

# A Cosmology of Conservation in the Ancient Maya World

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The Classic Maya of the southern lowlands were one with world rather than one with nature, a view that promoted the conservation of their world for millennia, what I term a cosmology of conservation. I explore how their cosmocentric worldview fostered biodiversity and conservation by discussing the ceremonial circuit and pilgrimage destination of Cara Blanca, Belize. Here the Maya left a minimal footprint in the form of ceremonial buildings from which they performed ceremonies, doing their part to maintain the world at several of the 25 water bodies/portals to the underworld. The Maya intensified their visits when several prolonged droughts struck between 800 and 900 CE; it was to no avail, and many Maya emigrated and have successfully renegotiated their relationship in the world to the present day. Their history of engagement serves as a lesson for present society, one that cannot be ignored.

**Key words:** Maya, cosmology, conservation, pilgrimage, cosmocentric worldview, sustainability

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M. C. Escher created intricate, interwoven drawings in which objects, animals, or persons seamlessly meld into other objects, animals, or persons (Figure 1). Each element is connected, like a jigsaw puzzle; a missing piece leaves a blaring gap and an incomplete picture. This image also conveys to a certain extent a cosmocentric worldview, one that is the polar opposite of anthropocentrism, and as such situates objects, humans, animals, land, water, and everything else in an analogical manner such that each plays a role in maintaining its place and the world itself (see Descola 2013:268–80, 401; Ingold 2011: 149; e.g., Astor-Aguilera 2010:208). For people, mutual responsibility is reflected in how they engage on a daily basis. Diversity is key—just as it is for financial portfolios, vitamins and nutrition, genetics, or exercise regimes. The ancient Maya appreciated this fact, as evidenced in their diverse approach to living—from their worldview to subsistence practices. This frame of thinking, doing, and existing explains the millennia of survival in the tropical southern Maya lowlands. In current terminology, we would call this sustainable living. Bringing this concept full circle, diversity is key for a sustainable existence. In this paper, I focus on how diverse aspects of the Classic Maya worldview contributed to its longevity, a story relevant today. When the Maya diverged from this sustainable

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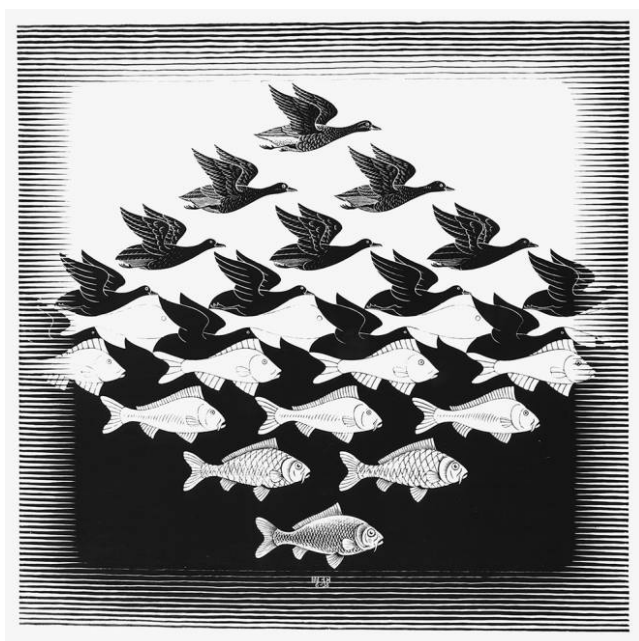


Figure 1. M.C. Escher's 1939 "Sky and Water I" (© 2017 The M.C. Escher Company, The Netherlands. Reproduced with permission; all rights reserved. [www.mcescher.com](http://www.mcescher.com))

path, as they did with their growing reliance on large-scale water-control systems in the Late Classic period (c. 550–850 CE), things fell apart politically and demographically.

The Maya constituted one of many parts in an animated, cyclical world, each with duties and responsibilities. As such, they were one with the world rather than one with nature (cf. Ingold 2011: xvi, 30). The Maya used, maintained, and had relationships with other components of the world—the sky, soil, forests, animals, aquatic life, water, birds, and other entities—via daily interaction and ceremonies in fields, houses, forests, water bodies, caves, temples, and plazas (e.g., Astor-Aguilera 2010; Houston 2014:29, 75). This view also informs how they constructed buildings, how they manufactured stone tools and ceramics, how they farmed and hunted, and other interactions with nature. It was not a perfect relationship; the Maya overused resources and deforested some areas. For example, in the Mirador Basin of Guatemala, the Maya had to abandon the earliest centers and reservoirs by 150 CE for several reasons, including drought, cutting down too many trees, and perhaps mismanagement of water systems (Douglas et al. 2015; Hansen et al. 2002; Medina-Elizalde et al. 2016; Scarborough 1993). The Maya then adjusted and renegotiated this relationship, a strategy that worked since they did not abandon southern lowland centers again for another 700 years. This way of life continues to work, as evidenced in the more than seven million Maya liv-

ing today. Such a view, as I attempt to show, promoted the conservation of their world, what I term a cosmology of conservation (Lucero 2017). Remnants of this way of existence remain today; for instance, evidence suggests that the current “primary” forest actually is a descendant forest reflecting ancient management (Ford and Nigh 2015; e.g., Lindsay 2011).

Since a linear, nature-culture dichotomy was a foreign concept to the Maya, as it was and is for most premodern or nonindustrial societies (see Descola 2013:113–14; Ingold 2011; Latour 1999), a Western, dichotomous Cartesian approach does not work when attempting to grasp a non-Western cyclical, melded existence with fluid, complementary oppositions—death/life, destruction/creation, sacred/secular, wild/domestic, supernatural/natural, culture/nature, and others (e.g., Astor-Aguilera 2010:188; Taube 2003). To unravel and capture this complex “messiness,” we need to take a monistic or more encompassing approach (see Descola 2013:xvii, 14; Ingold 2011:14) and think about the various parts as *intersecting vectors* (Ingold 2011:140–44). In so doing, we can reveal the world as Aldo Leopold described it in 1939 (1991:268), as one that includes plants, animals, soils, photosynthesis, water, and other nonhuman properties as being part of the chain of life. This chain of life is “a tangle of chains so complex as to seem disorderly, but when carefully examined the tangle is seen to be a highly organized structure. Its functioning depends on the cooperation and competition of all its diverse links.” A change or disruption in one link has reverberations throughout.

Everything is connected and interrelated. We can capture this view by focusing on the archaeology of place rather than just on artifacts and sites. I explore the melded Classic Maya world and how such an existence fostered biodiversity and conservation by discussing the ceremonial circuit and pilgrimage destination of Cara Blanca, Belize. Cara Blanca, with its 25 pools, has everything a rational person needed: plentiful year-round water and nearby fertile land. But the story is not so simple, especially since the Maya neither farmed nor lived near most pools even when severe droughts struck. Pools, as openings in the earth, were portals through which the Maya communicated with gods and ancestors. Consequently, the Maya interacted with Cara Blanca as a place of pilgrimage that they experienced as part of a ceremonial circuit, and in so doing left a minimal footprint.

## THE LATE CLASSIC MAYA IN THE SOUTHERN LOWLANDS: THE SETTING

The Maya renew the sun and their world, even while  
the sun and their world renew them  
—(Astor-Aguilera 2010:138).

The Late Classic period (c. 550–850 CE) in the southern Maya lowlands,<sup>1</sup> including Belize, northern Guatemala, and parts of western Honduras and southeastern Mexico, witnessed the emergence of powerful kings, the largest population, and the most active engagement with their world via low-density urbanism, a sociopolitical system

that integrated water and agricultural systems, roads, urban centers, hinterland farmsteads and communities, exchange networks, and resources (Lucero et al. 2015) (Figure 2). Centers are centripetal in nature with large-scale reservoirs, public ceremonies, markets, ballgames, and other integrative events that took place at temples, plazas, and ballcourts. In contrast, hinterlands are centrifugal owing to the high but dispersed biodiversity mirrored in scattered farmsteads and subjects (Chase and Chase 2014; Fedick



Figure 2. Maya area with sites mentioned in text and numbered Cara Blanca pools (courtesy of VOPA)

1996; Fedick and Ford 1990; Ford 1986; Lucero 2001). The Maya relied on labor, skill, and stone tools to create a writing system, incise stelae and jade items, manufacture painted ceramic vessels, and build monumental constructions, including palaces, temples with royal tombs, ballcourts, and large-scale water systems. They accomplished these feats without metal tools, beasts of burden, wheeled carts, an extensive road network, and large-scale irrigation systems.

The Maya lived in the humid tropics, where annual dry and wet seasons impacted their agricultural, social, political, and religious life—everything was rainfall-dependent. Rains were critical for the diverse plants the Maya cultivated (maize, beans, squash, manioc, cacao, chile peppers, tobacco, pineapple, cotton), as well as to replenish reservoirs, manufacture plaster and ceramics, and for other daily needs. Seasonal vagaries such as tropical storms and hurricanes required continual supplications to gods and ancestors, especially during the annual drought from about February through June, when their world turned into a green desert. Most Maya lived and farmed scattered throughout the karstic landscape interspersed among centers. Each center—and there are hundreds—had its own king, though some were more powerful than others, such as at Tikal, Calakmul, Caracol, and Naranjo, located in areas with abundant fertile land (Lucero 2006). Many locations, however, lacked permanent surface water, such as lakes and rivers, because much of the rain percolated through the porous limestone bedrock. Instead, early leaders built what eventually came to be massive reservoirs (Scarborough 1993, 1996). Urban layout increasingly became interlinked with water systems; for example, *sak b'eh*,<sup>2</sup> or raised causeways, also served as dams and for diverting water (e.g., Scarborough et al. 2012).

Kings were water managers. Reservoirs provided dry-season water to farmers during the agricultural downtime, which afforded kings a means to acquire tribute to fund the political economy (Lucero 2006). Standing water in the dry season, however, unless properly managed, provides ideal conditions for waterborne parasites and diseases (e.g., hepatic schistosomiasis) to proliferate, as well as the build-up of noxious elements (e.g., nitrogen) (Burton et al. 1979). Intimate knowledge of their environment allowed the Maya to maintain water quality by creating wetland biospheres composed of certain surface and subsurface plants, as well as fish and other aquatic life, that together kept the water clean (Lucero et al. 2011). The presence of *Nymphaea ampla* (water lilies) on reservoir surfaces indicates potable water since they can only flourish in clean water. Water lilies proliferate in royal iconography and inscriptions, signifying the close tie between clean water and kingship (Lucero 1999; Scarborough 1998). Subjects were drawn to centers for clean water, to attend ceremonies, exchange goods in markets, watch ballgames, and meet up with family and friends. During the intensive agricultural period in the rainy season, farmers lived in hinterland farmsteads and communities and worked their biodiverse fields, relying on small-scale, localized subsistence features (e.g., *aguadas*, terraces, dams, channels, raised fields) and attending local ceremonies and markets (Masson and Freidel 2012; Scarborough and Valdez 2009). Also at their disposal

were diverse flora and fauna in what likely was a managed forest landscape (Ford and Nigh 2015).

Changing rainfall patterns set in motion events that ultimately resulted in an urban diaspora (Lucero et al. 2015). The Maya area experienced several prolonged droughts between c. 800 and 930 CE (Medina-Elizalde et al. 2010; see also Douglas et al. 2015; Kennett et al. 2012). This tumultuous century was preceded by a long period of stable climate patterns (Akers et al. 2016). The prolonged droughts exacerbated existing problems, which, depending on the area and polity, included the overuse of resources, deforestation and erosion, population growth and expansion, increasing reliance on reservoirs, and disrupted trade networks (see Iannone 2014). Even centers without problems were no match for water sources slowly drying up. When reservoir levels dropped and water quality worsened, the symbol of Maya rulership—water lilies—died, as did royal power. The multiple droughts explain why southern lowland kingship took 100 years to fall apart; the pace and extent of urban diaspora depended on particular circumstances at each center (water source, location in terms of trade routes, the political hierarchy, etc.). In the end, the climate was too unstable, and people abandoned southern lowland kings and centers for good, emigrating in all directions in search of new land, water, and opportunities near coastal areas and along major rivers, where market towns and trade thrived (Graham 2011; Masson and Freidel 2012; Sabloff 2007). Maya who remained in the interior lived in smaller communities near lakes.

This brief introduction to the Classic Maya highlights the major factors with which the Maya dealt—seasonality in the humid tropics and dependence on rainfall. History brought much change, to which they adjusted in accordance with their cosmocentric worldview.

## MAYA COSMOCENTRIC WORLDVIEW

Native Americans often refer to the sun, mountains,  
clouds, rain, and so forth in kin terms  
—(*Astor-Aguilera 2010:221*).

A cosmocentric worldview is one in which all of its mobile and immobile inhabitants live and work to ensure its continuity. Everything is alive or animated. Everything is connected. Everything has a soul. This view differs from an animistic one, in which animals and things are believed to possess a humanlike intentionality (Descola 2010, 2013; see Bird-David 1999). Analogism—the worldview discussed here—instead promotes an animated existence in and of itself without assuming human qualities; humans and nonhumans are similar in many respects but possess “micro-differences” that place them on a “seamless continuum” of being (Descola 2010:338). In both ontologies, everything is animated or vibrant (Bennett 2010). In an analogistic or cosmocentric worldview, nonhumans and humans are separate beings beyond just their physical appearance; humans are similar to but still separate from nonhumans, just as each



nonhuman is separate from other nonhumans. The point is that each plays a role in maintaining the world.<sup>3</sup> The major aspects of the Classic Maya worldview include several interdependent entities: a world with three realms that interweave through a quadripartite layout, cyclical life histories of death and renewal, complementary oppositions, and reciprocal obligations that are acknowledged in diverse ways and scales, most notably through ritual. It is a cosmology of conservation because it emphasizes long-term engagement and maintenance.

The Classic Maya lived in a multidimensional world folded within three principal and intersecting realms—the upper world, the earth’s surface, and the underworld (Schele and Freidel 1990:66–67). They believed that the earth floats on a primordial sea, typically represented as a crocodile or a turtle carapace. People inhabit the middle world and engage other realms via openings (*ch’é’n*) in the earth, such as caves and cenotes (steep-sided karstic sinkholes fed by groundwater), where the Maya perform ceremonies and make offerings (e.g., Vogt and Stuart 2005). They further perceived their world as a quincunx, demarcated by the cardinal directions and the center (Ashmore 2009). Each direction has its own suite of associated birds, trees, colors, and deities (Houston et al. 2009:27–40): east, the major direction symbolized by red, is where the sun is born and emerges each day; west, represented by black, is where the sun dies each night; north/white is associated with the origins of rain; south/yellow is associated with the sun; and the center, the *axis mundi*, is represented by blue-green (Houston et al. 2009:27–28; Schele and Freidel 1990:66; Thompson 1934:211). This melded existence is reflected everywhere—for example, in the fact that “the bodies of humans and animals possess the same four-part symmetry as the quincunx. The two arms and two legs can be likened to the four outer points, centrally focused on the heart at the center” (Stuart 2011:168). Simultaneously, “the body is made up of the same elements as is the rest of the material world,” that is, earth (body), wind (breath), water (blood), and others (Hanks 1990:86); among Tzotzil Maya, “*Sjol* is both hair and cornsilk, blood the same as red sap” (Houston 2014:11). The colors of the major varieties of maize are the same as the four cardinal directions (Stuart 2011:182). Houses are enlivened (Gillespie 2000; Houston et al. 2006:36; Mock 1998; Vogt 1969:71) and analogous to a microcosm of the world (García-Zambrano 1994; Stone 1992). Everything is connected.

Everything and every being has a soul. The soul, or *ch’ulel* among ethnographically documented Tzotzil Maya, is a “life force associated with the heart, blood, and human breath” (Sharer and Traxler 2006:733; see Houston 2014:78–79; Houston and Taube 2000). It is comparable to oxygen; we cannot see, smell, taste or feel it, but it envelops and sustains us, it is recycled through our bodies. Souls are recycled, too. “Children and grandchildren were called *kexol*, ‘replacements’ of their ancestors” (Schele and Miller 1986:266; e.g., Houston 2014:11; Redfield and Villa Rojas 1964:199; Vogt 1969:372–73). Further, “the most important interaction going on in the universe is not between persons nor between persons and material objects, but rather between souls inside these persons and material objects” (Vogt 1969:371). In other words, more sig-

nificant than the person, animal, or thing were the enduring relations among them (Astor-Aguilera 2010:64; Bird-David 1999; Harrison-Buck 2012) and their role in maintaining the balance of existence.

This melded, cosmocentric worldview is not conveyed with our Western, Cartesian vocabulary (see Hanks 1990:306); we have no terms for life/death, wild/domestic, sacred/secular, natural/supernatural, nature/culture, and other pairings. In Western society, we attempt to keep nature separate from what we create around us and to control or tame it; we do not conceive of the built environment as merging with what is already present. The Maya saw more than we do—or at least acknowledged the vibrant forces of others and the fact that everything is connected and played a part, a concept illustrated in the ergative nature of Mayan languages in which a “plurality of subjects” is a common feature (England 2017). The Tojolab’al Maya of Chiapas, Mexico, for example, deemphasize “I” and instead emphasize “we” (Lenkersdorf 2006); the latter includes clouds, plants, rivers, mountains, and animals. Taking care of the world was just part of their daily existence. In fact, Mesoamerican languages have no term for “religion” (Pharo 2007:44–45). Instead, the Maya use words or phrases that express how to live properly on a daily basis, such as *okol k’u*, “to enter God” in Yucatec Mayan; in Tzotzil (Ch’uul), *utz xanbal* conveys “a (sacred) righteous way of life” (see also Astor-Aguilera 2010). Nor is there a word for nature. For the Yucatec Maya in Chunchuhub, Quintana Roo, Mexico, “Maya speakers must borrow the . . . Spanish word, *naturaleza*” (Anderson 2005:120).

The Maya world was a seamless continuum through time and space (Brady and Ashmore 1999), a concept that relates to their cyclical versus linear view of life. Everything was renewed or reborn as part of one’s life history; for example, the Classic Maya dish shown in Figure 3 depicts the reborn Maize God emerging from a turtle carapace while being “watered” by his sons, the Hero Twins. This scene also represents the watering, growth, and death of maize and other beings. Before they can begin a different part of their life history, people and things are “de-animated” via funerary rites, kill-holes in ceramic vessels, breaking items, dismantling and covering buildings, or burning (Lucero 2008). Death thus begets life; destruction begets creation (Tozzer 1941:151; Vogt 1969:733). Their cyclical view can be conceptualized as a continuously moving spiral without a beginning or end that connected the Maya to their past, present, and future. This renewal was the same for everything and everyone—people, objects, fields, monumental and small buildings, pilgrimage destinations, plazas, and centers.

Another major component of this worldview is the dual nature of things—more specifically, their complementary opposition, which is the antithesis to the Western worldview. Maya duality can be conceptualized as the different side of a transparent coin: male/female, death/life, wild/domestic, day/night (see Bassie-Sweet 2008:178ff; Christenson 2001:155; Taube 2003). Pairings are directly (e.g., female/male) or indirectly (wild and dangerous vs. domestic and safe) interdependent. The latter case





Figure 3. Classic period dish showing the reborn Maize God emerging from a turtle carapace while being “watered” by his sons, the Hero Twins. The kill-hole shows it has been de-animated as well (K1892 © Justin Kerr, reproduced with permission)

serves as another means of conservation because the Maya engaged less or not at all with parts of the world they considered spiritually off-limits. For example, in the modern (1930s) Maya village of Chan Kom in the Yucatán, plants and animals in or near cenotes are considered sacred and are not to be killed (Redfield and Villa Rojas 1964:207–8). But because they need forest resources to survive, Maya enter the jungle physically to hunt and collect food, and spiritually via their animal spirit companions (see below), keeping in mind that forest spirits or deities punish those who overuse resources (e.g., Anderson 2005:7, 117). Also illustrating this concept are Classic Maya deities and their several complementary oppositions. Even though Maya gods imply a single purpose (K'inich Ajaw, the sun god; the maize god; Chahk, the rain god), these designations do not convey their complex and fluid nature. Some deities comprise not one but four individuals, each associated with a cardinal direction and its corresponding color with their own meanings and characteristics (Coe 2011:224). Some deities have a counterpart of the opposite sex, basically as a consort. Other complementary oppositions, such as young and old, fleshed and fleshless, good and bad, are found as well, depending on the context.

Mesoamerican languages do, however, distinguish between human and nonhuman worlds and concepts (Pharo 2007). The Maya distinction of wild and domestic (Taube 2003; e.g., Hanks 1990:306–7) is not to be equated with that of nature and society (Descola 2013:29). For instance, the Yucatec Maya “distinguish between the settled world—*kaaaj*, ‘community’ and *kool*, ‘fields’—and the *k’aax* (‘forest’). These interpenetrate” (Anderson 2005:120). Animal spirit companions are another means of interpenetration. Although everything has a soul (Fitzsimmons 2009:39; Houston et al. 2006:142–43; Vogt 1969:369–71), humans also have an animal spirit companion or co-essence that, unlike souls, is not recycled. As documented ethnographically, animal spirit companions are wild animals, not domesticated ones, and live with ancestors in *wits* or ancestral mountains. Although the modern Maya typically distinguish the domestic from the wild, animal spirit companions reintegrate them. Classic period *way* or co-essences can be sinister, dark, and demonic because of their association with the darkness, night, the wild, and even sorcery (Stuart 2005; Taube 2003). During the Classic period, these co-essences may also have been composed of other animated forces, such as whirlwinds (Houston 2006) and personified diseases (Helmke and Nielsen 2009). Whereas complementary opposition might seem to complicate or even contradict the argument for a cosmocentric worldview, in fact it serves to acknowledge the slight distinctiveness of humans in that we have the conscious capacity to intellectually evaluate not only our place in the world, but the world itself; we also are the only part of the world that overuses resources—that is, we fail to do our part.

Although structural replication is inferred, as Vogt (1969:125, 127, 576) has shown for the Tzotzil Maya through rituals performed at the level of the domestic group, several domestic groups (*sna*), and waterhole groups (several *sna*), I see it more as the cyclical recreation or renewal at different scales (e.g., Fash 2005; Fash and Davis-Salazar 2006) and situations. Complementary opposition integrates the three realms through which inhabitants interact, acknowledge each other’s roles, and survive through physical and spiritual means. Everything is folded into the three realms inhabited by animated mobile (e.g., people, animals, rivers, plants, clouds) and immobile (stones, mountains) denizens, all with endlessly recycling souls. Diverse interactions spread out the risks and resulted in a sustainable way of life through which the Maya interacted with other components of the world in the domestic and wild spheres—that is, a cosmology of conservation. The former includes house gardens and fields; the latter, forest management through culling plants and trees and promoting flora and fauna.

### THE VIBRANT LANDSCAPE

The forest belongs to the Maya and they belong to it  
—(Hanks 1990:389).

The Western view of landscape is colored by how we define geography—“the study of the physical features of the earth and its atmosphere, and of human activity as it affects and is affected by these, including the distribution of populations and resources,

land use, and industries.”<sup>4</sup> This take is rational and straightforward—how people interact with the “natural” landscape. The Classic Maya perceived and experienced a vibrant landscape with its own life history (Ashmore 2015), with which their cyclical existence interwove. The Maya relied on literal (geographical) and figurative (cosmological) landmarks to determine where they were in the world. It is not “what people did *to* the landscape, but rather what they did *with* the landscape” (Lucero and Kinkella 2014:13). This concept is aptly illustrated in how the Maya define *wits*, a term used for both lineage mountains and pyramid temples (Stuart 1987, 1997; Stuart and Houston 1994:82). Temples do not represent ancestral mountains; they *are* ancestral mountains (see Brady and Ashmore 1999; Harrison-Buck 2012). Ancestors and gods reside in the latter, while the living interact and often bury the dead in the former as a means of communicating with them. Major temples often have nine terraces, signifying the different underworld realms (see Nielsen and Reunert 2009); doorways, which the Maya sometimes decorated with cave imagery (e.g., structure 5D-33-2<sup>nd</sup> at Tikal), are portals to the underworld. For example, the Temple of the Inscriptions at Palenque, Mexico, has nine terraces; Pakal, its most powerful king, was interred at the base of a steep flight of stairs accessed through the opening (*ch’e’n*) that extends deep into the temple (*wits*). His sons and subjects made sure that he began his journey through the underworld to ensure his emergence as a powerful ancestor. Pyramid temples are not static entities, but animated ones with which the Maya engaged via ceremonies, walking up and down its steps, and performances on the summit (Reese-Taylor 2002). Processions to and from buildings and places served the same purpose. Chahk, the rain god, also resides in openings in the earth, which served as places for the Maya to communicate with gods and ancestors to propitiate them for rain, bountiful crops, continued membership, and well-being. *Wits* and *ch’e’n* are also where mists, rain, and clouds originate (Ishihara 2008).

A key feature of the vibrant landscape is water. Rainfall dependency amplifies this fact. Water shimmers and flows; even still water looks alive through its pulsating undercurrents. Other beings bring water to life: fish, fowl, plants, flowers, crocodiles, dragonflies, and so on. Its mirrored surface records daily sunrise and sunset. Iconography and inscriptions show the vital importance of water (e.g., Finamore and Houston 2010; Schele and Freidel 1990; Schele and Miller 1986; Stone and Zender 2011). Most Classic Maya place names, in fact, incorporate aspects of stone/mountain and watery places (Tokovinine 2013:10). The “couplet *chan ch’e’n* sums up the two sacred domains and is used in the narratives to highlight the moments when those of *chan* [sky] and *ch’e’n* [opening] are directly involved in the affairs of those of *kab* [earth] and *ch’e’n* and vice versa, when the landscape of the living becomes fused with the landscape of the ancestors and gods” (2013:42–43). The creation of watery portals at centers (e.g., sunken plazas at Copán, Honduras; Fash 2005) was another means to reach ancestors. As mentioned, cenotes are steep-sided sinkholes where freshwater emerges from the earth. This pure water (*subuy ha’*) also connected with the sea, merging the watery realms. Collecting pure, vibrant water for curing and other ceremonies makes sense not only in

view of water bodies serving as portals, but also for what portals contain—life-giving sustenance (e.g., Fash and Davis-Salazar 2006). The Zinacantecos (Tzotzil) in Chiapas, Mexico, for example, would mix water from the seven most sacred waterholes for larger ceremonies, but only from one or two for curing ceremonies (Vogt 1969:576; see also Bassie-Sweet 1996:70; Scarborough 1998).

Certain water bodies served as pilgrimage destinations, where the Maya left a minimal footprint. Pilgrimage is a worldwide phenomenon in which people from all walks of life journey to local, regional, national, or international places to interact and engage with the sacred to keep the world on its traditional course or as a source of renewal (Turner 1973). People travel from distant places (e.g., Astor-Aguilera 2010:124; Broda 2015), and the journey, which can be a challenge, is just as significant as the destination (Ashmore 2009). Ceremonial circuits connect diverse places (Vogt 1969:374), not to mention other world parts. In Zinacantan, Chiapas, Mexico, for instance, Maya walk ceremonial circuits to renew and maintain balance; processions to unaltered places (wits, ch'e'n) also express ancestral land and water rights (Vogt 1969:144, 149, 300, 399). *Sak b'eh* or causeways within centers served the same purpose (Vogt 1983), linking several wits and ch'e'n. Religious, community, and family leaders undertake ceremonial circuits as part of major ceremonies (End of Year, New Year, etc.; Vogt 1969:465, 471) and for exceptional circumstances, such as severe drought (1969:473). Processions are scripted journeys (Reese-Taylor 2002). For instance, among the Yucatec Maya, "Maya cultural geography is defined according to landforms and the sun's apparent path over and under these areas" (Astor-Aguilera 2010:139); consequently, the procession mirrored the path of the sun, counterclockwise, east to west (2010:131–43), a pattern found throughout Mesoamerica (Ashmore 2009; Broda 2015; García-Zambrano 1994). In places the Maya acknowledged but did not settle, build on, or transform, flora and fauna flourish, which in turn promotes biodiversity and conservation.

Evidence of a cosmocentric worldview can be challenging to identify with a Cartesian frame of mind, requiring expanding what we define as the archaeological record—that is, one comprising more than just buildings, features, and artifacts. We need different ciphers to reveal their worldview, expanding them to better appreciate what Bradley (2000:13) would refer to as the "significance of unaltered places" (see Brady and Ashmore 1999). Archaeologists need to focus on place or landscape to reveal the entire story of engagement.

### THE MATERIALITY OF THE MAYA COSMOCENTRIC WORLDVIEW

For the Maya, human society is intimately involved with plants and animals. . . .

There is no opposition of "man" and "nature"; the world is a garden

—(Anderson 2005:167).

The Maya built houses, plazas, and monumental buildings in reference to the four directions and created a seamless continuum of their universe across the landscape,

merging it with that created by the gods. The roof area signifies the sky; the walls, the mountains; and the floor, the earth's surface on which we find termination deposits from de-animation events that took place after the Maya buried their dead and before rebuilding/renewing their home. The Maya placed dedicatory caches under floors, opening the earth in the process. Lip-to-lip vessels found in burials and caches enclose items that typically include "artifacts as places" (Bradley 2000:85)—that is, artifacts signifying the earth (stones, jade) and the watery underworld (marine items, chert flakes, marl, etc.), while the space underneath the inverted vessel represents the sky and upper world (e.g., Garber et al. 1998; Guderjan 2004). In a burial lip-to-lip cache exposed by looters in a small temple (Temple 3B, 20 × 20 m, 6 m tall) at the medium-sized center of Yalbac in central Belize (Lucero 2007), for example, the bottom vessel is red, signifying the east where the sun rises each day; the upper is black, representing the west where the sun goes to die (Figure 4). Resting on the red dish were two freshwater *Pomacea* shells (water) with drilled spheres, two thin obsidian blades (earth), and either a carved jaguar tooth or boar tusk (forest).

Things are transformed as their life histories change; wood and limestone are transformed into a house, which dedicatory rites turn into a home when it is then re-absorbed back into the landscape. When Tzotzil Maya build a house, they thank the Earth Lord/Owner (Vogt 1969:302) for providing—and allowing—use of His materials. People need permission from gods to reconfigure their world, but they do not try

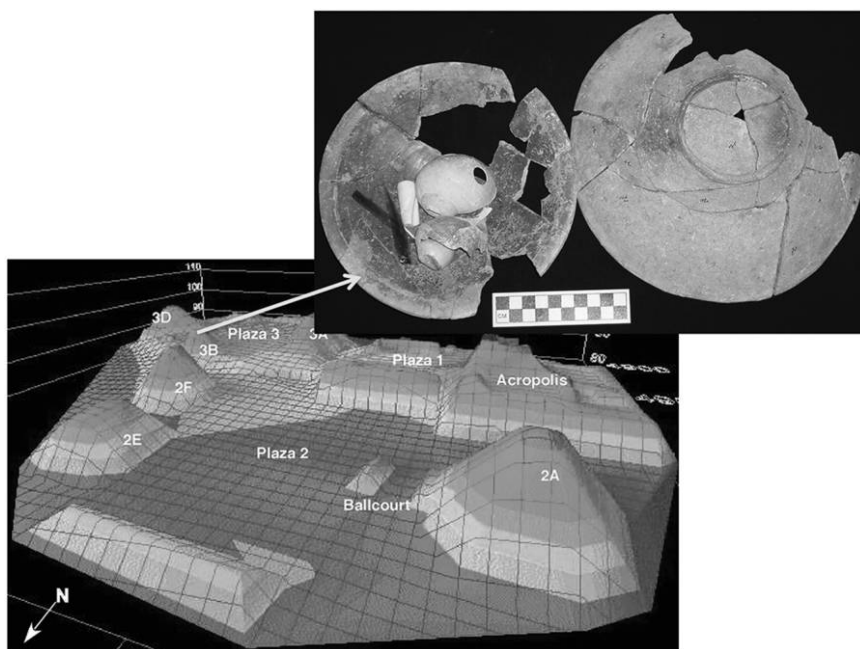


Figure 4. Lip-to-lip burial deposit from Temple 3B at Yalbac, Belize (courtesy of VOPA)

to redefine nature into culture. Things made/created/manufactured, from vessels to monumental buildings, had to be dedicated to animate them in their transformed state, whereas “natural” things—soil, mountains, caves, and so on, did not require dedication ceremonies since the gods had created them (Lucero 2008, 2010). Dedication rites constituted part of the process of this landscape transformation and absorption; termination rites, which typically happen after funerary rites in the home (see Chase and Chase 2011), are the first step in renewal (e.g., Stross 1998). Everything had to be de-animated by dismantling structures or breaking and burning items. This practice has continued to the ethnographic present as seen at, for example, Kankixaja near Momostenango, Guatemala, where at “the close of the 260-day ritual calendar, each household ritually smashed its primary cooking vessel used for boiling maize prior to grinding. The larger fragments of the pot were then carried as a family to an ancestral shrine in the mountains and placed atop a great mound of other shards that had accumulated over the years” (Christenson 2016:27). In short, “Domestic rites revolved around life, death, and renewal” (Lucero and Kinkella 2014:16).

This cyclical, continuously moving spiral is visible in the archaeological record via depositional histories of Maya structures, from small houses to large palaces and temples (e.g., Lucero 2008; Walker and Lucero 2000). Compare, for example, a temple complex (SC-3) from the minor center of Saturday Creek along the Belize River in central Belize, where no kings held sway, to the North Acropolis at Tikal in Guatemala, the capital of a major kingdom. At Saturday Creek, the major temple (5.44 m tall) was used for nearly 2,000 years with moderate additions, termination deposits, and caches (Lucero 2006:75, 79, figs. 4.6, 4.7); its pyramid structure (5 × 5 m, 2.44 m tall) was built on top of a 48 × 24 m terraced platform 3 m high with plastered steps. Trench excavations, which did not reach sterile deposits or bedrock, revealed at least 14 strata ranging 0.20–0.65 m in thickness that date from c. 300 BCE to 1500 CE. Ceramics dating as early as 600 BCE were recovered in clay fill deposits. Its long use and evidence for continual rebuilding does not indicate large amounts of labor expenditure in any single time period or construction event, but rather the repeated activity of communal labor parties. In contrast, by the time of its abandonment by 900 CE, the North Acropolis at Tikal was approximately 100 × 80 m and c. 40 m tall; however, it started out as a 6 × 6 m structure c. 1 m tall sometime after 600 BCE (Coe 1990:525–54). By the Early Classic c. 250 CE, its royal sponsors built increasingly larger additions with more ornate tombs, termination deposits, and caches; by the Late Classic they had added structures to limit access to the acropolis. Its additions increased from about 1 to 15 m in thickness. Although SC-3 and the North Acropolis had a similar beginning, the former was only 5.44 m tall, compared with nearly 40 m for the latter. Saturday Creek’s occupants built SC-3 as a community project; Tikal’s kings garnered tribute labor to build the North Acropolis. In both instances, however, they signify the same thing—a cycle of renewal through destruction and rebuilding.

Reaffirming this worldview beyond farmsteads and centers are ceremonial circuits throughout the landscape (Vogt 1969:374). Caves, for example, and other openings in



the earth are sacred/dangerous, yet the Maya selected center locations with openings over which to build temples, shrines, and other buildings (Brady 1997; Stone 1992). That said, those portals found outside habitation areas were to be approached carefully and only under certain conditions (Moyes et al. 2009). This instance is another example of merging domestic and wild aspects, further blurring any dichotomous notions. The Maya, rich and poor, left offerings inside caves and other openings in the earth. Jars are the most common artifacts found in caves, some purposefully broken, some with food, others containing water (Moyes et al. 2009). The Maya also placed the dead in portals, many on the surface versus buried in the floor with grave goods (Lucero and Gibbs 2007). In addition to extracting *suway ha'* (pure water), the Maya also left offerings in watery portals. A well-known cenote, the Sacred Cenote of Chichén Itzá in the northern lowlands, yielded items from throughout Mesoamerica including ceramic vessels and figurines, masks, copper bells, jade, de-animated objects, representations of Chahk, gold and silver items, copal incense balls, wood items, shell, textiles, chert and obsidian objects, rubber, and human remains (Coggins 1992; see Anda 2007). Watery portals served as repositories critical in a rainfall-dependent society whose members continuously needed to supplicate gods and ancestors during seasonal torrential downpours and months-long drought (e.g., Bassie-Sweet 1996; Lucero 1999, 2006; Moyes 2006; Moyes et al. 2009). Lakes served the same purpose. At Lake Amatitlán in Guatemala, for example,

divers recovered over 400 ceramic vessels depicting spider monkeys, various fruits, flowers, snakes, lizards, and human heads that largely date to the Classic period (c. AD 250–950). . . . Chaak, the Maya rain deity, and Tlaloc, a central Mexican storm deity, were also represented, as were fertility and death gods. The stylistic diversity of materials from Teotihuacan in central Mexico, the central Mexican highlands, the Maya area, and other regions indicates that the lake functioned as a pilgrimage destination for diverse ethnic groups from throughout Mesoamerica (Lucero and Kinkella 2015:165–66).

The archaeological record provides evidence of the diverse ways the Maya engaged with other world parts if we look for it, as I attempt to show at the vibrant landscape of Cara Blanca.

### THE CEREMONIAL CIRCUIT OF CARA BLANCA, BELIZE

The waterholes are highly sacred, and myths are told about each of them, describing the circumstances under which the ancestors found the water and the ways in which the waterhole acquired its distinctive name  
—(*Vogt 1969:146*).

The 25 pools at Cara Blanca (White Face) run east-west at the base of a steep escarpment c. 100 m high, with a seemingly endless supply of fresh water—even through-

out the dry season (see Figure 2). Patches of rich agricultural soils are found just south of the pools (Lucero et al. 2004) (Figure 5). There is also abundant aquatic life, such as fish, crocodiles, waterfowl (including egrets, cormorants, and herons), deer and other game, jaguars, turtles, frogs, toads, snakes, snails, and crabs. Pools range from lakes 2–17 m deep (Pools 6–14) to cenotes 15–60+ m deep (Pools 1–5, 16–25) (Kinkella 2009:126–36). The Maya constructed buildings at five of the pools (1, 7, 8, 9, and 20) and in the vicinity of several others (6, 14, and 15; Kinkella 2009, 2011, 2015). Settlement is dense near the western pools or lakes (e.g., 7–9), but noticeably less so near the central pools, most of which are cenotes (e.g., 1–5). What the Classic Maya did add at these central pools consisted of ceremonial buildings, a sweatbath, and a stela compound. The Maya came to Cara Blanca as a place of pilgrimage and intensified their visits during several multiyear droughts that occurred between 800 and 900 CE (Lucero and Kinkella 2015). In what follows, I highlight some of the archaeological research to show how the pools constitute a sojourn along a ceremonial circuit, especially Pool 1, and how their engagement at Cara Blanca manifests their cosmocentric worldview.

At Pool 1 (100 × 70 m, 60+ m deep) the Maya built seven buildings, of which we excavated two, structures 1 and 3. Structure 1 is a corbel-vaulted water temple (20 × 7.5 m, 3.5 m tall) built to mirror the cenote edge (Figure 6).<sup>5</sup> Here, visitors performed and witnessed water rites from the temple, which would have been reflected on the pool's surface. It sits on a slight rise and seems to emerge from the earth as one walks toward it. Its northeast section has collapsed into the water as a result of exten-

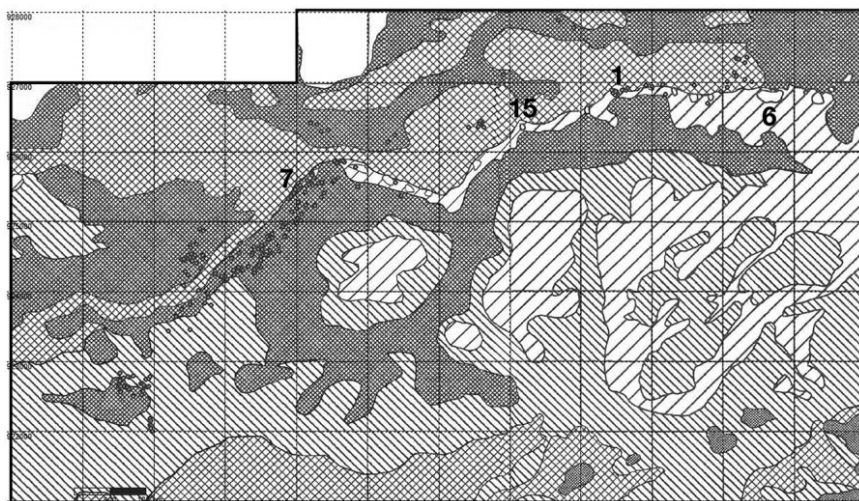


Figure 5. Cara Blanca soil map showing pools (black numbers; not all pools are labeled) and individual structures (filled circles). The darker hatched areas signify fertile soils (generated by A. Kinkella, reproduced courtesy of VOPA)

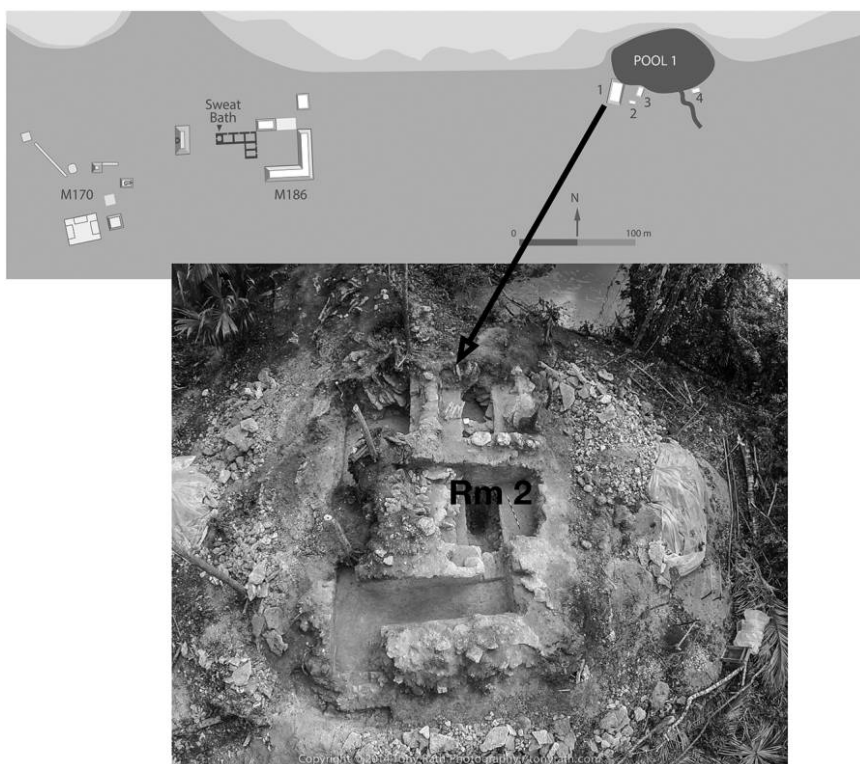


Figure 6. Pool 1 settlement showing location of structures 1 and 3, and M186 and M170 compounds. Drone aerial photo of structure 1 by T. Rath (courtesy of VOPA)

sive looting. The excavations have been detailed elsewhere (Lucero and Kinkella 2015; Lucero et al. 2016); I highlight only a few results here. Structure 1 has a relatively complicated layout that includes a bench in one room, offset rooms, and a passageway that wraps around the temple in a way that would have directed people to room 2, where we found evidence of ceremonial feasting and offerings. The 1-m-wide trenches excavated in three exposed rooms revealed thick plaster floors (c. 9 cm), cobble ballasts (c. 10–13 cm thick), and boulder and cobble fill (up to 1.7 m thick), some with tufa (all of which are labor-intensive). The Maya de-animated the water temple by dismantling its roof, the vault stones of which are massive, some exceeding 1 m in length and up to 50 cm wide and 15 cm thick. In a final act, they covered the entire temple with tufa stones they collected from the water. Tufa, only found in structure 1 at Pool 1, is a limestone that forms underwater when calcium carbonate precipitates around objects (e.g., fallen tree limbs) (Pedley 1990), leaving little doubt as to the watery nature of the temple and the role it played in world (rain) maintenance.

Excavations yielded sherds from large, wide-orifice jars (with fewer rim sherds than would be expected if they were whole vessels) and serving vessels and other artifacts (e.g., marine shell). The majority of diagnostic sherds ( $n=260$ ) consist of Cayo Unslipped jars (75.4%), a common Terminal Classic (c. 800–900 CE) type. Also notable are the large serving vessels (bowls, dishes, plates) with orifices up to 55 cm in diameter (Lucero et al. 2016: table 1). Ceramic styles reflect different regions of the Maya lowlands based on varied rim lip treatments, pastes, and surface treatment; for example, we recovered vessels with jaguar and water symbolism from the northern lowlands, and Achote Black ceramics from the Petén in Guatemala (see Gifford et al. 1976:278–79; Harrison-Buck 2007:241–44; Mock 1994:273–74). Noticeably absent is a complete domestic artifact assemblage, which would typically include individual serving vessels (e.g., small bowls), plates, dishes, vases, and 15% to 38% jars (narrow and wide orifice) (Lucero 2001: tables 5.2, 6.1), manos and metates to grind maize, and chert agricultural and cutting tools. Although we recovered five broken mano fragments, we did not recover metates or many lithics. Nor did we recover *incensarios* (incense burners), typically found in domestic and ceremonial contexts. We did recover more than 200 faunal bone fragments, some quite charred, including bird and deer, as well as edible freshwater shellfish (*Pomacea*), likely the remains of feasting. The Maya also purposefully broke off thumb-sized pieces from Cayo Unslipped jar necks and shoulders, likely indicating their de-animation and revised life history.

We also excavated structure 3 (7.46 × 3.65 m, 0.8 m tall), a ceremonial platform located 22 m southeast of structure 1 (Larmon 2017; Larmon and Nissen 2015; Lucero et al. 2017) (Figure 7). Two 1-m-wide trenches in the northern half of the structure exposed several construction events that all date to Tepeu 2/3 or the late Late Classic–Terminal Classic (Kosakowsky 2017). Before abandoning Pool 1 and the entire area by 900 CE, the Maya sealed structure 3 with a thick layer (c. 1 m) of large uncut boulders (60+ cm diameter) under which we found a layer of burned sherds on top of a burned plaster surface. In fact, the majority of the 6,792 sherds, which constitute 98.5% of the recovered artifacts, came from this burned surface. Vessel proportions and sizes are similar to those at structure 1, and styles from different regions are also represented. All vessels are incomplete, indicated by the low percentage of rims (8.3%,  $n=563$ ). We only recovered 106 nonceramic artifacts (1.5%), including obsidian and chert pieces, groundstone, and faunal bone fragments. The Maya constructed a step on the north edge of the platform c. 1 m from the cenote edge. Just south of the step, we exposed a cross-shaped feature immediately under the plaster surface constructed of flat boulders that perhaps provided extra support for visitors walking as part of a procession to the step, from where they likely made offerings into the watery portal.

We also exposed remains of three individuals at structure 3, referred to as human caches (HC) since none were found with grave goods (Lucero et al. 2017; see Figure 7); the Maya typically bury the dead in or near their homes with grave goods, keeping their ancestors close so they can interact with them daily (see McAnany 1995). HC 1 con-



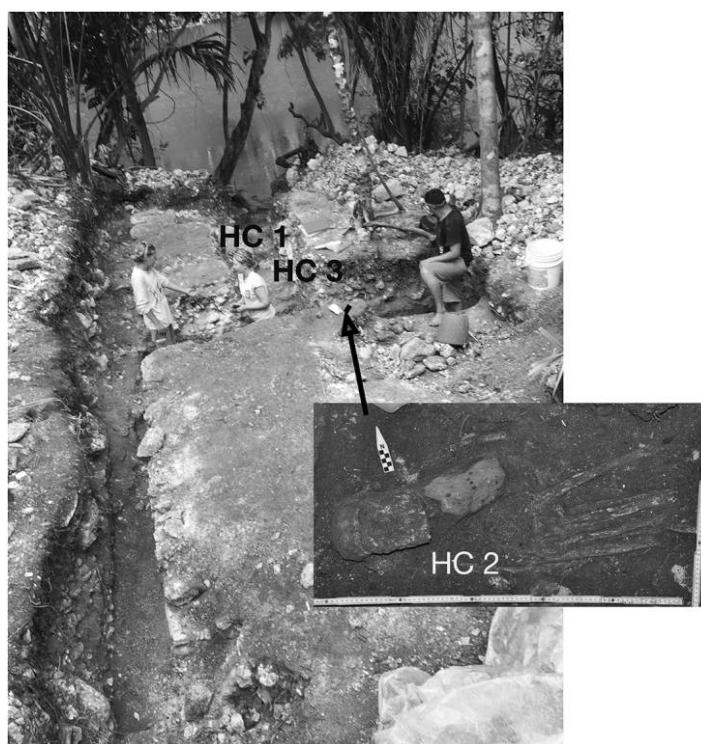


Figure 7. Structure 3, looking north, showing open trenches and location of human caches (HC). (courtesy of VOPA)

sists of a cranium on top of a pile of limestone cobbles, under which were poorly preserved postcranial remains that suggest a primary interment of a young adult (20–35 yrs.) of indeterminate sex in a tightly flexed position (Carbaugh 2017). HC 3 is a primary deposit of a young adult (20–35 yrs.) of indeterminate sex placed on its right side and tightly flexed. HC 2, another primary interment, is an adult male in a supine position with his legs tightly flexed and resting on his chest, suggesting he had been bundled. The Maya had dug through floors and fill to place this individual, and tightly packed small boulders around him, as well as a metate fragment against the right side of his face; interestingly, the cranium is located in the exact center of structure 3. Among the Yucatec Maya, bundles, which have their own animating forces, are used to communicate with ancestors, gods, and other entities (Astor-Aguilera 2010:103, 143, 179). The Postclassic K'iche' would take bundles of ancestors or major gods on pilgrimages and migrations (Fitzsimmons 2009:80). The human caches may have been revered personages rather than sacrifices, merging the landscape via platform construction, dedication, and visitations. Here, the human caches can be viewed as similar to other caches or deposits, demonstrating their equal roles in establishing place and a new array of relations.

Pool 1 was one of several likely visited as part of a ceremonial circuit. About 400 m west of Pool 1 is a compound (M186) that includes a sweatbath that the Maya probably used for ritual cleansing and other purification rites (see Child 2007; Houston 1996; e.g., Vogt 1969:89, 446). Another possible stop may have included the escarpment above two cenotes (Pools 14 and 15); here, the Maya built seven structures that may have served as a water shrine (Kinkella 2009:138–42). In the foothills above Pool 6 (a lake c. 17 m deep) we found a six-structure compound (M124) with a plain stela and altar on top of a small knoll that dates to Tepeu 2/3. Stela and altar complexes are typically only found in centers. Yet another possible stop is Pool 20, a cenote c. 3.8 km east of Pool 1 (see Figure 2); here the Maya integrated architecture into the existing landscape (geomancy) (see Dowd 2015; e.g., Woodfill et al. 2015). It is likely that other cenotes also served as stops along the way. I will briefly discuss two potential stops: the two compounds (M186 and M170) near Pool 1 and one (M208) at Pool 20.

M186 is a cluster of Late/Terminal Classic buildings with a sweatbath (c.  $5.05 \times 5.05$  m) that abuts a linear structure with contiguous, presumably single-width rooms (Larmon and Amin 2017; Lucero et al. 2017) (see Figure 6). The sweatbath has a  $3.66 \times 3.66$  m “squirrel”-shaped interior with the remnants of a rare, true arch c. 1.8 m high (Figure 8). Looters destroyed most of its plaster floor; however, we excavated a small intact section in the southwest interior and exposed several plastered features, including a possible seating area and a sloped floor that likely was used for drainage. We also revealed a box-shaped cobble feature ( $1 \times 0.95$  m) that may have served as a hearth or firebox to house hot stones used to create steam (see Helmke 2006). Notwithstanding the sampling bias due to the looting, seven of the 16 rims (or 43.8%) are jars, suggesting a non-residential function. M186 may have served as a staging area for



Figure 8. M186 sweatbath, looking northeast. The entrance, shown on the lower left, has been expanded by looters; they also are responsible for the collapsed east wall (courtesy of VOPA)



visitors to stay, prepare, and ritually purify themselves before visiting Pool 1. Just west of M186 is M170, a group consisting of five low mounds and a plazuela complex with three low structures. We excavated a 1 × 1 m test pit in the complex and exposed a burial c. 30 cm below the surface, over which the Maya had placed an inverted Belize Red plate and an inverted Achote Black bowl that date to Tepeu 2/3 (Kinkella 2008) (see Figure 6). The layout of M170 and the associated burial suggest a residential function, while the low mounds suggest short-term occupation, perhaps for visitors. Finally, Pool 20 is a cenote c. 100 m wide and 40 m deep; the Maya had altered a hillside 40 m north of the pool, creating a massive platform (M208) (38 × 26 m) upon which they reshaped a natural knoll into a pyramid structure (22 × 12 m, 3.5 m tall) that included a staircase carved into the limestone bedrock (Lucero et al. 2016; Nissen 2015) (Figure 9). They placed cut stone as needed on the knoll to create a pyramid that melded the one built by humans and that built by the gods.

If the Maya visited the Cara Blanca pools as part of a ceremonial circuit, they either followed the path of the sun east to west or wove north and south to mirror their cyclical existence. The journey to the pools itself was a challenge; to the north are steep

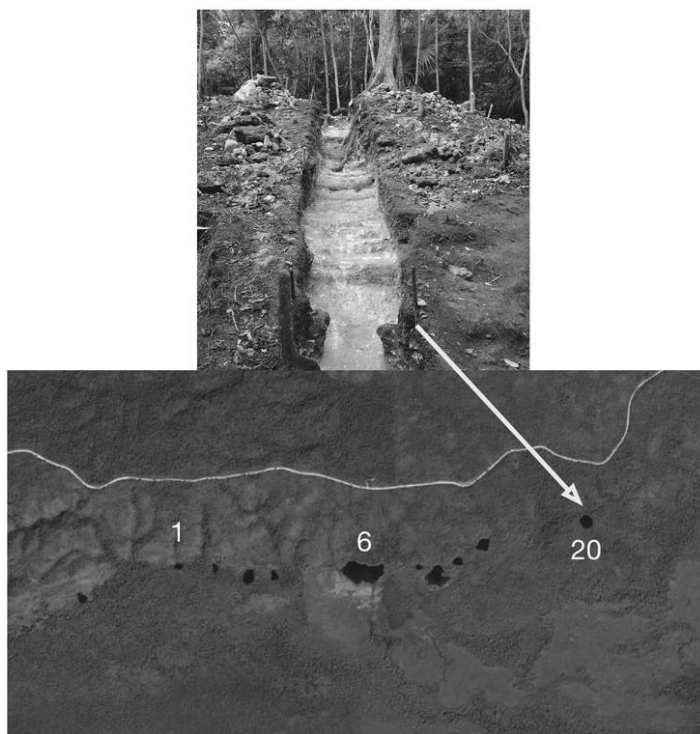


Figure 9. Pool 20 and M208; the photo shows the staircase the Maya had carved into the knoll (courtesy of VOPA)

cliffs transected by narrow, steep, and rocky ravines. Coming up from the south required the crossing of Labouring Creek, a perennial stream that eventually merges into the Belize River. Artifacts and symbolism indicate that visitors from the north, west, and east likely performed water rites using the large jars to collect *subuy ha'* at the cenote, facing east from where the sun emerges daily. When ceremonies and engagement did not work to bring things back into alignment, the Maya terminated everything before departing via dismantling, breaking, or burning, not so much as to end the structures but to set them on a different path as part of their life history to ensure world maintenance. The Maya may have taken some of the broken pieces to their new post-diaspora homes and communities as keepsakes, deposited them elsewhere, or thrown them into the pool. No matter where the Maya placed the pieces, they represented not only where items and people originated, but also their mixing with other broken pieces from other places, signifying a different yet melded trajectory in the life history of all involved.

## DISCUSSION AND CONCLUDING REMARKS

In Quintana Roo, Mexico, bird and insect damage  
[to crops] is tolerated: "They have to eat, too"  
—(Anderson 2005:116).

Even though the Maya left much of the central area of Cara Blanca "untouched," they did not perceive it as "empty." Cara Blanca served as a threshold where visitors and ceremonies merged objects from the sea, land, water, sky, and forest to emphasize and highlight their mutual world membership, integration, and maintenance. It was no accident that the water temple faces east, the direction of renewal. The three realms encompassing the heavens, sky, hills/cliffs, surface, portal, and underworld converged at Cara Blanca (see Figure 3). The unending cycle of death/renewal—in this case, drought/rain—were played out here when domestic, communal, and royal rituals became inadequate to keep the seasonal cycle going. This situation resulted in the Maya intensifying their engagement with the vibrant landscape of Cara Blanca when they built ceremonial buildings and performed rituals. They conducted the same water/rain rites they had in the home, community, or center *wits/ch'e'n* to supplicate Chahk to cease withholding rainfall.

The ceremonial circuit as a scripted and challenging journey was a means for the Maya to engage with other components of the world dispersed across the landscape, without leaving much of a footprint. There is no indication that the Maya had earlier visited Cara Blanca as extensively as they did after 800 CE. They intruded more than they had done in the past because their situation had become dire, a fact that changed the nature of engagement. That said, they neither planted crops nor built homes here—the only transformations were ceremonial in nature. With fertile agricultural soils just south of the pools, they could have extracted water from them to irrigate crops. Labouring Creek, which meanders from some pools and skirts others, also could have

been tapped, assuming levels did not drop too much. But the Maya did none of this. This minimal interaction for millennia allowed flora and fauna to flourish, which in turn promoted biodiversity, and thus conservation at Cara Blanca and other comparable places.

With water levels dropping at center reservoirs in the Terminal Classic period, people began to lose faith in their kings and intensified ceremonies at non-center *ch'è'n* and *wits*. Supplications, however, were to no avail; urban diaspora ensued (Lucero et al. 2015). The few who remained in the interior lived in small communities near water (e.g., Pool 7)—some even continued to use the royal reservoirs. In the end, kings, after nearly a thousand-year reign, seem to have forsaken the rituals important to keeping the balance and doing their part to maintain the world. Instead, they took a path-dependent route, increasingly relying on expanding reservoir systems that progressively became vulnerable in the face of prolonged droughts. Those who did not forget—that is, the majority—moved on and renegotiated relations; their descendants survive to this day. They did so because of a cosmocentric worldview that embraced diverse means of engagement and survival.

At present, Maya knowledge, appreciation, and management of the diversity of their tropical world is astounding (e.g., Argivo 1994; Ford and Nigh 2015; Nations and Nigh 1980). For example, one of my Belizean foremen, a Mopan Maya, identified more than 90% of the 300+ botanical specimens collected from plots between Cara Blanca and Yalbac with and without archaeological sites and described their uses (e.g., medicinal, building materials, edible fruits, nuts, roots, etc.) (Lindsay 2011; Lucero et al. 2014). The few plant specimens he could not identify did not have a “use” for humans and thus were unnamed—that is, there were no relations between them (but the plants were not necessarily inanimate). The point is that the Maya today use, work with, and promote a plethora of forest fruit, nut, and berry bushes and trees, construction materials, household supplies (leaves to make brooms, nuts to make soap, etc.), medicine, fauna, and myriad other items. They acknowledge the need to cull and hunt in the forest, and cut and burn vegetation, but with long-term planning, benefits, and relations.

Diversity was (and is) key. The diverse rituals, from domestic to large-scale public ones, served the same purpose, no matter where they took place, and acknowledged and emphasized reciprocal obligations. Also, diversifying what they planted in addition to forest management, combined with a different kind of engagement as seen at “sacred” places, provided the Maya the means to live while conserving their environment (Ford and Nigh 2015:13). This cosmology of conservation promoted a sustainable human-environment relationship for millennia—and still can. This fact is particularly relevant given that “the density of occupation of what was the Central Maya Lowlands remains about one to two orders of magnitude less than the density of the Late Classic Period, depending on the location” (Turner and Sabloff 2012:13912).

Rather than try to explain natural features, the Maya situated them and then re-created some of them (e.g., *wits*, *ch'è'n*). In doing so, the built environment became one

with the landscape. And one does not destroy one's own home/cosmological place (see Bennett 2010). That said, people in the past still damaged their world (Redman 2000), but they learned from their mistakes and changed their behaviors and practices (e.g., El Mirador's failed water systems were not used in later centers). The Terminal Classic Maya diaspora impacted their cosmocentric worldview and resulted in a renegotiation that has worked up through the present.

Today the urban, industrial world has lost this cosmology of conservation, which has led to dire consequences. If we are to recover and survive the impacts of climate change and our deeply incised global footprint, exponential population growth, and overuse of resources, we need to turn away from an anthropocentric view, as Alexander von Humboldt suggested about 175 years ago, and appreciate the world for what it is—a web of life where “everything was interwoven as with a ‘thousand threads’” (Wulf 2015:67, 101). We need to emphasize relations with the nonhuman world, not its domination. Diversifying our notions of the world as the Maya and other non-Western societies have done and integrating bottom-up (family and community-scale rites of protection) and top-down (infrastructural support) solutions are means to start taking care of our world as the Maya did theirs.

#### NOTES

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1. The northern lowlands, encompassing most of the Yucatán Peninsula, have different histories. Their lower elevation results in a higher water table and, subsequently, nearly 7,000 cenotes with accessible water (Schmitter-Soto et al. 2002; e.g., Hare et al. 2014). In contrast, higher elevations in the southern lowlands result in a much lower water table and relatively few cenotes.

2. Most Mayan terms are Tzotzil unless otherwise noted; Yucatec terms include *sak b'eh* and *subuy ha'*.

3. Descola discusses two additional ontologies that are not considered here: (1) totemism, a cosmogenic view that basically equates all beings both physically and internally, and (2) naturalism, an anthropocentric view that centers and distinguishes humans from all other beings and things (Descola 2013:144–200).

4. The result of a Google search on “definition of geography.”

5. Results of the diving program can be found in Lucero and Kinkella (2015). Pool 1 actually has two portals, the cenote and Actun Ek Nen (Black Mirror Cave), a 40-m-wide cave beginning c. 30 m below the surface of the pool; divers explored c. 70 m into the cave without reaching its end.

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