



FIGURE 10.1. DIVING IN POOL 1, SEARCHING FOR ARTIFACTS
IN SIDEWALL NICHES (TONY RATH PHOTOGRAPHY).

Chapter 10

Actun Ek Nen: Reflections on the Black Mirror Cave at the Cara Blanca Pools, Belize

Andrew Kinkella and Lisa J. Lucero

Since our first visit to the Cara Blanca Pools in the jungles of central Belize in 1997, our research has focused on issues of sacred landscapes and the associated ritual behavior that the ancient Maya practiced at these water-rich locations (Kinkella 2000, 2004, 2009; Lucero and Kinkella 2014). As a corn-based economy, the assurance of substantial rain to bring a bountiful harvest would have been of paramount importance to ancient Maya farmers and the rulers whose power depended on a strong crop yield (Lucero 2006). The specific water rituals associated with bringing rain and placating water gods would often be undertaken in caves or beside pools of water. For Maya rulers, these rituals would serve as the catalyst between crop yield and political power, as it was these rituals that would unite the dispersed population of farmers under a single ruler. The practice of these water rituals would have inscribed themselves on the landscape over time in the form of water shrines, settlement location near pools and caves, artifact placement within pools and caves, and other archaeologically measurable phenomena (Kinkella 2009).

To study the nexus of landscape and water ritual in the Cara Blanca area, Andrew Kinkella's dissertation research was dedicated to analyzing the patterns of ancient Maya settlement located between ritually important pools of water, the Cara Blanca Pools, and the local minor centers in the Cara Blanca area of Belize. This research was one aspect of Lisa Lucero's Valley of Peace Archaeology Project (VOPA), which conducted investigations at the minor centers of Yalbac and Saturday Creek in addition to the Cara Blanca area (Lucero 2006). The completion of the Cara Blanca Settlement Survey (CBSS) by Kinkella included the initial description of the Cara Blanca Pools and the first underwater explorations using SCUBA. This research laid the groundwork for a larger and much more complex diving expedition focused on the Cara Blanca Pools and specifically Cara Blanca Pool 1 (Kinkella 2009, 2011; Lucero 2011, 2012, 2013).

The Cara Blanca Pools are a string of 25 fresh water *cenotes* and lakes located in west-central Belize (Figure 10.2). They run in an east/west line for approximately 11 kilometers (7 miles), formed in part by a geologic fault where the steep Yalbac Hills to the north abut the lower and flatter Belize Valley to the south (Figure 10.3). The name "Cara Blanca" refers to the "white face" of the cliffs that form the northern boundary of the pools. This limestone escarpment is c. 80 to 140 m (262-460 ft) higher than

the pools and quite steep; dramatic scenery that would have been both appreciated and appropriated by the ancient Maya (Figure 10.4). We have visited 22 of the 25 pools over the years (Numbers 1-21, 24), five of which have associated settlement (Numbers 1, 7, 8, 9, and 20) (Kinkella 2009, 2011).

The significance of the Cara Blanca Pools and other *cenotes* in the Maya area stems from their concentration of sacred water; water that could be used to sustain both corn and people in times of drought, and also provide a meaningful location to practice water ritual. This importance seemed to increase at the end of the Late Classic (c. AD 800-900) when the Maya intensified ritual activities at the pools in the midst of several multiyear droughts (Medina-Elizalde *et al.* 2010; Moyes *et al.* 2009). The concentration of so many pools in one area and the relatively small-scale and unique settlement at Cara Blanca indicate a place that likely served as a sacred locale to the ancient Maya, as a pilgrimage center and location of water ritual activity.



FIGURE 10.2. THE MAYA WORLD AND THE LOCATION OF THE CARA BLANCA AREA (AFTER LUCERO 2006: FIGURE 2.1).



FIGURE 10.3. THE 25 NUMBERED CARA BLANCA POOLS AND SURROUNDINGS, FROM A GOOGLE EARTH IMAGE OF WEST-CENTRAL BELIZE (KINKELLA 2011: FIGURE 5.1).



FIGURE 10.4. CARA BLANCA POOL 2 SHOWING THE “WHITE FACE” ESCARPMENT IN THE BACKGROUND, A TYPICAL VIEW FOUND AT MOST CARA BLANCA POOLS (KINKELLA 2009: FIGURE 5.32).

Defining Pools of Water: Scarp-foot Springs, Lakes, and Cenotes

The term “*cenote*” comes from the Mayan word “*dzonot*,” meaning “well.” In the most basic sense, *cenotes* are steep-sided sinkholes fed by the water table. These pools of water are created when sections of the porous limestone base of the area collapse beneath the water table and fill with water. They tend to have sheer walls, which may converge underwater, maintain their vertical characteristics and end with a flat bottom, or broaden outward to form a bulbous bottom (Bell 1998). In contrast, scarp-foot springs retain many of the same characteristics of *cenotes*, but form along a narrow geological fault. Scarp-foot springs appear in karst terrain where permeable and impermeable geologic layers intersect, creating a fault where ground water can easily rise to the surface (Fetter 1994; Johnston 2004). These springs tend to be long and narrow in form, following the natural fault line. There is no evidence that the ancient Maya made a distinction between *cenotes*, pools, lakes, or scarp-foot springs, and there is no discernable difference between them in Maya history or iconography (Bell 1998; Finamore and Houston 2010).

The 25 pools in the Cara Blanca area differ in their geological makeup, but can be loosely defined as fitting into three categories: spring-fed lakes, scarp-foot springs, and *cenotes*. While many of the pools in the Cara Blanca area exhibit a mixture of *cenote* and scarp-foot spring characteristics, the largest pool in the Cara Blanca area (Pool 6, c. 250 by 400 m (820 by 1,312 ft) and 20 m (66 ft) deep, Table 10.1) is best defined as a spring-fed lake (Lucero 2011). The westernmost pools (e.g. Pools 7, 8, 9) exhibit traits most similar to scarp-foot springs, and tend to be quite shallow (c. 2-5 m deep). The easternmost pools (e.g. Pools 1-5, 15-25) most closely resemble *cenotes*.

Symbolism and Ritual at the Maya Cenotes

In the Maya area, pools of water have been defined as locations of ritual importance since very ancient times, and modern Maya groups still share this belief. *Cenotes* are viewed as one of the three symbolic entryways into the Maya underworld of *Xibalba*, the other two being caves and the Maya ballcourt. Pools and caves operated as similar nodes of ritual activity, where the rites practiced focused on water, sacrifice, and renewal (Brady 2005; Ishihara 2008; Vail and Hernandez 2012). Direct evidence of the ritual use of bodies of water in the form of discarded artifacts and related architecture, such as sweatbaths and water shrines, is found at many *cenote* sites. The famous “Sacred Cenote” at the Maya site of Chichén Itzá, located in the northern lowlands of the Yucatan Peninsula, illustrates the connection between artifacts, architecture, and water ritual (Kinkella 2010; Tozzer 1957).

Chichén Itzá’s reign as the most powerful Maya center of the Early Post-Classic Period began during the Terminal Classic period (c. AD 900) and lasted until the end of the Early Post-Classic (c. AD 1250). Its influence on

Maya society was vast. The Sacred Cenote at Chichén Itzá, sometimes referred to as the “Well of Sacrifice” or the “Cenote of Sacrifice,” is one of two *cenotes* at the site. The Sacred Cenote is located in a sparsely settled area several hundred meters north of the dense site core, and is connected to the core via a causeway. The pool is approximately 60 m (197 ft) in diameter and only about 13 m (43 ft) deep, and the water table lies 20 m (66 ft) below the edge of the sheer-sided limestone wall that forms the *cenote* (Tozzer 1957; Figure 10.5). The second *cenote* at Chichén Itzá, Cenote Xtoloc, is located in the center of the site core, and was used for utilitarian needs such as drinking water. The Sacred Cenote was used for ritual activities, which included artifact offerings, sacrifice, and pilgrimage.

The Sacred Cenote was a pilgrimage destination for many centuries, from approximately AD 700 to contact period, c. AD 1520 (Coggins and Shane 1984; Tozzer 1957). The large quantities of artifacts, and human remains, found within the *cenote* attest to its importance as a water ritual site, and there is a small water shrine structure (Structure 1D1 – see Tozzer 1957) built directly on the southern edge of the *cenote* (Figure 10.6). This water shrine acted as the

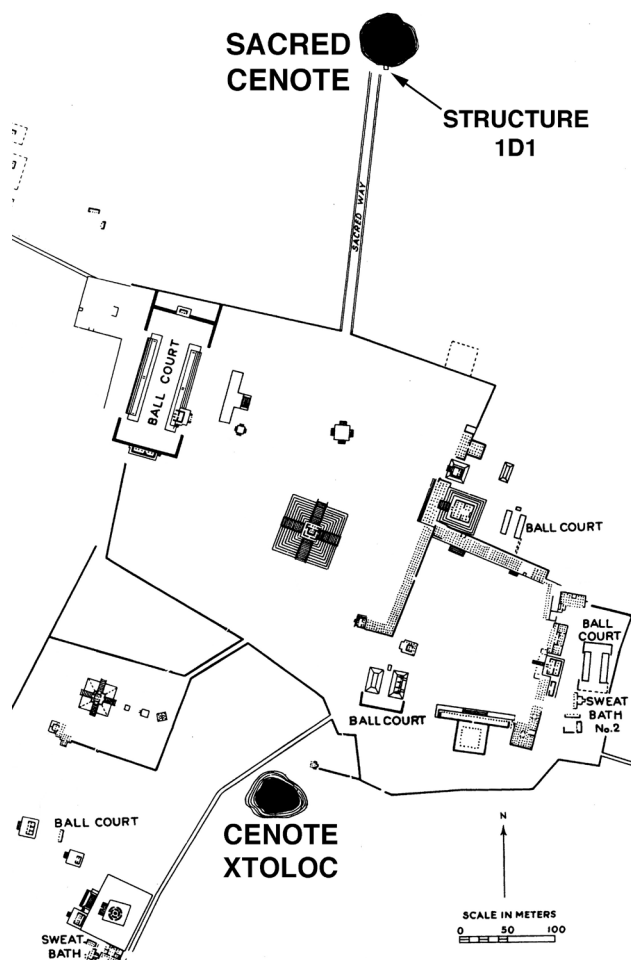


FIGURE 10.5. PLANVIEW OF THE CORE AREA OF CHICHÉN ITZÁ WITH CENOTE XTOLOC AND THE SACRED CENOTE HIGHLIGHTED (AFTER SHARER AND TRAXLER 2006: FIGURE 9.29).

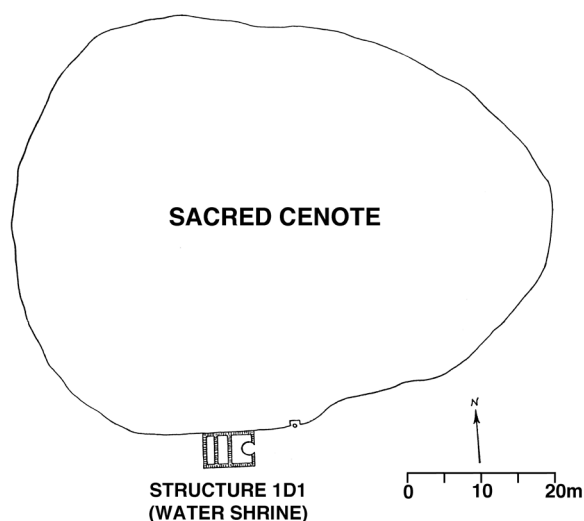


FIGURE 10.6. THE SACRED CENOTE AT CHICHÉN ITZÁ WITH WATER SHRINE STRUCTURE 1D1 (AFTER TOZZER 1957: FIGURE 706).

focal point of ritual events including human sacrifice. In the sixteenth century, Bishop Diego de Landa recorded some of the rituals that were practiced at this location; he reported seeing an intricate water ritual act that began with the burning of incense - usually copal - and culminated in sacrificial victims being thrown in to the Sacred Cenote (Tozzer 1941: 120-121; 1957: 199). This activity was not restricted to Chichén Itzá; there are a number of other sites with associated *cenotes* throughout the Maya world such as Dzibilchaltún and Mayapán (Andrews and Corletta 1995), and most contain evidence of water ritual. While human sacrifice at the *cenotes* is well-documented, stories of young female virgins being sacrificed at *cenotes* to appease the gods do not have a scientific or ethnographic basis. In fact, recent archaeological analysis of the human remains found in the Sacred Cenote show that most of the individuals were either men or children (Anda 2007).

Reverence of *cenotes* continues into the present day for some Maya groups. The Maya of Zinacantan manage and maintain their local *cenotes* throughout the year, and conduct water ritual ceremonies in May and October (Fash 2005: 109-111). At Zinacantan, each *cenote* has a myth about an ancestral deity associated with it, and other sacred natural features including mountains and caves that relate to the waterhole are also acknowledged (Fash 2005: 110; Vogt 1976: 99-101). Maya water ritual was also observed by an ethnographer in the 1930s being practiced by the Chorti Maya of the Highlands of Guatemala, during their rain-making ceremony conducted at the beginning of May (Wisdom 1940). This ceremony began with children travelling to the local sacred spring to fill jars with sacred water. Then the rain-maker priest would lead the community on a small pilgrimage to the sacred spring, where they would enact rituals that would call the Water Serpent out from the spring to bring rain. The ceremony ended back at the village, where the collected sacred water would be used to cook a ceremonial meal for the

community (Wisdom 1940: 425-440). The Chorti Maya's belief in a water serpent may be a modern aspect of the ancient Maya belief concerning the Water Lily Serpent and its influence on terrestrial water.

Ancient Maya mythology describes three gods that relate directly to the symbolic aspects of *cenotes*: Chac, Chac Chel, and the Water Lily Serpent. Chac, the Rain God, is the most prominent of the three in ancient Maya texts and iconography (Figure 10.7). Chac is one of the oldest known gods in Mesoamerica, with more representations in the Maya codices than any other god (Taube 1992: 17-27). He is characterized by a long down-curving nose, and at times has a snake protruding from his mouth. Chac is also associated with serpents and stone axes as common symbols of his control of lightning. Because of his association with rain, Chac is also a prominent figure in the rain cycle, which includes caves. Thus, Chac is sometimes depicted in cave or *cenote* settings (Graham 1997).

Chac Chel is the Maya goddess associated with the positive aspects of medicine, divination, and childbirth (Figure 10.8). She is also associated with the more fearful aspects of water, specifically with storms and floods (Taube 1992: 99-105). Chac Chel is often depicted pouring water from a jar, an act that symbolizes bringing rain but also floods. Like Chac, Chac Chel is often depicted in association with caves (Moyes *et al.* 2009: 179).

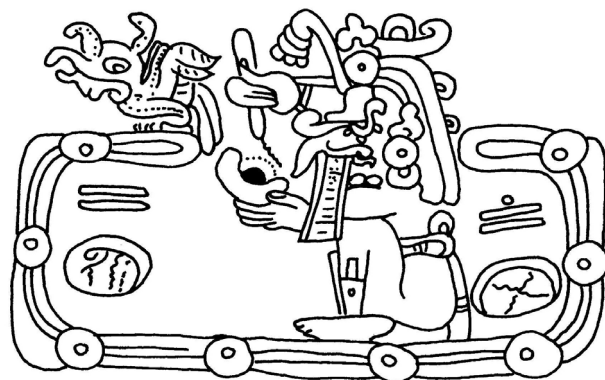


FIGURE 10.7. CHAC DEPICTED IN A CAVE OR CENOTE (TAUBE 1992: FIGURE 38D).



FIGURE 10.8. CHAC CHEL POURING SACRED WATER FROM A JAR AS RAIN, FROM THE DRESDEN CODEX (TAUBE 1992: FIGURE 50E).



FIGURE 10.9. THE WATER LILY SERPENT (AFTER ROBERTSON 1990: FIGURE 7).

While the Water Lily Serpent is the least well known of the three water gods, he may be the most important when discussing *cenotes* (Figure 10.9). Chac and Chac Chel embody water as rain, but the Water Lily Serpent is a symbol of water on the ground such as rivers, lakes, *cenotes*, and the sea. As a god who symbolically floats between the world of the living and the dead, the specific traits of the Water Lily Serpent include a serpent body with fish imagery, an avian head, and a prominent water lily headband (Robertson 1990). The water lily symbol is used because the water lily plant floats on the surface of fresh water, signifying both pure water and rulership (Ishihara *et al.* 2006).

There are three archaeologically measurable phenomena that we look for when defining water ritual at a *cenote*: water shrines, sweatbaths, and artifacts located inside the pools including jars, human remains, and other offerings such as long-distance trade objects. Water shrines are difficult to define in Maya architecture, their location in immediate proximity to water being their main defining characteristic, although some may contain sweatbaths. Often, water shrines are small buildings that may have partially collapsed into the pool because of their extreme closeness to the water's edge. They may not have specific architectural motifs that point to a ritual use, and artifacts that may have been used in water ritual may have been looted in antiquity, but their utility as a staging area for water ritual at the water's edge is undeniable (Tozzer 1957). Both Structure 1D1 at Chichén Itzá and Structure 1 at Cara Blanca have these traits (Kinkella 2009; Lucero 2013).

In contrast, a Maya sweatbath is a very specific structure. Throughout Mesoamerica, sweatbaths serve as renewal devices that cleanse and purify the body while also operating as symbolic springs or caves (Houston 1996: 138-139). The specific architectural motifs that define a sweatbath include distinctly rounded interior corners, an interior bench, and a small entryway (Houston 1996). Sweatbaths are comparatively rare structures in the Maya world, usually found at major centers in association with

water symbolism. The existence of multiple sweatbaths at Chichén Itzá attests to the importance of the Sacred Cenote (Figure 10.5). In rare instances, sweatbaths are constructed at important locations without associated major architecture, such as at Cara Blanca, or in caves where a symbolic sweatbath is built within the cave (Kinkella 2009; Moyes 2005).

The most common artifacts associated with *cenotes* and water ritual are ceramic jars. Although jars are used for basic transportation and storage of water, they are also used in a specific ritual context to collect sacred water. When poured, the water symbolizes rain as brought in jars by the Rain God Chac and the goddess Chac Chel (Moyes *et al.* 2009: 178-179; Figure 10.7). Jars are intrinsically associated with both cave and *cenote* sites, and the percentages of jars found in excavations will tend to be much higher at *cenotes* and caves than at other locations (Kinkella 2009). Other artifacts such as long-distance trade items strongly support both water ritual and its ties to pilgrimage, and human remains highlight the importance of this ritual to the functioning of Maya society.

Previous Underwater Archaeological Research in Belize

Because Belize does not have the extensive underwater cave systems that are so prevalent in the northern Yucatan, or they have yet to be discovered, underwater archaeological research within the country is still in its beginning stages. While the diving component of the archaeological research undertaken at the Cara Blanca Pools is not the first underwater archaeology practiced in the country, it is still a relatively recent discipline in Belize. Our project is the third to use diving as part of its research design, and the first to use advanced technical diving techniques.

Heather McKillop directed the first sustained underwater archaeological explorations in Belize as part of the South Coastal Archaeology in Belize project (SCAB) (McKillop 1995, 2005). McKillop focused her efforts on recording

ancient Maya settlement and specifically salt production at several of the coral atolls, or cayes, off the coast of southern Belize. At locations such as Stingray Lagoon and Wild Cane Cay, she invented basic, economical methods to practice underwater archaeology in a shallow water environment (McKillop 2005, 2009). Examples of this include the use of simple floatation devices to enable her crew to float over the shallow (c. one meter, or 3.3 ft, deep) water looking for artifacts that would otherwise be ruined by their footsteps. McKillop has also excavated shovel test pits and 1x1 m (3.3 ft) units in the shallow water environment (McKillop 1995, 2005, 2009). While most of her research is focused in the shallows of the first several meters underwater, her finds have been impressive, including wooden architecture preserved in shallow peat in the Paynes Creek area on the coast of southern Belize. At the site of K'ak' Naab', McKillop's crew found an ancient Maya wooden canoe paddle dating to the Late Classic period (McKillop 2009).

While dry cave research has a robust history in Belize (see Awe *et al.* 2005; Moyes 2005; Moyes *et al.* 2009), cave research with an underwater component is relatively rare. In 2000, the Western Belize Regional Cave Project (WBRCP) completed an initial underwater assessment at the mouth of Tunichil Creek in central Belize and also dove in the shallow, confined water within the Actun Tunichil Muknal Cave (Bassendale and Ransom 2001). This location warranted underwater exploration because Actun Tunichil Muknal, or Stone Sepulcher Cave, is the

site of some of the most impressive discoveries relating to cave ritual in the Maya world (Awe *et al.* 2005). The researchers excavated several shallow 1x1 meter units (final depths no deeper than approximately 50 cm, or 20 in) at underwater depths no greater than approximately 2.5 m (8 ft). While they uncovered several ceramic sherds, the researchers complained of the difficulties common of any underwater excavation: cold water, silt-outs, and a difficulty in keeping stratigraphic control due to slumping sidewalls (Bassendale and Ransom 2001: 76-78).

Surface Archaeology at Cara Blanca, Belize

The Valley of Peace Archaeological Project (VOPA) began in 1997 with the purpose of discovering and recording ancient Maya sites within a 193 km² (120 m²) research area located in west-central Belize (Lucero *et al.* 2004). Within the project region, we focused on three areas: the minor riverine center of Saturday Creek, the minor center of Yalbac (the largest Maya center in the VOPA survey area), and the Cara Blanca Pools. While most of the project's resources have been spent on the survey and excavation of above ground sites, VOPA has included an underwater component since 1998 when the possibility of uncovering submerged cultural resources inside the pools became readily apparent (Kinkella 1999). The underwater explorations have centered on Pool 1 at Cara Blanca, which has been the focus of more archaeological and underwater research than any other body of water in the Valley of Peace vicinity (Figure 10.10).

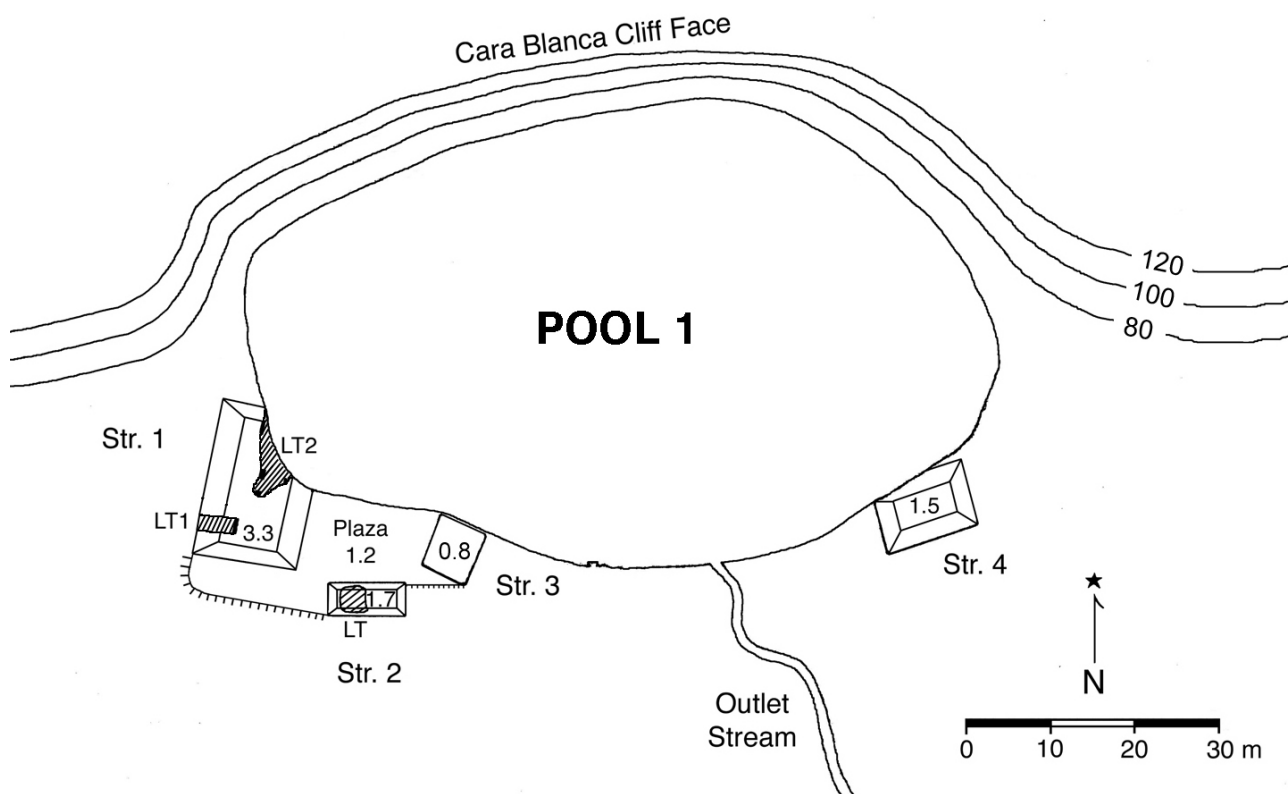


FIGURE 10.10. CARA BLANCA POOL 1 WITH STRUCTURES NOTED (KINKELLA 2009: FIGURE 5.24).

Before explaining the underwater research at Pool 1, it is important to note that there has been a good deal of above-ground research undertaken at the pool that has direct bearing on the ancient Maya and their relationship with sacred water locations. Pool 1 is surrounded by seven mounds, four of which are directly associated with the pool's edge, and the largest (Structure 1) is collapsing into the pool due to its location (Kinkella 2000). These mounds range in height from 3 m (10 ft) to under a meter, and are situated along the western and southern edges of the pool. Looters' trenches show that Structure 1 (20x10 m, or 66x33 ft, and 3.3 m tall, or 11 ft) is a vaulted building with six rooms, three to a side and radiating out from a central spine wall with a series of four pillar-like walls that run the poolside length of the structure (Kinkella 2000, 2004) (Figure 10.11 and 10.12). Long-term looting has further compromised the architectural integrity of Structure 1.

FIGURE 10.11. PLAN VIEW OF STRUCTURE 1 AT POOL 1 SHOWING POSSIBLE ORGANIZATION OF INTERIOR ROOMS, AND MISSING NORTHEAST CORNER (AFTER KINKELLA 2011: FIGURE 5.7).

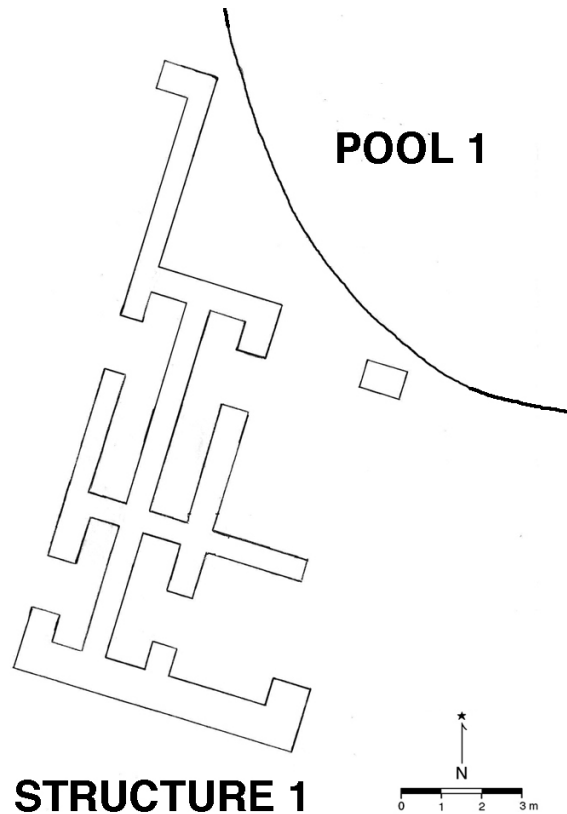


FIGURE 10.12. EAST SIDE OF STRUCTURE 1 AS IT CRUMBLES INTO POOL 1 (KINKELLA 2011: FIGURE 5.8).

Test excavations at Structures 1 and 2 at Pool 1 yielded a ceramic assemblage consisting of 63% jars, dating to the end of the Late Classic period, c. AD 800-900 (Kinkella 2009). As noted above, this high percentage of jars indicates a ritual rather than residential function. Initial ceramic analysis also implies that ancient Maya visitors to the Cara Blanca Pools likely came from local centers to the north, as the ceramics were more closely related to sites in northern Belize rather than to those in the Belize Valley to the south (Kinkella 2009: 184-187).

Approximately 400 m (1,312 ft) to the west of Pool 1, the settlement survey team discovered a sweatbath. Although very badly damaged by looting, we were able to discern the specific architectural motifs of rounded interior corners, interior bench, and small doorway that enable a positive identification as a sweatbath (Kinkella 2009: 152-156). The presence of a sweatbath near Pool 1 strongly suggests that the cultural activities once practiced at the site were of a ritual nature.

Diving the Cara Blanca Pools

In 1998, two divers, Andrew Kinkella and Anna Osterholtz, made two dives into Pool 1 at Cara Blanca, the first to 20 m (65 ft) and the second to 10 m (30 ft). While these initial exploratory dives only enabled the recovery of a single ceramic sherd from an underwater context at a depth of 10 m (30 ft), they allowed the divers to observe conditions underwater including current and visibility, and proved that a larger scale diving expedition was possible and warranted (Kinkella 2000; Osterholtz 1999). In 2008, Kinkella made additional underwater examinations of several other pools at Cara Blanca (Pools 7, 9, 15, and 16) using snorkeling gear and a simple swimming pool inner tube as a base station to take depth measurements with a tape measure attached to a plumb bob. He also free dove these pools to get additional information on water clarity and other pertinent environmental conditions needed for later, more advanced diving.

In 2010, Lucero received funding from the National Geographic Society to undertake a full-scale diving exploration of the Cara Blanca Pools. This exploration included an analysis of the geology of the pools by geologist Patricia Beddows, and sediment cores were drilled out of the bottom of several pools for further paleoenvironmental reconstruction (see Lucero 2011). The dive team, consisting of four to six divers who operated in several buddy teams, successfully mapped and explored eight of the 25 Cara Blanca Pools, noting the vast differences in the pools in terms of depth (from 2- 70 m or 6.6-230 ft – see Table 10.1). The 2011-2013 field seasons have all included an underwater component that built upon the groundwork laid in 2010. To date, Pools 1, 2, 3, 4, 5, 6, 16, and 20 have had underwater explorations with SCUBA equipment (Kinkella 2011; Lucero 2011; 2013). As of this writing, no other project in Belize has undertaken archaeological research at the underwater depths that the Cara Blanca Pools demand.

Actun Ek Nen: The “Black Mirror Cave” Under Cara Blanca Pool 1

During our explorations in 2010, the divers discovered a massive cave entrance on the north wall of Pool 1 starting at 30 m (98 ft) below the surface of the water (Figure 10.13). At this point, the cavern dive became a true cave dive, as the overhead environment stretched northward underneath the steep Cara Blanca escarpment above. The cave was a challenge to map because it is pitch black, penetrates over 50 m (165 ft) into the cliff face and bottoms out at over 70 m (235 ft). At the conclusion of the field season, it was decided to name the cave portion of Pool 1 Actun Ek Nen, or “Black Mirror Cave” in the Mayan language. This geological feature is the largest of its kind in Belize according to the Institute of Archaeology (IOA) records (Lucero 2011).

In 2010 and 2011, divers mapped Pool 1 and the associated Black Mirror Cave by attaching a knotted nylon line (every 10 ft or 3.05 m) at various depths (5-6 m, 14-16 m) of the pool perimeter spiraling down to c. 40 m (131 ft) (Lucero 2011, 2012). The divers were equipped with dive computers that recorded their location throughout the dive, so they would follow the line that had been laid around the circumference of the *cenote* at given depths, crisscross the bottom at measured intervals, and venture into the darkest recesses of the cave. The data from the dive computers, underwater compasses, and surface GPS units were used to construct a three-dimensional map of the underwater boundaries of Pool 1 and Actun Ek Nen. As of this writing, the basic morphology of the *cenote* or cave has been mapped, and it appears to be a large underwater void that does not connect to any additional underwater passageways. However, the sheer size and volume of the site coupled with the difficulties inherent in deep technical diving means that survey research is ongoing, and we have not ruled out the possibility of additional passageways connecting to other locations.

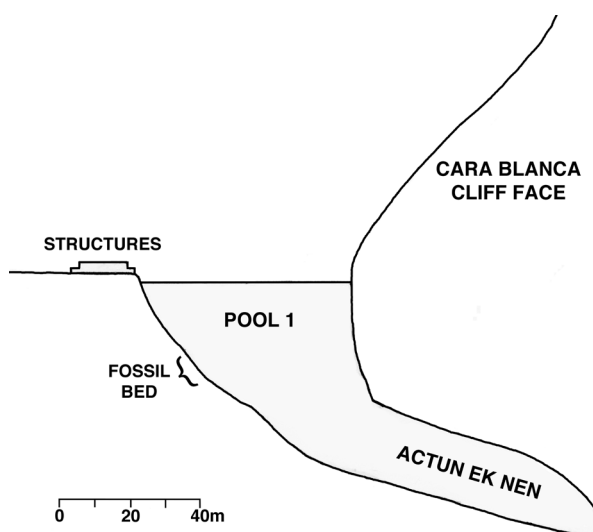


FIGURE 10.13. WEST WALL PROFILE OF POOL 1 WITH ACTUN EK NEN.

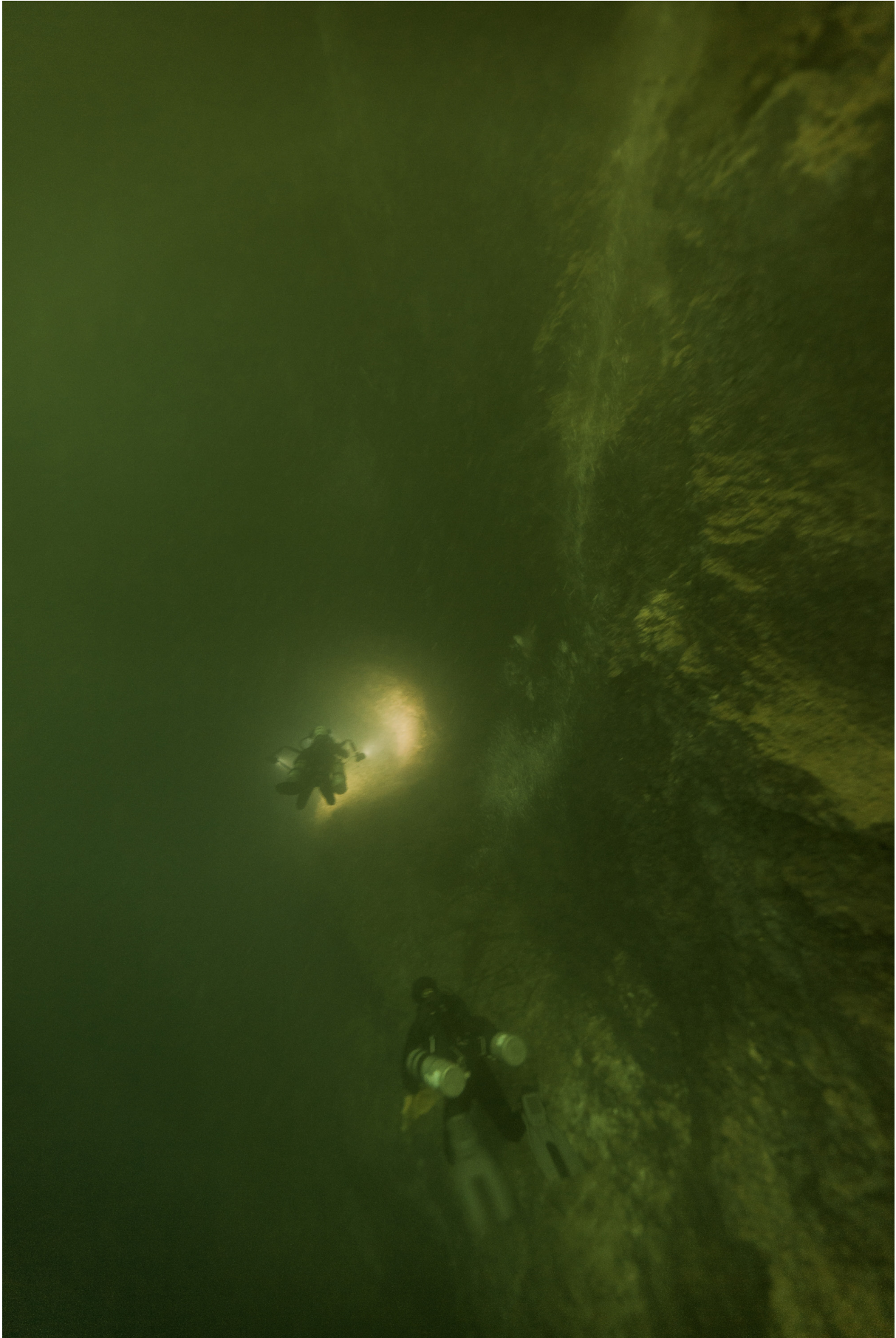


FIGURE 10.14. A DEEP DIVE INTO ACTUN EK NEN. THE DIVERS ARE DESCENDING ALONG THE NORTH WALL OF POOL 1 AT A DEPTH OF APPROXIMATELY 25 METERS, AND WILL SOON ENTER THE CAVE (TONY RATH PHOTOGRAPHY).

The underwater topography (bathymetry) of the *cenote* determined where divers searched for offerings. As the pool sidewall slopes downwards towards the north (Figure 10.14), diver Marty O'Farrell had noticed that the pool bottom is roughly half the size of its surface at the cave entrance. If the Maya gave offerings into the pool from Structure 1, they likely either would have landed on a small shelf five meters below the building, or rolled all the way down to the bottom at 60+ m (197 ft). This disparity in artifact location ultimately informed our research design and methodology. To date, we have found artifacts underwater at depths from one to 54 m (3.3-177 ft). Ongoing exploration will attempt to discern the depths at which artifact recovery is the most likely.

Finally, in 2010 divers also discovered geological beds at approximately 20 m (66 ft) below the surface laden with fossilized megafauna bones (e.g. possible tusk, long bones, pelvis, vertebra, etc.), the first fossils recorded in Belize according to IOA records. Divers collected three specimens: a rib, vertebra, and arm bone fragments, the latter likely belonging to a giant sloth, *Eremotherium laurillardii* (McDonald 2011) (Figure 10.15). Wood fragments, soil, and gastropods from the same geological bed collected in 2011 were dated via AMS radiocarbon dating to between 9,000 and 39,000 years BP (Lucero 2012: 9). The most recent dates fall into the realm of early human occupation, which may have interesting implications for future discussions of early humans in the New World.

Research Methods: Diving

The underwater research methods used in the exploration of the Cara Blanca Pools evolved over the years with a focus on simplicity and ruggedness, as the jungle environment is not kind to delicate equipment, rubber gaskets, and electronic technology. As our knowledge of what worked and what did not improved, we ultimately employed a three-stage system of pool exploration.

Stage One uses the essential tools of a mask and snorkel, with fins and a wetsuit being optional, considering size and weight. Rope, a compass and GPS, an inner tube, and a 100 meter (328 ft) tape are carried in a small backpack along with the free-diving equipment, and can be taken many miles by foot into the jungle where an initial reconnaissance of the underwater environment of a pool can take place. During the first several years of exploration, the most useful tool was a simple mask and snorkel, as many of the small finds (e.g. ceramic sherds) were located at a depth of 1-2 m (3.3-6.6 ft), directly below terrestrial structures at the water's edge. Even today, snorkeling is the most economical way to get initial underwater information at the pools concerning depth, water clarity, and artifact location. Initial depth measurements were recorded using a rock tied to a 100 meter tape. This simple, jungle-proof method is still used by the team when defining depth measurements at a pool for the first time. The 100 meter tape used in tandem



FIGURE 10.15. GIANT SLOTH PELVIS IN SITU IN THE SIDEWALL OF POOL 1 AT A DEPTH OF 20 METERS (TONY RATH PHOTOGRAPHY).

with a compass is also essential for getting length and width measurements of the pools themselves, as well as the first measurements of any associated structures. The pools are assigned a datum that is recorded by GPS, as the pools are one of the few places in the jungle where a strong GPS signal is available due to the absence of trees. Finally, possible entry points at the edge of the water are recorded to serve as staging areas for the SCUBA divers during Stage Two research.

Stage Two is defined as diving with single tank SCUBA and atmospheric air. After our first use of SCUBA equipment in 1998, we found that standard SCUBA equipment, a single aluminum 80 ft³ tank filled with 3000 psi of air, worked quite well. While more difficult to transport than free-diving equipment, we found that it is reasonable to hike into the jungle with basic, single tank SCUBA equipment, set up on the edge of a pool, and explore underwater based on information collected from the Stage One underwater survey. Crewmembers can help carry additional tanks into the jungle, enabling multiple dives per day. At the end of the week, empty tanks can be filled with relative ease at dive shops in Belize City or San Pedro. Most underwater research at the Cara Blanca Pools has been carried out in this manner, but some pools require advanced diving equipment and techniques be used due to extreme depths, which we outline in Stage Three.

Stage Three consists of multiple tank SCUBA equipment, using mixed gasses such as nitrox (the mixture of oxygen and nitrogen), tri-mix (the addition of helium to a nitrogen and oxygen mix), and rebreathers. This equipment cannot be carried deep into the jungle without multiple trips and additional personnel, and necessitates the establishment of a base camp, so it is reserved for use only at pools where access is sufficient for a vehicle to drive close to the pool, and earlier explorations have deemed that deep diving is required. This complex and highly technical method is necessary on deeper dives for two reasons. First, nitrox is used to safely increase bottom time at moderate depths (c. 18-30 m or 60-100 ft). Second, tri-mix and rebreathers are used to explore depths below 40 m (140 ft) where the use of atmospheric air becomes increasingly dangerous. It was not until 2010 that the necessary funds and crewmember expertise were obtained to make this type of technical diving feasible at the Cara Blanca Pools.

We have found that the best results are obtained by splitting the divers up into two groups: one group uses advanced techniques and equipment (i.e. Stage Three - tri-mix, rebreathers) to explore and survey the deepest depths of the pool, while a second group uses more rudimentary equipment (Stage One and Two - snorkels, single tank SCUBA) to record finds near the surface. This dual focus approach has evolved due to the geology of *cenotes*, where their steep sides allow archaeological finds to be found either in the shallows near structures, or at the greatest depths where gravity has pulled them.

Research Methods: Artifact Collection and Excavation

Once the initial underwater survey was complete, we experimented with several methods for recording the location of an artifact and then collecting it from an underwater context. Artifacts found within the first several meters underwater were simply recorded by using a tape measure and compass from a known point on the pool edge to the point directly over the artifact, and/or swimming over on the surface with a GPS held above water at the correct location, and then a tape measure was used to record depth. To record the location of artifacts found at extreme depths within the *cenote*, an air bag was deployed to the surface and its location was recorded via GPS and tape/compass. Depth was measured using the diver's depth gauge. For locations within the cave, measurements would be taken out to a known location of an air bag outside of the overhead environment using compass and tape measure. In addition, the advanced dive computers used by the divers to record their location underwater also enabled them to record the location of artifacts as they were found.

Excavation underwater at Cara Blanca Pool 1 is still in its preliminary stages. When the excavation was of a shallow nature (c. 30 cm or less), we found that lightly fanning the surface with the diver's hand works best, especially with finds that occurred on the steep *cenote* sidewall (e.g. the giant sloth fossil). Of course, a silted out situation occurs within several minutes, so any fanning-style excavation was precisely planned (usually for later in the day) and quickly executed, as underwater visibility was adversely affected for the rest of the day. For deeper excavations (c. 30-50 cm), we used a modified shovel test pit style of excavation, described below.

For the first excavation attempt at extreme depth (at over 54 m deep, or 177 ft), the diver used a regular pointed shovel and a plastic 5-gallon bucket to excavate a small shovel test pit. He filled about half the bucket with dirt, and then used a lift bag filled with air from his tank to help raise the bucket. At the same time, the bucket was attached to a pulley system rigged to an overhanging tree at the surface that a fellow diver floating at the surface would slowly pull up. When raised, each bucket was dumped onto a tarp and inspected thoroughly by hand. We realize that the bucket-and-shovel method will only work up to the point that the sidewall collapses and this is an issue in controlled excavations, but as an initial underground probe - just like shovel test pits on the surface - it was a great success. Again, silting was a constant problem, but was expected and planned for accordingly. Also, the millennia-worth of accumulated overburden at the bottom of the *cenote* meant that the choice of excavation spots was severely limited. We discovered that the best locations for artifact recovery were usually deeply buried by dead trees, leaves and other detritus, something that we will have to address on future projects. Ultimately, even in these difficult situations, the divers were able to record and recover the provenience of artifacts such as ceramic sherds and several pieces of the giant sloth skeleton (Figure 10.16).



FIGURE 10.16. CERAMIC JAR SHERD PICTURED IN SITU UNDERWATER AT POOL 1 (KINKELLA 2011: FIGURE 5.10).

For future field seasons, we are planning more complex excavations into Structure 1 at Pool 1 in order to better understand the relationship between Maya ritual, water shrines, and the pools. We also plan to continue diving Pool 1, making further inroads into Actun Ek Nen and attempting more advanced underwater survey and excavations, including further study of the fossil deposit. Once we have more artifacts from Pool 1, we plan to compare Cara Blanca jars and artifacts with collections from local Maya centers to determine if people from multiple areas made pilgrimages to deposit offerings in the pools and collect sacred water.

Interpretation: Water Symbolism and Ritual at the Pools

The Cara Blanca Pools sit at the base of steep cliffs, at a location where the natural geologic and hydrologic changes in the environment enable water to emerge from the earth in a fashion that suggests the supernatural in Maya belief. It is at this junction of water and earth “where concepts of an upper world, a Lower World and the earth plain come together visually in a striking manner” (Taçon 1999: 37). In addition, the pools are often covered with water lilies, a cosmologically significant water flower associated with gods and an additional sacred element that would add to the visual presentation of the pools. With a water shrine built directly on the edge of the pool and a Maya sweatbath nearby, Pool 1 appears to hold high ritual value. This value is bolstered by the dramatic rise of the escarpment directly behind it, creating a natural version of the Maya “water mountain” imagery (Figure 10.17). In settings as ritually charged as Cara Blanca, it seems the inhabitants built ritually important buildings - such as sweatbaths and water shrines - near sacred features, but there was no need

to construct large pyramids, as the natural landscape of the area already provided what pyramids could only emulate. The idea of a remote pool as a sacred ritual locale is observed at other ancient Maya sites as well, such as the Sacred Cenote at Chichén Itzá, and in modern Maya contexts, where *cenotes* located in more remote areas are utilized specifically for their sacred qualities (Redfield 1941: 119; Tozzer 1957; Wisdom 1940). Pools and caves that are distant from local centers could have functioned as “shrines removed from daily life” (Freidel 1981: 380) where the Maya engaged in “scheduled periodic circulation of large numbers of people over broad sacred networks” (Freidel 1981: 378).

For the Maya, water with the highest ritual value was often from *cenotes* or caves, and pilgrimages were undertaken to these sources. These pilgrimage destinations could have acted as social hubs that maintained group cohesion for a dispersed populace, and may have left their archaeological signature in the form of either artifacts offered at the pools or structures constructed at the edge of the water. During the Late Classic (AD 600-900) these locations took on additional meaning, as a series of droughts fueled “area-wide water cults, which included pilgrimages to ‘sacred’ water localities, and ritual offerings of elite goods and human victims to water and other deities” (Andrews and Corletta 1995: 112). This idea is corroborated by evidence of a Late Classic “drought cult” found within cave contexts that may have been related to periods of intense drought in the Maya lowlands that peaked during AD 780 and AD 910 (Medina-Elizalde *et al.* 2010; Moyes *et al.* 2009). Growing evidence from exploratory dives, excavations, and ceramic analysis also indicate that the Maya began to intensify their ceremonial visits to Cara Blanca at the end of the Late Classic, AD 700-900 (Kinkella 2009; Lucero 2011).

A pilgrimage center at Cara Blanca would have played an important role in the belief system of the local populace, like other pilgrimage centers at locations throughout Mesoamerica. When taken together, these symbols paint a picture of the ancient Maya where water ritual was of utmost importance, and practiced at specific areas where underworld connections would be the most potent. These locations were significant enough that pilgrimages were warranted, and at certain times in the past water ritual was so important that religious splinter groups – cults - focused their activities on the *cenotes* in the hopes of bringing rain to a population struggling with drought and crop failure.



FIGURE 10.17. POOL 9 AT CARA BLANCA, ILLUSTRATING THE NATURAL LANDSCAPE AT THE NEXUS OF WATER, EARTH, AND SKY, SUGGESTING THE SUPERNATURAL IN MAYA BELIEF (KINKELLA 2009: FIGURE 5.15).

Conclusion

In this chapter, we have defined Cara Blanca Pool 1 and its Actun Ek Nen cave component as a pilgrimage center used by the Maya during the Late Classic period. A potent symbol of underworld power, the Actun Ek Nen *cenote* was an essential part of the cycle of water ritual. At the end of the Late Classic period (c. AD 900), offerings were thrown into the pool in an attempt to end drought and secure a bountiful harvest by placating gods and ancestors. Ultimately, it did not work. By AD 900, the Cara Blanca Pools were vacant, the great centers of the Classic Period had been abandoned, and the focus of Maya culture had moved to the north, to the site of Chichén Itzá, where similar water rituals were practiced until the arrival of the Spanish in the sixteenth century, and where certain aspects of this belief system endure even today. Through the tandem use of terrestrial and underwater archaeological methods, we are able to more completely reconstruct the ritual transactions made by the Maya at the Cara Blanca Pools a millennium ago.

References

- Anda, Guillermo de
2007 Sacrifice and Ritual Body Mutilation in Postclassical Maya Society: Taphonomy of the Human Remains from Chichén Itzá's Cenote Sagrado. *New Perspectives on Human Sacrifice and Ritual Body Treatments in Ancient Maya Society*, V. Tiesler and A. Cucina, editors, pp. 190-208. Springer, New York.
- Andrews, Anthony P. and Robert Corletta
1995 A Brief History of Underwater Archaeology in the Maya Area. *Ancient Mesoamerica* 6: 101-117.
- Awe, Jaime J., Sherry Gibbs, and Cameron Griffith
2005 Stelae and Megalithic Monuments in the Caves of Western Belize. *In the Maw of the Earth Monster: Mesoamerican Ritual Cave Use*, James E. Brady and Keith M. Prufer, editors, pp. 223-248. University of Texas Press, Austin.
- Bassendale, Megan, and Jeff Ransom
2001 Assessment of the Archaeological Potential of Tunichil Creek, Roaring Creek Valley, Cayo District,

- Belize. *The Western Belize Regional Cave Project: A Report of the 2000 Field Season*, edited by Reiko Ishihara, Cameron S. Griffith and Jaime J. Awe, pp. 65-82. Department of Anthropology, Occasional Paper No. 4, University of New Hampshire, Durham.
- Bell, Julie A.
1998 A Developing Model for Determining Cenote and Associated Site Settlement Patterns in the Yalahau Region, Quintana Roo, Mexico. Unpublished Master's Thesis, Department of Anthropology, University of California, Riverside.
- Brady, James E., and Keith M. Prufer (eds)
2005 *In the Maw of the Earth Monster: Mesoamerican Ritual Cave Use*. University of Texas Press, Austin.
- Coggins, Clemency C. and Orrin C. Shane
1984 *Cenote of Sacrifice: Maya Treasures from the Sacred Well at Chichén Itzá*. University of Texas Press, Austin.
- Fash, Barbara W.
2005 Iconographic Evidence for Water Management and Social Organization at Copán. *Copán: The History of an Ancient Maya Kingdom*, edited by E.W. Andrews and William L. Fash, pp. 103-138. School of American Research, Santa Fe.
- Finamore, Daniel, and Stephen D. Houston (eds)
2010 *Fiery Pool: The Maya and the Mythic Sea*. Peabody Essex Museum and Yale University Press, New Haven.
- Freidel, David
1981 The Political Economy of Residential Dispersion Among the Lowland Maya. *Lowland Maya Settlement Patterns*, edited by Wendy Ashmore, pp. 371-382. University of New Mexico Press, Albuquerque.
- Houston, Stephen D.
1996 Symbolic Sweatbaths of the Maya: Architectural Meaning in the Cross Group at Palenque, Mexico. *Latin American Antiquity* 7: 132-151.
- Ishihara, Reiko
2008 Rising Clouds, Blowing Winds: Late Classic Maya Rain Rituals in the Main Chasm, Aguatemala, Guatemala. *World Archaeology* 40(2): 169-189.
- Ishihara, Reiko, Karl A. Taube, and Jaime J. Awe
2006 The Water Lily Serpent Stucco Masks at Caracol, Belize. *Research Reports in Belizean Archaeology* 3: 213-223.
- Kinkella, Andrew
1999 Return to the Sacred Pools: 1999 Reconnaissance and Excavation at Cara Blanca, Cayo District, Belize. *Testing and Mapping Saturday Creek: The 1999 Field Season of the Valley of Peace Archaeological (VOPA) Project*, edited by Lisa Lucero, pp. 44-49. Report submitted to the Department of Archaeology, Ministry of Tourism, Government of Belize.
- 2000 Settlement at the Sacred Pools. Unpublished Master's thesis, California State University, Northridge.
- 2004 The Pools at Cara Blanca: Archaeology in the Valley of Peace Above and Below the Water. *Research Reports in Belizean Archaeology* 1: 93-102.
- 2009 *Draw of the Sacred Water: An Archaeological Survey of the Ancient Maya Settlement at the Cara Blanca Pools, Belize*. Unpublished Ph.D. dissertation. University of California, Riverside.
- 2010 The Importance of Cenotes in pre-Hispanic Mesoamerica. Available online at <http://www.mexicolore.co.uk/aztecs/home/sacred-sinkholes> (accessed 10 July 2014).
- 2011 Return to Pool 1 and Reconnaissance at Pool 20: The 2010 Cara Blanca Settlement Survey. *Results of the 2010 Valley of Peace Archaeology Project: Cara Blanca and Yalbac*, edited by L. J. Lucero, pp. 53-68. Report submitted to the Institute of Archaeology, National Institute of Culture and History, Belize.
- Lucero, Lisa
2006 *Water and Ritual: The Rise and Fall of Classic Maya Rulers*. University of Texas Press, Austin.
- 2011 Exploring the Sacred Pools of Cara Blanca, Belize. *Results of the 2010 Valley of Peace Archaeology Project: Cara Blanca and Yalbac*, edited by L. J. Lucero, pp. 12-27. Report submitted to the Institute of Archaeology, National Institute of Culture and History, Belize.
- 2012 *VOPA 2011: Exploring Cara Blanca Pool 1 and Assessing Yalbac*. Report submitted to the Institute of Archaeology, National Institute of Culture and History, Belize.
- 2013 *VOPA 2012: Cara Blanca Pool 1*. Report submitted to the Institute of Archaeology, National Institute of Culture and History, Belize.
- Lucero, Lisa J. and Andrew Kinkella
2014 A Place for Pilgrimage: The Ancient Maya Sacred Landscape of Cara Blanca, Belize. *Of Rocks and Water: Toward an Archaeology of Place*, edited by Ömür Harmansah, pp. 13-39. Oxbow, Oxford.
- Lucero, Lisa J., Scott L. Fedick, Andrew Kinkella, and Sean M. Graebner
2004 Ancient Maya Settlement in the Valley of Peace Area, Belize. *Archaeology of the Upper Belize River Valley: Half a Century of Maya Research*, edited by J. F. Garber, pp. 86-102. University Press of Florida, Gainesville.
- McDonald, H. Gregory
2011 Preliminary Identifications of Pleistocene Mammal Remains from Cara Blanca, Belize. *Results of the 2010 Valley of Peace Archaeology Project: Cara Blanca and Yalbac*, edited by L. J. Lucero, pp. 46-52. Report submitted to the Institute of Archaeology, National Institute of Culture and History, Belize.
- McKillop, Heather
1995 Underwater Archaeology, Salt Production, and Coastal Maya Trade at Stingray Lagoon, Belize. *Latin American Antiquity* 6: 214-228.
- 2005 *In Search of Maya Sea Traders*. Texas A&M University Press, College Station.
- 2009 Mapping Ancient Maya Wooden Architecture on the Sea Floor, Belize. *ACUA Underwater Archaeology Proceedings 2009*: 277-286.
- Medina-Elizalde, Martín, Stephen J. Burns, David W. Lea, Yemane Asmerom, Lucien von Gunten, Victor Polyak, Mathias Vuille, and Ambarish Karmalkar
2010 High Resolution Stalagmite Climate Record from the Yucatán Peninsula Spanning the Maya Terminal Classic Period. *Earth and Planetary Science Letters* 298: 255-262.

- Moyes, Holley
 2005 The Sweatbath in the Cave: A Modified Passage in Chechem Ha Cave, Belize. *Stone Houses and Earth Lords: Maya Religion in the Cave Context*, edited by Keith M. Prufer and James E. Brady, pp. 187-212. University Press of Colorado, Boulder.
- Moyes, Holley, Jaime J. Awe, G. A. Brook, and J. W. Webster
 2009 The Ancient Maya Drought Cult: Late Classic Cave Use in Belize. *Latin American Antiquity* 20: 175-206.
- Osterholtz, Anna
 1999 Underwater Archaeology of the Maya Area: A History and Study of the Methodological Approaches for the Recovery and Treatment of Cultural Materials Recovered from a Freshwater Environment. Honors Thesis, Department of Anthropology, New Mexico State University, Las Cruces.
- Robertson, Merle Green
 1990 The Celestial God of Number 13. *Triptych* September/October: 26-31.
- Taçon, Paul S. C.
 1999 Identifying Ancient Sacred Landscapes in Australia: From Physical to Social. *Archaeologies of Landscape: Contemporary Perspectives*, edited by Wendy Ashmore and A. Bernard Knapp, pp. 33-57. Blackwell, Oxford.
- Taube, Karl A.
 1992 *The Major Gods of Ancient Yucatan*. Studies in Pre-Columbian Art and Archaeology, Number 32. Dumbarton Oaks, Washington D.C.
- Tozzer, Alfred M.
 1941 *Landa's Relación de Los Cosas de Yucatán*. Papers of the Peabody Museum of American Archaeology and Ethnology, No. 28. Harvard University, Cambridge.
- 1957 *Chichén Itzá and its Cenote of Sacrifice: A Comparative Study of Contemporaneous Maya and Toltec*. Memoirs of the Peabody Museum of Archaeology and Ethnology, vols. XI and XII. Harvard University, Cambridge.
- Vail, Gabrielle and Christine Hernandez
 2012 Rain and Fertility Rituals in Postclassic Yucatan Featuring Chaak and Chak Chel. *The Ancient Maya of Mexico: Interpreting the Past of the Northern Maya Lowlands*, edited by Geoffrey E. Braswell, pp. 285-305. Equinox Publishing, Sheffield.
- Vogt, Evon Z.
 1976 *Tortillas for the Gods: A Symbolic Analysis of Zinacanteco Rituals*. Harvard University Press, Cambridge.
- Wisdom, Charles
 1940 *The Chorti Indians of Guatemala*. University of Chicago Press, Chicago.