facet Kanluk assemblage. For the first time slipped pottery is clearly dominated by orange and red monochromes, and waxy Peten wares first occur, in comparatively insignificant quantities, near the end of the period.

The Kanluk Ceramic Complex: Late Facet

Placed between 650-350 B.C., the late facet of the Kanluk complex has been dated by ceramic analogy and by a radiocarbon date (Beta-40863) of 2470 ± 90 B.P., which calibrates in the one sigma range to 791 (757, 689, 656, 645, 590, 577, 545, 458, 452) 407 B.C.. Stratigraphically, late Kanluk pottery was found in construction phases one and two in the Str. B-2 sequence, in phases seven and eight on Str. B-4, phase one of Str. 6 in the Tzinic Group, phase one in Strs. 1 and 2 at Tolok, and phases one and two of the central platform in the Cas Pek Group.

The unslipped pottery of late facet Kanluk is dominated by wide-mouth jars of the Jocote group. A majority of these jars are decorated with vertical strap handles and with impressed fillet appliques along vessel necks and shoulders. Predominant among the slipped pottery are shallow dishes of the Savana group of Mars Orange Ware (cf. Ball and Taschek 1986:18-21). Decorations on these flat-base dishes include preslip grooves and incisions on the walls and labial surfaces of vessels (see Reforma Incised, Figs. 62-63). Other Savana group vessels include spouted chocolate pots with lip to lip handles (i.e. Fig. 58i) and groove/incised decorations (Fig. 66b). The red Joventud group (Figs. 58g-i; 64) in its Sampopperro and Pinola Creek Incised types, are represented in what may be a local and foreign variety. The

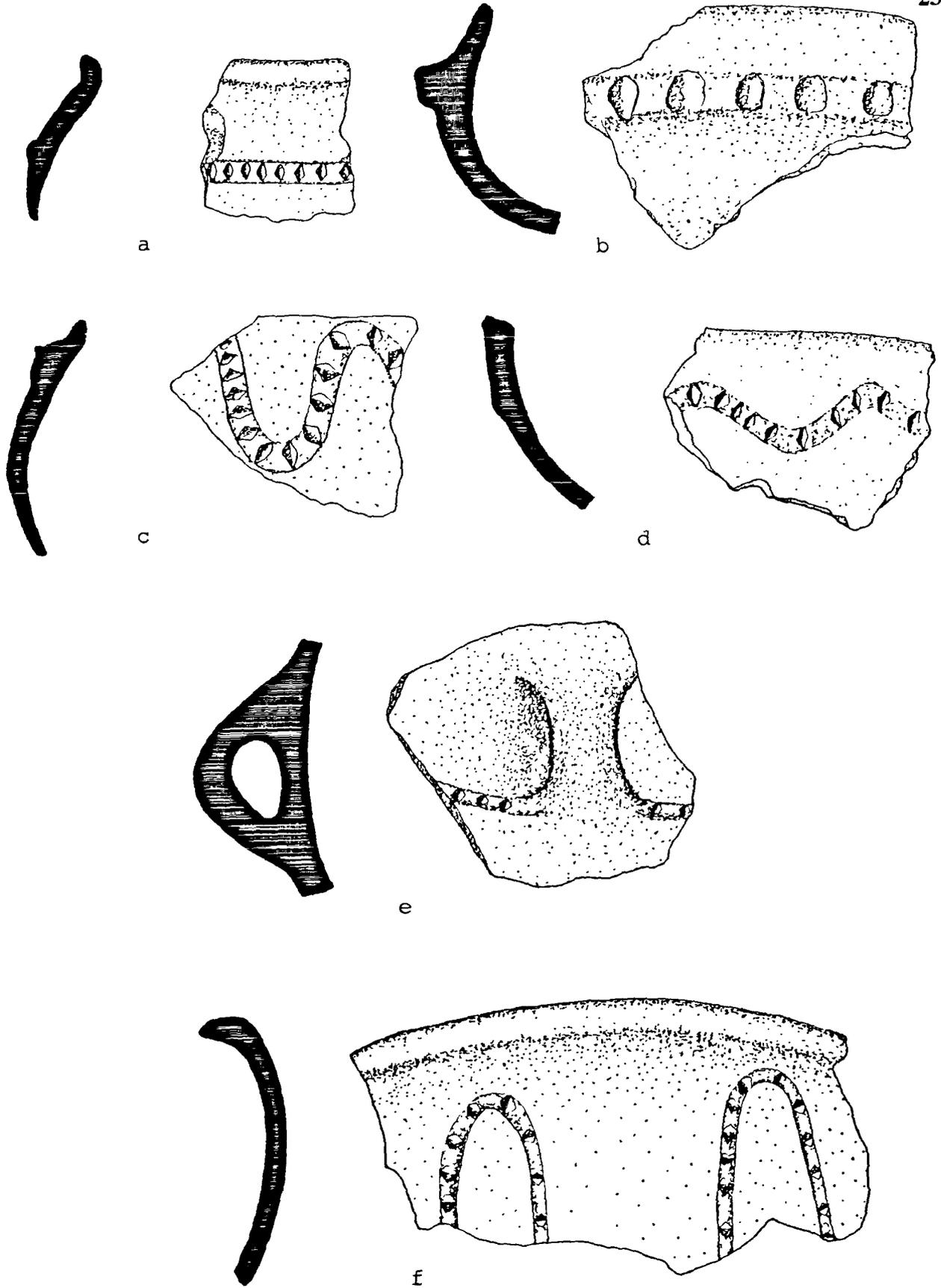


Figure 61: Jocote Orange-brown pottery
(65% actual size)

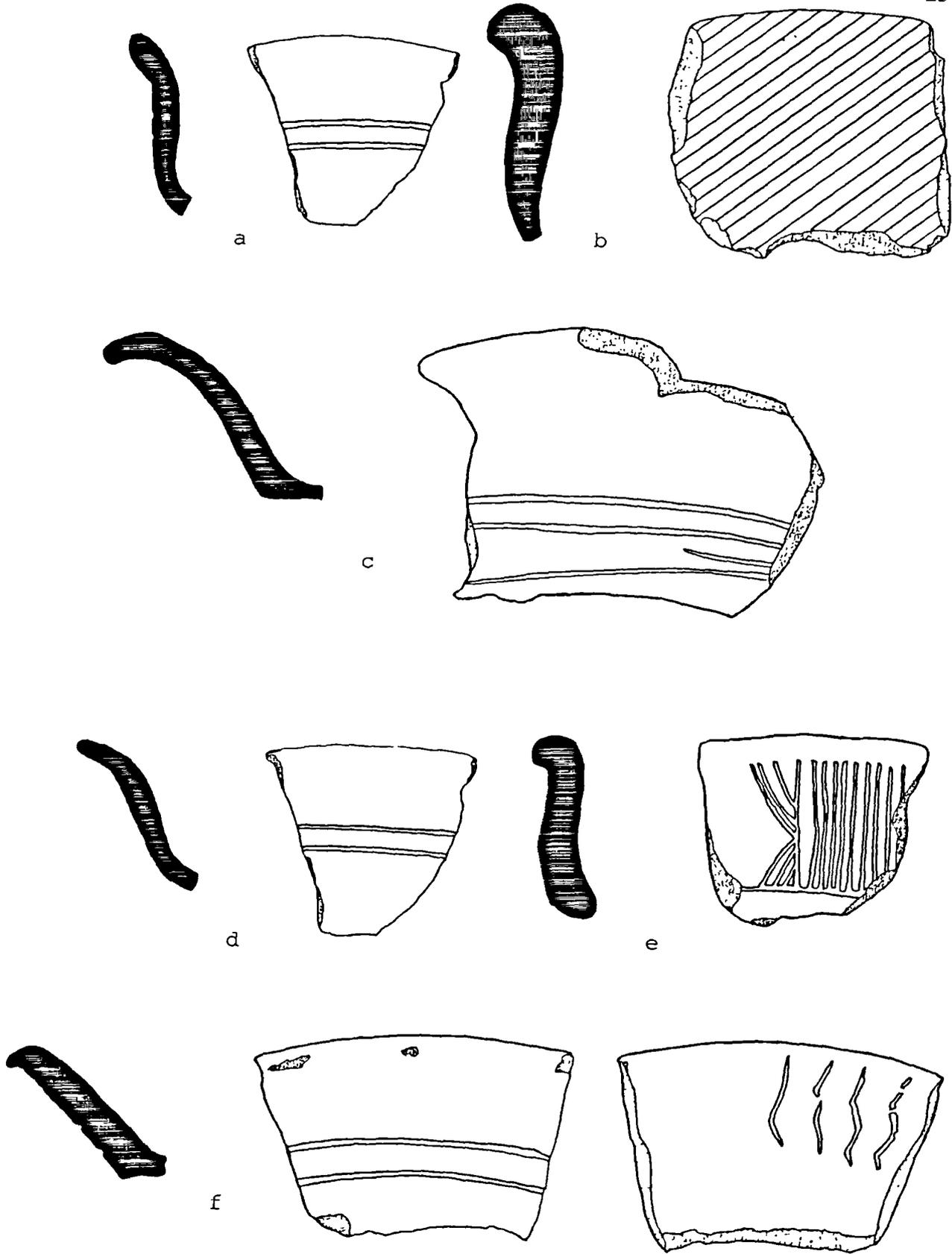


Figure 62: Savana Orange (b) and Reforma Incised (a,c-f) (65% actual size)

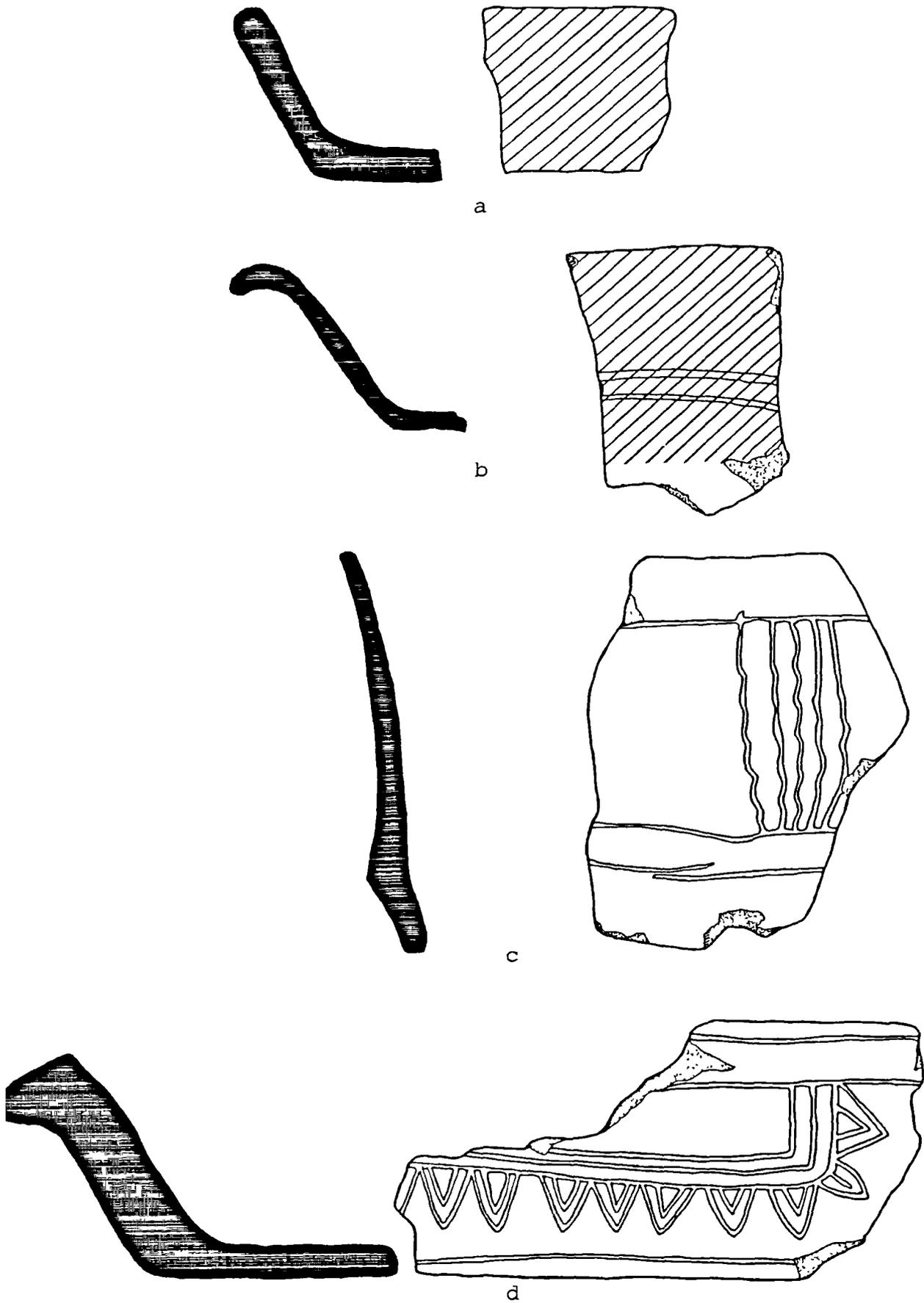


Figure 63: Savana Orange (a) and Reforma Incised (b-d)
(65% actual size)

local variety occurs in pottery with true Joventud slips on a Savana paste, while foreign elements consist of vessels with true Joventud slips on Joventud pastes (Fig. 58g).

Rounding out the slipped pottery of late facet Kanluk are the cream Pital (Fig. 65a-b) and black Chunhinta groups (Fig. 66a). Both black and cream groups, however, occur in very low frequencies in the Cahal Pech assemblage. Small quantities of Iguana Creek White (Fig. 65d) also show up in late facet Kanluk contexts, and it is possible that they represent the introduction of this local member of the Flor ceramic group.

Late facet Kanluk pottery, which is related to ceramics from the Mamom sphere, shares a greater number of modes and types with other Lowland regions than previous Cahal Pech assemblages. This is particularly indicated by the increased occurrence of waxy wares. Strong ties with northern Belize also continue and are manifested by the presence of Jocote and Savana group ceramics in both regions, and by modal similarities in the pottery from the two assemblages. Included among the shared modes are several fragments of human effigy bottles (Fig. 70g-h) from Cahal Pech with close parallels to the Unnamed Red Modeled types of the Joventud group at Colha (Valdez 1987:103-105), and the occurrence of chocolate pots with strap handles in both regions. These ceramic parallels suggest that during the late Middle Formative there was an increase of regional interaction and the establishment of greater ceramic homogeneity in the central Maya Lowlands.

The Xakal Ceramic Complex: Early Facet

Early facet Xakal dates to the first half of the Late Formative period (350 B.C.- A.D. 100), and is a "full member" of the Chicanel ceramic sphere (cf. Ball and Taschek 1986:20).

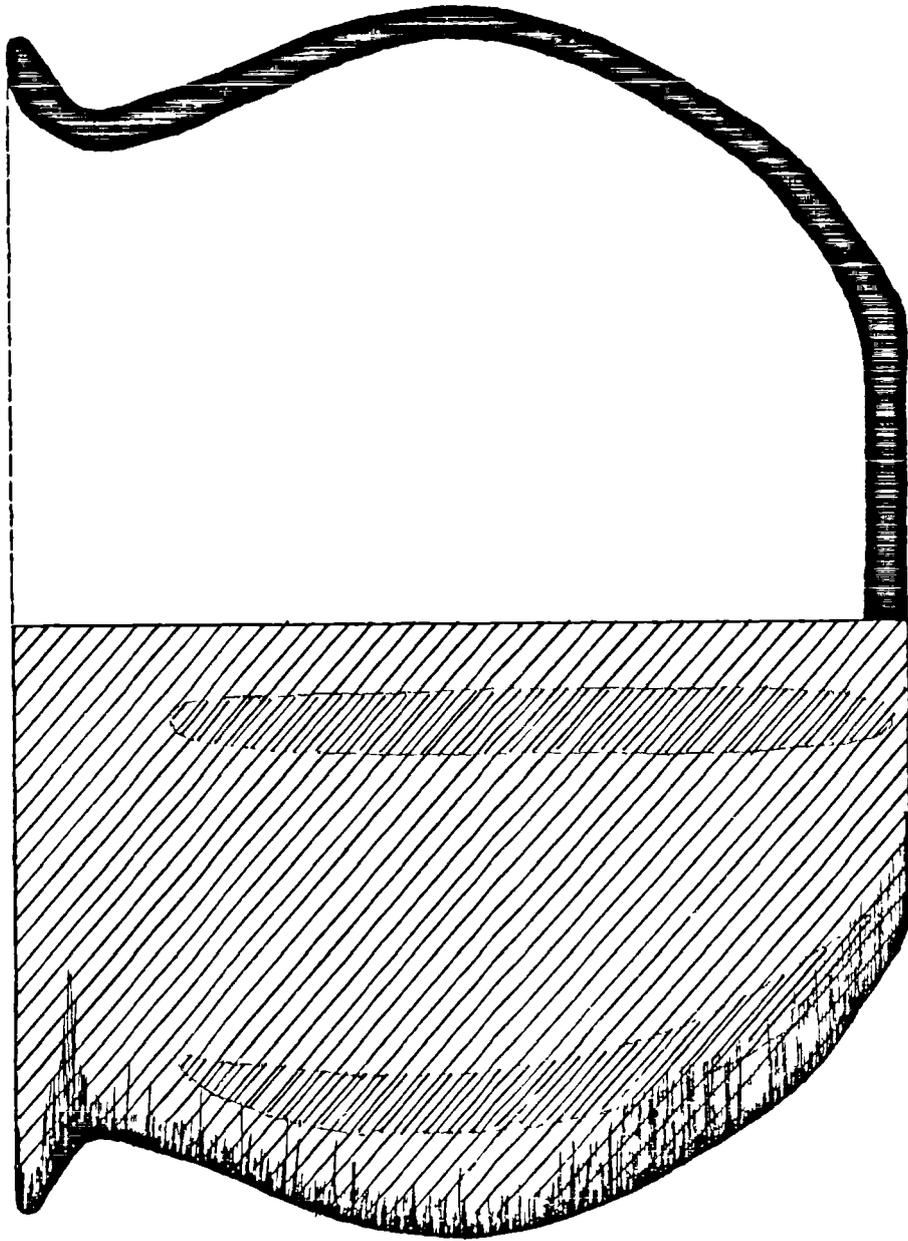


Figure 64: Joventud Red vessel (65% actual size)

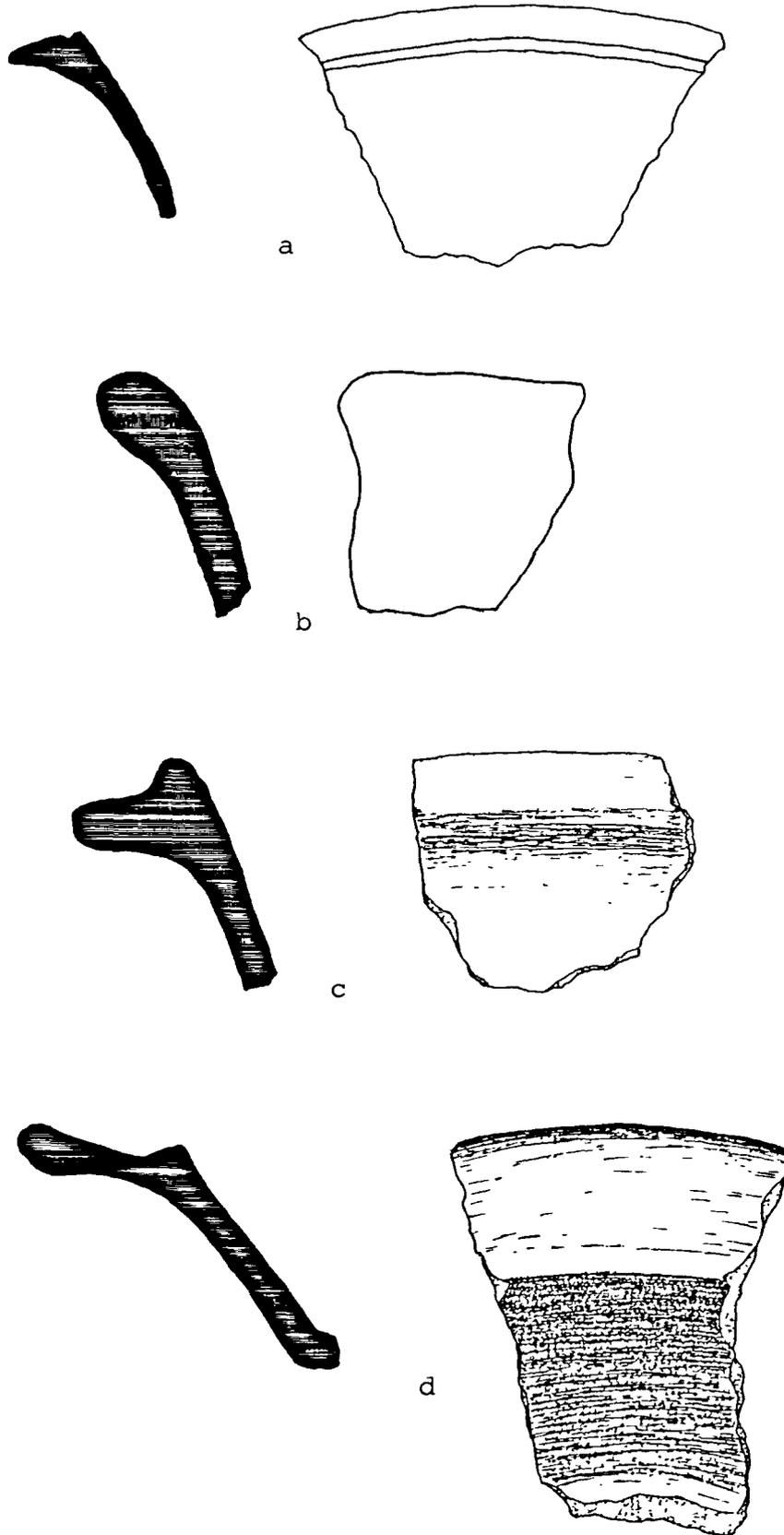


Figure 65: a-b - Pital Cream; c- Flor Cream; d- Iguana Creek White (65% actual size)

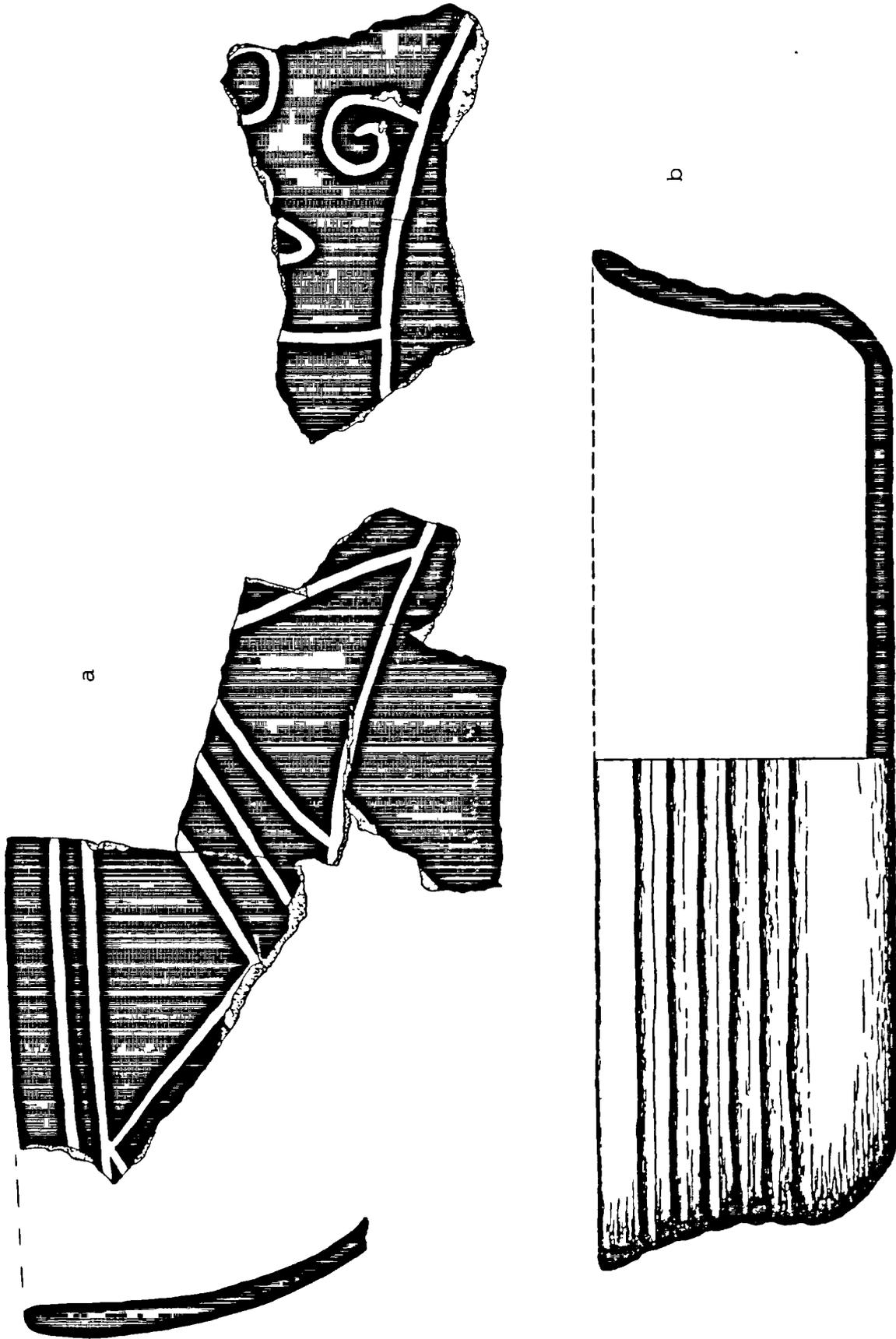


Figure 66: a- Chunninta group (Deprecio Incised), b- Savana group (Desvario Chamfered)
(65% actual size)

The pottery from this complex was also ubiquitous in excavations at Cahal Pech and was found in Formative contexts as well as in the fill of most Classic period construction.

Most of the Xacal ceramics belong to what Ball (cf. Ball and Taschek 1986:20) has redefined as "Paso Caballo-Flores Polished Ware". At Cahal Pech these polished (or waxy) wares are dominated by red and cream-slipped pottery with the addition of a small number of brown and black slipped types. The red-slipped pottery is largely represented by the Sierra (Varieties Unspecified and Society Hall variety) and Laguna Verde Incised types of the Sierra group (Fig. 67a). Creams are dominated by specimens from both the Flor and Pital (Fig. 65c) groups. The smaller number of black-slipped pottery occurs in varieties of the Polvero and Chunhinta groups, and browns are represented by types which correspond to San Felipe Brown and San Antonio Golden-brown. The unslipped pottery consists primarily of ceramics with close affinities to the Paila (Fig. 67d) and Sapote ceramic groups. A small quantity of Jocote Orange-brown was also found in early Xacal contexts, but they probably represent the phasing out stage of this previously common ceramic type.

The dominant vessel forms are flat-base dishes with flaring or out-curving sides and everted-thickened rims. A number of these dishes contain upper body and medial flanges (see Fig. 65c-d)). Other vessel forms include bowls, jars, and spouted chocolate pots. Most of the bowls have flat bases and medium to thick incurving sides. Jars predominantly have low-necks and wide mouths, and are often decorated with mid and lower body striations. The spouted chocolate pots are similar to those of the late Kanluk complex, and several specimens contain lip to lip handles.

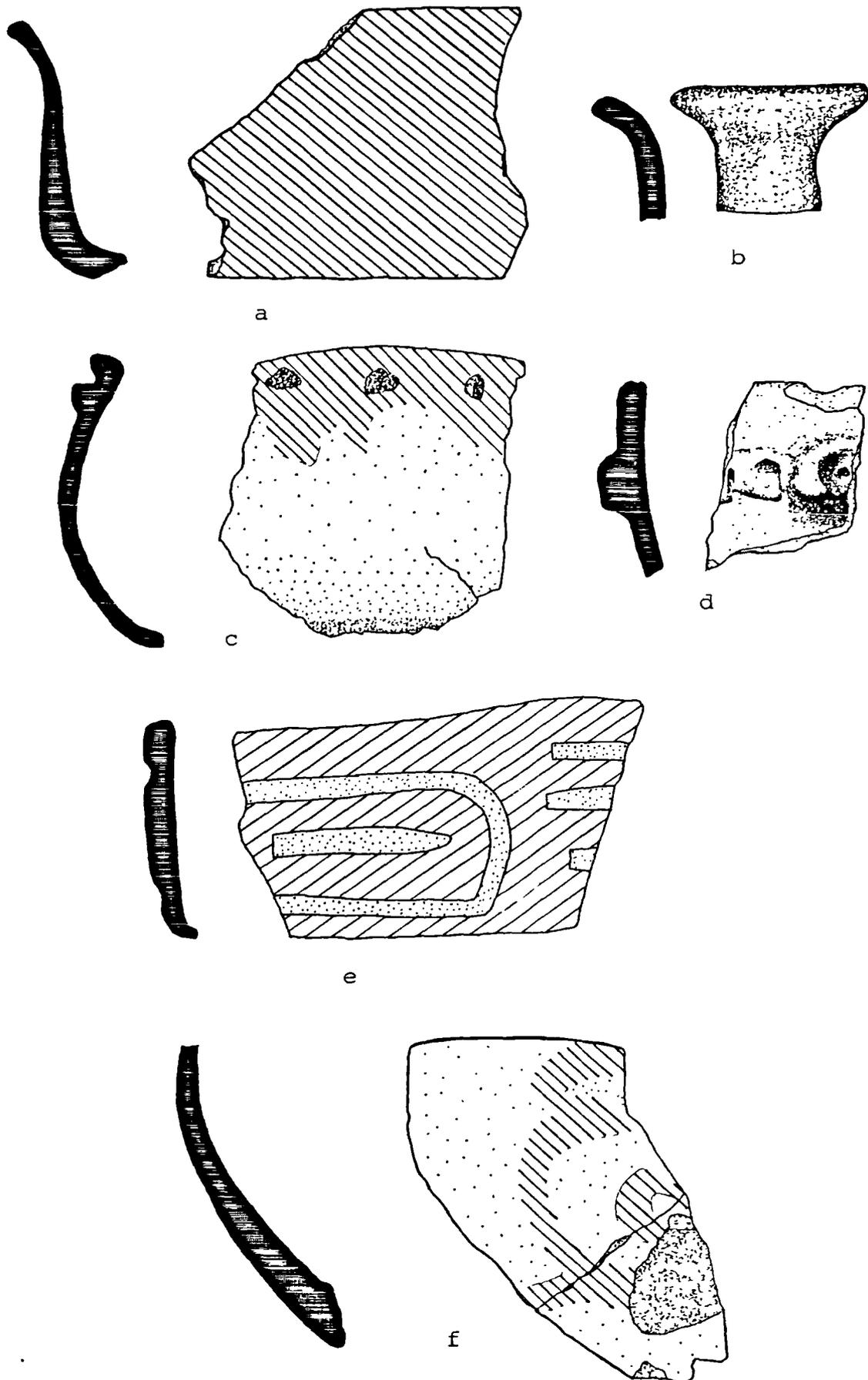


Figure 67: Middle and Late Formative pottery
 (Sierra Red - a; Paila Unslipped - b,d;
 Chachinic Red-on-orange-brown - c;
 unidentified specials - e,f) (65% actual size)

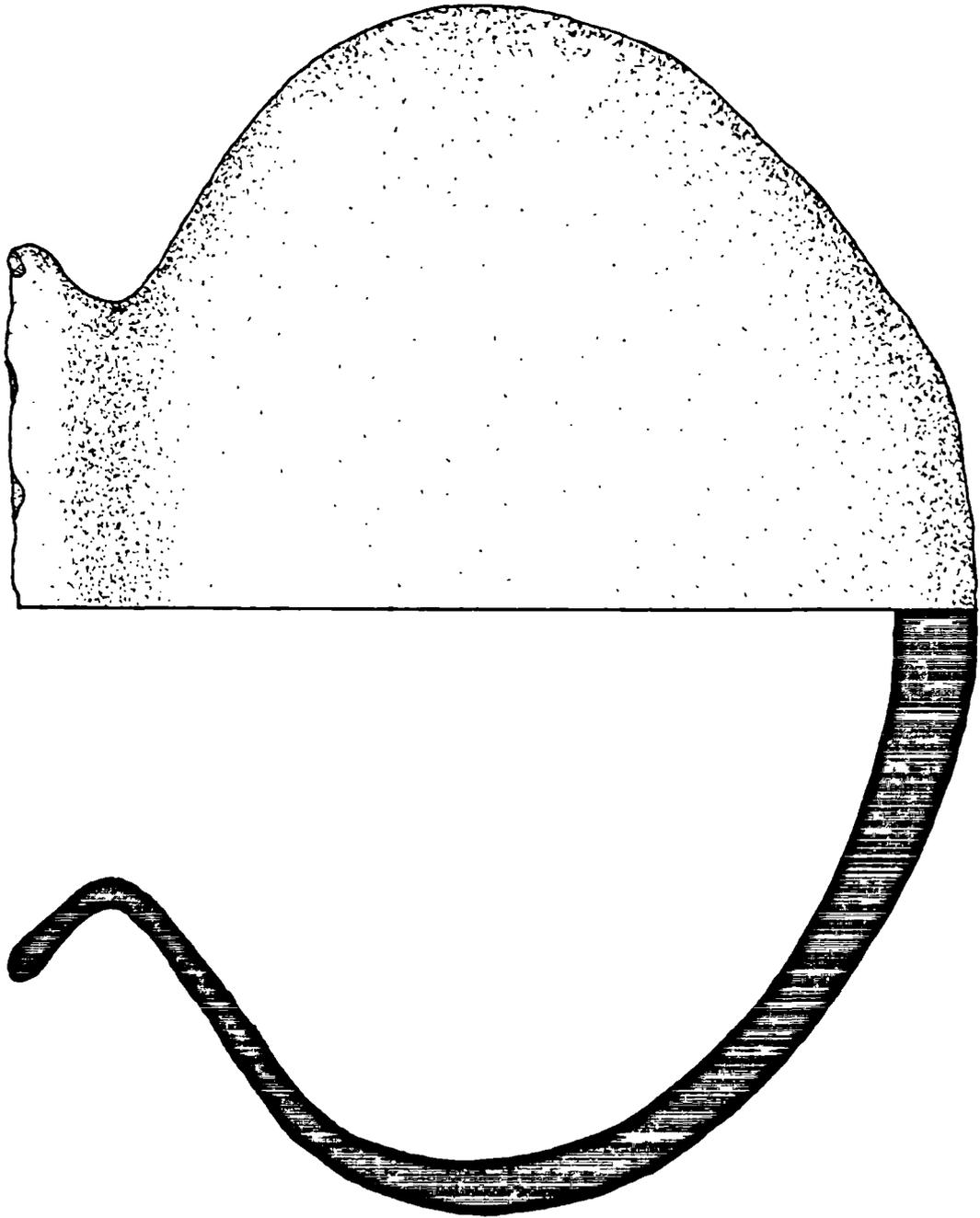


Figure 68: Chan Pond Unslipped vessel (65% original size)

The Xakal Ceramic Complex: Late Facet

Late facet Xakal (A.D. 100-350) is represented by a continuation of the diagnostic types which characterize the previous Chicanel-like inventory, and by the introduction of material typical of the Floral Park complex at Barton Ramie.

The Floral Park type pottery include specimens which belong to the Aguacate, Monkey Falls, and Chan Pond ceramic groups. Within the Aguacate group both Aguacate Orange and Ixcanrio Orange-polychromes have been identified. The latter predominantly occurs in the form of dishes or bowls with basal breaks and tetrapodal mammiform supports. Aguacate Orange is found in various vessel forms (bowls, dishes, and jars) and generally have thin orange-red slips which tend to erode easily. The Monkey Falls group is represented by unslipped jars with medium-high necks. Decorations on these vessels include vertical or horizontal striations below the neck and on the walls of the vessels. The Chan Pond group (Fig. 68) consists of pottery with similar forms to the Monkey Falls specimens, but lack striated decorations. The surface finish on these vessels is also rough and grainy.

While pottery with affinities to Floral Park types occur at Cahal Pech, it is important to note that they represent a small percentage of the terminal Late Formative Xakal ceramic assemblage. The red Sierra group and the unslipped-striated Sapote group remain the predominant ceramic types during this time. The cream-slipped Flor group, and the black Polvero group also continue, but their relative frequency remains much lower to that of red-slipped pottery.

Interestingly, the presence of Floral Park types within terminal Late Formative contexts

at Cahal Pech is in contrast with the situation at Buena Vista. According to Ball and Taschek (1986:21) the Xakal complex at that site "demonstrated no evidence of participation in the Protoclassic Floral Park sphere..." They add that this is "an especially noteworthy point given..." Buena Vista's "immediate proximity to the Barton Ramie type-site for this trait-complex" (Ball and Taschek 1986:21).

6.3 The Modified Ceramic Sherd Industry

The modified ceramic sherd industry comprises all artefacts manufactured from ceramic sherds. The three forms identified under this category at Cahal Pech include perforated disks, ovals, and plugs/lids. In all cases these artefacts were produced by cutting, flaking and grinding.

ARTEFACT FORM: Perforated Disk (Fig. 69a-e)

FREQUENCY: 5

MATERIAL: Sherd

DATING: Fig. 69a, Early Kanluk (Early Middle Formative)

Figs. 69b-e Late Kanluk (Late Middle Formative)

CONTEXT: Fig. 69a- Construction Fill of B-4\6th

Fig. 69b- Construction Fill of B-4\7th

Fig. 69c- Construction Fill of B-4\8th

Figs. 69d & e- Construction Fill of B-2 1st

COMMENT: The perforated sherd disks at Cahal Pech range between 4.5-6.0 cm in diameter. Perforations are either conically or biconically drilled, and the edges of the disks

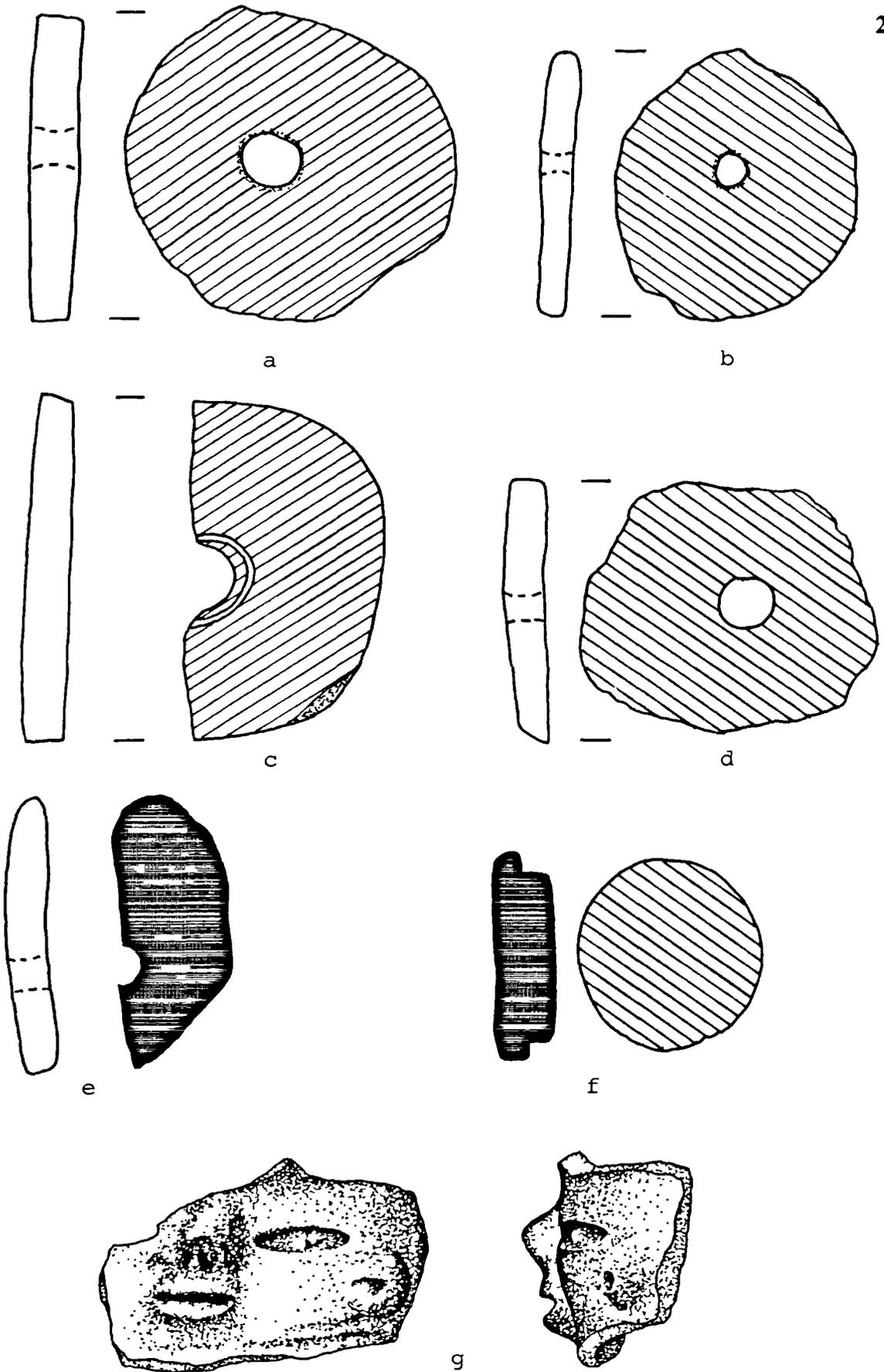


Figure 69: Modified sherds and bottle fragment

are grounded and smoothed. The ceramic types for the sherds were identified as follows: Fig. 69a,c are Savana Orange, Fig. 69b-d are Joventud Red and Fig. 69e is Chunhinta Black.

Although perforated sherd disks are ubiquitous in the Maya lowlands, they most frequently occur in Classic period contexts (Willey 1972:80-82). At Barton Ramie, Altar de Sacrificios, and Cerros, the earliest specimens date to the Late Formative period (Willey et al. 1965:402-403; Willey 1972:80-82; Garber 1989:83). At Uaxactun, Colha, and Cuello, they occur in both Middle and Late Formative contexts (Kidder 1947:67-68; Gillis 1981; Buttles n.d.:14-15; Hammond 1991b:176).

At Altar de Sacrificios, Willey (1972:80-81) divided perforated sherd disks into small and large subforms. His small subform, which ranges between 2.4-5.7 cm in diameter, is similar to the size of the Cahal Pech specimens. Willey (1972:80-81) suggested that small perforated disks may have served as spindle whorls. In his analysis of the Cuello artefacts, Hammond (1991b:176) proposed that they could have functioned as whorls, tokens, gaming pieces, or beehive doors. Citing Folan and Hyde (1980), Gillis (1981:234) also suggested that many of the objects "regarded as gaming disks, amulets, etc., may actually be an early form of record keeping".

ARTEFACT FORM: Oval (Fig. 70a-b)

FREQUENCY: 2

MATERIAL: Sherd

DATING: Fig. 70a, Cunil (Early Middle Formative)

Fig. 70b, Late Xakal (Late Formative)

CONTEXT: Fig. 70a- Construction Fill of B-4\3rd

Fig. 70b- Construction Fill of B-4\11th

COMMENT: Although the two sherd ovals at Cahal Pech are incomplete, their estimated size is approximately 5.0 X 8.0 cm. In his Altar de Sacrificios report, Willey (1972:82) classified sherd ovals as "Imperforate Rectangular and Ovate-Trapezoidal Forms". He added that their function was unknown, and that they occurred in late Middle, and Late Formative contexts. At Cerros, Garber (1989:86) described these forms as "Geometrics" and reported that they were discovered in Late Formative contexts. Garber (1989:86) also remarked that although the function of these artefacts could not be determined, it is possible that they may have functioned as "gaming pieces, trinkets, or unfinished pendants".

ARTEFACT FORM: Plugs/Lids (Fig. 69e)

FREQUENCY: 1

MATERIAL: Sherd

DATING: Late Xakal (Late Formative)

CONTEXT: Construction Fill of A-2\Sub 2

COMMENT: This artefact is made from the sherd of a Sierra Red vessel. It is 3.2 cm in diameter, and 1.0 cm thick. Previous investigators (cf. Willey et al. 1965:406) have generally placed similar artefacts under an unperforated disk subform. In his analysis of the Altar and Seibal artefacts, Willey (1972:78-79; 1978) suggested that they either served as gaming pieces or "lids for narrow mouthed vessels". Garber (1989:76) argues that the *in situ* discovery of five disks "atop narrow-mouthed vessels in three caches at Cerros" provides convincing evidence for their function as lids. Since the form of the Cahal Pech specimen resembles a lid, it lends support to Garber's suggestion. The chronological distribution of these lids in the

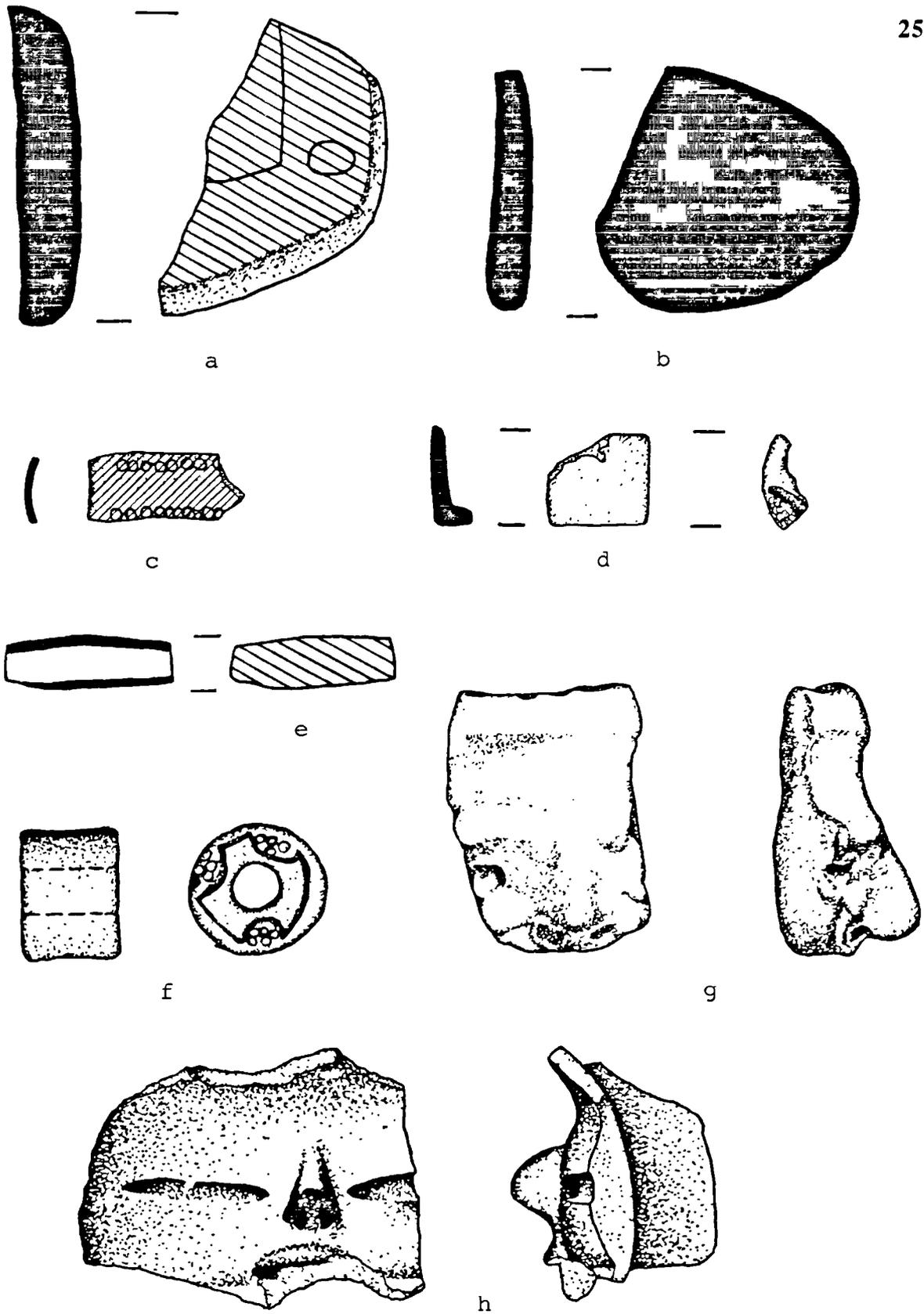


Figure 70: Miscellaneous pottery artefacts (ovals - a,b; earspools - c,d; tubular bead - e; solid spool - f; red modeled bottles)

Maya Lowlands spans from Late Formative to Postclassic times (Willey et al. 1965:406; Garber 1989:73; Buttles n.d.:13-14)

6.4 The Modeled Clay Industry

This industry comprises all hand-modeled artefacts made from clay. Three forms were identified under this category at Cahal Pech. They include ear ornaments, tubular beads, and figurines. Ear ornaments are subdivided into two subforms: earspools and solid spools. The figurines are subdivided into anthropomorphs, zoomorphs, whistles, and an unidentified category. As previously indicated, the figurines are not described in detail in this monograph for they are the subject of a separate dissertation research by D. Cheetham.

ARTEFACT FORM: Ear Ornaments

SUBFORM: Earspool (Fig. 70c-d)

FREQUENCY: 2

MATERIAL: Modeled Clay

DATING: Late Kanluk (Late Middle Formative)

CONTEXT: Construction Fill of B-4\8th

COMMENTS: The diameter of the Cahal Pech earspools have an estimated range between 1.3-2.5 cm. The walls are thin and have an average thickness of about 1.5 mm. Both specimens have thin red slips, and are decorated with shallow circular impressions, or with post-slip incised lines. One specimen (Fig. 70d) has an inner flange and is similar in form to a sample from Altar de Sacrificios (Willey 1972: Fig.74c).

Pottery ear ornaments have been reported from Classic period contexts at Barton Ramie (Willey et al. 1965:410), and Seibal (Willey 1978:49), and from Late Formative contexts at Altar de Sacrificios (Willey 1972:89-90). The modal and stylistic attributes of the Cahal Pech specimens are more closely related to the collection from Altar.

ARTEFACT FORM: Ear Ornament

SUBFORM: Solid Spool (Fig. 70f)

FREQUENCY: 1

MATERIAL: Modeled Clay

DATING: Late Kanluk (Late Middle Formative)

CONTEXT: Construction Fill of B-4\8th

COMMENTS: The solid spool is 2.3 cm in diameter and 1.6 thick. In the center it has a uniconical perforation. On one of its smooth unslipped surfaces the spool is decorated with an incised design. The design has three projections separated by three semi-circles which enclose small circular impressions.

At several Maya sites similar artefacts have been classified as spindle whorls (cf. Willey 1978:46-47, Fig. 51c). Most of these "whorls", however, are conical in shape and modally different from the Cahal Pech specimen. Furthermore, no spindle whorls have been reported from Middle Formative contexts in the Maya Lowlands. Thus, it is more likely that the Cahal Pech specimen represents a ceramic spool. The geographical and chronological distribution of these solid spools is similar to that of other ceramic ear ornaments (see above for comparisons).

ARTEFACT FORM: Tubular Bead (Fig. 70e)

FREQUENCY: 2

MATERIAL: Modeled Clay

DATING: Fig. 70e, Late Kanluk (Late Middle Formative)

Early Xakal (Late Formative)

CONTEXT: Fig. 70e, Construction Fill of B-4\8th

Construction Fill of B-4\10th

COMMENT: These tubular ceramic beads are between 0.1-0.2 cm thick, and are 0.9 to 1.5 cm in diameter. The complete specimen (Fig. 70e) is 2.8 cm in length. Both beads have thin red slips, and one bead has small circular impressions along the side.

Although Willey (1978:48-49, Fig. 48m) reports tubular ceramic beads from Classic period contexts at Seibal, no Formative period specimens were found in the available literature. It is possible, however, that similar artefacts may have been classified as ear ornaments at Altar de Sacrificios (Willey 1972:89-93).

Pottery Figurines:

The collection of Formative period figurines at Cahal Pech presently consists of 187 fragments. During the analysis of these artefacts the specimens were divided into three major forms: anthropomorphs, zoomorphs, and figurine whistles (Table 3). A fourth category, listed as unidentified, includes small fragments whose forms could not be determined with a high degree of accuracy. Anthropomorphs were subdivided into three categories: heads, torsos, and appendages. In cases where heads were connected to torsos the artefacts were listed under heads. Similarly, where appendages were connected to torsos they were filed under torsos.

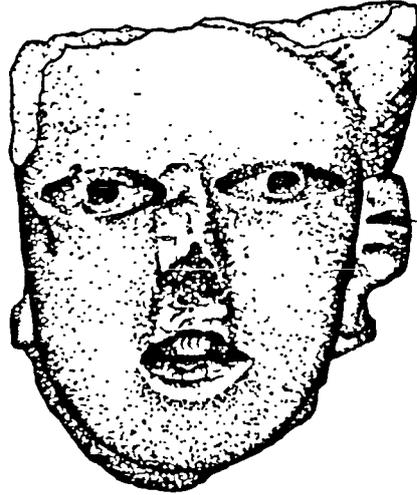
In most cases whistles are also zoomorphic in form, but not all zoomorphs may have functioned as whistles.

The Formative period figurines are all hand-modeled, sometimes slipped in red, orange, cream or buff, and with the exception of whistles they are all solid. The largest number of specimens (91) were found in the fill of Middle Formative architecture. Another 81 fragments come from Late Formative contexts, and 14 were recovered from Classic period levels (Tables 3 and 4). These contexts, however, may not reflect an accurate date of production for technological and stylistic attributes suggest that a large majority of the figurines were probably manufactured during the Middle Formative period.

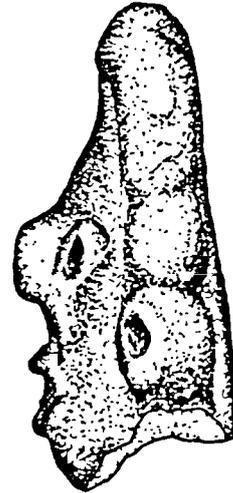
Anthropomorphs:

Numbering 142 fragments, anthropomorphs represent the largest modal category in the Cahal Pech collection (Table 3). They are represented by 34 heads, 59 torsos, and 49 appendages.

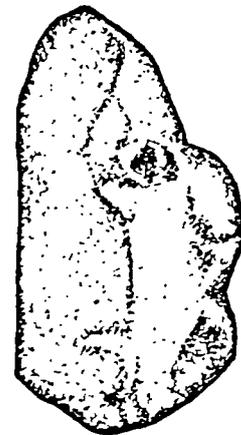
The heads range between 5.0-8.0 cm in height, and 5.0-8.5 cm in width. They predominantly have naturalistic human faces with prominent or prognathous mouths and noses, and some specimens display what may be fronto-occipital head deformation (Cheetham n.d.). Hair is represented by incised lines and punctations (Figs. 71a, 73c) and hairdos are often styled with a topknot above the center of the forehead (Figs. 72a, 73a, 76a-b). Mouths are normally open, teeth are sometimes indicated by horizontal lines and grooves (Figs. 71a, 73a-b, 74a-b), and ears sometimes project slightly outward from the head (Fig. 73a-b). Several specimens appear to be wearing ear ornaments in the form of spools or flares (Figs.



a

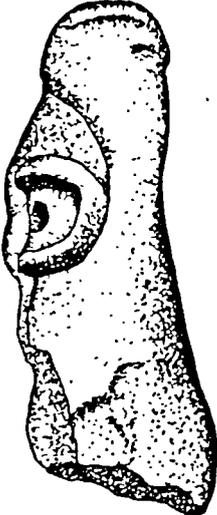
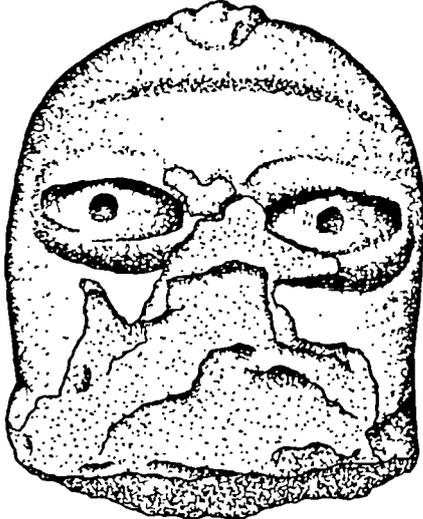


b

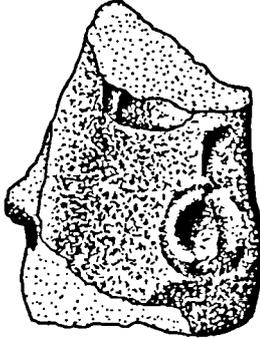
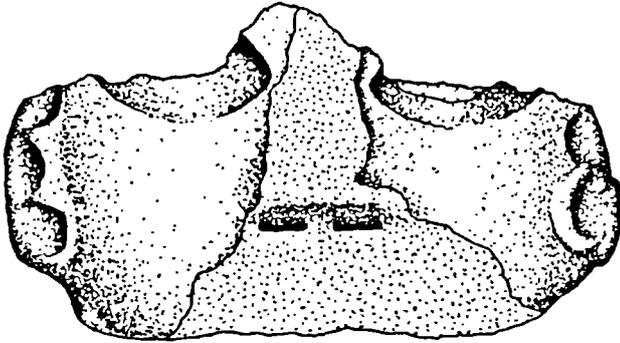


c

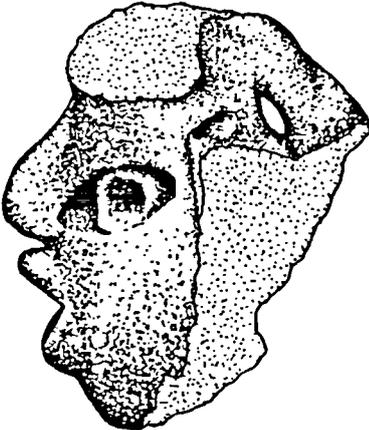
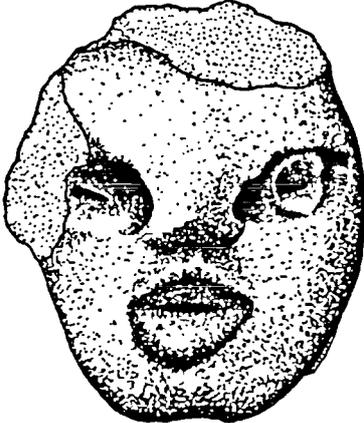
Figure 71: Anthropomorphic figurine heads



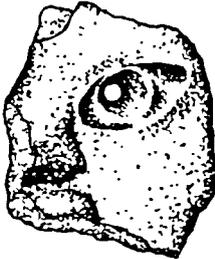
a



b

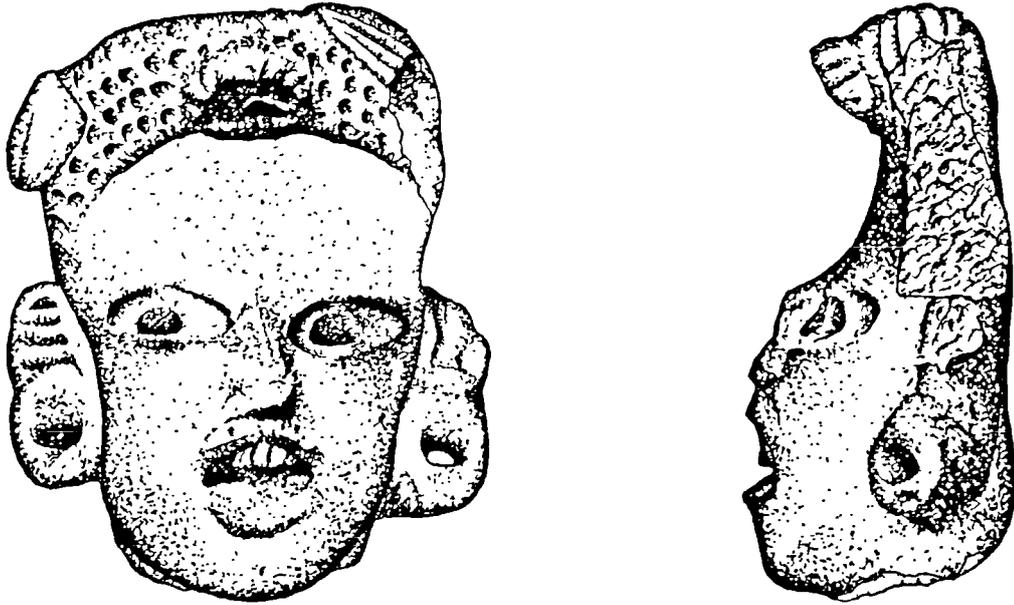


c

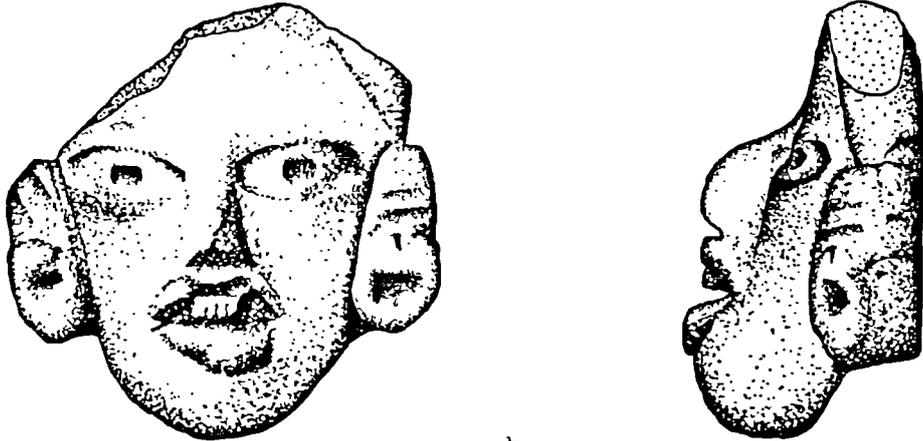


d

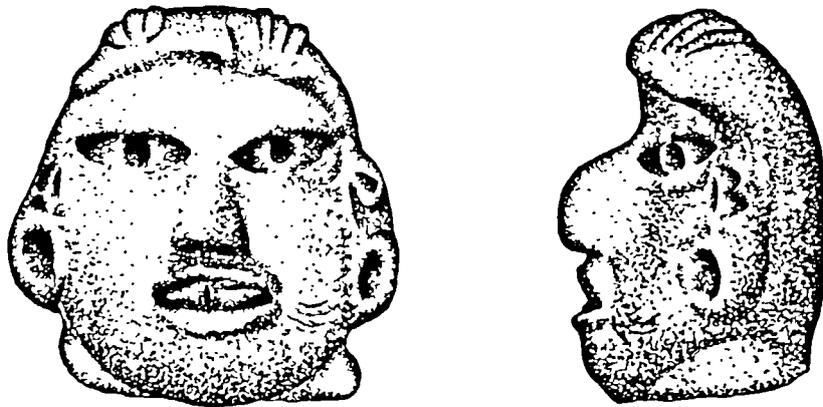
Figure 72: Anthropomorphic figurine heads



a

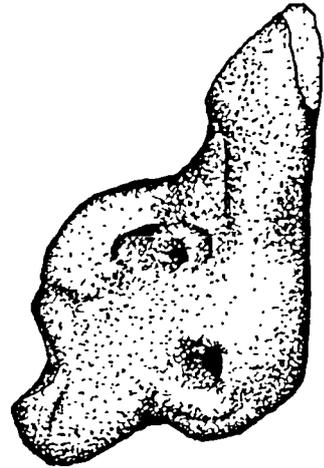
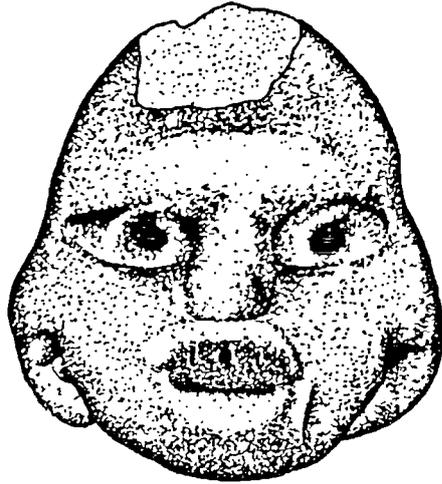


b

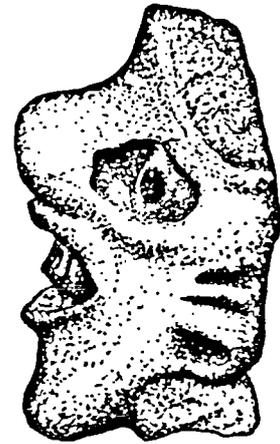
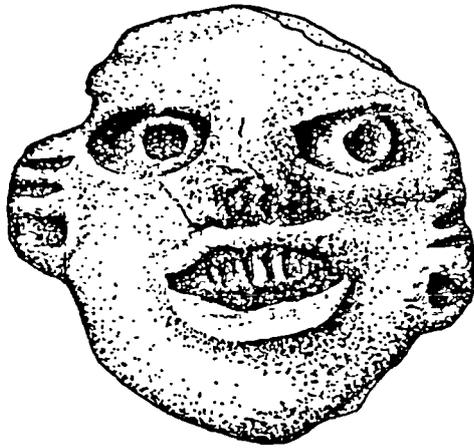


c

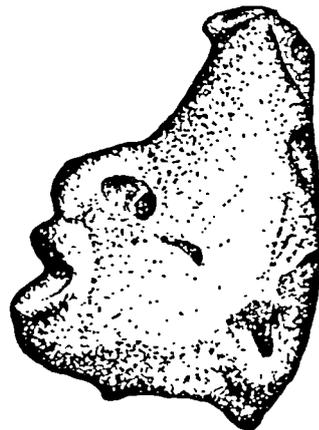
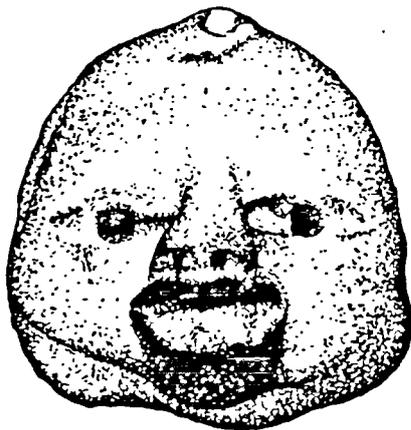
Figure 73: Anthropomorphic figurine heads



a



b



c

Figure 74: Anthropomorphic figurine heads

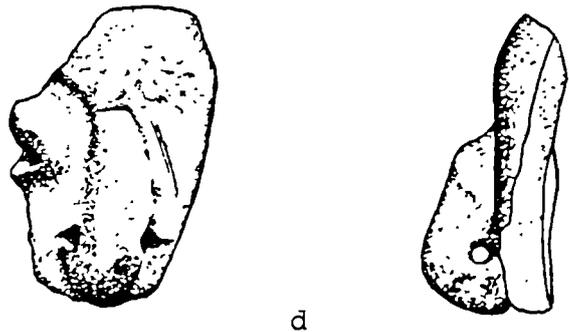
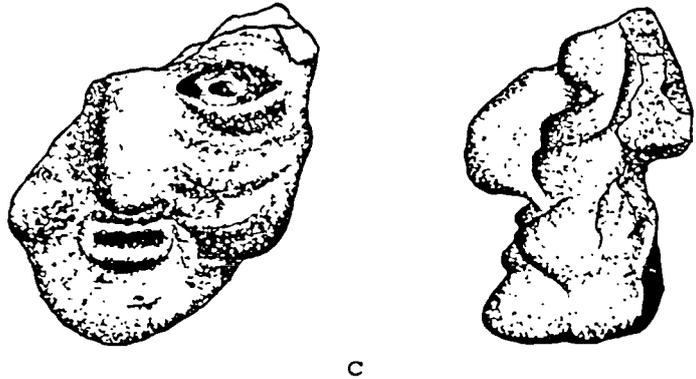
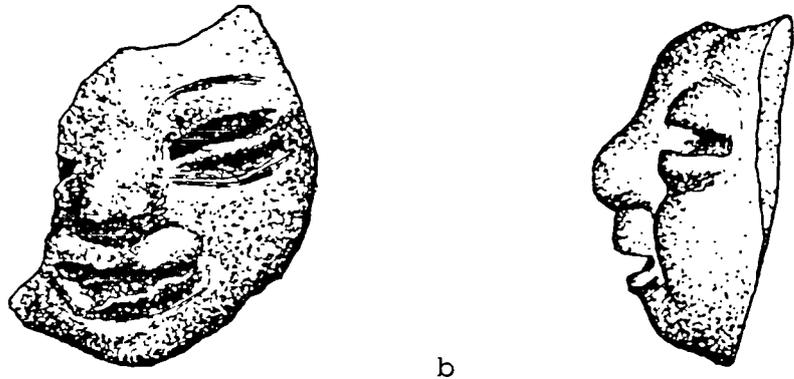
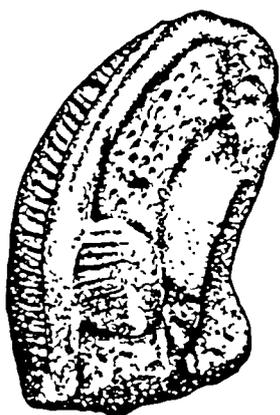
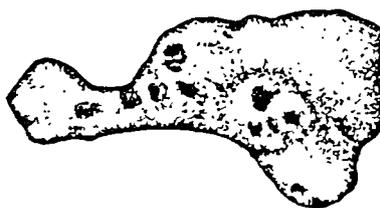
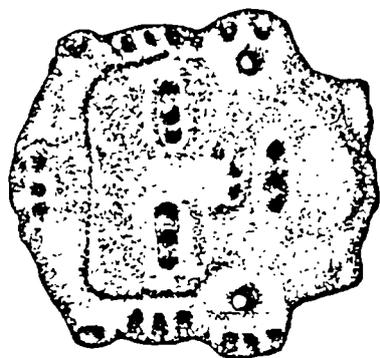
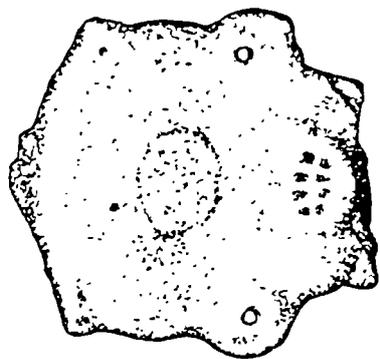
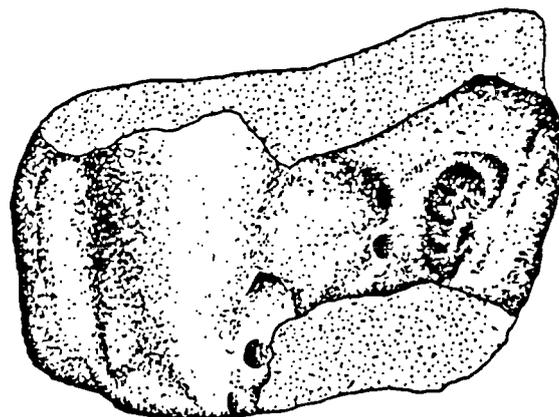
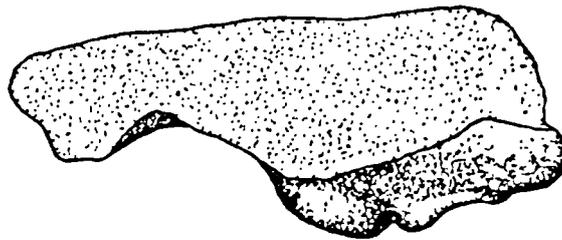


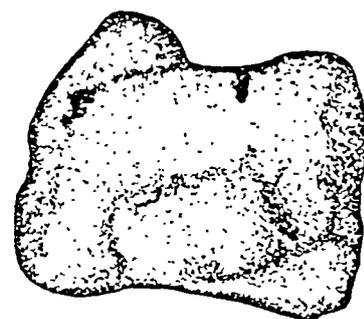
Figure 75: Anthropomorphic figurine heads



b



c



d

Figure: 76: Anthropomorphic figurine heads

71a-b, 73a-c). The eyes on most figurine heads are represented by oval or almond-shape impressions with single central punctations indicating pupils. Two figurines differ from this pattern. The first is represented by a head with tri-punctate eyes (Fig. 76b), and the second has oval-shaped eyes which are encircled by raised applied eyelids (Fig. 72a).

Torsos range between 8.0 and 11 cm in height. They depict female bodies with swollen abdomens, wide hips, well-defined breasts, and punctated nipples (Fig. 78a-b). Male bodies are also numerous, but except for one instance (Fig. 80a), the conspicuous absence of reproductive organs often makes sexing a difficult task. Most of the torsos tend to be nude, and only one (Fig. 80b) appears to be wearing a "G-string". Fine striations on the chest and abdomen of a specimen (Fig. 78b) from Cunil context may be indicative of the practice of scarification. With the exception of one fragment (Fig. 81b), which probably stood upright, most torsos are also in seated positions.

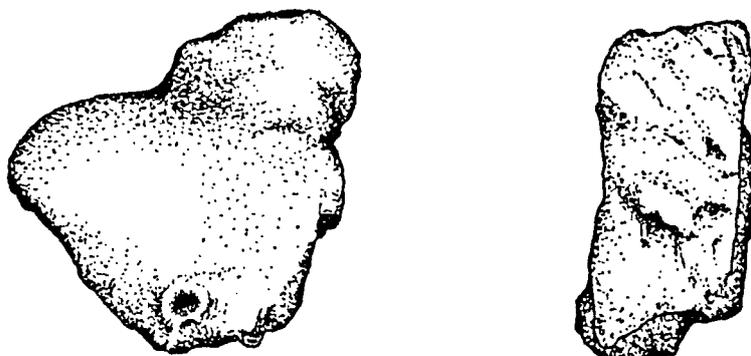
Appendages are represented by arm and leg fragments. In most cases these limbs taper to rounded and stubby elements (Figs. 80c, 81c-d), but in a few specimens toes and fingers are represented by incised lines (Fig. 81b,e). Legs are normally outstretched and arms either hang down along the sides of the body, or rest on thighs or the upper section of the leg.

Zoomorphs/Whistles:

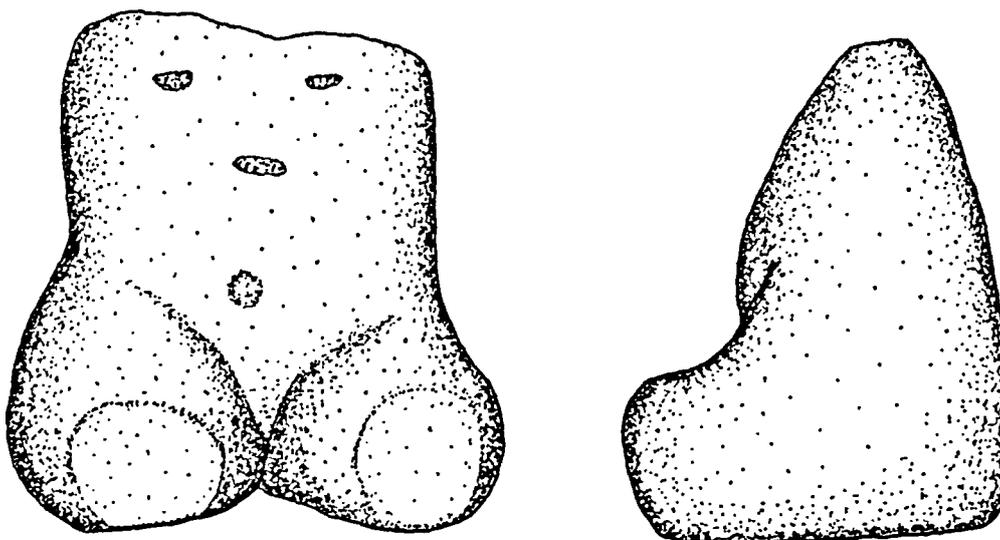
Zoomorphs predominantly occur in the form of simple hollow whistles. The animal effigies represented in the Cahal Pech assemblage include turtle, dog, deer, monkey, frog, feline, and bird (Figs. 81a,f; 82a-d). The mouthpiece on a complete bird whistle (Fig. 82d) is at the tail of the figurine, and a single stop is located at the center of the chest. This



a



b



c

Figure 77: Anthropomorphic figurine head and torsos

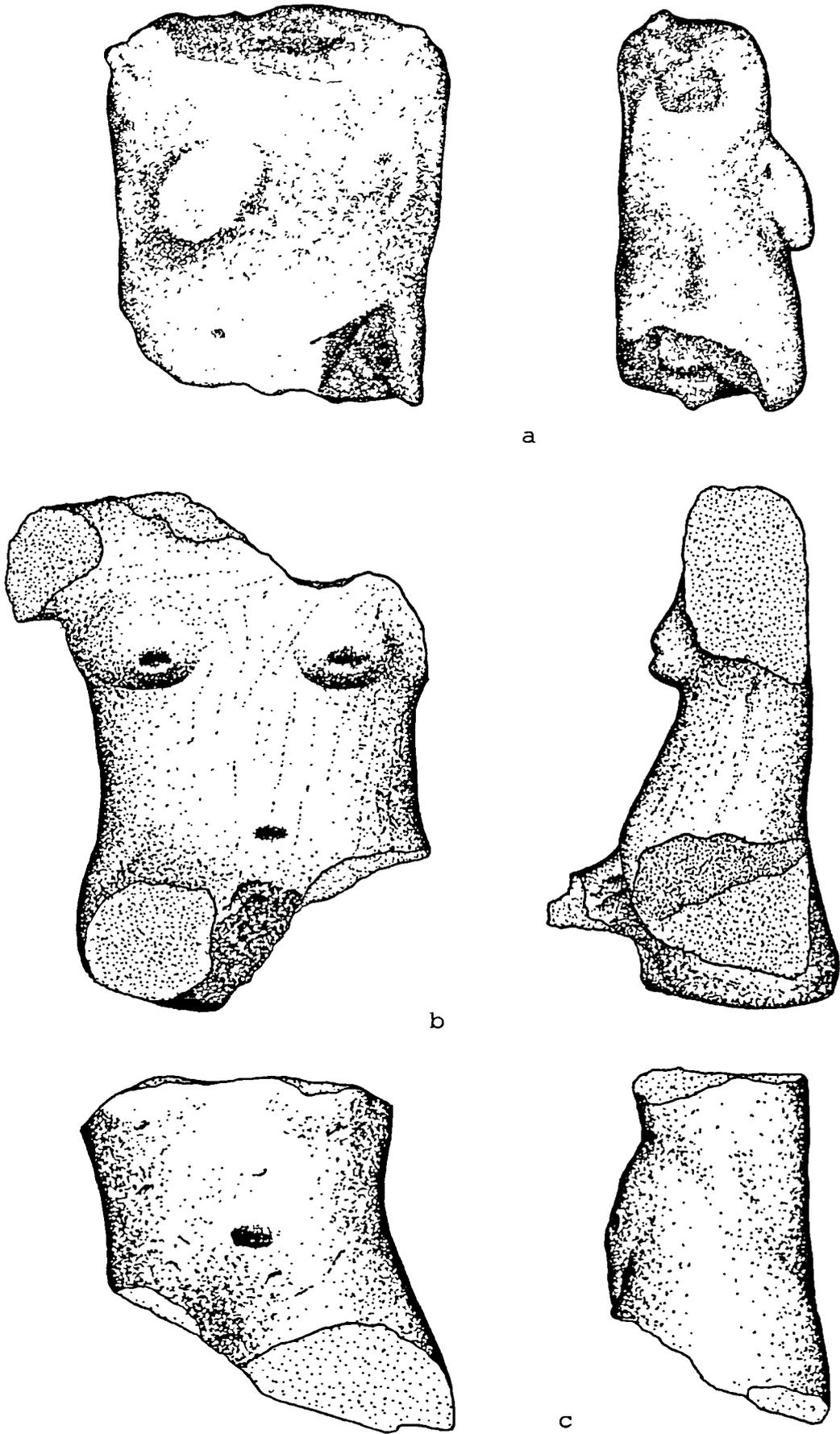


Figure 78: Anthropomorphic figurine torsos

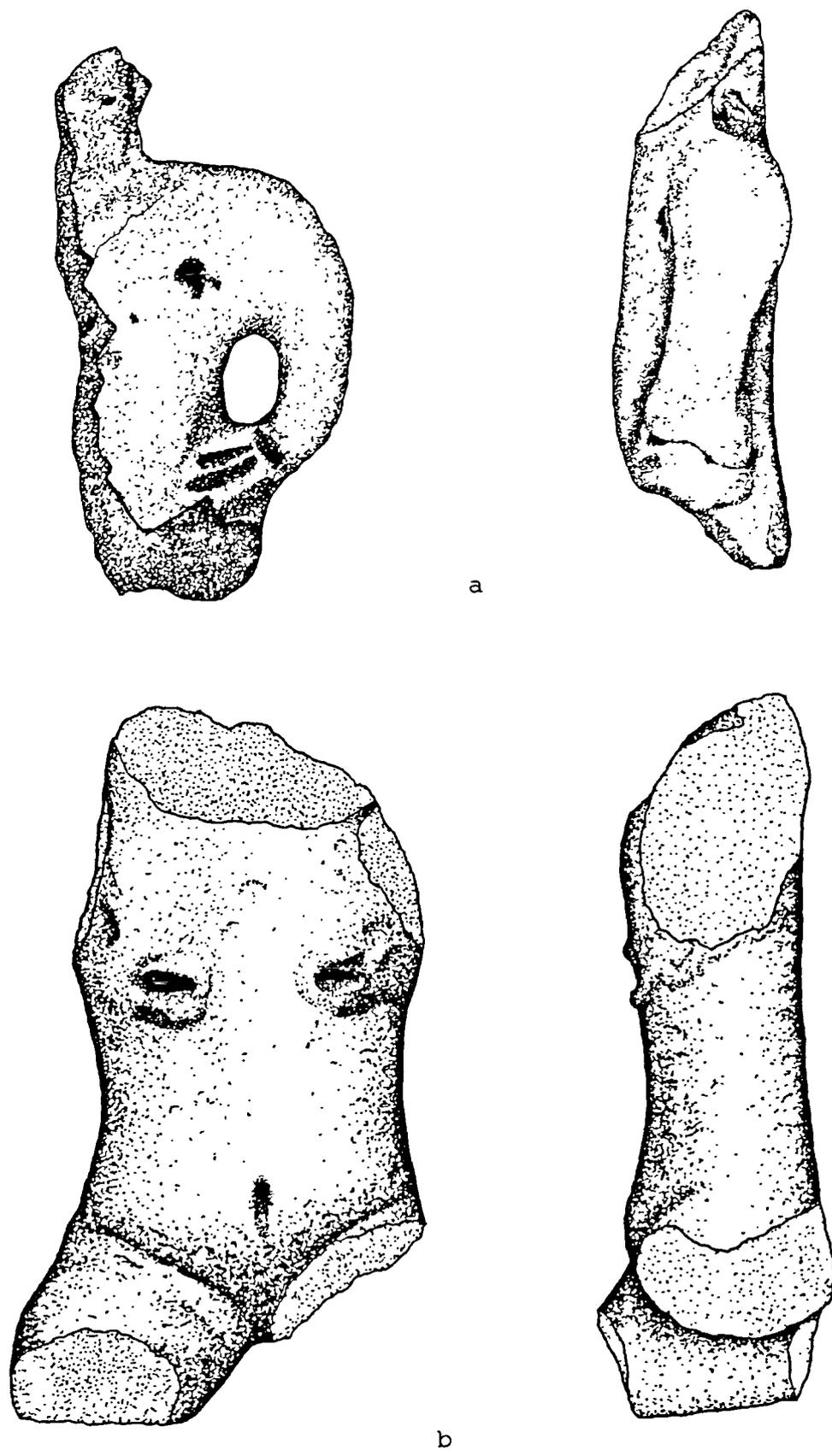
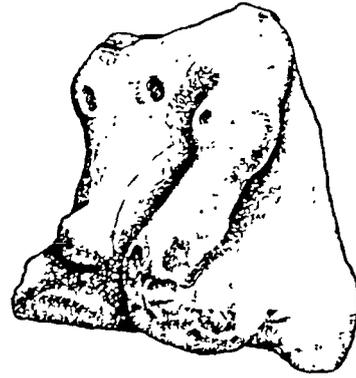
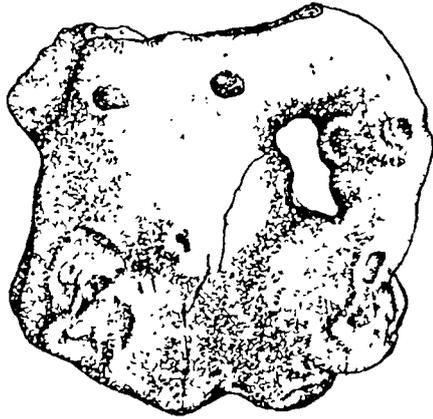
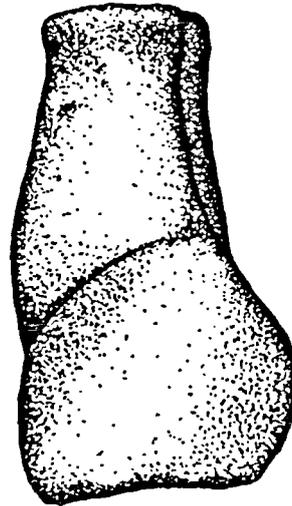
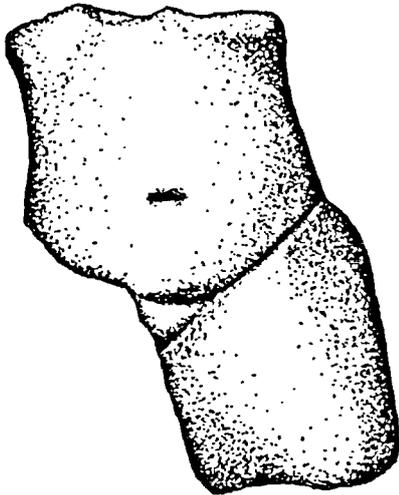


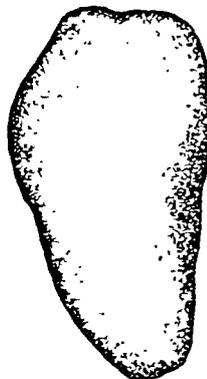
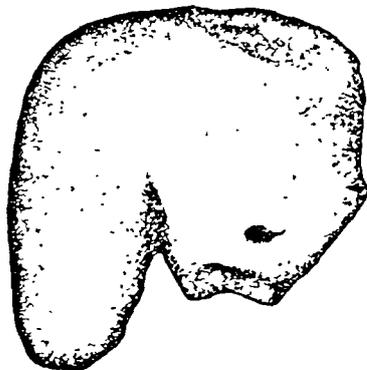
Figure 79: Anthropomorphic figurine torsos



a



b



c

Figure 80: Anthropomorphic figurine torsos

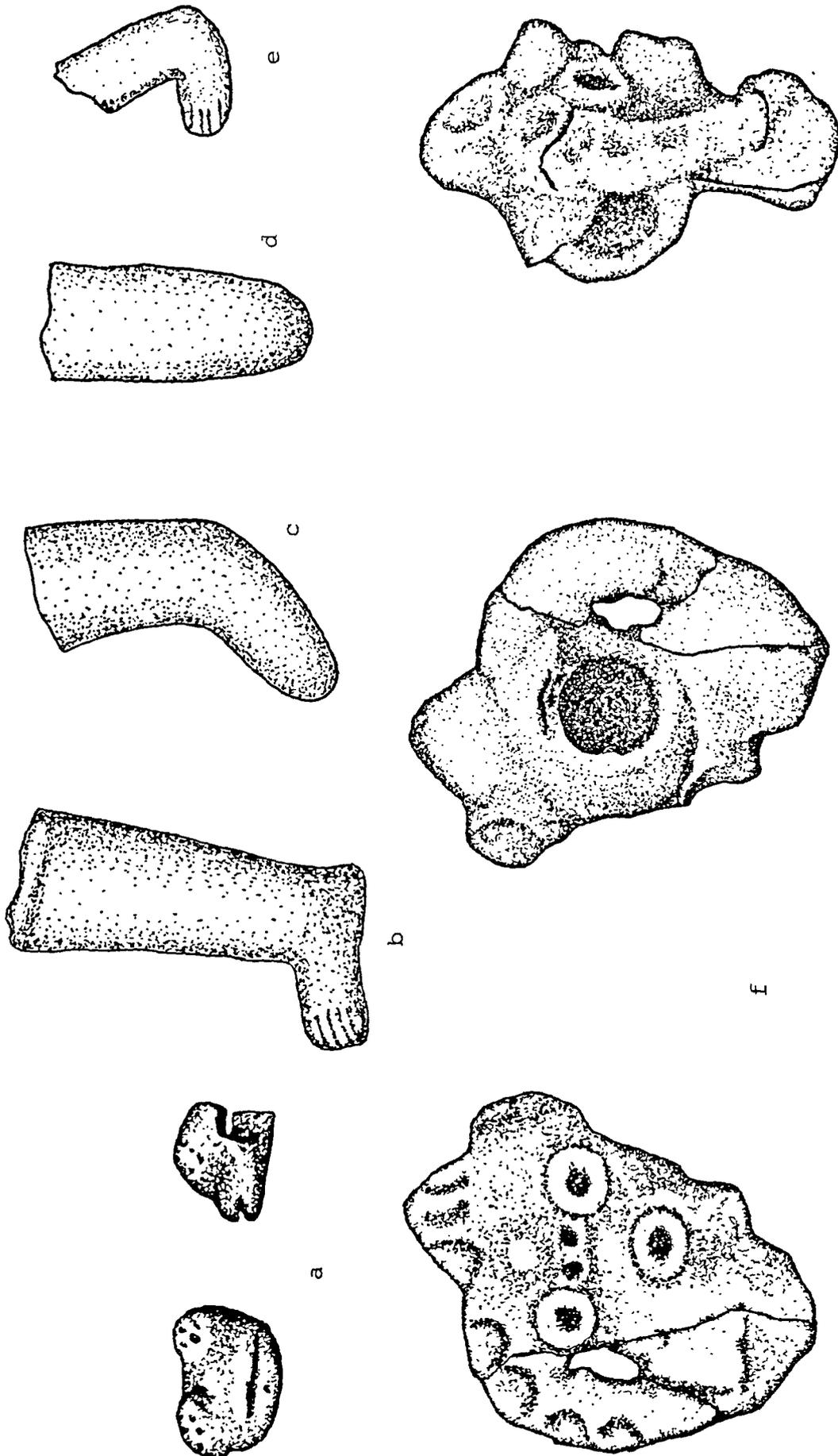


Figure 81: Anthropomorphic figurine appendages and zoomorphic figurine heads (a-frog; f-monkey)

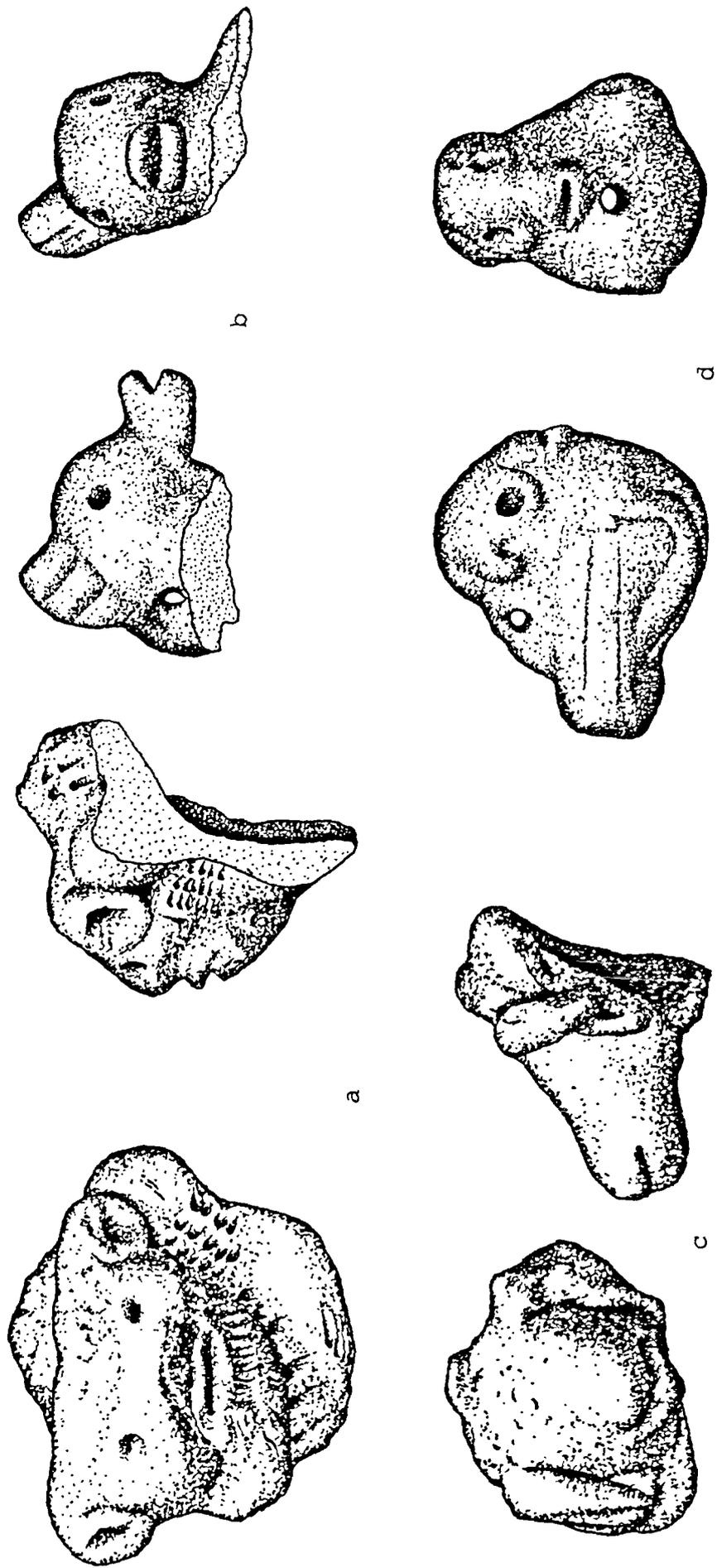


Figure 82: Zoomorphic figurine heads and whistle (a-feline; b-deer; c-dog ?; d-bird)

specimen also has a suspension hole on its back.

As a rule, zoomorphs do not display the facial detail evident among anthropomorphs. Eyes are generally represented by single round punctations, nostrils are often absent, and mouths are defined by horizontal impressions below the nose (Fig. 82a, c). The most detailed zoomorph/whistles in the Cahal Pech collection are specimens which represent a monkey (Fig. 81f), and a feline (Fig. 82a). The former has small deep-set eyes, round ears, a crested head, prognathous snout, and rounded mouth. A poorly defined arm curves upward and rests on the monkey's head. Along the edges of the arm and crest-shaped head, shallow semi-circular impressions probably represent body hair. Although poorly preserved, the feline whistle has round eyes, outspread ears, a slit mouth, and small round nostrils. Below the chin, on the body, and on the side of the face, hair is represented by striations and narrow impressions.

Contextual Distribution Of Figurines:

Cunil Phase

Three figurine fragments were found within Cunil contexts in Str. B-4 (Tables 3-4). These include two torsos and one appendage. The paste of these specimens contain very fine temper, and the colour ranges between cream and brown. The surfaces of these figurines are also smoothed but only one torso retains evidence of a cream slip. This specimen (Fig. 78b) has fine striated lines which probably represent scarification on the front of the body. Its well-defined breasts and swollen abdomen further indicate that it may represent a pregnant female.

TABLE 3: Modal Frequency and Provenience of Formative Period Figurines at Cahal Pech, Belize.

PROVENIENCE	ANTHROPOMORPHS			ZOO-MORPHS	WHISTLE	UNIDENTIFIED	TOTAL
	HEADS	TORSO	APPEND				
Str. A-1	0	1	0	0	0	0	1
Str. B-2	2	1	1	0	1	0	5
Str. B-4	29	41	38	7	21	9	145
Str. B-5	0	0	2	0	0	0	2
Str. G-2	0	0	1	0	0	0	1
Plaza B	0	1	0	0	0	0	1
*CP-Plat.	0	5	0	0	0	0	5
*TO-Str.1	2	6	1	0	4	0	13
*TO-Str.2	0	0	0	0	1	0	1
*TO-Str.3	1	1	0	0	0	0	2
*TO-Str.4	0	0	1	0	0	0	1
*TZ-Str.2	0	4	2	0	1	0	7
*TZ-Stela	0	1	0	0	0	0	1
*ZO-Str.2	1	0	0	0	1	0	2
TOTAL	33	59	46	7	29	9	187

*CP-Plat. = Cas Pek Group Central Platform
 *TO-Str.1-4 = Tolok Group Structure 1 - 4
 *TZ-Str.2 = Tzinik Group Structure 2
 *TZ-Stela = Tzinik Group Stela Cache
 *ZO-Str.2 = Zotz Group Structure 2

TABLE 4: Contextual Distribution of Formative Period Figurines at Cahal Pech, Belize.

PERIODS	CERAMIC PHASE	STRUCTURAL CONTEXT	FREQUENCY
MIDDLE FORMATIVE	Cunil	Structure B-4	3
	Early Kanluk	Structure B-4	36
	Late Kanluk	Structure B-4	35
		Structure B-2	3
*Tolok-Str.1		12	
	*Cas Pek-Cent. Plat.	3	
LATE FORMATIVE	Early Xakal	Structure B-4 Tolok-Str.2 Cas Pek-Cent. Plat.	18 1
	Late Xakal	Structure A-1 Structure B-2 Structure B-4 Structure B-5 *Tzinic-Str.2 *Zotz-Str.2	1 1 53 2 1 1
CLASSIC PERIOD	Classic Phases	Plaza B Structure G-2 Tolok-Str.1 Tolok-Str.3 Tolok-Str.4 Tzinic-Str.2 Tzinic-Stela Cache Zotz-Str.2	1 1 1 2 1 7 1 1
TOTAL FIGURINE FRAGMENTS			185

- *Cas Pek Group (Central Platform)
- *Tolok Group
- *Tzinic Group
- *Zotz Group

Early Kanluk

Thirty five figurines were recovered in early Kanluk contexts in Str. B-4. These are represented by nine heads, eight torsos, 10 appendages, three zoomorphs, four whistles, and one unidentified fragment. The paste of these specimens are grey, cream, and orange in colour. The temper includes ash and small grains of calcite. The orange paste of a few specimens resembles that of Mars Orange ware, thus it is possible that some of these figurines were made from clays similar to that used in the production of Savana Orange pottery.

Late Kanluk

Fifty three figurines were discovered in late Kanluk contexts in Str. B-4 (35), Str. B-2 (3), Str. 1 in the Tolok Group (12), and in the central platform of the Cas Pek Group (3). Within the forms identified in this sample there are 10 heads, 19 torsos, 11 appendages, and 14 whistle fragments. The predominant paste colour of these specimens is orange, followed by cream/buff, and a smaller number of greys. Tempering is similar to that of earlier figurines, and some specimens retain evidence of thin red, orange, cream, or black slips.

Early Xakal

As in Cunil levels, relatively few figurines were found in early Xakal contexts at Cahal Pech. Of the 21 samples recovered, there are six heads, eight torsos, five appendages, two zoomorphs, and one whistle. Among these are the tri-punctate-eye head (Fig. 76b) which is anomalous in the collection, the feline zoomorph (Fig. 82a), a torso possibly depicting a pregnant female, and a head fragment which might represent an old "god" (Fig. 75c). The latter is slipped brown and has a hard, dark brown paste. The other early Xakal specimens have red/orange and cream pastes, and a few retain evidence of orange and red slips.

Late Xakal

Fifty eight figurines were recovered in late Xakal contexts. Fifty three were found in Str. B-4, one in Str. B-2, two in Str. B-5, one in Str. A-1, and one in Str. 2 at the Tzinic Group. The specimens include eight heads, 14 torsos, 18 appendages, two zoomorphs, and eight unidentified fragments.

Although some of the figurines from late Xakal contexts have buff or greyish black paste, the majority have orange pastes akin to that of Mars Orange ware. This characteristic, plus similarities in style and design with earlier specimens, strongly suggest that these figurines may have actually been produced during Middle Formative times rather than in the Late Preclassic period. It is therefore possible that many of these artefacts were kept for a considerable period of time before being deposited within the fill of later construction phases.

Classic Period

Fifteen figurines were found in Classic period contexts at Cahal Pech. Six (four torsos, one appendage, one whistle) were recovered from construction fill in Str. 2 at Tzinik, and a single modified torso (Fig. 77c) was found in a stela cache in front of the same structure. The other eight specimens were recovered in Str. 1 (one head), Str. 3 (one head, one torso) and Str. 4 (one appendage) in the Tolok Group; in Str. 2 at Zotz (one whistle); Str. G-2 (one appendage) in the site core; and below Floor 1 in Plaza B (one torso). Except for the whistles, which are hollow, these figurines are all solid and hand-modeled. Several also have the bright orange paste typical of Mars Orange ware, thus they are considered to be of Formative period date.

The specimen recovered in the stela cache at the Tzinik Group is particularly interesting. It is represented by the headless and armless torso of an anthropomorph which was made from Savana Orange paste (Fig. 77c). Three small impressions on the chest area of the figurine seem to represent eyes and a mouth. Since these modifications were executed sometime after the figurine had been made, it is possible that this artefact was an heirloom which was not ritually disposed of until long after its initial production. Its use in a stela cache also indicates that figurines may have been important icons associated with the practice of ancestor worship. If so, its association with the stela further suggests that it may have served to demonstrate familial ties between a Classic period elite and his Formative period ancestor, and to legitimize the former's hereditary right to rule.

Intersite Comparisons:

Solid hand-modeled figurines are ubiquitous in the artefactual assemblages of most Middle Formative sites in Mesoamerica. They have been found in the Olmec heartland, the Mexican Highlands, the Chiapas and Guatemalan Highlands, and in the Maya Lowlands. (Kidder 1965; Rands and Rands 1965; Willey 1972:7-14; Coe and Diehl 1980:259-283).

Olmec Area: Within the Olmec area hand-modeled clay figurines were produced from the Ojochi through the Palangana Phases (1500-400 B.C.). Coe and Diehl (1980:259-283), report that the earliest specimens have naturalistic and classic "Olmec" features such as down-curved mouths, slanted/closed eyes, large rounded cheeks, and heads which are generally depicted with caps or helmets. Beginning in the Nacaste phase (900-700 B.C.) and climaxing during Palangana times (600-400 B.C.), there is a dramatic change to non-Olmec characteristics. These changes are particularly evident among anthropomorphic figurine heads. Unlike

previous specimens with slanted and very "Asian" eyes, some of the Nacaste and most of the Palangana figurines have single, double, or tri-punctated pupils set in oval eyes (Coe and Diehl 1980:276, 278). Lips are also parted, noses are prominent, and hair styles display "frontal buns" or topknots. These features are similar to Conchas phase (900-300 B.C.) figurines from the Pacific coast of Guatemala (Coe 1961:91-99, Coe and Diehl 1980:276), and with Dili phase (900-300 B.C.) types from the Chiapas Highlands (Lee 1969).

Among the Cahal Pech specimens only one artefact, which is either part of an effigy bottle or hollow figurine whistle, bears resemblance to the early Olmec figurines. This specimen (Fig. 75b) has rounded puffy cheeks and slanted eyes which are very "Asian" in appearance. The majority of the Cahal Pech specimens, however, are closer, but not identical, to some of the Nacaste and Palangana figurines. This is indicated by similarities in eye and hair treatment, and general parallels in facial characteristics.

Maya Highlands: Highland sites have produced the largest number of Formative period figurines in the Maya area. At Kaminaljuyu and Chalchuapa alone, over 2,000 fragments have been recovered (Wetherington 1978; Dahlin 1978). At these and other sites in the region (cf. Kidder 1965; Sharer and Sedat 1987), anthropomorphic figurines are generally slipped in cream, white, or red, and faces are predominantly naturalistic. The eyes on Early and Middle Formative specimens are predominantly represented by single punctated pupils in oval impressions. Mouths are "invariably open, showing either a plain sculptured dental arch or a dental arch with incised or punctated teeth" (Dahlin 1978:170), and noses are prominent. Torsos are generally in seated positions with out-stretched or crossed legs. They also tend to be nude, genitalia are mostly absent, and large breasts and swollen abdomens "attest to

representations of pregnant females" (Dahlin 1978:165).

During the Late Formative there is greater diversity in figurine styles. Double-punctate and tri-punctate-eye types become more popular, and topknots are more common. Late Formative torsos also tend to be dressed in skirts, "sarongs", aprons, or "G-strings". Nude varieties do continue, however, and "depiction of genitalia is both more frequent and realistic" (Dahlin 1978:171).

Although rarer than anthropomorphs, animal effigies and whistles occur in small numbers in the Maya Highlands. The most common forms present at Chalchuapa and Kaminaljuyu are monkeys, dogs, and birds (Kidder 1965; Dahlin 1978; Wetherington 1978). Some monkey figurines have hands raised to the head or cheek (Kidder 1965:153, Fig. 3c), and whistles are predominantly in the form of birds.

The characteristic features of highland Maya figurines are in many cases duplicated in the Cahal Pech assemblage. This is true of anthropomorphs as well as zoomorphs. The tri-punctate-eye head from Cahal Pech, for example, is identical to Dahlin's (1978:150-154) Alvarez Tri-punctate-eye type from Chalchuapa, and to specimens from Kaminaljuyu (Kidder 1965:fig.6), and the northern Highlands (Sharer and Sedat 1987:311). The naturalistic features, oval-shaped eyes, and single punctated pupils of the majority of the Cahal Pech figurines are also similar to Middle Formative specimens from Kaminaljuyu, and with the Villanova Naturalistic and Gomez Egg-shaped types defined at Chalchuapa (Dahlin 1978:147-149). Furthermore, torsos with "G-strings" are found in both areas.

Parallels between zoomorphs are particularly evident among the monkey forms from Cahal Pech and those from Formative levels at Kaminaljuyu (Kidder 1965:Fig. 3c), and bird effigies are the predominant whistle forms in both regions.

Maya Lowlands: Within the Maya Lowlands, Formative period figurines have been found in varying frequencies at Uaxactun, Altar de Sacrificios, Seibal, Barton Ramie, San Jose, and Cuello.

Uaxactun: Among the lowland sites, Uaxactun has produced the largest collection (approximately 300 fragments). Ricketson and Ricketson (1937:209-215), and Rands and Rands (1965:536), report that the entire Uaxactun assemblage was recovered from late Middle Formative Mamom contexts, and that their absence in Late Formative Chicanel deposits reflect a general southern Maya Lowland pattern.

In their description of the Uaxactun collection, the Ricketsons (1937:211-214) noted that human effigies are "strongly Maya" in appearance, that they have projecting wedge-shaped noses, and eyes are represented by oval or elliptical impressions with single punctations. Heads also display fronto-occipital deformation, hair is depicted by incised lines and punctations, and torsos are predominantly "female" in seated positions. Furthermore, bodies are nude, fingers and toes are indicated by incised lines, and zoomorphic whistles occur in the form of birds and other animals.

The stylistic, technological, and particularly the modal similarities between the Cahal Pech and Uaxactun assemblages suggest that by late Middle Formative times both sites may have

been participating in the same cultural tradition. This situation is further indicated by the ubiquity of Mamom pottery in both regions.

Altar: At Altar de Sacrificios 40 figurine fragments were recovered in Formative contexts (Willey 1972:8-14). Unfortunately, few of these are heads, thus intersite comparisons are difficult to make. Willey (1972:13), nevertheless, argues that the Altar specimens "resemble those of the Uaxactun Mamom phase...", and those in the Barton Ramie collection. In general terms this may be true, but in my opinion the anthropomorphic heads from Altar also display salient differences from the Uaxactun, Barton Ramie, and Cahal Pech collections. These differences are particularly evident in the features of the few human effigies from Middle Formative San Felix deposits (Willey 1972: Fig.3h,j,k). These heads have oval-shaped eyes "made by double gouging", and "Nose and lips are applique features and are very pronounced" (Willey 1972:9). These characteristics, especially the double gouged eyes and the pronounced applied lips, are absent on the figurines from Uaxactun and the Belize Valley. The facial characteristics of the Altar specimens may therefore represent local artistic idiosyncrasies, or perhaps external influences from elsewhere in the Maya area.

Seibal: Eighty-one figurine fragments associated with the Real (900-600 B.C.) and Escoba (600-300 B.C.) phases were recovered at Seibal (Willey 1978:7-12). Willey (1978:9) describes the seven anthropomorphic heads in this collection as "naturalistic human faces, usually with a topknot or piled hairdo, although sometimes with a hairband". He adds that "Hair, nose, ears, ear ornaments, and sometimes the mouth, are little kneaded pellets of clay that have been pressed onto the head and face area" (Willey 1978:9). One specimen (Willey 1978:Fig. 3a, and 4b) also has raised applied eyelids. These characteristics parallel those

on the figurines from Altar de Sacrificios, but similarities with the assemblages from Uaxactun and the Belize Valley are again more general than specific.

Barton Ramie: Six figurines were found in Jenney Creek and Barton Creek (800-300 B.C.) contexts at Barton Ramie. This low frequency is quite unlike the situation at Cahal Pech, but it may reflect sampling rather than an actual scarcity of this artefact type at the site. The few Barton Ramie specimens are also similar in form, stylistic representation, and overall characteristics to the larger Cahal Pech collection. Of particular interest was the discovery of a single specimen within a Formative period burial at the site. This association is rare in the Maya area where figurines are primarily recovered in the fill of Formative period structures.

San Jose: Thompson (1939:154-156) recovered seven Middle Formative figurines at San Jose: five torsos and two heads. The torsos were "apparently" all "female", and were in standing and seated positions (Thompson 1939:154-155). The small size of the two head fragments limits intersite comparisons. Thompson (1939:155) nevertheless reports that they are slipped and that they differ from "figurine heads of Uaxactun 1a". The treatment and depiction of the eyes on one specimen (Thompson 1939: Fig. 92g) also duplicates the technique and pattern evident among the Cahal Pech collection.

Cuello: Although present, figurines were not very common in the Formative period artefact assemblage at Cuello (Hammond 1991b:177). Of the approximately 12 fragments recovered, Hammond (1991b:177-178) reports that the earliest are human effigies "which appear from Swasey times onwards." The earliest figurine head fragment is dated to the Bladen phase.

It appears to have an oval-shaped eye with a single round punctation representing the pupil (Hammond 1991b: Fig.8.18b). Hair is depicted by incised lines and the ears project slightly from the head. Although there is very little left of this small figurine fragment, Hammond (1991b:177) argues that it resembles the Villanova Naturalistic type from the Kulil Complex (1200-600 B.C) at Chalchuapa. He adds that other specimens share parallels with the Barton Ramie assemblage, and that animal effigies, including a bird-shaped ocarina, first appear in late Bladen times. Similarities in the facial treatment of the Cuello and Cahal Pech collections also indicate that the two sites shared a similar figurine tradition.

Figurine Function: In a recent article focusing on the role of Middle Formative Maya figurines, Hammond (1989:111-114) accurately reports that "their function in ancient Maya society is unknown, and has rarely been debated". Previously, and in the only synoptic study of this artefact type, Rands and Rands (1965:535-560) suggested that the large number of pregnant female effigies were associated with fertility rites and fetishes; that whistles could have been used for hunting and in religious ceremonies; and that figurines could have been collectively used in sympathetic magic, for purely secular activities, or even as toys.

Rands and Rands (1965) proposed function for Formative period whistles has never been questioned, perhaps for the simple reason that no in depth study has ever been made of these Preclassic "musical instruments". If analogy between Classic period specimens and Formative period examples are valid, however, the Rands' (1965) hypothesis may be partly accurate. At Pacbitun, for example, Healy (1988) reported the discovery of several ceramic flutes, drums, and ocarinas within two Late Classic burials. He proposed that this association indicated that the instruments may have been used during funeral processions, then were

deposited within the graves of the deceased (Healy 1988:25). Healy adds that a similar situation may have occurred at Jaina where the largest number of these artefact types have been found at that island necropolis. The use of musical instruments in ceremonial processions is also known from the murals at Bonampak. If we therefore accept that Formative period whistles played a similar role as their Classic period counterparts, Rands and Rands (1965) suggest on that they were sometimes used in ritual ceremonies may have some validity.

The fertility fetish hypothesis has been supported by Willey's analysis of the Barton Ramie (Willey et al. 1965:393-397), Altar de Sacrificios (Willey 1972:8-14), and Seibal (Willey 1978:7-12) figurine collections. In these monographs Willey reported that the majority of figurines from these sites were recovered in domestic contexts, and that they predominantly represented female effigies with swollen abdomens. He (Willey 1978:7) does indicate, however, that specimens with flat chests and broad shoulders probably depict males, but he offered no functional interpretation for these non-female effigies.

The only "explicit hypothesis" (cf. Hammond 1989:112) on the function of anthropomorphic figurines was one recently proposed by Grove and Gillespie (1984). In their analysis of more than 4,000 specimens from Chalcatzingo, they noted that during the Early Formative (1600-900 B.C.) the figurine assemblage from that and other Mexican sites usually depicted females "with heavily emphasized hips and thighs and only stylized facial details" (Grove and Gillespie 1984:28). These figurines, they suggested, were probably used in fertility cults. On the contrary, Middle Formative figurines exhibited "greater variety". Although they included specimens with "highly stylized features" and emphasized hips, the

heads and ornamentation on nearly 50 percent of the more than 1400 Middle Formative specimens received much greater attention. Grove and Gillespie (1984) grouped these specimens under a single type designated as C8 figurines. The C8 human effigies have realistic facial features, eyes are represented by oval-shaped orbits with single circular punctations depicting pupils, and hair and head ornaments are portrayed with a fair amount of detail. Grove and Gillespie (1984:28) added that,

Initial analysis revealed that there are numerous repetitions of many of the specific faces in the sample. In other words, specific "people" can be identified. At the same time, each distinct facial type has an equally distinctive and repetitive headdress. Because these figurines were hand-modeled, this repetition suggests that the ceramic artisans purposely created a large number of figurines with specific face and headdress combinations. Thus a portrait figurine personage can be identified by both facial features and headdress form.

They (Grove and Gillespie 1984) further argue that the portrait figurines are in many ways similar to the colossal Olmec monuments which are believed to have portrayed successive rulers at San Lorenzo and La Venta. Consequently, they propose that the figurines may themselves represent the portraits of rulers and that they were directly related to an ancestor cult. This cult,

...clearly placed a special importance on the person of the ruler, both in life and in death. Particular attention was paid to his head, the focus of his identity. At his death, his supernatural powers- which still apparently posed a threat to the living- were neutralized by decapitating his statues and effacing the head... The portrait figurines may also have been decapitated and disposed of at this time. Although we cannot be sure from the present data when this figurine breakage occurred, it seems a logical act on the part of the Chalcatzingo commoners in acknowledging, in a very dramatic way, their community's change in leadership. These household figurines were thus used in domestic rituals having political as well as ideological aspects (Grove and Gillespie 1984:32).

In a brief paper focusing on the function of Maya Middle Formative pottery figurines, Hammond (1989) recently applied Grove and Gillespie's (1984) hypothesis to the Maya area. Citing data from Uaxactun and Cuello, he argued that the principal criteria used in defining

the C8 figurines at Chalcatzingo are also present in lowland Maya collections. This is particularly true in the "comparative realism of the faces", the "consistent elaborations of the headdress" and the "oval, single-punched eyes" (Hammond 1989:112-113). Hammond concludes that if Grove and Gillespie's theory is valid, then "ruler portraits were already current in the Middle Preclassic of the Maya lowlands, with Cuello Q4091 forming an especially striking example" (Hammond 1989:113).

The Cahal Pech assemblage, which is considerably larger and more complex than the small Cuello collection, provides an interesting body of data which: a) supports Grove and Gillespie's (1984) hypothesis, and b) suggests that some of these figurines may also represent the heads of different lineages at the site. As previously noted, a large number of the human figurines from Cahal Pech have similar characteristics to the C8 specimens at Chalcatzingo. They are very realistic, eyes are represented by oval impressions with central punctations, headdresses are relatively elaborate, facial and other ornamental features are depicted with a relatively high level of detail, and heads are consistently found dislocated from torsos. Striking similarities in the facial and ornamental features of two Cahal Pech figurines (Figs. 71a; 73a-b) further indicate that, like some of the C8 figurines at Chalcatzingo, these specimens probably depict portraits of the same person. At the same time, differences among other heads suggest that a number of separate individuals are being represented. Since many of these human heads are contemporaneous, it is possible that in addition to depicting "ruler portraits", some of the figurines may also represent male family elders or the lineal heads of other households.

Another factor supporting the notion that some of the Cahal Pech figurines are probably

associated with an ancestor cult is the context in which most of the figurines were recovered. As Tables 3 and 4 indicate, the largest number of figurines were found in Str. B-4 in the site core. In the periphery they were recovered in the central platform of the Cas Pek Group, in Str. 1 at Tolok, Str. 2 at Tzinic, and Str. 2 at Zotz. Interestingly, these mounds contain the earliest phases of construction within their respective groups, and they also contain the longest occupation sequence within the site core and peripheral settlement clusters. If these mounds therefore represent the initial residences of the founding families at the site, it is possible that the lineage heads of Middle Formative families may have resided in these dwellings. Furthermore, if the heads of portrait figurines were indeed broken off at the death of the individual whom they represented, and if they were subsequently deposited within the residence of the deceased, this could account for the marked frequency of figurines within these mounds and their relative absence in others.

More convincing evidence of an association between figurines and ancestor cults is suggested by the interesting stela cache which was recovered in the Tzinik Group. As previously reported, the only offering at the base of the uncarved Classic period monument at Tzinic was the nearly complete lower torso of a Middle Formative figurine (Fig. 77c). In their initial description of this cache, Conlon and Awe (1990:11) noted that the figurine was discovered sitting upright, but that it was missing both arms and head. On the chest area, a mouth and eyes had been crudely incised on the upper torso in order to represent facial features. Since these modifications were executed sometime after the figurine had been made, Conlon and Awe (1990:11) argued that the figurine probably represented an heirloom whose date of production predated that of the stela. More important, the association of the figurine and stela provides convincing evidence in support of Grove and Gillespie's (1984) hypothesis.

Following Proskouriakoffs' (1960, 1963) original identification of the genealogical information on carved Maya monuments, it is unanimously accepted that stelae were used by Classic period elite to record their hereditary and legitimate right to rule. If some Middle Formative figurines indeed represent "ruler portraits" or family elders, then it is possible that by placing the figurine below his stela, the chief personage in the Tzinic Group may have provided two reasons for his high status. Through the figurine he was demonstrating his relationship to the founding ancestor of Tzinic, and the stela, if carved or painted, may have recorded genetic or familial ties with the ruling elite in the site core.

The forms, features, and particularly the context of Formative period figurines at Cahal Pech, therefore indicate that these small hand-modeled effigies played at least three important roles in early Maya culture. These functions included the use of "pregnant" female effigies in fertility cults, the representation of ruler portraits or lineal heads in an incipient ancestor cult, and, in the case of whistles/ocarinas, as musical instruments which were used during funerary and other ritual ceremonies.

6.5 The Ground Stone Industry

The ground stone industry includes all artefacts that were manufactured by pecking and grinding. As at Chalchuapa (Sheets 1978) and Cerros (Garber 1989), however, ground stone artefacts which were purposely polished have been placed under a separate category designated as the polished stone industry.

The ground stone industry at Cahal Pech is comprised of several artefact forms which were produced from a variety of raw materials. The Formative period modes consist of

manos, metates, spindle whorls, bark beaters, peanut stones, pendants, mirror backs, and small plaques. The raw materials used to produce these implements include granites, limestone, slate, and shale. Limestone occurs naturally throughout the sustaining area of the site. Although there are no immediate outcrops of granites, slates or shale, these raw materials are brought down with alluvium from the nearby Mountain Pine Ridge and are readily available along the river beds and beaches of the Macal River.

ARTEFACT FORM: Mano

SUBFORM: Oval (Figs. 83-84)

FREQUENCY: 6

MATERIAL: Granite

DATING: Late Formative (Early to Late Xakal)

CONTEXT: 2-Construction Fill, Str. B-4\10th

1-Construction Fill, Str. B-4\11th

1-Construction Fill, Str. 1\2nd Tolok Group

1-Construction Fill, Central Plat. Cas Pek Group

COMMENT: These manos are made from grey and pinkish granites. They range from 5.0 to 7.5 cm in diameter, and in complete form they all exceeded 10 cm in length. All the manos also exhibit use wear and polish which attest to their use as grinding implements.

Oval manos have a wide temporal and geographical distribution in the Maya Lowlands. They occur in Formative and Classic period contexts in Belize (Willey et al. 1965:459; Garber 1989:15-17), and have been reported as thick-ovate-rectangular forms in the Peten (Willey 1972:116-124, 1978:165). At Cahal Pech they were predominantly found in Late Formative contexts.

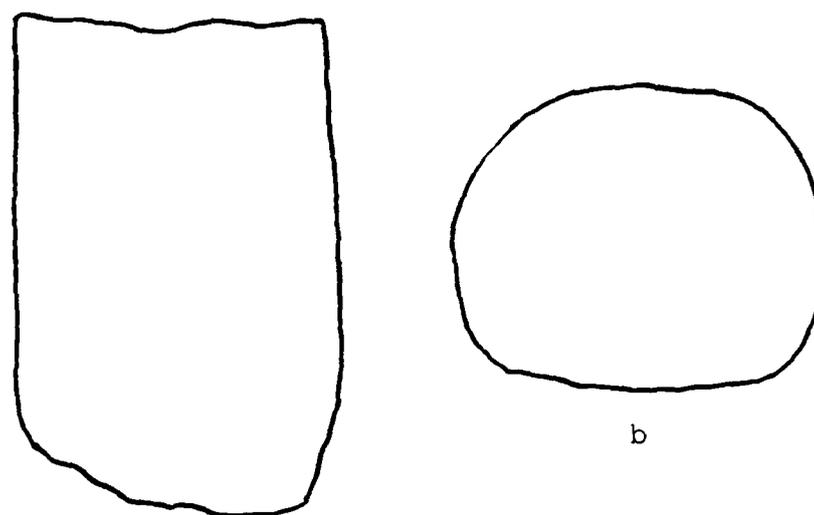
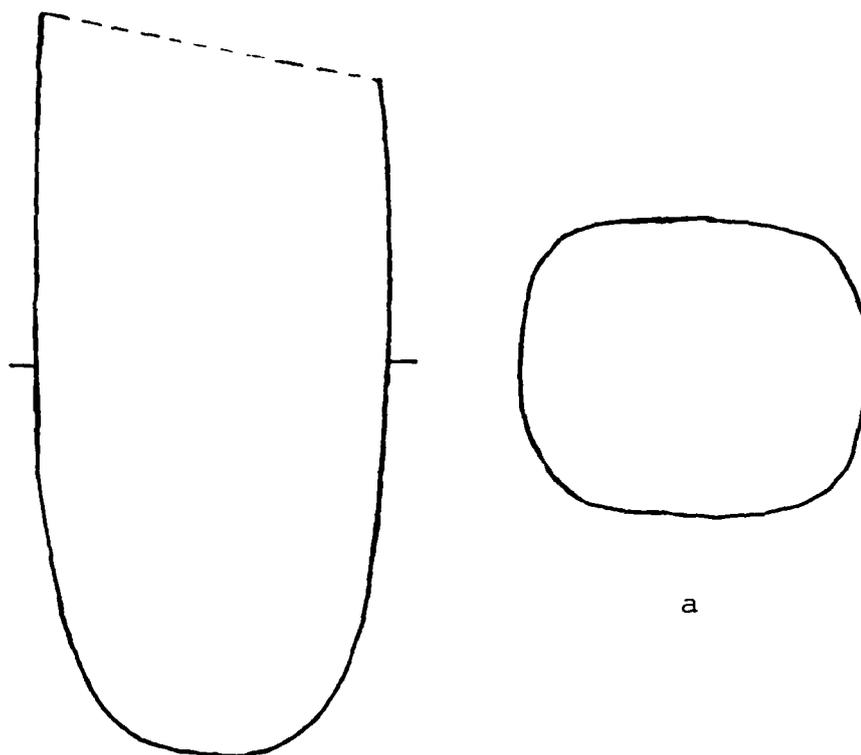


Figure 83: Oval manos (65% actual size)

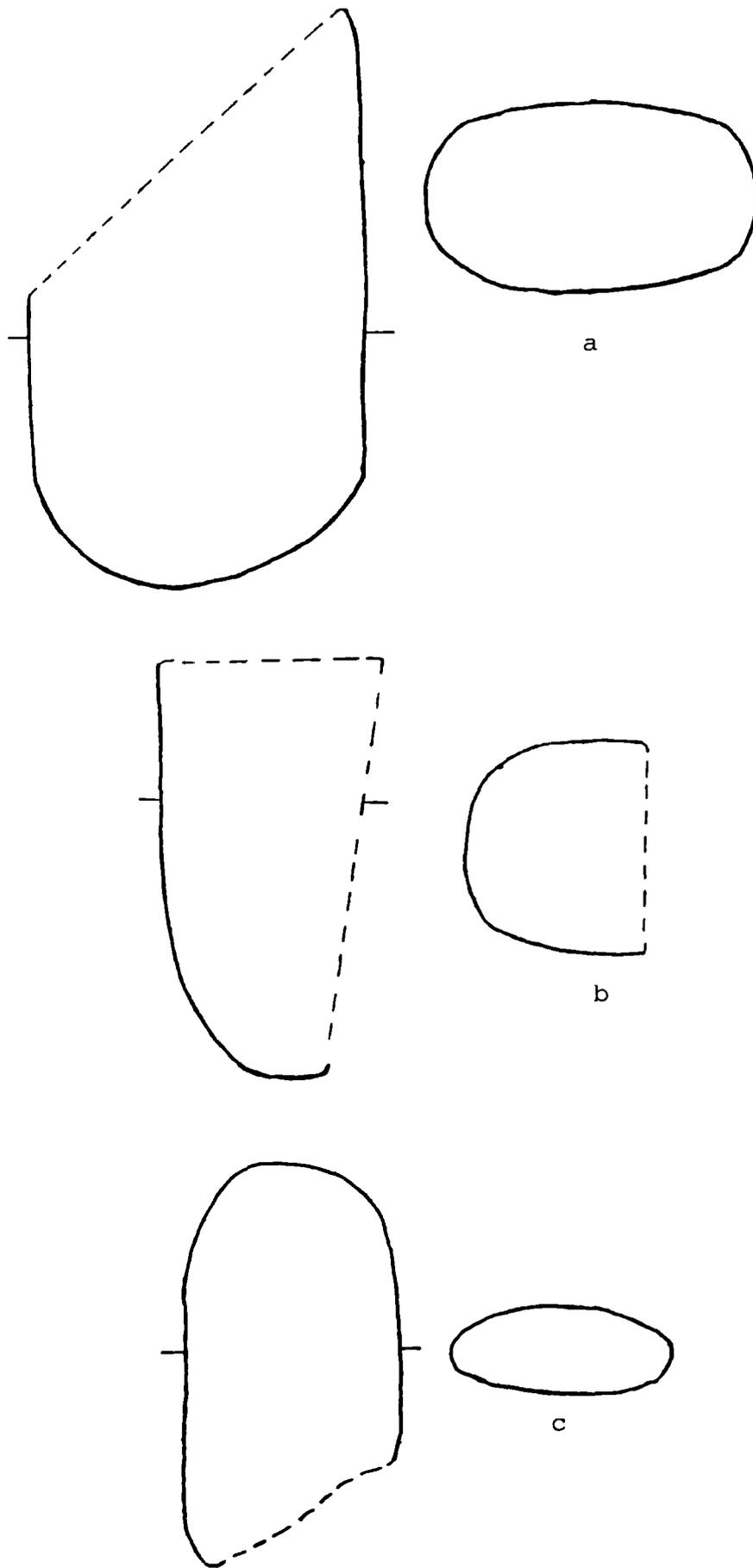


Figure 84: Oval manos (65% actual size)

ARTEFACT FORM: Mano

SUBFORM: Plano-convex (Fig. 85a-b)

FREQUENCY: 3

MATERIAL: Granite

DATING: Fig.85b, Early Middle Formative (Early Kanluk)

Fig.85a, Late Formative (Early Xakal)

CONTEXT: 1-Construction Fill, Str. B-4\5th

1-Construction Fill, Str. B-4\10th

1-Construction Fill, North. Periphery mound

COMMENT: Made from grey and pinkish granites, these manos range between 9.0 and 11.5 cm in diameter. Their geographical distribution is similar to that of other subforms, but Willey et al. (1965:462) report that they are predominantly found in Formative period contexts. Their contextual distribution at Cahal Pech confirms Willey et al. 1965) observation.

ARTEFACT FORM: Mano

SUBFORM: Rectangular (Figs. 86a-c; 87a)

FREQUENCY: 4

MATERIAL: Granite

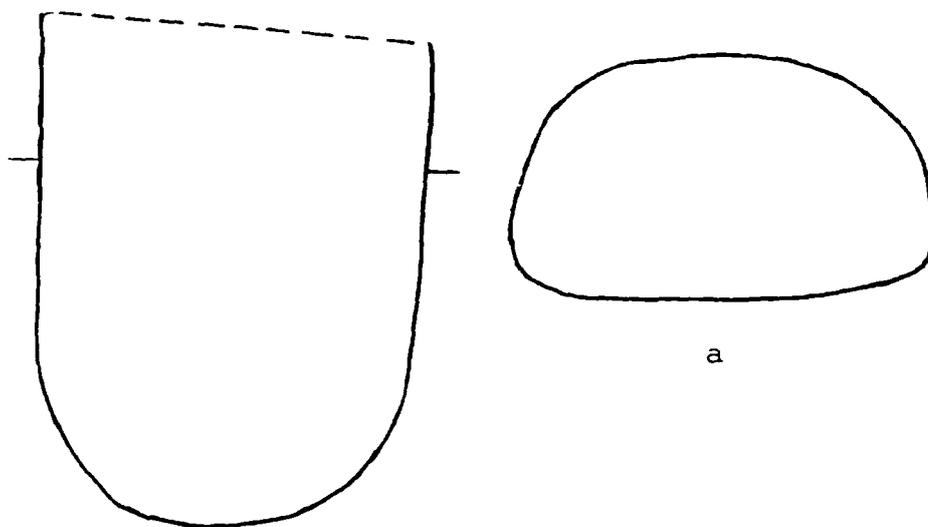
DATING: Fig.86a, Late Middle Formative (Late Kanluk)

Figs.86b-c; 87a, Late Formative (Early-Late Xakal)

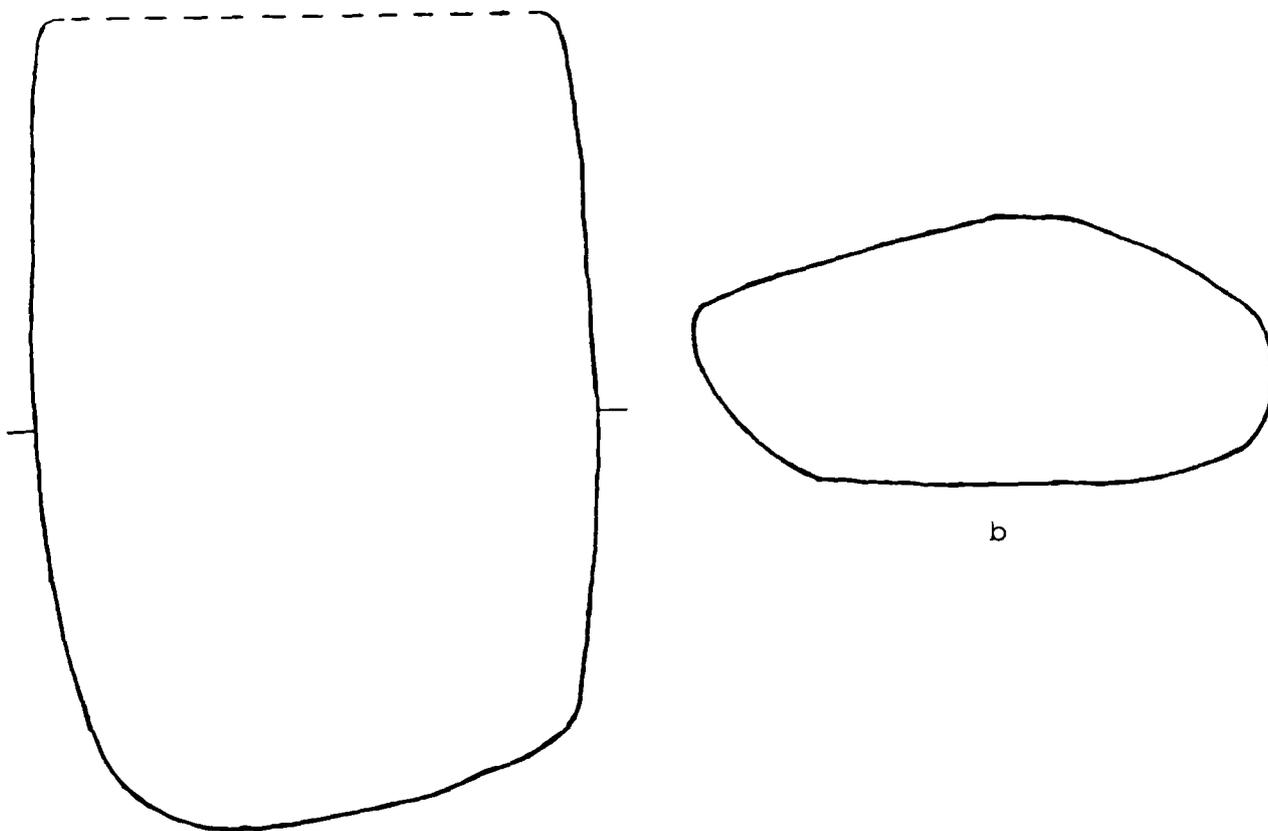
CONTEXT: 1-Construction Fill, Str. B-4\8th

2-Construction Fill, Str. B-4\10th

1-Construction Fill, Str. B-4\11th



a



b

Figure 85: Plano-convex manos (65% actual size)

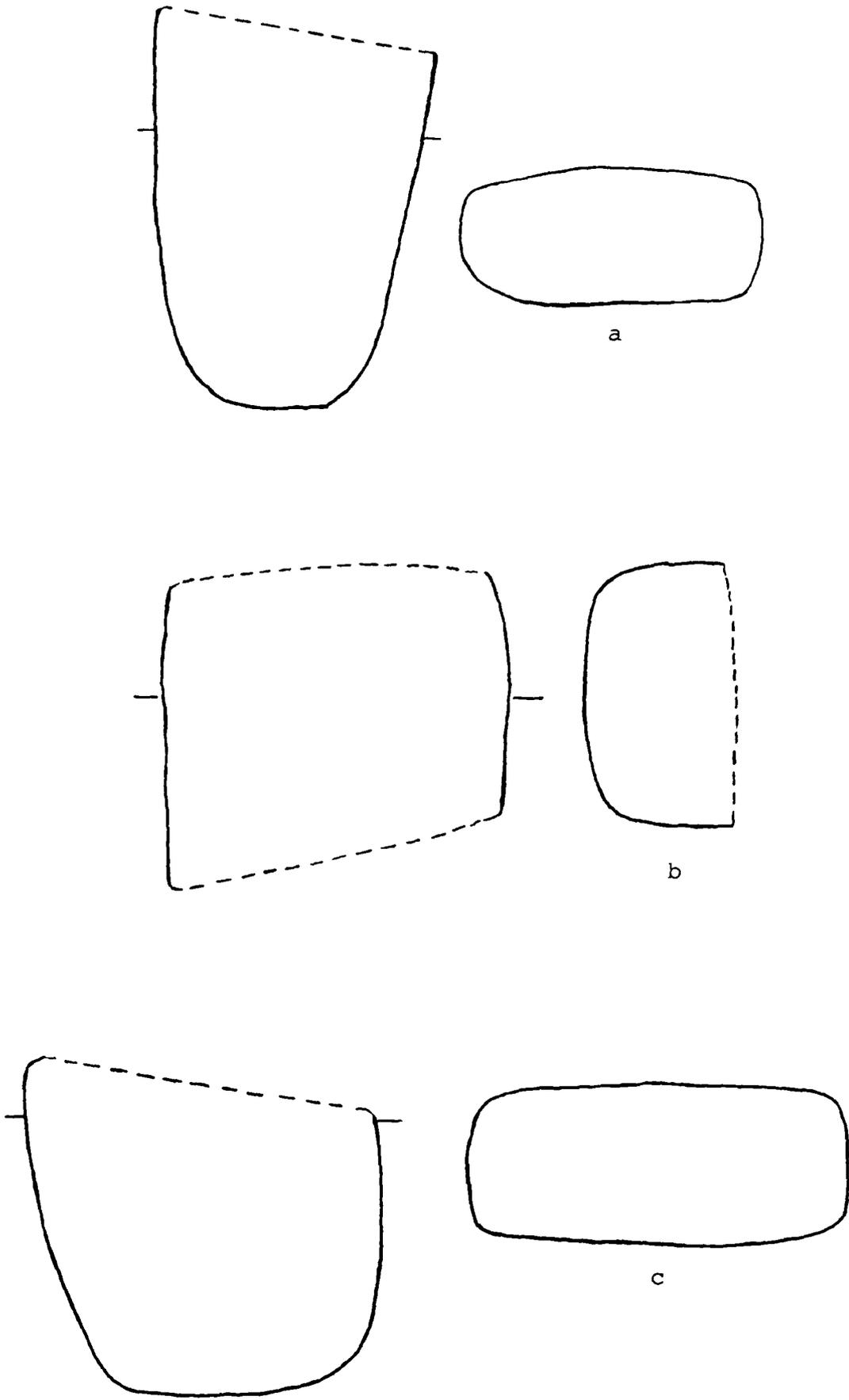


Figure 86: Rectangular manos (65% actual size)

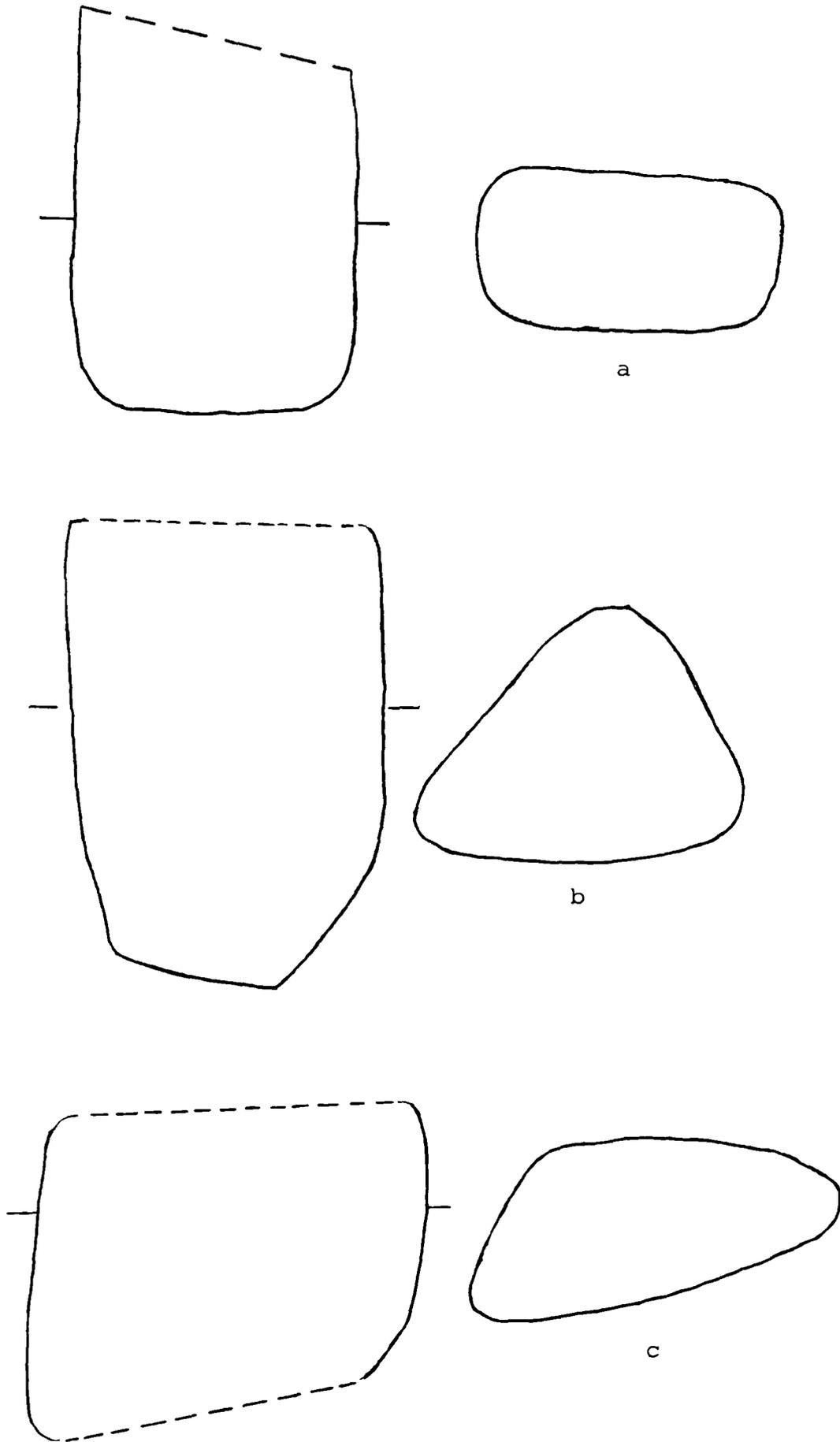


Figure 87: Rectangular (a) and triangular (b-c) manos (65% actual size)

COMMENT: These mano fragments average between 7.7 to 9.0 cm in width, and 3.5 to 6.8 cm in thickness. Rectangular manos were recovered from Middle Formative through Classic period contexts at Altar de Sacrificios (Willey 1972:116-118), Seibal (Willey 1978:65), and Barton Ramie (Willey et al. 1965:457-459), but only in Classic period deposits at Cerros (Garber 1989:17).

ARTEFACT FORM: Mano

SUBFORM: Triangular (Fig. 87b-a)

FREQUENCY: 2

MATERIAL: Granite

DATING: Late Formative (Early and Late Xakal)

CONTEXT: Fig.87a, Construction Fill, Str. B-4\10th

Fig.87b, Construction Fill, Str. B-4\11th

COMMENT: Although triangular manos have a wide distribution in the Maya Lowlands, they have previously only been recovered in Formative period contexts at Cerros (Garber 1989:17-18) and Cuello (Hammond 1991:Fig.8.7g). Other occurrences in the comparative area all date to the Classic period (c.f. Willey et al. 1965:462; Willey 1978:72).

ARTEFACT FORM: Metate

SUBFORM: Basin or Turtle back (Figs. 88a-c, e-f; 89b)

FREQUENCY: 9

MATERIAL: Granite

DATING: Early Middle to Late Formative (Cunil to Xakal)

CONTEXT: Str. B-4\5th; B-4\7th, B-4\10th, B-4 11th, Tolok Str. 1, Cas Pek Central Platform.

COMMENT: These basin-shaped or turtle back metates are legless, they have rounded bases, and generally curve upward at both ends. At Cahal Pech they range between 3.5 and 8.5 cm in thickness, and probably averaged about 35 cm in length. According to Willey (1972:106-110; 1978:57-61) and Garber (1989:19) they represent the most common form of metates at lowland Maya sites, and occur from Middle Formative times through to the Late Classic period.

ARTEFACT FORM: Metate

SUBFORM: Slab (Fig. 89a,c-d)

FREQUENCY: 3

MATERIAL: Granite

DATING: Late Formative (Xakal)

CONTEXT: Fig. Construction Fill, Str. B-4\10th

Fig. Construction Fill, Str. B-4\11th

Fig. Construction Fill, Tolok Str.1

COMMENT: At Cerros, Garber (1989:21) defined slab metates as having a "surface that is flat along at least one dimension". The flat surface is generally at the base of the grinding stone, while the grinding surface on the opposite side is usually concave. The Cerros specimens ranged in date from the Late Formative to the Classic period. At Barton Ramie (Willey et al. 1965:454), Altar (Willey 1972:106-109), and Seibal (Willey 1978:57-64) this form was included under the Basin Shaped or the Thin Flat varieties, and occurred in both Formative and Classic period contexts.

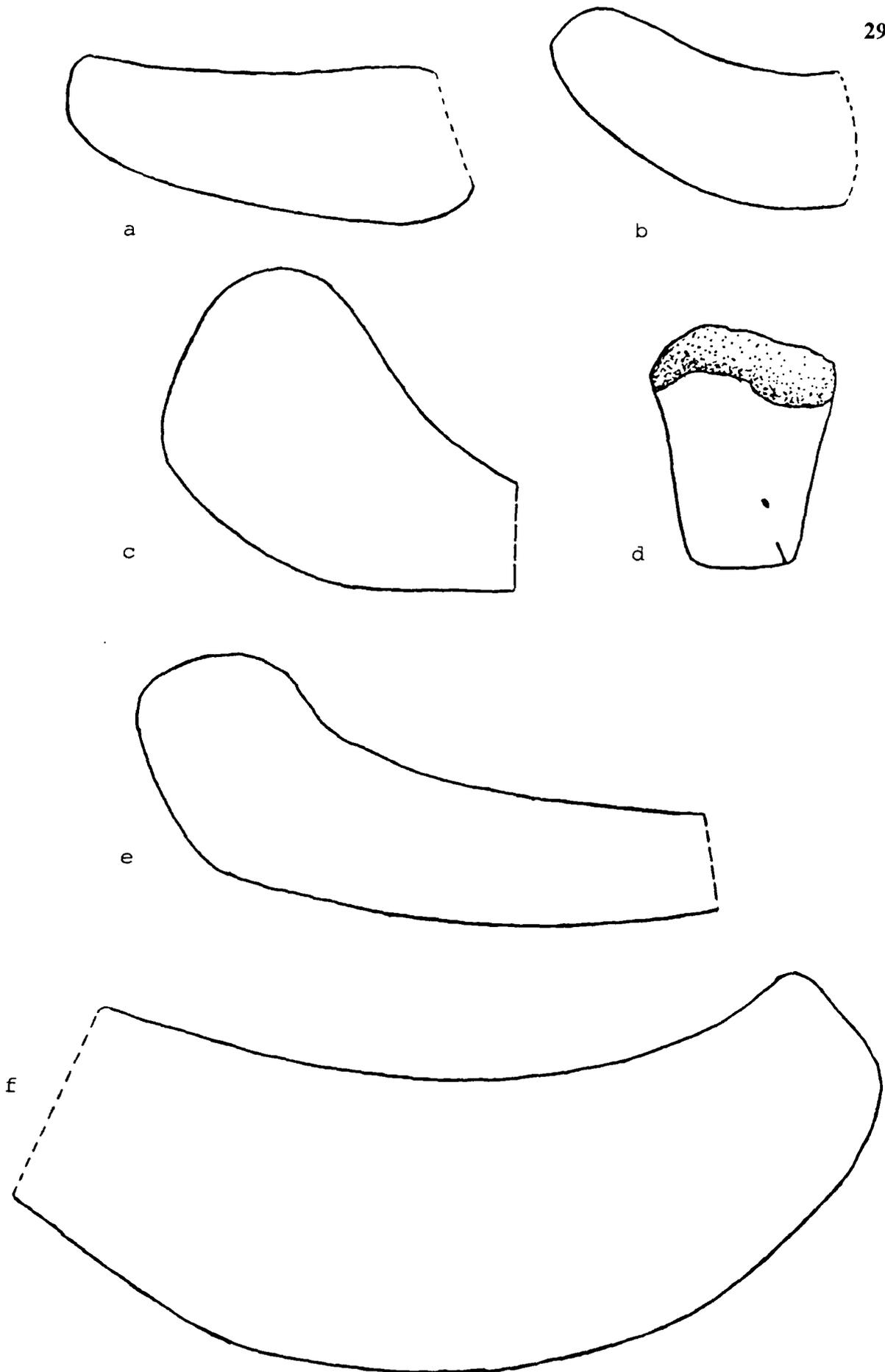


Figure 88: Turtle-back and legged metates
(65% actual size)

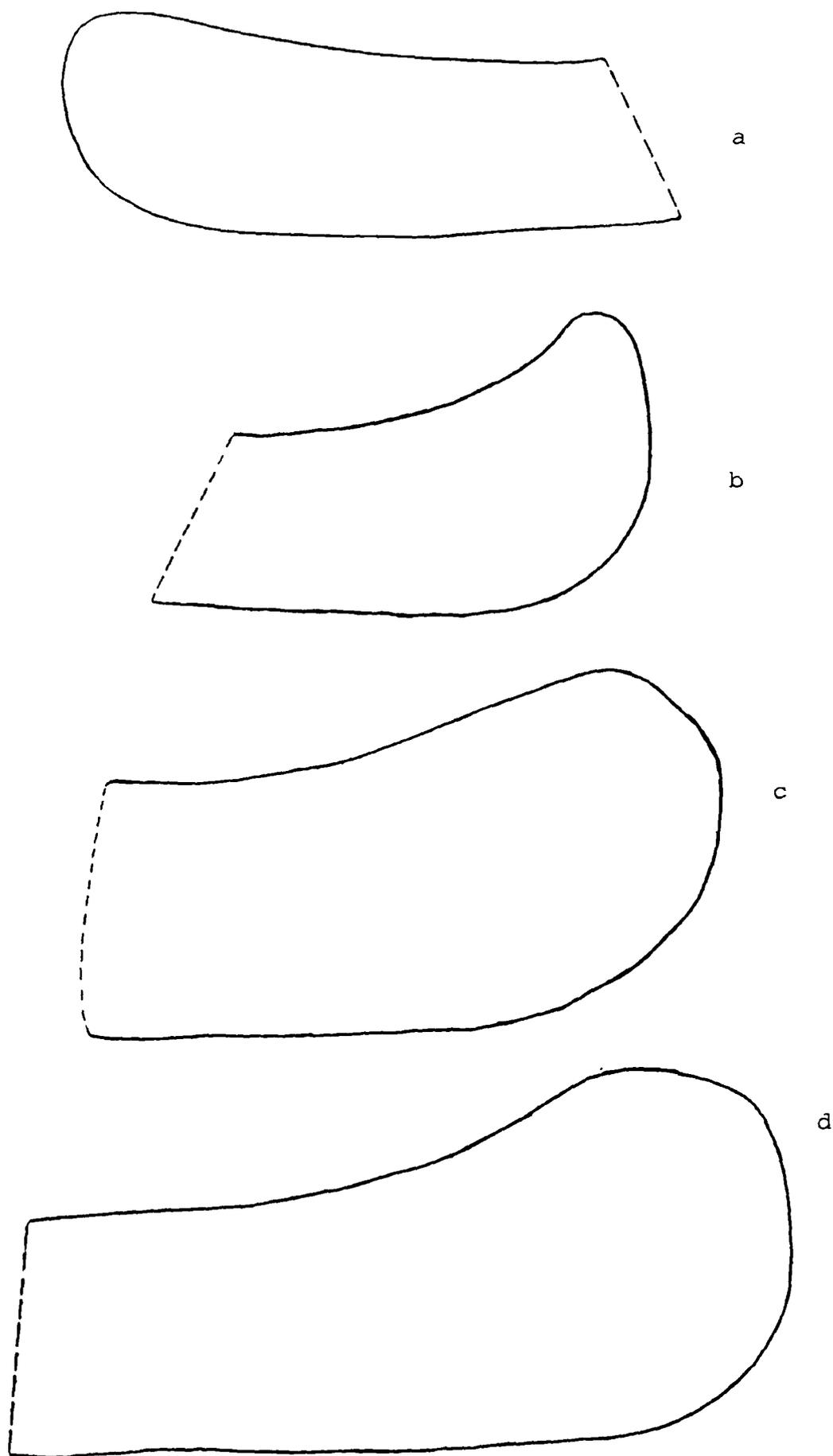


Figure 89: Slabbed and turtle-back metates
(65% actual size)

ARTEFACT FORM: Metate

SUBFORM: Legged (Fig. 88d)

FREQUENCY: 2

MATERIAL: Limestone

DATING: Formative

CONTEXT: Looters Trench, Tolok Group Str. 1

COMMENT: Only two fragments of legged metates were recovered at Cahal Pech. They are represented by a single leg, and by a body fragment with two legs attached. These specimens are also the only ones made from limestone in the assemblage. This low frequency is interesting because it suggests that Cahal Pech, like the Belizean sites of Barton Ramie (Willey et al.1965), Caledonia (Awe 1985), and Pachitun (Healy 1990), is one of the few centers in the Maya Lowlands where metates from metamorphic rocks greatly outnumber those from limestone. This distribution probably reflects the fact that Belize Valley sites are located on the periphery of the granite-rich Pine Ridge region of the Maya Mountains. The presence of granitic rock on the banks and alluvium of the Macal and upper Belize Rivers therefore made this preferred, harder raw material easily available to the sites in this region.

ARTEFACT FORM: Spindle Whorl (Fig. 90a-c)

FREQUENCY: 3

MATERIAL: Limestone

DATING: Terminal Late Formative (Late Xakal)

CONTEXT: Burial 2, Central Platform, Cas Pek Group

COMMENT: These spindle whorls range from 2-3 cm in diameter and 0.7-1.4 cm in height. They have flat bases, two have domed tops, and one has insloping sides and a flat top. The

three specimens all have uniconically drilled holes, and one has two encircling lines incised around the body.

In both the Maya Highlands and the Lowlands stone spindle whorls have only been recovered in Classic period (particularly Late Classic) contexts (cf. Sheets 1978:62; Willey 1972:183, 1978:90). The Cahal Pech specimens therefore represent the earliest examples of this artefact form produced from stone. It should be noted, however, that perforated sherd disks, which have been classified as *ad hoc* whorls, have a greater antiquity than stone whorls. In his Seibal report Willey (1978:43) noted that ceramic whorls date to the Middle Formative period at that site, and to the terminal Late Formative at Altar de Sacrificios and Barton Ramie.

ARTEFACT FORM: Bark beater (Fig. 90e)

FREQUENCY: 1

MATERIAL: Limestone

DATING: Late Formative (Late Xakal)

CONTEXT: Construction Fill, Cas Pek Central Platform

COMMENT: This bark beater was originally rectangular in shape. It has rounded corners, and hafting grooves are present along the two longest sides. Due to its incompleteness it was impossible to determine its length, but it has an average thickness of 2.8 cm.

Detailed descriptions and comparisons of bark beaters have been made by Willey et al. (1965:469-471), and by Willey (1972:125-127). Both of these reports indicate that barkbeaters are common throughout the Maya Lowlands, and that they are present from

Middle Formative times to the Late Classic Period.

ARTEFACT FORM: Peanut Stone or Pestle (Fig. 90f)

FREQUENCY: 1

MATERIAL: Shale

DATING: Late Formative (Late Xakal)

CONTEXT: Construction fill Str. B-4\11th

COMMENT: This artefact has a bilobed form, and is 2.0 to 3.2 cm in diameter and 6.0 cm in length. The larger of the two rounded ends displays use-wear and a light polish which suggest that it may have been used as a pestle. Peanut stones have been recovered in Formative and Classic period contexts at Barton Ramie (Willey et al. 1965:485-487), at Altar de Sacrificios (Willey 1972:139) and at Seibal (Willey 1978:95). They may also be similar to what Garber (1989:35) refers to as girdled stones at Cerros, but at this site he suggests that these Late Postclassic artefacts may have functioned as weights.

ARTEFACT FORM: Ground stone pendants (Fig. 90d,h)

FREQUENCY: 3

MATERIAL: Slate (2) and shale (1)

DATING: Late Formative (Early Xakal)

CONTEXT: Fig.90d, Construction Fill, Str. B-4\10th

1, Construction Fill, Str. A-1 Sub 2

Fig.90h, Construction Fill, Tolok Str. 1

COMMENT: These pendants are oval or hemispherical in form. They range between 2.3 and 5.0 cm in diameter. Two of the specimens have single suspension holes that are

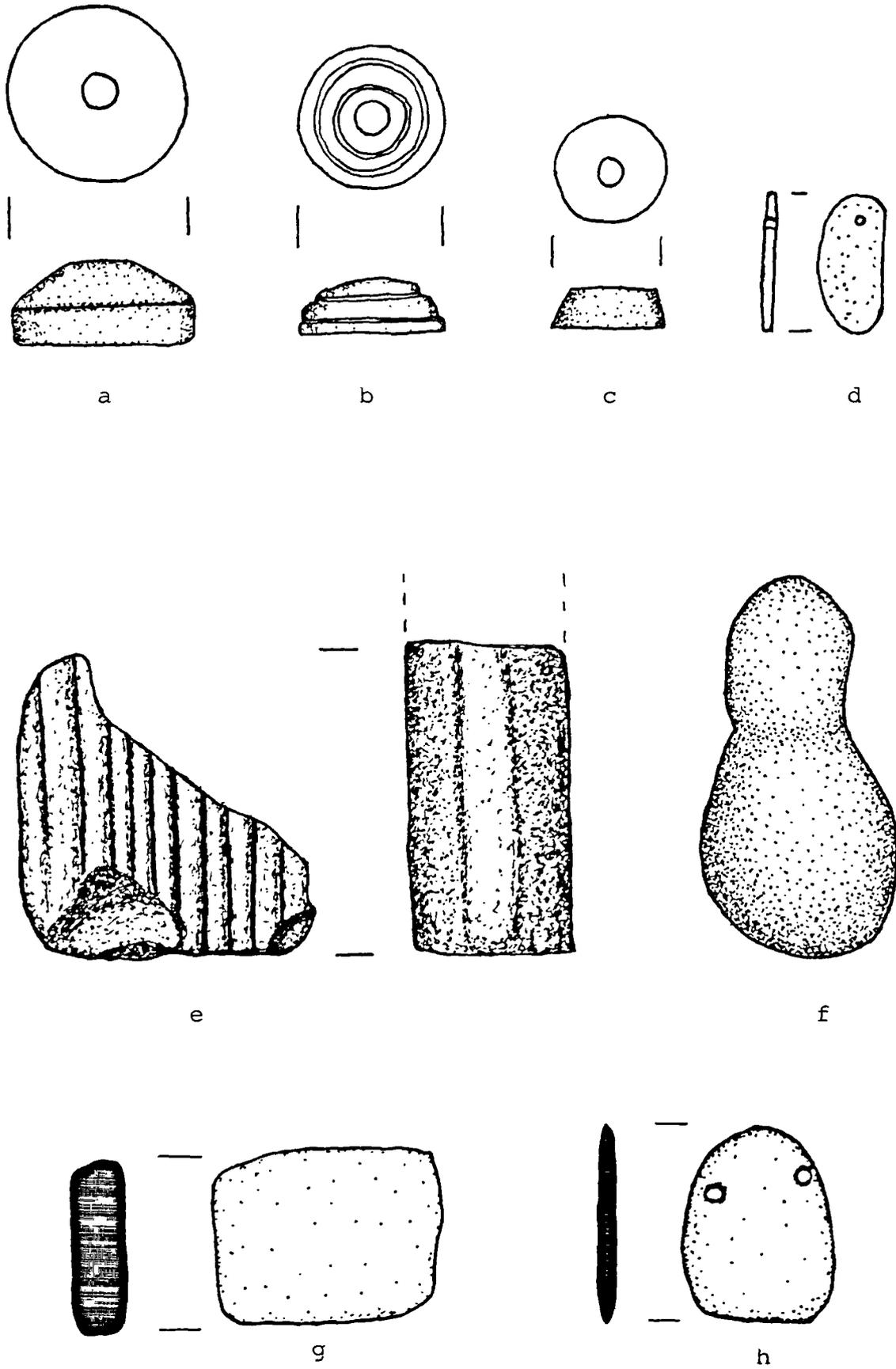


Figure 90: Ground stone artefacts (spindle whorls - a-c; slate pendants - d,h; bark beater - e; pestle - f; slate plaque - g)

uniconically and biconically drilled, and the third has a pair of uniconical perforations. Non-jadeite ground stone pendants are reported throughout the central Maya Lowlands and occur in Late Formative contexts at Cerros (Garber 1989:35), and in Classic period contexts at Barton Ramie and Altar de Sacrificios (see Willey 1972:150 for extensive comparisons).

ARTEFACT FORM: "Mirror" back (Fig. 91a,d)

FREQUENCY: 2

MATERIAL: Slate

DATING: Fig.91a, Late Middle Formative (Late Kanluk)

Fig.91d, Late Formative (Xakal)

CONTEXT: 1-Construction Fill, Str. B-4\8th

1-Construction Fill, Tolok Str. 1

COMMENT: The larger of the two mirror back fragments is 7.2 cm in diameter and 0.8 cm thick. The diameter of the second fragment is unknown, but it has an average thickness of 0.5 cm. A small section of the large fragment also retains the rusty residue left behind by the thin pyrite plaques which originally formed the front of the "mirror".

In his report of the artefacts at Altar de Sacrificios, Willey (1972:142-143) provides an extensive inter-site comparison of pyrite encrusted mirrors. He notes that although these artefacts may have not served as "looking glasses", they probably represent "valuable ceremonial objects". More recently, Schele and Miller (1983), and Garber (1989:92) have argued that mirrors were "important symbols of kingship" in Classic period Maya culture. Willey (1972:142-143) also reports that while they occur from Late Formative to Classic period times in the Highlands, they have only been found in Classic period contexts in the

Lowlands. While this chronological distribution may have been true two decades ago, the recent discovery of several mirrors in a Late Formative cache at Cerros (Garber 1989:93), plus the two Formative period specimens from Cahal Pech, indicate that these artefacts have a similar diachronic range in the Lowlands as they do in the Highlands.

ARTEFACT FORM: Slate Plaque

SUBFORM: Rectangular (Fig. 90g)

FREQUENCY: 1

MATERIAL: Slate

DATING: Early Middle Formative (Cunil)

CONTEXT: Cache 1, below the floor of Str. B-4\4th

COMMENT: This small rectangular slate plaque is 0.3 cm thick, 3.0 cm wide, and 3.4 cm long. It is made from gray-black coloured slate, and its edges are slightly battered and ground. The plaque was among a large and diverse number of artefacts which were found in a dedicatory or termination cache (Cache 1) below the floor of Str. B-4\4th. At Barton Ramie, Willey et al. (1965:489) described similar artefacts as "worked shale or slate sections". They also reported that these "thin stone slabs" were found "through Preclassic and Classic periods" (Willey et al. 1965:489). The Cahal Pech specimen may be the oldest positively dated slate object in the central Maya Lowlands (Healy et al. n.d.)

6.6 The Polished Stone Industry

This polished stone industry is comprised of all stone artefacts which were intentionally polished. The forms identified under this category include mosaic "mirror" fragments, beads,

adornos, spheres, and stone figurines. An unidentified category includes specimens whose original forms could not be determined. Both local and non-local raw materials were used in the production of these artefacts. The local rocks include limestone and shale, and the imported materials are represented by greenstones, pyrite (or specular hematite) crystals, and possibly magnetite.

ARTEFACT FORM: Mosaic Crystal or "mirror" fragments

SUBFORM: Polygonal Plaque (Fig. 91c)

FREQUENCY: 1

MATERIAL: Pyrite (or Specular hematite) crystal

DATING: Late Formative (Early Xakal)

CONTEXT: Construction fill below Plaza B Floor 3c

COMMENT: This small fragment of pyrite is only 0.15 cm thick, and has an estimated diameter of approximately 3.0 cm. Two straight sides along its edges indicate that it may have been originally polygonal in shape. The surface of the artefact is highly polished, while its rear side is grounded and smoothed. These polygonal pyrite crystals were commonly used to form the face of "mirrors", and are often found encrusted on "mirror" backs. Their geographical and chronological distribution parallels that of "mirror" backs, and as the comparisons of the latter indicate, they are rarely found in Formative period contexts in the Maya Lowlands.

ARTEFACT FORM: Bead

SUBFORM: Subspherical (Fig. 91e-f)

FREQUENCY: 2

MATERIAL: Limestone (1) and Greenstone (1)

DATING: Fig.91f, Early Middle Formative (Early Kanluk)

Fig.91e, Late Formative (Early Xakal)

CONTEXT: Fig.91f, Cache 3, Str. B-4 5th

Fig.91e, Construction fill below Plaza B Floor 3c

COMMENT: The small greenstone or jadeite bead has a bright apple green colour. It was found with a discoidal greenstone bead (Fig. 91k) and four marine shell discs just above the floor of the building platform which supported the raised B-4\5th structure. This context indicates that these artefacts were purposely deposited in this location, and prior to the construction of the subsequent B-4\6th platform. It further suggests that the bead, and associated artefacts, were used as part of a termination or dedicatory ritual. This practice has been recorded at several sites in northern Belize (see Buttles n.d.:37, Garber 1987:47-50, Hammond and Gerhardt 1991:228). Subspherical beads have also been recovered in Formative period contexts at several sites in the Peten (see Willey 1972:143-147 for an extensive comparative analysis). In general, however, greenstone beads are rare during Middle Formative times, but they do increase in frequency during the Late Preclassic (Willey 1972.143-147; Garber 1989:47-50; Hammond and Gerhardt 1991:228)

ARTEFACT FORM: Bead

SUBFORM: Discoidal (Fig. 91k)

FREQUENCY: 1

MATERIAL: Greenstone

DATING: Early Middle Formative (Early Kanluk)

CONTEXT: Cache 3, Str. B-4\5th

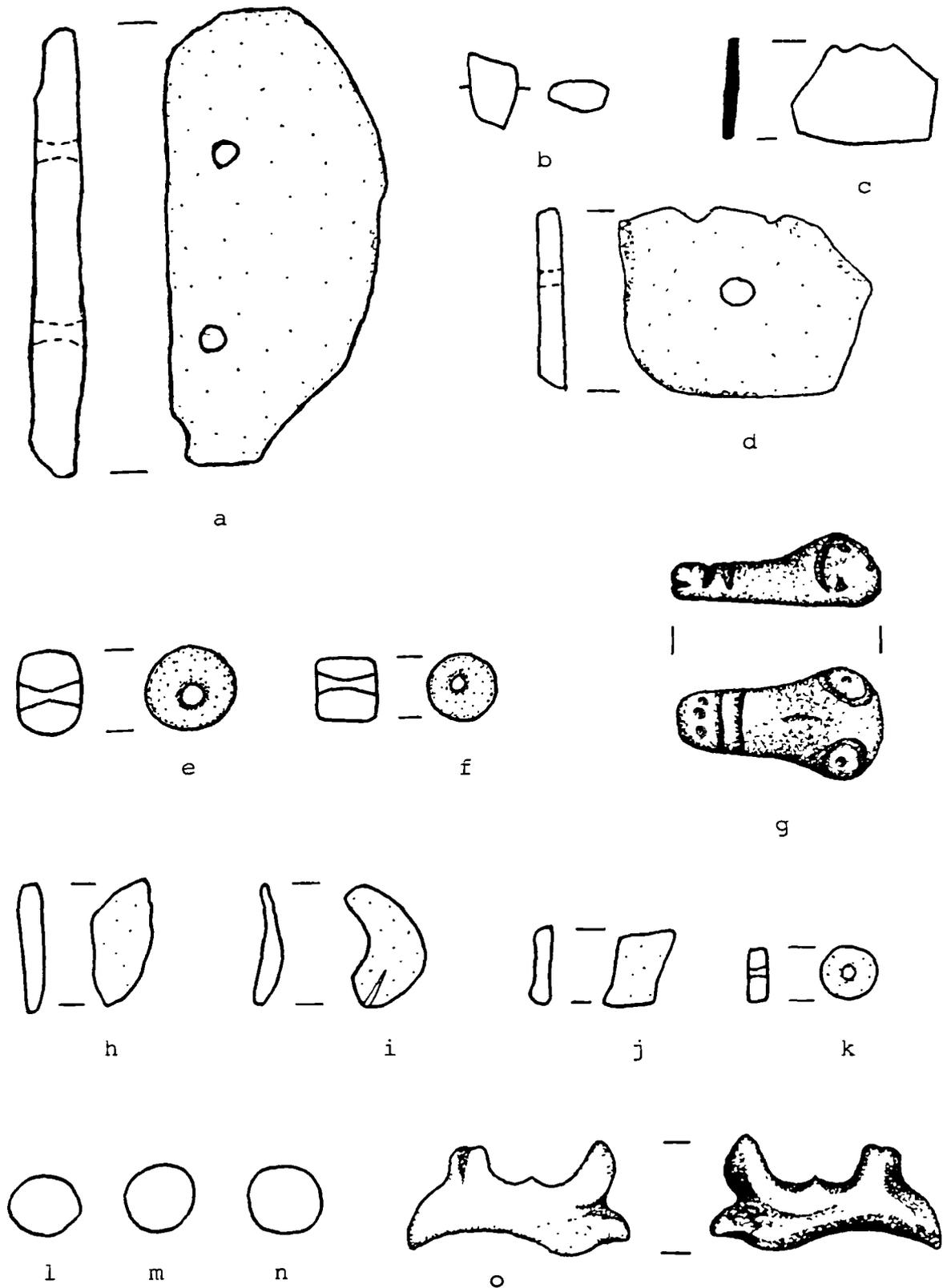


Figure 91: Ground stone and polished stone artefacts
 (slate plaques - a,e; magnetite - b; mosaic
 pyrite crystal - c; greenstone beads - e,f,k;
 slate figurine - g; greenstone mosaic fragments
 h-j,o; dolomitic limestone spheres - l-o)

COMMENT: This discoidal greenstone bead was found with a subspherical greenstone bead and four shell beads in Cache 3. It is 0.9 cm in diameter and 0.3 cm thick. Willey (1972:143-147) and Garber (1989:39-41) report that discoidal greenstone beads are ubiquitous in the Maya Lowlands, and that they have been recovered in Formative and Classic period contexts.

ARTEFACT FORM: Adornos or Mosaics (Fig. 91h-j, o)

FREQUENCY: 4

MATERIAL: Greenstone or Jadeite

DATING: Fig.91i-j & o, Early Middle Formative (Cunil)

Fig.91h, Late Formative (Late Xakal)

CONTEXT: Fig.91i-j & o, Cache 1, Str. B-4\4th

Fig.91h, Construction Fill, Str. B-4\11th

COMMENT: Figure 91i-j and 91o are part of a large dedicatory or termination cache (Cache 1) which was discovered below the floor of Str. B-4\4th. The colour of these artefacts range from apple green to light green. The faces of the three greenstones are highly polished, and the rear sides are ground and smoothed. Differences between the two surfaces of the artefacts indicate that they were fragments of a mosaic whose parts were attached, perhaps glued, to a background made from perishable material. The fourth mosaic fragment, recovered within the construction fill of B-4\11th, is also polished on one face and smoothed on the other. It has a light green colour, and is 0.35 cm thick.

The form of Fig. 91o is reminiscent of a stylized "flaming brow" (see Coe 1965:Fig. 43a). This modal similarity does not necessarily indicate that the piece originated in the Gulf Coast,

but it does imply that the artefact's morphology may be of apparent Olmec inspiration.

Along with the "jadeite bloodletter" and a few small adornos from Real contexts at Seibal (Willey 1978:97-99), plus small "jade artifacts" from Colha (Potter 1982:118-119), the three greenstone adornos from Cache 1 at Cahal Pech represent the earliest "jadeite" artefacts in the central Maya Lowlands. Other Formative period greenstone artefacts have been reported at Barton Ramie (Willey et al. 1965:482-483), Cerros (Garber 1989:37-50), Colha (Buttles n.d.:27-37), and Cuello (see Hammond 1991:199-203), but these generally range between Late Middle and Late Formative in date. Willey et al. (1965:483) also reported two Late Formative, jadeite shell effigies from Barton Ramie which bear close resemblance to artefacts from the Olmec area.

ARTEFACT FORM: Spheres (Fig. 91l-n)

FREQUENCY: 3

MATERIAL: Dolomitic limestone or Chert

DATING: Fig.91l, Early Middle Formative (Cunil)

Fig.91m-n, Late Middle Formative (Late Kanluk)

CONTEXT: Fig.91l, Cache 1, below the floor of Str. B-4\4th

Fig.91m, Cache 3, below the floor of Str. B-4\5th

Fig.91n, Construction Fill, Str. B-4\8th

COMMENT: These small unperforated stone spheres have an average diameter of 1.1 cm. They are pinkish red in colour and are smoothed and lightly polished. Two of the specimens were associated with Cache 1 and Cache 3 respectively. The third sphere was recovered within the construction fill of Str. B-4\8th.

At Barton Ramie, Willey et al. (1965:487-488) reported two similar artefacts under their "small unperforated hemispheres" category. Both of the Barton Ramie specimens were of white limestone and were discovered in burials of Jenney Creek and Barton Creek (Early and Late Middle Formative) date. Small spheres have also been reported at Piedras Negras (Coe 1959:39, Fig.43d-f), and at Uaxactun (Ricketson and Ricketson 1937:191, Fig.122, Plate 62d; Kidder 1947:39, Fig.21). Willey et al. (1965:487) noted that while their function was "problematical", they probably represented unfinished whorls or "ornaments of some kind". In my opinion the shape and small size of these stone spheres makes it doubtful that these artefacts could have served as whorls. On the contrary, their form is very similar to the small rattles which are sometimes found in whistles, and in the hollow legs of some Classic period dishes.

ARTEFACT FORM: Figurine (Fig. 91g)

SUBFORM: Zoomorphic

FREQUENCY: 1

MATERIAL: Slate or Shale

DATING: Late Middle Formative (Late Kanluk)

CONTEXT: Construction Fill, Str. B-4\8th

COMMENT: This zoomorphic stone figurine is 3.2 cm long and has an average thickness of 1.0 cm. It is dark grey to black in colour, it is lightly polished on its upper surface, and is smoothed at its base. The form of the artefact closely resembles that of a crocodile head. Facial features such as eyes, nostrils, and mouth, are depicted by shallow drilled impressions, and by narrow incised lines.

Although crocodile effigies have been reported among ceramic figurines at Altar de Sacrificios (Willey 1972:15-16, Fig. 7c), no similar polished stone artefacts were noted in the comparative area. Willey et al. (1965:489) also report fragments of "worked shale or slate sections" from Formative to Late Classic contexts at Barton Ramie, but none of these artefacts were formed into zoomorphic or anthropomorphic effigies.

ARTEFACT FORM: Unidentified (Fig. 91b)

FREQUENCY: 1

MATERIAL: Magnetite ?

DATING: Late Middle Formative (Late Kanluk)

CONTEXT: Construction Fill, Str. B-4\7th

COMMENT: This small artefact is 1.1 cm long, 0.7 cm wide and 0.5 cm thick. Its colour ranges from dark grey to black, and it is highly polished on its outer surface. When placed next to metallic objects it reacts, like magnets, by adhering to the object. No parallels to this artefact was found in the comparative area.

6.7 The Chipped Stone Industry

The chipped stone industry from Cahal Pech is the subject of a separate study by University of Toronto student W. James Stemp. During the analysis of these artefacts, Stemp (1991, 1992) and the author recorded more than 1000 specimens in the Formative period assemblage. This collection represents both the products and byproducts of the industry.

The raw materials used to produce the chipped stone artefacts consist of chert,

chalcedony, and obsidian. The latter is an exotic rock which had to be imported from the volcanic highlands. The former are available throughout the site's sustaining area, with major outcrops occurring just northeast of the confluence of the Macal and Mopan Rivers. The chert and chalcedony also have a wide range in colour; from white, grey, and brown, to honey coloured and deep purple. The obsidian was predominantly banded black and grey.

Chert Tools:

Like Cuello (see McSwain and Johnson 1991:160-173), the number of formal tool types is limited in the Cahal Pech assemblage. Within the chert/chalcedony artefact category they include stemmed macroblades, blades, burins, and standard bifaces such as celts, adzes, and tranchet bit tools (Fig. 92). These implements appear to have been the products of a standardized reduction sequence and are represented by both unifacially and bifacially chipped tools. Informal chert implements, produced by non-standardized reduction techniques, consist of hammerstones, flake tools, and scrapers. Together with small amounts of debitage, the informal tools make up the largest percentage (68%) of Formative period chert artefacts at the site.

The chert tools of the early and late Middle Formative period are characterised by a limited number of forms, but these generally display a developed level of workmanship. The modal types represented include unifacially flaked macro blades, burins, tranchet bit tools or adzes, hammerstones, and retouched flakes (Fig. 92). The latter, in a variety of subforms, is the predominant tool type recovered in early Middle Formative contexts. They also occur throughout the sequence, but formal tool types increase in relative frequency during the late Middle and Late Formative periods.

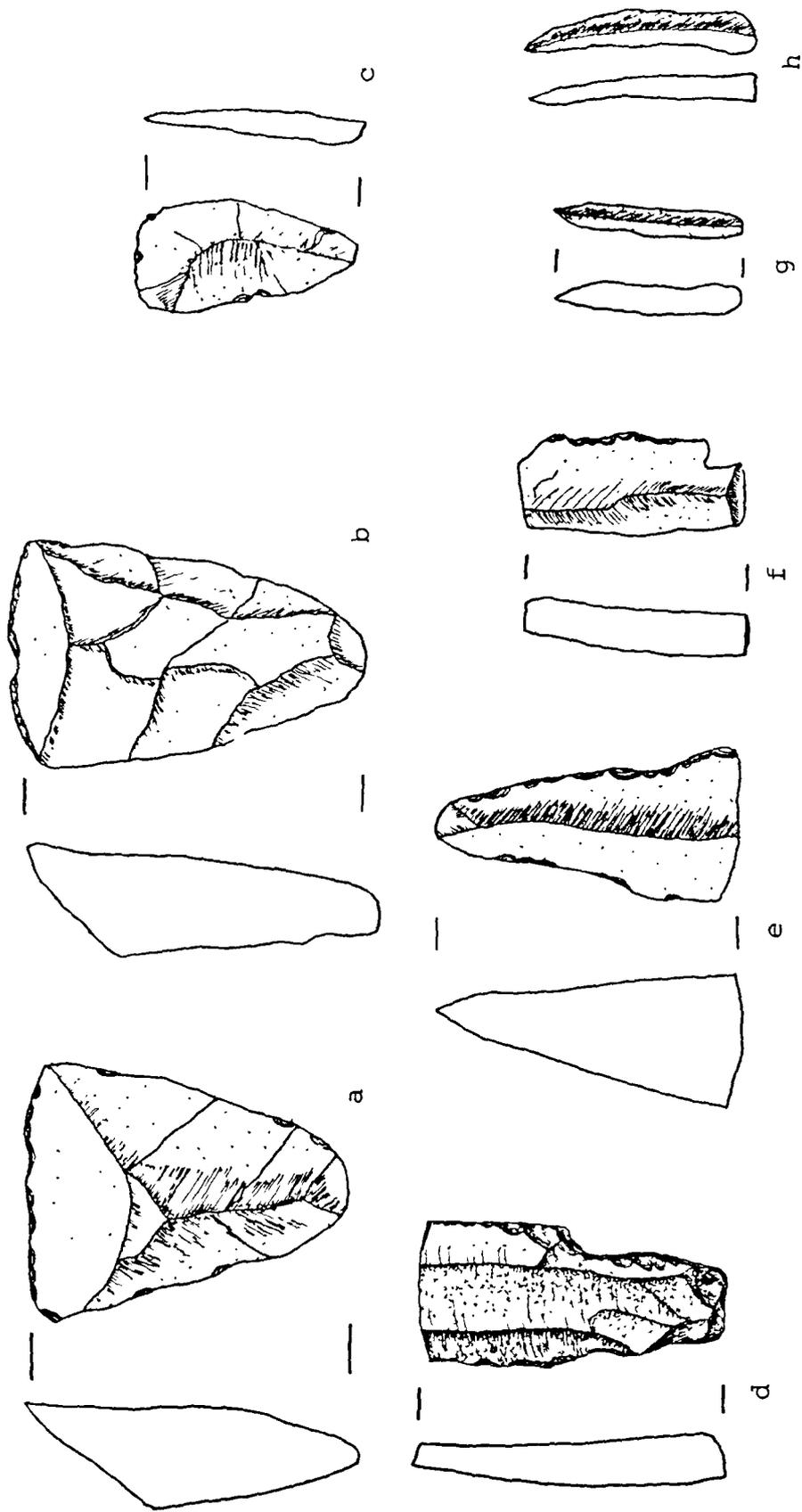


Figure 92: Chipped stone artefacts (tranchet bit tools - a-d; adze - c; large macroblades - d-f; burrins - g-h) (65% actual size)

The Late Formative assemblage differs little from that of the preceding period. Large oval bifaces, burins, hammerstones, and adzes continue to be produced, and flake tools remain a very common form in domestic contexts. The major distinction among the Late Formative collection is the appearance of large stemmed macroblades (Fig. 92d-f). These large blades are represented by both unifacially and bifacially flaked specimens. The Late Formative introduction of these stemmed macroblades at Cahal Pech reflects the same pattern noted at Colha. Hester (1982:47) reports that a similar distribution has been recorded at most sites in the Maya Lowlands.

Obsidian Tools:

Tools produced from obsidian are represented by two types: prismatic blades and flakes. Although flakes occur throughout the Formative sequence, they are the only obsidian tool type present during the Cunil phase. The early Middle Formative, Cunil (1000-850 B.C.) flake tools appear to have been manufactured from what Clark and Lee (1984:236) refer to as "spall cores". According to Clark (1981:273),

The term spall refers to large flakes, large flake fragments, and chunks. "Spall" is used in preference to these other terms to avoid the confusion such as would arise from describing flakes removed from larger flakes".

The 28 Cunil phase flakes (Fig. 93) range from 1.5 to 3.0 cm in length, and 0.8 to 2.5 cm in width. A few specimens contain small sections with cortex and the entire assemblage exhibits a wide variation in form. These characteristics suggest that the flake tools were produced by a technology based on hard-hammer percussion. In this technique "Percussion blows were struck directly into the obsidian mass at a 90 degree angle to the spall surface" (Clark and Lee 1984:237). Since this mode of production requires little skill, Clark (1981:280) argues that it represents a "nonspecialized domestic industry conceivably within

the cultural repertoire of the common man".

Prismatic blades (Fig. 94) first appear in the Cahal Pech assemblage during the late Kanluk phase (650-350 B.C.), and they remain the predominant type of obsidian artefact throughout subsequent phases. The bladelets are either trapezoid or trianguloid in cross section. They range from 0.7 to 1.2 cm in width, and complete specimens from a Xacal phase burial in the Cas Pek Group (Fig. 94g) are between 6.0 and 8.0 cm in length.

The flake to bladelet developmental sequence of obsidian tools at Cahal Pech has never been explicitly documented in the Formative period assemblages of other sites in the Maya Lowlands. This is interesting for at Seibal, Willey (1978:131) noted that bladelets were recovered from the late Middle Formative Escoba phase "through the Late Classic, with the preponderance of occurrences in the Late Classic phases". Conversely, flakes were present from the early Middle Formative, Real Xe phase (Willey 1978:134). At Altar de Sacrificios, Willey (1972:214-218) again reports that "...use-nicked Flakes come from all parts of the site and range in time from Xe through Boca Jimba". On the contrary, only one "Use-Nicked" blade fragment was recovered in Xe contexts, and most were found in San Felix (late Middle Formative) and later deposits.

The absence of blades in the first half of the early Middle Formative period in the Maya Lowlands has also been observed at Pacbitun. According to Healy (personal communication), the earliest obsidian from that site dates to the early facet of the Mai complex (900-600 B.C.), and is represented by a flake which is similar in form to the Cahal Pech specimens. Blades subsequently occur in late Middle and Late Formative deposits. A similar infrequency of

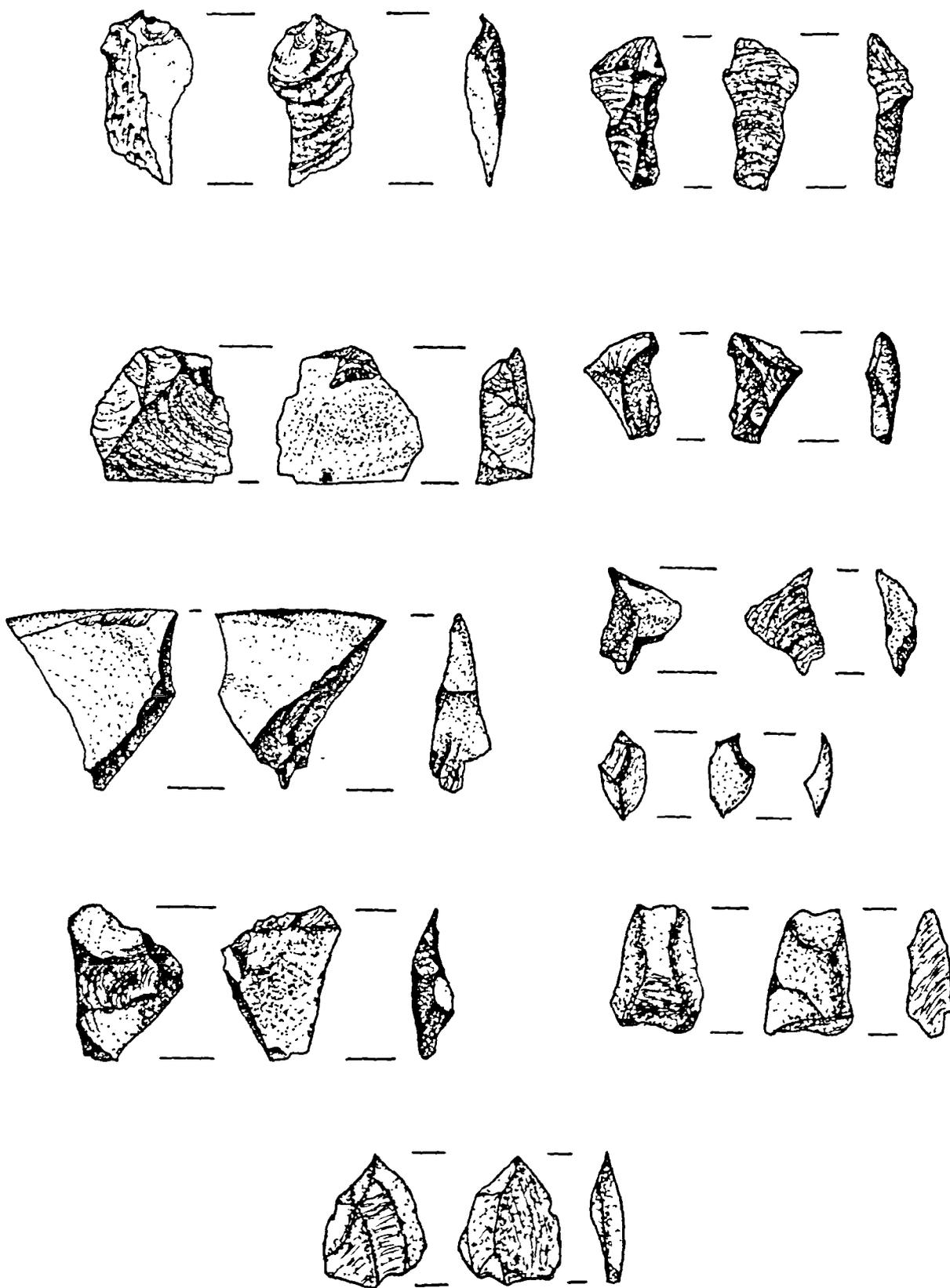


Figure 93: Representative sample of obsidian flakes

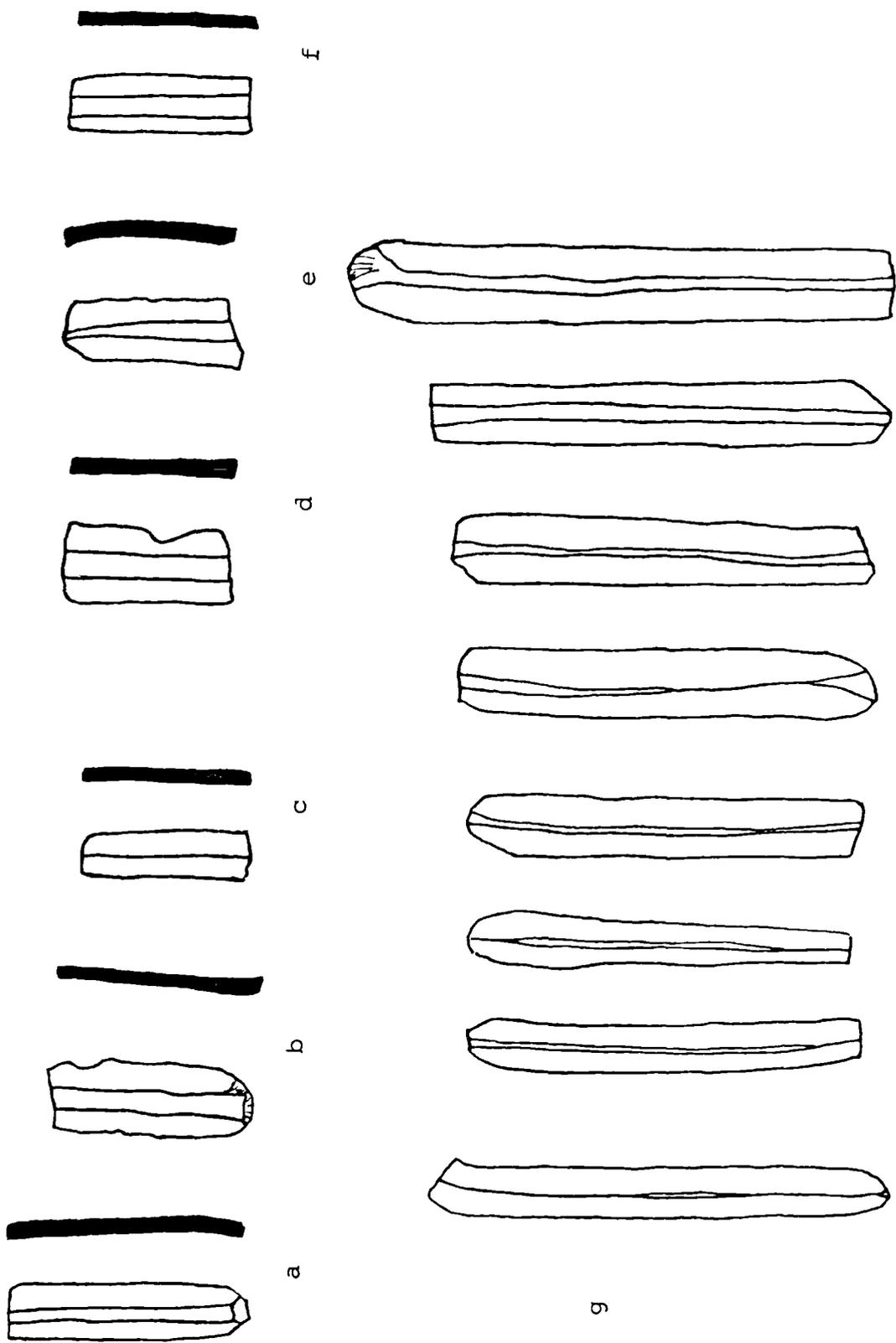


Figure 94: Obsidian prismatic blades

blades in early deposits was noted at Barton Ramie. At the latter site, Willey et al. (1965:444-445) report that "There are no occurrences of these bladelets in pure Jenney Creek refuse", but they were present during the late Middle Formative Barton Creek phase. In their comparison of prismatic blades, Willey et al. (1965:445) further noted that blades are rare in late Middle and Late Formative contexts at Uaxactun and Tikal, and that they primarily occur in Classic period contexts at Xunantunich, Holmul, San Jose, and Piedras Negras. Citing Longyear's work at Copan, they (Willey et al. 1965:444) also report that at that site "miscellaneous obsidian scrap", or flakes, were found "more frequently in the Archaic (Preclassic Period) levels, cores and blades struck from cores were more abundant in the Classic Period debris".

In a recent article which focuses on the procurement of obsidian in the central Peten lakes region of Guatemala, Rice (1984) reported on the discovery of 826 pieces of obsidian. This collection included a wide range of forms, and dated from the early Middle Formative Eb phase (ca. 800-600 B.C.) to the Postclassic period. The Formative period assemblage consisted of 97 artefacts, of which at least 63 were Middle Preclassic in date. Within this collection, Rice et al. (1985:595-596) report that one blade, two bladelet fragments and two exhausted core fragments were from Eb (800-600 B.C.) contexts. They also refer to 21 "flakes or small chunks of obsidian recovered from Preclassic fill contexts" (Rice et al. 1985:596), but there is no clear indication of the total number of flakes or bladelets recovered from Eb deposits. The reports by P. Rice and her colleagues, nevertheless, suggest that an obsidian blade technology was in use between ca. 800-600 B.C. in the Peten. Since these dates are equivalent to the early Kanluk phase at Cahal Pech, the Peten data does not negate the possibility that the earliest obsidian tool technology in the Maya Lowlands may have

relied primarily on flake tools.

The Formative period assemblage of 44 blades and four flakes (calculated from Table 8.6 in Hammond 1991:171) from Cuello is difficult to use in this comparative analysis due to inconsistencies in the reports. McSwain and Johnson's (1991:169-173) chapter on the obsidian artefacts from Cuello, for example, state that "The earliest obsidian comes from late in the Bladen phase (IIIA): one of the two early pieces is retouched and incised (Fig. 8.13 SF 1899)". In the same section they note that,

One context (Q3033) yielded 24 Swasey/Bladen phase sherds and two obsidian blades while another (Q3032) yielded a single blade of Bladen date. These, with SF 1899, represent the earliest documented obsidian from the Maya Lowlands so far reported (McSwain and Johnson 1991:170).

In their summary, they reiterate that "...obsidian blades were being used in limited numbers during the early Middle Formative, Bladen phase" (McSwain and Johnson 1991:178). Unfortunately, these published contexts do not correlate with Table 8.6 which records three obsidian blades occurring in the Swasey phase, and none present during Bladen times. Their (McSwain and Johnson 1991:169) statement that "The earliest obsidian comes from late in the Bladen phase (IIIA)" is also corroborated by Hammond, Clark and Robin (1991), but at the same time contradicted by Hammond (1991c). In the first article Hammond, Clark and Robin (1991:362) report that "Imports also included jade and obsidian, although neither came from contexts earlier than the Bladen/Lopez transition around 600 B.C.". In the subsequent article Hammond (1991c:197) claims that, "a Bladen phase III specimen from the Rio Pixcaya source (SF1899) is the earliest stratified obsidian in the Maya Lowlands to date...". Since Bladen phase III dates between ca. 900-750 B.C., and phase IIIA to ca. 750-600 B.C., these chronological inconsistencies, particularly the date of specimen SF 1899, make it difficult to accurately determine when blade technology first appears at Cuello. I do suspect, however,

that the later date is accurate, and that blade technology is a late Middle Formative development at Cuello.

In 1988 Dreiss reported on her extensive technological and distributional study of obsidian artefacts from Colha. Of the 2688 specimens which she analyzed, 16 were from Middle Preclassic contexts, 63 from Late Preclassic deposits, and the remainder were Classic or Postclassic in date (Dreiss 1988, Table 16). In her classification of this assemblage, Dreiss (1988:4-26) divided the artefacts into 10 categories. Several of these represented subforms of blades, and two represented subforms of flakes. There is, however, an incomplete tabulation of the diachronic frequency of all the forms and subforms, and since there is no subdivision of the Middle Formative period (i.e. early and late facets) in her study, it is impossible to determine temporal changes in early obsidian technology at that site.

A developmental sequence from flakes to blades has, however, been recorded in Chiapas and on the Pacific coast of Guatemala. Coe and Flannery (1967:63) and Clark and Lee (1984) report that at Salinas La Blanca and in Chiapas respectively, the Early Formative obsidian assemblages consisted of a flake technology which was produced by direct hard-hammer percussion. At both sites bladelets did not occur until Middle Formative times. Recent investigations by Jackson and Love (1991) has reinforced this regional developmental sequence. In a report on obsidian from La Blanca, Guatemala, they note that prismatic blades first appeared at the site "at the beginning of the Middle Preclassic, ca. 900 B.C." (Jackson and Love 1991:47). They further suggest that blades were initially "imported in finished form and supplemented an existing technology based on hard-hammer percussion" (Jackson and Love 1991:47).

Why then does the Cahal Pech assemblage reflect the developmental sequence observed on the Pacific Coast? Could it be that the obsidian flakes from Cunil contexts at Cahal Pech predate the obsidian artefacts from other lowland Maya sites, or is it because other regional reports have not explicitly recorded diachronic changes in the forms of obsidian artefacts? I suspect that the latter may be true for as indicated above, the Seibal, Altar de Sacrificios, Copan, and Pacbitun assemblages all suggest that obsidian bladelets are either absent or rare during the first half of the early Middle Formative period, and that they only increase in frequency during late Middle and Late Formative phases. Hopefully, future studies will provide a larger data base that will allow more accurate recognition of the development of obsidian tool technology in the Maya Lowlands. Only then will researchers be able to test the validity of the flake to bladelet sequence proposed for Cahal Pech, and previously noted in the Pacific coast of Guatemala and Chiapas.

Trace Element Analysis of Formative Period Obsidian:

Thirteen of the 38 Preclassic obsidian artefacts recovered in Str. B-4 were submitted for source analysis. Only specimens from Str. B-4 were selected because this mound had produced the longest stratified sequence of Formative period occupation at the site. Since we had radiocarbon dates for four of the 12 construction phases in the structure, it was felt that these artefacts would provide a more accurate picture of diachronic changes in the sources of this raw material.

Eight of the obsidian samples submitted for sourcing analysis were from early Middle Formative, Cunil contexts, two from late Middle Formative, Kanluk context, and three came from Late Formative Xakal deposits. The analysis was conducted with a Spectrace 5000

energy dispersive X-ray fluorescence system, and the samples were analyzed for nine elements (see Appendix 2). Results of the source analysis are presented in Table 5 and Appendix 2. They demonstrate that the eight early Middle Formative samples originated from the El Chayal outcrop, that the two late Middle Formative samples came from San Martin Jilotepeque (also known as Rio Pixcaya), and one of the three Late Formative specimens was from El Chayal, and the other two from San Martin Jilotepeque.

The El Chayal source of the eight early Middle Formative obsidian samples from Cahal Pech is of particular interest for it differs from the pattern observed by other studies in the Maya Lowlands. Previous trace element analyses of obsidian from several sites in Belize (cf. Dreiss 1988:60-79, Table 21) and the Peten (Nelson, Sidrys and Holmes 1978:153-161; Rice 1984; Rice et al. 1985) for example, suggest that the San Martin Jilotepeque (Rio Pixcaya) source was the primary supplier of obsidian to the lowlands during the Middle Formative period.

While the Cahal Pech data is therefore anomalous, it is important to note that it is not unique. This is evident from the sourcing results of four Middle Formative obsidians from Kichpanha in northern Belize. Two of these specimens originated from Ixtepeque, one came from San Martin Jilotepeque, and the fourth was sourced to the El Chayal quarry (Dreiss 1988:129, Appendix C). In the Peten, Nelson, Sidrys and Holmes (1978:160; Figure 160) also report that three out of 27 Middle Formative samples from Seibal originated from El Chayal, and Rice et al. (1985: Table 7) found that out of 63 Middle Preclassic specimens from the lakes region, 47 were from San Martin Jilotepeque, 11 from El Chayal, three from Ixtepeque, and two came from an unidentified source. The only other reported cases where

OBSIDIAN SAMPLES FROM STR. B-4 SUBMITTED FOR SOURCING

LEVEL 3.....3 SAMPLES
 LEVEL 7.....2 SAMPLES
 LEVEL 9.....1 SAMPLE
 LEVEL 11.....6 SAMPLES
 LEVEL 13.....1 SAMPLE

TOTAL # OF SAMPLES = 13

RELATIVE DATE	CONTEXT	# OF SAMPLES RECOVERED	# OF SAMPLES SOURCED	GEOLOGIC SOURCE
EARLY MIDDLE FORMATIVE 1000-850 B.C.	Str. B-4, Unit 5 Constr. Phase 1	1	1	El Chayal
EARLY MIDDLE FORMATIVE 1000-850 B.C.	Str. B-4, Unit 4 Constr. Phase 3	27	6	El Chayal
EARLY MIDDLE FORMATIVE 850-650 B.C.	Str. B-4, Unit 4 Constr. Phase 6	1	1	El Chayal
LATE MIDDLE FORMATIVE 650-350 B.C.	Str. B-4, Unit 4 Constr. Phase 8	3	2	San Martin Jilotepeque
LATE FORMATIVE 350 B.C.-A.D. 250	Str. B-4, Unit 4 Constr. Phase 11	6	3	2 -San Martin Jilotepeque 1 -El Chayal

TABLE 5: Geological Sources and Archaeological Contexts of Formative Period Obsidian from Str. B-4, Cahal Pech.

El Chayal obsidian outnumbers those from San Martin Jilotepeque in Early and Middle Formative deposits at San Lorenzo in the Olmec subarea (Hester, Heizer, and Jack 1971), and in the Pacific coast of Guatemala and Chiapas (Nelson and Voorhies 1980; Clark and Lee 1984; and Jackson and Love 1991).

The data from Cahal Pech, and that from Kichpanha, Seibal and the Peten lakes region, therefore suggest that obsidian trade in the Middle Formative period may have been as complex and diverse as it subsequently was in the Classic period (cf. Healy, McKillop, and Walsh 1984). It also demonstrates that unless we improve our classification of obsidian artefacts and pay closer attention to their stratigraphic context, it will always be difficult to trace the development of obsidian tool technology in the central Maya Lowlands.

6.8 The Worked Shell Industry

Forty-four worked shell artefacts were recovered from Formative period contexts at Cahal Pech. This assemblage, however, does not include the more than 2000 "jute" (*Pachychilus indiorum* and *Pachychilus glaphyrus*), *Pomacea flagellata* and fresh water mussel (*Nephronais ortmanni*) shells which demonstrate evidence of alteration for consumption, or the large quantity of marine shell fragments which were not used for the production of artefacts.

The worked shell assemblage is represented by three major forms: disk beads, tinkler pendants, and irregular-shaped beads. Whenever possible, the genus and species of the shells used for the production of each modal variety is provided under the subheading "material". The entire collection is of Caribbean origin, and *Strombus* was the most common species

represented in all subphases of the Formative period. Identification of the shells were made by Norbert Stanchley from the University of Toronto.

ARTEFACT FORM: Beads

SUBFORM: Disk (Fig. 95a-b,d; Fig. 96a-d, g)

FREQUENCY: 34

MATERIAL: Shell (*Strombus*, *Spondylus*, *Ostrea*, *Jeneria*)

DATING: Early Middle to Late Formative (Cunil to Xakal)

CONTEXT: 18 specimens from Cache 1, Str. B-4\4th (Cunil)

9 specimens (Fig.95a) from Cache 2, Str. B-4\5th (early Kanluk)

3 specimens from Cache 3, Str B-4\5th (early Kanluk)

1 specimen from construction fill, Str. B-4\7th (late Kanluk)

1 specimen from construction fill, Str. B-4\8th (late Kanluk)

1 specimen from construction fill, Str. B-4\11th (Xakal)

1 specimen from Burial 2, Cas Pek Group (Xakal)

COMMENT: These disk beads range from 0.7 cm to 2.0 cm in diameter, and from 0.15 cm to 0.7 cm in thickness. They are either uniconically or biconically drilled, and some specimens display pitting on their surfaces. Like at Cahal Pech, Buttles (n.d.) reports that the majority of shell artefacts at Colha are of the disk subform, and that they occur from early Middle Formative to Postclassic times. A similar distribution was recorded at Cuello (Hammond 1991b:183-185). At Cerros, Garber (1989:64) notes that they are the most common subform during the Late Preclassic. They also occur in Formative to Classic period contexts at Barton Ramie (Willey et al. 1965:508-509) and at sites throughout the Maya Lowlands (see Willey 1972:223-224 for extensive comparisons).

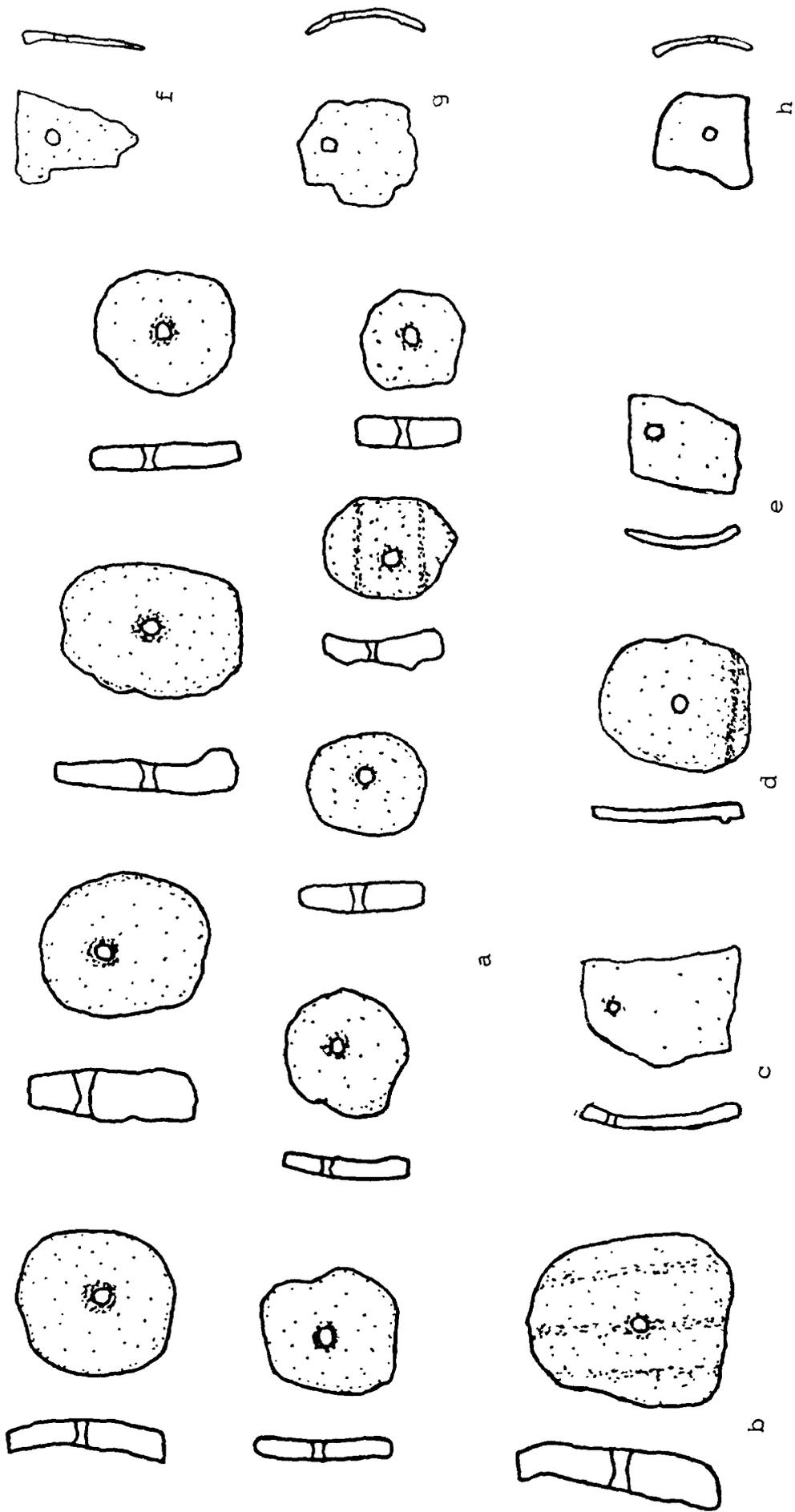


Figure 95: Shell pendants (disk - a-b,d; irregular-shaped - c,e-h)

ARTEFACT FORM: Beads

SUBFORM: Irregular-shaped (Fig. 95c, e-h)

FREQUENCY: 6

MATERIAL: Shell (*Strombus*, *Pomacea*, *Jeneria*)

DATING: Early Middle to Late Formative (Cunil to Xakal)

CONTEXT: 1 specimen from Cache 1, Str. B-4\4th

1 specimen from Cache 3, Str. B4\5th

And single specimens from construction fill in Str. B-4\7th, B-4 8th, B-4\10th, and B-4\11th.

COMMENT: These irregular-shaped beads may have originally been hemispherical in form. They are predominantly made from relatively thin shells, and all, but one, have central uniconical perforations. The anomalous specimen has two perforations along the edge of its rounded side. The average thickness of these beads is about 0.2 cm, and their diameter ranges between 1.4 and 4.0 cm. Comparative specimens have been discovered in Formative and Classic period contexts throughout the Maya area (see Willey 1972:223-224 and Garber 1989:61-67 for extensive comparisons).

ARTEFACT FORM: Pendants

SUBFORM: Tinkler (Fig. 96h-k)

FREQUENCY: 4

MATERIAL: Shell (*Olivella reticularis*)

DATING: Late Middle to Late Formative (Late Kanluk-Xakal)

CONTEXT: 3 specimens from Burial 2, Cas Pek Group

1 specimen from construction fill, Str. B-4\8th

COMMENT: The *Olivella* tinklers range from 2.0 to 4.0 cm in length. Two specimens have double perforations at their proximal and distal ends. One specimen has no perforations, and the fourth has two perforations and two incised lines at the larger end of the shell. Willey et al. (1965:508) report that "*Oliva* tinklers are a widespread Maya lowland as well as a Mesoamerican trait...", and that they have been found in Formative and Classic period contexts at most sites.

6.9 The Worked Bone Industry

Few worked bone artefacts were recovered in Formative period contexts at Cahal Pech. Within this category, four pendants, two pins and two needles were recorded. Three of the pendants were made from the scapulae of deer, peccary and dog, and the fourth was made from the tooth of the latter species. The bone used for the two pins were identified as possibly being from *Odocoileus virginianus*, commonly known as the white-tailed deer. Due to the substantial reduction of bone for the production of the needles, neither the species or genus of these bones could be determined. The toothless mandible of a crocodile (Fig. 97e) was also found in Cunil contexts. Although this ecofact does not appear to have been modified, it has been suggested (Stocker, Meltzoff and Armsey 1980) that crocodile mandibles were used in early rituals.

ARTEFACT FORM: Pendant

SUBFORM: Scapula (Fig. 97a-c)

FREQUENCY: 3

MATERIAL: Fig.97a, Scapula of *Canis familiaris* (dog)

Fig.97b, Scapula of *Tayassu* sp. (peccary)

Fig. 97c, Scapula of *Odocoileus virginianus* (deer)

DATING: Early Middle Formative (Cunil)

CONTEXT: Fig. 97b-Cache 3, Str. B-4\5th

Fig. 97a,c-Cache 1, Str. B-4\4th.

COMMENT: These artefacts were produced from the lateral portion of dog, peccary and deer scapulae. All three elements consistently show the same modification: a hole drilled in the body of the scapula adjacent to the spine. Although it is difficult to determine the exact function of these artefacts, they may have been used as pendants, amulets, or as part of a shaman's outfit. No parallels were found of these artefacts in the comparative area, but Willey et al. (1965:49-503) and Willey (1972:229-242) report that artefacts made from dog and deer bones have a wide diachronic and geographical distribution in the Maya area.

ARTEFACT FORM: Pendant

SUBFORM: Tooth (Fig. 97d)

FREQUENCY: 1

MATERIAL: Canine of *Canis familiaris*

DATING: Early Middle Formative (Cunil)

CONTEXT: Cache 1, Str. B-4 4th

COMMENT: This small dog tooth pendant is 3.3 cm long and has a biconically drilled hole through the root tip. It was found with various other artefacts in a Cunil phase dedicatory/termination cache (Cache 1) below the floor of the Str. B-4 4th platform. Perforated animal teeth pendants have been recovered in Classic and Formative period contexts at Barton Ramie (Willey et al. 1965:502), Altar de Sacrificios (Willey 1972:239,

Fig.201a-d), Cerros (Garber 1989:53, Fig.17c-g), and several other sites in the Maya area (see Willey 1972:239 for regional comparisons).

ARTEFACT FORM: Pins (Fig. 96l-m)

FREQUENCY: 2

MATERIAL: Probably ulna of deer (*Odocoileus virginianus*)

DATING: Late Formative (Xakal)

CONTEXT: Burial 2, Cas Pek Group

COMMENT: The two pins are 15 cm and 24 cm long respectively. They both have what Willey (1972:235-236) refers to as expanded heads. The distal pointed ends of both specimens are smooth and exhibit use polish. For extensive areal comparisons of these artefacts one should refer to Willey et al. (1965:500-502) Barton Ramie report, and to Willey's (1972:235-236) monograph on the artefacts from Altar de Sacrificios. The chronological distribution of these hairpins in the Maya area ranges from the Formative to the Classic period.

ARTEFACT FORM: Needles (Fig. 96e-f)

FREQUENCY: 2

MATERIAL: Unidentified animal bone

DATING: Late Formative (Xacal)

CONTEXT: Burial 2, Cas Pek Group

COMMENT: The two needles are 6.0 cm in length and average about 0.3 cm in diameter. They exhibit use polish, have cylindrical cross-sections, and are pointed at one end. Both specimens are also broken at the position of the eye slit. Willey et al. (1965:500) and Willey

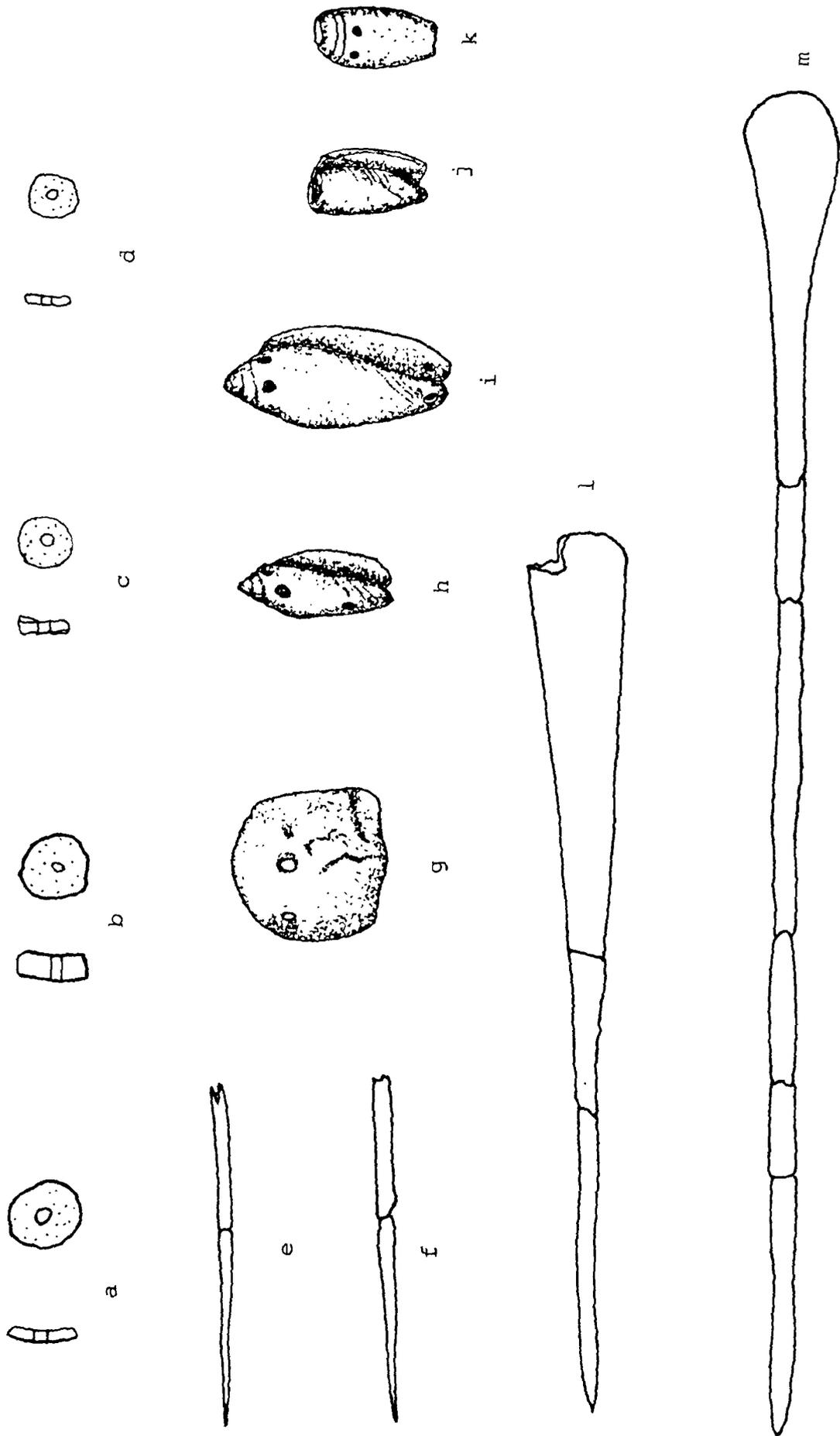


Figure 96: Modified shell and bone artefacts (a-d, g-k - shell; e-f - bone needles; f, l - bone pins)

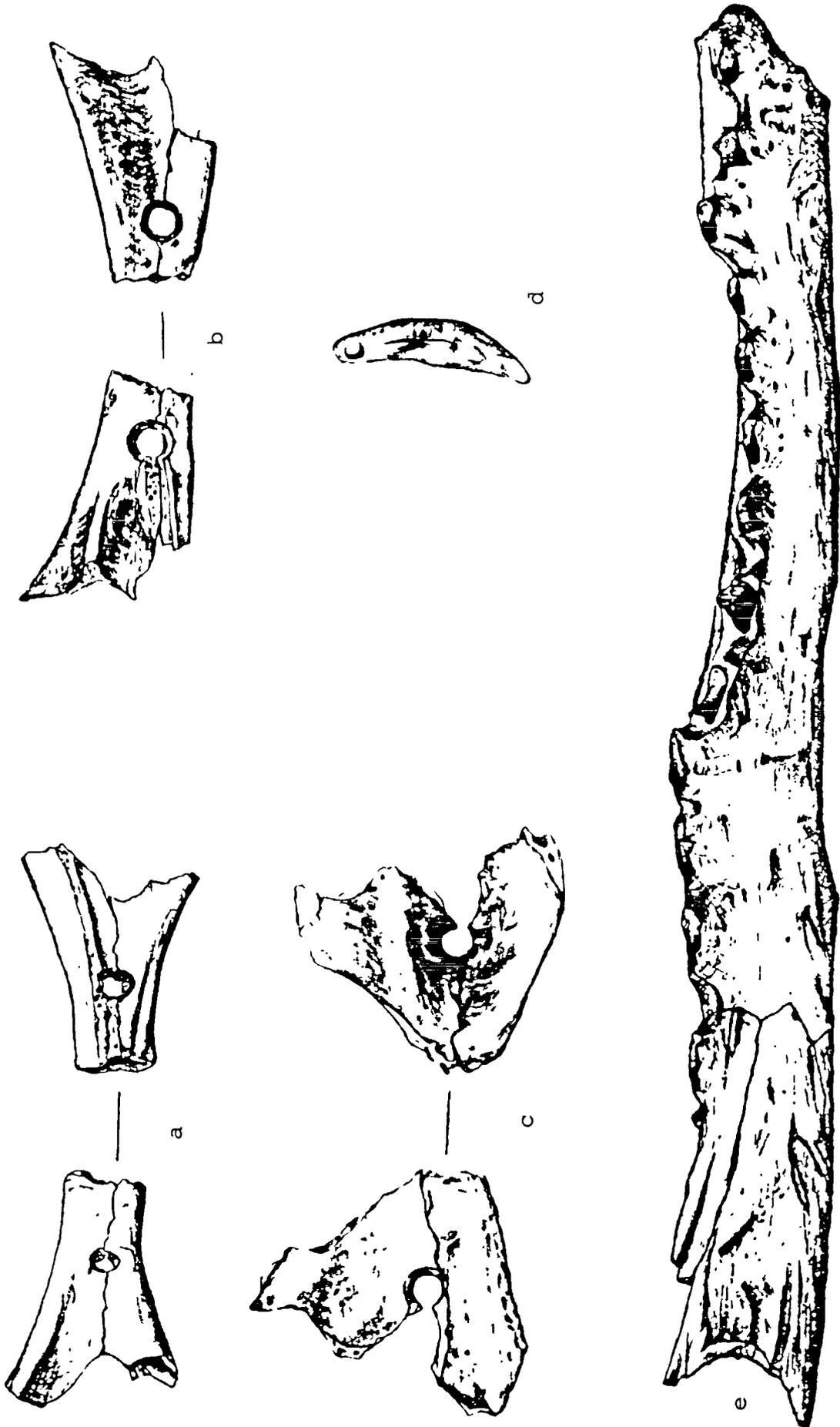


Figure 97: Modified animal remains and Crocodile mandible (Fig. 97c is 85% actual size)

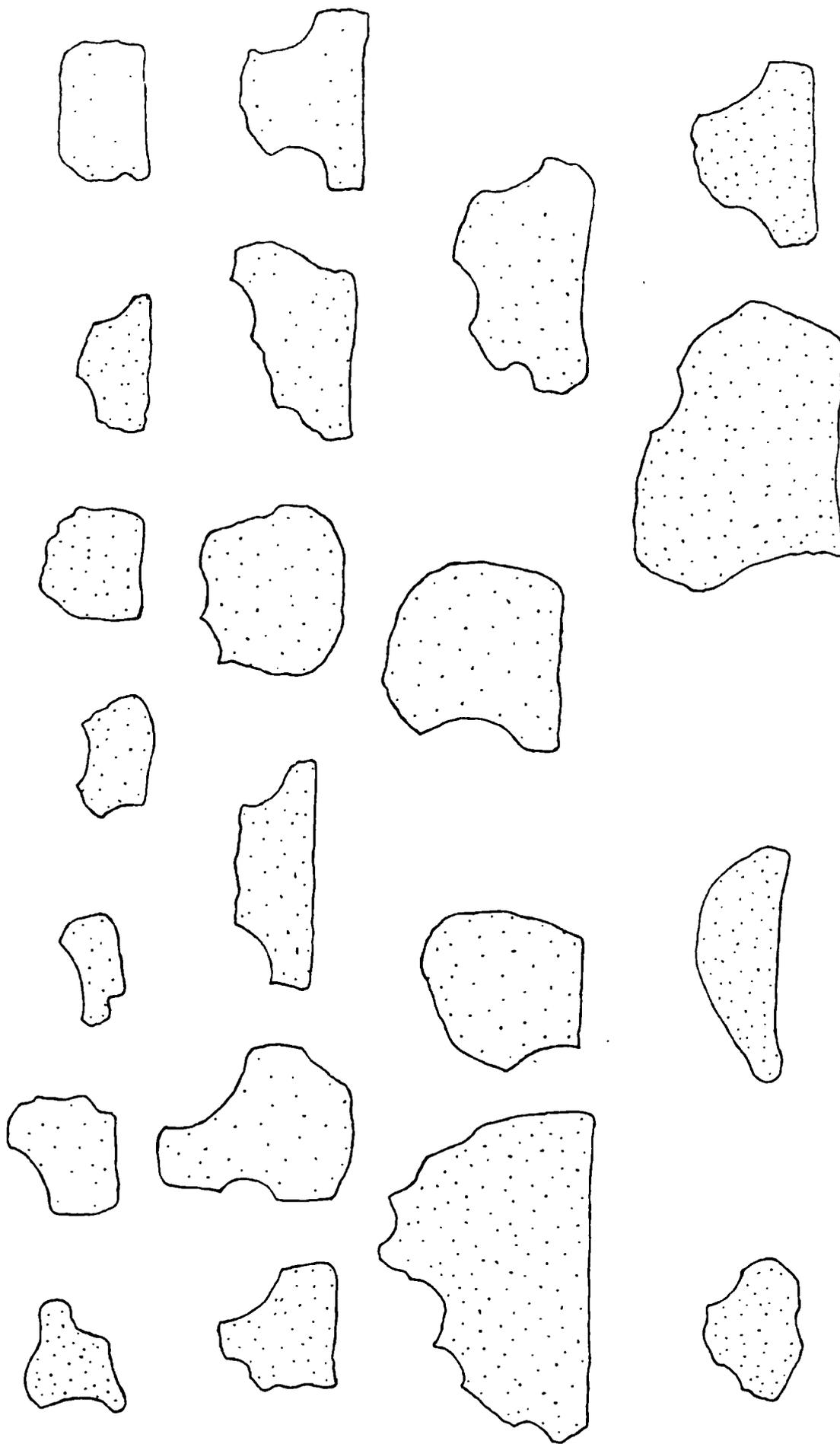


Figure 98: Briquette fragments from Str. B-4 (65% actual size)

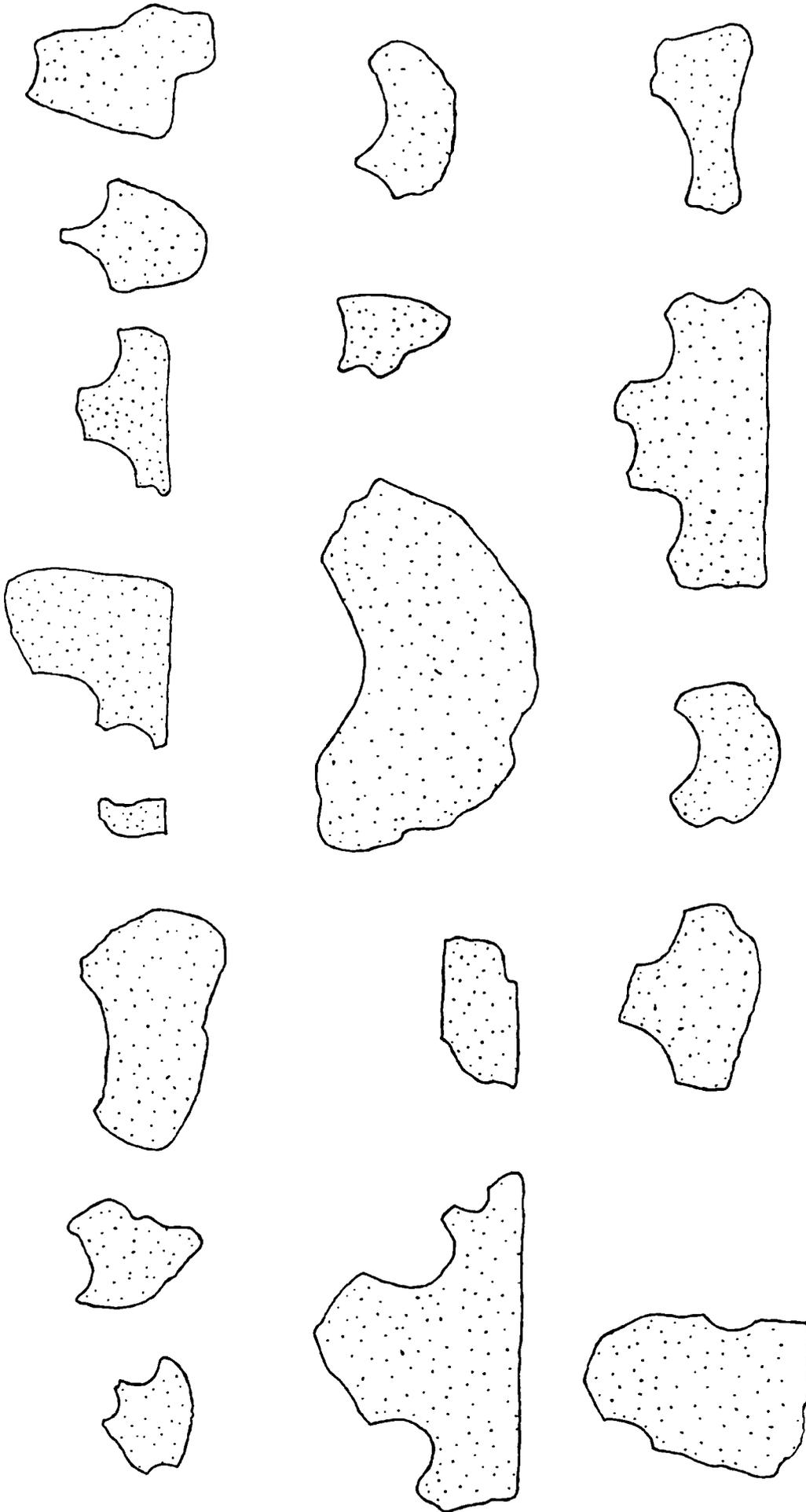


Figure 99: Briquette fragments from Str. B-4 (65% actual size)

(1972:231) provide extensive discussion and comparative references for this type of artefact, and note that they occur in Formative and Classic period contexts.

6.10 Miscellaneous Objects

DESCRIPTION: Briquette or Daub fragments (Figs. 98-99)

FREQUENCY: Several hundred

MATERIAL: Clay, limestone, and organic materials

DATING: Early Middle Formative (Cunil and early Kanluk)

CONTEXT: Str. B-2\1st, Str. B-4\3rd, B-4\4th, and B-4\5th

COMMENT: Briquettes or daub fragments are small sections of the clay and lime plaster which originally covered the pole or wattle walls of perishable buildings. The outer face of the briquettes are generally flat and smooth, and some fragments have a thin outer layer of lime plaster. The plaster surface of several specimens have wide vertical bands painted in red. The inner faces of the briquettes generally display diagnostic semi-circular impressions which were created when the plaster was stuccoed onto pole walls. The diameter of these pole impressions ranges from 0.8 to 8.0 cm. Similar briquettes or daub fragments were found in Formative period contexts at Barton Ramie (Willey et al. 1965) and at Cuello (Hammond 1991b).

6.11 Formative Period Burials

With the exception of northern Belize, few Formative period burials have been found in the central Maya Lowlands (Robin 1989; Hammond, Clarke and Robin 1991). They are rare

in the Peten and Pasion Zones of Guatemala (Coe 1959, 1988; Tourtellot 1990:81-142), and limited in the Belize River Valley region (Willey et al. 1965). The same holds true at Cahal Pech where only six Formative period burials have been discovered. Two of the Cahal Pech burials were found in Str. 2 in the Zotz Group, and the other four were in Str. 9 and the central platform of the Cas Pek Group.

The skeletal remains from Preclassic burials at Cahal Pech were poorly preserved. They are represented by male and female adults and by adolescents. Except for one instance (Cas Pek Burial 2) where the skeletal remains were in a fetal position, all the burials were extended, and had a north/south orientation. Because the human remains are presently being analyzed by Dr. David Glassman of Southwest Texas State University, a detailed osteological report cannot be presented at this time.

Three of the Formative period graves at Cahal Pech were of the "simple type" and three were cists. The former category of grave is defined by Smith (1972:212) as an "unlined hole in the ground or inclusion of a body in the fill during construction". A cist is defined as a "grave with definite outlines, either the sides of an excavation into structural fill or stone walls; no capstones" (Smith 1972:212).

None of the Cahal Pech burials date to the early Middle Formative period (1000-650 B.C.). The only human remains recovered from Cunil and early Xakal contexts were several, burnt, long bone fragments. These charred remains suggest that cannibalism may have occasionally been practised by the early lowland Maya, or that cremation was the preferred burial practice during this early period of settlement.

Burials 1 and 2 in Str. 2 at the Zotz Group, and Burial 1 from the Cas Pek Group date to the terminal Middle Formative. All three burials were extended, supine, and north/south in alignment. Zotz Group Burial 1 had been placed in a cist and contained a single Jocote Orange-brown jar. Burial 2 was in a simple grave and had no grave goods. Burial 1 from the Cas Pek Group was also in a cist and contained a small jar which is typologically similar to Joventud Red vessels.

The other three Cas Pek burials, two from the central platform and one from Str. 9, date to the Late Formative period. Burial 2 dates to the early facet of the Xacal phase (350 B.C.-A.D. 100), and Burials 3 and 4 are late facet Xacal (100-350 A.D.) interments. Two of the Late Formative Cas Pek Group burials contained grave goods. Burial 2 had a single pottery vessel represented by a Sierra Red flaring-side dish. Burial 3 contained the remains of two individuals (1 female, 1 adolescent) and several artefacts. The latter included a Polvero/Balanza Black dish, a Chan Pond Unslipped jar, three stone spindle whorls, six obsidian prismatic blades, two bone pins, and two bone needles.

Late Middle Formative Burials

Burial #: Zotz Group Burial 1

Grave Type: Cist

Context: Within Str. 2\2nd (round structure) of the Zotz Group

Condition: Poorly preserved

Sex/Age: Adult, probably male

Orientation: North/south

Position: Extended, supine, head to the south

Grave Goods: One jar of the Jocote Group

Comments: This burial may be associated with Burial 2.

Burial #: Zotz Group Burial 2

Grave Type: Simple

Context: Within Str, 2\2nd (round structure) of the Zotz Group

Condition: Very poorly preserved

Sex/Age: Adult, probably female

Orientation: North/south

Position: Extended, supine, head to the south

Grave Goods: None

Comments: Burial 2 had been place just outside of the cist which contained Burial 1. If the individual is indeed female, it may represent the spouse of the persona interred in Burial 1.

Burial #: Cas Pek Group Burial 1

Grave Type: Cist

Context: Floors 6 and 7, Central Platform, Cas Pek Group

Condition: Poor

Sex/Age: Adult, probably male

Orientation: North/south

Position: Extended, supine, head to the south

Grave Goods: Small jar of the Joventud Red type

Comments: The cist was capped by several slabs of limestone

Late Formative Burials

Burial #: Cas Pek Group Burial 2

Grave Type: Cist

Context: Below Floor 5 of the Central Platform, Cas Pek Group

Condition: Poor

Sex/Age: Adult, sex undetermined

Orientation: North/south

Position: Extended, on its side, face to the east, head to the south

Grave Goods: One flaring-side Sierra Red dish

Comments: None

Burial #: Cas Pek Group Burial 3

Grave Type: Simple

Context: Below Floor 4 of the Central Platform, Cas Pek Group

Condition: Poor

Sex/Age: One adult (possibly female) and one adolescent (sex undetermined)

Orientation: North/south

Position: Extended, supine, head to the south

Grave Goods: One Chan Pond Unslipped jar, one Polvero or Balanza Black dish, six obsidian prismatic blades, three spindle whorls, two bone pins and two bone needles

Comments: The skeletal remains of the adolescent was lying beside and to the right of the adult.

Burial #: Cas Pek Group Burial 4

Grave Type: Simple

Context: Below Floor 1 in Str. 9

Condition: Poor

Sex/Age: Adult

Orientation: North/South

Position: Extended, head to the south

Grave Goods: None

Comments: None

6.12 Formative Period Caches

The term cache "refers to one or more objects found together, but apart from burials, whose grouping and situation point to intentional interment as an offering" (W. Coe 1959:77). On the basis of their contexts, caches may also be described as being associated with dedicatory or termination rituals. In the Cahal Pech Project dedicatory caches referred to offerings which were intentionally placed with a monument, or during the construction of an architectural feature or structure. Termination caches referred to offerings which were intentionally deposited during the abandonment or ritual destruction of an architectural feature or construction phase. The two categories were identified on the basis of their archaeological context. Dedicatory caches are normally found in the construction fill of architectural features, and termination caches are predominantly discovered on the surface of floors of abandoned or destroyed architecture.

Three Formative period caches were discovered at Cahal Pech. The earliest (Cache 1) dates to the Cunil phase and was associated with the fourth construction phase in the Str. B-4 sequence. Cache 2 and Cache 3 were also discovered in Str. B-4, and both were associated with the B-4\5th construction phase. The contents and contexts of these caches are listed below, and detailed descriptions of the artefacts have been made under their associated industries (see above).

The contents of the Formative period caches at Cahal Pech contained a variety of objects which were produce from several different raw materials. The most common items in the three caches were made from marine shell and greenstone. Shell artefacts were found in all three caches and they are the exclusive item in Cache 3. Greenstone artefacts were found in Cache 1 and 2. The predominant use of marine shell objects in the Formative period caches at Cahal Pech probably represents a temporally diagnostic pattern in the Belize region. At Colha (Buttles n.d.) and Cerros (Garber 1989) for example, marine shell objects are prominent in offerings which date between the Middle and Late Formative periods. A similar pattern has been noted at Cuello (Hammond 1991b) and at Barton Ramie (Willey et al. 1965). This is in contrast to Classic period caches in the southern Cayo District, and to caches in general in the Pasion Zone of Guatemala. At Caledonia, for example, Awe (1985:117-118) noted that pottery vessels were the predominant objects in Classic period caches. A similar pattern was observed by Thompson (1931) at Mountain Cow. The predominant use of pottery vessels in caches was also noted at Altar de Sacrificios where A.L. Smith (1972:208) reports their discovery in contexts ranging from the Formative to the Classic period.

Cache 1

Type: Termination

Context: In a thick lens of ash and carbonized material above the surface of Floor 10C in Str. B-4.

Date: Early Middle Formative (Cunil phase)

Contents: 18 perforated marine shell discs

1 perforated, irregular-shaped, marine shell bead

1 fragment of marine shell

27 obsidian flakes

3 pieces greenstone

1 small, spherical, red stone

1 rectangular slate plaque

77 chert flakes

1 perforated peccary scapula

1 perforated canine scapula

1 perforated canine tooth

1 fragmented pottery vessel

Comments: The large quantity and variety of the artefacts, plus the exotic source of several items (jade, obsidian, and marine shell) within Cache 1 indicates that Str. B-4 was either the dwelling of a wealthy family, or that the structure was used for important ritual functions. This conspicuous disposal of wealth further indicates that social inequalities were already established in the early Middle Formative period at Cahal Pech. Due to the paucity of contemporaneous local data, however, it is difficult to determine how extensive status differences were in this early community. The Cahal Pech data nevertheless demonstrates that

social ranking, and perhaps political complexity, in lowland Maya society had its origins in the Middle Formative period.

Cache 2

Type: Dedicatory

Context: Within construction fill below Floor 9a (Str. B-4\5th)

Date: Early Middle Formative (early facet Kanluk phase)

Contents: 9 perforated marine shell discs (Fig. 95a)

Comments: Unlike Cache 1 and 3, which were discovered on the floor of their associated architecture, Cache 2 was found within the construction fill of a structure. As previously mentioned, this context appears to be more indicative of a dedicatory rather than a termination ritual.

Cache 3

Type: Termination

Context: Discovered on the surface of Floor 9A, at the base of the raised structure.

Date: Early Middle Formative (early facet Kanluk phase)

Contents: 3 marine shell discs

1 perforated marine shell fragment

1 subspherical greenstone bead

1 discoidal greenstone bead

Comments: At Cuello, Hammond and Gerhardt (1991:228) report two instances where "complete jade beads" were used in termination and/or dedication rituals associated with Middle Formative architecture. They argue that the use of complete jade beads in offerings

is probably characteristic of Middle Formative caches. In contrast, the smashing of jades during these rituals "may be an innovation of Late Preclassic times" (Hammond and Gerhardt 1991:228). In his analysis of the Cerros artefacts, where both complete and smashed beads were found in caches, Garber (1989:47-50) reached a different conclusion. He proposed that "whole jades are associated with structure completion or dedication, and broken jades are associated with abandonment and destruction" (Garber 1989:50). I believe that the context of the complete jade beads and associated artefacts (that is, directly above the floor of B-4\5th) more likely indicates that they were used in a termination ritual. This interpretation is supported by the discovery of Cache 2 within the construction fill of the same building platform (B-4\5th), and which, in contrast, represents a dedicatory ritual.

CHAPTER 7

CONCLUSIONS

7.1 Introduction

The research interests of the Cahal Pech Project were primarily concerned with the early period of occupation at the site. As stated in Chapter 2, the objectives of this study were: 1) to determine the temporal limits of Formative occupation at Cahal Pech, and 2) to ascertain the socio-political morphology and complexity of the community during the Preclassic period. It was hoped that this information would subsequently enhance the Formative period data base of the Belize Valley, and that it would help to determine the cultural affiliation of Cahal Pech with contemporaneous sites in the central Maya Lowlands. The results of these investigations, and their implications, are described below. The Formative prehistory of Cahal Pech is first presented in a traditional culture-historical framework, and the implications of this data are discussed under a topical format.

7.2 The Formative Period Culture History of Cahal Pech

The Early Middle Formative Cunil Phase (1000-850 B.C.)

The initial occupants of Cahal Pech first settled at the site slightly before or around 1000 B.C. Evidence for this early stage of occupation has been confirmed by radiometric dating techniques, has been recorded in secure stratigraphic contexts in the site core, and is represented by the cultural remains of the Cunil phase (1000-850 B.C.).

The discovery of tranchet bit tools and grinding stones in Cunil phase levels indicate that the first settlers were sedentary agriculturalists. These pioneering farmers nevertheless relied heavily on a wide variety of aquatic and terrestrial animal resources (see Appendix 1). The freshwater snails *Pachychilus glaphyrus*, *Pachychilus indiorum*, and *Nephronaias ortmanni*, plus white-tailed deer and domesticated dog appear to have been particularly important for subsistence. Undoubtedly, there was also a great reliance on wild plants, but specific information on the exploitation of these resources cannot be provided until organic remains (collected by flotation techniques) have been fully analyzed by S. Fedick (U.C. Riverside).

The location of the earliest settlement within the site core suggests that there may have been a preference for locating early Middle Formative villages on the foothills overlooking the river valleys. A similar settlement pattern has been recorded for early village sites in the northern Maya Highlands (Sharer and Sedat 1987:428). There are several possible reasons for this early locational preference in the upper Belize Valley. Unlike the sandy loams and clay base soils of the river valleys, the limestone foothills have good sources of building material. They also provide drainage, safety from flooding, and easy access to the rich agricultural soils in both the uplands and alluvial valleys. Close proximity to streams and navigable rivers further facilitated the exploitation of aquatic resources and provided early settlers with major avenues for communication.

The dwellings of the Cunil phase settlers were relatively simple. They were either erected on the old ground surface of the site, or the uneven surface was levelled prior to the construction of house platforms. The latter were raised slightly (10 to 20 cm) above ground level and their clay/marl floors were generally tamped down. Superstructures were mostly

constructed of perishable material. They consisted of wattle and daub buildings with thatched roofs, and were predominantly apsidal in plan. Many of these buildings were encircled by low retaining walls or mouldings (two tiers high) constructed from coarse or roughly shaped limestone. Wide vertical stripes or bands of red paint on daub fragments also indicate that simple forms of decoration were being applied to this early form of lowland Maya architecture.

The Cunil phase people produced a wide range of utilitarian and craft objects. Their stone tools included tranchet bit adzes, retouched flakes, scrapers, burins, hammerstones, metates, and manos. Obsidian tools were relatively simple and represented solely by flakes or chips. These flakes were probably produced domestically by a technology based on hard-hammer percussion. The absence of bladelets in Cunil phase levels and their subsequent appearance in the late Kanluk phase suggests that there was a flake to bladelet sequence of obsidian tool development at Cahal Pech. This evolutionary pattern has not been previously noted in the Maya Lowlands, but it has been recorded in Early Formative contexts in Chiapas and the Pacific coast of Guatemala (Coe and Flannery 1967; Clark and Lee 1984; Jackson and Love 1991).

Craft objects are represented by jadeite or greenstone adornos, perforated marine shell discs, slate plaques, drilled animal teeth and scapulae, and pottery figurines. While most of these objects probably served as jewelry for individuals of high status, some items could have been associated with early forms of ritual and ancestor worship. This is particularly true of the drilled animal scapulae and the pottery figurines. According to Pohl (1985:141-142) the ancient Maya used the hind limbs of vertebrate fauna as offerings in religious ceremonies, and

they are found in greater frequency in elite associated architecture. The use of figurines in fertility cults, as "ruler portraits", or in association with early forms of ancestor worship has been suggested by Grove and Gillespie (1984), Hammond (1989), and by the author (see Chapter 6). It should be noted, however, that figurines were not very common in Cunil levels. Their limited presence at this time may therefore correlate with the initial introduction of these concepts.

The ceramic tradition of the Cunil phase settlers was relatively modest but not experimental. Vessel forms consisted of jars, tecomates, shallow bowls with straight sides, and dishes with flaring sides and wide everted rims. The decorations applied to some of this pottery included monochrome slips in red, orange, or cream, post-slip incising, and zoning. Although the latter technique may not actually represent dichroming, its application often had similar results.

Cunil pottery displays affinities to Swasey and Bolay ceramics in northern Belize, and has ancestral ties to the succeeding early Jenney Creek complex material from the Belize Valley. The former is indicated by the presence of Consejo Red ceramics and by burnished unslipped pottery with possible ties to Yotolin Patterned-burnished specimens at Cuello. Chitam Zoned-incised pottery from Cahal Pech may also be related to the subsequent Tower Hill Red-on-cream, and the Cunil phase Cocoyol Cream may be an antecedent of Quamina Cream. Ancestral ties between Cunil and early Jenney Creek are suggested by the stratigraphic relationship of the two complexes, and by the development of Jocote Orange-brown from the unslipped pottery (Sikiya and Tuki) of the Cunil complex.

From the establishment of their initial settlement the Cunil community at Cahal Pech was involved with long distance exchange and trade. Exotic goods from Cunil phase levels predate the appearance of similar materials at Cuello, and include jadeite or greenstone, obsidian, and marine shell. Greenstone objects in Cunil levels at Cahal Pech represent the earliest use of jade in the Maya Lowlands, and include small adornos or mosaic fragments which were cut from brilliant green jadeite that was probably imported from sources in the Motagua Valley. One of the greenstone adornos is reminiscent of a "flaming eyebrow", but this object was more likely of Olmec influence rather than of Olmec origin. This is substantiated by the general absence of other Olmec or Olmec like traits within the Cunil assemblage.

Trace element analysis of obsidian artefacts indicate that early Middle Formative obsidian at Cahal Pech derived solely from the El Chayal source in highland Guatemala. In contrast, marine shells, which are predominantly of the *Strombus* species, were all obtained from the Caribbean coast. The early occurrence and diverse origins of exotic goods imply that a relatively complex system of long distance trade and exchange had been established in the Maya Lowlands by the beginning of the first millennia B.C.. The movement of these goods may have followed overland and riverine routes, and the location of Cahal Pech at the headwaters of the Belize River afforded the site an advantageous position for participating in this system of exchange and external contact.

Although the traditional view of early Middle Formative Maya society is one of egalitarian farming villages (Willey et al. 1965:562), there is every reason to believe that a system for social ranking was already in operation by 1000 B.C. Evidence for status

differences during the Cunil phase is suggested by Cache 1 in Str. B-4\4th, by the presence of elite related objects, and by personal adornments or jewelry made from local and exotic raw materials. It was previously (see Chapter 6) noted that the large quantity (132 items) and variety of objects within Cache 1 are a clear demonstration of the conspicuous disposal of wealth. The presence of adornments made from jadeite, shell, and pottery in this same construction phase further suggests that the occupants of B-4\4th may have enjoyed a high status within the early Cahal Pech community. This is also supported by the predominance of the hind limbs of deer bones and other vertebrate fauna, plus the presence of crocodilian remains, within Cunil deposits in Str. B-4 (cf. Rust 1992:126). Pohl (1985) has noted that bones from the hind limbs of vertebrate fauna generally occur in greater frequency within elite related architecture. Stocker, Meltzoff and Armsey (1980), and Rust (1992) also argue that:

Differential presence of crocodilian faunal remains at La Venta sites, ..., raises new possibilities for linking subsistence findings to iconographic studies of both Olmec and Maya symbolism, as well as for improved focus on distinctions in Olmec social groupings (Rust 1992:126).

Given that status objects and other indicators of wealth are not equally distributed in early Maya or Mesoamerican villages (cf. Pires-Ferreira and Flannery 1976:291; Hammond 1991a) their concentration in the Cunil levels of Str. B-4 therefore indicate that social inequalities were already established at Cahal Pech during the early Middle Formative period.

The characteristic features of the material remains from Cunil phase levels suggest that the initial settlers of Cahal Pech were full participants in a lowland Maya cultural tradition. A few traits and objects imply ties with the Olmec area and Maya Highlands (i.e. jade, obsidian, "flaming brow" and figurines), but I suspect that these traits and objects derive from trade and ideological diffusion rather than being characteristic of the cultural traditions of

foreign immigrants. A compelling and increasing body of data suggests that Paleoindian and Archaic people had occupied the Belize region of the Maya subarea for many millennia. The presence of these truly pioneering groups was first indicated by the discovery of a large femur of an extinct giant sloth, with butchering marks, down river from Cahal Pech (recovered at Santa Familia by the Belize Department of Archaeology in the 1960s), and by the discovery of the Ladyville fluted point (Hester et al. 1981). More recently, Pohl (cf. Romero 1991; and personal communication 1992) recovered a second Archaic projectile point near Pulltrouser Swamp, and Hester (personal communication, 1991) has recorded a preceramic level at Colha. To this can be added MacNeish's proposed preceramic sequence for Belize which spans from approximately 8000 to 2000 B.C. (MacNeish, Wilkerson and Nelken-Terner 1980; MacNeish and Terner 1983). That Archaic groups may have settled on the coast and along the major river valleys, and that they were probably major contributors to Formative period culture in Belize is therefore a real possibility. This is an archaeological problem that must be investigated in the near future. Failure to pursue this line of research will continue leading Mayanists in search of diffusionary hypotheses to explain the presence of precocious Formative period communities in the Maya Lowlands.

The Early Kanluk Phase (850-650 B.C.)

During the second half of the early Middle Formative period (early Kanluk phase 850-650 B.C.) there were several changes within the early Cahal Pech community. The use of lime plaster for surfacing the floors of building platforms, which was introduced late in the Cunil phase, became a standard feature of early Kanluk architecture. Limestone blocks were also more commonly utilised in construction, and for the first time masonry structures, which probably served non-domestic purposes, were erected at the site. Structure B-4 5th is a prime

example of the latter. This construction phase is represented by a large, 0.7 to 0.9 m. high, masonry structure which was erected above a rectangular building platform. Two caches, one below the surface of the platform (Cache 2) and the other (Cache 3) on the floor of the platform, indicate that dedicatory and termination rituals were enacted during the construction and subsequent abandonment of this structure, and attest to its significant role within the community.

The early Kanluk phase, which is coeval with early facet Jenney Creek at Barton Ramie, witnesses the introduction of several new pottery types. Primary among these is the appearance of true Jocote Orange-brown and the initial production of Mars Orange ware. Except for decorative differences, the Jocote group is similar to its unslipped precursors in the Cunil Complex. In contrast, Mars Orange ware is a new tradition which, together with Jocote group pottery, eventually becomes the predominant type of the early Kanluk Complex. Other ceramic types, previously unrecorded in the Belize Valley, also make their first appearance at this time. This pottery includes types with close affinities to the Ramgoat group from Colha, and to the Quamina group of the Bladen Complex at Cuello. The former is represented by modeled bottle fragments, and the latter is present in two varieties of Tower Hill Red-on-cream. Along with these changes there is an increase in vessel forms, and grooving, incising, and filleting become the most commonly used methods for decorating ceramics.

Early facet Kanluk pottery was found in the site core and in mixed deposits in the lower levels of the larger peripheral groups. This distribution implies that population was on the increase, and that new settlements or family compounds were being established around the

initial Cunil phase settlement. External contacts, particularly for the acquirement of exotic goods, were maintained along pre-established trade routes. The El Chayal quarry continued to be the only source for obsidian, jade probably still derived from the Motagua Valley, and marine shell from the Caribbean coast remained the most numerically significant trade item.

Changes in the social structure of the community are more evident during early facet Kanluk than in the preceding Cunil phase. This is indicated by the construction of relatively large masonry architecture (i.e. B-4\5th), the presence of a larger number of simple house platforms, the concentration of exotics within the site core, a marked increase in the production of figurines and a corresponding rise in their frequency in Str. B-4. Together these cultural remains suggest that differences in status and wealth were more marked during this period and that they were probably increasing along established family lines.

The Late Middle Formative Kanluk Phase (650-350 B.C.)

The late Kanluk phase is marked by some of the most notable changes at Cahal Pech. A major increase in population and considerable construction activity is manifested by the presence of late Middle Formative architecture throughout the site. Indeed, seven of the eight peripheral groups tested produced evidence of construction at this time. The form of this architecture also varies from settlement to settlement. In most peripheral groups it is represented by low house platforms. In contrast, late Middle Formative architecture at the Zopilote Group consists of a large special function structure which is approximately four meters in height. Coeval construction in the Zotz Group is represented by a 1.2 m high round structure with an elliptical shaped stairway.

Within the site core the construction of civic architecture surpasses that of the periphery. It is marked by the construction of the first lime plastered courtyard, and by the erection of several new domestic and non-domestic structures around the perimeter of the plaza. The seventh construction phase of Str. B-4 (B-4\7th) is an excellent example of the non-domestic architecture of this time. This construction phase consists of a large round structure which was erected above a raised building platform. The platform stood approximately 3.0 m above the courtyard and had a wide stairway on the northface of the structure. Architecture on an even grander scale probably lies below the large, Late Formative, A-1 Sub 1, but due to structural instability and tourism related concerns, it was not possible to investigate the Middle Formative levels of this large mound.

The late facet Kanluk phase is defined by pottery which was first introduced in the latter part of the early Middle Formative period and by several new types which belong to the Mamom ceramic sphere. The previously introduced pottery dominates the ceramic assemblage, and is represented by unslipped jars of the Jocote group, and by the Savana and Reforma Incised types of the Savana group. Mamom related pottery is present in the red Joventud group, the black Chunhinta group, and the cream Pital group. The Joventud group occurs in both its Sampoperro and Pinola Creek Incised types. The black Chunhinta and the cream Pital groups are present in relatively low frequencies and it is possible that this pottery, particularly the black slipped Chunhinta, represent imports.

Trade during the late Middle Formative period continued to be dominated by the acquisition of greenstone, obsidian, and marine shell. There are however, changes in obsidian technology and in the sources of this raw material. Whereas El Chayal represented the only

source of early Middle Formative (1000-650 B.C.) obsidian, during late Kanluk times (650-350 B.C.) this exotic good appears to have been imported solely from the San Martin Jilotepeque (Rio Pixcaya) quarry. Changes in obsidian technology are manifested by the initial appearance of bladelets and a conspicuous decrease of flakes or chips. As indicated above, pottery may have also been imported during late Kanluk times. This is suggested by the low frequency of Flores Waxy wares and especially by the minuscule quantity of Chunhinta Black ceramics. Indeed, black slipped pottery is not very common in Middle Formative levels in the Belize Valley (Gifford 1976), and it occurs in very insignificant quantities throughout the region. Other indications of external contact are suggested by the first appearance of slate-backed mirrors. These objects first occur in the Gulf Coast (Coe and Diehl 1980) and later become widespread throughout the Maya Area (Healy et al. n.d.).

Social ranking is more evident during the late Kanluk phase than it was during the preceding phases. This is suggested by differences in architecture, by late Middle Formative burials, and by the contextual distribution of certain artefact types. Differences in architecture have been described above. To reiterate, they indicate that the late Kanluk architectural spectrum included round structures which probably served as ancestral shrines, plus other elite and non-elite domestic structures. Differences in burial patterns are best illustrated by Burials 1 and 2 from the round Str. 2\2nd of the Zotz Group. Apart from sharing the same general provenience, these burials are quite distinct. Whereas Burial 1 had been placed within a cist and was accompanied by a Jocote Orange-brown vessel, Burial 2 had been interred within the fill of the same structure and contained no grave goods. Burial 1 in the Cas Pek Group was also placed in a cut-stone cist and was accompanied by a Consejo Red jar. If differences in grave type (i.e. simple and cist) and the presence or absence of grave goods reflect social

status, it is logical to assume that the individuals interred within the two cist burials were of higher social standing than the individual interred within the construction fill of Str. 2\2nd at Zotz.

With regards to the contextual distribution of artefacts, there is clear indication that elite related objects were concentrated in the site core, in special function structures, and in architecture which may have served as dwellings for individuals of high rank. This is true for exotic goods, for mosaic mirrors and slate objects, and particularly for figurines. It was previously noted (see Table 4) that the distribution of figurines in late Middle Formative contexts demonstrates an obvious concentration of these artefacts in Str. B-4. In the periphery they are also concentrated in structures with the longest history of occupation and which probably represent the dwellings of the lineal heads of these outlying settlements. The discovery of the slate back of a mosaic mirror in Str. B-4\7th further indicates that this structure may have been associated with elite activity. Schele and Miller (1983) and Garber (1989:92) have noted that these mirrors predominantly occur in elite related architecture, and have suggested that they were "important symbols of kingship". Similar arguments have been made of their context and role in the Olmec area (Coe and Diehl 1980).

The picture of Middle Formative culture at Cahal Pech is, therefore, one of a very precocious society. There is evidence for the construction of special function structures, for long distance exchange and contact, for a system of social ranking, and for increasing socio-political complexity.

The Late Formative Xakal Phase (350 B.C.-A.D. 250)

During the Late Formative Cahal Pech becomes one of the pre-eminent sites in the upper Belize Valley. Approximately 75% of all the mounds tested (see Table 2) produced evidence of initial construction or of architectural modification at this time. Most of these structures were simple house platforms with perishable buildings, but others are represented by truly monumental architecture. The 15 m high Str. A-1₁, and the 7.0 m high Str. 1_{3rd} in the Zopilote Group are conspicuous representations of the latter. So is Str. B-4 10th\11th with masks, stair-side outsets, and overall architecture which resembles that of E-VII-Sub at Uaxactun, Str. 350 at Cuello, and Str. 450 at Dzibilchaltun. With the possible exception of the Actuncan settlement at Xunantunich (R. Leventhal, personal communication 1992), comparable, Preclassic, monumental architecture has yet to be found in the region, and its general absence at neighbouring sites suggests that Cahal Pech may have been one of the primate centers in the upper Belize Valley during the Late Formative period.

Tool production during the Xakal phase sees a continuation of several previous forms and the introduction of several new tool types. Among the latter are stone spindle whorls, barkbeaters, and stemmed macroblades. The earliest bone pins and needles discovered at the site also date to the Xakal phase, but their earlier occurrence at Barton Ramie (Willey et al. 1965) suggests that these objects may have been produced for some time.

During the Late Formative period there is an increase in the number of exotic goods. In addition to jadeite, obsidian, and marine shells, the Xakal population at Cahal Pech was importing iron pyrite for mosaic "mirror" plaques, magnetite, and possibly ceramics. Contrary to previous practice, Xakal phase obsidian was simultaneously acquired from the San Martin

Jilotepeque source and from the El Chayal quarry. The acquisition of these new exotics, and the pattern of dual obsidian source procurement indicate that trade had become more extensive and complex than in previous phases.

Burials of the Xakal phase were interred in simple and cist graves. Simple burials display no change in complexity from their Middle Formative precursors and grave goods are generally absent within them. In contrast, cist burials are more elaborate, they consistently contain grave goods, and the graves are lined and capped with cut stone.

Xakal phase pottery is a "full member" of the Chicanel ceramic sphere (cf. Ball and Taschek 1986:20-22). Pottery of the red Sierra group, in its Unspecified and Society Hall varieties, and Laguna Verde Incised, dominate the assemblage. Cream and black-slipped types of the Flor and Polvero groups also occur, but in relatively low frequency. Unslipped types are dominated by ceramics of the Paila and Sapote groups. During the second half of the Late Formative period several new types are added to the ceramic inventory. Some of this pottery is similar to material from the Floral Park Complex at Barton Ramie, and includes types from the Aguacate, Monkey Falls and Chan Pond ceramic groups. Within the Aguacate group are orange slipped specimens with tetrapodal mammiform supports, and ceramics which represent the initial introduction of polychrome pottery (Ixcanrio Orange-polychromes) at the site.

In summary, the cultural remains of the Xakal phase demonstrate that by Late Formative times Cahal Pech exhibited all the characteristics of an advanced and complex society. The presence of truly monumental architecture suggests that an established elite were able to

mobilize large groups of people for the construction of public and special function structures. External contacts were maintained with distant regions for the procurement of exotic goods and this in turn may have fostered a symbiotic exchange of technology and ideology. The increasing use of iconographic symbols, as displayed on polychrome ceramics and the masks on Str. B-4\10th and 11th, may have been influenced by these contacts.

The reasons for Cahal Pech's precocious development in the Formative period may never be accurately determined, but I do believe that the site's location at the headwaters of the Belize River, within easy reach of the Caribbean coast and the central Peten, plus its access to and control of very fertile land, may have definitely stimulated its early development. Willey et al. (1965:574) previously alluded that the Belize Valley may have been involved with the commercial farming of cacao during the Jenney Creek phase. Ethnohistoric records confirm this activity for the Postclassic and early historic periods (Jones 1982:283-284), and indicate that Negroman/Tipu (which is just upriver from Cahal Pech) was on a major trade route to the central Peten lakes region. If a parallel situation existed during the Preclassic, it too could partially account for the precocity of Cahal Pech during the Formative period.

7.3 Implications of the Cahal Pech Data for the Upper Belize Valley

A primary objective of the Cahal Pech Project was to improve the Formative period data base of the upper Belize Valley. At the start of our project what we knew of the Belize Valley Formative was essentially what Willey and his colleagues (1965) had discovered nearly half a century (1950s) ago. The existing information indicated that the Jenney Creek complex represented the earliest ceramic tradition in the region. This pottery, however, had

never been isolated stratigraphically, and its early Middle Formative date had only been determined by seriation (Willey et al. 1965:562-563; Gifford 1976).

The cultural morphology of the early Middle Formative inhabitants of the Belize Valley was also solely represented by Jenney Creek pottery (Willey et al. 1965; Gifford 1976; Ball and Taschek 1986; Healy 1990; Ford and Fedick 1992). There was no information on securely dated Jenney Creek phase architecture, no evidence whatsoever for settlements or construction prior to 850 B.C., and no monumental architecture dating to the Late Formative had ever been recorded at neighbouring sites. Data regarding the procurement of exotic goods was also limited. The earliest occurrence of obsidian had been dated to the terminal Jenney Creek phase, and jade or greenstone first appeared in the Barton Creek (650-300 B.C.) phase (Willey et al. 1965). Partly because of this limited data base, Willey et al. (1965), Gifford (1970) and Sharer and Gifford (1970) previously suggested that socio-political complexity did not develop in the upper Belize Valley until the terminal Late Formative, and they argued that this development was probably sparked by foreign highland influences.

The investigations described here have, for the first time, recorded Jenney Creek material in secure cultural levels. Its stratigraphic position, plus an associated radiocarbon date, confirm the early Middle Formative date (850-650) of early facet Jenney Creek pottery, but reject the suggestion that it represents the initial ceramic tradition of the Belize Valley. The Cunil complex precedes Jenney Creek material stratigraphically and its ancestral ties to the latter is suggested by the development of Jocote Orange-brown from unslipped Cunil (Tuki and Sikiya) types. The stratigraphic position of early facet Jenney Creek ceramics at Cahal Pech also precedes that of the Mamom sphere. Thus, it is possible that the former may have

actually influenced the ceramic tradition of the later period.

The regional data on Formative period architecture has been significantly improved by the investigations at Cahal Pech (cf. Chapter 5). We have recorded evidence for the construction of domestic structures prior to 850 B.C., of special function and elite related architecture during the Late Middle Formative, and the introduction of large monumental architecture in the Late Preclassic. Detailed information regarding regional participation in long distance exchange has also been improved. The Cahal Pech data indicates that the procurement of exotic goods from the Guatemalan highlands, the Motagua Valley, and the Caribbean coast predates the late Middle Formative period. Additionally, a developmental sequence of obsidian tool technology has been noted, and the large number of figurines represents the second largest collection of this early artefact type yet recovered in the central Maya Lowlands.

The major contribution of the Cahal Pech data, however, is its impact on the study of the development of cultural complexity in the Belize Valley. In the preceding section, and below, evidence is presented which suggests that social ranking, plus an increasing level of cultural complexity, was present during the early Kanluk phase (850-650 B.C.), and certainly entrenched by late Middle Formative times. These developments are indicated by the presence of distinctly different domestic and public architecture, the conspicuous disposal of wealth, differences in the treatment at death, and differential access to resources and exotic goods. By the onset of the Late Formative period, Cahal Pech was a major regional center and its monumental architecture, local influence, and external contacts was comparable to that of Cerros and other Preclassic sites in northern Belize (cf. Freidel 1977, 1979).

7.4 Implications of the Cahal Pech Data to the Central Maya Lowlands

Inter-regional Affiliation of Cahal Pech

In two papers which focused on early Middle Formative pottery from the Maya Lowlands, Andrews (1990) and Andrews and Hammond (1991) recently suggested that the early ceramic traditions of northern Belize, the Pasion Zone, and the Belize Valley were unrelated and distinct from each other. Andrews (1990) further argued that these differences probably developed due to the multiple origins of these early Lowland settlers. The Cahal Pech data is inconsistent with this hypothesis. Alternatively, it indicates a long history of close cultural affiliation between the Belize Valley and northern Belize.

It was previously noted that the early Middle Formative Cahal Pech pottery (from the Cunil (1000–850 B.C.) and early Kanluk (850–650 B.C.) complexes) consists mostly of monochromes, dominated by red and orange slipped types (see Chapter 6). Dichromes are also present at this time and include red-on-cream and red-on-orange material. Flat-base dishes and bowls with flaring sides, short-necked jars, and tecomates are the prevalent modes in the form repertoire. Surface decorations include punctating, filleting, zoning, and pre-slip and post-slip grooving and incising.

Stylistically, the Cunil complex material demonstrates close ties, and typological parallels, with ceramics from the Swasey, Bladen, and Bolay complexes in northern Belize, and it also displays ancestral ties to early facet Jenney Creek types from Barton Ramie. The ancestral

link between Cunil and early Jenney Creek is manifested by the stratigraphic association of the two complexes at the site, by the stratigraphic primacy of Cunil pottery, and by similarities between the Tuki and Sikiya Unslipped Cunil types to Jocote Orange-brown. The subsequent early Kanluk pottery from Cahal Pech includes most, if not all, the types present in the Jocote, Sayab and Savana ceramic groups of the Jenney Creek complex. Furthermore, the ceramics from the two sites remain particularly close from late Middle Formative times to the Late Classic period. This relationship is not surprising, especially when we consider that both sites are located on the same river system, and are only 10 kilometres apart.

Cultural affiliation between the early Middle Formative settlements in the Belize Valley and northern Belize is suggested by pottery from the Cunil and Xakal/Jenney Creek complexes. Swasey/Bladen and Bolay types tentatively identified in the Cahal Pech collection include Consejo Red, Yotolin Pattern-burnish, Ramgoat Red, Tower Hill Red-on-cream, Unnamed Red-modeled bottles, and possibly Quamina Cream and Calcutta Incised. In some cases, particularly with some samples of Tower Hill Red-on-cream, the Cahal Pech material is indistinguishable from samples found at Cuello (Pring 1977; Kosakowsky 1983) and Colha (Valdez 1987, personal communication). Other red-on-cream pottery from Cahal Pech only differs from its northern counterpart at the varietal level. The double line break motif, which is found at both northern Belize sites, may also be present on Calcutta Incised specimens in the Cahal Pech collection, while zoning, as a form of decoration on Red-on-cream pottery, is present at Cuello and at Cahal Pech.

Contrary to Pring's (1977:364) previous statement, that "Despite... chronological overlap there appears to be little similarity between Jenney Creek and Swasey pottery", and Andrews

and Hammond's (1990:580) more recent argument, that there is a lack of similarity in the pre-Mamom complexes of northern Belize, the Belize Valley, and the Peten, the presence of Swasey/Bladen and Bolay ceramic types at Cahal Pech suggests that there was a ceramic, and by extension a cultural, affiliation between the Belize Valley and northern Belize. The fact that Kosakowsky (1983, 1987) and Valdez (1987) reported the presence of Jocote group and Savana Orange material in northern Belize, and Valdez's suggestion that "Honey Camp Orange-brown is probably the same as Barton Ramie's ceramic type Jocote Orange-brown" (Valdez 1987:56), further supports this position.

When comparisons of ceramics of the Mamom and Chicanel sphere, and the subsequent Floral Park horizon, are made, the relationship between the Belize Valley and northern Belize is even stronger. Both Barton Ramie and Cahal Pech share the late Middle Formative diagnostic types identified in northern Belize. This even includes what Valdez (1987) had previously thought was a unique characteristic among "chocolate pots" at Colha. In his dissertation, Valdez (1987:102-103) reported that "... the combination of spouts and handles on the same vessel seems to be limited to northern Belize and may be unique to Colha." During the last five years several fragments of these lip to lip handles on spouted "chocolate pots" have been discovered at Cahal Pech, and Pacbitun (Healy, personal communication), and they are also present at Barton Ramie (Willey et al. 1965, Fig. 184a-b).

Cultural affiliation is further suggested by parallels in the Middle Formative figurine collections at Cuello, Barton Ramie and Cahal Pech (cf. Hammond 1989:113), and by the presence of granitic grinding stones in Swasey contexts at Cuello (Hammond 1991b:187). According to Hammond (1986:402), the raw material for these mortars was "from the Maya

Mountains some 150 km to the south". Since the Belize River is the principal drainage for the northern Maya Mountains, and given its role as a major Precolumbian trading route, it is conceivable that most of the granite imported by northern Belize settlements were procured via Belize Valley sites with whom they maintained close cultural ties.

In summary, the presence of Swasey, Bladen, and Bolay-like ceramics at Cahal Pech, plus their associated early radiocarbon dates, suggest that previous arguments for the lack of unity between the pre-Mamom complexes of northern Belize and the Belize Valley should be reassessed. Contrary to previous opinion, the evidence from Cahal Pech indicates that: a) the early Middle Formative ceramic complexes and figurine collections from these two sub-regions share many parallels and, b) that these similarities were probably the result of close cultural affiliation between the early settlements of the Belize Valley and northern Belize. Because a similar relationship does not appear to have existed with Pasion Zone sites, Andrews (1990) and Andrews and Hammond's (1991) arguments would be more valid if comparisons were made between the early ceramic traditions of the Belize region and the Pasion Zone.

The Evolution of Complex Culture in the Maya Lowlands

The transition from egalitarian to socially complex societies in the Maya Lowlands has preoccupied Mayanists for the greater part of this century (Adams and Culbert 1977; Willey 1977b; Freidel 1979). The intent here is not to discuss the historical evolution of this problem, nor is it to review the diverging hypotheses for causality. Instead, it is to briefly focus on the characteristic features of this cultural phenomenon and to examine their earliest occurrence at Cahal Pech.

In a recent article, Grove (1981:374) listed "several basic archaeological traits which were part of the pattern exhibited by the complex societies of Mesoamerica". These traits include,

...civic or public structures arranged around plaza areas and/or within separate precincts; monumental and portable art which served ritual, dynastic, or other functions; ceramics bearing iconographic motifs; figurines; and the use of jade and greenstone as precious, status items (Grove 1981:374).

A brief review of the cultural stratigraphy and associated cultural remains at Cahal Pech indicate that several of the traits listed by Grove (1981) were already in place during the early Middle Formative, and most were established by late Middle Formative times.

There is little doubt that the architecture, tool industries, and social organization of the initial settlers of Cahal Pech were that of a relatively simple society. Even at this early stage, however, the cultural traditions of these Cunil phase settlers were not indicative of a totally egalitarian community. The large quantity of goods within Cache 1 in Str. B-4\4th implies conspicuous disposal of wealth. In this regard, Cache 1 is akin to the early potlatches of the northwest coast of North America where fledgling chiefs conspicuously disposed of their resources and status objects (cf. Hayden 1992). The presence of exotic objects, such as greenstone, obsidian, and marine shell, in the cache further indicates that inter-regional networks for the procurement of foreign resources had been established by this time, and that its organization may have been under the control of a small group or family at the site. Some decorations on Chitam Zoned-Incised dichromes may also represent early iconographic motifs. Figure 57c in particular has a design which could be related to subsequent Classic period forms of the "Kan Cross" or "Kin sign" (Smith 1955:74). Though limited in comparison to their subsequent frequency, figurines were also being produced during Cunil times. Some of these figures may have been associated with fertility cults, while others could have

represented "portraits" of the lineal heads of the community.

The indicators of nascent social complexity are much more pronounced during the Kanluk phase (early and late facets). This stage (850-350 B.C.) of development is marked by the introduction of several new architectural forms, including domestic and elite related architecture. The size and morphology of Strs. B-4\5th, B-4\6th, and B-4\7th are obvious indicators of the latter, while the round structures in the Tolok and Zotz Group most likely represent the family shrines of early peripheral groups. Domestic architecture in the form of low house platforms is also present in the site core and within most of the outlying settlements.

During the Kanluk phase figurine production far surpasses that of the previous Cunil phase. The forms produced at this time included anthropomorphs, zoomorphs, and whistles. Grove and Gillespie (1984) and Hammond (1989) have convincingly argued that some types of anthropomorphs represent "ruler portraits", and I have previously suggested (Chapter 6) that, like stelae in the Classic period, these effigies may have been associated with early forms of ancestor worship. At the same time, non-portrait figurines such as zoomorphs may have represented early forms of deities. Feline figures in particular have been associated with early cults in the Olmec area. At Cahal Pech zoomorphic figurines include felines, deer, birds, and several other forms. Prolific representations of these animals on later Classic period polychromes attest to their significance in Maya iconography, and it is possible that this role, in the form of figurines, had its origins in the Middle Formative period.

The number of Middle Formative burials found at Cahal Pech were very limited. They

included simple burials with no grave goods, and interments which had been placed in cut-stone cists accompanied by ceramic vessels. Though few in number, the burials and grave types indicate that there was differential treatment at death, that differences in mortuary practices were possibly associated with public stature, and that a system for social ranking was already becoming entrenched in the society.

Trade in exotic goods continued to flourish during the Kanluk phase, and new sources of obsidian were added to the exchange network. While some of these exotics were distributed in small quantities throughout the site, most were concentrated in Str. B-4 and in other special function structures. Changes in the ceramic tradition are also noteworthy. There is a broadening of the form repertoire plus an increase in decorative techniques. The latter included incising, grooving, chamfering, filleting, and modelling, plus the production of true bichrome pottery.

Collectively, the foregoing traits indicate that a system for social ranking was in operation at Cahal Pech throughout the Cunil phase (1000-850 B.C.). The changes which followed during the subsequent 500 years (Kanluk phase) were more significant, and their introduction had major and long lasting effects on the social structure of the Cahal Pech community. The Cahal Pech data strongly suggest that it is here, during the second half of the Kanluk phase, or the late Middle Formative period, that a high level of socio-political complexity was established in the Maya Lowlands. At Cahal Pech these changes are manifested by the late Middle Formative introduction of large, public, masonry architecture, an increase in the production of figurines, long distance exchange, possible differential access to exotics such as jade and obsidian, differences in the treatment at death, and the increasing use of

iconographic motifs. Recent research at Cuello, El Mirador and Nacbe (Hammond 1991a, 1992; Sharer 1992) reflect a similar developmental sequence, but as Hammond (1986a, 1986b, 1992) has often extolled:

"Those changes, which were concentrated in the three centuries preceding 450 B.C., are not yet well understood. Indeed, considerable difficulties stand in the way of understanding them, since the artifacts needed for full comprehension are in many instances buried under tons of material from later construction. Yet what happened near the end of the Middle Preclassic poses some of the most significant questions in New World archaeology, because by the beginning of the Late Preclassic in 450 B.C. a society quite different from that of the village farmers had emerged (Hammond 1986b:108)

We clearly need to focus more attention on Middle Formative occupation in the lowlands for here, indeed, "...lies the key to the genesis of Maya civilization" (Hammond 1986a:403).

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APPENDIX 1**AN ANALYSIS OF THE FAUNAL REMAINS FROM STRUCTURE B-4,****CAHAL PECH, BELIZE****BY****NORBERT STANCHLY****Introduction**

Ongoing analyses of the faunal remains recovered from Structure B4, Cahal Pech, Belize, indicate that its inhabitants were utilizing a wide variety of animal resources throughout its occupation. These included mammal, fish, bird, reptile, and crab remains, as well as several mollusc species of both local and marine origin.

Apart from providing important information on Maya subsistence, particularly during the early Middle Formative period (1000-650 B.C.), evidence for differential access to faunal resources, as well as ceremonial utilization of fauna, may also be suggested. These possibilities are currently being investigated by the author as part of an independent research project under the supervision of Dr. Howard Savage at the University of Toronto.

This report will focus mainly on the mammalian, reptilian, and shell remains recovered because the analysis of the majority of the fish, bird, and crustacean elements has not been completed. All interpretations expressed should therefore be considered tentative.

Methodology

All faunal remains considered identifiable by element to order or lower taxon were returned to Canada for further analysis. For all identifiable specimens, where possible, the following basic observations were recorded: taxon, element represented, side from which the element came from, portion of the element represented and percentage thereof, age at death, sex, and any modifications (cultural or non-cultural) that may be present.

This preliminary report will list only the taxon identified to date as represented by the number of identified specimens (NISP) and minimum number of individuals (MNI) methods of quantification. To date, no attempt has been made to obtain biomass estimates. The validity of this method has been questioned by some authors especially with reference to faunal assemblages recovered from Maya sites (Hamblin 1984:16; Pohl 1985:133). Minimum number of individuals have been calculated by counting and adding the most abundant element present from each identified species. Age, sex, and size differences which might affect minimum numbers were noted when warranted. For the purposes of this report all cultural levels will be treated as one assemblage until all taphonomic processes have been identified and accounted for. It may be possible therefore, that minimum numbers presented herein are too conservative in nature and reflect an under representation of species identified. A complete list of all faunal identifications as well as specific provenience data will be provided in the final report.

The Faunal Sample

A total of 2273 specimens recovered from Str. B-4 were presented for analysis (Table 2). Of these, 1553 (68.3%) are shell remains, and 720 (31.7%) are bone. All of the shell

remains have been identified to order or lower taxon and are represented by snail, bivalve, and crustacean elements of both local and marine origin. An account of shell remains identified is provided below.

Although some 720 bone specimens were recovered, the majority of these (ca. 520) are considered too fragmented to be identifiable below the class level. However, an attempt has been made to fit these fragments with each other as well as to identified pieces, with some success. I believe that it is unlikely that any further analysis of these fragments would alter either the number of taxa or the minimum number of individuals already present in the sample.

Less than 200 bone remains are considered identifiable below the class level. Mammal, fish, bird, and reptilian remains are represented. To date, 125 have been identified to family or lower taxon and are reported on in detail below. Of these, 83 (66.4%) are of mammalian origin, 41 (32.8%) are reptilian, and one is avian.

Account of Shell Remains

Six taxon are represented by 1553 shell remains. These include the freshwater river snail known locally as jute or tutu (Pachychilus spp.), the apple snail (Pomacea sp.), marine conch shell (Strombidae?), freshwater bivalves (Nephronaias ortmanni), and crab elements (Bracyura). These are discussed in greater detail below.

GASTROPODA - Both local and marine species are represented. The majority of the sample consists of the freshwater river snail jute (Pachychilus spp.). At least two species are

represented by the 938 remains recovered. Also represented, though to a much lesser extent, is the freshwater apple snail (Pomacea flagellata). The remainder of the gastropods are marine conch shell fragments (Strombus sp.?) which would have been imported from the Caribbean coast. These have been tentatively assigned to the family Strombidae until further analysis has been completed.

Jute (Pachychilus spp.) - This genus is represented at Cahal Pech by at least two species, Pachychilus indiorum and Pachychilus glaphyrus. These can be distinguished in the archaeological record by the presence or absence of shell sculpturing. Sculpturing is present on the shell of P. glaphyrus, but is absent on P. indiorum.

The majority of the jute snails recovered from Cahal Pech are P. glaphyrus which are characteristically larger and heavier than P. indiorum. A total of 490 (52.2%) remains of P. glaphyrus were identified. P. indiorum is represented by 416 (44.3%) remains, while the remaining 32 (3.4%) specimens have not been identified below the genus level. Almost all remains examined had broken spires, usually along the third or fourth whorl from the apex, indicating that the snails were used as a food source by the inhabitants of Cahal Pech before deposition. Jute snails are still prepared and eaten by some of the modern Maya residents of the region today though its consumption appears to be on the decline (Healy et al. 1990).

Pomacea flagellata - The apple snail, as it is more commonly known, is represented by a total of 15 remains. This represents only 1% of all shell remains recovered. This snail is known to have been used as a food source by the ancient Maya, and may also have played an important role in ceremony and mythology (Moholy-Nagy 1978; Emery 1986, 1989).

The low percentage of recovered remains may be attributable to habitat preferences of the apple snail (Jaime Awe, personal communication). Pomacea inhabit slow moving waters, i.e. swamp or marsh type environments, at a depth of usually 1-2 metres. These types of environments are not found in the immediate area surrounding Cahal Pech.

Conch Shell (Strombidae?) - A total of 166 conch shell fragments have been tentatively identified as belonging to this family. This represents 10.7% of all shell remains, and 14.8% of all gastropod remains. Worked specimens as well as charred fragments were recovered. The analysis of these is not yet complete.

PELECYPODA - This class is represented by only one species at Cahal Pech. A total of 432 remains of the freshwater bivalve Nephronaias ortmanni were recovered, representing 27.8% of all shell remains. This included 180 right valves, 178 left valves, and 74 fragments which could not be assigned to side, representing a minimum of 180 individuals.

CRUSTACEA - Two crab claw portions were recovered. To date, these have only been identified to taxonomic order (Brachyura). Crabs that might be expected in the area are the blue crab (Callinectes sapidus), stone crab (Menippe mercenaria), and the blue land crab (Cardisoma guanhumi) (Hartshorn et al. 1984:138). Both elements were calcined. A marine origin for these crab elements has not been ruled out.

Account of Bone Remains

Of the approximately 200 bone remains considered identifiable below the class level, only 125 have been identified to family or lower taxon. The remaining identifiable bones

contain representatives of fish, bird, turtle, and mammalian species. A more detailed account of the 125 identified specimens is given below.

REPTILIA - A total of 41 remains have been identified as crocodile (Crocodylus sp.). All are cranial elements and are believed to represent only one individual. To date, portions of a partial maxilla and premaxilla, as well as a complete dentary and splenial have been identified. The remaining fragments are believed to represent portions of these elements. These remains are representative of either the American crocodile (Crocodylus acutus) or the smaller Morelet's crocodile (Crocodylus moreleti).

Because no comparative reference material was available for the Morelet's crocodile, identification could only be made to the genus level.

AVES - Only one avian element has been identified to family or lower taxon to date. This is a partial tibiotarsus tentatively identified to the Cracidae family. Bird members of this family found in Belize include the great curassow (Crax rubra), the crested guan (Penelope purpurascens), and the plain chachalaca (Ortalis vetula). Due to the fragmentary nature of the specimen, identification to the species level may not be possible. The size of the fragment is comparable to that of the great curassow or crested guan.

MAMMALIA - Fifteen taxa are represented by the 83 remains identified to family or lower taxon. These included dog, deer, rabbit, opossum, armadillo, peccary, rodent, insectivore, and human remains. Very few remains exhibit any evidence of modification. It is possible that poor preservation of the faunal material may account for the lack of evidence for modification such as cut marks. Only one charred element has been identified.

Deer, dog, armadillo, rabbit, and peccary would have been used as food sources by the Maya. It is possible that the opossum may have also been consumed. Ritual and or ceremonial use of fauna at Cahal Pech may be accountable for the presence of some specimens. Ceremonial use of fauna among the Maya has been well documented (Pohl 1983, 1985).

Deer (Cervidae) - A total of 25 deer elements were identified, representing a minimum of 3 individuals. This included 17 white-tailed deer remains (Odocoileus virginianus), 2 red brocket deer bones (Mazama americana), and 6 elements which could only be identified to the family level. At least two white-tailed deer and one brocket are represented. Three modified elements were recovered. This included one metapodial fragment which has been polished along one edge, one metapodial fragment which appears to have been in the process of being made into an awl or punch, and one drilled scapula which has been tentatively identified as cervid. One white-tailed deer charred antler fragment was also recovered.

Deer were the preferred source of meat for the Maya, especially among the elite (Pohl 1985:137). Their remains have been found at many sites and in some cases, such as at Lubaantun, they greatly outnumber other animal remains recovered (Hammond 1982:158).

The majority of deer elements identified are those of the hind limbs (pelvis, femur, tibia, calcaneum, and astragalus). Pohl has stated that the hind legs of deer were often served as offerings in religious ceremonies (1985:141). She also discusses the distribution of left and right deer elements within elite contexts at Seibal and concludes that "directional symbolism" played an important role in religious activity (1985:142). Evidence for this at Cahal Pech may

be present and is currently being investigated by the author. Inferences pertaining to differential access to, and ceremonial use of fauna at Cahal Pech would nevertheless be premature at this point.

Dog/Coyote (Canis sp.) - A total of 14 specimens were identified as Canis sp.. A minimum of three individuals are present. It is likely that these are domestic dog remains rather than coyote, primarily on size differences between the two. Most of the remains, however, are post-cranial, making the distinction between the two at the species level problematic.

The majority of these remains (9 specimens) were recovered from within Cunil contexts which has been dated between 1000 and 800 B.C. Of interest is the fact that seven of these represent scapula portions, including one drilled specimen. The significance of this high percentage of scapulae portions is unclear. It is possible that these remains, together with the deer hind limb bones recovered from similar contexts, may reflect ceremonial use. This too remains to be investigated. Also recovered were one right mandible and one left upper canine which has been drilled through the root portion.

Opposum (Didelphidae) - A total of 12 remains were identified representing a minimum of 2 individuals. These remains closely follow those of the common opossum (D. marsupialis), however several species within the family are present in Belize. The remains have yet to be checked with reference material for all species present, though the size of the remains strongly suggests that either the common or Virginia (D. virginiana) opossum is represented.

Rabbit (Sylvilagus sp.) - A total of 11 rabbit remains were identified. Two individuals may be represented. These remains are from either the eastern cottontail (S. floridanus) or the forest rabbit (S. brasiliensis).

Nine-Banded Armadillo (Dasypus novemcinctus) - A total of six osteoderms (scutes) were identified representing a minimum of one individual. Armadillos are prized for their excellent meat (Emmons 1990:42).

Peccary (Tayassu sp.) - Two elements, including one drilled scapula, were identified as peccary. These represent either the collared (T. tajacu) or white-lipped (T. pecari) species. One individual is represented.

Procyonids (Procyonidae) - Two elements have been tentatively placed within this family. Both are humerus portions and may represent the same element. The presence of an entepicondylar foramen and size of the element was used to identify the element as most likely belonging to a procyonid. Members of this family which would be expected in Belize include the raccoon (Procyon lotor), coati (Nasua narica), kinkajou (Potos flavus), and cacomistle (Bassariscus sumichrasti) (Hartshorn et al. 1984:144).

Human (Homo sapiens) - Three human elements were identified. These included a premolar and two metacarpal fragments representing a minimum of one individual.

Intrusive Elements - Six remains recovered are considered intrusive. These include the remains of shrew, big-eared climbing rat, hispid cotton rat, and rat or mice remains identified

only to family. One squirrel element identified may also be intrusive.

Summary

Ongoing analyses of the faunal remains recovered from within Str. B-4, Cahal Pech, suggests wide faunal resource utilization by its inhabitants throughout the Middle and Late Formative periods. Shell and bone remains representing over twenty taxa have been identified to date. Among shell remains, the primary food source was the local freshwater jute snail. Marine conch shell is also present. The major meat sources appear to have been deer, dog, rabbit, armadillo, and possible opossum.

The completion of the analysis of the faunal material recovered from Cahal Pech will provide important information on animal resource utilization among the lowland Maya, particularly during the early Middle Formative period (1000 - 600 B.C.), and may also indicate that status differences and differential access to wealth or goods that featured prominently during Classic times may have been present during the early Middle Formative period.

Acknowledgements

Identification of the bone remains recovered from within structure B4, Cahal Pech, have been carried out with the aid of the skeletal reference collections housed at the Royal Ontario Museum (Departments of Vertebrate Palaeontology and New World Archaeology) and the University of Toronto (Faunal Archaeo-Osteology Laboratory, Department of Anthropology). I would like to thank Kevin Seymour, and Drs. Elizabeth Graham and Howard G. Savage respectively, for their assistance.

All shell identifications were made while in the field by the author and Jacqueline Dale (Department of Archaeology, Simon Fraser University) during the 1991 season. We wish to thank Jaime Awe and Mercedes Velasco (both of the University of London) for providing us with an initial introduction to some of the various shell species present in Belize.

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Table 1: List of Taxon Represented**CRUSTACEA**

Brachyura	crab
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MOLLUSCA

Gastropoda	
Strombidae	conch shell
Ampullaridae	
<u>Pomacea flagellata</u>	apple snail
Pleuroceridae	
<u>Pachychilus</u> spp.	jute snail
Pelecypoda	
Unionidae	
<u>Nephronaias ortmanni</u>	freshwater mussel

REPTILIA

Testudines	turtle
Crocodylia	
Crocodylidae	
<u>Crocodylus</u> sp.	crocodile

AVES

Galliformes	
Cracidae	curassows/guans

MAMMALIA

Marsupialia	
Didelphidae	opossum
Edentata	
Dasypodidae	
<u>Dasypus novemcinctus</u>	nine-banded armadillo
Insectivora	
Soricidae	
<u>Criptotis</u> sp.	shrew
Primates	
Hominidae	
<u>Homo sapiens</u>	human
Lagomorpha	
Leporidae	
<u>Sylvilagus</u> sp.	rabbit
Rodentia	
Sciuridae	

	<u>Sciurus</u> sp.	squirrel
	Cricetidae	
	<u>Ototylomys phyllotis</u>	big-eared climbing rat
	<u>Sigmodon hispidus</u>	hispid cotton rat
	Cricetidae sp.	mouse/rat
Carnivora		
	Canidae	
	<u>Canis</u> sp.	dog/coyote
	Procyonidae	procyonid
Artiodactyla		
	Tayassuidae	
	<u>Tayassu</u> sp.	peccary
	Cervidae	
	<u>Odocoileus virginianus</u>	white-tailed deer
	<u>Mazama americana</u>	red brocket deer
	Cervidae sp.	deer species

Table 2: Faunal Sample from Structure B-4

	<u>NISP</u>	<u>%Sample</u>
Shell Remains		
<u>Pachychilus glaphyrus</u>	490	21.6%
<u>Nephronaias ortmanni</u>	432	19.0%
<u>Pachychilus indiorum</u>	416	18.3%
Conch shell	166	7.3%
<u>Pachychilus sp.</u>	32	1.4%
<u>Pomacea flagellata</u>	15	0.7%
Brachyura	2	0.1%
Total	1553	8.4%
Bone Remains		
Unidentifiable	520 (app.)	22.9%
<u>Crocodylus sp.</u>	41	1.8%
<u>Odocoileus virginianus</u>	17	0.7%
<u>Canis sp.</u>	14	0.6%
Didelphidae	12	0.5%
<u>Sylvilagus sp.</u>	11	0.5%
<u>Dasyopus novemcinctus</u>	6	0.3%
Cervidae sp.	6	0.3%
<u>Homo sapiens</u>	3	0.1%
<u>Criptomys sp.</u>	2	0.1%
<u>Ototylomys phyllotis</u>	2	0.1%
Procyonidae	2	0.1%
<u>Mazama americana</u>	2	0.1%
<u>Tayassu sp.</u>	2	0.1%
Cracidae sp.	1	trace
<u>Sciurus sp.</u>	1	trace
<u>Sigmodon hispidus</u>	1	trace
Cricetidae sp.	1	trace
Not yet identified	76 (app.)	3.3%
Total	720	31.7%
Total	2273	99.9%

Table 3: Faunal Remains by Cultural Phase

<u>Taxon</u>	A	B	C	D	E	F
<u>Pachychilus</u> spp.	146	267	248	186	91	938
Conch shell	53	45	53	15	-	166
<u>Nephronaias</u> sp.	43	92	174	72	51	432
<u>Pomacea</u> sp.	5	3	4	3	-	15
Crab	-	1	1	-	-	2
unident. bone	23	19	84	191	258	575
Crocodile	-	-	-	-	41	41
Curassow/Guan	-	-	-	-	1	1
White-tailed deer	2	3	2	9	1	17
Dog/coyote	1	-	4	1	8	14
Opossum	-	-	5	6	1	12
Rabbit	-	-	-	9	2	11
Cervid	1	1	-	4	-	6
Armadillo	-	-	-	-	6	6
Human	2	-	-	-	1	3
Red brocket deer	1	1	-	-	-	2
unident. bird	-	1	-	2	-	3
unident. fish	-	3	-	8	-	11
Turtle	-	-	1	-	-	1
Procyonid	-	-	-	2	-	2
Peccary	-	-	-	1	1	2
Rodent	-	-	-	5	-	5
Carnivore	-	-	-	1	-	1
Shrew	-	-	-	-	2	2
Rat/Mouse	-	-	-	-	4	4
Squirrel	-	-	-	-	1	1
Total	277	436	576	515	469	2273

Legend

A - Classic Period (A.D. 250-900)

B - Late Formative (Xakal Phase (350 B.C. - 250 A.D.))

C - Late Middle Formative (late Kanluk Phase (650-350 B.C.))

D - Early Middle Formative (early Kanluk Phase 850-650 B.C.)

E - Early Middle Formative (Cunil Phase (1000-850 B.C.))

F - Total

APPENDIX 2

**REPORT OF RADIOCARBON DATING ANALYSIS
OF CHARCOAL SAMPLES FROM CAHAL PECH**

BETA ANALYTIC



BETA ANALYTIC INC.
 (305) 667-5167

UNIVERSITY BRANCH
 P.O. BOX 248113
 CORAL GABLES, FLA. 33124

REPORT OF RADIOCARBON DATING ANALYSES

FOR: Jamie J. Awe DATE RECEIVED: November 14, 1990
Trent University DATE REPORTED: December 5, 1990
 _____ SUBMITTER'S PURCHASE ORDER # _____

OUR LAB NUMBER YOUR SAMPLE NUMBER C-14 AGE YEARS B.P. \pm 1 σ

Beta-40863	Sample #1	2470 +/- 90 BP	(charcoal)
Beta-40864	Sample #2	2720 +/- 60 BP	(charcoal)
Beta-40865	Sample #3	2740 +/- 70 BP	(charcoal)

These dates are reported as RCYBP (radiocarbon years before 1950 A.D.) By International convention, the half-life of radiocarbon is taken as 5568 years and 95% of the activity of the National Bureau of Standards Oxalic Acid (original batch) used as the modern standard. The quoted errors are from the counting of the modern standard, background, and sample being analyzed. They represent one standard deviation statistics (68% probability), based on the random nature of the radioactive disintegration process. Also by International convention, no corrections are made for DeVries effect, reservoir effect, or isotope fractionation in nature, unless specifically noted above. Stable carbon ratios are measured on request and are calculated relative to the PDB-1 International standard; the adjusted ages are normalized to -25 per mil carbon 13.



BETA ANALYTIC INC.
 (305) 667-5167

UNIVERSITY BRANCH
 P.O. BOX 248113
 CORAL GABLES, FLA. 33124

REPORT OF RADIOCARBON DATING ANALYSES

FOR: Jamie J. Awe DATE RECEIVED: October 6, 1992
Trent University DATE REPORTED: November 2, 1992
 _____ SUBMITTER'S
 PURCHASE ORDER # _____

OUR LAB NUMBER YOUR SAMPLE NUMBER C-14 AGE YEARS B.P. $\pm 1\sigma$

Beta-56765 Sample #2 2730 +/- 140 BP (charcoal)

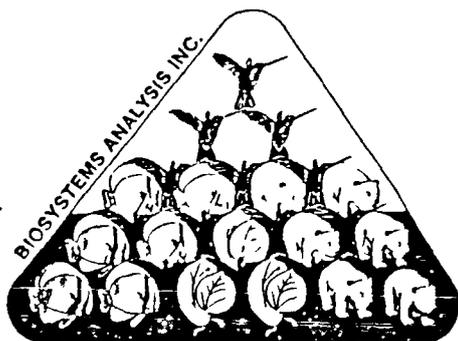
These dates are reported as RCYBP (radiocarbon years before 1950 A.D.). By international convention, the half-life of radiocarbon is taken as 5568 years and 95% of the activity of the National Bureau of Standards Oxalic Acid (original batch) used as the modern standard. The quoted errors are from the counting of the modern standard, background, and sample being analyzed. They represent one standard deviation statistics (68% probability), based on the random nature of the radioactive disintegration process. Also by international convention, no corrections are made for DeVries effect, reservoir effect, or isotope fractionation in nature, unless specifically noted above. Stable carbon ratios are measured on request and are calculated relative to the PDB-1 international standard, the adjusted ages are normalized to -25 per mil carbon 13.

APPENDIX 3

**REPORT OF X-RAY FLUORESCENCE ANALYSIS
OF ARTIFACT OBSIDIAN FROM CAHAL PECH**

BY

C. STEVENSON AND T.L. JACKSON



REPORT OF X-RAY FLUORESCENCE ANALYSIS OF ARTIFACT OBSIDIAN FROM CAHAL PECH

Thomas L. Jackson

February, 18, 1992

Thirteen pieces of artifact obsidian from Cahal Pech were submitted for determination of the original geological source of the raw material using energy dispersive X-ray fluorescence trace-element analysis.

X-RAY FLUORESCENCE METHODS

Analyses were completed using a Spectrace 5000 energy dispersive X-ray fluorescence system. The system is equipped with a Si(Li) detector with a resolution of 155 eV FWHM for 5.9keV X-rays (at 1000 counts per second) in an area 30mm². Signals from the spectrometer are amplified and filtered by a time variant pulse processor, and sent to a 100 MHz Wilkinson type analog-to-digital converter. The X-ray tube employed is a Bremsstrahlung type, with a Rh target, and 5 mil Be window. The tube is driven by a 50 kV 1 mA high voltage power supply, providing a voltage range of 6 to 50 kV.

For analysis of the elements zinc (Zn), gallium (Ga), lead (Pb), thorium (Th), rubidium (Rb), strontium (Sr), yttrium (Y), zirconium (Zr), and niobium (Nb), the Rh X-ray tube is operated at 30 kV, .30 mA (pulsed), with a .127 mm Pd filter. Analytical lines used are: Zn (K-alpha), Ga (K-alpha), Pb (L-alpha), Th (L-alpha), Rb (K-alpha), Sr (K-alpha), Y (K-alpha), Zr (K-alpha) and Nb (K-alpha). Scanning period is 300 seconds live-time in an air path. Trace-element intensities for the Zn-Nb series elements are converted to parts-per-million (ppm) by weight using a least squares polynomial fit routine. Ppm values may vary according to specimen mass and nature of the surface of the sample. All samples are scanned as unmodified rock specimens (not powder).

X-RAY FLUORESCENCE RESULTS

Analytical results are given in the following table.

Trace-Element Concentration Values: Cahal Pech

Sample #	ZN	GA	PB	TH	RB	SR	Y	ZR	NB	Location
DL-92-106	48.1	13.3	23.0	9.3	148.7	143.9	21.2	91.1	11.5	EC
+/-	3.9	1.7	1.9	2.0	1.5	5.4	1.1	4.2	1.4	
-107	48.7	11.5	24.2	11.1	147.5	150.2	21.0	106.0	10.1	EC
+/-	3.8	1.7	1.8	1.9	1.4	5.4	1.1	4.2	1.4	
-108	47.2	12.9	27.4	12.8	152.5	153.9	21.1	108.1	12.7	EC
+/-	4.0	1.8	2.0	2.0	1.6	5.4	1.3	4.3	1.5	
-109	38.8	12.1	23.2	7.8	118.1	196.0	15.7	110.3	6.4	SMJ
+/-	4.2	1.8	1.9	2.1	1.5	5.5	1.2	4.3	1.6	
-110	48.5	10.9	21.4	6.4	116.3	195.3	16.8	112.0	9.2	SMJ
+/-	4.2	1.9	2.1	2.3	1.7	5.5	1.4	4.4	1.7	
-111	44.5	9.0	23.3	6.6	116.8	198.8	17.8	112.7	8.9	SMJ
+/-	4.1	1.7	1.8	2.2	1.5	5.5	1.2	4.3	1.5	
-112	47.0	11.2	21.8	10.5	118.6	194.3	14.0	109.1	7.0	SMJ
+/-	4.4	2.0	2.0	2.1	1.6	5.5	1.4	4.3	1.6	
-113	41.4	12.9	25.6	9.1	148.5	152.7	19.5	105.2	8.6	EC
+/-	3.7	1.5	1.7	1.9	1.4	5.4	1.1	4.2	1.4	
-114	49.8	11.5	24.6	11.3	148.7	147.3	19.7	106.9	11.7	EC
+/-	3.6	1.5	1.8	1.9	1.4	5.4	1.1	4.2	1.4	
-115	52.5	13.0	28.1	17.5	150.8	152.1	20.4	107.1	11.2	EC
+/-	4.1	1.9	2.0	2.0	1.8	5.5	1.3	4.3	1.6	
-116	46.3	12.1	26.5	10.0	137.5	145.4	21.0	105.6	10.5	EC
+/-	4.0	1.7	1.9	2.0	1.5	5.4	1.2	4.2	1.4	
-117	45.4	14.0	23.6	11.9	146.9	150.9	18.3	106.7	9.5	EC
+/-	4.1	1.8	2.0	2.0	1.6	5.4	1.2	4.3	1.5	
-118	50.4	12.4	25.6	9.0	150.6	155.2	21.9	108.7	9.2	EC
+/-	3.9	1.7	1.9	2.0	1.6	5.4	1.2	4.3	1.5	
RGM-1	39.1	10.4	18.7	15.6	144.1	103.1	26.0	215.4	10.1	reference
+/-	3.8	1.7	1.8	1.9	1.3	5.3	1.0	4.2	1.3	standard

Abbreviations: EC = El Chaya ; SMJ = San Martin Jilotepeque

Table 1

Obsidian Hydration Rim Measurements and Dates
from Cahal Pech, Belize

Lab No.	Provenience	Obsidian Source	Rim Width (um)	S.D.	Date	S.D.
DL-92-106	Str. B-4,U.5,L.13	EC	5.17 4.28	0.05 0.05		
DL-92-107	Str. B-4,U.5,L.9	EC	3.67	0.05		
DL-92-108	Str. B-4,U.4,L.3	EC	1.01	0.07		
DL-92-109	Str. B-4,U.4,L.3	SMJ	2.14 1.06	0.07 0.07		
DL-92-110	Str. B-4,U.4,L.3	SMJ	0.99	0.04		
DL-92-111	Str. B-4,U.4,L.7	SMJ	3.91	0.07		
DL-92-112	Str. B-4,U.4,L.7	SMJ	3.89	0.07		
DL-92-113	Str. B-4,U.4,L.11	EC	4.12	0.06		
DL-92-114	Str. B-4,U.4,L.11	EC	4.14	0.05		
DL-92-115	Str. B-4,U.4,L.11	EC	4.42	0.04		
DL-92-116	Str. B-4,U.4,L.11	EC	4.24	0.05		
DL-92-117	Str. B-4,U.4,L.11	EC	4.34	0.07		
DL-92-118	Str. B-4,U.4,L.11	EC	4.27	0.08		

