

PRELIMINARY INVESTIGATION OF A RITUAL CAVE SITE IN THE PUUC REGION OF YUCATÁN, MEXICO: ACTUN XCOCH

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Abstract: Within the Lowland Maya site of Xcoch is a deep cave first described by John Lloyd Stephens in 1843. Evidence indicates the Maya settled the area during the Middle Preclassic (800 BC) and continued to maintain occupation at the site until the Terminal Classic. The cave's central location within the Xcoch site and its location at the base of a pyramid indicate that the cave played an important role in replicating Maya cosmology. Initial exploration of the cave in 2006 by Michael Smyth revealed examples of the oldest ceramic known in the Yucatán-Yotolin Patterned Burnished. Mapping of the cave in 2009 and 2010 revealed a cave that had been heavily used for ritual purposes. Throughout its reaches are broken ceramic vessels, and the lowest chamber, which contains a pool of water, contains piles of ceramic meters deep. As few caves in this region contain freshwater and the land above is void of natural surface water, it is assumed that the focus of interest was the water in the cave and that Chaac, the Maya rain god, was the principal deity for which the offerings were made. An obsidian blade found in a passage suggests bloodletting, and human bones indicate the cave was used for funerary purposes or for human sacrifice. It is evident that this cave was an important religious site for the Maya, and future excavations will produce a better understanding of the site.

INTRODUCTION

Early investigations of a deep cave in the Lowland Maya site of Xcoch were first described by John Lloyd Stephens in 1843. Stephens' wrote: "The water was in a deep, stony basin running under a shelf of overhanging rock, with a pole laid across on one side, over which the Indians leaned to dip it up . . . [T]he sight of it was more welcome to us than gold or rubies" (Stephens, 1843). Caves have been a significant component of Maya worldview and their assessment of the sacred landscape for millennia. The rain deity, Chaac, was believed to reside within caves, where wind was formed that carried water to the sky. While caves were places connected with supernatural and often malevolent forces, they were also places that the Maya considered as wombs of the earth, connected to the primordial water that was the source of creation (Halperin et al, 2003). This duality is best described as reflecting breaks in the quadrilateral fabric of the world through which destructive forces and essential elements could enter (Bassie-Sweet, 2008). The Maya connected with caves and their cosmic denizens by integrating caves into town and city plans (Ashmore and Brady, 1999; Bassie-Sweet, 1991; Brady and Stone, 1986). Rituals were often performed both near and within caves. In 1841, John Lloyd Stephens and Frederick Catherwood were the first outsiders to visit one such cave, filled with the remains of past ritual activities, while visiting the ancient Maya site of Xcoch. This article reports on the first systematic exploration and mapping of Xcoch Cave, undertaken in 2009 and 2010.

The site of Xcoch is located just outside of the town of Santa Elena in Yucatán, Mexico, and approximately 10 km east of the famous ruins of Uxmal (Fig. 1). Xcoch lies in the heart of the Puuc Hills, a region famous for its high density of ancient Maya sites, most of which date to the Late and Terminal Classic periods (ca. AD 600–900). It is located south of a line of fault-block ridges known as the Sierrita de Ticul, and the permanent freshwater table in the Puuc lies tens of meters below the ground surface and is accessible through only a small handful of deep caves, including Xcoch (Dunning, 1992). Excavation of the site began in 2006 under the direction of Michael Smyth and has continued since then. Xcoch includes a 10 ha acropolis, primarily displaying megalithic-style architecture dating to the Middle and Late Preclassic periods (ca. 800 BC–AD 150). The largest pyramid, referred to as the Great Pyramid, is 30 meters high and exhibits Late Classic construction (ca. AD 600–800) overlying massive, earlier Preclassic phases. Actun Xcoch is located near the base of another pyramid, dubbed the Cave Pyramid. This edifice had four entrances and stairways indicating that it once may have been a radial pyramid, an architectural device used to align the site with the Maya model of the cosmos (Dunning, 2011). The Great Pyramid and an associated plaza are connected to other parts of the site by two

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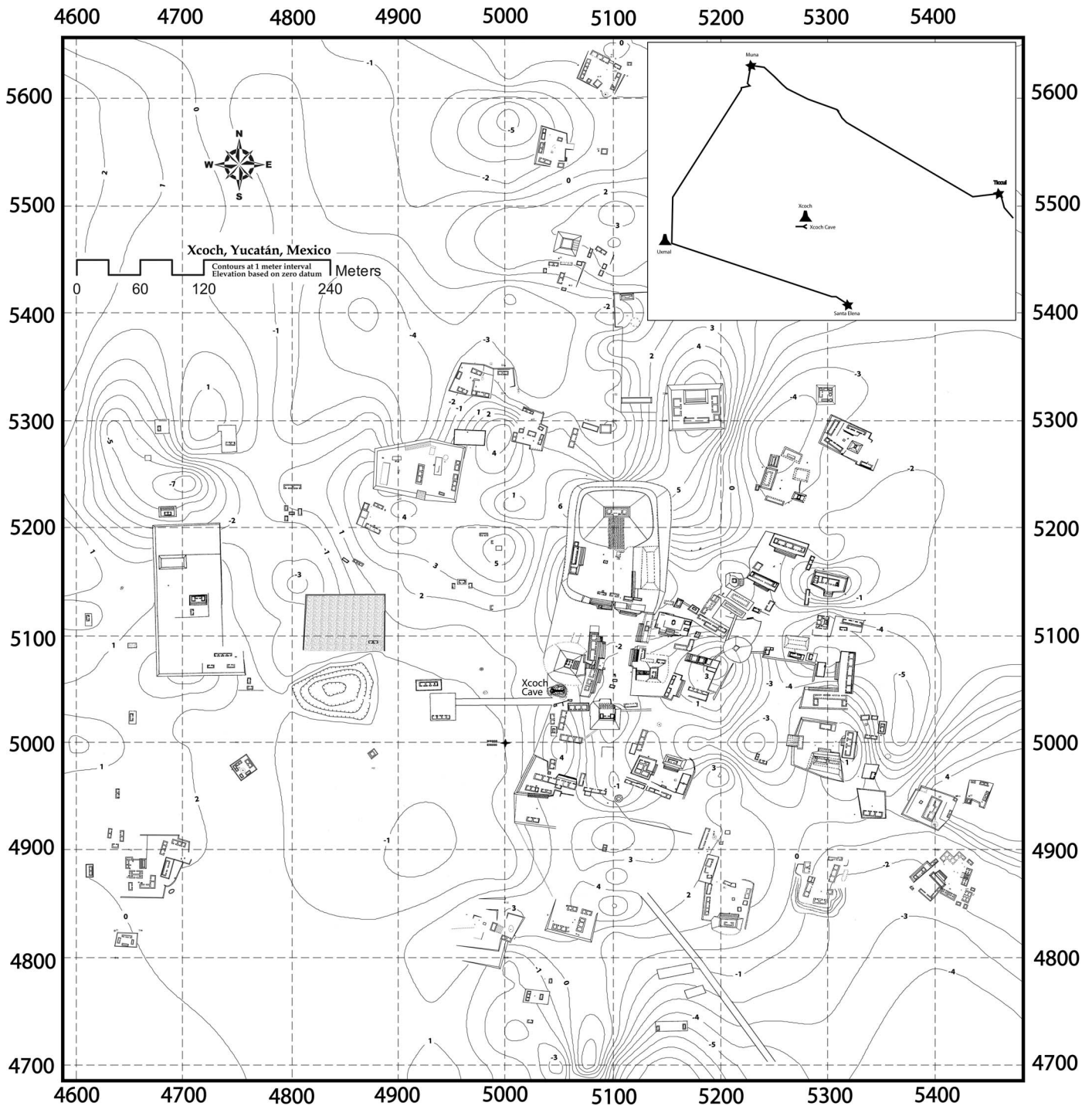


Figure 1. Map, with topography and identified structures, of the Xcoch archaeological site (Smyth et al, 2010).

causeways, one of which runs due west from near the cave entrance to a nearby ancient reservoir. The central plaza is approximately 100 meters by 50 meters in size. An overlay of the maps of central Xcoch and the underlying cave system (Fig. 2) indicates that the main plaza and associated monumental architecture were developed around and above the cave. A series of structures around the plaza form what appears to be an “E-Group Complex,” a

Preclassic solar observatory also used to cosmically align urban space (Smyth, 2008). Most of the central architecture shows evidence of construction in early styles (e.g., Early Puuc, Proto-Puuc, and Megalithic) that likely span the period between 800 BC and AD 600. Very few buildings, mainly those on the outskirts of the acropolis, resemble the later AD 700–900 Classic Puuc style of architecture for which the region is best known. Xcoch shows evidence of a

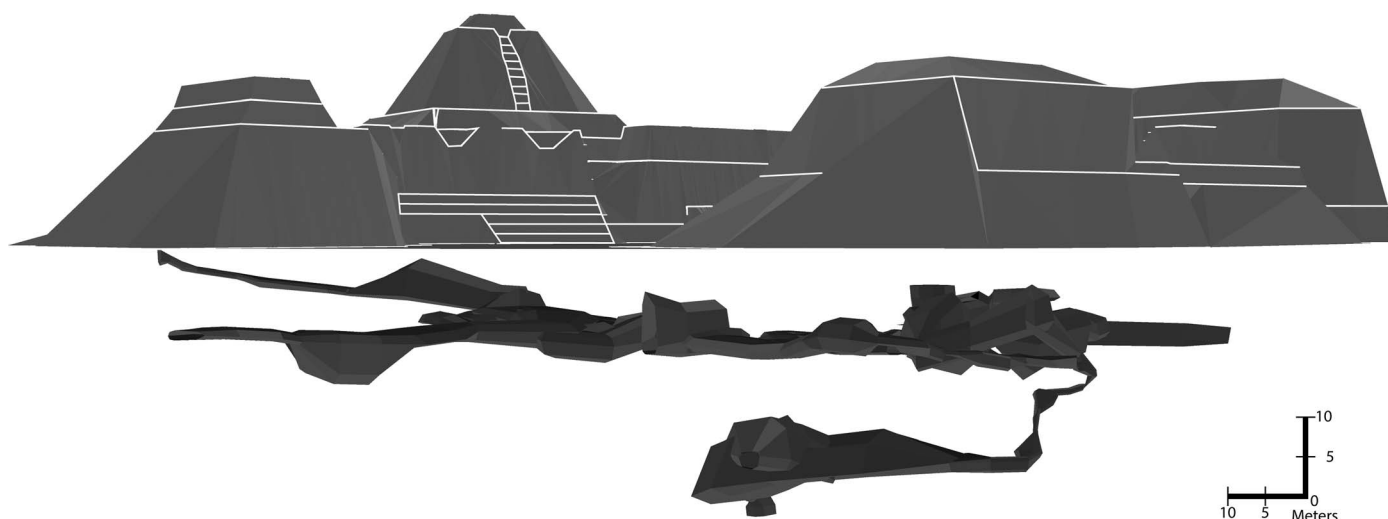


Figure 2. Profile of Actun Xcoch underlying monumental structures on the surface above.

significant population as early as 800 BC during the Middle Preclassic. While the site is still in the early stages of excavation, it seems evident that Xcoch was a major early center, but played a relatively minor role in the Late Classic/Terminal Classic florescence of the Puuc region (Smyth and Ortigón Zapata, 2008).

The first published account of Actun Xcoch is from John Lloyd Stephens (1843) in his book *Incidents of Travel in the Yucatán*. Stephens' account of the cave expresses both disappointment, because it did not contain an underground cathedral as he had been lead to believe by the residents of the area, and excitement because of what the cave did contain. The next report of any exploration of the cave is from a group of entomologists in 1971, who indicated that the cave entrance required reopening for them to gain access. They were unable to reach the water pool in the deep recesses of the cave because the passage to it had been intentionally sealed. The cave was entered again in 2006 by Michael Smyth during the course of mapping and excavating the Xcoch acropolis (Smyth and Ortigón Zapata, 2008). The survey of the cave began in 2009 and continued in 2010. At the onset of the survey, very minimal excavation work had occurred within the cave; but some ceramics had been collected, including a rare, specialized ware known as Chac Polychrome and the Middle Preclassic diagnostic ware Yotolin Patterned Burnished (Smyth and Ortigón Zapata, 2008).

MODERN EXPLORATION AND MAPPING

After two field seasons in the cave, its total surveyed length is currently 1,286 m with a surface length of 131 m. The depth of the cave is 34.9 m. There are two significant upper rooms, Chambers I and II, in the cave and two lower rooms, Chambers III and IV (Fig. 3). The cave entrance is situated at the bottom of a large sinkhole, where

excavation in 2010 revealed a staircase that had descended from the top of the depression to the entrance of the cave. The entrance is a small pit 2.3 m deep in which there is a carved rock at the bottom on the left-hand side. The rock is a spool element common in the decorated facades of Puuc architecture, and it is unclear whether this stone simply fell into the cave entrance or was deliberately placed. The pit immediately becomes a crawl space less than 1 m in height, where a strong breeze blows through the cave passage, and then proceeds to a stoop-walk between 1 and 1.5 m in height. Stephens aptly describes this breeze as capable of taking a person's breath away, and, indeed, the breeze blows dirt directly into one's face when crawling into the entrance. The breeze seems to diminish after several meters of crawling. Nearby is another carved rock that marks the location of what may be a blocked passage. No efforts have been made yet to remove the debris for further exploration.

Eventually the cave becomes large enough to accommodate upright walking, and the ceiling has multiple cupolas. There is a side lead to the left, the B Passage, marked by a round stone; it loops back into the main passage. The main passage then begins to open up into a relatively complex room, referred to as Chamber I. It would have been an ideal meeting location in the cave, as it is large enough to comfortably hold twenty or more people. Several significant passages branch from this room. The C Passage is a small passage that loops into the much longer E Passage. Multiple sets of human remains are identifiable at this location, primarily in the E Passage. From there, the E Passage continues in a southerly direction and eventually surpasses the entrance as the southern-most point in the cave. A major extension discovered during the second year of survey substantially increased the length of this passage. The connection of the A Passage with the E and C Passages is marked by an inverted conical stone altar (Fig. 4). On the surface such altars are typically found upright in the



Figure 3. Map of Actun Xcoch based on the 2009 survey; 2010 extensions not shown or reflected in the statistics.

center of courtyards and are thought to represent world trees or cosmic centering points (Kowalski and Dunning, 1999). The emblematic Maya world tree is the Ceiba (*Ceiba pentandra*), the branches of which created 13 celestial tiers and the roots of which formed 9 subterranean layers. The inverted cave altar may represent the roots of the world tree.

The D Passage branches to the east and reaches the eastern-most point of the cave. Human bones in the D Passage are marked off by wooden torches in a way that appears to frame their location. When or by whom these bones were marked remains unclear. While broken pottery and used torches are evident in the smaller passageway, Chamber I is the point where torch fragments become



Figure 4. The inverted cone altar at the entrance to Passage E.

conspicuously visible. Radiocarbon dates through Chamber I range from Middle Preclassic through Colonial (Smyth and Ortégón Zapata, 2010). An area with a relatively high concentration of pottery is found in a small alcove, and some human bones as well as a *pila*, a carved stone water basin, are also located in the vicinity. This location is almost directly above the deeper subterranean water pool. During a heavy rainstorm, it was observed that water from the entrance ran directly to the *pila*. Pollen analysis of sediment samples taken in this area identified insect-pollinated plants, including *Passiflora*, Solanaceae, *Annona*, *Bauhinia*, *Ceiba* (two species), *Pachira*, Sapindaceae, and Tiliaceae. These pollens were likely introduced into the sediments through bat feces, as they are normally not associated with wind-borne, surface-water assemblages in the Maya Lowlands. *Gossypium* (cotton), *Manihot* (manioc; probably both wild and domesticated forms), and *Zea mays* (maize) of lower quantities were present in the sediment samples as well. Typically, grains from these cultigens are too heavy to travel far from their source, and this suggests that these were brought in as a result of human activity, possibly in dedicatory offerings such as flowers or honey.

Beyond Chamber I, the ceiling drops and there is a small crawl space before another smaller room opens up. A diminutive passage, the F Passage, breaks off to the right and may have once reconnected with the A Passage. A wooden beehive that appeared to have been ceremonially broken was found in this passage. After the crawl, the A Passage begins to expand into Chamber II. This large room appears to be the most geologically complicated in the cave

and contains unusual ceiling features resembling boxwork. One large boulder, approximately 3 m long and 2 m high, has a peculiar hole 20 cm in diameter at its tip, with some of the rock around the hole appearing chiseled. A small passage that quickly ends in breakdown debris was found by climbing to the bottom of the boulder. A significant amount of pottery and a large number of human infant bones were identified at the base of the boulder. A polished iron-ore mirror was also found in this area, and a charcoal sample taken from on top of the mirror indicated a Late Classic date of AD 700 (Smyth and Ortégón Zapata, 2010).

Above a drop in the floor is a small traverse that connects the A Passage with the H Passage. It is evident that the floor of this traverse was built up as a trail. The H Passage is composed of a combination of several interconnected passages, beginning as a large walking passage with a relatively steep incline. Evidence suggests that a significant amount of water ran through this passage in the distant past, with several winding holes in the ceiling that appear to have rapidly fed surface water at one time. The wall in this area is often flowstone with associated travertine pools that are now dried up and heavily weathered. Below this zone is a rounded-out hole that may have been modified to isolate some of the flowing water, with an obsidian blade found in proximity. Small rock cairns of unknown origin and age were also located in this passage. The passage splits into a northwestern passages to the left, the HX and HE Passages, and a southeasterly or southerly passage to the right, the HN Passage. Based on overlays of the site, this area rests

underneath the megalithic staircase of the Great Pyramid. There is a climb that reaches an additional 10 or more meters up at this location, but it was not attempted because of the instability of the rocks in the area. It has the potential to be another entrance to the surface or to a feature within the pyramid. In the second year of field work, further investigation revealed a significant extension of the HX passage. A small alcove at the end of this passage has heavily calcified walls and the only remaining speleothems in the cave. Unfortunately, none of the speleothems were of sufficient quality to assist in paleoclimate studies of the site. Several stone tools and markings on the walls suggested that the ancient Maya extracted crystallized crust and speleothems, which were commonly used in rain-related rituals, from this location (Brady et al., 1997; Brady and Rissolo, 2006; Moyes, 2002).

Past Chamber II is a junction of several passages. It is the pivot for the continuation of the A Passage, and the HN passage connects here, as well as the G Passage. This is another location that figured prominently in Stephens' (1843: v. 1, 215) description of his descent into the cave: "We . . . came out upon a ledge of rock, which ran up on the right to a great height, while on the left was a deep, yawning chasm. A few rude logs were laid along the edge of this chasm, which, with a pole for a railing, served as a bridge, and, with the torchlight thrown into the abyss below, made a wild crossing place." The drop here is approximately 5.5 m before it is choked up with break down. A small opening in the breakdown reveals a further drop that reaches into a room below, Chamber III. An old decaying log bridge is still present and is used to prevent slipping into the chasm rather than as a true bridge across the chasm. The A Passage goes around a bend on the right, and then proceeds to wind downward into a room through a small trail that maneuvers through a large breakdown pile. A wooden barrel, probably a Colonial Era artifact, was noted at the top of this climb-down. At the bottom of this route is a large room filled with breakdown, Chamber III. A large number of bats are present in this room, and the rocks are coated in a layer of guano. The breakdown pile contains significant amounts of broken pottery, and Chamber III contains some very small but active stalactites and flowstone. A marked drop in the oxygen level at this point is apparent, and breathing becomes increasingly difficult. A test of air quality indicated oxygen levels as low as 12%. From this point to the end of the survey at the water pool, the oxygen levels remain low and any movement results in labored breathing and profuse sweating.

A steep drop in the floor of Chamber III is the continuation of the A Passage, a location directly below the chasm. The remains of an old wooden ladder are scattered near a hole in the floor, apparently once used to assist with the difficult climb down necessary to reach the lower chambers of the cave. The climb leads into a further downward-sloping crawl. Another climb-down after this descent reaches the lower passage. This lower passage

begins as a crawl and is filled on each side with many broken pottery sherds. The floor of the passage changes from black, fine sediment and guano to primarily charcoal, and a hollow sound is heard when traveling across the charcoal. Whether this indicates the floor has been built up or it is a result of the acoustics is unclear. The passage proceeds into a large room, Chamber IV. At the entrance of Chamber IV, where one transitions from a hands-and-knees crawl to full standing, there are two deep deposits of charcoal, dubbed fire pits, to the left and right of the trail. These are the likely origin of the charcoal used to develop the trail. Two radiocarbon dates obtained from one of the fire pits indicated Postclassic usage (Smyth and Ortigón Zapata, 2010). Directly past these two pits one can follow a small path up a slope, with the entire slope composed of sediment and broken pottery (Fig. 5). At the end of the trail is a small alcove that has a broken *pila* or *metate* (corn-grinding basin) set near its center (Fig. 6), and it is possible that this was used to hold *vuhuy ha*, "virgin water" taken from the water source. Its location at the center of the alcove at the top of the hill of broken pottery indicates that it was the primary focus for whatever ceremonial activity occurred in the chamber for countless generations. Many ancient Maya rituals involved the breaking or killing of objects in order to make the essence of the material available to deities or ancestors (Brady et al., 1997; Brady and Colas, 2005). The mountain of broken artifacts attests to thousands of such rituals.

Returning to the main trail, the survey continues towards the water source, a small pool of water trapped in a drop in the floor. The entire pool is encircled with layers of broken pottery. It is the lowest point in the cave and is located 32.6 m below the entrance and 16.259 m above sea level. The bottom of the pool is littered with the skeletal remains of a significant number of bats. The rather anticlimactic pool (Fig. 7) is 10 to 15 cm in depth and has a visible extent of about a square meter before dipping under a stone shelf. However, in a dry land—within the confines of an oxygen-starved chamber of a dry cave—a pool of cool water containing translucent invertebrates swimming over a layer of broken ceramics becomes a mesmerizing sight. The cave passage continues through breakdown past the water source. This area has not been mapped or extensively explored, but it does not appear that any human activity has occurred in this area. This marked the end of the survey of the primary passage.

Further exploration of the E Passage in 2010 resulted in a significant amount of new cave passage to survey. The total passage surveyed there was 397.8 m. The passage is very distinct from the rest of the cave. In particular, it is much larger in comparison with the majority of the rest of the cave, with the air quality better, the temperature much cooler, and significant air movement present. While it was evident that the Maya had used this passage, it did not show the same kind or intensity of use that is present in the rest of the cave. No evidence of heavy traffic or even



Figure 5. The slope of sediment and broken pottery in Chamber IV.

footprints was encountered during the survey. A small number of spent torches were found, as well as vines used to wrap torches. A sample from one large torch appears to be a dicot, possibly *Vitex gaumeri* (2011 personal communication, David Lentz). Radiocarbon dates derived from the torch indicate the remains are from the Colonial Era (Smyth and Ortégón Zapata, 2010). Small amounts of

broken ceramic were also located in the passage. The most prevalent indicator of past usage of the passage was large cairns used to mark off the maze of side passages. An unusual aspect of these cairns is that they do not resemble the few others found elsewhere in the cave. Charcoal was noted in various areas of the passage. Toward the terminus of the main passage in the E and EK areas, it was noted



Figure 6. Broken *pila* or *metate* in Chamber IV.



Figure 7. Pool of water at the lowest level of the cave.

that the floor was coated with a layer of charcoal. The E Passage was also interesting because its terminus appears to be several meters higher than the known entrance to the cave. This strongly suggests that the E Passage once had an entrance to the surface that has now been buried. This assessment is further reinforced by the presence of ground-termite nests in wall and ceiling cracks, as well as some leaves and roots present in the passages. Using the coordinates drawn from the cave survey, a surface examination of the area above the E Passage was conducted. A surface feature was identified in an ancient plaza situated above the location of the EK and E junction. This feature is a significant depression that appears to be ringed with carved stones. Several workers were dispatched in an attempt to locate an entrance to the E Passage by digging into the bottom of the surface feature. While a physical connection was not made with the surface, voice and tapping communication was established, indicating a very close proximity from the workers digging from the surface to the surveyors in the cave.

DISCUSSION

Stephens' original description included the following passage: "As a mere cave, this [place] was extraordinary; but as a well or watering-place for an ancient city, it was past belief, except for the proofs under our own eyes (Stephens, 1843)." Stephens was absolutely correct that Actun Xcoch is an extraordinary place. However, his assessment of the cave and its pool as the sole water source

for an ancient city was erroneous. Recent mapping and excavations have revealed that water was supplied to the ancient city of Xcoch by an elaborate system of rain-fed reservoirs and household cisterns (Dunning et al., 2012). Nevertheless, there is compelling evidence that the cave was the symbolic heart of this water system and of the ancient population that depended on it. The cave has been used ritualistically from the time of the Preclassic Maya (ca. 800 BC) through Classic Maya times and into the Colonial Era. Ritual activity at Xcoch appears to have even occurred when the center above it experienced periods of abandonment. Based on the spatial arrangement of some of the earliest structures at the site, it is posited that the cave was a key rationale for original settlement at Xcoch. Because the cave is one of only three caves in the area known to contain a permanent water source, there is no doubt that it was seen as a very special place to the Maya. The suffocating, low-oxygen experience of reaching the water, if present during the time of the ancient Maya, may have only reinforced the supernatural nature of this cave. Certain caves are known to have functioned as places to communicate with the rain deity in bringing forth rain (Moyes, 2006; Prufer, 2002; Brady, 1989); Xcoch appears to have been such a cave. A radial pyramid close to the cave entrance and abundant deposits of broken pottery suggest that ritual activity also occurred outside of the feature (Smyth et al, 2012). Of special note is the causeway that runs from the cave entrance to a nearby reservoir, suggesting that virgin water may have been brought forth from the home of the rain god and carried to the reservoir, replicating the passage of trade-

wind-borne rain clouds, to begin filling the reservoir and initiate the onset of seasonal rains.

It is evident that other rituals occurred in Xcoch cave that may not have been as closely associated with water. Obsidian blades indicate at least some bloodletting occurred in the cave. At present, it is unclear whether the human bones found within the cave represent human-sacrifice rituals within the cave or important burials. Both practices are known from other caves in the Maya Lowlands, probably reflecting the belief that caves were entrances to the Maya underworld and places to communicate with a variety of deities as well as venerated ancestors (Vogt, 1993; Thompson, 1970; Redfield, 1941; León-Portilla, 1988). One can imagine that the ritually broken beehive might provide an interesting story, if it were ever retold. The E passage may be the most perplexing. While it was obviously known to the Maya, it has very little evidence of ritual activity, despite the fact that the passage is much more comfortable than any other spot in the cave.

In short, while our survey work has greatly expanded our knowledge concerning Actun Xcoch, much remains unknown. Test pits during the next field season should help to increase the stratigraphic knowledge of the samples. Future research, including systematic excavations, will begin to shed more light on this sacred place of the ancient Maya.

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