CHAPTER 15

Caves, Karst, and Settlement at Mayapán, Yucatán

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Introduction

Mayapán was the capital of most of northern Yucatán during much of the Late Postclassic Period. The city was the seat of a "joint government" (*mul tepal*), or political confederacy, that ruled a regional state for about two hundred years (ca. AD 1250–1450) before the Spanish conquest of Yucatán in 1542. According to native and Spaniard alike, the founding, governance, and collapse of the city formed the most dramatic and singular topic in Maya history at the time of the Spanish conquest; in the chronicles, the rise and fall of Mayapán overshadowed all other preconquest historical events.

Archaeologically, it is easy to see that Mayapán was a primate center in the regional settlement pattern: no other contemporary site in the Maya Lowlands approaches it in size. Because of its political and economic status, Mayapán probably dominated all aspects of art and literature as well (Love 1994:8–13).

The ruins of the city lie some 40 kilometers south-southeast of Mérida, Yucatán (Figure 15.1). The archaeological site measures 4.2 square kilometers inside its 9-kilometer-long defensive wall, within which over four thousand ancient structures are densely packed. The spatial organization of those structures, and especially how they relate to the natural landscape, is the theme of this chapter.

Mayapán lies on a great limestone plain that has developed a distinctive karstic topography and hydrology. Certainly no greater natural influence on ancient Maya settlement patterns ever existed. The structure of the karst determined where water was available in an arid environment. The character of the karst also controlled where suitable land was available for residence. Throughout their history, the Maya had a preference for building their houses on high ground, where good drainage and a cool breeze were to be found. The karst landscape, therefore, governed the pattern of habitable land and the placement of

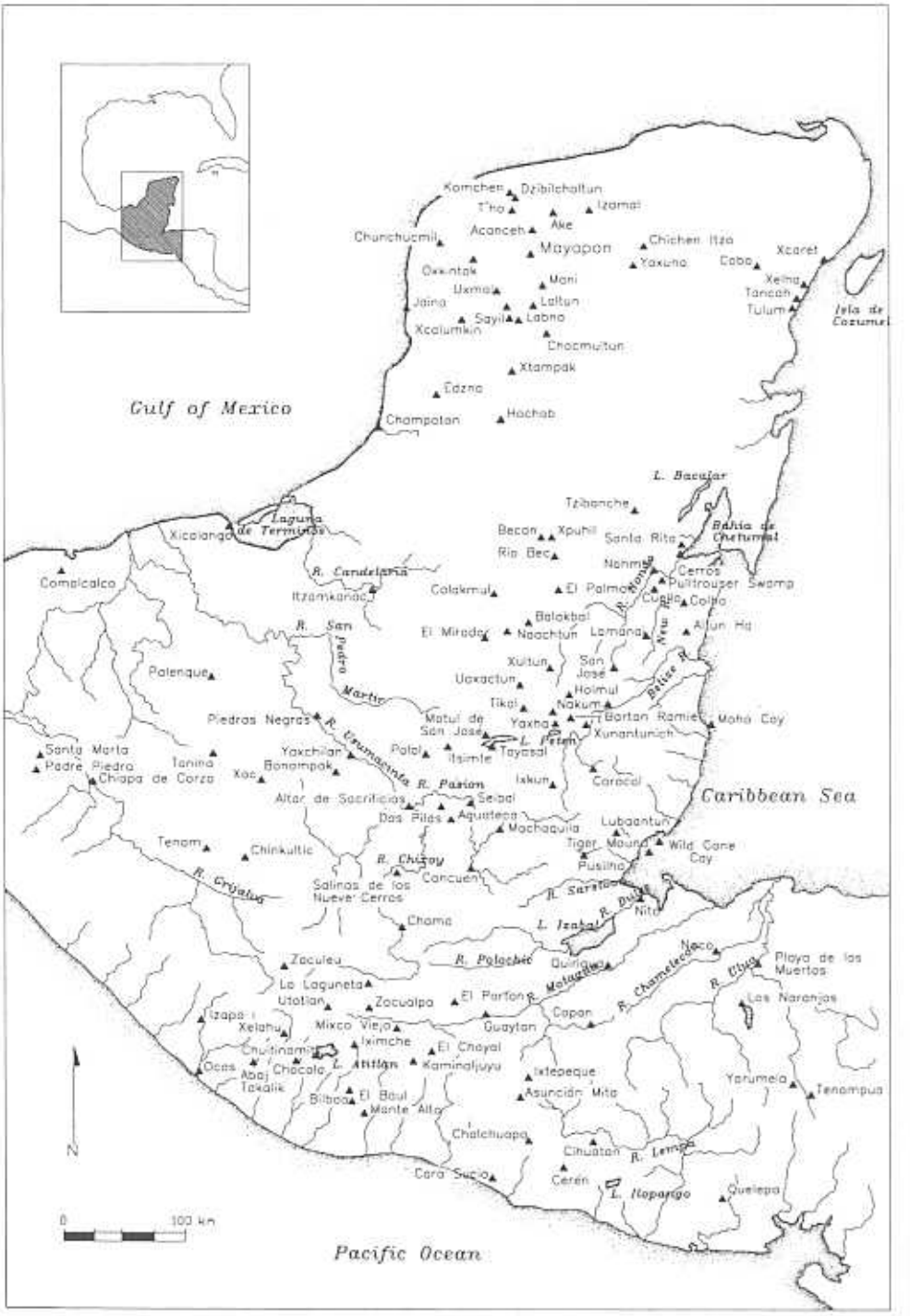


Figure 15.1. Yucatán, with location of Mayapán and other archaeological sites. Drawn by Lynn Berg.

water sources; consequently, it controlled the underlying pattern of settlement within and among communities.

Because the character of the karst varies across the peninsula for a number of reasons, including climatic variation and structural geology, so too did the natural strictures on ancient Maya settlement. Since the sociological, economic, and political facts of Maya society varied across the peninsula for equally complicated reasons, the result is an endlessly complex interplay of nature and culture, of theme and variation.

In this chapter, I explore one example of this patterned variation: how the Maya adapted the social, aesthetic, and religious aspects of their settlement at Mayapán to the karstic landscape. The results of the inquiry are of interest not only because Mayapán was one of the great historical capitals of Maya civilization, but also because some patterns found at Mayapán occur at other Maya cities.

Residential Settlement and Karst Geomorphology

Despite the extensive literature on Lowland Maya settlement patterns and architecture, relatively little progress has been made in describing the distribution of settlement across the landscape. A glance at almost any archaeological site map demonstrates that the Maya preferred to build on high ground, an observation also made by the early Spanish colonists (de la Garza et al. 1983:218). Beyond that, and beyond the obvious fact that residential architecture occurred in various types of groups or clusters, the spatial characteristics of intrasite settlement have not been specified successfully in any detail. Although excellent maps of a few Maya sites exist, no one has created an accurate formal model of settlement within a site. Some scholars think that the settlement pattern was partly random (A. Smith 1962:205); that belief is at least partly false.

At Mayapán, a multitude of small artificial terraces take advantage of the contours of the land to expand the flat living space of the hills and ridges. These constructions are not random, because they relate systematically to the landscape. Accordingly, the morphology of the karst terrain played a role in determining the distribution of the residential architecture. To understand the settlement patterns, therefore, one must describe and understand the underlying topography.

The distribution of water sources at the site played an equally important role in the organization settlement at the site. In and around Mayapán, water occurs only in solution caverns and collapse dolines, more often in the former. Collapse dolines only occasionally reach base level; sometimes they are associated with solution caves that do extend down to the water table. A. L. Smith thought there

was a correlation between the density of settlement and the location of water sources at Mayapán; according to him, the densest settlement occurred around the largest numbers of cenotes (1962:210–211).

Karst is a varied and complex phenomenon. It is "terrain with distinctive hydrology and landforms arising from a combination of high rock solubility and well developed secondary porosity" (Ford and Williams 1989:1; cf. Jennings 1985:1). Karst exhibits distinctive morphology at many scales, from tiny microkarren (measuring less than one centimeter) to regional structures that measure many square kilometers in extent. This patterned variation across many orders of magnitude is fractal. Both genetic and morphological taxonomies have been developed to describe and explain the many varieties of karstic forms. Geologists and geographers (e.g., Dunning 1992:13–20; Miller 1982) have applied these typologies to limited portions of the Maya Lowlands. Unlike in some parts of the lowlands, such as the Bolonchen district, where kegelkarst predominates (Dunning 1992:16), the terrain at Mayapán resists simple classification.

Williams (1972:772–773) calls the closest taxonomic equivalent to the morphology of the Mayapán karst "ridge karst." Ridge karst is a variant of tropical cockpit karst in which the cones between the cockpits appear more as culminations on ridges than as isolated hills (Williams 1972:772). The scale of this pattern at Mayapán is small. The range in elevation is approximately five meters. The ridges meander eccentrically between solution dolines and are topped by small peaks that range in elevation from twenty-seven to twenty-nine meters (in the system of elevations given on the map; true elevations are about eight meters lower [Jones 1952:3–4]).

This morphology is caused by denudation of the surface rock through solution, corrosion, and corrasion, not collapse. Collapse dolines do occur at the site, but are morphologically distinct from the ubiquitous solution dolines that create the cockpits in the ridge karst. Collapse features are steep-sided, they are often associated with solution caverns, and they often approach base level (around thirteen meters below the surface). Furthermore, the origin and evolution of solution dolines is now well documented (Ford and Williams 1989:399–405; Jennings 1985:114–118), and it is widely acknowledged that they are not caused by collapse.

Geologists long supposed that karsts were chaotic, a random jumble of collapse and solution features (Ford and Williams 1989:422). Since the early 1970s, however, karst geomorphologists have demonstrated that this is not the case (Day 1978; Ford and Williams 1989:418–423; Jennings 1985:114–123; Troester et al. 1984; Williams 1972). These researchers have employed morphometric methods to show that karst features, including collapse and solution dolines and residual towers and pinnacles, tend to have nonrandom spatial distributions. The nonrandomness of the distribution is caused, first, by structural controls on the

solution and corrosion processes and, second, by spatial competition that limits the size and shape of solution features. For example, solution dolines normally form around drainpipes that draw surface runoff into the subsurface hydrological system. The pipes tend to develop along joints and fractures in the limestone. The joints and fractures, in turn, often are distributed with some uniformity, because they are created by processes with geometric outcomes, such as, for example, stresses to which the rock responds by sheering or cracking systematically in patterns dependent on its lithology. As the dolines become more numerous and grow, they press against each other, eventually limiting their size and growth. Ultimately, the whole surface is fully occupied by solution dolines. As solution continues, only ridges, pinnacles, or mogotes remain before the surface is fully denuded. Thus, a genetic model of their development can explain the uniformity of the spatial distribution of surficial solution features.

If the distribution of solution features were nonrandom at Mayapán, it would carry important implications for the apparently chaotic distribution of residential architecture. Elsewhere (Brown 1999:157–160), I have used nearest-neighbor analysis to show that the spatial distribution of residual knolls (*h'uu'tun*) is not statistically random at Mayapán, but, instead, tends toward uniformity.

The distribution of known cenotes at the site also appears to be patterned (Jones 1952; Figure 15.2). This begs the question, however, of the actual number of cenotes and their locations. By "cenotes," I mean watering places, because at Mayapán these are often solution caverns with water in them; they may or may not be associated with classic collapse dolines (Figures 15.3–15.8). A few, such as X-te-Toloc, do not now have water in them, but appear to have held water in the recent past. Even those cenotes that have collapse dolines, such as Ch'en Mul, Itzmal Ch'en, and Ch'en Max, also have caves; frequently, it is the cave, rather than the doline, that reaches the modern water table. Locally, the term *ch'e'en* ("well") is used to denote such "caves-with-water-in-them," rather than *'áaktun*, the common Yucatec word for "cave." In fact, the word *ch'e'en* is used for all natural water sources in the area, regardless of whether they are collapse dolines or caves, except for the lakes of the "cenote zone."

The Carnegie Institution archaeologists asserted that there were twenty-six cenotes within the city wall on the map of the site (A. Smith 1962:210, 265). I have been able to find only twenty-three on the final site map (Pollock 1957), but this is only one of several problems in estimating the total number of cenotes at the site. I have identified one cenote at the site that does not appear on the Carnegie map (the unnamed cenote in Square P of Figure 15.2). It is not clear why the Carnegie Institution archaeologists named certain cenotes but not others. Caves apparently were not systematically investigated to determine whether they held water—the only distinction between caves and cenotes. For

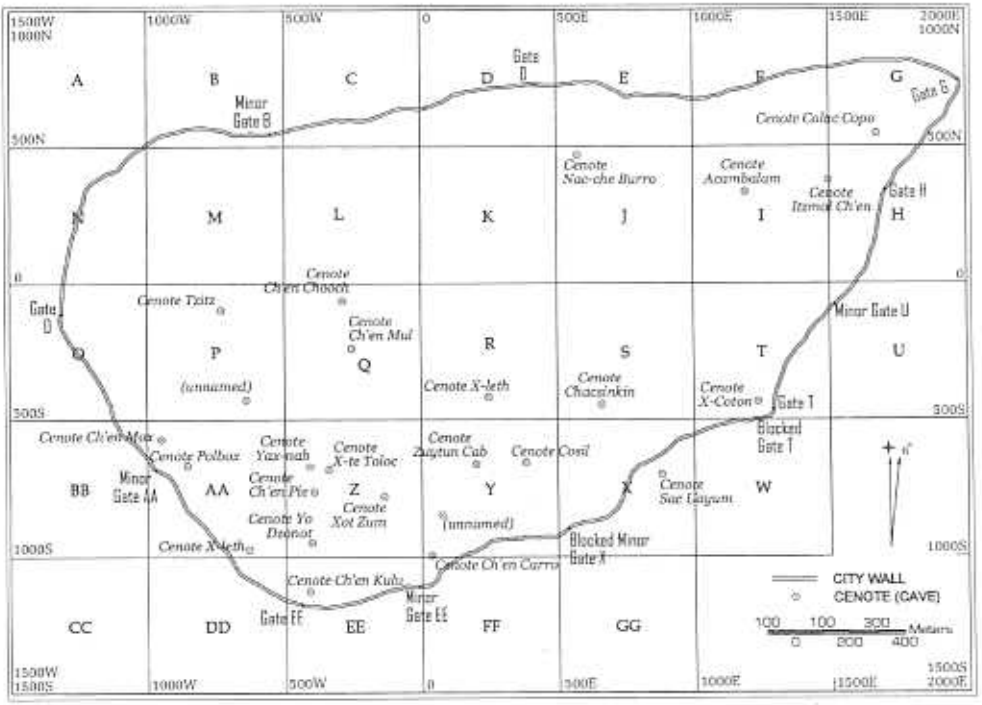
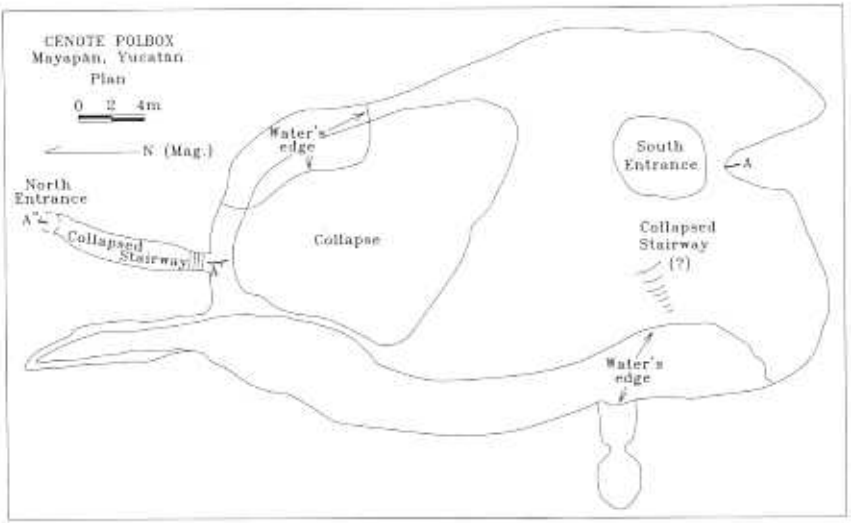


Figure 15.2. Locations of cenotes at Mayapán. After Jones (1952).

Figure 15.3. Plan of the Cenote Polbox, Mayapán. Drawn by the author.



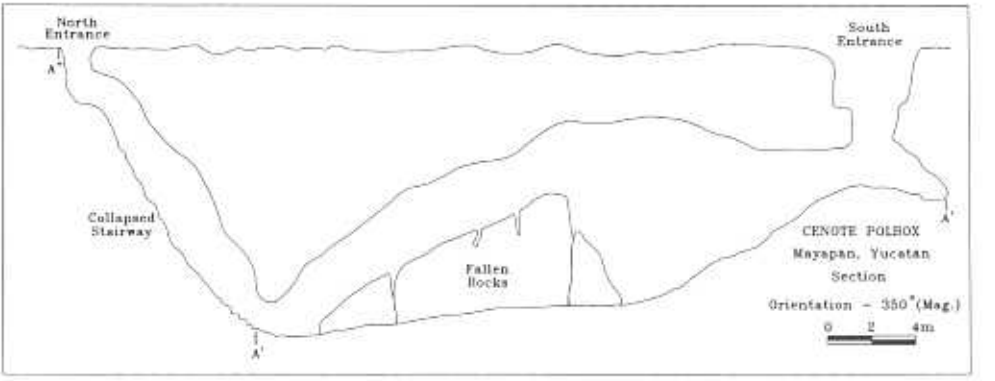
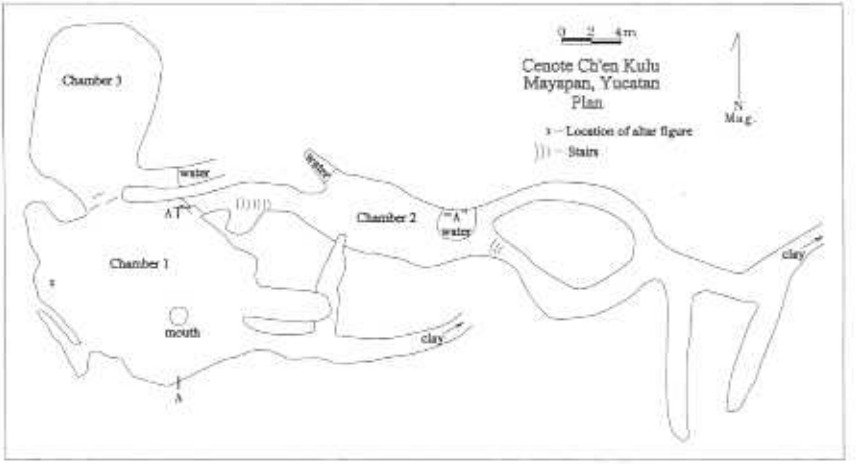


Figure 15.4. Section of the Cenote Polbox, Mayapán. Drawn by the author.

Figure 15.5. Plan of the Cenote Ch'en Kulu, Mayapán. Drawn by the author.



example, the Cenote Polbox is marked on the map as having water in it. A short distance north of the cenote, a cave is marked "W?," indicating that water may be present. In fact, the northern "cave" was the principal entrance to the Cenote Polbox in antiquity. The north entrance has a stairway, while the southern one is a precipitous hole in the ground (Figures 15.3 and 15.4).

Similarly, Cenote Zuytun Cab is marked as having four entrances, one of which is indicated as having water. In reality, the four mouths lead to three cenotes, one of which appears to be dry today, but which clearly held water in the past. The other two cenotes contain large pools of water. The western mouth is a well-like hole in the bedrock that opens into a large chamber with a large, deep pool of water. We found a tunnel leading off from this chamber. The tun-

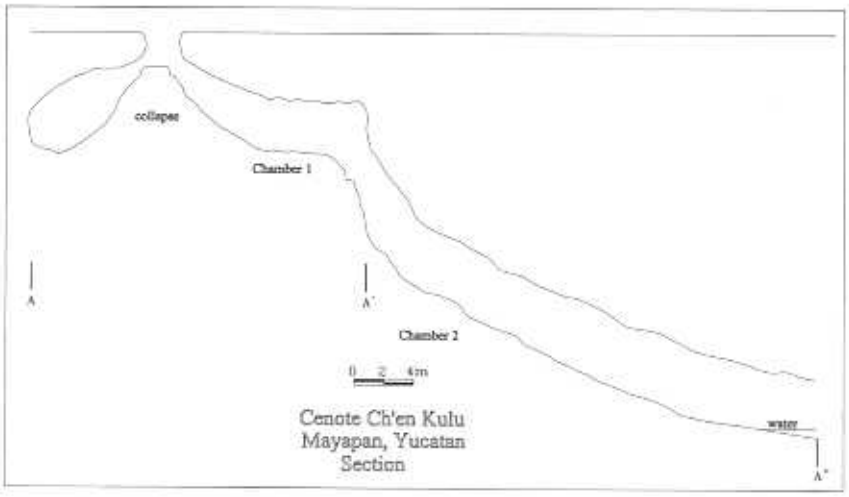
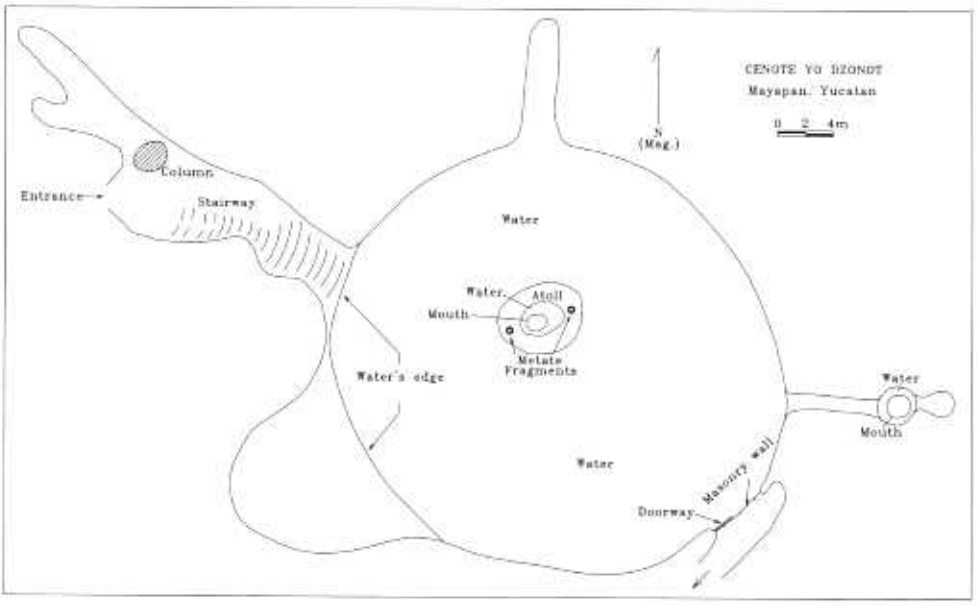


Figure 15.6. Section of the Cenote Ch'en Kulu, Mayapán. Drawn by the author.

Figure 15.7. Plan of the Cenote Yo Dzonot, Mayapán. Drawn by the author.



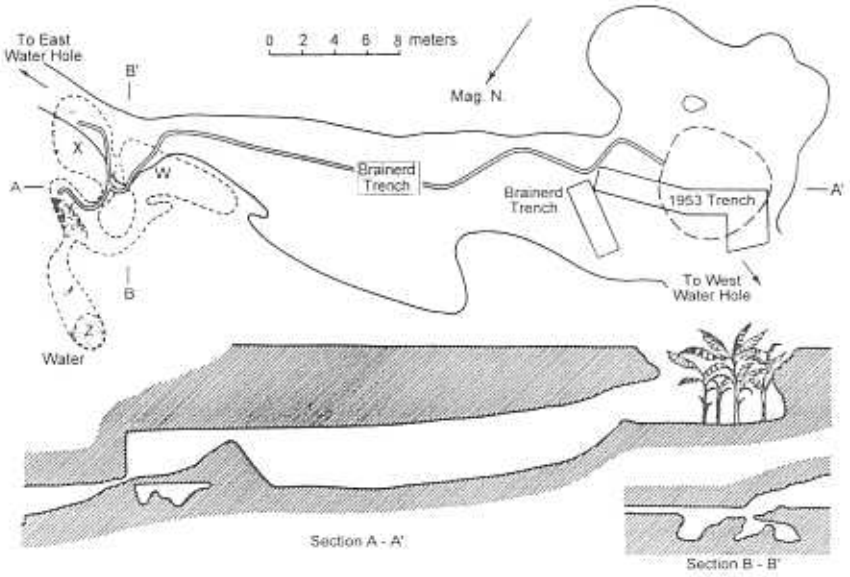


Figure 15.8. Plan and section of the Cenote Ch'en Mul, Mayapán. After R. Smith (1954); courtesy Carnegie Institution of Washington.

nel is littered with artifacts, including some chert, which is rare in the caves of Mayapán. The tunnel is not passable now, but a breeze through it suggests the presence of another entrance, now partially sealed, which probably was the main access in antiquity. The mouth of the tunnel may be in one of the dolines south of the cenote. So, the map indicates one cenote where there are actually three. Moreover, one entrance is apparently lost.

It is also known that some cenotes have been intentionally sealed, since before the Carnegie Institution project, to prevent injury to cattle or to block up raccoon lairs. These have not been explored in modern times. Three such cenotes were reported by Bullard (1954:245; A. Smith 1962:210–211), but do not appear on the site map. In sum, the Carnegie map is not an accurate indicator of the number and location of cenotes. (Since this chapter was written, Arqlgos. Eunice Uc and Carlos Peraza L. have found and explored a number of previously unknown cenotes at Mayapán. I was also shown a previously unrecorded cenote in Square X [Figure 15.2] in the summer of 2002. The total number of known cenotes now may approach forty.)

Nevertheless, from the Carnegie map, one can observe regularities in the spatial distribution of cenotes. For example, the two mouths of the Cenote Polbox, the Cenote Yax-nab, the Cenote X-te Toloc, the four mouths of the Cenotes Zuytun Cab, and the Cenote Cosil form a line running east to west across the southern part of the site. The large Cenote Sac Uayum, just outside the Great

Wall, is not far south of that line. Similarly, the Cenotes Yax-nab, Ch'en Pie, Yo Dzonot, and Ch'en Kulu align north to south. These linear arrangements of cenotes/caves could be developing along fractures in the bedrock.

Fracturing in the Mayapán area may be associated with the Chicxulub impact crater. Mayapán lies just inside the rim of the crater, which is marked by the "cenote zone." The crater is a geological structure dating to the Cretaceous-Tertiary boundary (Hildebrand et al. 1995; Perry et al. 1995; Steinich and Marin 1996; Swisher et al. 1992). Small lakes that formed in collapse dolines or uvalas distinguish the cenote zone. The nearest such lakes lie only a couple of kilometers from Mayapán. Associated fracturing could extend into the site.

Residential Settlement and the Religious Connection to Caves

In addition to the patterned relationship between residential settlement and karst geomorphology, domestic settlement also exhibits a ritual and religious relationship to caves. Descent groups' worship of lineage ancestors created an association between caves and settlement units related to kinship groups. The use of caves for ancestor worship of corporate or territorial groups appears to be a pan-Maya phenomenon. The custom is better documented in the Maya Highlands than in the Lowlands. I will present some of the evidence from the highlands first, and then discuss some previously unrecognized historical evidence for this cult at Mayapán.

A clear understanding of the structure of the cult can be gleaned from Vogt's description of Tzotzil settlement patterns and social organization in the *municipio* of Zinacantan, Chiapas. Vogt (1969:127–180) and his students (e.g., Collier 1975:79–87) have documented in detail a system of patrilocal, patrilineal settlement. Domestic residential groups in Zinacantan are composed of patrilineally related kin living patrilocally. These domestic groups have important social, economic, religious, and political functions. Land is inherited patrilineally. The domestic groups are economic units. Both men and women from the domestic group cooperate economically in tasks ranging from land rental and farming to sheepherding (Vogt 1969:129–130, 136). A cross symbolizing group unity marks each domestic group. The domestic group is the smallest unit in the patrilineage.

Several adjacent domestic groups, which are spatially localized, form a *sna*, or patrilocal patrilineage (Vogt 1969:140). These are self-conscious groups in that they can trace their genealogical connections and live on adjacent lands inherited from ancestors. The *snas* have some jural authority, some control of land, and religious functions. The *sna* may contain only one localized patrilineage or several. The patrilineages vary in size from those with one lineage, four or five

houses, and no more than 15 people to large ones with seven patrilineages, over forty houses, and over 150 people (Vogt 1969:141). Each *sna* maintains a number of cross shrines in caves and on mountaintops that allow them to communicate with ancestral deities. The social group practices ceremonies that reinforce solidarity and mark the *sna* boundaries both geographically and socially (Vogt 1969:141–144).

Next in size in the social structure is the water-hole group, which can vary in size from two to thirteen *snas*. The water holes themselves are highly sacred and are associated with myths. Water-hole groups have religious functions and jural powers over some aspects of life. They maintain cross shrines, as the individual *snas* do, and perform similar ceremonial circuits and other group rituals that define and solidify the entire water-hole group. These too are related to ancestor worship (Vogt 1969:147).

Above the level of the water-hole group is the hamlet, or *paraje*. These are generally endogamous political and territorial units composed of one or more water-hole groups. The hamlets making up the *municipio* of Zinacantan unite for certain ritual and political purposes.

At a yet higher level in the kinship and settlement system are two systems of patronymics: a Spanish surname and a Maya surname. The origin and function of the one based on Spanish surnames is obscure, although it is known from other Maya communities in Chiapas (Siverts 1969; Villa Rojas 1947). Vogt calls these "phratries." The Maya patronymic groups are, in effect, patriclans because they are descent groups composed of people whose genealogical relationships can no longer be traced. These name groups are exogamous and therefore perform an important social function in regulating marriage (Vogt 1969:145). This is a simplified sketch of the social structure of Zinacantan. Many of the patterns are statistical and many anomalies occur; nevertheless, the patterns are robust.

The Zinacanteco social and settlement system highlights the importance of water sources in Maya settlement. They are simultaneously and systematically interconnected with settlement, religion, and social structure. This pattern is not new: there is evidence for the system fairly early in the colonial period (Megged 1999). This is not a localized phenomenon, either, but one that is certainly pan-Maya.

Brady (1997) has reviewed the religious and cosmological importance of caves and springs among various Maya groups. Caves are related to mountains and the gods that inhabit them. These, in turn, are related to ancestor worship (Vogt 1969:378–379, 386–387, 595; Wisdom 1940:425). Among the Tzeltales of Cancuc, for example, sacred caves are associated with the three (there were originally four) exogamous, patrilineal, patrilocal clans. These caves were believed to be caves of origin. The smaller *parajes* were also associated with particular caves, and there was a system of sacred household crosses (Guiteras Holmes

1992:48, 111, 143–146). In Oxchuc, another Tzeltal town in the Chiapas Highlands, religious bonds tied patrilineal settlements to sacred caves (Villa Rojas 1947:579). June Nash has documented a complex system of ritual cave use in Amatenango del Valle, a Tzeltal town between San Cristóbal de las Casas and Comitán. She notes both ancestral spirit caves and more dangerous caves that are inhabited by malevolent spirits (Nash 1985:19–25). A similar system of ancestor worship associated with caves of origin seems to have functioned historically among highland Guatemala groups, like the Pokom, K'iche', Kaqchikel (Miles 1965:285), and Qéqchi' (Gurnee et al. 1968). Thus, caves form major loci in the sacred landscape (see Vogt 1969:378–379, 386–387, 595).

In the relatively arid area of northern Yucatán, where Mayapán is located, caves are, if anything, more important in determining settlement patterns than they are in the relatively well watered highlands. In Yucatán, cenotes are sacred and dangerous: they are thought to be entrances to the Underworld and dwelling places of the *chaaks*, the rain gods. They are sources of evil winds; the plants and animals that inhabit them, especially tortoises, are sacred (Redfield and Villa Rojas 1934:178, 205–206). A cenote is thought of as the cosmological center of the village. At one time, the village cenote was marked by a cross, as were the four corners of the town (Redfield and Villa Rojas 1934:114). However, the social and religious importance of water sources is poorly documented for northern Yucatán. The point is an important one for this investigation because of the possibility that settlement at Mayapán was organized in relation to cenotes. It has been written, and often repeated, that Mayapán's location was based on the existence of a large number of cenotes there (A. Smith 1962:265). My concern here is the ethnohistorical evidence for the significance of these cenotes.

As a preliminary, it is important to recognize that the Yucatec Maya, like their cousins in the highlands, had patrilineages with varied social functions related to landholding, residence, inheritance, marriage, and, apparently, politics and warfare (Brown 1999). The presence of matrilineages (making the Yucatec bilineal) has long been suspected (Eggan 1934; Roys 1940, 1957). The matrilineages probably had economic functions as well (Brown 1999).

As noted earlier, the word *ch'e'en*, "well," is the common term of reference for the cenotes of Mayapán. Although a few are named *ts'ono'ot*, literally, "cenote," most are caves with water in them and are referred to as "wells," which describes their social function. Most of the water sources, both inside and outside of the city, have names and are well known fixed points in the landscape.

Cenotes are mentioned repeatedly in the Books of Chilam Balam, which are colonial-period native books written in the Yucatec Maya language but using the Roman script. The word *ch'e'en* and its derivatives, *ch'e'enil* and *ch'e'enob*, occur seventy-eight times in the Books of Chilam Balam (Miram and Miram 1988:2:322–323), *actun* (*'áaktun*) and its derivatives (including *yactunil*) forty-

two times (Miram and Miram 1988:1:4–5, 6:1456), and *ts'ono'ot* seven times (Miram and Miram 1988:2:397). *Ch'e'en* and *actun* frequently occur together in a couplet or kenning of the form "t u ch'enil—/—T u y ac tunil," which Edmonson (1982:75) translates as "to the wells, to the springs." Similar phrasing occurs a number of times (pp. 79, 92, 94, 97, 105), suggesting a true kenning. I count twenty instances of the parallelism listed in Miram and Miram's (1988:6:1456) concordance of the Books of Chilam Balam, all from the Pérez and Tizimin books.

What does this kenning mean? First, *'áaktun* means "cave," not "spring," at least in Yucatec Maya (Bricker et al. 1998:2–3). "Spring," although poetical, is an unlikely denotation in northern Yucatán, where springs are rare. Second, "wells" and "caves" are usually the same places in northwest Yucatán. The parallelism, therefore, does not contrast two ideas, but emphasizes one through repetition. Edmonson (1982:89) glosses the kenning as "towns and villages," because of, apparently, the close association of settlements with their water sources. I agree with this interpretation. "Generally speaking, the local names of northern Yucatan are those of the watering places: ponds, natural rock tanks, wells, and cenotes" (Roys 1935:2).

The primordial association between towns and their cenotes is often overlooked today, as the ancient cenotes are paved over and water comes out of faucets. This connection is strongest at Chichén Itzá, but many town names incorporate the names of cenotes, wells, or other water sources: Hopelchen, Dzitbalchen, Panabchen, Cacalchen, Bolonchen, Yaxachen, Kancabchen Dzonot, Chikindzonot, Kancabdzonot, Yokdzonot. Less-obvious cases include Cusama ("water where the swifts are") (Roys 1957:60) and Yaxa ("green water") (Roys 1957:96). Other towns are named after adjacent lakes, like Chuaca (Chauac-Ha) (de la Garza et al. 1983:2:83), and some after caves, like Actuncoh and Yoactun. The examples are too numerous to list all. The parallel with the Nahuatl term *altepetl* should not be overlooked. Literally, "water-hill," *altepetl* is glossed as "community," "town," or even "city-state." It is written with a glyph composed of a stylized representation of a hill with a cave at its base.

Many places that do not appear to be are, in fact, named after cenotes. Telchaquillo, which is called Chaak in Maya, is actually named after a now-unused cenote in town. Cansahcab and Sotuta are named after their cenotes (de la Garza et al. 1983:1:94, 145–146).

In a number of cases, the name of the cenote, and hence of the town, comes from one of its characteristics: the name of the town of Pixoy came from the great *pixoy* tree that grew in the town cenote (de la Garza et al. 1983:2:51); Teabo appears to have been named after the grove of plum trees (*abal*) in its cenote (de la Garza et al. 1983:1:318); Dzitnup was corrupted in some way from the name of the *cocoyol* tree growing in its cenote (de la Garza et al. 1983:2:59);

Tecay was reputedly named after the fish in the cenote (de la Garza et al. 1983: 2:125). Thus, although some towns are named after people or animals, plants or gods, others are actually named after their cenotes. So many settlements are synonymous with the names of their cenotes that I believe Edmonson's deduction is correct: "wells and caves" is a metaphor for "towns and villages" or settlements in general.

One of the passages in the Book of Chilam Balam about cenotes is particularly interesting because it mentions Mayapán (Edmonson 1982:94; original emphasis):

Mayapan	*Mayapan*
Uchom ual e	It happened there again
T u cal ch'en	In the pass of the well
T u cal y ac tun	In the pass of the spring
Tan sacil	Before the whitening
Chakan	Fields.
T u kin tz'am coot	At the sun given the ditch,
T u kin y an paa	At the sun there was a wall,

Edmonson interprets this as the continuation of a description of sacrifices that begins on the previous page. *Ual* probably means "then" or "later" (Barrera Vásquez 1980:909) rather than "again." It could also mean "perhaps" (Bricker et al. 1998:299). *Cal* really means "throat" or "neck" and can be easily read this way. Thus, "In the throat of the well/In the throat of the cave" is clearer and more accurate. The next two lines clearly form a couplet because both *coot* and *paa* mean "wall." *T u kin* in this context scans more smoothly as "on the day" or "at the time," rather than as "at the sun." *Coot* is used in modern spoken Yucatec to mean specifically the ubiquitous, dry-laid stone walls that mark property boundaries, which Bullard and I call "boundary walls" and which are called "*albarradas*" in the local Spanish of the peninsula. I cannot adduce any support for "ditch." *Paa* is used generally to denote larger, defensive walls in texts like the Books of Chilam Balam. Edmonson reads *tz'am* as a form of *ts'ah*, "give," but in this context it means to "square" or "smooth" stones (Barrera Vásquez 1980:876). Thus:

Mayapan
It happened then
In the throat of the well,
In the throat of the cave
Before the fields

On that day, an *albarrada* was squared
On that day, there was a wall.

This translation is clearer and more accurate than Edmonson's, though less graceful. The passage is an affirmation of the importance of the caves and cenotes at Mayapán and suggests their relation to sacrifice and ritual.

The most important passage on this theme is also from the Tizimin (Edmonson 1982:110; original emphasis):

Tutz'oc ucuch katun	The burden of the katun is finished
Ti to uil y okol *Mayapan*	Which is one moon over *Mayapan,*
Ti uchom may cu	The cycle seat,
U y etz'	His setting,
U ch'ibal	His lineage,
T u ch'enil	At the wells,
Ti y ac tunil	At the welling fountains.
Ti x uchom cim cehil	And there occurred deer death
Ma ya cimlal	And painless death.

This passage indicates that caves and cenotes were ritually and religiously associated with lineages at Mayapán. The text is relatively clear and straightforward. The translation presents some of the same problems already discussed, such as the rendering of *yactunil* as "welling fountains." Edmonson does, however, provide the basic meaning. There is a parallel, nearly identical passage in the Pérez manuscript of the Book of Chilam Balam (Miram 1988:3:90).

Thus, the Books of Chilam Balam tell us that aspects of the cenote cult, so famous from Chichén Itzá, took place at Mayapán. The cult was probably ubiquitous. One may recall that the victims of sacrifices uncovered by Landa's inquisition were uniformly dumped in cenotes, and also some of the witnesses interrogated admitted to keeping their idols in caves (Scholes and Adams 1938:25, 94, 97). There is, of course, a great deal of archaeological evidence that caves were used ritually in northern Yucatán (e.g., Andrews 1970; Thompson 1975), and, as we will see, the caves of Mayapán itself yield evidence of such practices. Most scholars, however, seem to connect the rituals only with a rain-bringing cult. The above passage from the Tizimin (and its analogy from the Pérez) is the only evidence I know of that links the Yucatecan cenote cult directly to lineages, and presumably to ancestor worship. That it does so specifically at Mayapán is particularly important. The parallels with the Highland Maya settlement and kinship model are remarkable and suggest that parts of Vogt's model are probably applicable to Mayapán.

Civic and Ceremonial Architecture

The second portion of this chapter is about the relationship of civic and ceremonial architecture to the karst geomorphology at Mayapán and, more specifically, to caves and cenotes. A large corpus of evidence has accumulated that Maya ceremonial architecture and its spatial organization were related to ancient Mayan conceptions of politics, religion, society, and the cosmos. There is good reason to believe, for example, that some Maya ceremonial centers can be read as cosmograms (e.g., Ashmore 1989; Aveni 1980:218–286; Aveni and Hartung 1986; Carlson 1981; Coe 1965; Coggins 1980, 1983; Fox 1991). The iconography and architecture of individual buildings were imbued with cosmic and ritual symbolism. The orientation of buildings and groups of buildings was related to astronomical phenomena of religious and calendrical significance. The arrangement of whole ceremonial centers and even sites replicated celestial archetypes.

The best systematic explanation for these phenomena is Eliade's account of the relationship between religion and cyclic history in "archaic" (i.e., non-Judeo-Christian) cultures (Eliade 1958, 1965; see also Aveni 1980:219; Gossen and Leventhal 1993; Kus 1983; Wheatley 1971). Eliade (1965:3) took as his problem the "conceptions of being and reality that can be read from the behavior of the man of premodern societies." He wrote that

> the chief difference between the man of the archaic and traditional societies and the man of the modern societies with their strong imprint of Judaeo-Christianity lies in the fact that the former feels himself indissolubly connected with the Cosmos and the cosmic rhythms, whereas the latter insists that he is connected only with History. Of course, for the man of the archaic societies, the Cosmos too has a "history" . . . But this "history" of the Cosmos and of human society is a "sacred history," preserved and transmitted through myths. More than that, it is a "history" that can be repeated indefinitely, in the sense that the myths serve as models for ceremonies that periodically reactualize the tremendous events that occurred at the beginning of time (Eliade 1965:xiii–xiv).

He argues that for non-Western peoples, "reality is a function of the imitation of a celestial archetype . . . reality is conferred through participation in the 'symbolism of the Center': cities, temples, houses become real by the fact of being assimilated to the 'center of the world' . . . Rituals and significant profane gestures . . . acquire the meaning attributed to them, and materialize that meaning, only because they deliberately repeat such and such acts posited *ab origine* by gods, heroes, or ancestors" (Eliade 1965:5–6).

It was this view of reality that led to the periodic regeneration of cosmos, society, and time through the ritual reenactment of the cosmogonic act (Eliade 1965:51–92). In other words, the repetition of archetypical mythical acts sacralizes profane space and the quotidian tasks of life. The repetition of archetypes, in turn, is a necessary element of life in cyclical time. Prominent among the repeated archetypes were ceremonies of ending and renewal. Eliade (1965:112–130) presents an impressive list, drawn mostly from the Old World, of rituals associated with cosmic regeneration, many of them, naturally, New Year ceremonies, not a few reminiscent of ancient Maya New Year rituals. These periodic recapitulations of cosmic birth take place in the context of great cycles of time.

To understand how Eliade's theory helps explain the organization of sacred space and architecture at Mayapán, let us examine a concrete example. Eliade (1965:12) argued that the architectonic symbolism of the sacred Center consisted of

1. the Sacred Mountain—where heaven and earth meet—situated at the Center of the World.
2. Every temple or palace—and by extension, every sacred city or royal residence—is a Sacred Mountain, thus becoming a Center.
3. Being an *axis mundi*, the sacred city or temple is regarded as the meeting point of heaven, earth, and hell.

There is a growing body of direct iconographic and epigraphic evidence that the Maya regarded their pyramids as sacred mountains (Fash 1991:100; Schele and Freidel 1990:71–72, 427). The ritual and spiritual center of Mayapán was Structure Q-162, also known as the Temple of Kukulcan or the Castillo. It was the largest and tallest pyramid at the site and was located at the center of the largest concentration of civic-ceremonial architecture. It was, in short, the architectural focus of the site's ceremonial architecture (Figure 15.9) (Shook 1954:89):

> Even a casual inspection of the ruins of Mayapan would enable one to state that the temple of Kukulcan (Str. Q-162), popularly known as the Castillo, was the most important architectural unit of the site. Situated on the northwest edge of Cenote Ch'en Mul, it occupies the central position in a tight assemblage of lesser temples, shrines, colonnaded halls, and buildings of diverse types. The terraced pyramid and the temple on its summit tower above the surrounding structures, and the flatness of the land for leagues in all directions tends to magnify the Castillo's height. In ancient times the white stuccoed temple and pyramid must have gleamed like a beacon above the forested land.

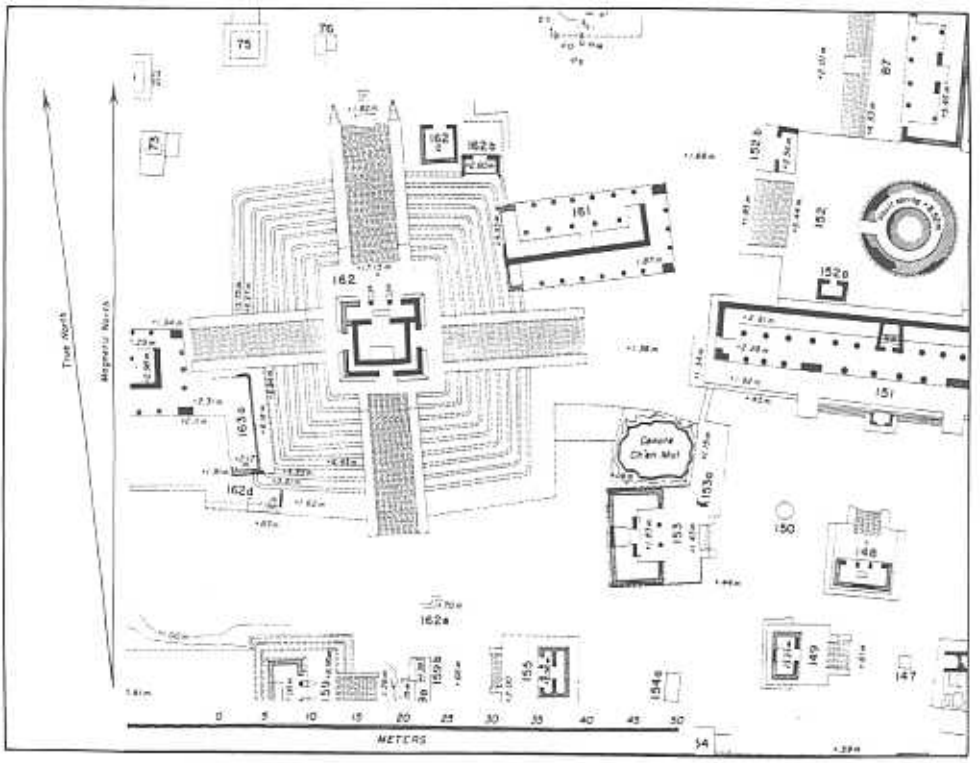


Figure 15.9. Part of a detailed map of the ceremonial center of Mayapán, showing the relationship of the Temple of Kukulcan to the Cenote Ch'en Mul. From Pollock et al. (1962); courtesy Carnegie Institution of Washington.

Interestingly, the Temple of Kukulcan is a radial temple; that is, it exhibits four roughly symmetrical stairways descending the four sides of the structure. Coggins (1980, 1983) has written extensively about this architectural form. She has argued that radial temples were ritually associated with completion, specifically, with calendrical termination rituals, like *katun* endings and New Year ceremonies (see also Carlson 1981). This is shown not only by their plan, which resembles a glyph for completion, but also by their astronomical orientation.

Two radial temples in northern Yucatán are known to participate in astronomical hierophanies: the Temple of Kukulcan at Chichén Itzá and the Temple of the Seven Dolls at Dzibilchaltun. Since the Temple of Kukulcan at Mayapán is apparently a copy of the one at Chichén, the former may also have a special astronomical orientation, especially because it too has a round temple, perhaps an observatory, nearby (Structure Q-152). At Chichén Itzá on the equinox the play of light and shadow on the balustrade of the Temple of Kukulcan creates

the visual impression of a serpent. Apparently, this is not the case at Mayapán, where the orientation of the radial temple is different. If there is an astronomical hierophany at Mayapán, it has been difficult to observe because of the ruined condition of the building. Now that the Instituto Nacional de Antropología e Historia (INAH) has excavated and consolidated the structure, perhaps a hierophany will become visible.

There is direct evidence that the Temple of Kukulcan at Mayapán acted as an *axis mundi* that united Heaven, Earth, and the Underworld. Like its analog at Chichén Itzá, the Temple of Kukulcan at Mayapán had nine terraces (Shook 1954:93), equal to the number of levels in the Maya Underworld (Carrasco 1990:67). Carlos Peraza's excavation of the Temple of Kukulcan has also revealed human figures with death imagery modeled in stucco on the southeast corner of the Castillo substructure (Q-162-sub). This is the corner of the building nearest the Cenote Ch'en Mul. In Postclassic Mesoamerica, death imagery like this was associated with cyclic completion (Klein 1975).

The connection to the Underworld is made palpable, however, by the presence of a natural cave below the temple. Robert Smith (1953a:280; 1954) reported that an arm of the Cenote Ch'en Mul extended approximately west-northwest beneath the Temple of Kukulcan, but he does not seem to have attached much importance to the fact (see Figure 15.8). It has since been discovered that caves or tunnels occur beneath several major pyramids in Mesoamerica, including the Temple of the Sun at Teotihuacan (Heyden 1975, 1981, 1989) and the Temples of K'ucumatz and Tojil at Utatlan (Fox 1991). These tunnels and caves have been interpreted as being related symbolically to Central Mexican creation myths and to the Maya Underworld, Xibalbá, of the K'iche' Maya *Popol Vuh*. The cave beneath the Temple of Kukulcan probably possessed similar mythical significance for the Maya and likely determined the placement of the structure.

The association between the radial temple, symbolic of completion and renewal, and the underlying cave, symbolic of origins, is explained by Eliade's paradigm in an interesting way. Instead of the cave's being merely an entrance to the Underworld, Eliade (1959a:80–81; original emphasis) asks us to consider that

> 1) through annual repetition of the cosmogony, time was regenerated, that is, it began again as sacred time, for it coincided with the *illud tempus* in which the world had first come into existence; 2) by participating ritually in the end of the world and its re-creation, any man became contemporary with the *illud tempus;* hence he was born anew, he began life over again with his reserve of vital forces *intact*, as it was at the moment of his birth.
>
> These facts are important; they reveal the secret of religious man's attitude

> and behavior in respect to time. Since the sacred and the strong is the *time of origins*, the stupendous instant in which a reality was created, was for the first time fully manifested, man will seek periodically to return to that original time. This ritual reactualizing of the *illud tempus* in which the first epiphany of a reality occurred is the basis for all sacred calendars; the festival is not merely the commemoration of a mythical (and hence religious) event; it *reactualizes* the event.
>
> The paramount *time of origins* is the time of the cosmogony, the instant that saw the appearance of the most immediate of realities, the world. This . . . is the reason the cosmogony serves as the paradigmatic model for every creation, for every kind of doing. It is for this same reason that *cosmogonic time* serves as the model for all *sacred times*.

And (Eliade 1959a:78–79; original emphasis),

> Since the New Year is the reactualization of the cosmogony, it implies *starting time over again at its beginning*, that is, restoration of primordial time, the "pure" time that existed at the moment of Creation. This is why the New Year is the occasion for "purification" . . . For it is not a matter merely of a certain temporal interval coming to its end and the beginning of another . . . the sins and faults of the individual and of the community as a whole are annulled, *consumed as if by fire*.

The relation of a cave to the origin myth is relatively obvious in the case of the Temple of the Sun at Teotihuacan (Heyden 1975), assuming, of course, that the inhabitants of Teotihuacan shared later Nahua mythology. In the Maya case, it is reasonable to assume a connection with some version of mythological events similar to those related in the *Popol Vuh*, in which the ancestral Hero Twins die and are reanimated during their journey through Xibalbá. In the alternative, there might be a connection with Highland Mexican mythology and ritual, as Coggins has argued for many of the radial temples and their associated ritual behaviors (Coggins 1980, 1983). We can see in this example the advantage of referring to a paradigm like Eliade's: the relationship between calendrical renewal ceremonies and origin myths might not be evident to the archaeologist.

Are there other especially sacred cenotes at the site? Several were obviously related to a variety of ritual activities. For example, both Itzmal Ch'en and X-Coton are associated with assemblages of civic-ceremonial architecture, the former being the largest such assemblage outside of the main group. Today, and since at least 1950, the Cenote Itzmal Ch'en has been the site of the annual *ch'a'ah-chaak* (rain-bringing ceremony) of the men of Telchaquillo (Shook 1952). The cenote itself, which lies in the eastern extreme of the site, is unusually large

and dramatic. It is probably not coincidental that a visually inspiring cenote at the most sacred of the cardinal directions should develop and retain a holy aura.

The position of the Cenote X-Coton raises another and different issue (Proskouriakoff 1962b:130):

> The X-Coton temple and the shrines are located near one of the principal gates of the city wall, and the course of the wall at this point seems to be deliberately deflected to contain the buildings, or at least to contain the area around the cenote near which they stand. The buildings themselves are of Mayapan date, but a considerable amount of pre-Mayapan pottery was found in the vicinity, and there is some evidence that the cenote itself may have been used for burial in pre-Mayapan times . . . It therefore seems reasonable to think that an ancient tradition associated specifically with X-Coton is responsible for the ceremonial buildings in this locality. (See also R. Smith 1953b)

These observations raise the question of the course of the city wall. There is a series of cenotes near the wall in the southern part of the site. The Cenotes Ch'en Max, Polbox, X-leth, Ch'en Kulu, and Ch'en Carro are all within about 250 meters of the wall, most even closer. Like X-Coton, Ch'en Kulu also may have had a sacred or ceremonial character. In the cave, we found both a stone altar figure (Proskouriakoff 1962a:331–333) with clear calendrical associations and a feature of possible ceremonial or ritual function (Figures 15.5 and 15.6). The large bulge in the southwestern part of the great wall probably existed to embrace Ch'en Kulu and the other nearby cenotes.

If the wall deviates to include this large group of cenotes, why then would it take a sharp inward curve between the cenotes Ch'en Carro and X-Coton, thereby excluding the large Cenote Sac Uayum? Bear in mind that the great wall of Mayapán was the brand and symbol of the city. Rarely does the word *Mayapan* occur in the native chronicles (such as in the Books of Chilam Balam) without the epithet "*ich paa*" (inside the wall), which thus became the ruling trope or metaphor for the city, not unlike the ramparts of "holy Ilios." Clearly, the course of wall would have been important in separating the sacred from the profane and the center from the periphery. Surely, simplicity and convenience would dictate that a large cenote would be better within the city than outside it.

Sac Uayum is a visually dramatic cenote. A shallow depression in the limestone surface opens on one side to expose a large cavern. Only a small amount of light penetrates the cavern through the entrance and through another, smaller aperture in the roof. The walls are vertical or overhanging. The water is unusually deep and clear. The cenote has a fearful reputation. Some local people believe that a feathered serpent lives in the cave. Children are prohibited from approaching it lest the serpent snatch them. Some local residents claim to have

seen the creature. Some say they have seen it swimming in the depths of the water. One old man claims to have seen a feathered serpent in a nearby tree; as he watched, it flung itself out of the tree and dove into the mouth of the cave.

Although there is no direct evidence, it can be assumed that the legend of the feathered serpent in the cenote is of preconquest age. It reminds one of the dangerous caves of Amatenango described by Nash (1985:23–26). The beliefs about Sac Uayum provide an explanation for the deliberate exclusion of the cenote from the city, the absence of a gate in the immediate vicinity, and the lack of residential platforms surrounding it. Note that this dangerous and malevolent cenote is on the south side of the site, at *nohol*, the nadir. The presence of a sacred cenote in the east and an evil one in the south leads us to the idea of a quadripartite cosmogram. Perhaps the whole site, and not merely the ceremonial center, participated in the cosmogram.

Some Mayanists have seen the relevance of Eliade's ideas to the interpretation of Maya religion (Aveni 1980; Brady 1997; Schele and Friedel 1990). There is evidence that these ideas are specifically applicable to Mesoamerica and the Maya. For example, the relevance of Eliade's religious archetypes to the ancient Maya is strongly reinforced by recent reconstructions of Mesoamerican belief systems. Mesoamerican ethnohistorians, for instance, have developed some of the same paradigms as Eliade through examination of specific, local problems (Gossen 1986:5–6):

> At the very least, the symbol clusters noted below have both temporal and spatial persistence in Mesoamerican thought . . .
>
> 1. The abiding theme of cyclical time as a sacred entity . . . it is clear that sacred, cyclical, solar time has held powerful sway in both the ancient and contemporary Mesoamerican universe . . .
> 2. A consistent delimitation of sky, earth, and underworld in the spatial layout of the cosmos, with mediation among these realms as a key intellectual, political, and religious activity, for with successful mediation come power, wisdom, even personal health, and community survival. Some variant of this spatial layout, with subunit segmentation and directional symbolism, occurs throughout pre-columbian Mesoamerica . . . and persists in our time, particularly in the Maya area.

Carrasco (1990) presents another extended treatment of this subject.

Such correlations suggest that Eliade's theory of religion is applicable specifically to Mesoamerican and Maya cases, whether or not its claim of cultural universality can be substantiated. The extensive and detailed parallels between Maya religion and Eliade's archetypes go well beyond those described here,

strongly implying that such an interpretive approach can be fruitful. The potential advantage in doing so lies in the explanatory power of his approach. Eliade sought to establish a science of comparative religion, or *Religionswissenschaft* (Eliade 1959b). Although his methodology has been questioned, the alleged hermeneutical and psychological bases of his phenomenology allowed him and his successors to make claims of cultural universality for their analyses (Allen 1978, 1982; Dudley 1977).

Tambiah (1985:257) offers three cogent criticisms of Eliade's views: (1) the view is static and fails to account, therefore, for the variation and dynamism of the subject societies; (2) there is no evidence for the existence of "a prior ontology," that is, what Eliade calls "the mind of Archaic man" or pre-Judeo-Christian thought as such; and (3) it is impossible to separate the sacred from the profane or from the religious, political, and economic domains, because culture is a holistic phenomenon. This last point represents a position widely held by cultural and social anthropologists. Its opposite—that culture can be studied analytically—is equally widely held. In archaeology, the former represents an extreme cultural relativism in which knowledge of the past is almost impossible. This is not the place to debate the issue.

Tambiah's second point says less about Eliade's view of "Archaic man" than it does about his optimistic assessment of modern thought as being more linear and historical than its predecessor. One should not therefore conclude that Eliade's view of ancient religion is incorrect, because the error may lie in his view of "modern" man.

Tambiah's first point is more valid, but does not, I think, reduce Eliade's interest to Mesoamericanists. The vividness, detail, and specificity of Eliade's arguments do much to compensate for their technical lack of dynamics. Furthermore, I do not think Eliade's mode of explanation is invalid for failing to conform to contemporary expectations of how explanatory models should be structured. Eliade identified broad and widely applicable patterns of human thought and experience. That we do not fully understand how, when, and why they arose and persisted speaks more to our ignorance about this domain of culture (or its complexity) than to the quality of his observations and interpretations.

Summary and Discussion

The geomorphology of the karst underlying Mayapán clearly affected the site's residential settlement pattern. The effect on the distribution of patio groups is difficult to ascertain, however, precisely because they are not correctly delineated on the site map. The patterning of *b'uu'tuno'ob'* certainly influenced the spatial distribution of clusters of house lots, but to understand how requires further in-

vestigation through additional mapping at the site. The mathematical and geometrical characteristics of both landscape and settlement at the site have only begun to be described and analyzed (Brown 1999:111–191).

The caves and cenotes of Mayapán were used for a variety of rituals, and they were probably major foci in the sacred landscape. The watering places were likely associated with a "cenote cult" concerned with rainmaking. Caves and cenotes were also connected to kinship and social organization. Caves must have been the dwelling places of lineage ancestors, as they are among the Highland Maya of Chiapas and Guatemala. Other nearby caves may have been evil and dangerous.

The civic-ceremonial architecture of the site was clearly organized in conformity with Mayan cosmological principles. The Temple of Kukulcan was shown to represent a sacred mountain linking Heaven, Earth, and Hell. The Underworld was literally present in the site cosmogram, in the form of a natural cave below the pyramid. The cave must have been a surrogate for the place of origin where the cosmogony first occurred. The temple as a hierophany surely participated in calendrical rites, either of the New Year or *katun* endings, and probably both. The locations of other caves also influenced the layout of city. The positions of the Cenotes X-Coton, Ch'en Kulu, and Sac Uayum, for example, almost certainly affected the course of the city wall.

I have not discussed many important characteristics of the caves of Mayapán. They were, for example, used for burial. I observed human remains in Yo Dzonot and Ch'en Kulu, and the Carnegie Institution team also found burials in several caves. Caves served as sources of raw materials, such as certain types of calcite and clay, and produced stalactites, which at Mayapán were used as elements in altars (Adams 1953). Much research on this topic remains to be done at Mayapán and will undoubtedly produce greater insight into Maya society and religion.

Acknowledgments

I thank the personnel of the Instituto Nacional de Antropología e Historia for their generous assistance and cooperation during my work at Mayapán. Special thanks go to Lorena Mirambel, then president of the Consejo de Arqueología; Fernando Robles C.; Tomás Gallareta N.; Alfredo Barrera R.; Luis Millet C.; Silvian Boucher; and Carlos Peraza L., who all helped significantly; and to the other archaeologists of the Centro Regional de Yucatán. Luis Leira of the Centro Regional de Quintana Roo also provided invaluable assistance in the course of the project. The financial assistance of the National Science Foundation, in the form of a Dissertation Improvement Grant, and of the Fulbright Program

are gratefully acknowledged. I cannot thank E. Wyllys Andrews V enough for making the project possible. My deepest gratitude goes to all those who explored the caves with me, especially the men of Chaak.

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