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Continuity and Disjunction: The Pre-Classic Antecedents of Classic Maya Architecture

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Since the early 1960s, archaeological explorations in the Maya area have recovered remnants of Pre-Classic buildings of varying form, function, and meaning that clearly prefigure later Classic forms. The lack of hieroglyphic texts in the Pre-Classic periods, however, dictates that the function and meaning of these early buildings be demonstrated by means of detailed archaeological and technical analyses of the variations and consistencies in their sizes, forms, construction techniques, and use. My purpose in this paper is to initiate such a study and to describe the Pre-Classic antecedents of Classic Maya architecture and construction techniques. This exercise is inherently developmental and has clear implications for the evolution and early development of the institutions thought to be embodied in Classic architecture. The Middle Pre-Classic beginnings of complex architecture in the lowlands, for example, imply an equally early evolution of the complex sociopolitical institutions represented in such architecture.

Classic Maya buildings stand as mute monuments of the sociopolitical, economic, and ideological systems of their creators. Unfortunately, the antecedents of these buildings, and by implication their associated institutions, remain poorly understood. To date, information on the formal and technical antecedents of Classic Maya buildings has been limited, inaccessible, or subject to intellectual and sampling biases. Consequently, my main purpose here is to bring together the extant data on early Maya architecture and to demonstrate the connections between early developments and later architecture. New evidence of Pre-Classic architecture underscores both its novelty and uniformity vis-à-vis Classic architecture. The continuities are clear and convincing and generally much

earlier than previously supposed. Considering early Maya buildings broadly in synchronic and diachronic perspective, the data presented here, I argue, suggest an autochthonous development of elaborate architecture in the Maya lowlands.

MAYA ARCHITECTURE AND EVOLUTIONARY MODELS

Traditional models for the rise of lowland Maya civilization result from decades of archaeological investigations in sites that, on the basis of architecture and associated artifacts, display what appeared to be a gradual evolutionary development. Use of terms such as "simpler," "developmental," or "formative" with respect to ceramics and architecture (i.e., Smith 1937: 3; Coe and Coe 1956: 372) had clear evolutionary implications. In 1968, Sanders and Price (1968: 140) stressed that monumental architecture accurately reflects societal complexity. But they also assumed that these patterns occurred most clearly in the great highland centers, an assertion with unfortunate, tendentious effects on regional and chronological research. According to Sanders and Price (1968) "in architecture, the contrast (between Highland states and Lowland chiefdoms) is even more striking; no Formative site is comparable in size, quality, or complexity to the great Classic and Postclassic centers."

Accordingly, Maya civilization was thought to have emerged later in Mesoamerica, and Maya accomplishments were thought to have stemmed largely from contact with their more sophisticated highland neighbors. Thompson, for example, suggested that

> such an isolated region as the Peten would hardly have witnessed the beginnings of Maya civilization, which might rather be expected in parts of the Maya area where the stimulus of contact with other cultures should have quickened development—Central Chiapas seems ideal. (Thompson 1954: 50)

Before about 1962, the relative paucity and diminutive size of known lowland Pre-Classic buildings (see Hansen 1990: 3ff), in contrast to the spectacular and abundant Classic remains, fostered a bias that Maya civilization developed by about a.d. 300. This model assumed that architectural development, as a reflection of cultural complexity, was gradual in nature, with assumptions about the antiquity and nature of formative ceremonial architecture (and related sociopolitical interactions) based on negative evidence. The initial work on the North Acropolis at Tikal was perhaps the first indication of a problem with the chronology that purported a gradual, lineal evolution from egalitarian groups to civilization. Coe and McGinn noted:

> Nevertheless, as we cut farther down, the elaborateness and Classic appearance of the discovered structures were no less apparent. Things were not getting simpler, or cruder, or increasingly formative. (Coe and McGinn 1963: 26)

Pre-Classic Maya constructions have been relatively sparse with few exceptions. Puleston found in his settlement study at Tikal that

> in comparison with areas within what later becomes the site residential area, Pre-Classic settlement is comparatively light. Sometime during Early Classic times there appears to have been a really substantial increase in population. While out of 41 tested groups, only 7 showed even possible evidence of Pre-Classic occupation, and all but 1 produced evidence of Early Classic occupation. (Puleston 1974: 308)

Haviland (1965: 19) showed that 6 of 117 housemounds surveyed at Tikal dated to Pre-Classic periods, whereas Fry (1969) noted only 14 of 102 test pits throughout the site that had Pre-Classic ceramics. Culbert (1977: 31–32) determined that little more than 13% of 267 excavation locations produced ceramic evidence of Pre-Classic occupation. Recent excavations of housemounds near Structure 5C-54 at Tikal failed to locate a single Pre-Classic residence in the 16 major groups investigated (Valdés 1985), and similar low frequencies of Pre-Classic remains are found at numerous sites throughout the Maya area (Coe and Sharer 1979: 22; Fash 1991: 71; Folan, Kintz, and Fletcher 1983: 213; Hammond 1977: 65; Pendergast 1979; Rands 1974: 54; 1977: 160; Rice 1976; A. L. Smith 1950: 71; Tourtellot 1970: 411; Valdés n.d.; Willey 1973: 22–39; Willey et al. 1965: 96, 562–564; Willey et al. 1975: 36, 40–41, 231). The various investigative strategies used at the sites suggest, in some cases, a genuine lack of Pre-Classic occupation. In other instances, however, the sample may have been biased only to superficial deposits. Of greater theoretical import is the evidence for rapid population growth and settlement concentration in some regions of the lowlands.

PRE-CLASSIC ARCHITECTURE: LOCATION AND CONTEXT

What we know today about Pre-Classic architecture comes from a variety of excavation techniques, including large- and small-scale horizontal exposures, tunnels, and deep architectural trenches. These studies permit a detailed view of Pre-Classic architectural developments as precursors of later Classic traditions (Fig. 1). It is curious that many of the great Classic centers such as Palenque, Copan, and Quirigua, situated near rich alluvial plains, were small or

Fig. 1 Map of the Maya area showing Pre-Classic sites with known public architecture. Courtesy of the Brigham Young University Department of Geography.

nonexistent in Pre-Classic times (Rands 1977: 160; Fash 1991), suggesting that initial settlement and architectural development were not necessarily related to competition for prime agricultural soils or for other advantages such as irrigation or river transportation.

Investigations in the extreme north-central Peten reveal new information about early architectural development. This area, which we term the "Mirador

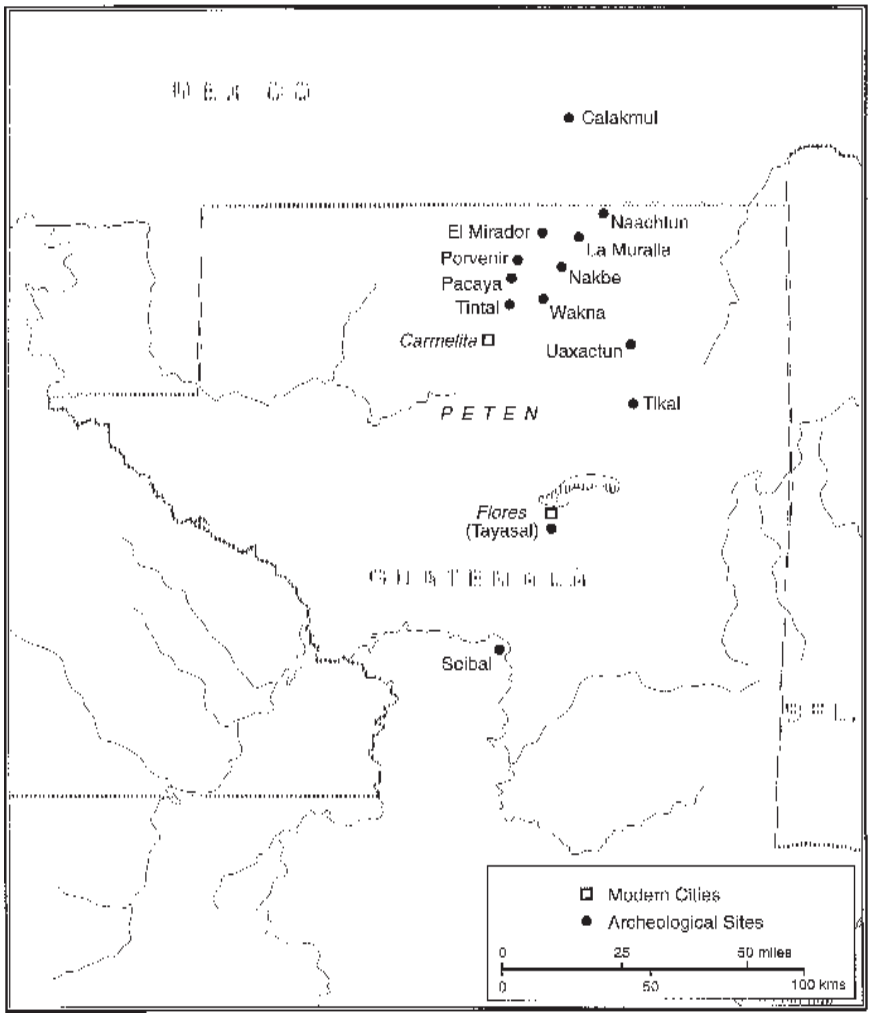

Fig. 2 Map of the northern Peten showing the concentration and density of Pre-Classic sites within the Mirador Basin. Courtesy of the Brigham Young University Department of Geography.

Basin" after the largest site in the area, is bordered by rugged karstic formations on the eastern, southern, and western flanks, forming a triangular region of approximately 1100 km^2 (Fig. 2). Extensive bajos or low-lying, seasonal swamps characterize the area. To date, excavations have revealed abundant Middle and Late Pre-Classic architectural remains and other manifestations of complex so-

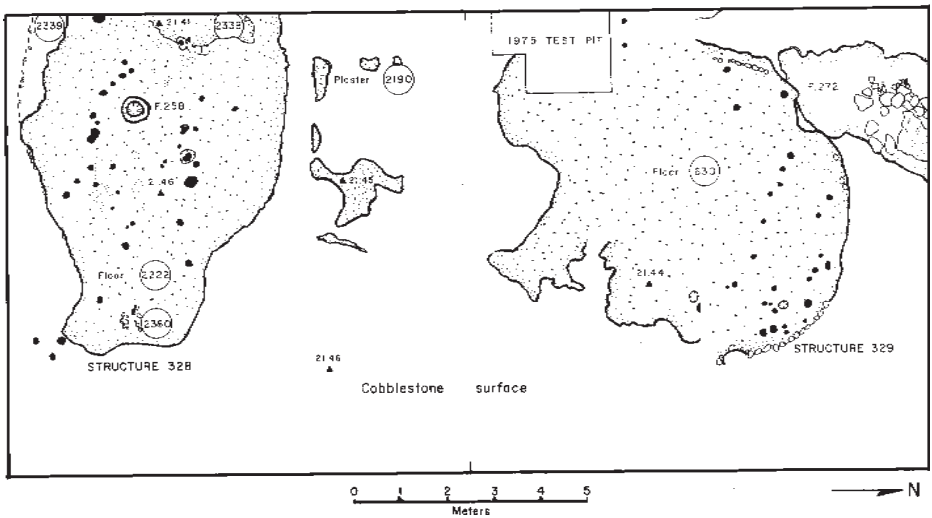

Fig. 3 Early Middle Pre-Classic architecture at Cuello, Belize (after Gerhardt 1988: 9).

ciety. The large size and scale of several sites in the basin (El Mirador, Nakbe, Wakna, Tintal) are impressive in view of their antiquity (ca. 1000 b.c. to a.d. 150) (Hansen 1992c). The presence of exposed Middle and Late Pre-Classic architecture allows easier access to early buildings than the deeply buried constructions found elsewhere (Matheny, Hansen, and Gurr 1980; Dahlin 1984; Demarest 1984; Matheny 1986, 1987; Hansen 1990, n.d.a, n.d.b; Hansen and Forsyth 1987; Howell and Copeland 1989; Forsyth 1989); but there are also problems. The preservation of these surface structures is often poor because of prolonged exposure to elements, tropical forest growth, and subsequent stone plundering. Furthermore, looters' trenches in Pre-Classic structures often result in more severe destruction than in other buildings because looters tend to place numerous trenches on the earlier structures in the mistaken belief that they missed a tomb in the initial attempts (see Hansen, Bishop, and Fahsen 1991). One advantage is that the antiquity of the surface remains allows for access to substructures of even greater antiquity with better preservation.

PRE-CLASSIC ARCHITECTURE: MIDDLE PRE-CLASSIC

From stratigraphic, ceramic, and absolute dating controls, I believe that the earliest, most securely dated architecture yet identified in the lowlands occurs at Cuello sometime around 1000 b.c. (Hammond 1977, 1991; Hammond, Clarke,

and Robin 1991; Estrada 1992) (Fig. 3). The earliest constructions at Cuello, Structures 329 and 328, consisted of thin (0.05 m) plaster floors on a low platform (0.25 m high) of clay and small black stones. Associated postholes suggest a wooden superstructure that was probably apsidal in shape (Gerhardt 1988: 9–12). Subsequent fill and patio construction were surrounded by Structure 327 (rounded), Structure 326 (apsidal), and Structure 325 (Gerhardt 1988: 22). These three structures with perishable superstructures were slightly elevated above the patio floor through the accumulation of various layers of plaster floors, wash coats, and shallow construction fills. Structure 326 was apsidal, with front and back steps and a "thresholded" doorway. The apsidal forms of the earliest architectural constructions at nearby Colha (Potter et al. 1984) and other areas of Mesoamerica, such as the Pacific coast and Soconusco regions (Clark 1994; Clark and Blake 1994), indicate the antiquity and homogeneity of this form and establish a predictable pattern of early residence architecture.

Early in the Middle Pre-Classic period (ca. 900 to 600 b.c.), there are indications of an extensive, although light, occupation in several areas of the lowlands, such as at Seibal, Altar de Sacrificios, Barton Ramie, and Colha. At Altar de Sacrificios, plaster floors and small platforms, wattle-and-daub constructions (e.g., Md. 25), and postholes occur with such occupations (Willey 1973: 23, 1990: 193). The early Jenny Creek material from Barton Ramie came from 18 of the 65 mounds showing basal deposits, although only three substructure platforms were associated with this phase (Willey et al. 1965: 562). Imprints of poles in burnt mud suggested the presence of wattle-and-daub construction (Willey et al. 1965: 562). Middle Pre-Classic constructions yielding Bolay and Chiwa ceramics were found in the main plaza at Colha (Potter et al. 1984; Anthony and Black 1994). The earliest structure found there, Structure 1, was built in apsidal form on an earthen platform (Anthony and Black 1994: 56; Potter et al. 1984: 629).

Northern Peten

The earliest constructions identified so far at Nakbe in the northern Peten consist of packed, earthen floors on a buried paleosol level with postholes carved into bedrock. Carbon samples from these levels have yielded consistent calibrated radiocarbon dates of 1400 to 1000 b.c. (Table 1), but the sample of ceramics from this period is poor. Later Middle Pre-Classic deposits, primary in nature, buried these earliest levels in both the eastern and western groups at Nakbe, but we have reason to believe that remains from this period may be found closer to the *bajos* surrounding the site center. Similarly, the earliest remains at Tikal were near the Bajo Santa Fe (Harrison 1986: 49, 57), and Adams

Table 1. Selected Carbon Dates in Association with the Earliest Primary Deposits at Nakbe, Calibrated According to Stuiver and Pearson (1986)

Provenience	Lab	B.P.	Uncalibrated	Calibrated
51C.29.12	UCLA 2834	3085 ± 50	1135 ± 50 b.c.	1433–1295 b.c.
				1278–1265 b.c.
51C.11.33	Beta 31753	2950 ± 80	1000 ± 80 b.c.	1370–1340 b.c.
				1319–1077 b.c.
				1064–1051 b.c.
53G.15.36	UCLA 2840	3110 ± 45	1160 ± 45 b.c.	1433–1373 b.c.
				1436–1318 b.c.*
				1357–1355 b.c.*
				1336–1321 b.c.*
51H.13.60	UCLA 2849 D	2980 ± 100	1030 ± 100 b.c.	1390–1080 b.c.
				1064–1051 b.c.
51G.09.43	UCLA 2836	3185 ± 55	1235 ± 55 b.c.	1519–1412 b.c.
51C.10.23	UCLA 2831	2900 ± 45	950 ± 45 b.c.	1212–1014 b.c.

*These dates are possibilities according to the Sigma ranges (Sigma 1).

(1983: 326–327) points out that population densities may be greater near swamp/marsh areas where agriculture was practiced.[1]

Sometime around 800 b.c., the occupation at Nakbe covered a 50 ha area of the site center. Architecture consisted of low, vertical stone walls forming small platforms with roughly shaped, flat, rectangular stones. These walls range from three to five courses high and about half a meter in height (Fig. 4). They apparently supported wooden superstructures, although no postholes were detected within the walls themselves. These walls contained thin *sascab* (gritty limestone marl) floors[2] and, on occasion, hard clay floors. Rich midden deposits were found on the exterior face of these walls, with sherd densities as great as 4000 sherds per m^3 (Forsyth 1993a, 1993b). Changes in the orientation and increasing size of the wall and platform constructions indicate that growth during this period was dynamic. Several clues point to changes in the society associated with the early architectural development at Nakbe, possibly in the differentia-

[1] See also Folan and Gallegos (n.d.).

[2] *Sascab,* or decomposed limestone marl, was easily mined from deposits immediately above bedrock. Unlike lime, this material did not need firing. *Sascab,* a white or yellowish material with a slightly gritty texture, was placed in the earliest floors in the Tigre plaza (Late Pre-Classic) at El Mirador and on small platforms at Nakbe (Middle Pre-Classic). Apparently lime plaster was available before the introduction of *sascab* as a widely used surfacing technique.

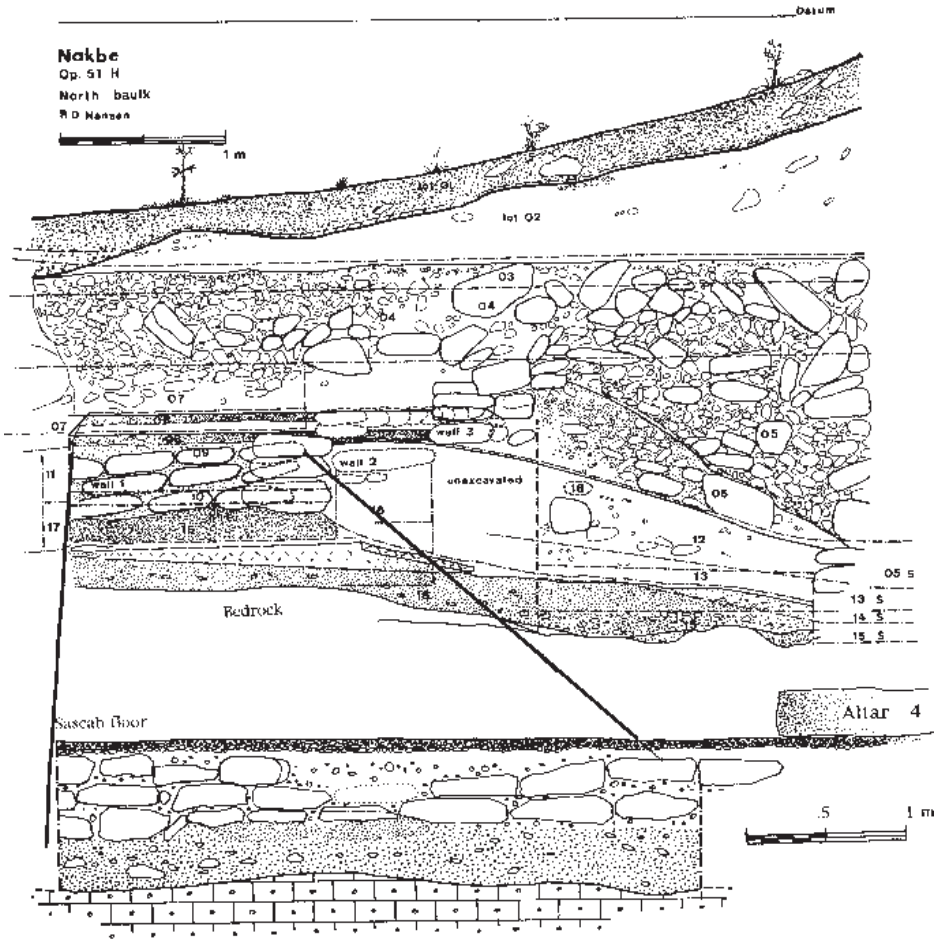

Fig. 4 Early Middle Pre-Classic walls at Nakbe, Guatemala.

tion of status, including exotic imports, symbols of rulership, and dental incrustations, which are considered markers of high status (Hansen 1992c; Mata Amado and Hansen 1992).

Evidence of wattle-and-daub constructions was recovered from a structure sealed below a Middle Pre-Classic plaster floor in the eastern group at Nakbe (Operation 51 K). This low platform had a hard clay floor flanked by large, coarse stones (Fig. 5) with imprints of parallel, narrow, wooden poles in the *mezcla* (lime and clay mortar). Similar buildings were found in Lopez Mamom contexts at Cuello with fragments of wall cladding, parallel impressions of poles,

Fig. 5 Remains of an elevated platform (a) at Nakbe with a small trench (b) for vertically placed wooden poles and covered with mud (Op. 51 K). This wattle-and-daub construction was bordered on the exterior by large stones (c) stacked originally against the wall. One of the blocks had a patch of *mezcla* with imprints of poles.

marks of binder vines, and other perishable materials (Hammond, Clarke, and Robin 1991). At Colha, Middle Pre-Classic stone alignments formed the base of apsidal pole-and-thatch structures with wattle-and-daub walls (Anthony and Black 1994: 39). In the Olmec area, Coe and Diehl (1980: 388) found wattle-and-daub constructions in San Lorenzo that date to 1000 b.c. The range and dispersal of this building technique is impressive in the early Middle Pre-Classic period throughout the lowlands and deserves further study.

At Nakbe, architectural constructions during this period consist of platforms up to 2 m high with vertical walls, small, rough rectangular stones, and a crude *mezcla* surfacing (Fig. 6). The summits of these platforms were covered with thin stucco floors. Rich primary refuse middens accumulated along these platforms, indicating possible residential functions, although much of this material may also have been ritual refuse.[3]

[3] Most of the middens surrounding Middle Pre-Classic platforms contain probable do-

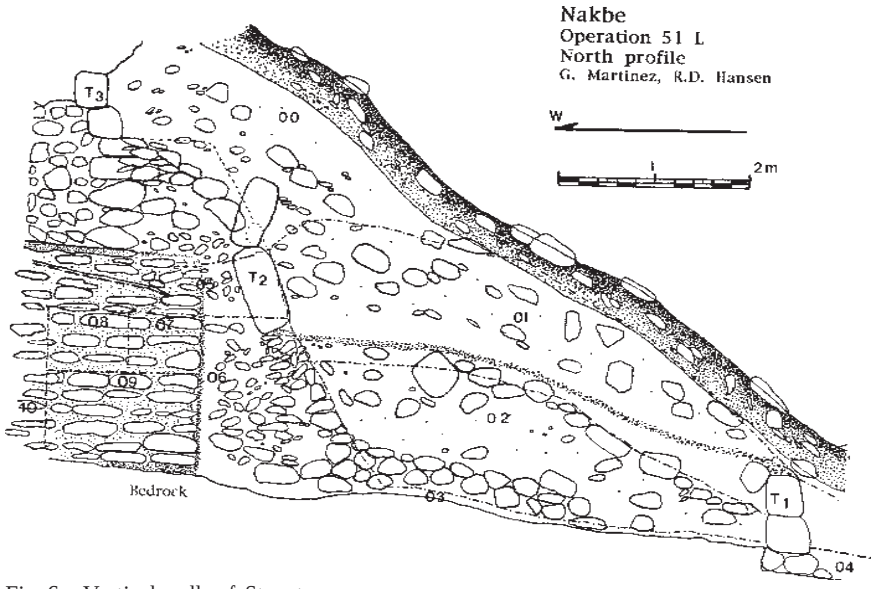

Fig. 6 Vertical walls of Structure 51 L-Sub 1. This buried structure exemplifies larger platforms of the Early Middle Pre-Classic. The vertical walls and thin, roughly shaped blocks were covered with a crude mortar/stucco *mezcla* (*right*). Drawing by Gustavo Martínez Hidalgo and Richard Hansen.

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mestic refuse: broken tecomates, bowls, Palma Daub vessels associated with ash, a few bones, shells, diagnostic waste flakes from stone tool production/rejuvenation. They lack traditional diagnostic remains such as incense burners (*incensarios*). The presence of figurines, ceramics with delicate polychrome stucco applied to the slip, and the abundance of fine ceramics point to trash left by elites.

Fig. 7 Large horizontal excavations of Middle Pre-Classic deposits at the western base of Structure 51, Nakbe. Note the linear placement of stones, the thick stucco floors, and the monument, Altar 4, in the center-line axis of Structures 51 and 52. Photograph by F. R. Hillman.

The next 200 years witnessed a period of expanding platforms and the placement of thick plaster floors (Fig. 7). Platform walls continued to be vertical, although a series of unusual projecting buttress constructions were appended to them (Fig. 7). A thick, well-made plaster floor in the East Group was covered with roughly hewn stones placed in single-file rows. The stones weighed about 100 kg, requiring at least two or three individuals to move them. The increasing sizes of stones and greater labor needed to transport and place them indicate an expanding investment in the architectural landscape. The end of a platform was defined by a row of stones, whereas the top of the platform was a stone mosaic pavement covered with a thin stucco surface (Fig. 8). The construction of platforms filled with carefully placed stones in rows differs substantially from subsequent architecture with rough stone fill and mortar in cell wall

Fig. 8 Middle Pre-Classic stone pavement, which had been covered by Late Pre-Classic Structure 59 at Nakbe. Photograph by F. R. Hillman.

constructions. Nonetheless, it clearly represents a perceptible increase in the ability to muster labor by the early Middle Pre-Classic period.

Recent explorations have located a series of elevated platforms about 1 m high along the southern edge of Nakbe, with a single, elevated structure on one side of the platform. Although we have yet to excavate these structures (which are believed to date to the Middle Pre-Classic), they may be a diagnostic form of Pre-Classic residential architecture as identified at Komchen (Ringle and Andrews 1988; Andrews and Ringle 1992; Ringle n.d.a, n.d.b).

One of the enduring characteristics of Mesoamerican architecture is the association of stone monuments with specific buildings, a trait that extends to the Early and Middle Pre-Classic periods among the Olmec. During the latter part of the Middle Pre-Classic period (late Ox phase) at Nakbe, around 600 to

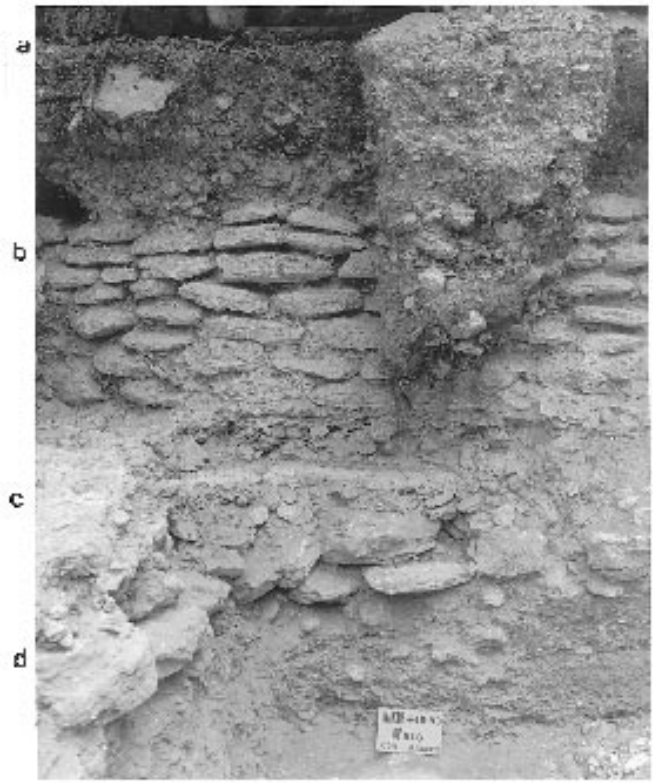


Fig. 9 Excavation at Nakbe showing (a) the present-day ground surface, (b) a Middle Pre-Classic platform wall, (c) a plaster floor, and (d) Early Middle Pre-Classic walls. Photograph by C. Bieber.

500 b.c., a large altar (Altar 4) was placed at the base of a platform wall (Fig. 7). This monument was situated in a center line axis immediately west of Structure 51, indicating that the linkage of architecture to freestanding monuments existed by this time.

Stonework from the early Middle Pre-Classic (Ox) period (1000 to 600 b.c.) at Nakbe consists of quarried, unfinished stones of a rough rectangular shape. These stones consisted of relatively uniform, roughly hewn, flat stones stacked vertically in walls (Fig. 9b) and in platforms. It is probable that the "meaningless rows of stones" (Ricketson and Ricketson 1937: 134, 136) and "alignments of rough stones" (Smith 1950: vi) from the earliest occupation at Uaxactun were simple Mamom platforms. The early building reported by Coe

and Coe (1956) at Nohoch Ek, Belize, appears to be the same, albeit more complete. In no instance of early Middle Pre-Classic period (early Ox) building remains have finely cut blocks or evidence of complex quarry specialization been found, although these characteristics followed shortly toward the end of the Middle Pre-Classic period.

LATE MIDDLE PRE-CLASSIC ARCHITECTURE

Ceramics and absolute dates from Nakbe and Wakna indicate that between 600 and 400 b.c. the Mirador Basin experienced major changes in architectural construction styles and techniques. This period belongs to the late Middle Pre-Classic because of the continuation of ceramic types that are confined to the Mamom ceramic sphere (Palma Daub, Muxanal-Red-on-Cream). The Mamom presence is confirmed by the complete absence of types known to exist in the subsequent Chicanel phase, such as unslipped striated ceramics, mushroom vessels, and labial and medial flange bowls. In addition, vessel forms introduced during this period—large bowls with extremely wide, everted rims (up to 12 cm)—seem restricted chronologically. There is some continuity with several early Chicanel forms (incurved-rim bowls), although slip, paste, and surface treatment (incisions) appear to be more consistent with Mamom materials.

It is during this period that many of the modal attributes of later Maya architecture were introduced. The most impressive transformations included the construction of major platforms 3 to 8 m high, covering areas up to 40,000 m^2. The major platforms of the West Group at Nakbe, and nearly all the platforms of the East Group, were constructed during this time. Vast amounts of stone fill, placed in "dry" fashion (without mortar), were dumped over earlier village levels and platforms and covered with thin stucco floors. A few platforms and floors consist of a flat surface formed by a pavement of large stones (Fig. 8). In several instances, a thin *sascab* floor extended underneath Middle Pre-Classic constructions (Structure 49; Fig. 10), but in most cases the floors extended only to the edge of the buildings surrounding a plaza, indicating that the platform construction and erection of monumental architecture were planned, simultaneous events. In the East Group of architecture at Nakbe, the structures extended to heights 18 m (Structure 47) and 14 m (Structure 51) above the platform floor.

"E-Group" Complexes

The earliest consistent architectural form, the E Group, appears during the latter part of the Middle Pre-Classic period in the lowlands. This architectural pattern was first recognized as an important ritual assemblage by Blom in 1924

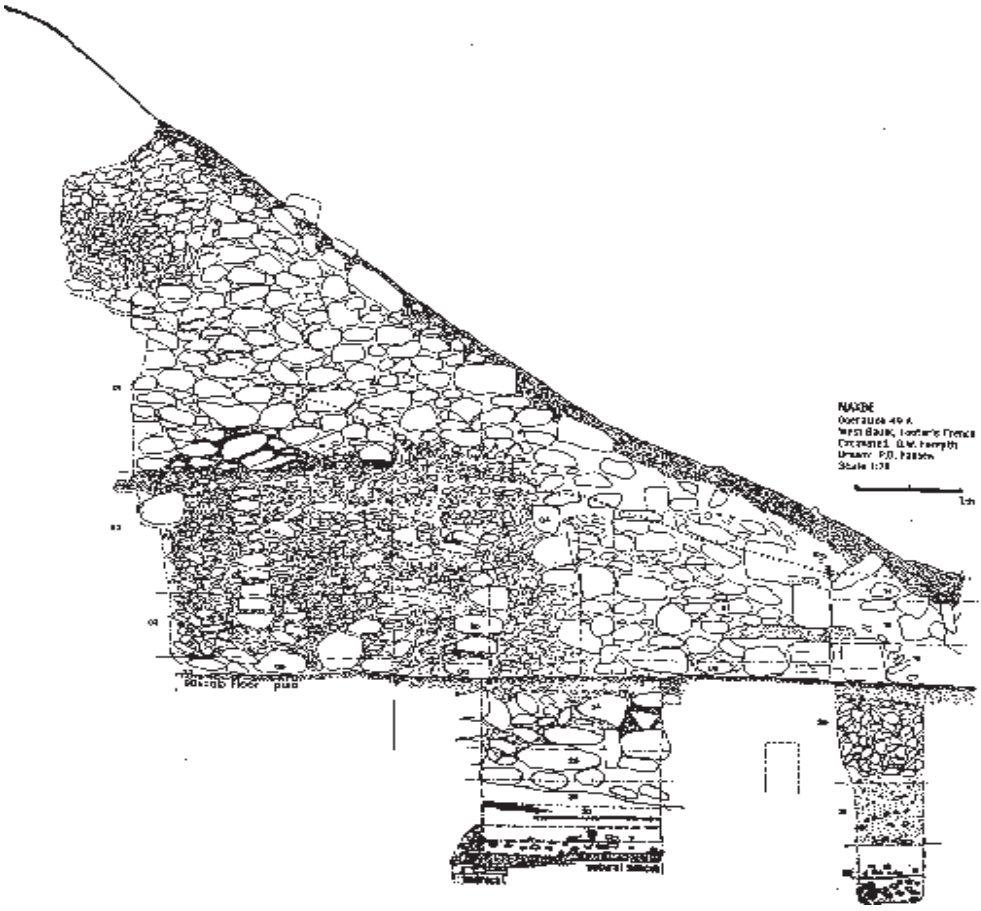


Fig. 10 Profile of Structure 49 and Middle Pre-Classic structure at Nakbe. Note the placement of cell walls and the thin *sascab* floor that extends beneath the building (after Forsyth 1993a: 141).

in the E Group at Uaxactun (Ruppert 1940: 222).[4] The pattern of this architectural assemblage consists of a large pyramidal structure on the western side of a plaza or platform; the eastern side of the plaza is dominated by an elevated, elongated structure on a north–south axis (Fig. 11). Often, there are two other

[4] See also Ricketson and Ricketson (1937), Ruppert and Denison (1943: 5–6), Cohodas (1980: 212–214), Chase (1983: 1236 ff), Fialko (1988), Hansen (1992a, 1992c), and Laporte (1993).

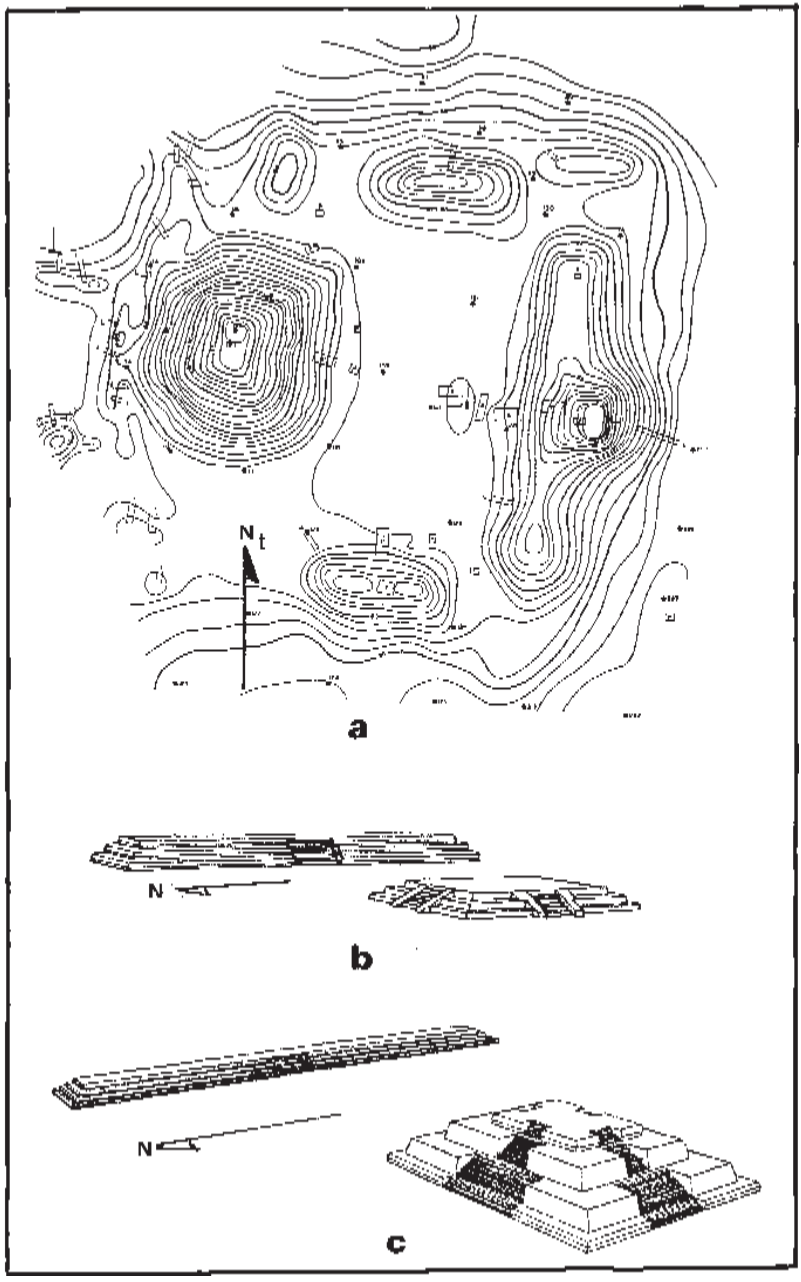


Fig. 11 E-Group complexes at (a) Nakbe, East Group (Late Middle Pre-Classic), (b) Tikal (late Eb phase), and (c) Tikal (Tzec phase) (after Laporte and Fialko 1993: 19, 20; 1995: 47, 49).

simpler and smaller buildings bordering the north and south sides of the platform to form a distinct plaza. However, it is clear that the east–west structures of the compound are the most important and most consistent in their placement and format.

The architectural group was argued by Blom (1924) to have "astronomical significance" because of perceived solar alignments of the structures (Ricketson and Ricketson 1937: 105–109). However, later evaluations of the E-Group complexes have suggested that the architectural arrangements do not appear to have had astronomical significance for solstice or equinox alignments (Aveni and Hartung 1989: 451–455). Nevertheless, further testing of possible stellar or planetary alignments may be productive, and several researchers continue to use astronomical terms—i.e., Fialko (1988); Laporte, Torres, and Hermes (1991); and Laporte and Torres (1993).

The early version of the E Group usually contains an elongated structure on the eastern side of the complex, as at Tikal (Laporte and Fialko 1995: 47–49), or the elongated eastern structure has a single, elevated building in its center, as at Tikal, Nakbe, Wakna, El Mirador, and possibly Tintal. Later forms of the eastern structure have three linearly placed structures on the platform facing toward the west (Ruppert 1940). An important distinction between the eastern platform structures of the E-Group complex and the triadic architecture format discussed below is that the end (distal) structures on the platform always face west rather than each other as do the triadic buildings. Often, the south side of the structure has another low structure, as is the case at El Mirador Structure 5D1-1 (G219) and the Cenote E-Group complex at Caracol (Chase and Chase 1995: fig. 3).

The arrangement of structures in the eastern group at Nakbe embodies an early E-Group format in the lowlands and is contemporaneous with the late Eb and Tzec E-Group constructions of the Mundo Perdido complex at Tikal (Laporte and Fialko n.d., 1993, 1995). Other groups that are believed to date to this period are at Wakna and possibly at Tintal in the Mirador Basin. In the case of Wakna,[5] the eastern structure exceeds 200 m in length and has a height of 10 m, whereas the center building extends to a height of 30 m.

The form of the western pyramidal structure of the E-Group complexes seems to vary slightly with regard to stairway construction, because the struc-

[5] Ian Graham and I changed the name of the site from Güiro (which Graham named in 1970) to Wakna because of the difficulty of spelling the name and the inconsistency of the lexical context. Graham noted that the aerial photos of the site, particularly the E-Group assemblage on the southern portion of the site, effectively formed a dot and bar, hence the number six (*wak*) when viewed from the air.

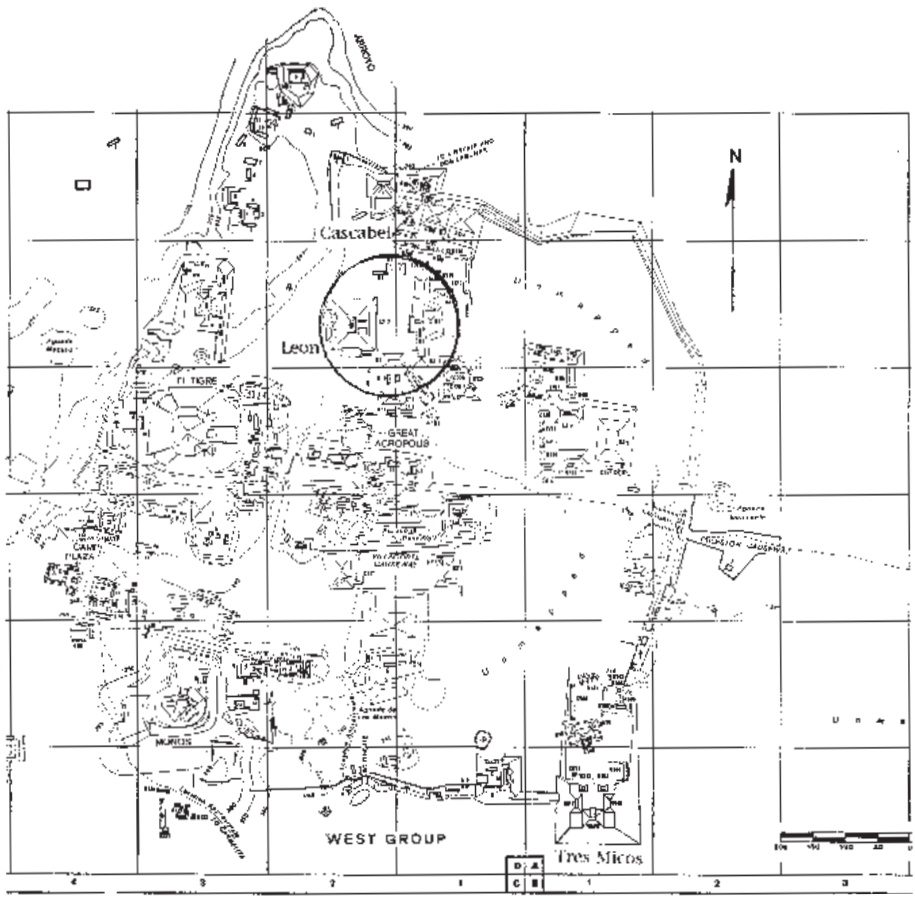


Fig. 12 E-Group complex at El Mirador with Leon pyramid. Courtesy of Bruce H. Dahlin.

ture is almost always nearly square at the base. Quadripartite stairways are commonly found on the western pyramidal structure, such as the Late Pre-Classic Structure E-VII-Sub at Uaxactun. Similar architecture is known throughout the lowlands, such as at Naachtun (of undetermined date), Tikal, and El Mirador (Fig. 12). Structure 5C-54 at Tikal had a quadrilateral stairway by the late Middle Pre-Classic Tzec phase, with four terraces (undecorated) and a height of 8 m (Laporte and Fialko 1995), whereas the eastern structure is simply an elongated, simple platform (Fig. 11). Structure 5C-54 became radically more complicated during the succeeding Late Pre-Classic Chuen and Cauac phases, when it follows closely the architectural pattern of E-VII-Sub at Uaxactun.

El Mirador Structure G212, a 34 m high building (also known as Leon

Pyramid), is identical to Uaxactun Structure E-VII-Sub with inset quadrilateral stairways, large projecting balustrades with masks and panels of architectural art (now badly damaged), and successive terraces with access to the summit only on the eastern side of the structure (Fig. 12) (Nielsen 1990: fig. 2.1). Surface ceramics, as well as information from test pits on the elongated eastern structure (Structure 5D1-1 or G219), suggest that the structure dates to the Pre-Classic, but a more accurate assessment of the antiquity of its construction will remain uncertain until more comprehensive investigations can begin. Other western pyramidal structures, such as those at Nakbe Structure 47 and Wakna Structure G31, do not appear to have quadripartite stairways. It appears that the quadripartite stairway is more common during the Late Pre-Classic.

The consistency and persistence of the E-Group form is suggested by its chronological range from the Middle Pre-Classic in the Mirador Basin to the Late Classic examples at nearby Calakmul, Uxul, Balakbal, and Naachtun (Fig. 13) and numerous other sites in the central and southern lowlands (Table 2). Ruppert and Denison (1943) and Chase (1983: table 43) note the range and distribution of the E-Group complexes within a restricted area of the southern lowlands, including areas of southern Campeche, and northern, eastern, and central Peten. In addition, there is a concentration of E-Group complexes in the southeastern Peten and southwestern Belize area (Laporte and Torres 1987; Laporte, Torres, and Hermes 1991; Laporte and Torres 1993; Laporte 1993; Chase and Chase 1995), hinting at a plausible religious unity within these areas.

The unusual predominance and antiquity of the E-Group complexes points to its central role in Maya ritual life.[6] Many early E Groups in the lowlands, including those in the Mirador Basin, are connected by a causeway to other dominant compounds. Often, but not always, the causeway extends to the northeast from the E-Group complex as observed, for example, at Ixkun (Graham 1980: 2–135; Laporte and Torres 1987: fig. 3), Ixtutz (Laporte and Torres 1987: fig. 3), and Wakna (Hansen 1992b, 1992c).

[6] There is a weak but tantalizing hint that the E-Group complex could represent a symbolic residence of First Father of Maya mythology, the "Six Sky place," the *wak chan*. The residence of First Father was the site of the first planting of three stones (Yax Ox Tun Nal) mentioned in Quirigua Stela C and the Tablet of the Cross (D5–D8). The frequent placement of three stelae, or superstructures, as on the eastern platform of Uaxactun Group E, the Mundo Perdido complex, Calakmul, and Pacbitun (Healy 1992) may allude to this mythological event. If Freidel and Schele are correct, the architectural triad on the southern side of many E-Group complexes corresponds to the three hearthstones of the fires of creation in the constellation Orion (see Taube, this volume). This important constellation is found on the southern hemisphere of the night sky.

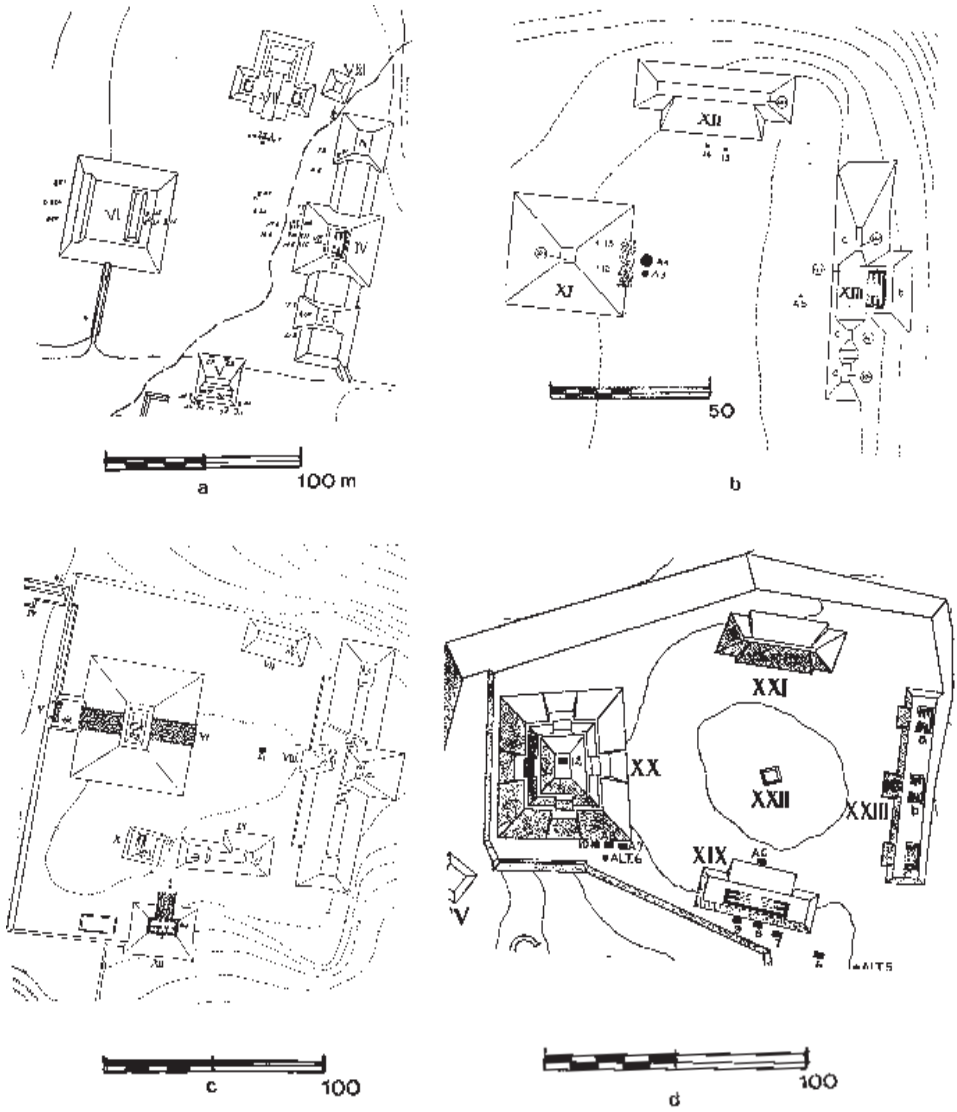


Fig. 13 E-Group complexes at (a) Calakmul, (b) Uxul, (c) Balakbal, and (d) Naachtun, all surrounding the Mirador Basin (after Ruppert and Denison 1943; pls. 61, 70, 69, 66).

Table 2. Selected Examples: E-Group Complex

Site	Structure	Phase*
Balakbal	Str. VI, VIII	?
Calakmul	Str. VI, IV	? LPC?, EC?, LC
Cahal Pichik	Str. B, D-E-L	LPC, EC, LC
Caracol	Cenote E Group	LPC?, EC, LC
	Str. A2, A5–7?	LPC?, EC, LC
Cenote (Peten)	Str. C5, C1	LC
Ixac (Peten)	Group A	LC
Ixcoxol (Peten)	Group GR-B	?
Ixkun (Peten)	Plaza A	?
Ixtonton (Peten)	Group JP1, Str. 11, 9	LPC, EC, LC
Ixtutz (Peten)	Plaza A, Str. 2, 8–10	?
Itzan (Peten)	?North Plaza, Str. 14, Str. 22–26	?
Hatzcap Ceel	Str. A, I-F-E	?LPC–EC?
El Mirador	Str. G212 Leon, 5D1-1	MPC?, LPC
Moquena (Peten)	Group PL-1	?
Naachtun	Str. XX, XXIII	?
Nakbe	Str. 47, Str. 51	MPC
Nakum	Str. C, A	LC
Sukche (Peten)	Group A, Str. 4, 2	?
Tikal	Str. 5C-54, 5D-84–88	MPC, LPC, EC, LC
Uxul	Str. XI, XIII	?
Uaxactun	E-VII-Sub, E-I–III	LPC, EC, LC
	Group D, Plaza IV, Str. 4, 2	MPC, LPC, EC, LC
Wakna (Guiro)	G31, G30	MPC?, LPC
Yaxha	Plaza F Str. LXXI, LXIX	EC?–LC
	Plaza C Str. XV, XIII	EC?–LC

*MPC = Middle Pre-Classic; LPC = Late Pre-Classic; EC = Early Classic; LC = Late Classic.

Middle Pre-Classic Architectural Variants

The variations in size between earlier small substructures and the much larger superstructures of the late Middle Pre-Classic period appear to have resulted from dramatic changes in society. Other architectural patterns also begin to appear during this time. For example, at Nakbe, large deposits of dark brown, *bajo* clay were placed in various platform constructions (Structure 31, Structure 18) in the western group during the late Middle Pre-Classic period (late Ox, 600 to 400 b.c.) (Martínez Hidalgo and Hansen 1993; Velásquez

1993). The clay deposits at Nakbe are contained by stone walls. The use of clay fill has been observed in other known Middle Pre-Classic constructions, such as those at Abaj Takalik (Schieber de Lavarreda 1994a, 1994b).

Other late Middle Pre-Classic architectural innovations include the circular structures found by Awe and Powis (Terry Powis, personal communication, 1995) in the Belize River valley. Several circular structures were found in Middle and Late Pre-Classic stratified contexts at Cuello (see below).

Late Middle Pre-Classic Masonry

During the late Middle Pre-Classic period, the size and form of quarried stone changed from the rough, simple, small stones that composed the early Middle Pre-Classic constructions to much larger blocks of consistent size and form (up to a meter long and half a meter wide). This standardization and technical expertise in production of stone blocks points to the existence of quarry and construction specialists at this time. The blocks used in late Middle Pre-Classic and early Late Pre-Classic constructions have been studied by Woods and Titmus (1994, 1996), and related investigations and experiments in the quarries at Nakbe involved horizontal excavation, detailed examinations of quarry edges, macro- and microanalyses of the stone tools recovered from quarry contexts, replication of quarrying tools, and actual quarrying of limestone blocks with stone tools to determine the energetics of architectural construction (see Abrams, this volume). This allowed the estimation of labor investment, and possible specialization, as well as identification of the methods and markers of limestone extraction along with breakage and wear patterns in tools. Woods and Titmus (1994, 1996) determined a probable minimum labor investment of approximately 34 man-hours per block for the large stones quarried during late Middle Pre-Classic and Late Pre-Classic periods.

Middle Pre-Classic: Apron Moldings

Although apron moldings at Tikal were thought to have first appeared during the Late Pre-Classic Chuen period (Coe 1965a: 1408; 1965b: 13), it is clear, on the basis of data from Mundo Perdido (5C-54-2, upper terrace) at Tikal and the architecture at Nakbe (Structures 32, 35, and 47) that such architectural manipulation began at least during the late Middle Pre-Classic period (Tzec, late Ox). The systematic production of large blocks facilitated the construction of pronounced apron moldings with stones tenoned into the structure (Fig. 14). In the case of Nakbe Structure 32, a containing wall was built on the terraces, possibly to capture and control rainwater (Hansen 1992c; López 1993; Acevedo n.d.). An identical construction, probably a hydraulic feature, was

found on later Cauac phase causeways at Tikal between the Mundo Perdido complex and the Aguada del Templo (Laporte and Fialko 1995: 50, fig. 11c). The large stones were also placed in façades with a pronounced slope (or *talud*) on platforms and a combination of the talud and apron moldings with the long axis of the stones parallel with the wall. In addition, rounded corners on platforms and structures first appear during this period (Fig. 14b).

Middle Pre-Classic: Architectural Art

The façades flanking the stairways of major Middle Pre-Classic structures do not appear to have been associated with monumental architectural art. The evidence is ambiguous because of poor preservation of exposed stucco, but the façades definitely lack the relief known in subsequent Maya architectural art. Laporte and Fialko (1993) note a similar lack of artistic embellishment on the late Eb remnants and Tzec architecture within Structure 5C-54 and associated platforms at Tikal. David Freidel (personal communication, 1994) has recently discovered an 11 m high Middle Pre-Classic pyramid with no associated architectural art within a later structure at Yaxuna. However, the recent discovery by Adams and Valdez of a probable Middle Pre-Classic Mamom structure within a Late Pre-Classic structure at Río Azul shows that the façade was decorated with a large stucco J-scroll and bracket motif in very shallow relief (Valdez 1995). The pattern appears to be a general absence of monumental architectural sculpture, or at least a very limited stucco relief, in stark contrast to iconographic depictions from the subsequent Late Pre-Classic period.

Middle Pre-Classic: Internal Construction

Another characteristic of monumental Middle Pre-Classic architecture in the Maya lowlands, particularly at Tikal, Nakbe, and Wakna, is the lack of mud mortar in fill. The architectural fill consists of large stones that had been loosely dumped in the structure, making deep trenching and tunneling of the structure risky or impossible without extensive support systems. The use of cell-wall construction, however, is evident in all known monumental architecture from this period at Nakbe (see Fig. 10), occurring also in Late Pre-Classic constructions throughout the lowlands. Cell walls are crudely fashioned walls, internally constructed on various levels to contain loose fill of a building. Although the origins of the cell-wall technique are elusive, the presence of cell walls in monumental Middle Pre-Classic architecture at Nakbe indicates their great antiquity.

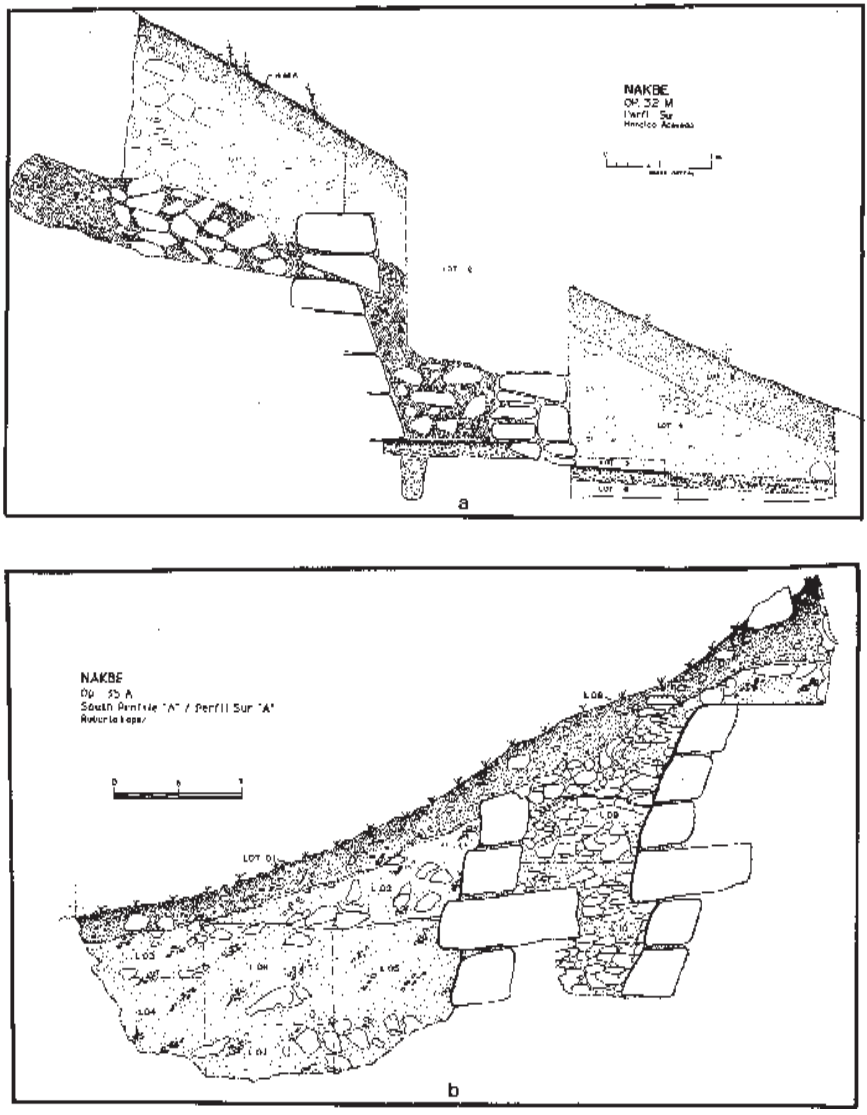


Fig. 14 Examples of late Middle Pre-Classic (ca. 630–400 b.c.) apron moldings at Nakbe: (a) Structure 32, Nakbe (note the short wall at the base of the main wall, which is believed to have captured water from the building); (b) Structure 35, platform (note how the axes of the stone are parallel with the structural line, with the apron-molding stone tenoned into the building). Drawings by Renaldo Acevedo (*top*) and Francisco R. López (*bottom*).

Ballcourts

During the latter part of the Middle Pre-Classic Ox period at Nakbe, the first phase of a ballcourt was constructed on the southern side of Structure 53 of the East Group at Nakbe (Velásquez 1992b). These structures (Structures 75, 76, and 77) were constructed in traditional form, although of a reduced size and scale consistent with known Pre-Classic ballcourts. The 2 m high ballcourt at Nakbe consists of two low parallel structures (Structures 76 and 77), separated by a narrow (5 m) playing alley, with sloping interior walls and a vertical exterior wall. Similar small Late Pre-Classic ballcourts are known at Cerros (Scarborough et al. 1982), Pacbitun (Healy 1992), Buenavista del Cayo (Ball 1993: fig. 43), Colha (Eaton and Kunstler 1980), and possibly at Tonina (Taladoire 1981). Another structure perpendicular to the axis of the alley usually borders the southern end of the ballcourts, a pattern of some duration in the lowlands. I suspect that a monument was in the alley of the ballcourt at Nakbe.[7]

The appearance of early ballcourts and related architecture places the Maya lowlands on a coeval level of development with the highlands and Pacific Coast regions, although the origins of the ball game may be foreign to the Maya area. For example, a Middle Pre-Classic ballcourt has been found at Abaj Takalik (Schieber de Lavarreda 1994a, 1994b), and Coe believes that a Middle Pre-Classic Olmec ballcourt existed at San Lorenzo (Coe and Diehl 1980: 29, 62, 388; Coe 1981: 132). Recent excavations at the Olmec site of El Manatí have located rubber balls in the muck of ancient springs (Stuart 1993: 101; Ortíz and Carmen Rodríguez 1994). In the Mexican highlands, Grove located a Middle Pre-Classic construction that resembles a ballcourt at Chalcatzingo (Grove and Cyphers Guillén 1987: 26), and evidence for what may be an early symbolic ballcourt has been found at Teopantecuanitlan, Guerrero (Martínez Donjuán 1994). The recent discovery of an Early Pre-Classic ballcourt on the Pacific Coast of Chiapas by Blake and Clark (John Clark, personal communication, 1995) may prove to be the earliest example. Parallel and elongated mounds measuring 85 m in length have been found dating to the Barra-Locona phases at the site of Paso de la Amada (John Clark, personal communication, 1995). If this complex is a ballcourt, then the ball game and the associated architectural

[7] A carved circular monument, Monument 8, was discovered at Nakbe about 70 m to the east of the ballcourt with no architectural association. The large stone was isolated and upside down, and it may have been abandoned in its present location by Late Classic Maya. The iconography of the monument represents an extremely early version of the downward-peering, dual serpent/saurian heads. The early style of the altar suggests the antiquity of such sculpture and its possible association with ballcourts.

constructions are among the most enduring cultural and architectural components of Mesoamerican societies.

Site Layout and Architectural Distribution

Architectural arrangements at various Pre-Classic sites show considerable regional variation. The Middle Pre-Classic sites of San Isidro, Finca Acapulco, and La Libertad in Chiapas (Lowe 1989, Clark 1988), for example, differ substantially in site layout from contemporaneous sites such as La Venta (González Lauck 1994) and in the valley of Oaxaca (Marcus 1976, 1989). Nakbe and Wakna also differ from all these sites in their architectural style and site layout. The differences constitute a strong case for in situ development of complex architecture in the Maya lowlands rather than borrowing from adjacent regions.

Causeways

The earliest causeway at Nakbe was probably built during the late Middle Pre-Classic period (Suasnavar 1994, n.d.). Causeways linked important platforms with other major architectural groups at this time (Fig. 15). The earliest causeway does not seem to have had a parapet, but two subsequent early Late Pre-Classic causeways had low parapets on both sides. The causeways were paved with thick layers of white *sascab* (up to a meter thick). During the Late Pre-Classic at Nakbe, causeways linked nearly all the large sites in the Mirador Basin, with an abundance of them at El Mirador (see Dahlin, Foss, and Chambers 1980). These constructions represent some of the finest engineering accomplishments of the time. Labor investment and volume of construction materials were enormous. For example, the Kan Causeway, which joins the East and West Groups at Nakbe, was built as high as 4 m above the undulating terrain and with a width of 24 m. Similar causeways join Nakbe to El Mirador (13 km) and El Mirador to Tintal (25 km). The size and extent of the causeways, their directional precision, and their number indicate an accomplished engineering program in the Pre-Classic.

LATE PRE-CLASSIC ARCHITECTURE: INITIAL CYCLE 7

Middle Pre-Classic culture in the Mirador Basin seems precocious, but it pales when compared to the cultural florescence that swept through the lowlands during the Late Pre-Classic period at the beginning of Cycle 7 (ca. 350 b.c.). Architectural innovations included a focus on monumentality, triadic building arrangements, and the introduction of monumental art on the façades of buildings. The acropolis layout characteristic of later Classic-period sites was

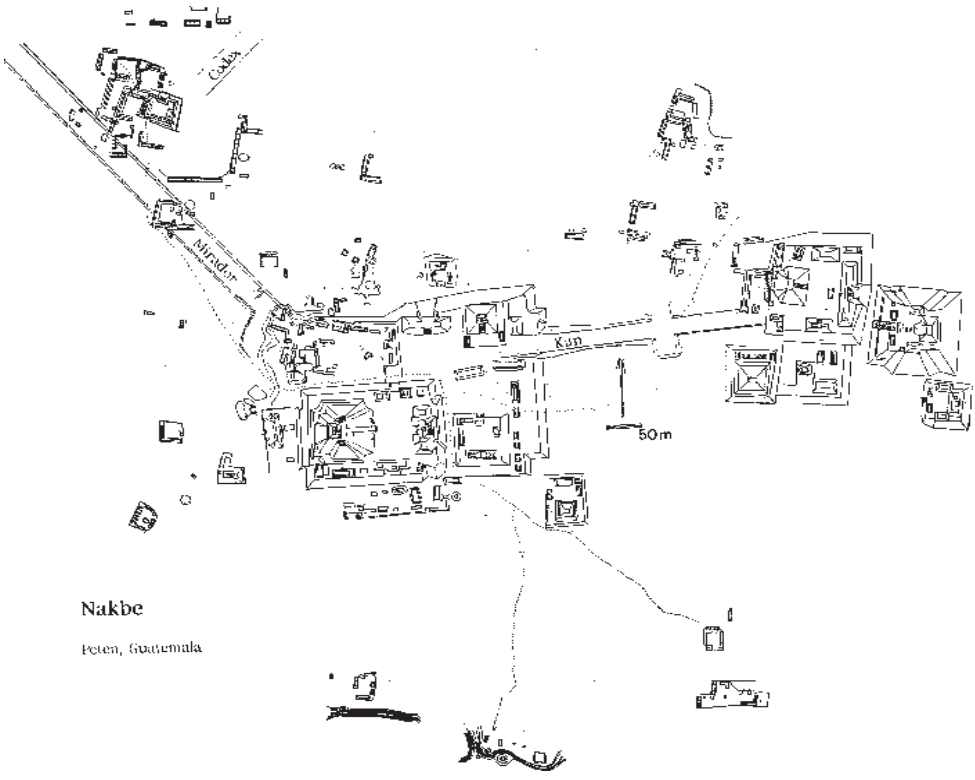


Fig. 15 Map of Nakbe, Peten.

also established during this period. The extent of the architectural transformations throughout the lowlands was paralleled by a remarkably homogeneous Chicanel ceramic sphere.

Monumentality

Massive augmentations in the size and scale of monumental architecture are evident by about 300 b.c. in the Maya lowlands. Many Late Pre-Classic structures were built, with heights ranging from 24 to 72 m. Equally impressive is the volume of materials used in construction. The explosive growth in architecture is perhaps best demonstrated at El Mirador. Tigre pyramid, which dominates the western portion of the site, was apparently built to its present height of 55 m at this time and covered an area of 19,600 m^2. When compared to Classic-era Tikal, Tigre effectively covers the entire complex of Temple I, Temple

II, the Great Plaza, and the entire North Acropolis (Hansen 1990: 215). The platforms of Danta, located on the eastern side of El Mirador, were built in the Late Pre-Classic period with the lowest platform base covering an area 500 × 350 m and rising 72 m to the summit. The masonry construction of this edifice is consistent with the long-standing Pre-Classic tradition of large, limestone tenons. Apron molding, introduced in the Middle Pre-Classic, also occurs in the building (see Fig. 26).

The variation in architectural elaboration and density of structures in the Late Pre-Classic period, ranging from major buildings on upland hills to small settlements in the *bajos*, indicates a social and economic complexity comparable to the Classic period. Demarest et al. (1984) found housemounds surrounding plazas at El Mirador, thus demonstrating that the standard Classic period format for residential architecture was established by the Late Pre-Classic. Dahlin's discovery of Late Pre-Classic rectangular and apsidal domiciles in the *bajos* is an important indicator of settlement density. Future excavation in these areas may provide more evidence of economic specialization and related differences in rank or status.

The monumentality in the Mirador Basin during the early Late Pre-Classic period also appeared in the Mundo Perdido complex at Tikal during the Chuen (ca. 400 to 200 b.c.) and Cauac (200 b.c. to a.d. 200) periods (Laporte and Fialko 1995) and in the North Acropolis (Coe 1965a, 1965b). Comparable leaps in building monumentality and sophistication are evident at Lamanai on Structures N9-56, P9-2, P9-30, P8-9, and particularly N10-43, which acquired a height of 33 m and seems to have erupted from what had earlier been a modest residential construction (Pendergast 1981: 39–42). Cerros, a nucleated village, was transformed into an impressive ceremonial center at this time (Freidel 1986: 12).[8]

Triadic Architectural Form

Accompanying the shift in the scale and elaboration of public architecture during the Late Pre-Classic period was the introduction of the triadic form (Graham 1967: 45–46; Hansen n.d.a: 411–415, 1990: 171–172, 1992a: 54–56; Cohodas 1985: 58–59). The triadic pattern consists of a dominant structure, usually on a platform, flanked by two, inward-facing smaller mounds of equal

[8] Recent excavations at Cerros suggest that the process may have been more gradual (Kathryn Reese-Taylor, personal communication, 1995). Although Freidel noted that Structure 3 at Cerros appears to have been erected in a "single episode" (Freidel 1986: 10), it appears that earlier interior structures may be inside Structure 3 (Kathryn Reese-Taylor, personal communication, 1995).

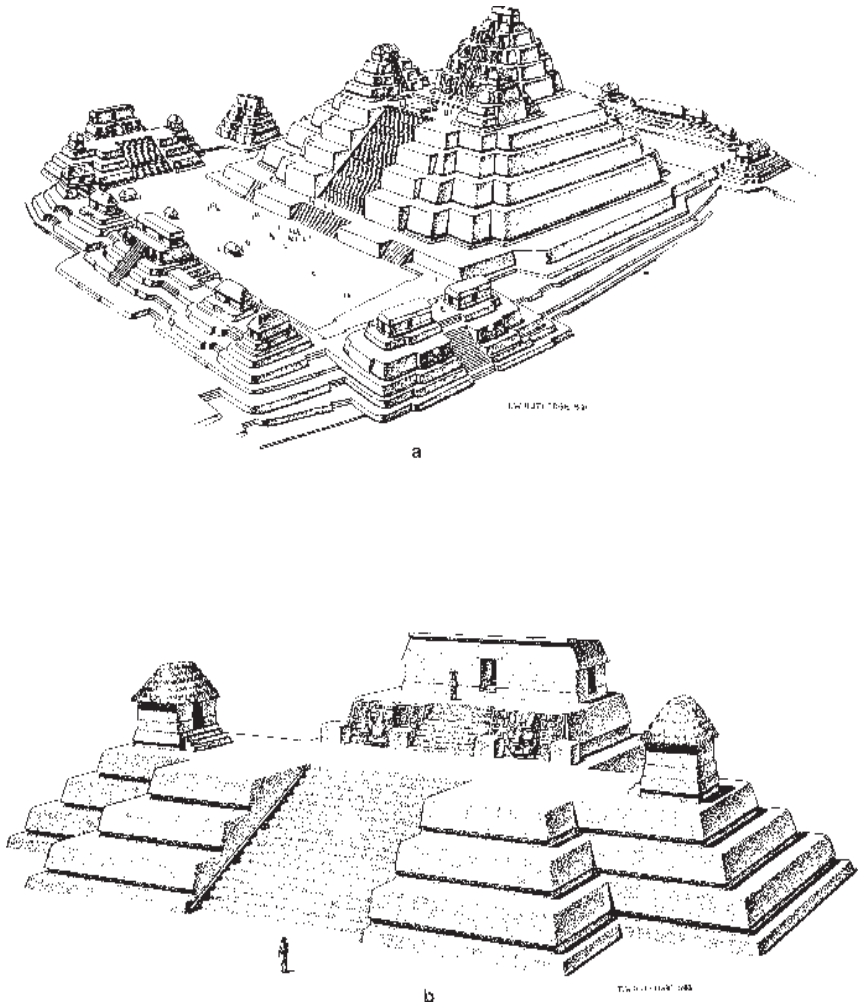


Fig. 16 Triadic platform arrangements at El Mirador: (a) Tigre complex and (b) Structure 34 (after Hansen 1990: ii and 116). Drawings by Terry Rutledge.

size (Fig. 16). Although there are no known Middle Pre-Classic antecedents, the triad may be a stylized descendant of the elongated eastern building of the E-Group complexes (Hansen 1992a: 55–56). Once the triad pattern was established, it enjoyed a special recognition for centuries. The four largest structures at Nakbe are triadic, as are more than 15 major structures at El Mirador (Graham 1967; Matheny 1986; Stutz-Landeen n.d.; Howell and Copeland 1989;

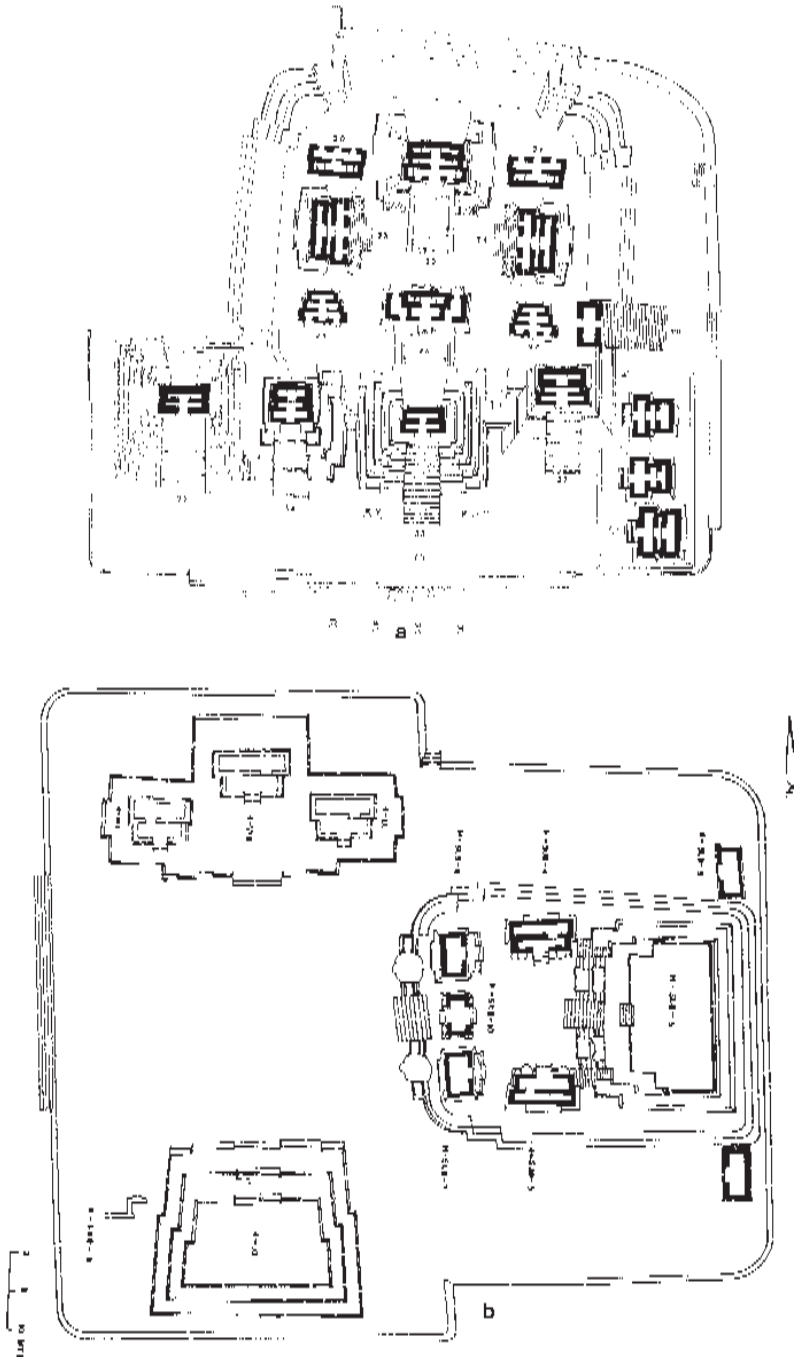


Fig. 17 Triadic platform arrangements at (a) Tikal, North Acropolis (after Coe 1967: 42), and (b) Uaxacatun, Group H (after Valdés 1992: 19).

Hansen n.d.a, 1990), the early large structures at Wakna, and two of the largest buildings at Tintal (Hansen 1992a) as well as Uaxactun Structures H-Sub-3, Sub-4, and Sub-5 (Valdés 1986, 1989a, 1992), Lamanai Structures N9-56 and N10-43 (Pendergast 1981: 39–41), Cerros Structure 29B, and possibly Structures 3 and 4 (Freidel 1981, 1986: 11), and structures at Sacnab (Rice 1976: fig. 8). The geographical extent of the triadic form is further demonstrated by its appearance at Dzibilchaltun during the Komchen phase (Andrews 1965: 29).

The continuity of the triadic arrangement is evident in the Early Classic Uaxactun complex A-V, constructed over an earlier group of three small house platforms in triadic layout (Smith 1950: 17–19), and Structures E-IV, E-V, and E-VI (Ricketson and Ricketson 1937: 60–61). The perpetuation of the triad also extends to later structures, such as Caana at Caracol and the more modest Structures D-31, 32, and 33 at Seibal. This configuration also occurred in the Late Classic on Structure N and a variant in Structure E at Nakum (Tozzer 1913: 171, 175, pl. 32; Ricketson and Ricketson 1937: 61). At Tikal, the innermost sanctum of the North Acropolis was reserved for the triad of Structures 22, 23, and 24 (Fig. 17). At Palenque, Kan Balam commissioned construction of the Temple of the Cross, the Temple of the Foliated Cross, and the Temple of the Sun in the standard triad format (Cohodas 1979, 1985), recording his accession and regal genealogy in an architectural context depicting the basic tenets of Maya ritual and mythological tradition. The identification of the three hearthstones of the mythological Maya creation as a group in the Orion constellation (Tedlock 1985: 261; Freidel, Schele, and Parker 1993: 79) may be what the ancient Maya intended to reproduce in triadic architecture (Taube, this volume). The centrality of this myth may account for the prominence of the triadic pattern. In the case of Palenque, however, the extraordinary texts themselves indicate a function for the buildings as metaphorical houses for the gods and monuments to the creation (see Schele, Stuart, Taube, and Houston, this volume). The specialized events that occurred during the accession of Kan Balam included dedication and ritual activities (Cross), bloodletting (Sun), heir designation ceremonies (Sun), and bloodletting and accession rituals (Foliated Cross). The peculiar order and placement of the events recorded at Palenque suggest the possibility that the triad may have been a standardized format for important religious and ideological rituals (see Hansen 1992a: 149 ff). The continuity of the triadic arrangement may indicate the antiquity of accession rituals and bloodletting rituals in the lowlands.

As with many fundamental aspects of Maya culture, the patterns of triadic architecture continued until historic times. Hellmuth and Estrada found an original, handwritten *relación* of Nicolás de Valenzuela regarding the Spanish

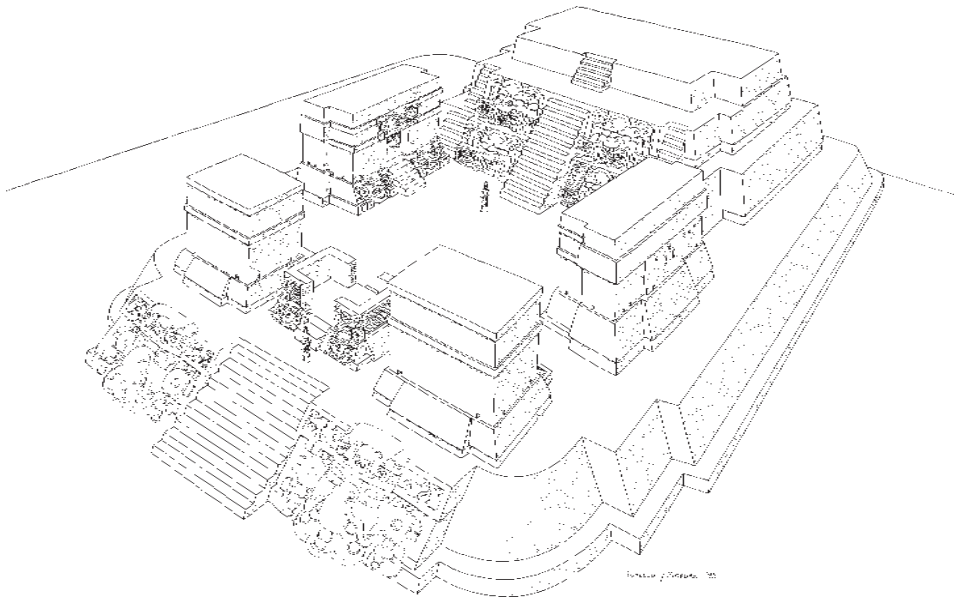


Fig. 18 Reconstruction drawing of Group H at Uaxactun. Drawing by Terry Rutledge and Dave Morgan.

conquest of the Cholti-Lacandon, which includes the following comment on building arrangement and function in the settlement of Sac Balam (Nuestra Señora de los Dolores de Lacandon):

> and there are one hundred and three houses, including three of community use. . . . In the center of this town of Sac Balam you find three community houses, one from east to west, another from north to south, and the other from east to west, each one looking out on the other, leaving in the center a spacious atrium. (Hellmuth 1977: 425)

Clearly, the layout of Sac Balam fits the triadic pattern, with the buildings ascribed to "community" or public use as opposed to private use or personal residences.

Monumental Architectural Art

With greater monumentality and introduction of the triad by ca. 300 b.c., Maya architecture adopted a new character. Architectural sculpture flanked the primary stairway of structures, although designs also adorned piers, inset panels,

and cornices of Pre-Classic buildings (Fig. 18). Although the temporal range for architectural sculpture extends from the Middle Pre-Classic "Olmec" societies in Guerrero to Post-Classic and contact periods at Tayasal, the size and extent of the Late Pre-Classic architectural art differs substantially from previous or subsequent depictions. Indeed, by Cycle 7, architectural embellishment became a major means of communicating ideological expression (Freidel 1985; Freidel and Schele 1988a, 1988b) at sites such as Uaxactun (Ricketson and Ricketson 1937; Valdés 1986, 1989a, 1992, 1993), Tikal (Coe 1965a, 1990; Miller 1986), Cerros (Freidel 1979, 1981; Robertson and Freidel 1986), *Lamanai* (Pendergast 1981), El Mirador (Hansen n.d.a, 1990, 1991, 1992a), and Nakbe (Hansen 1992a, 1992b, 1992c). An unusual aspect of the sculpture is the size and extravagance of its early forms. At Nakbe, for example, the mask and panels depicting the great mythological bird of the Maya, the "Principal Bird Deity," at the base of Structure 1, were 11 m wide and 5 m high, coated with a single coat of plaster, and painted in cream, black, and red (Hansen 1992a; Martínez Hidalgo and Hansen 1992; Hansen, Hansen, and Derrick 1995). Similar immensity of architectural art was also noted on the masks of Structure H-Sub 3 at Uaxactun (Valdés 1986, 1992) (Fig. 18). As found on the masks at Nakbe, the art was primarily cream colored and outlined with red and black.

Monumental architectural art became standardized in the Late Pre-Classic and continued into the Early Classic, Late Classic, and Post-Classic periods. Architectural, sculptural façades also flanked the stairs of adobe structures at Kaminaljuyu, indicating the geographical extent of the medium and format of the religious symbols.

Group H, Uaxactun

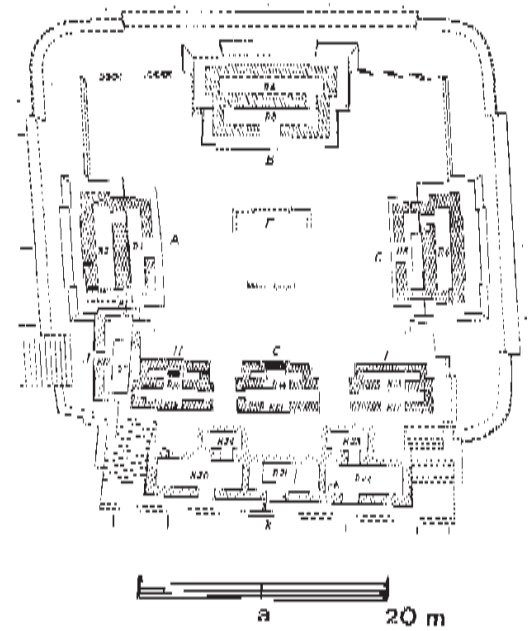
Exemplary architecture with many diagnostics of the period was exposed in large-scale excavations in the near-complete acropolis of Group H at Uaxactun (Fig. 18). Large-scale excavations exposed a Late Pre-Classic acropolis complex that had all of the architectural characteristics known for this period (Valdés 1986, 1989a, 1989b, 1992). The construction sequence indicated that the earliest structure was a small rectangular platform upon which stood a small, circular building (H-Sub 1) (Valdés 1992, 1993). Shortly after, Structure H-Sub 2 was placed at the east side of the platform. This 5 m high rectangular structure had two corbeled vaulted chambers divided by an offset entranceway. Although the front of this structure was badly damaged during construction of the later phases of the platform, the east side of the building still had an elaborate frieze above the cornice on the sloping roof (Valdés 1989a, 1990; Hansen 1992a: 350, fig. 120). It displayed two prone supernatural figures, flanked by downward-

peering heads. This structure was then covered by the dominant structure (H-Sub 3) of the entire complex as part of a triadic arrangement of Structures H-Sub 4 and H-Sub 5 (Figs. 17b and 18). The stairway of this 7 m high building was inset into the three terraces, with auxiliary stairways on the distal sides of projecting façades. Only the central stairway extended to the top of the platform. The façades contained masks and panels in excellent condition (Valdés 1986, 1989a, 1990, 1992, 1993; Hansen 1992a: 154–160). No superstructure was found on the surface of the upper platform of H-Sub 3.

The formation of the triad created an architectural landscape of profound significance. All three structures had sculptured deities bordering inset stairways. The two inward-facing buildings of the triad, Structures H-Sub 4 and H-Sub 5, were vaulted with two chambers divided by a wall with an offset entranceway. The offset entranceways, also found on Late Pre-Classic Structure 13 at Nakbe and the Early Classic triad on Group A-V at Uaxactun, vary markedly with the three-room chambers of Late Classic pyramids, which have the entranceway in the center-line axis. The interior chamber of the Group H buildings was slightly higher and narrower than the first room. The cornice on both sides of the flanking structures had a raindrip carved on the exterior basal surface of the stones, a trait that also extends clearly into the Late Classic. Also, these Late Pre-Classic structures had a mask immediately above the entranceway into the chambers (Schele, this volume). This mask, combined with the two other masks flanking the stairway, represented the three deity portraits that may have important parallels to the architectural triad. This pattern extended into the Late Classic as a common format (i.e., Tikal Temple II).

A subsequent modification of the platform of Group H created an enclosed acropolis effect. The platform with rounded corners was extended to the west to accommodate three more buildings, Structures H-Sub 6, H-Sub 10, and H-Sub 7. Both H-Sub 6 and H-Sub 7 were vaulted and faced inward toward the earlier triad. No masks were on the façades of these buildings, but remnants of a frieze were present above the cornice. The center structure, H-Sub 10, was apparently open. Masks flanked the inset stairway, and standing figures of modeled stucco were found on the walls and all corners of the superstructure. These figures bordered a woven mat design placed above the basal masks of the building (Fig. 18).

A single, inset stairway made the entire platform accessible. Large masks and panels of mythological importance adorned both sides of the stairway (see Hansen 1992a: 354, fig. 124). Group H demonstrates the continuities of individual structures as well as the overall layout of the acropolis in Maya architectural history. The same architectural sequences occurred in the Early and Late Classic ver-



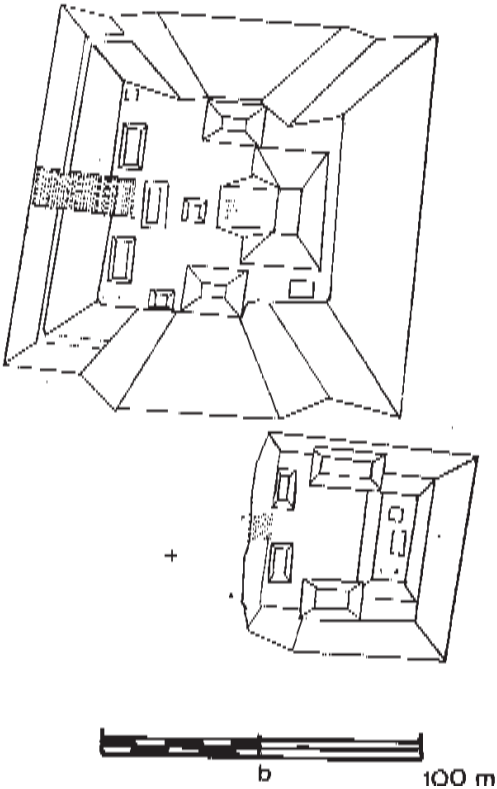


Fig. 19 Triadic architecture at (a) Uaxactun, Structure A-V (after Smith 1950: fig. 66), and (b) Nakbe, Structure 59.

sions of the North Acropolis at Tikal, Structure A-V at Uaxactun, and Structure 59 at Nakbe (Fig. 19).

The excellent preservation of Group H resulted from burial by later construction. The varied and detailed architectural sculpture, plinths, cornices, piers, friezes, stairways, corbeled vault chambers, and platforms with well-preserved stucco and intact masonry are some of the most remarkable discoveries from the period. Although there are continuities and disjunctions with both earlier and later architecture, it is clear that nearly all the known diagnostic features of Classic Maya architecture appear on this platform group in the Late Pre-Classic period.

Circular Structures

One of the lesser-known, but widely distributed forms of Pre-Classic architecture is the circular structure. These buildings may spring logically from apsidal structures of great antiquity in Mesoamerica (i.e., Clark 1994; Anthony and Black 1994). Circular structures range in date from the Middle Pre-Classic through Post-Classic periods, and their limited distribution within sites throughout Mesoamerica leads some to infer a specialized function (Pollock 1936).

Circular buildings have great antiquity in the Maya area, with the earliest appearing at Cuello as Structures 328 and 329 (Phase I-IA, early Middle Pre-Classic) and Structure 327 (Phase II) (Gerhardt 1988; Gerhardt and Hammond 1991). The constructions consist of thin plaster floors with successive timber superstructures, a low platform height (0.2 m), and diameters of 8 m (Gerhardt and Hammond 1991). The domestic function of these constructions seems evident, but it is uncertain what precipitated the difference between apsidal and circular structures. Both apsidal and circular structures are found throughout the Cuello sequence.

Circular, Middle Pre-Classic structures have recently been identified at Colha, where they were defined by carefully placed limestone blocks (Anthony and Black 1994). Middle Pre-Classic round buildings have also been found at Louisville (Haberland 1958: 128) and Cahal Pech. The largest platform at Cahal Pech, Structure 14, was situated among four small rectangular platforms erected around the perimeter of the structure (Terry Powis, personal communication, 1994). Awe and Powis found ten burials and four caches in Structure 14, indicating an emphasis on funerary and ritual behavior (Terry Powis, personal communication, 1994). The Cahal Pech example also had a rectangular "keyhole" appendage on the side, a feature noted on a round Late Pre-Classic building at Río Azul (Hendon 1989: 97); Late Pre-Classic Structures E, F, and G of E Group and the Early Classic east plaza of Group A at Uaxactun (Ricketson and

Ricketson 1937: 116; Valdés 1989b, 1992); BR-1 Structure F at Barton Ramie (Willey et al. 1965: 51–58); and the Classic–Post-Classic Structure 9 at Nohmul (Hammond 1983).

Circular structures dating to the Late Pre-Classic period appear to be more common, or at least more frequently encountered, at Nakbe (Velásquez 1992a), El Mirador (Nielson 1980: 32), Río Azul (Hendon 1989), Tikal (Coe 1965a: 1415; 1990: fig. 49), Colha (Day and Laurens 1980; Anthony and Black 1994), Ixac (Morales 1993: 312), and Chan Chen (Sidrys and Andresen 1978: 643–648; Sidrys 1983: 92–103). The earliest structure in the Group H platform (Structure H-Sub 1) at Uaxactun, described above, was also circular (Valdés 1992).

In general, these constructions are up to half a meter high and as wide as 10 m in diameter. Structure F-2 at Chan Chen is one of the larger examples (11 m wide) and has postholes placed in the edge of the 2 m high platform, demonstrating that the perishable superstructure was also circular (see Sidrys 1983: 92–103). Many of the circular structures appear to have been razed, and it is uncertain whether other levels had been constructed on the platforms. However, Late Pre-Classic Structure 70 at Nakbe consisted of a concentric series of four consecutive platforms forming a structure much like a large, 2 m high wedding cake (Velásquez 1992a). This pattern was also documented by Valdés on an Early Classic round building (Structure A-Sub 9) at Uaxactun (Valdés 1989b; Valdés and Fahsen 1992), which was called an "altar" because of the reduced size, the central location of the construction, and the fact that a small, uncarved stone monument was placed in its interior (Valdés 1989b: 34).

The longevity of circular buildings is suggested by Early Classic round edifices at Barton Ramie (Willey et al. 1965: 51–59) and Uaxactun Group A (Valdés 1989b: 34; Valdés and Fahsen 1992). Late Classic Structure C-79 at Seibal (Smith 1982: 164–172) represents the largest circular building known in the lowlands (3 m high, 18 m in diameter). Late Classic examples have also been found at Ixcol and Ixtonton (Morales 1993: 312–313), Coba (Benavides 1987), and Structure 9 at Nohmul (Hammond 1983). Circular buildings have been located in Post-Classic contexts at San Gervasio, Cozumel (Gregory 1975: 88–106).

As with most Maya constructions, paint was found on the stucco of round buildings. Round Pre-Classic examples at Río Azul and Tikal were painted red, as was Early Classic Uaxactun Altar A-Sub 9 (Valdés 1989b: 34). Late Pre-Classic Structure 70 at Nakbe was painted in red and blue (Velásquez 1992a: 38).

Modest Residence Constructions

A few Late Pre-Classic residence constructions have been found throughout the lowlands. They often consist of simple, perishable structures on packed-earth floors, low rectangular stone alignments, and low rectangular and apsidal platforms. Excavations indicate that these structures are often not detectable from the surface, a problem also noted in Late Pre-Classic sites in other areas of the Peten (e.g., Johnston, Moscoso Moller, and Schmitt 1992 and Johnston 1993). Some of the best preserved Pre-Classic examples are Structure 27 at Becan (Ball and Andrews 1978) and Structure G314 at El Mirador (Stutz-Landeen n.d.). The diversity of their architectural details suggests a wide range of construction patterns that is evident throughout all Maya periods. Structure 27 at Becan and Structure 314 at El Mirador are about the same size (1 m high), with inset stairways, walls with a *talud,* and low walls of the superstructure. But the Becan platform was topped by an apron molding, whereas the El Mirador platform sides formed a shelf at the base of the superstructure walls. Also, a bench was constructed in the rooms of Structure 314 (Stutz-Landeen n.d.: 61) that is missing from Becan Structure 27. Thick, red stucco was applied to the platforms in both cases.

Barrier Constructions/Fortifications/Canals

By the Late Pre-Classic period, the first barrier constructions or fortifications were built in the Maya lowlands. At Becan, the Maya built a moat during the latter Late Pre-Classic period (Webster 1975, 1976, 1977). This massive trench, which originally had been excavated 16 m wide and 6 m deep, completely surrounded the site center.[9] The inner edge of the construction had a 1 to 3 m high parapet or embankment formed with excavated earth upon which timbers were placed, thereby exaggerating the depth of the moat as an impressive and effective barrier. Seven causeways spanned the moat and allowed the greatest access on the northwestern and southeastern areas of the site (Webster 1976: 14–15).

Similar barriers have been found at Edzna in the form of an elaborate system of canals (Matheny et al. 1983: figs. 2, 36). The canals date to the Late Pre-Classic period and were used to provide water, aquaculture, and possibly transportation to the site. The main canal to the site was more than 12 km long. The canals were used as a wet-moat system to surround a complex of architec-

[9] The moat at Becan has long been proclaimed to have been a dry moat, but on a recent visit to Becan shortly after the hurricanes of 1995, I observed that some sections of the moat were completely filled with water, whereas other sections remained dry. I suspect that portions of the trench, particularly those on the northeastern and northern sides of the site, may have also served as *aguadas* (reservoirs).

ture known as the "Fortress" (Matheny et al. 1983: 78–79). The excavation volume of canals in the Late Pre-Classic at Edzna (1.5 ¥ 10^6 m^3) represents one of the largest ancient construction programs in the Maya world (Matheny 1987) and directly reflects the complex sociopolitical and economic systems of the Late Pre-Classic.

A variant of a Late Pre-Classic barrier system is found at El Mirador; a massive wall was built on the southern, eastern, and northeastern sides of the site during the latter Late Pre-Classic period (Chambers 1982, n.d.), whereas the northern and western sides of the site were bordered by a 20 to 30 m natural escarpment. The wall is artificially elevated to a height of about 4 m. The exterior face of the wall was terraced, whereas the summit of the wall seems to have been a parapet upon which timbers may have been placed. The construction restricted access through stuccoed openings (7 m wide) at strategic locations (Chambers 1982: 8). However, by about a.d. 250 the wall had fallen into disrepair, and later inhabitants did not refurbish it (Chambers 1982: 8).

Late Pre-Classic Funerary Architecture

The nomenclature for Maya tombs and burials has long been established in the Maya lowlands (Smith 1950: 88; Satterthwaite 1954: 50; Coe 1959: 120). Although its application to remains from the Pre-Classic periods has been used in other areas of Mesoamerica (i.e., Lowe and Agrinier 1960: 39; Lowe 1962: 21; Agrinier 1964; Robles and Martínez Donjuán 1989), it could not be applied to mortuary descriptions in the Maya region because of the paucity of examples. Maya funerary constructions have been defined as tombs, crypts, cists, and simple burials, with important distinctions being made within each designated form. Simple burials consist of an "unlined hole in the ground or inclusion of a body in fill."[10] Cist burials have definite outlines[11] or consist of single, stone-lined graves with cover slabs (Satterthwaite 1954: 50). The simple, stone-lined constructions, which had been termed "crypts" by Smith,[12] have more commonly been redefined as cists, although crypt appears to refer to more complex cist burials (i.e., Sharer and Sedat 1987: pl. 4.3). Pre-Classic simple burials and cists in the lowlands have been recovered in greater frequency (for example, Tikal Burials 120–123 and 126) than tombs (and crypts).

Formal tomb constructions in Mesoamerica appear in the early Middle Pre-Classic at sites in Guerrero, such as Teopantecuanitlan (Martínez Donjuán 1994: 160) and Coovisur-Chilpancingo (Robles and Martínez Donjuán 1989). These tombs are formal masonry constructions, rectangular in form, and large (2.20 m long, 1.45 m wide, with vertical walls 1.20 m high). The chambers were covered by a corbeled vault with capstones (Robles and Martínez Donjuán 1989: 14, 16, 20). Middle Pre-Classic tombs have also been noted at La Venta, namely, Tomb A (Monument 7), Tomb B (Monument 6), and Feature A-3-a (Drucker,

[10] Smith (1950: 88) cited in Coe (1959: 120).
[11] Ibid.
[12] Ibid.

Heizer, and Squier 1959: 126–127). Both the Guerrero and the Gulf Coast tombs are noted here as a cautionary point: the corbeled vault and tomb placement in buildings may not be of Maya origin.

Pre-Classic triadic buildings consistently lack tombs.[13] One notable exception is a series of tombs in Wakna Structure 3 (Hansen 1992b, 1992c). These tombs, which undoubtedly guarded the remains of important royal figures, occur in a triadic arrangement at the base of each of the primary structures of the group (see below). Extensive tunneling and trenching of Nakbe Structure 13, which is nearly identical in size, form, and antiquity to Wakna Structure 3, however, failed to uncover any tombs or burials in comparable locations.

The differences in placement of Chicanel tombs at Wakna and other Late Pre-Classic examples are intriguing. The Wakna tombs correspond more closely to patterns in Early and Late Classic buildings. For example, a large looter's trench at Caracol found at least three major Classic-period tombs under the lower floors and in the fill of Structure B20 (see Chase and Chase, this volume). Important Classic tombs at Caracol were also placed at the base of the central building of the triad (Chase and Chase 1987). Yet, excavations in similar locations on both of the flanking structures on the Pre-Classic pyramid of Tigre at El Mirador and the central and flanking superstructures of Late Pre-Classic Structures 1, 27, and 59 at Nakbe revealed no such funerary features.

Tomb Constructions

The scarcity of known Pre-Classic tombs in the Maya lowlands may result from inadequate testing in structures. Tombs are clearly less common in Pre-Classic structures than in Classic buildings of the same size and form. Numerous looters' trenches at Tintal, Wakna, and portions of Nakbe and El Mirador failed to locate tombs or burials. As a result, additional looters' trenches were often placed in the same structures in the belief that previous trenches missed the burials (Hansen, Bishop, and Fahsen 1991: 239).

An important Middle Pre-Classic tomb or crypt with stone slab sides and

[13] Architectural excavations of triad buildings at El Mirador—Structure G34 (3D3-1, 3D3-2, 3D3-3), Tigre (4D3-1, 4D3-2, 4D3-3), Monos (2D3-1, 2D3-2, 2D3-3, 2D3-5, 2 D3-6, Structures G313 and G314), Pavos Acropolis (Structures 2A6-3 and 2A6-6)—Nakbe (Structures 1, 2, 13, 27, 59, and 60), and all triadic structures at Tintal, which have now been heavily excavated by looters, had no mortuary constructions. A similar observation was noted in the large-scale excavations of Uaxactun Group H-Sub 3, Sub 4, and Sub 5, where no Pre-Classic tombs were located in buildings. An interment known as Burial 233 was located in a sealed context under Structure H-Sub 4 (Valdés 1986: 166), but it is believed that this burial preceded construction of the building.

roof was found in a low structure at Los Mangales in the Salama Valley (Sharer and Sedat 1987: pl. 4.3). A more modest crypt, containing a male occupant with numerous vessels, was found near the summit of a Late Pre-Classic edifice (Structure A-7) at La Lagunita in the Quiche highlands (Ichon and Viel 1984: 19, fig. 15). However, extensive tunneling in the buried Pre-Classic structures in Tikal's Mundo Perdido and Group H at Uaxactun failed to locate burials in similar locations.

The best-known early tombs in the North Acropolis at Tikal are Late Pre-Classic (Fig. 20). These elite interments (chronologically ordered as Burials 164, 166, 167, 85, 117, and 125) indicate that burial of nobles did not necessarily correspond to the largest or most sophisticated buildings. Burial 85, perhaps the most elaborate Pre-Classic tomb found at Tikal (Coe and McGinn 1963), was found within the diminutive (50 cm high) Structure 5D-Sub 2-2nd. This modest, 3 m^2 platform placed at the axial base of the stairway of Structure 5D-Sub 1 contained a crude, vaulted tomb measuring 1.25 m wide and 0.9 m high. A slightly larger vaulted chamber, Burial 167 (1.80 × 1.2 × 1.6 m high), was located inside Structure 5D-Sub 10-2nd (Coe 1990: fig. 30), a modest platform only 0.9 m high, with an elaborately painted masonry superstructure.

Tikal Burial 166 was sealed by Structure 5D-Sub 11 (1.75 m high), which appeared to be situated as the center structure of a triad, but only two buildings (5D-Sub 11, 5D-Sub 12-1st) were identified by excavations. Burial 166 was a vaulted chamber (1.20 m wide and 1.35 m high) with black line paintings on the interior walls (Coe 1965a: 1410–1411; 1990: figs. 34 and 35).

The Wakna Late Pre-Classic tombs were looted in a 17 m high triadic structure, Structure 3 (Fig. 21). Structure 3 rests on a platform on the northern edge of the major architecture. This building, in the typical triad form, had been looted by large-scale trenching in all three edifices. Formal tombs had been located under all three structures of the triad, with a large chamber (Tomb 1) located in the center building at the level of the platform; the two less-elaborate tombs (Tombs 2 and 3) were found under the flanking structures at the base of the platform (Hansen 1992b). Whole Chicanel ceramic vessels were found in situ in the tomb chambers, indicating the unequivocal Late Pre-Classic date for the constructions.[14]

Wakna Tomb 1 is a chamber of pentagonal form and is 1.6 m wide, 2.3 m

[14] The Chicanel vessels at Wakna consisted of three medial-flange Sierra Red bowls, a figure-8-shaped Flor Cream bowl, and two Sapote Striated unslipped vessels. The informant, a now-deceased *chiclero* named Abraham Mejía Fajardo ("Chorro"), admitted that he had been responsible for looting the structure approximately ten years before. During excavations at El Mirador from 1980 to 1982, workers reported the existence of these tombs,

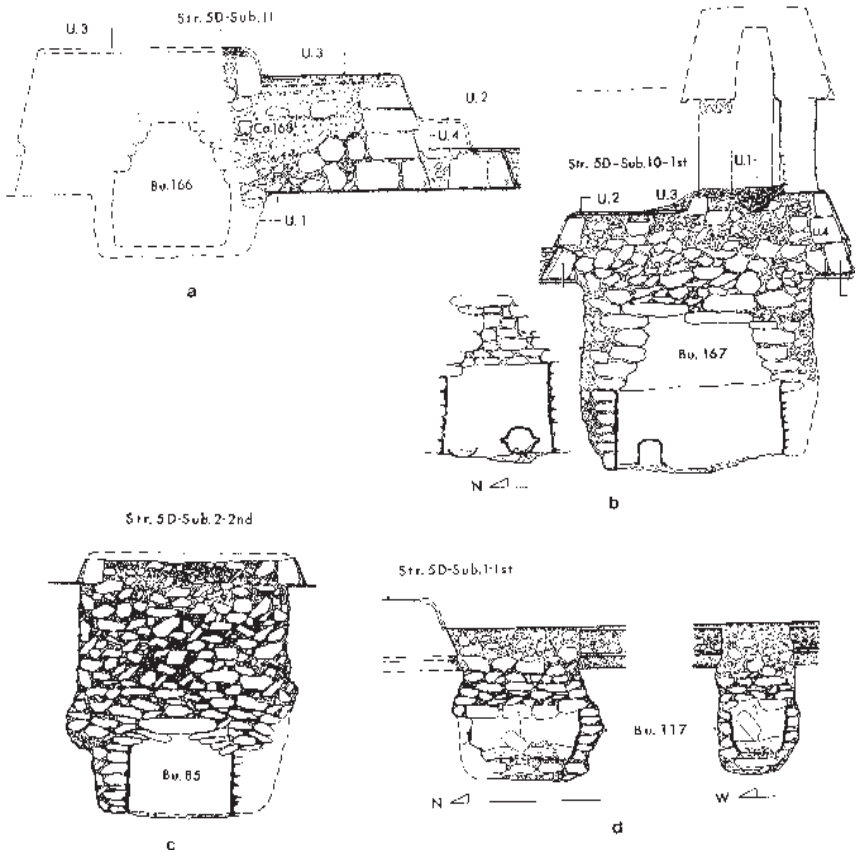


Fig. 20 Late Pre-Classic tombs at Tikal: (a) Burial 166, (b) Burial 167, (c) Burial 85, and (d) Burial 117 (after Coe 1990: figs. 33b, 30c, 27b, 26a). Reproduced by permission of the University Museum, University of Pennsylvania.

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noting similarities with ceramics from the Tigre area (R. Hansen, El Mirador Field Notes, 1982; Hansen 1992b: 6). The informant spent considerable time searching for large Sierra Red *floreros,* which he claimed were located in the central tomb (Tomb 1) and in the eastern tomb (Tomb 2). Other artifacts purported to have come from the tombs were 17 vessels from the eastern tomb and a large quantity of jade, particularly from the center chamber of Tomb 1 (reportedly 23 pounds!), which the looter had weighed in the village of Carmelita. Intact Late Pre-Classic vessels are still in place in Tomb 2 and Tomb 3. The artifactual wealth of the tombs; the unusual, if not extravagant, architectural format; and the fact that the informant drew unsolicited drawings of three large jade plaques suggest the probable royal nature of the deceased occupant of Tomb 1.

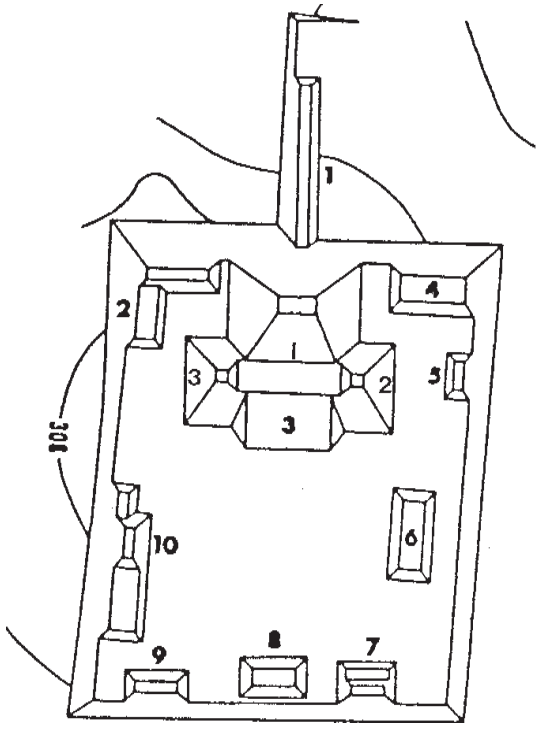

Fig. 21 Structure 3, Wakna. Courtesy of Ian Graham.

long, and 1.9 m high (Fig. 22). A springline above the floor narrows the chamber to about 0.7 m wide. Above the springline are large, finely cut blocks that had been placed on end to form an apex. Each stone rests on those from the opposite side of the chamber. There were no capstones. (This pattern perhaps best resembles the load-bearing concept of a true arch rather than a corbeled arch because the weight of each side is directly dependent on the other.) The tomb was enhanced by a façade on the southern side, thus forming a series of stepped, vertical walls or panels that receded in equal fashion on both sides of the chamber (Fig. 23). Visible portions of the walls revealed a red façade with remnants of black and blue lines and scrolls. In addition, the eastern panels revealed the faint remnants of a hieroglyphic text.

The two flanking tombs at the eastern and western distal base of the platform were not stuccoed but were crude vaults plastered with brownish-gray clay. These chambers (1.4 × 1.2 × 1.3 m high) were roughly rounded. The western chamber (Tomb 3) was not explored because of the possibility of structural collapse. The eastern chamber (Tomb 2) was located immediately inside an earlier structure (Structure 3-Sub 1) buried by the final form of Structure 3.

Fig. 22 Late Pre-Classic tomb (Tomb 1) from Wakna, showing pentagonal form and the heavy blocks that formed the vaulted roof.

This earlier building had some of the finest polychrome-painted surfaces I have seen on Maya architecture.

The architectural format of Tomb 1 in Wakna Structure 3 is not unique to the Maya area. Laporte and Fialko (1995: 52–53) note a Cimi phase burial (PNT-021) found on a north–south orientation near the center-line axis of Structure 5D-86 (Fig. 24a). The form of this vault was also pentagonal, with two large blocks forming an apex, as at Wakna. It is the earliest tomb in the Mundo Perdido complex (Laporte and Fialko 1995: 52–53).

The slab-apex tomb constructions at Wakna and Tikal are common in Zapotec tombs and other buildings in Oaxaca. A tunnel in Building J at Monte Alban has the large slab-apex construction dating to early Monte Alban II, about 200 b.c. to a.d. 250 (Fig. 24b). Large stone slabs in a later Zapotecan tomb formed the vault of Tomb 5 at Huijazoo, Oaxaca (Mendéz Martínez 1986: 79), and Tomb 7 at Monte Alban (Caso 1981: 263). It is also found in one wing of a subterranean tomb at Lambityeco (personal observation, 1990). In addition to

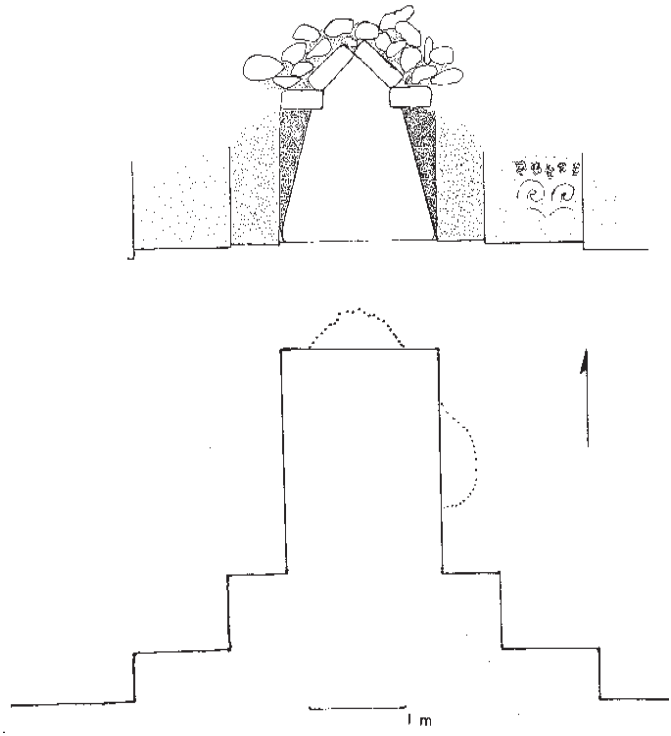

Fig. 23 Cross section and plan drawing of Tomb 1, Wakna. Note the walls that are recessed from the entrance to the back of the tomb.

the wide geographical range of this architectural form, there is considerable temporal continuity as well. Large, flat stones forming an apex were found at Hatzcap Ceel, Belize (Thompson 1931: 55), and at Chichen Itza (Holmes 1895: 5, fig. 11a; A. Smith 1940: 208–209) in Late Classic and Early Post-Classic contexts.

The varied forms of known elite Pre-Classic burials in the lowlands may suggest independent origins for tomb constructions. A good deal more information on lowland tomb architecture from the Pre-Classic periods is sorely needed to identify the variety of constructions, chronological variations, and possible sources of architectural influence.

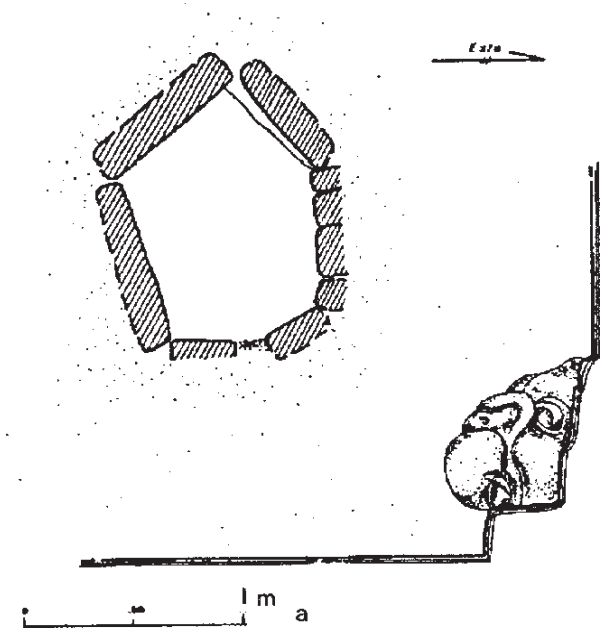

Fig. 24 Early tomb constructions: (a) Cimi phase tomb (PNT-021) in Structure 5D-86 at Tikal (after Laporte and Fialko 1993: 34), and (b) vault construction of tunnel in Building J, Monte Alban (II).

ARCHITECTURAL MASONRY

Some of the most diagnostic architectural features of the Pre-Classic are evident in masonry. The earliest stonework in the Mirador Basin, dating from 900 to 600 b.c., consists of vertical walls of small, crudely shaped stones placed in stacks up to 2 m high. The architectural transformation from these stones to finely cut megalithic blocks placed in apron moldings took place during the late Middle Pre-Classic period in the lowlands (see above). Four walls of Middle Pre-Classic terraced buildings at Nakbe (Fig. 14), and an early Late Pre-Classic terraced platform inside Structure 34 at El Mirador (Hansen 1990: 70–74), have megalithic blocks stacked parallel to the axis of the structure. During the Late Pre-Classic period at Nakbe and El Mirador, there was a slight reduction in block size from known Middle Pre-Classic antecedents, but blocks were tenoned into the fill, allowing minimal exposure of stone—see Howell and Copeland (1989: 9, fig. 5). Tenoned blocks may have provided greater architectural stability because the long axes of stones were parallel to the outward pressure of the fill of the structure. However, the labor expense of both building-stone and architectural construction was significantly greater because many more blocks were required to cover the surface area of a wall (Fig. 25). The additional manpower and materials corresponded to an emphasis on architectural monumentality during this time, which is especially notable considering the surface area of large-scale architecture, up to 72 m high, on buildings such as Danta and Tigre pyramids at El Mirador or Structures 1 and 2 at Calakmul. These edifices display sloping walls with apron moldings formed by tenoned blocks (Fig. 26).

Masonry of the Middle and Late Pre-Classic periods exhibits traits that both resemble and differ from examples of the Classic and Post-Classic periods (Fig. 27). Yet, Structure 34 in the Tigre complex at El Mirador (Hansen n.d.a, 1990) revealed a wide variation of architectural traits and masonry on a single Late Pre-Classic building, showing a greater heterogeneity of masonry types than previously thought. Whether this reflects different episodes of construction, different architects, or other variations remains unclear.

Ten varieties of modified stones have been found in architectural contexts at El Mirador and Nakbe (Hansen 1990: 156 ff), each having different functional and chronological values. The modal characteristics of the stonework are consistent with other examples of Pre-Classic and Classic architecture in the lowlands. Several of the most diagnostic shaped stones include the following forms.

1. Cornice Stones. Among the most diagnostic stones from the Late Pre-Classic, these projecting blocks were placed on the vertical walls of summit structures about 2 m above the plaster floor. Although large blocks were placed in

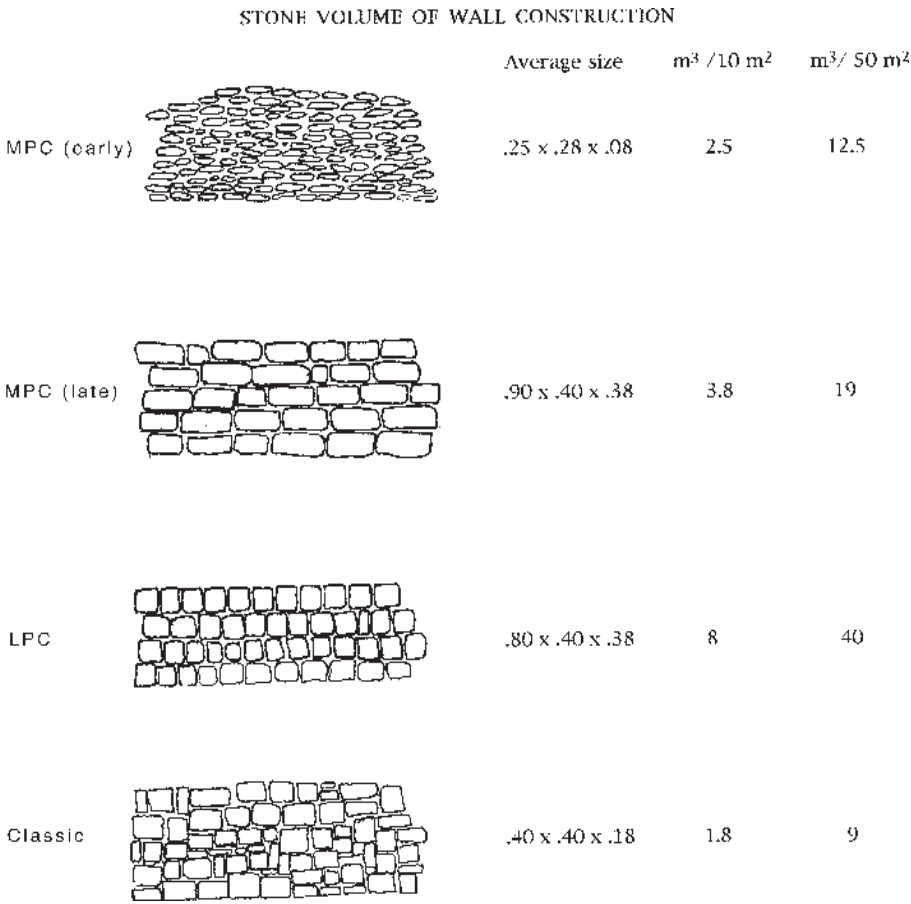

Fig. 25 Variations in wall constructions and compositional stone volume according to time period. Volume calculations are based on similar surface areas. MPC = Middle Pre-Classic; LPC = Late Pre-Classic.

apron moldings on the platforms of Middle Pre-Classic structures at Nakbe (Structures 35A and 32) and Tikal (Structures 5C-54-2 and 5D-84-88-2), cornice stones did not appear until about 250 b.c. at El Mirador, Tikal, and Uaxactun (El Mirador: Structure 34, Danta; Tikal: Structure 5D-Sub 1-1st, Structure 5D-Sub 10-1st; Uaxactun: Structure H-Palacio Sub 2). The cornice formed a projecting, sloped roof, which often displayed sculpted panels, as shown on Uaxactun Structures H-Sub 2, H-Sub 6, and H-Sub 7 (Valdés 1986, 1987, 1989a, 1992;

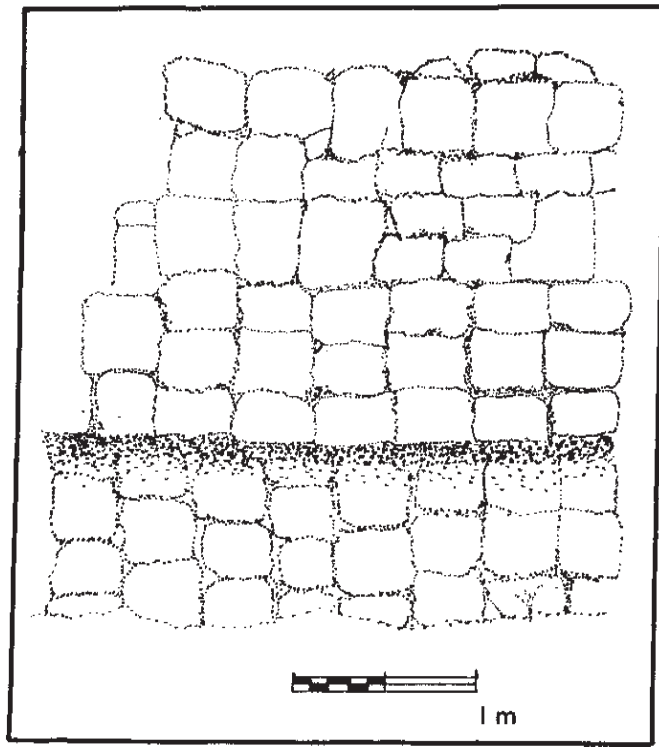

Fig. 26 South wall, Danta pyramid, El Mirador.

Laporte and Valdés 1993). The cornice usually signals the presence of a corbeled vault, although Structure 5D-Sub 1-1st at Tikal has evidence of both a vaulted chamber (with the capstone) and a room formed with flat timbers associated with the cornice. On Structure 34 at El Mirador and Structures 5D-Sub 14-1st and 5D-Sub 1-1st at Tikal, the cornice stones measured approximately 1.2 m long and 0.4 m thick and weighed approximately 460 kg at a specific gravity of 2700 kg/m^3—see Sidrys (1978: 174). In addition, the stones were carved with a raindrip, a slight overhang on the exterior lower edge of the cornice that allowed water to drip at the exterior point rather than down the face of the wall. This feature indicates the specialized function of the stones (Fig. 27)—see Coe (1990: fig. 25a).

2. Corner Stones. Another diagnostic stone is found on the corners of Late Pre-Classic buildings at the cornice level, such as on Structure 5D-Sub 1-1st at Tikal (Coe 1990: fig. 23). These stones are among the largest Late Pre-Classic

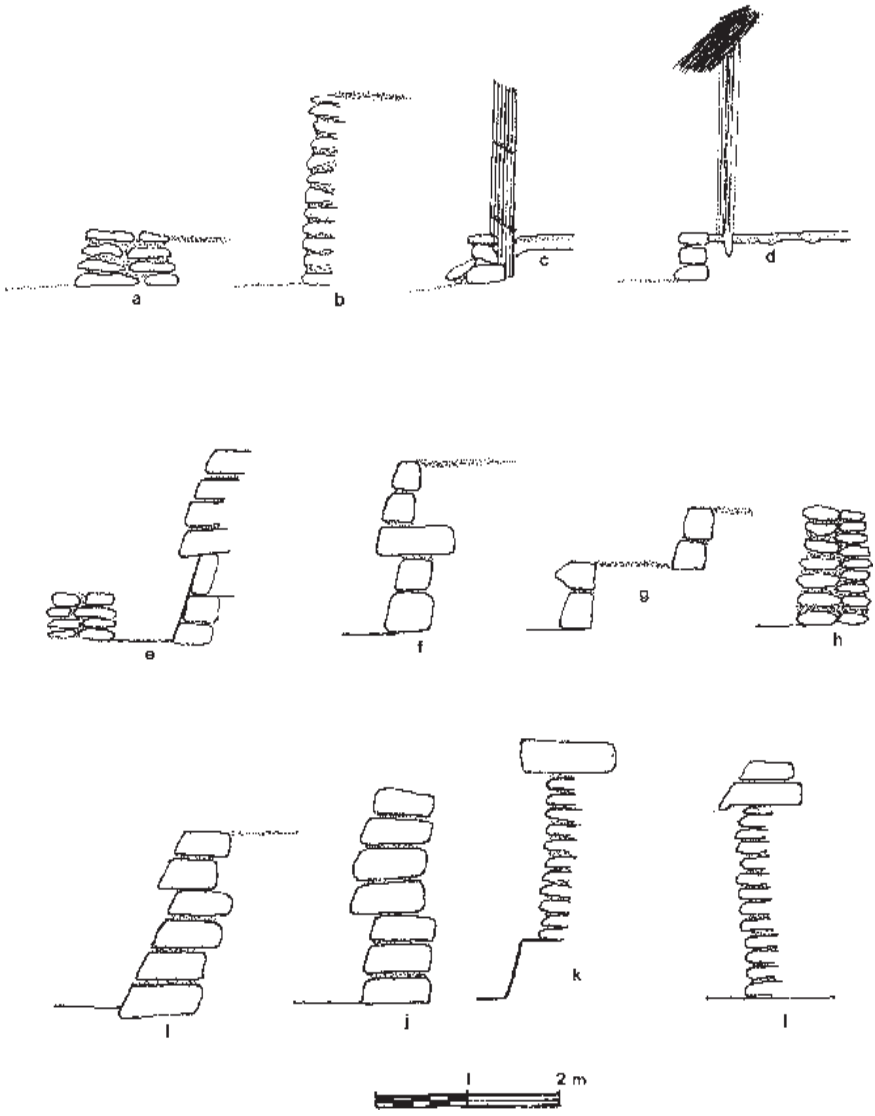

Fig. 27 Chronological chart of selected buildings and superstructures: (a–d) early Middle Pre-Classic, (e–h) late Middle Pre-Classic, (i–l) Late Pre-Classic.

blocks (up to 1.0 × 1.25 × 0.36 m thick) at El Mirador (Hansen 1990: 118–119, 157) and Nakbe.[15] These blocks are marked with a raindrip but are more square than cornice blocks and weigh up to 1400 kg.

3. Step Armatures. Pre-Classic structures also have diagnostic blocks that formed step armatures in the stairways. Although not all Pre-Classic buildings had these stones, they are rectangular, finely cut, long stones measuring up to a meter long and half a meter thick at Tikal, Uaxactun, Nakbe, Tintal, and El Mirador. They are similar to wall blocks that formed the terraced walls of Middle and Late Pre-Classic structures, except that a long side of the stone is beveled to form the exposed riser. Pre-Classic step armatures differ from Classic stairways because of their larger size, beveled sides, and lack of sharp corners.

Variant step armatures dating to the terminal Late Pre-Classic period were found on Structure 2A6-6 (La Pava) at El Mirador, where rectangular, finely cut blocks were tenoned into the building but were placed on edge so that the narrow width of the stone formed the tread (Howell and Copeland 1989: 31, fig. 14). There was also a small projection of a few centimeters at the base of each step armature, which have been termed "false steps" (Howell and Copeland 1989: 32). This feature was probably used to attach lime plaster on the tread to the riser. However, these steps are rare in the Mirador Basin.

4. Flat Wall Stones: Exterior. These stones consist of flat, rectangular blocks with rounded corners that formed the exterior walls of superstructures in the Late Pre-Classic period (Fig. 28). These flat, thin stones (0.6 × 0.3 × 0.1 m high) were stacked vertically to form the walls. These stones have been particularly noted on the superstructures of Structures 34, 313, and 4D2-1 at El Mirador (Hansen 1990; Stutz-Landeen n.d.: 33, fig. 8) and Structures 1 and 27 at Nakbe (Hansen 1992b; Forsyth and Acevedo 1994). Both exterior and interior walls were built to accommodate air ventilation apertures.

5. Slab Wall Stones. Some of the most unusual architectural stones were uncovered in the central plaza at El Mirador (Nielsen 1990) where enormous slabs of limestone, many considered by Nielsen to be reused stelae, were set in place along the edges surrounding two low platforms. These slabs were set on edge to form the walls of the structure. Associated ceramics indicate a use of the buildings in the Late Pre-Classic period.

6. Flat Wall Stones: Interior. A more common wall stone is usually buried

[15] The period of use for the large corner block on Nakbe Structure 51 is uncertain. Most of the building dates to the late Middle Pre-Classic period, with later use during the Proto-Classic period. Although we have yet to identify any portion of the building constructed during the Proto-Classic period, the upper walls of the building may have been modified at this time.

Fig. 28 Wall exterior of Structure 34, El Mirador. Note the evenly shaped stone blocks and cornice stones.

beneath stucco on interior surfaces of walls and is cruder than those on the exterior. These stones date from the early Middle Pre-Classic to the Late Pre-Classic and consist of roughly shaped, rectangular stones with no finely cut surfaces; they are not found in formal alignments (Fig. 29). These stones are usually about half the size of those on the exterior.

7. Beveled Tenon Blocks. Beveled tenon blocks were impressively large stones placed on the façades and flanks of structures, with the long axes tenoned into the building; the exposed area of the block was sloped. These blocks formed apron moldings and façades of both Middle Pre-Classic (Fig. 14) and Late Pre-Classic buildings (Fig. 26) and represented a maximum investment of labor. These blocks were slightly smaller in the Middle Pre-Classic; they commonly measure a meter long and half a meter thick during the Late Pre-Classic period.

8. Wall Blocks. These large blocks are carved in rectangular form and are approximately the same size as the tenon blocks. They lack the beveled end and the finely cut corners of the Classic period examples. They were usually placed in walls with the long axes parallel to the exterior line of the structure; this allowed maximum exposure of the stone. This is the case particularly with late Middle Pre-Classic/early Late Pre-Classic walls, such as the platform of Structure 32 at Nakbe (Fig. 14) and the interior terraced building inside Structure 34 at El Mirador (Structure 34-Sub 1).

9. Vault Stones. Evidence for corbeled-vault buildings dating to the Late Pre-Classic was found in Structures H-Sub 2, H-Sub 4, H-Sub 5, H-Sub 6, and H-Sub 7 at Uaxactun. Similar evidence for vaults was found on Late Pre-Classic Structures 5D-Sub 1-1st and 5D-Sub 10-1st at Tikal. Collapse patterns in the rubble-filled chambers of Structure 34 at El Mirador and Structure 27 at Nakbe indicate that the vaults were made of small, flat, roughly shaped stones.

Although some Classic vaults involved nothing more specialized than the flat interior wall stones (i.e., Structures 103 and 203 at Nakbe)—see López and Ortiz (1994) and Acevedo (1992)—many structures had specialized and diagnostic stones, such as the boot-shaped vault stones in the northern lowlands and the triangular block with the beveled edge in the central and southern lowlands. The triangular and boot-shaped blocks permitted the narrow end of the stone to be tenoned into the mortar of the structure, with the beveled face forming the interior exposed side of the vault surface.

10. Veneer Stones. During the Early Classic period, veneer stones were introduced; these consist of thin, finely cut blocks placed on end to cover a rubble-filled wall. Architecturally, the stones bore little or no weight, but they did provide the appearance of a finely worked wall surface. Veneer stones also

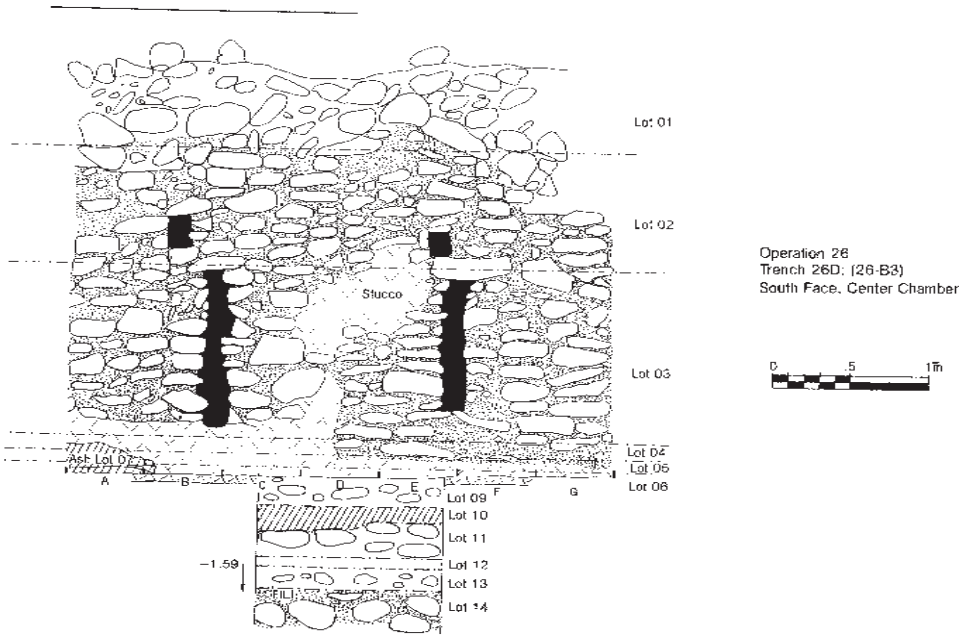

Fig. 29 Interior wall of the center chamber of Structure 34, El Mirador (after Hansen 1990: 32).

maximized the horizontal surface area of a wall with the minimal volume of stone. These exclusively Classic innovations represent a radical shift in the manufacture and use of stone, both technically and administratively. Classic masons minimized the labor per stone; Middle and Late Pre-Classic masons maximized it.

STUCCO AND COLORANT COMPOSITION

Continuities and disjunctions in the Maya built environment are further attested on a microscopic level. Preliminary studies of the chemical composition of Pre-Classic and Classic stucco and associated colorants demonstrate important differences. The red colorant from architectural contexts appears to be the same (iron oxide), but the Late Pre-Classic cream derives from an organic base with an intense autofluorescence under the ultraviolet spectrum (Hansen, Hansen, and Derrick 1995). The use of the cream color, which ranges from light cream to yellowish brown, occurs commonly on Middle Pre-Classic buildings, as in the late Eb Structure 5C-54-1 (Laporte and Fialko 1993).

The texture and composition of the stucco also differs. Late Classic stucco is harder, more gray, and denser than Late Pre-Classic samples (Hansen, Hansen, and Derrick 1995). The Classic samples analyzed to date also show a greater content of microscopic charcoal than the Pre-Classic samples, although the Pre-Classic examples had more ingredients.

Variations between the composition of architectural stucco and floor plaster indicate that floors were constructed with the addition of larger pebbles or stones but contained less aggregate overall, with a greater quantity of matrix (Hansen, Hansen, and Derrick 1995). Floor stucco from all periods displays more porosity than that used in architectural ornament. These preliminary data indicate that variations in the composition of stucco relate to architectural function.

PRE-CLASSIC/CLASSIC ARCHITECTURE: MESOAMERICAN CONTEXT

The discovery in the Maya lowlands of early architecture with its sophisticated and complex stone masonry dictates a reevaluation of the traditional models of Maya sociopolitical evolution. A review of the specific evidence concerning types of masonry, stucco composition, architectural form, and settlement distribution lends weight to the suggestion that the development of public and domestic architecture in the lowlands was indigenous to that region. These data would corroborate earlier assertions about the lack of evidence for direct external influences on Maya architecture, such as from the Olmec (Coe 1965a: 1418). The similarities of architectural development, size, and sophistication of early constructions place the lowland Maya less at odds with the developmental sequence of their cultural cousins in the highland and Pacific Coast regions. Variations in the details of construction techniques and architectural forms demonstrate more of an independent development. For example, constructions from the Charcas and Providencia phases at Kaminaljuyu differ, in form, style, and composition, from those observed on similarly early buildings in the lowlands (Gustavo Martínez, personal communication, 1995; Richard Hansen, personal observation, 1995).

SUMMARY

The sequence of architectural innovations in the Maya lowlands provides a visible record of the development of complex sociopolitical institutions that arose there during the Middle and Late Pre-Classic periods. By the Middle Pre-Classic, many of the attributes that marked the Maya as culturally distinct from their neighbors were already established. The use of stucco on floors and walls, placement of burials under floors, apsidal residences, construction of el-

evated platforms, and the use of limestone were developed during the earliest periods of the Middle Pre-Classic. By the late Middle Pre-Classic, architects developed the general forms of façade constructions that survived for more than a thousand years. During this time, specialist production systems for stone extraction were also established. The employment of full-time masons is evident in the archaeological record for the remainder of Maya prehistory. Ceramics also had become specialized and consistent in form, surface treatment, and use. The Middle Pre-Classic Maya conceived and constructed the E-Group architectural pattern, a major architectural format that endured for the entirety of Maya civilization. The ballcourt also appeared during this time, establishing a cultural identity with the ball game that was never to dissipate. Stone monuments were also being carved and erected in association with architecture by this time.

By the beginning of the Late Pre-Classic period, nearly all the material markers of Maya civilization were in place. It was during this time that the triadic architectural arrangement was established, and it became the dominant construction pattern in the Late Pre-Classic period. Architectural patterns utilizing the triad were replicated by Classic kings, indicating the fundamental importance of the pattern in accession ritual, ideology, cosmology, and fusion of sacred thought with secular construction programs. With the advent of major triadic buildings, monumental architectural art also became standardized, with deity masks flanking the stairways of buildings, entablatures, and walls. Such characteristics continued throughout the remainder of Maya civilization. Experimental uses of stone allowed architectural experimentation, and it was during this period that the corbeled vaults first appeared. Structures became monumental, with the largest Maya constructions being erected during this period. The establishment of true urban centers and specialized, monumental architecture demarcates the Maya as one of the world's great ancient civilizations.

Recent excavations suggest that the complexity and elaboration of architecture in the Maya lowlands were an indigenous, local development. By understanding these new data, and by evaluating them for evidence of function, meaning, and sociopolitical and ideological context, archaeologists may begin to understand what first stimulated architectural development. Along with greater knowledge of ancient ecology and other cultural factors, these understandings will sharpen our views of the beginnings of lowland civilization and reveal the foundations for the function and meaning of Maya buildings that emerged centuries later in the Classic period.

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