

# FINAL REPORT ON THE 2013 SEASON OF THE MAYAPÁN TABOO CENOTE PROJECT

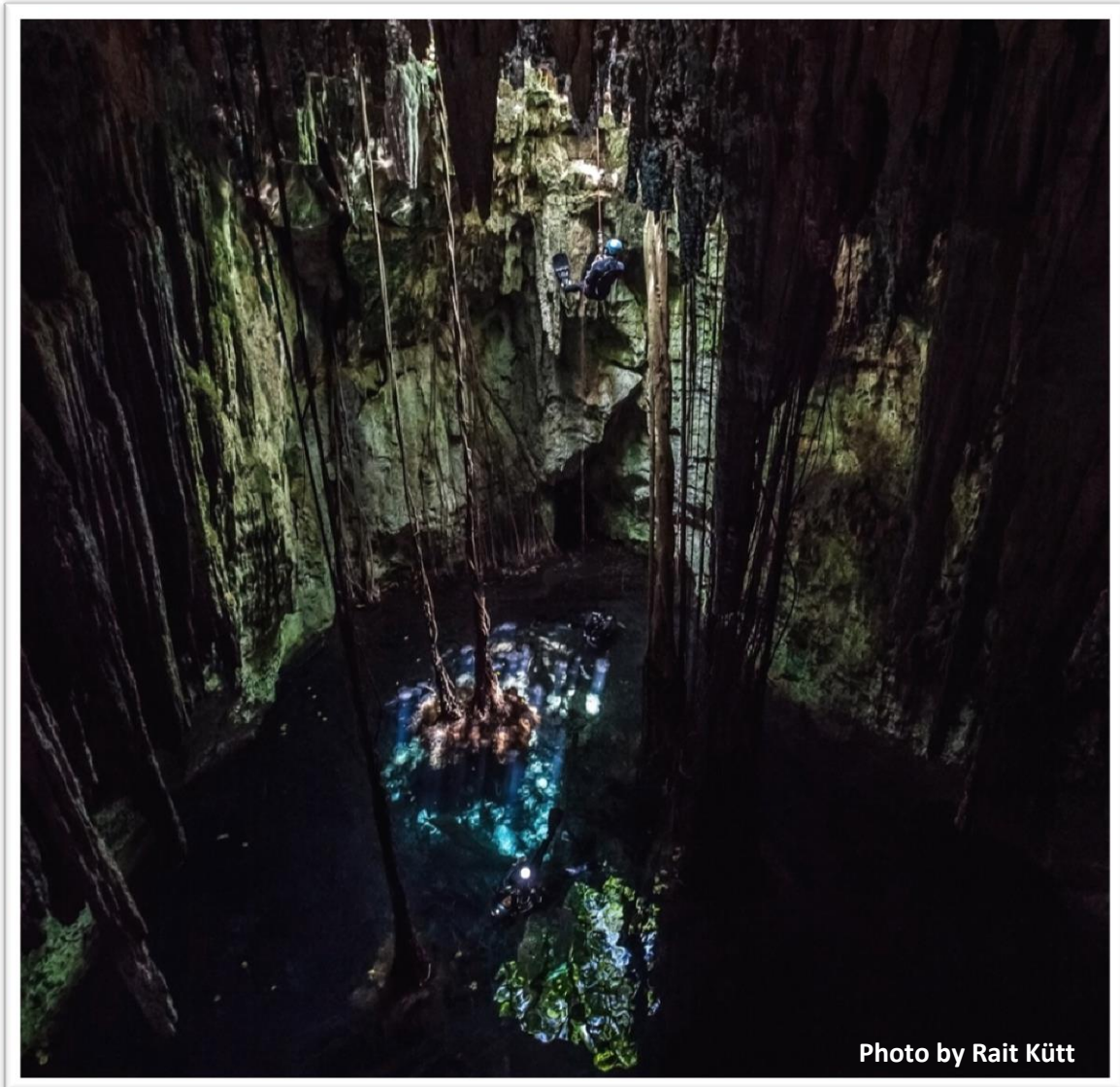


Photo by Rait Kütt

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## *Abstract*

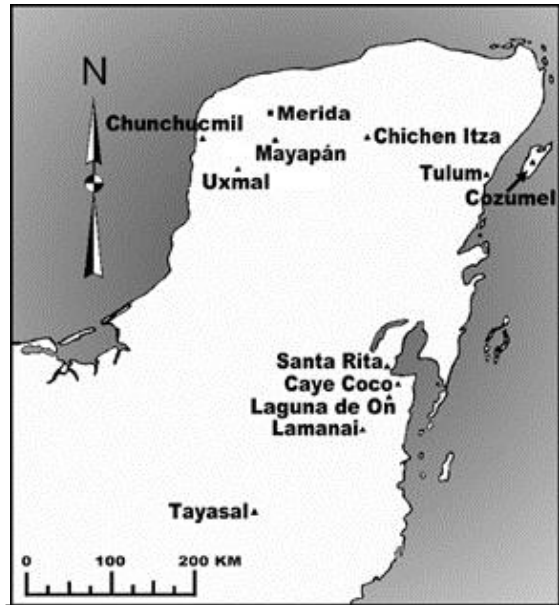
With support from The National Geographic Society and The Waitt Foundation, the **Mayapán Taboo Cenote Project** concluded its first season of exploration at Cenote Sac Uayum in the summer of 2013. Sac Uayum is a sacred, water-bearing sinkhole located at the Postclassic Maya political capital of Mayapán, Yucatán, Mexico (1150-1450AD). The work brought together an international collaboration of researchers from the United States, Mexico and Estonia. Principle Investigator Bradley W. Russell (College of St. Rose) and Co-Directors Carlos Peraza Lope (INAH Centro Yucatan), Eunice Uc González (INAH Centro Yucatan) and Marilyn A. Masson (SUNY Albany) enlisted the help of lead diver Rait Kütt and underwater archaeologist Lisseth Pedroza Fuentes. The study yielded significant new insights into the cenote that many modern inhabitants consider to be “alive” and believe is guarded by a large feathered serpent with the head of a horse. The feature has drawn the attention of researchers working at the site since the first archaeological work began at the ancient city because of its conspicuous and apparently intentional exclusion by the large defensive wall surrounding the bulk of the settlement. Caves and sinkholes were/are especially important to the Maya as they are believed to be accesses to the underworld and homes of gods. Sac Uayum remains sacred today and local residents both respect and fear it and the supernatural serpent said to guard it. In order to enter the cenote, we hosted a traditional Maya *Jeets’ Lu’um* or “calming of the earth” ceremony to petition the gods of the sky, earth and winds as well as its serpent guardian for permission to perform the work. Doing so provided new ethnographic data on modern Maya cave ritual and beliefs. Our team of divers and underwater archaeologists focused on detailed underwater mapping and photography of the cenote and its contents. During the study, we located 15 human crania and a large number of other bones, attesting to the use of the site as a burial location. Early data suggests that the site contains burials of both sexes and a range of ages, including one as young as six or seven years old. Ceramic fragments show a mix of Preclassic and Postclassic Maya use of the feature. We recovered a small sample of the bones (two femurs, a mandible and a tibia) that we will use to obtain radiocarbon dates for the burials themselves. We were surprised and excited to find that the cenote’s main chamber is connected to a second even larger and deeper cavern that contained five of the best preserved skulls identified along with many other bones. While connected, submerged cave systems are common near the coast, they are rare this far inland.



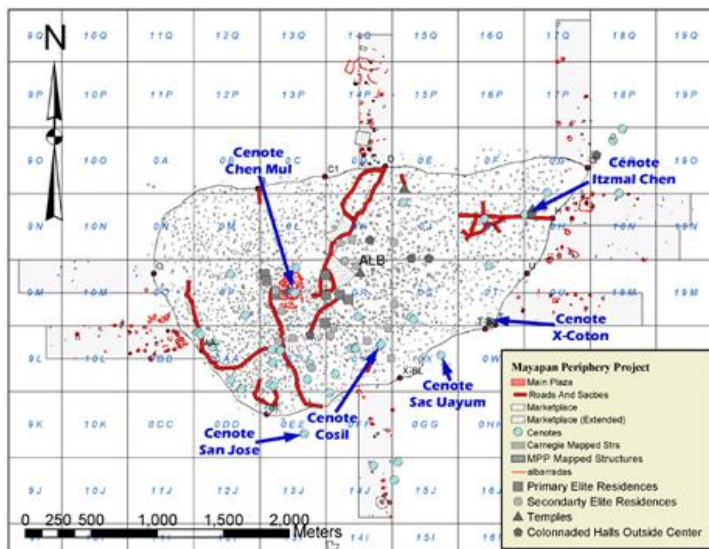
## Chapter 1 – Introduction

By Bradley W. Russell, Carlos Peraza Lope, Eunice Uc González and Marilyn A. Masson

The well preserved ruins of Mayapán (1150-1450), located 40km southeast of Merida, are what remain of the primate political center of the Maya Lowlands throughout the Late Postclassic Period (Figures 1.1 and 1.2). Mayapán’s power is reflected in its unusual size and density. The *Atlas arqueológico del estado de Yucatán* (Garza and Kurjack 1980) lists it as the largest contemporary center of the region by an order of magnitude. Population estimates for the site suggest as many as 17,000 people resided there (Russell 2008:486-487), supported by dozens of water bearing caves and sinkholes (collapse dolines) (Brown 2005, 2006). A high concentration of these features results from Mayapán’s location just inside the Chicxulub Crater, along the “Ring of Cenotes” (Brown 2006; Pope, Ocampo and Duller 1993). Known in Yucatec as *Ch’e’en* (plural *Ch’e’enob*) or *ts’ono’ot(ob)* in Spanish as *cenote(s)*, Mayapán’s “wells” were public spaces, never found enclosed within house lot walls. They provided water, *kát luúm* (potting clay), *Ch’aak xiix* (calcite for temper), *kancab* (a red soil useful as a pottery slip and to make daub to cover walls) and small edible fish. They provide soil and water to cultivate fruit trees (Brown 2005, 2006, R.E. Smith 1953). They attract fowl and other fauna. They



**Figure 1.1 – Map of Yucatán Peninsula showing location of Mayapán.**



**Figure 1.2 – Map of Mayapán highlighting several important cenotes.**

contain stalactites which were collected and used as the physical and spiritual core of stucco effigies (Adams 1953; Proskouriakoff 1962). Intentional stalactite removal is observed throughout the Maya area (e.g. Brady 1997; Brady et al. 2005; Fedick and Taube 1995; Peterson et al. 2005; Rissolo 2001, 2005). Cenotes are sources of *suhuy ha* or “virgin water” (Thompson 1975) used to prepare ritual food offerings. Virgin water collection has been documented as far back as the Preclassic in the Yalahau region (Fedick and Taube 1995; Rissolo 2003, 2005). Cenotes remain sacred spaces, accesses to the forces within the earth, as indicated by offerings, associated incense burners,



**Figure 1.3 – Photo of small temple constructed inside of Cenote X-Coton. Photo by Bradley Russell.**

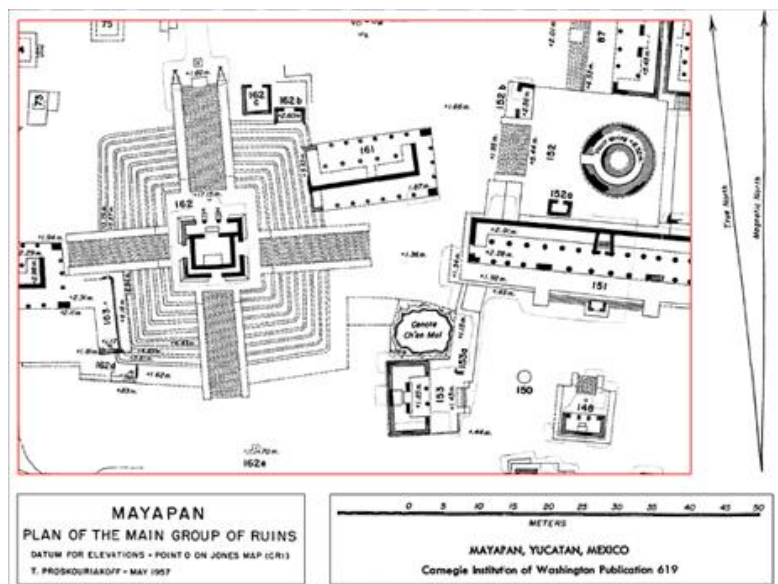
burials, artwork and ceremonial architecture (Figure 1.3) (Brady and Stone 1986; McLeod and Puleston 1978; Rissolo 2005; Smith 1953; Stone 1995; Vogt and Stuart 2005).

Mayapán's layout was greatly influenced by the distribution of cenotes (Brown 1999, 2005, 2006; Proskouriakoff 1962; Russell 2008; Shook 1952, 1954; A.L. Smith 1962). The Main Plaza, Itzmal Ch'en and X-Coton groups all incorporate cenotes within their layouts. Structure Q-162 (the Temple of Kukulcan) and the Q-152 round wind temple are situated directly above caverns extending from the mouth of

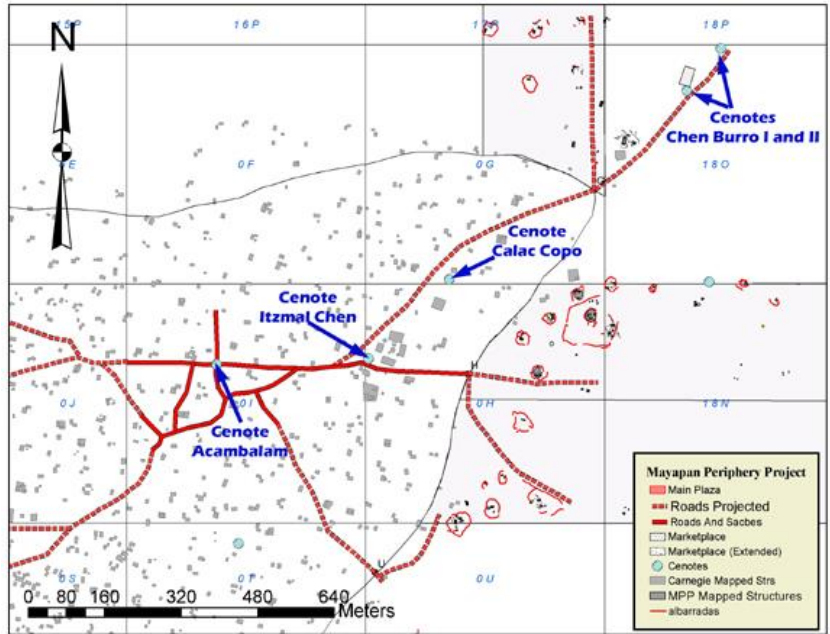
Cenote Ch'en Mul (Figure 1.4). This positioning makes Q-162, the dominant temple of the site its *axis mundi* (Eliade 1965), a spatial convergence of underworld, our realm and upper world and makes an explicit association between winds and caves (Aveni, Milbrath, Peraza Lope 2004; Brown 2005, 2006; Milbrath and Peraza Lope 2003; Proskouriakoff 1962; Pugh 2005; Shook 1954). Vertical burial shafts in two other Main Plaza temples containing disarticulated bones and other offerings represent caves, constructed features comparable to features at contemporary centers such as Uxatlán (Brady 1991; Fox 1991:221-232) and Zacpeten (Pugh 2003). Incorporation of these features into architectural groups suggests they were home to gods, places where mortals could go to interact with them (Pugh 2005; Stone 1995:35-37).

Open access is the rule.

*Ch'e'enob* served as key nodes for Mayapán's complex system of pedestrian lanes (Figure 1.5) (Bullard 1952, 1954). The southwest portion of the city wall



**Figure 1.4 – Map showing spatial relationship between Cenote Chan Mul, Temple of Kukulcan (Q-162) and Round temple Q-152 (modified from Proskouriakoff 1957).**



**Figure 1.5 – Map showing relationship between roads/trails and several key cenotes in northeast Mayapán.**

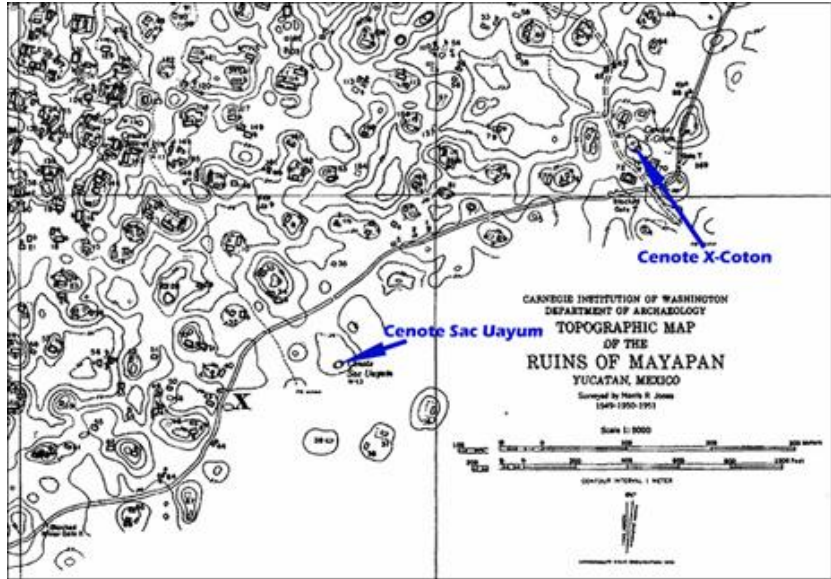
encloses a particularly dense zone of these features. The wall deviates to enclose Cenote X-Coton (Figure 1.6) which is flanked by two gates (Proskouriakoff 1962; Shook 1953). The northeast corner of the wall encloses the Itzmal Ch'en temple-cenote group and provides two proximate gates. Residential density is higher near cenotes (Brown 1999; Russell 2008). Cenotes were modified to facilitate access (R.E. Smith 1952; Uc González et al. 1997). This pattern persists throughout the area where many communities center on and are named after them (Brown 2005; Roys 1935). In Telchaquillo, the central

cenote of the settlement has modern cement stairs and electric lighting. Residents freely exploit many cenotes across the countryside, apparently without special ritual preparation. Sac Uayum conspicuously violates these access principles. It is naturally difficult to enter, requiring ropes. The trajectory of the ancient city wall deflects north to exclude it (Figure 1.6). It is far from gates and those closest were blocked in antiquity. Residential density is light near the feature. It remains taboo today. This exclusion is unexpected as it holds abundant clean water:

Sac Uayum is a visually dramatic cenote. A shallow depression in the limestone surface opens on one side to expose a large cavern. Only a small amount of light penetrates the cavern through the entrance and through another, smaller opening in the roof. The walls are vertical and overhanging. The water is unusually deep and clear. (Brown 2005:393)

Telchaquillo's modern residents have strong beliefs about the power of local water sources. Until 2003, locals practiced the annual *Ch'a'ah-Cha'ak* rain ceremony at Cenote Itzmal Ch'en (Brown 2006; Proskouriakoff 1962; Shook 1952). They continue to take place at other water bearing cenotes. In summer of 2013, the community celebrated this ceremony at a cenote in the northwest part of the town. Cenote Cosil and Cenote Sac Uayum, are considered "living" cenotes whose entry requires the performance of special rites (Quintal Aviléz 1998). Others may also exist. Clifford Brown reports that local workmen refused to enter Cosil after visiting others without incident (Brown 2006). He was told that Cenote Sac Uayum (Figure 1.7) is home to a feathered serpent that eats children, possibly *Hapai Kan* (Sucking Snake) (Roys 1962). Ritually important caves have serpent guardians in some modern Highland communities (Vogt and Stuart

2005). Bradley Russell and Miguel Aguilera visited the cenote in 2004 and were told that if anyone tried to get water from the cenote without permission from its guardian(s), its waters would begin to bubble and fill with sediment, making it undrinkable. Interestingly, on the same trip they observed a large boa constrictor consuming a recently captured bird in a tree within Cenote X-Coton (Figure 1.8). An INAH team led by Eunice Uc González (Uc González, et al. 1997) was asked not to enter Cosil or Sac Uayum without performing a *Jeets' Lu'um* or



**Figure 1.6 – Map of southeast Mayapán showing the relationship of the city wall to Cenotes Sac Uayum and X-Coton (Modified from Jones 1957).**

“quiet, pacify, appease, or calm earth” ceremony, asking permission from the “guardians”, “winds”, “crosses”, the Holy Trinity, various saints and apostles (Quintal Aviléz 1997). Informants indicated that those who access this water without permission become sick or die, punishment delivered by *los vientos malos* or the “bad winds”. Similar beliefs were documented in Chan Kom (Redfield and Villa Rojas 1934:165; Villa Rojas 1945:135). As noted above, especially difficult to enter and ritually taboo water sources often contain *suhuy ha* or “virgin water”. We were pleased to have another opportunity to document the *Jeets' Lu'um* ritual. Landowners stipulated its necessity in preliminary inquiries about the proposed research.

Sac Uayum’s exclusion from the walled city, its difficult vertical access, a large body of water, unconfirmed reports of human remains and the opportunity to further document local



**Figure 1.7 – Photo of Cenote Sac Uayum. Photo by Bradley Russell.**

beliefs all made Sac Uayum a prime focus for research on sacred landscape features at the city. This research makes a significant contribution to our understanding of the beliefs of modern Yucatec Maya and their ancient ancestors. By gaining sanction to enter the cenote, documenting local beliefs, and recording its form and contents, we add to a growing body of literature on a pan-Mesoamerican ritual system emphasizing earth lords, rain ritual, rites of passage and ancestor veneration.

### Previous Work on Mayapán's Cenotes

While Mayapán is one of the best surface mapped ancient cities in the entire world, our knowledge of its subterranean geography and associated material culture remains limited given the sheer quantity of underground locations to explore. Extensive efforts by the Carnegie Institution of Washington (Jones 1950, 1951) resulted in a remarkably detailed map of the walled portion of the city (Jones 1952). The team registered 26 cenotes at the site. However, the team did not systematically investigate the interiors to establish their suitability as water sources (Brown 2006). A number of additional cenotes have been recorded both within and outside of

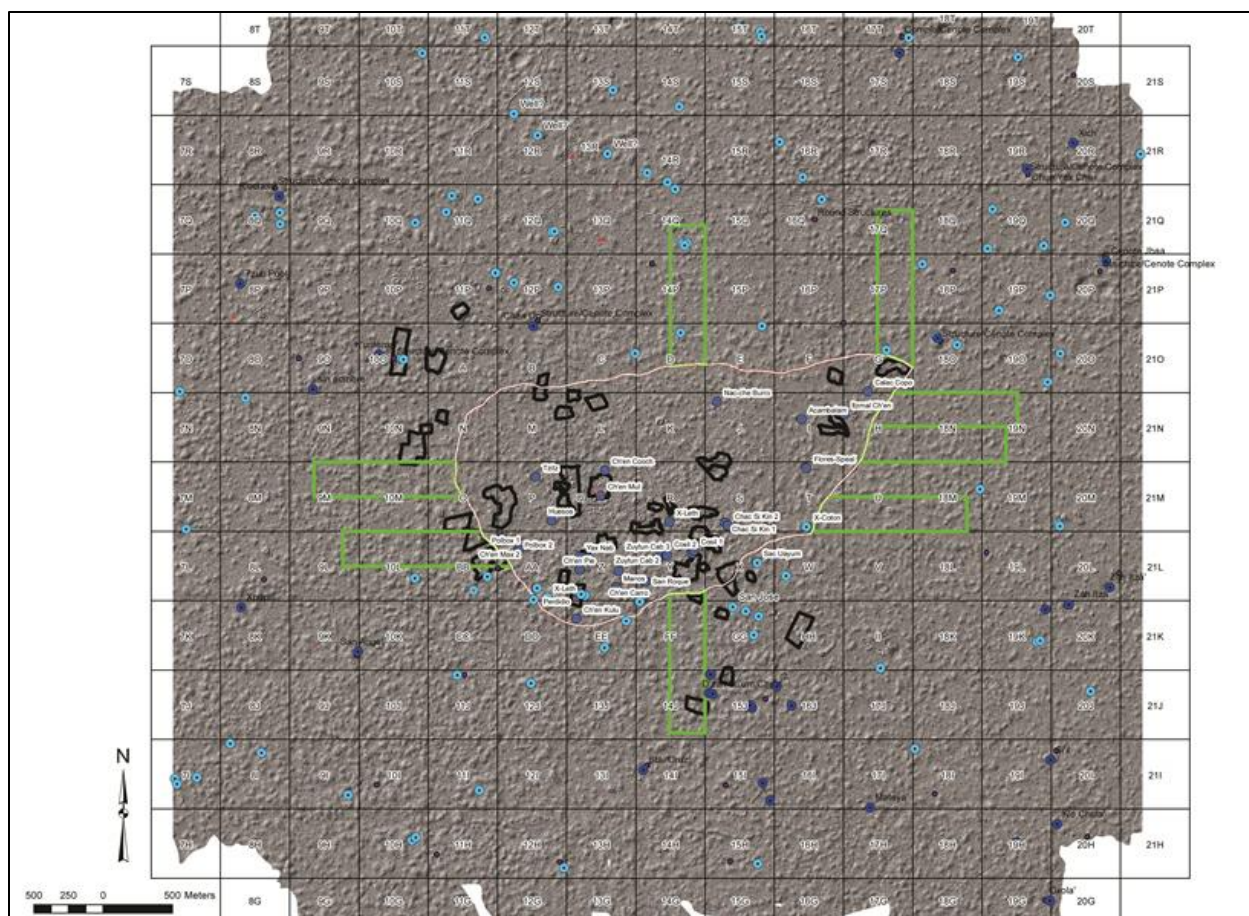


**Figure 1.8 – Photo of boa constrictor spotted feeding inside of Cenote X-Coton. Photo by Bradley Russell.**

the walls by successive researchers including Brown (1999), Carlos Peraza Lope's INAH team (Uc González et al. 1999), The Economic Foundations of Mayapán Project (Hare et al. 2008, Masson et al. 2012) and the Mayapán Periphery Project (Russell 2008). At least 40 cenotes have now been recorded within the city wall but our knowledge remains incomplete. Before work began this summer at Cenote Sac Uayum, The Mayapán LiDAR Mapping Project co-directed by Timothy Hare, Marilyn Masson, Bradley Russell and Carlos Peraza Lope located another roughly 150 newly recorded cenotes outside of the city wall during its 40 square kilometer laser mapping project (Figure 1.9).

The Carnegie researchers excavated limited stratigraphic pits to establish function and chronology in four of the area's many cenotes: two inside the walls, including Cenote Ch'en Mul and Cenote X-Coton and two beyond the city limits, including the town cenote of Telchaquillo, and Dzab-Na in the town of Tecoh (R.E. Smith 1953, 1954, Strömsvik 1965). Work in Cenotes Ch'en Mul and X-Coton quarried

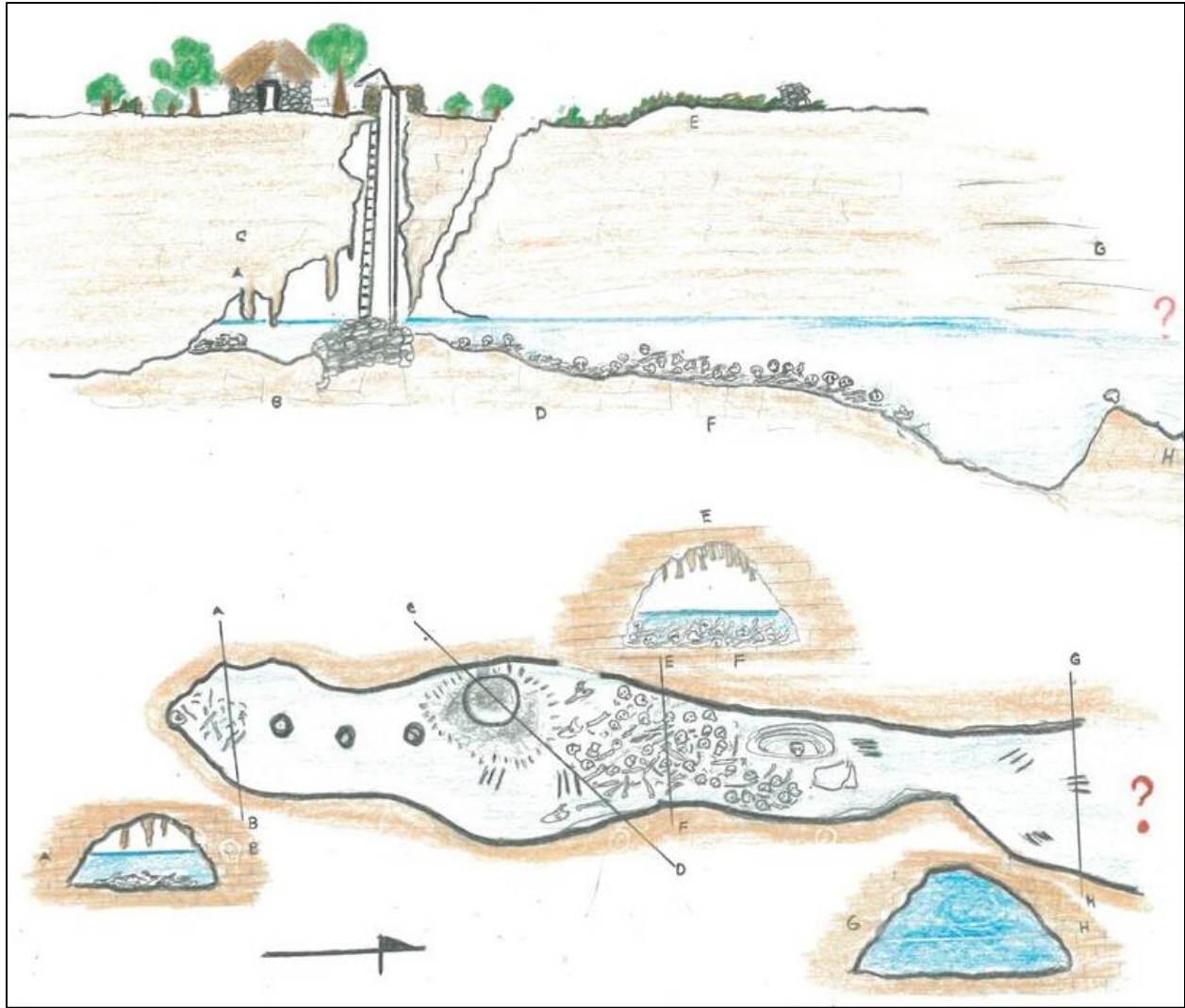
deposits of *kancab* soil as well as midden refuse. Ceramics suggest that exploitation predates the founding of the Postclassic city, but use continued until Mayapán fell. Work in Cenote X-Coton suggested that its floor had been leveled during the Postclassic and an interior shrine platform was built at its base. Similar Early Classic modifications have been documented at Actun Toh in Quintana Roo (Rissolo 2001, 2005; Figs 14.3-14.4). Effigy censers were found on the shrine as well as in a natural niche. They also exposed stairs that led to the water. Notably, the team also found “more than a dozen” burials in the sealed up entrance of a chamber, “Cave 1”. All but one of these was disarticulated and secondary. The articulated arm bones of one individual at the top



**Figure 1.9 – LiDAR map of Mayapán and surrounding area location of newly mapped cenotes in blue. Map by Timothy Hare.**

of the pile suggest the last burial was primary. While the ceramics in the main cenote were dominated by Mayapán period sherds, the ceramics from the burials were earlier (Terminal Classic). No other artifacts were found among the stones and bones, suggesting that the fragments of pottery vessels, which were smashed below a layer of stones, were the vestiges of food and drink offerings left for those interred there.

Work has resumed at the site since the late 1990's. Brown (1999, 2005, 2006) visited and mapped several of the best known cenotes and recorded new features. When INAH resumed work at the site in the late 1990's, a team led by Eunice Uc Gonzalez registered the locations previously known and newly discovered cenotes (Uc et al. 1997). They recorded 13 new cenotes, seven sascaberas (pits mines for construction material and often reused as dumps, gardens, etc.) four caves inside the wall and one more cenote beyond it. The team produced preliminary maps and made surface collections when possible. Among their most significant findings were a large number of disarticulated human remains inside of Cenote San Jose (figure 1.10), located 200m to the southeast of the city's Main Plaza (south of the city wall). Only the most superficial, recent material was recovered. A sample of the remains, primarily crania and long bones, was analyzed by Vera Tiesler (1999, 2005) who found a minimum of 24 individuals represented. Tiesler's work calls into question the Postclassic age for at least a portion of these remains as they do not show the typical region wide patterns of cranial deformation for the Postclassic and one shows signs of syphilis, suggesting a Colonial date. However, recent



**Figure 1.10 – Map of Cenote San Jose (Uc González et al. 1997).**

analysis of the entire collection suggests that the majority of the material recovered, both human remains and ceramics date to the Late Postclassic Period (Serafin et al 2010). Cranial deformation rates were consistent with known Postclassic burials from other portions of the city. The burials are almost entirely adult with a balance of sexes represented. Nearly half of the remains showed healed trauma to the crania that is consistent with face to face combat with blunt weapons. However, there were no indications that these wounds had been the cause of death. These remains exhibit morphological distinctions compared to samples from high status contexts and mass graves at Mayapán, and they may represent lower status individuals (Serafin and Peraza Lope 2007). Serafin (2010:64) notes that the presence of multiple burials in some cenotes may have presented a water quality issue.

Around the same time these remains were being recovered from San Jose, an Italian team of cave divers made a very brief visit to dive two cenotes at the site, Chacsinkin and Sac Uayum (Klingendrath 1998). They noted the presence of two burials in Chacsinkin and 20 human skulls and a large quantity of other human bones and artifacts within cenote Sac Uayum. Apparently, they took photos and left the remains untouched (Klingendrath 1998). We have been unable to

locate any of the photos. Despite this tantalizing observation, Sac Uayum had not been investigated by professional underwater archaeologists to date.

Maya cave ritual in the dry, karst Yucatán Peninsula is most often linked to water and rain rituals. Indeed, caves have been viewed as the source of water and rain by traditional cultures throughout Mesoamerica as far back as the Olmecs at Chalcatzingo (Grove 1984, 1987). Based on ethnohistoric sources such as the *Books of the Chilam Balam* (Edmondson 1982; Miram and Miram 1988; Roys 1935; Roys 1962), Clifford Brown (2005) argues that cenotes at Mayapán were linked to specific lineages and ancestor veneration analogous to activity documented in Zinacantan, Chiapas where individual patrilineages or groups of patrilocal patrilineages residing in close proximity form a *sna* and maintain mountaintop and cave shrines (Vogt 1969). Timothy Pugh (2005) also discussed the importance of geographic markers within Mayapán's subterranean landscape. The well-known Sacred Cenote at Chichen Itza has been extensively studied (Coggins 1992; Coggins and Shane 1984; Lothrop 1952, Sievert 1992; Willard 1926). Cenote rituals such as those practiced at Chichen Itza and recorded by Landa (Tozzer 1941) were rain ceremonies. Early attempts to identify indications of similar rites at Mayapán centered on explorations of Cenote Ch'en Mul in the Main Plaza, but results were ambiguous (Smith 1954). However, the lack of water at Ch'en Mul makes this feature a poor choice for a ritual of the type demonstrated at Chichen Itza, where Landa suggests that the submersion of offerings was important (Tozzer 1941:109, 181-182). Human remains were abundant in the cenote at Chichen Itza. Few similar deposits of have been documented for the site of Mayapán to date with the exception of Cenote San Jose, where ubiquitous human remains were found 60cm below the water surface (Uc González et al. 1997), and now Sac Uayum. The Cenote X-Coton burial chamber predates the city and contained what are clearly secondary burials. As a cenote with "unusually deep and clear" water, Sac Uayum may have been more suitable for the deposition of remains. Most cenotes at the city have only shallow pools of water at their base.

Brown (2005, 2006) argues that the southern location of Cenote Sac Uayum is ritually significant and that the alignment of other ritually important cenotes at the site may reflect cosmological principles. For example, the sun emerges from the underworld in the east, travels across the sky, peaking at zenith (associated with the north), descending into the underworld in the west and traveling through the dangerous underworld to a nadir conceptually represented as the south and linked with death. In this model, an eastern cenote such as Itzmal Ch'en or X-Coton (both ritually important) could serve as place of sun emergence. The west may be represented by Ch'en Mul in the main Plaza or a still undocumented cenote to the west of the wall. A northern cenote has yet to be identified but several possibilities exist within the wall and beyond. The southern accesses may be represented by Cenote San Jose or Cenote Sac Uayum, both of which are known to contain multiple burials. It seems significant that the both of the cenotes containing large numbers of burials, which may date to the main site occupation, lie to the south and beyond the formal wall.

### **Previous Work in Mesoamerican Cave Archaeology**

The Early Period (1840-1914) (Brady 1989, Brady and Prufer 2005b) of investigation of Mesoamerican caves began with the pioneering explorations of John Lloyd Stephens and Frederick Catherwood who visited and documented several caves including Bolonchen. Serious

archaeological work on caves sites in the Maya area continued around the turn of the century with the exploration of numerous caves in the region by the Corwith Expedition from the University of Pennsylvania (Mercer 1896, 1975), documentation of Loltun Cave (E.H. Thompson 1897), caverns at Copan (Gordon 1898) and Quen Santo (Seller 1901) followed. Much of this early work was interested in finding very early habitation of Mesoamerican cave sites and found little to support it. Work on Maya cave sites waned over the first half of the 20<sup>th</sup> century, the Middle Period (1914-1950) in Mesoamerican cave research. J. Eric Thompson took up the task in 1959, reviewing the existing archaeological, ethnographic and ethnohistoric data. This more synthetic study marked the beginning of the Post-War Period (1950-1980). The 1975 reissue of Mercer's volume contained an updated review of existing knowledge of Maya cave use. This review found far more ritual uses for caves than utilitarian ones (drinking water, refuge). Thompson, reflecting on the High Priest's Grave at Chichen Itza, was also among the first to note the Mesoamerican association between subterranean caves and surface level temples, so evident at Mayapán. That relationship became more widely appreciated with the discovery of a cavern beneath Teotihuacan's Temple of the Sun (Heyden 1973, 1975; Millon 1981). These caves are seen as associated with creation events like those described in Maya and Aztec origin myths and often as places of emergence for mythical ancestors and supernaturals (Brown 1999; Freidel, Schele and Parker 1993:123-172; Pugh 2005; Schele and Mathews 1998:36-40). This theme is also demonstrated by early references to the Teotihuacan cave as a possible "Chicomoztoc" (Heyden 1973), an allusion to the seven chambered cave said to have given birth to various Nahuatl groups that migrated to central Mexico from the north to found the Aztec empire (Smith 2012:34-37).

A body of literature on Maya cave rituals has been growing rapidly in recent decades (e.g. Bassie-Sweet 1991, 1996; Bonor Villarejo 1989; Brady 1997, 1999; Prufer and Brady 2005, 2005a; Stone 1995, 1997). The Foundation Period (1980-1997) marked a significant turn in our thinking about how caves were being used. This re-evaluation began with work at Naj Tunich (Brady 1989; Brady and Stone 1986; Stone 1995). During this period James E. Brady produced 45 publications that established new methods and interpretive approaches that have greatly influenced a generation of cave researchers. This new approach has been called "The Mesoamerican Cave Paradigm" (Brady 2007; Kieffer and Scott 2012; Nicolay 2007) and has four basic propositions. First, the primary use of caves in the area is for ritual. Second, caves must be understood from an indigenous (emic) perspective. Third, that caves played a very significant role in ancient Mesoamerican societies. Lastly, that cave archaeology as a discipline can address wider theoretical concerns. The first point is a final recognition that caves in this region did not hold evidence of long term occupational use analogous to that seen in Paleolithic sites across Europe. The second stresses the degree to which regional cave deposits are imbued with symbolic meaning, best understood by understanding indigenous beliefs, both ancient and modern. The third proposition emphasizes the degree to which subterranean features influenced activity (settlement patterning, etc.) of those living at the surface. The final point is a reaction to processual archaeologists who rather broadly rejected the study of ideology and religion in favor of more quantifiable issues such as economy. It is predicated on studies that have used data derived from cave studies to address a wide range of non-ideological questions.

The Recent Period (1997-Present) has seen a wealth of new studies employing this new paradigm. Of particular note, Keith Prufer and James Brady released two edited volumes in 2005, *In the Maw of the Earth Monster* and *Stone Houses and Earth Lords* which set a new and more useful direction for Mesoamerican cave archaeology by advancing our knowledge of cave

ritual and the patterning of material remains found in Mesoamerican caves. The first volume is comparative and looks at cave use in Central Mexico, Oaxaca and the Maya area. The second looks at new approaches to understanding sacred landscapes, reconstructing ritual and the interpretation of human remains from these contexts. Excavation and documentation the cave art of Naj Tunich fostered broader comparative studies of the geographic variation in Maya cave art themes, styles and meaning (Brady and Stone 1986; Stone 1995, 1997). Andrea Stone has championed cognitive archaeological approaches to the interpretation of the contexts, particularly directionality and relative heights of deposits (Stone 2005; Stone and Bahn 1993). Doris Heyden has moved from early investigations of the cave below the Temple of the Sun at Teotihuacan (Heyden 1975) to fully explore how Central Mexican caves have served in rites of passage from ancient through to modern times (Heyden 2005). This and other recent work has drawn heavily from ethnographic studies, some as old as Sapper's (1925) work with the Q'eqchi' Maya, Parson's (1936) work in Oaxaca and Redfield and Villa Rojas' (1934) classic study in Chan Kom, just outside of Chichen Itza. Insights from these and other more recent sources (Barrera Vásquez 1970; Blaffer 1972; Gossen 1974; Vogt 1969, 1976, 1981) have led many researchers to conclude that Maya earth ritual was and is far more complex than previously recognized. This has, in turn, led to new wave of ethnoarchaeological studies focused on the types of ritual still carried out today, the offerings involved, their specific placement, methods of deposition and meaning (L. Brown 2004; Ishihara-Brito and Guerra 2012; Scott 2009).

Taken together the work of the past three decades, beginning with studies at Naj Tunich has resulted in a very new and different approach to studying cave use in Mesoamerica. This work provides a powerful new basis for interpreting ancient deposits and their cultural meaning. Beliefs in a complex array of supernaturals have been revealed, some originally from the bowels of the earth, others revered ancestors who reside in caves. Entities are associated with almost every cave and hill and ritual landscapes are now understood to be vast and intricate. Symbols and features linked to earth rituals are now recognized as a pan-Mesoamerican phenomenon. While caves functioned as utilitarian water sources in Mesoamerica, they very rarely served as habitation sites: their importance as ritual facilities is clear, but the use of individual caves was not uniform (Pugh 2005; Stone 1995:35-37; Prufer and Brady 2005:11). For this reason, the nearly unique characteristics and contents of Sac Uayum at the site of Mayapán merited investigation. This investigation contributes to a more advanced understanding of the variation in cave use, resources, and symbolic importance for Mayapán and beyond.

### **This Investigation**

This season's work by the Mayapán Taboo Cenote Project was very productive. We were able to collect numerous new accounts about the beliefs surrounding the sacred cenote and witness a modern Yucatec Maya *Jeets' Lu'um* ceremony. That was followed by an investigation of the form and contents of the cenote itself. A detailed photo and video record was recorded along with a significant amount of preliminary mapping data. We also collected several samples of human bone from the cenote for carbon dating of the burials and several ceramic sherds for stylistic dating of the associated artifacts. The chapters that follow detail the initial stage of ethnoarchaeological investigation of Cenote Sac Uayum's form and contents as well as modern Maya beliefs about it. Chapter 2 details our observations of the ceremony to request ritual permission to explore and document the feature. Chapter 3 outlines our research methods for the

recording and documentation of the cenote. Chapters 4 and 5 respectively discuss our findings in the first and second cenote chambers. These findings provide a basis for further more detailed work at the site which will be discussed in the final chapter.

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## Chapter 2 – Jeets’ Lu’um Permission Ceremony By Bradley W. Russell and Marilyn A. Masson

In response to requests from the local community, the Mayapán Taboo Cenote Project organized a *Jeets’ Lu’um* or “calming of the earth” ceremony to petition various supernatural forces for permission to enter the sacred cenote, Sac Uayum. Residents of Telchaquillo have strong feelings about the cenote. Many have related tales of personally seeing a horse-headed, feathered serpent guarding the feature. Others have told us that the water itself is alive and can be easily angered, particularly by throwing stones in or attempts to collect drinking water



**Figure 2.1 – H’men Teodormio San Sores placing candles below the altar. Photo by Bradley Russell.**

without making appropriate offerings to appease it. We have been told that if someone were to try and draw water without permission, it would begin to bubble and fill with sediment, making it undrinkable. When greatly angered, they indicate, it will explode out in a geyser and wash its victims down to their deaths. There are concerns that transgressions of the cenote could cause draught, illness or other disasters to befall our team or the community as a whole. To avoid these fates, we were told we would need to conduct a permission ritual and provide offerings to the gods of the sky, earth and winds and to the serpent guardian of the cenote.

We contacted a local shaman or *h’men* who could assist with the ritual, Teodormio San Sores (hereafter referred to with the honorific title *Don*) (Figure 2.1). After a couple of meetings, we set the date. We then contacted a number of individuals in Telchaquillo that helped us gather the food and other items we needed for the ceremony including a table for an altar, candles, pots to prepare the food offerings and other items. On the appointed date,

July 15<sup>th</sup>, we hauled those items to the cenote, just south of the ancient city wall. Heavy rain began to pour almost exactly as we arrived on site. We wondered aloud if this was a negative

omen about the event to come. Fortunately, we were assured that it had nothing to do with us or the scheduled event. With rain falling, we erected shelters of tarps strung from the surrounding trees, built a fire and began to prepare for the prayers and offerings.

Don Teodormio San Sores was assisted by his son who is apprenticing to learn the needed skills and sacred knowledge to become a full-fledged h'men in his own right. With his son's help, Don San Sores set about establishing an altar for the day's event using a plastic table that we had brought to the site. He placed it beside the cenote, oriented so that the corners pointed to the four cardinal directions. He then placed five gourd bowls at the corners of the table and its center. This reflects Maya cosmology's emphasis on the directions and the center,



**Figure 2.2 – Don Teodormio San Sores prepares the altar. Photo by Bradley Russell.**

the point that serves as the *axis mundi* or world axis. In Maya cosmology there are three distinct levels, each with its own gods, and forces, an upper world in the sky, the world we inhabit and an underworld accessed by cenotes and caves. It is the central axis mundi that connects the heavens to the earthly plain and the underworld. Also placed on the altar from the start was a rough wooden cross (Figure 2.2), a mixed symbol reflecting both a Catholic crucifix and the traditional Maya “world tree”, a tree said to exist at the center of all four directions whose branches connect to the heavens, trunk to our world and roots to the underworld. The tree/cross serves as a kind of conduit through which one can contact spirits and gods at all three levels of the Maya cosmos. Lit candles were placed on the ground at the four corners of the altar. Candles are analogous to corn and burning them feeds the gods.

Don Teodormio then mixed a bowl of *saka'*, a sugar sweetened mix of water and corn masa which he used to fill five gourd bowls as the first of three food offerings. A series of low, inaudible prayers were then offered. A sixth bowl was placed directly at the side of the cenote also with prayers uttered. Short prayers like these went on intermittently though out the ceremony. Unfortunately, they were spoken in such low tones that recording or even transcribing was impossible. They were accompanied by numerous hand gestures including what appeared to be him “crossing himself” in the Catholic manner.



**Figure 2.3 – Participants prepare the chickens as an offering. Photo by Bradley Russell.**

Maya rituals frequently involve some form of blood sacrifice, in this case *suhuy ch'ich' ob* or “virgin birds” in the form of 8 chickens that were killed on site before being cooked as a food offering. The number of birds to be sacrificed was determined simply by the expected number of participants, it does not have specific ritual significance. The birds were dispatched by twisting their necks by hand, hanging them by the neck at the end of a line or clubbing them over the head with their necks placed to snap on impact. They were then plucked, boiled and spiced with salt, onion, garlic, achiote, yerba buena and other spices before being placed by the altar as another offering (Figure 2.3). More prayers were then spoken.

The third food offering, *k'ol*, is a mix of rendered pork fat, large quantities of corn masa and the seasoned chicken broth. Preparation of the *k'ol* is time consuming and labor intensive,

requiring the work of several individuals to keep the huge caldron of heavy, boiling masa stirred and in constant motion as it thickens. When completed, this too was placed by the altar with additional prayers said. Smaller portions of *k'ol* were dished out onto plates and laid out on the altar and chicken was added to the gourd bowls already containing *saka'*.

At this point, the shaman offered a longer series of prayers as he scattered small portions of the food in all four cardinal directions (Figure 2.4). Once this was completed he took chicken and *saka'* over to the single bowl he had placed on the rim of the cenote, adding them together. He scattered the food from this bowl to the 4 directions as well before he tossed the majority of it



**Figure 2.4 – Don San Sores says prayers over the finished food offerings. Photo by Bradley Russell.**

into the cenote while continuing to pray (Figure 2.5).

While the exact prayers were not audible, traditionally they are addressed to a wide range of Maya gods, the winds and to Jesus, the Virgin Mary and various Catholic saints. During research conducted in the late 1990's by Eunice Uc González (Uc González, et al 1997), a Jeets' Lu'um was also performed

and a full transcript of the prayers recorded (Quintinal Avilés 1997). This account gives us some indication as to what was likely contained in the words spoken by Teodormio San Sores. In the recorded text, the h'men petitioned a great many entities both Maya and Catholic. He beseeched numerous different cenotes and their guardians by name. He spoke to "the winds that run on the Earth, the winds below, the winds above", the hot and cold winds, "winds that run on the ground", "winds that run through the red lands", "the winds that run in the



**Figure 2.5 – Don San Sores make offerings at the edge of the cenote's mouth. Photo by Bradley Russell.**

caves", "the winds that run by all mounds", and "the winds that run in the mountains." He prayed to different Maya crosses including, the "Chapab Cross, "the santa Cross of Ermita", "the santa Cross of Hocabá", "the Saint Sitilpech Cross", and "the santa Cruz Verde." He asked the blessing of "the great ones of the Earth", "the great mountain", "the great and beautiful forest", "all the guardians of forests", "the owners of the woods", "virgin black earth", "the red ground" "the virgin hill", "the great jaguars", even the "guardian of the rabbits." He made the offerings on the altar to "God the son, God the Father, God the Holy Spirit", "Holy Virgin Mary, beautiful lady", "The Virgin of the Rosary", "Lord Jesus Christ and the beautiful Virgin", "all great Saints and minor Saints", "San Rafael the Archangel", "San Gregorio", "San Buenaventura", "San Isidro", "St. Mary Magdalene", "the beautiful woman of God of Chuy Naj", "the beautiful woman of God of Teya", "Santa Rita", "Santa Maria", "Santa Clara", "the 12 Apostles", "San Pedro", "San Pablo", "San Andres", "San Agustín", "San Diego", "San Román de Campeche", "Santa Cruz", "the three kings, Gaspar, Melchor and Baltazar", "the

Christ of Chumayel”, “the Christ of Teabo”, among others. Perhaps most succinctly he petitioned “all the gods of the world at large.”



**Figure 2.6 – Candles burning beside cenote as the team works. Photo by Bradley Russell.**

When Don San Sores had completed this final set of actions, we were instructed that we all needed to wait for half an hour while the gods consumed their fill of the ritual feast after which time we divided the food up for the participants and feasted ourselves. Food that was uneaten by us was sent home with local participants for their families to enjoy. The h'men then informed us that the offerings were well received and that we were now safe to enter and work in the sacred cenote. He added one final instruction before we departed, that we take the candles that were burning below the altar and light them by the rim of the cenote whenever we were working to feed the gods and help maintain their favor. Every day that we worked at the site from then on, the first action we took was to light the candles as instructed (Figure 2.6).

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### Chapter 3 – Research Methods By Bradley W. Russell

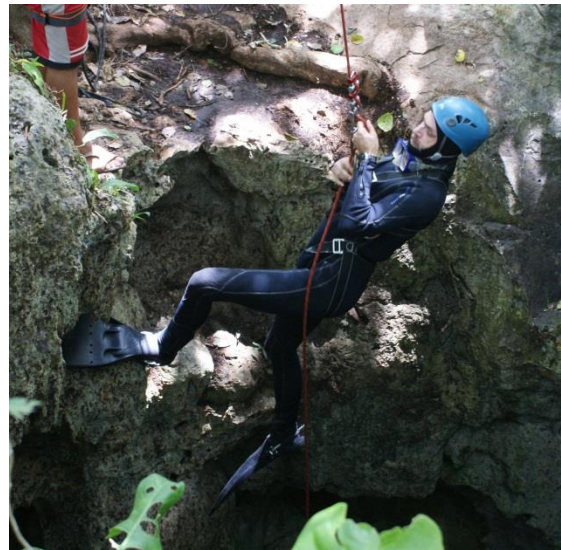
The goal of our dive work was to do an initial exploration of the cenote to assess whether it contained anything of archaeological interest. We wanted to map the feature and the locations of any finds, either human remains or artifacts. We also wanted to collect a detailed video and photographic record of the cenote itself and any materials discovered there. Given the difficult access and the need to work in dark, underwater space, the work required a range of specialized equipment and techniques. With this information in hand we are now able to formulate new research questions and plan further stages of investigation of the sacred cenote.



**Figure 3.1 – Preparing the rappelling ropes. Photo by Bradley Russell.**

The first challenge that had to be overcome was getting into and out of the vertical entrance safely. The cenote is filled wall to wall with water and the opening providing access is 11-12m above the water. This meant that we needed to rappel directly into the water rather than being able to suit up down in the cenote. So, Rait Kütt devised a system of climbing ropes, straps, pulleys,

carabiners and harnesses that allowed us to rappel down already in our wetsuits and helmets, as well as, climb out at the end of each dive (Figures 3.1 and 3.2). The same system was used to transfer our heavy tanks, cameras and other gear into and out of the water below. A large tree fell part way into the cenote during a recent hurricane. But, it was stopped from completely falling in by anchored roots and another tree blocking it. Since that time, it has grown more roots connecting it firmly to several sides of the cenote mouth suspended directly over the water. This unusual circumstance was very helpful to us as the tree was used as the backbone of our system of ropes.



**Figure 3.2 – Bradley Russell entering the cenote. Photo by Timothy Hare.**

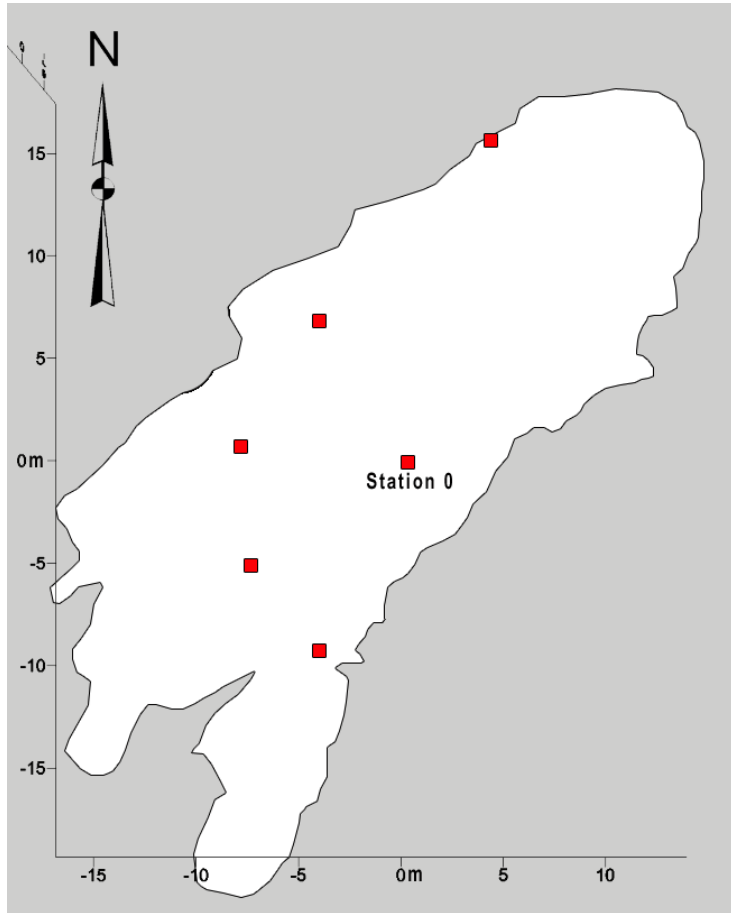
Once floating in the shallow water below the mouth of the cenote, we put on our dive gear. All divers used a twin tank setup with Apeks long hose and secondary short hose regulators to provide maximum air and bottom time during the work. Buoyancy control was provided by a wing with air bladder. The tanks were refilled each night in advance of the next day's work. All lights, cameras, etc. were charged nightly as well. Chamber One of the cenote was an open water diving environment, meaning that we could access the surface at any time simply by swimming vertically. This environment requires less redundancy in certain equipment such as lights, allowing divers to work with a primary light and just one back up. Chamber Two was a fully submerged and deeper cave environment with exit only available after returning to Chamber One through a narrow connecting passage. This required additional equipment and precautions such as double redundancy for back up lighting and the use of dive lines with directional markers pointing back to the exit. All divers adopted a standardized Hogarthian equipment set-up which emphasizes a clean equipment configuration designed to reduce issues like snags and possible failure points while providing the necessary redundancy. When diving in the second chamber all dives were planned based on the "rule of thirds", with one third of the air supply allowed for entering the cave, the next third used to exit and one third remaining in the tanks as a possible



**Figure 3.3 – Rait Kütt preparing his underwater camera setup. Photo by Bradley Russell.**

shared backup for any member of the team that experiences an equipment failure. All dives were planned and all dive data recorded using Suunto D6 or D6i dive computers. These provided compass, depth gauge and other features key for the work.

The team employed a mix of photographic equipment to document the research. Underwater Rait Kütt and Lisseth Pedroza Fuentes used two different cameras for the work, a Canon 5D MK II camera with Canon Canon 17-40mm lens with an Ikelite waterproof housing and a GoPro 2 video camera with a Golem housing (Figure 3.3). They used a mix of Green Force Squid LED 4000 and 1850 lights depending on the expected conditions and goals for the



**Figure 3.4 – Map of Chamber One showing location of all datum stations.**

day. They used the same Canon camera with a Canon 16-35mm lens for dry conditions. Bradley Russell used a Canon Eos M camera with a 25mm pancake lens inside of a Nauticam housing for dive work. He employed Sea&Sea YS-D1 lights. He used the same Canon Eos M with a Canon 16-35mm lens for dry shots/video. Using this equipment, we documented the exploration of the cenote’s two chambers and registered all finds made.

In order to map the cenote and remains, we again relied on our Suunto dive computer compasses and depth gauges. A datum was established at the deepest point of the cenote that still offered a reasonably unobstructed line of sight to most of the first chamber (Figure 3.4). Lisseth remained at this zero point recording azimuths for our mapping lines while Rait used a tape measure to record distance and depth for many points within sight of the datum (Figure 3.5). Due to the shape of the chamber, not all areas were in direct line of sight from the initial datum point. So,

several others stations were established relative to the first providing the ability to take measures in all areas of Chamber One and portions of Chamber Two. Combined these measures gave us X,Y,Z coordinates throughout the portions of the cenote we were able to map in this first season. The same method was used to record the locations of human remains and artifacts. These coordinates were entered into Surfer 11 and used to produce a chamber map depicting the floor of the cenote and the locations of various finds.

The initial exploratory dive by Lead Diver Rait Kütt revealed a number of human remains. With each day below the water the amount of discovered evidence of human use grew. We numbered the finds using marked Styrofoam balls mounted on metal bicycle spokes either shoved into the sediment or wrapped around adjacent stones or branches (Figure 3.6). The great number of finds made marking each individual bone impractical at this point. So, while isolated finds were marked individually, many concentrations of remains were marked as well. Once marked and added to the map, the finds were photographed with a scale and north arrow for basic registration purposes (see Appendix A for photos).



**Figure 3.5 – Lisseth Pedroza Fuentes and Rait Kütt recording map measurements. Photos by Bradley Russell**

The last step in our work was to collect samples of the evidence for further analysis on the surface. In total, we collected four human bones for AMS dating, osteological analysis and possible future DNA analysis (see Appendix B for photos of all samples). Three samples were collected from Chamber One. These included one femur from the southwest slope, another femur from a crevasse in the northeast end of the chamber, a mandible from the top of the southwest slope. We chose these from widely spaced locations to increase the likelihood that they would come from different individuals. One extremely well preserved tibia was also collected from the debris slope in Chamber two. All samples were handled with rubber medical gloves to avoid contamination with modern DNA. In addition, six ceramic sherds were collected for stylistic analysis (see Appendix C for photos). Five of these were from various locations in Chamber One and a single example was collected from Chamber Two. The location of all samples was marked prior to removal so that we will know their locations during future work.

All samples collected were placed in plastic boxes along with water from the chamber where they were collected and hauled to the surface on our climbing ropes. All samples were then conserved in our laboratory in Telchaquillo. Our conservation procedure consisted of distilled water baths (with weekly changes of the distilled water) over the following two months to remove any minerals or salts that could crystallize and damage the finds when dried. Once we were certain the minerals were removed, we



**Figure 3.6 – Markers used for evidence encountered. Photo by Bradley Russell.**

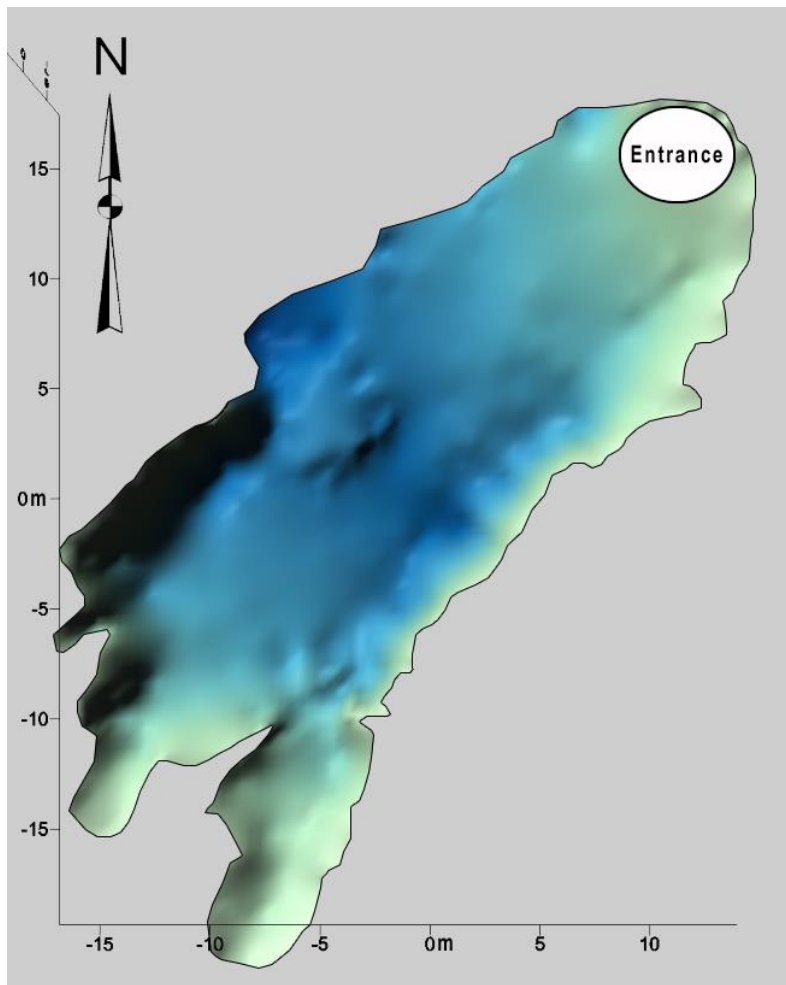
dried them and stored them for future lab work and dating. Small sections of each of the long bones and a single tooth from the mandible have been sent to Douglas Kennett of Pennsylvania State University for AMS dating. We are currently awaiting those results.



## Chapter 4 – Cenote Sac Uayum’s Chamber One

By Bradley W. Russell, Rait Kütt and Lisseth Pedroza Fuentes

Chamber One of Cenote Sac Uayum is fairly typical of cenotes in the area. It is a solution feature measuring roughly 45m by 15m and is oriented from northeast to southwest (Figure 4.1). The entrance is a collapse feature located at the northeast end of the chamber and is roughly round measuring approximately 8m across. There is a second round entrance near the center of the chamber that is only about 1m across. The distance from the ceiling to the water is



**Figure 4.1 – Map of Cenote Sac Uayum Chamber One.**

11-12m and the maximum depth is 16m below the water surface. It is just a few meters deep at each end, sloping down to the maximum depth in the center. The end slopes consist of rubble collapsed from the ceiling at some time in the past covered in dark, organic rich sediments. The ceiling is made of a layer of more durable limestone cap rock. It is covered in stalactites ranging from massive to very small (Figures 4.2 and 4.3). Stalactites near the mouth of the cenote show evidence of breakage and removal, a common feature in the cenotes of Mayapán. Those further inside of the cavern remain largely intact due to their inaccessibility. The sidewalls are almost totally vertical from ceiling to the floor and stained dark from the decomposing organics in the water. There are a number of fallen trees and branches below the main opening. The northeast end is rounded and the southwest end contains several small rooms/crevasses.

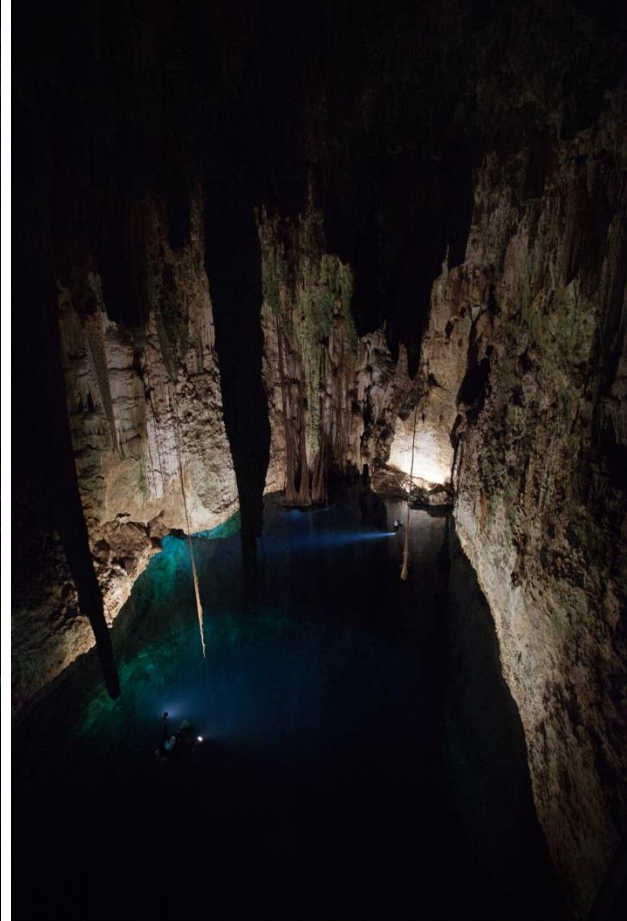
We found that there is a slow water flow from northeast to southwest that likely accounts for the highest concentration of remains being found in the southwest away from the main opening. All indications are that there are a good number of remains located below the sediment, some partially visible and others completely buried. We assumed incorrectly that this would be the only chamber present in Sac Uayum.

The first of our team to enter the cenote was Lead Diver Rait Kütt, who conducted a solo exploratory dive on July 22. The dive was short, just 15 minutes, and he recorded it with his

GoPro2 camera. In that time, he encountered five crania and long bones. He noted that most of the human remains were clustered in the southwest end of the cavern, at the end farthest from the opening and suggested that they may have floated in from a completely different but connected cenote in that direction. Further exploration and examination of mapped cenotes in the area ruled that out and made it clear that all remains located in Sac Uayum were originally deposited



**Figure 4.2 – Bradley Russell rappels into entrance at northeast end of Chamber one. Photo by Rait Kütt.**



**Figure 4.3 – Bradley Russell and Lisseth Pedroza Fuentes illuminate the Southwest end of Chamber one. Photo by Rait Kütt.**

in this cenote. He also observed that the cenote contained the remains of numerous cattle that had apparently wandered over its entrance and fallen in to their deaths. Kütt reported a number of modern buckets and other trash scattered around the cenote, suggesting some modern use. This was not unexpected as a modern corral wall had been built adjacent to the feature suggesting a likely source for the cattle found inside. He noted thick black silts covering most of the cenote floor (and probably many remains), the presence of numerous fallen trees below the entrance, as well as, decomposing leaves, bat guano, fungus and other organics. Overall, the initial reporting from this first dive was somewhat negative and left the team wondering how productive the work would be, an impression soon dispelled by additional dives.

On July 23, Rait Kütt and Lisseth Pedroza Fuentes entered the cenote with the goal of determining if there was another connected feature to the southeast that could be a source for the



**Figure 4.4 – Rait Kütt (left) and Lisseth Pedroza Fuentes (right) compare mapping data. Photo by Bradley Russell.**

bones we were finding. Kütt climbed up and out of the water at the far end of the cenote searching for another possible entrance in a crevasse found in the southeast end of the chamber. He made his way up the crevasse to the ceiling of the chamber but, found no additional opening or any additional remains to suggest that material was entering there. The two divers continued to explore the chamber locating a number of additional bones and the first ceramics that we

encountered in the study, one of the sherds was judged to be Preclassic in date. They observed a number of small but well preserved bones (phalanges and a patella) among the larger and more obvious remains. Some sediment was cleared to more fully expose some of the remains that had been recorded in the initial exploratory dive. The sediment turned out to be very heavy and large-grained, a positive development as disturbed sediment settled out quickly and did not cloud the water. Silted up water is a significant problem in cenotes given that the very limited flow results in slow clearing of fouled water. At the end of the dive, we attempted to haul out one of the many tree trunks present below the mouth to make entry and exit safer. It proved to be a very difficult task as the waterlogged trunk was extremely heavy. Plans to remove more of them were abandoned. The total dive lasted roughly 90 minutes.

The third dive lasted about 75 minutes and was the first involving all three members of the dive team. The goal was largely to orient Principle Investigator Bradley Russell to the site and the remains encountered so far, many of which he had seen in the video recorded during the first two dives. Two additional skulls and other



**Figure 4.5 – Mandible and skull (background) wedged in southeast crevasse. Photo by Rait Kütt.**

bones were located in the process including a mandible and skull wedged at a depth of ~10m in a crevasse in the southwest end of the cenote (figure 4.5) above a concentration of four already recorded skulls and various long bones near the base of the southwest slope (Figure 4.6).



**Figure 4.6 – Concentration of three skulls from base of southwest slope. A fourth is located behind rough the stone in the top right of the photograph. Photo by Rait Kütt.**

The next several dives were dedicated to establishing datum points and preliminary mapping of the chamber's floor (Figure 4.6). This was followed by mapping of the remains so they could be plotted on the preliminary map. Pedroza Fuentes and Kütt focused on tape and compass mapping while Russell worked to photograph and video record the ongoing work. Russell also continued exploring the chamber in detail, locating two additional crania and many other human remains in the process. The two new skulls were located near the bottom of the northeast slope. One, an apparent female was sitting upright in top of the sediments (Figure 4.7). The other appeared male and was distinguished by a surface coating of red mineral deposit that was also present on the surrounding rocks (Figure 4.8). These finds brought the number of skulls located in the first chamber up to 9. A tenth was found on the eleventh dive crushed between stones on the same slope not far from this point, making a total of ten recorded in the chamber. Mapping work on the seventh dive was interrupted when Kütt entered a passage in the southeast wall near the first datum established and discovered that it lead to the large second chamber. The remaining dives were split between additional mapping of the first chamber, marking and numbering evidence and exploring the newly discovered Chamber Two. With mapping of the chamber floor and remains complete, the final 2 dives were reserved for registration photos of the marked remains (see appendix A) and collection of bone and ceramics samples (see appendices B and C).



**Figure 4.7 – Two angles showing apparently female skull from base of northeast slope.  
Photos by Rait Kütt.**



**Figure 4.8 – Photograph of the “red skull” from the bottom of Chamber One’s northeast slope. Note red mineral deposits on skull and adjacent stones. Photos by Rait Kütt.**

## Chapter 5 – Cenote Sac Uayum’s Chamber Two

By Bradley W. Russell, Lisseth Pedroza Fuentes and Rait Kütt

On August 6<sup>th</sup>, the seventh day of our exploration of Cenote Sac Uayum, Lead Diver Rait Kütt entered a narrow opening in the southeast wall of the cenote that had previously been unexplored (Figure 5.1). It had been noted earlier but, from its entrance appeared to be a dead end and was consequently not made a priority to that point. Principle investigator Bradley Russell and underwater archaeologist Lisseth Pedroza Fuentes waited at the entrance for approximately ten minutes after which time they became concerned that Kütt had not returned. Pedroza Fuentes followed him in to ascertain his location. She emerged a few minutes later and gestured to send Russell in to take a look. Kütt had discovered a second chamber at the end of a narrow passage about 10m long, its size and depth significantly greater than the first chamber. All three divers were very surprised by the discovery. Multi-chambered submerged cave systems are extremely unexpected in this part of the Yucatan Peninsula.



**Figure 5.1 – Lisseth Pedroza Fuentes just inside of Chamber Two, framed by the entrance passage. Photo by Bradley Russell.**

Not much time was spent exploring the chamber that day as cave diving safety protocol calls for the use of lines and directional markers which were not yet in place. However, Kütt reported seeing one very well preserved skull and several long bones below the entrance passage.



**Figure 5.2 – View of two rooms along the northeast end of Chamber Two. Photo by Rait Kütt.**

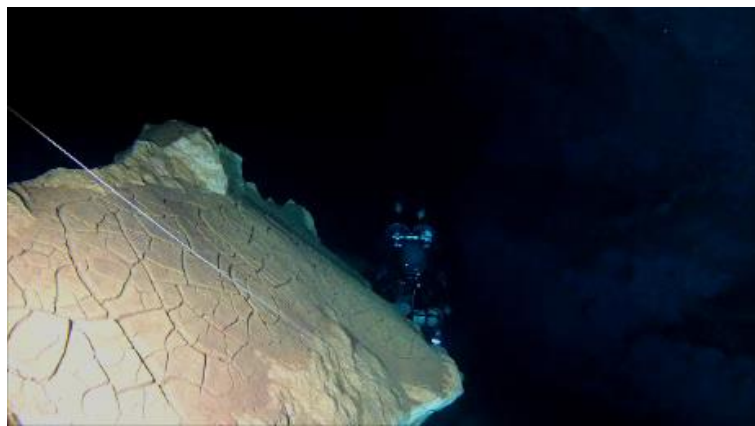
Further exploration revealed the complex chamber to be roughly twice the size of the first. The depth is considerably greater reaching 30m in some areas. In addition to being larger and deeper than the first chamber, Chamber Two was far more complex, with numerous rooms on multiple levels connected to a large central space (Figure 5.2). The passage between the two chambers emerges high on the wall of this



**Figure 5.3 – Lisseth Pedroza Fuentes entering Chamber Two. Note the small, albino crawfish at top left. Photo by Rait Kütt.**

central space (Figure 5.3). It has no direct opening to the surface which means that very little organic material has entered it, leaving it a much different environment than Chamber One. The walls for the most part are clean white limestone. The floor is covered in some areas by a layer of orange clay which is compact and cracked like a dry lake bed (Figure 5.4). Pedroza Fuentes and Kütt have seen this in other cenotes in the area and suggest that it indicates that at some as of yet undetermined point in the past the chamber dried out. This would

have to have been a very significant drought event as the water table currently reaches the ceiling, some nine stories above the floor level clay deposits. Stalactites do not form in fully submerged caves as they are created when mineral rich water enters and evaporates. Where Chamber One is home to many stalactites, the second chamber lacks such formations, with one exception. A single formation (Figure 5.5) exists near a point in the cave where the opening exceeds the current height of the water table, creating a small pocket of air below meters of intact limestone. If the chamber did dry out entirely, creating the cracked layer of clay, no significant stalactites formed during the drying event. This may suggest it was a very brief event or simply that there was a total lack of water entering through the porous limestone overhead. So, the form of the cave and the clay at its base suggest that this chamber has been almost continuously filled with water except for a period where it apparently dried out completely. Further study would be required to determine when and for how long this dry episode lasted.



**Figure 5.4 – Rait Kütt swims past a boulder covered in cracked clay suggesting an extreme dry period in the past. Photo by Lisseth Pedroza Fuentes.**

The remains that were located in Chamber Two were unexpected as the likelihood of anything floating onto the second chamber from the first is minimal. They were all located on close proximity to each other on a slope of cobbles. The area where they are located is unusual as it does have a layer of the heavy, black organic silt seen in the first chamber. This room extends under the first chamber. Combined these clues suggest that, while not currently visible because it is filled with silt and cobbles, there must be a collapse feature in the floor of the first chamber that has fallen in bringing cobbles, organic silt and the remains with it. Many of the remains in this chamber sit on top of the cobbles and silt suggesting

that with their lighter density that settled out last when the material entered (Figure 5.6). In total there were five skulls visible along with numerous other human bones. That makes a total of fifteen skulls located in this preliminary work. One of those, likely a female, had unfused cranial sutures (Figure 5.7) suggesting that it belonged to a child at most seven years old (Stanley Serafin, personal communication). More detailed analysis will be required to confirm those preliminary findings. One cranium was buried to its very top in the silt, with just the crown protruding. This indicates the possibility that more remains are buried in this silt as we believe is the case in Chamber One.



**Figure 5.5 – Single limestone formation located during exploration of Chamber Two. Photo by Lisseth Pedroza Fuentes.**

Unfortunately, time and money precluded the possibility of fully mapping this chamber. We simply had not expected such a development and had not budgeted for a second chamber, especially one of this size and complexity. Given its depth, the time that could be spent working in this chamber was far more limited than was the case for the first chamber where some dives lasted up to two hours. Limited mapping of the area where the remains were found confirmed that this chamber extends underneath the first (Figure 5.8). The bones in this chamber appeared to be extremely well preserved, lacking as much of the dark organic staining that we found in the

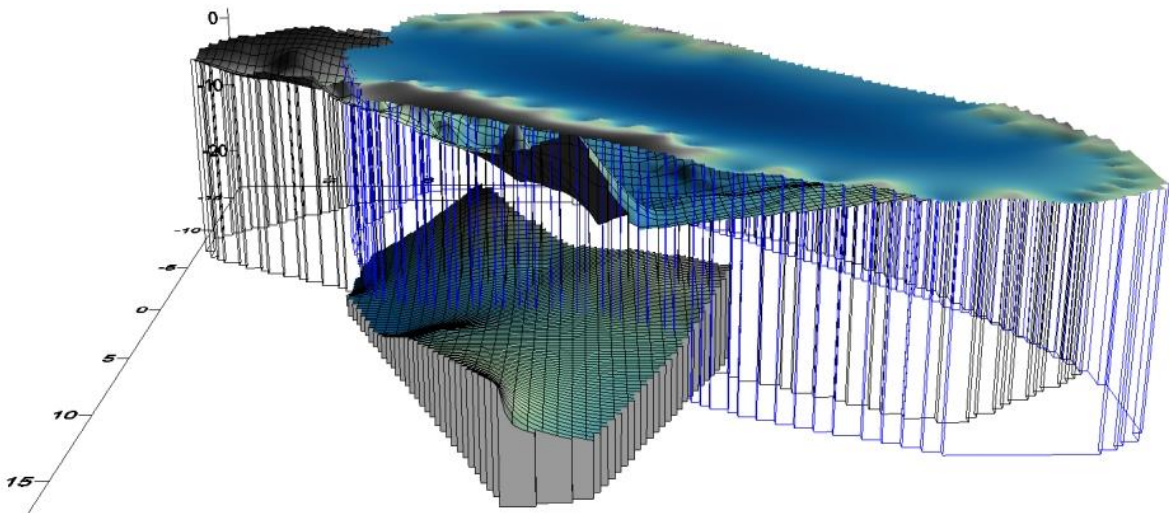
first. All were marked and registration photos were taken. In addition, a single tibia and Mama Red ceramic olla handle was collected. The tibia is extremely well preserved and generally lacks organic staining. It looks almost modern. However, we are quite confident that it is contemporaneous with the other burials observed. It is clear to us that much more work needs to be done to fully understand this fully submerged space.



**Figure 5.6 – The first skull encountered by the team in Chamber Two. Photo by Rait Kütt.**



**Figure 5.7 – Apparently female skull with unfused cranial sutures. Photo by Rait Kütt.**



**Figure 5.8 – Map showing vertical relationship between floor of Chamber One and portion of Chamber Two containing remains.**

## Chapter 6 – Conclusions

By Bradley W. Russell, Eunice Uc Gonzalez and Carlos Peraza Lope

The Mayapán Taboo Cenote Project's initial exploration phase research at Cenote Sac Uayum was very successful and lays the groundwork for a more intensive investigation going forward. We were able to document the modern Maya beliefs about this “living” and sacred landscape feature and rituals associated with its access. This adds to the growing ethnographic literature concerning cave ritual. Exploration of the cenote revealed that it contained a second, previously unknown submerged chamber of significant size, depth and complexity. Our international team of researchers documented at least fifteen ancient skeletons below the waters of the feature attesting to its use as a burial location. Preliminary maps produced of the cenote reveal its form and the location of the remains discovered. Samples of ceramics from both the Preclassic and Postclassic suggest its use over a very long period of time. Samples of the human remains retrieved will provide concrete AMS dating to establish when bodies were deposited. Importantly, the work raises numerous research questions that will need to be addressed if we are to fully understand the deposits it contains.

### Modern Beliefs and the Jeets' Lu'um Ritual

Over the course of several months prior to and during the dive work Principle Investigator Bradley Russell discussed the cenote with many modern residents of the nearby, Yucatec Maya village of Telchaquillo, Yucatán. He was told by more than a dozen informants that the cenote is believed to be guarded by a feathered serpent with the head of a horse ranging in size from 2-6 meters in length. Many reported seeing the creature with their own eyes at some time in the past, typically “a long time ago” or “many years ago”. He was also told by some informants that a serpent with those unusual characteristics, either the guardian itself or its offspring, was killed on the highway by a passing truck recently (in the past 2 or 3 year). Informants indicated that the cenote is “alive”, dangerous and easily angered. It is said that the cenote contains “agua bravo”, living waters that when angered will explode out in a geyser washing victims into the cenote. These beliefs are far more common among the older residents of the village. Many younger members of the community dismiss these beliefs as myths or “old people's stories”.

In order to avoid transgressing the sacred space, assure local support for the work and document modern Maya cenote/cave ritual, Russell organized a *Jeets' Lu'um* or calming of the earth ceremony to petition various supernatural forces and the serpent guardian of the cenote itself for permission to enter the water and document its contents. A traditional Maya shaman or *h'men* from the village of Tekit was hired to perform the ritual. Several food offerings (including 8 chickens sacrificed on site) and burning candles were placed on and around the altar decorated by the shaman with among other things a small wooden cross, a combined symbol of the Maya world tree and Christian crucifix. Particular emphasis was placed on marking the four cardinal directions and the center of the altar, a reflection of Maya cosmology which emphasizes the directions and the center which connects the upper world, our world and the underworld. A long series of prayers were offered at various points throughout the hours long ceremony. Once complete, the various participants feasted on the food and took the remainder home to their families.

## The Form of Cenote Sac Uayum

Cenote Sac Uayum is located in the forest just south of Mayapán's city wall close to the modern highway that bisects the ancient city. It contains two distinct chambers separated by a narrow 10m passage just large enough for a diver to pass through without removing tanks and other equipment. The two chambers are very different environments. Chamber One is open to the surface through a collapse window in the overlying cap rock that has allowed a large quantity of organic material including leaves, tree branches, and even numerous cattle to fall into the water. These decomposing organics have created heavy, black sediments throughout the chamber and darkly stained its walls and stones. It is only partially filled with a large open cavern above water level. The ceiling of the chamber is covered in dozens of stalactites of varying sizes. Chamber Two is deeper, sealed at the surface and completely filled with water. Lacking the organics of the first chamber, its limestone walls are generally a bright white. Sediments at the base of the chamber are fine grained, orange clay. The clay deposits are cracked and resemble a dried lakebed, suggesting a very significant drying even at some time on the past, one capable of lowering the area's water table at least 30 meters from present levels.

Chamber One measures approximately 45m by 15m and is oriented northeast to southwest, essentially parallel to the nearby defensive wall. Water fills the feature from wall to wall. The main entrance is a large collapse feature at the northeast end of the first chamber. A second small opening is located in the cap rock near the center of the chamber. To enter divers rappelled 11m from the opening directly into the water below. The chamber has debris slopes at both ends reducing the water depth in those areas to just a couple of meters. These piles of cobbles and silt slope downward to a maximum depth of 16m near the center of the chamber, which generally lacks collapse cobbles. The southwest slope densely is littered with human bones and ceramics. Several crania are clustered together near its base. A large fallen stone sits in this low, central area near the northwest wall. Sitting on top of the rock are a single human skull in two parts, many broken off stalactites and portions of a cow pelvis and spine, which led to it being dubbed "the cow rock". Several more crania were located near the base of the northeast slope. But the density of other bones observed in that area was much less than the southwest. The northwest and southeast walls of the chamber are tall, vertical and unusually flat. The northeast end of the cenote is rounded while the opposing end contains three small crevasses/rooms, each with bones present. Overall, Chamber One is shaped like a large bathtub or swimming pool. The passage leading to the second chamber is located in the southeast wall just above the lowest point in the center of the chamber.

Chamber Two is significantly larger, deeper and more complicated than the first, roughly twice as long and deep. The entrance passage emerges high on the north wall of the center room of the chamber. Around this central room are arranged several smaller rooms or grottos on three vertical levels. The deepest of these levels reaches the floor at ~30m in depth. There is a second vertical level roughly in the middle of the floor and ceiling and a third near the ceiling. Importantly, one room extends underneath the floor of Chamber One. This is the chamber that contains remains. It contains a slope of large cobbles and black, organic silt of the type found in the first chamber. No other black silt was seen in the rest of the second chamber. This slope also contains a scatter of very well preserved human bones including five crania. It appears that slope formed when a portion of the floor of the first chamber collapsed through bringing with it the silt as well as human bones and ceramic sherds. The collapse hole itself seems to be filled in by

cobbles from above. One room near the ceiling contains a small pocket of air at its apex, the only portion of the chamber exceeding the water table. This is where the chamber's only stalactite was located. Much more exploration and mapping work will be required to fully understand the form of this chamber as it was discovered late in our work and not adequately documented by the end of this season's work.

### **Human Remains**

Based on the crania observed so far, ten in Chamber One and five more in Chamber Two, we can say that there are at minimum fifteen burials present (see Appendix B for registration photos). The apparent collapse of materials from one chamber into the other suggests that we should treat these as a single related assemblage. We believe that there are many more bones buried below the silt and expect the actual number to be higher. The overall condition of the remains that were observed was very good. Almost all skulls appear to be entirely or mostly intact with just one badly damaged by cobbles. Teeth are present in many of the crania, including one with two adjacent teeth very badly damaged by dental caries and infection.

Preliminary observations made with the help of osteologist Stanley Serafin (working from project photographs) suggest that a mix of ages and sexes are present. The youngest appears to be 6-7 years old based on the unfused sutures on the skull. Most appear to be adults. However, the top of the age range cannot be estimated at this point. Tabular erect cranial deformation is seen on many of the skulls observed, including the young child. This type of modification was fairly common in the Postclassic Period and the dominant form seen at Mayapán, suggesting they are likely contemporaneous with the site occupation. However, two thirds of the ceramics we were able to collect have Preclassic dates as discussed below. AMS dates will be obtained from the samples that were collected for lab analysis.

Researchers collected just four bone samples at this stage of the study, two femurs from opposite ends of Chamber One, a mandible from the top of the southwest slope in Chamber One and a tibia from the collapse slope in Chamber Two. The mandible appears to be that of a young adult based on eruption of the second molar combined with the lack of evident wear. Serafin indicates that its form suggests it belonged to a female. But we stress that is just a preliminary conclusion until more work can be done. The femurs and tibia appear to be adolescent/adult sizes. But little else can be said at this point.

### **Ceramic Artifacts**

Researchers were able to locate just six sherds of pottery in the cenote, five in the first chamber and one more in the second (see Appendix C for photos). These were identified with the help of ceramicist Wilberth Cruz and Carlos Peraza Lope. Of the six samples, only two were Postclassic in date, both Mama rojo olla fragments. The remaining four were different Preclassic types, Sabán Burdo, Unto negro estriado, Tzutzquil crema a bayo and one from the Chunhinta negro group. All but the last of these also came from ollas. They may reflect intentional offerings. But, they may also be common water jars dropped accidentally. The last of these, the Chunhinta example, was the only fragment that did not come from a possible water jar. It belonged to a serving plate, far more appropriate to holding food offerings associated with a

burial or other ritual. As with the bones, we fully expect that there are more ceramics buried below the silt. As ceramics are not as likely to float as bodies, it seems that they should be found near the mouth of the cenote rather than far in. Future exploration in this area may yield more samples

### **Comparisons to Cenote San Jose**

As noted in the introduction, this is the second cenote where large numbers of human remains have been found at the site of Mayapán. The first, Cenote San Jose, was investigated in the late 1990's by a team led by Eunice Uc González (Uc González et al. 1997). Like Sac Uyaum, this cenote is also located just beyond the city wall south of the ancient city. 19 of the 24 burials recovered from San Jose have been analysed by Stanley Serafin who suggests they are primarily Postclassic in date (Serafin 2010, Serafin, Uc González, Peraza Lope in press). Preliminary observations made during this work suggest that the assemblage of bones from Cenote Sac Uayum is very similar to those found in San Jose. The San Jose collection was dominated by adult remains, although some remains are adolescent. A mix of sexes was present in the collection. Many of the skulls from the San Jose collection also showed a significant proportion with intentional cranial modification. Serafin found little evidence of the kind of trauma associated with victims of war or sacrifice, although many showed healed wounds consistent with hand to hand combat. Additional study will be needed to say definitively how similar or distinct these two deposits are.

### **New Questions and Future Research**

The goal of this first season of work was to determine if there were any vestiges of ancient human activity contained in Cenote Sac Uayum, especially remains that might shed light on why this cenote was excluded from Mayapán by its city wall and why it continues to be taboo to this day. The answer was a resounding “yes”. The cenote does contain those clues to past and present behaviour. However, much more study will be needed if we are going to fully understand what those clues are telling us.

These remains raise many important questions:

- Why were these individuals deposited in the cenote?
- When were they deposited?
- Are they all from the same period?
- Were they simply burials or do they reflect human sacrifice associated with the cenote?
- If they are burials of individuals that died on the surface and if they are Postclassic in date, why were they interred here when the vast majority of Mayapán's population was buried above ground, in house benches and floors or in the ground?
- Is it significant that the fact that the two known large deposits on human bone in cenotes at the site are both found south of the city beyond the formal site boundary, the defensive wall?
- What relationship if any is there between ceramic artifacts and the human remains?

In order to answer these and other questions, additional research will be required. In particular, the bones need to be collected and preserved for detailed laboratory study. This would allow detailed comparisons to be made between this deposit and others found at Postclassic Mayapán, including those from Cenote San Jose. More mapping data is required before firm conclusions can be made about the depositional history and taphonomy of these remains.

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Serafin, Stanley

2010 Bioarchaeological Investigation of Violence at Mayapan. Ph.D. dissertation, Department of Anthropology, Tulane University.

Serafin, Stanley, Uc González, E., & Peraza Lope, C.

In press Prácticas Funerarias y Rituales en el Cenote San José de Mayapán. In *The Archaeology of Yucatán: New Directions and Data*, edited by Travis W. Stanton. British Archaeological Reports, International Series.



**Appendix A – Registration Photos**



**Figure A1 – Evidence 1: Two views of skull and unidentified bone from southwest slope of Chamber One. Photo by Rait Kütt.**



**Figure A2 – Evidence 2: Concentration of three human skulls and various human and cow bones from base of southwest slope of Chamber One. Photo by Rait Kütt.**



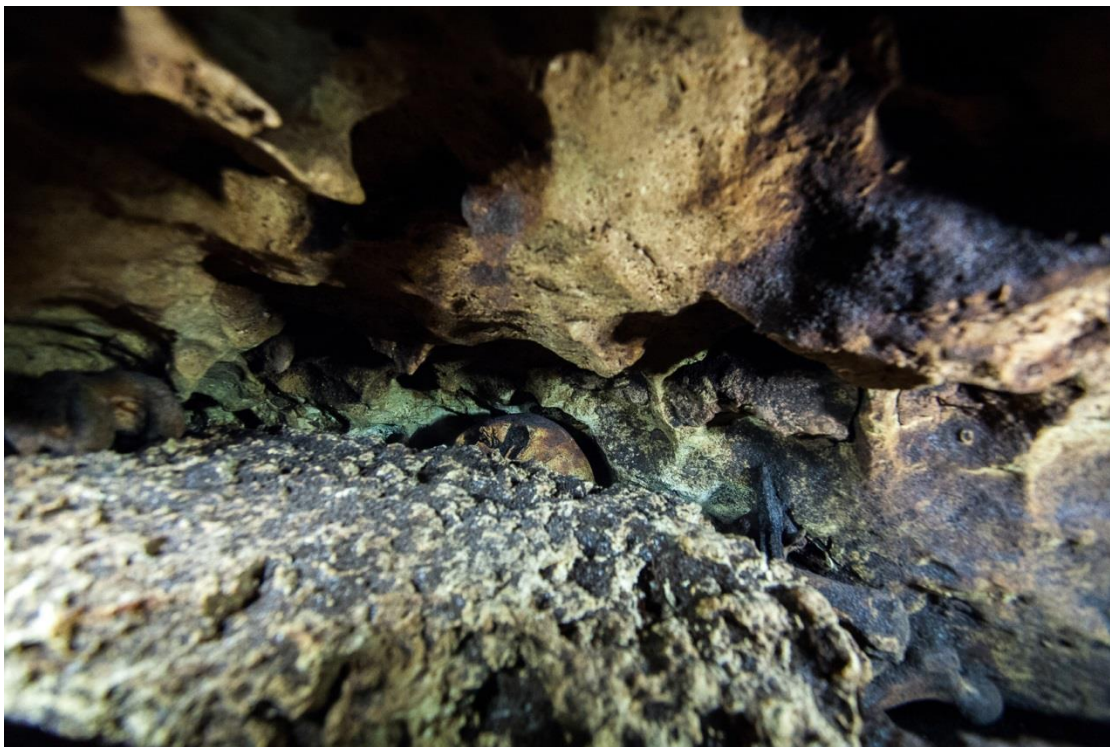
**Figure A3 – Evidence 2: Individual skull from concentration of bones at base of southwest slope of Chamber One. Photo by Rait Kütt.**



**Figure A4 – Evidence 2: Individual skull from concentration of bones at base of southwest slope of Chamber One. Photo by Rait Kütt.**



**Figure A5 – Evidence 2: Individual skull from concentration of bones at base of southwest slope of Chamber One. Photo by Rait Kütt.**



**Figure A6 – Evidence 3: Individual skull wedged behind rock from concentration of bones at base of southwest slope of Chamber One. Photo by Rait Kütt.**



**Figure A7 – Evidence 4: Patella and long bones from concentration of bones at base of southwest slope of Chamber One. Photo by Rait Kütt.**



**Figure A8 – Evidence 4: Long bone from concentration of bones at base of southwest slope of Chamber One. Photo by Rait Kütt.**



**Figure A9 – Evidence 4: Patella from concentration of bones at base of southwest slope of Chamber One. Photo by Rait Kütt.**



**Figure A10 – Evidence 5: Long bone sticking out of sediment from concentration of bones at base of southwest slope of Chamber One. Photo by Rait Kütt.**



**Figure A11 – Evidence 5: Long bone and vertebrae sticking out of sediment from concentration of bones at base of southwest slope of Chamber One. Photo by Rait Kütt.**



**Figure A12 – Evidence 6: Mandible and skull (background) located in southwest crevasse of Chamber One. Photo by Rait Kütt.**



**Figure A13 – Evidence 7: Bovine metatarsal and pelvis sticking out of sediment from southwest slope of Chamber One. Photo by Rait Kütt.**



**Figure A14 – Evidence 8: Mandible from top of southwest slope of Chamber One. Note: this was one of four bones collected for AMS dating. Photos by Rait Kütt.**



**Figure A15 – Evidence 9: Longbone (possibly radius) from the southwest slope of Chamber One.  
Photos by Rait Kütt.**



**Figure A16 – Evidence 10: Femur and humerus from the southwest slope of Chamber One.  
Photo by Rait Kütt.**



**Figure A17 – Evidence 10: Femur from the southwest slope of Chamber One. Photo by Rait Kütt.**



**Figure A18 – Evidence 10: Humerus from the southwest slope of Chamber One. Photo by Rait Kütt.**



**Figure A19 – Evidence 11: Human rib from the southwest slope of Chamber One. Photo by Rait Kütt.**



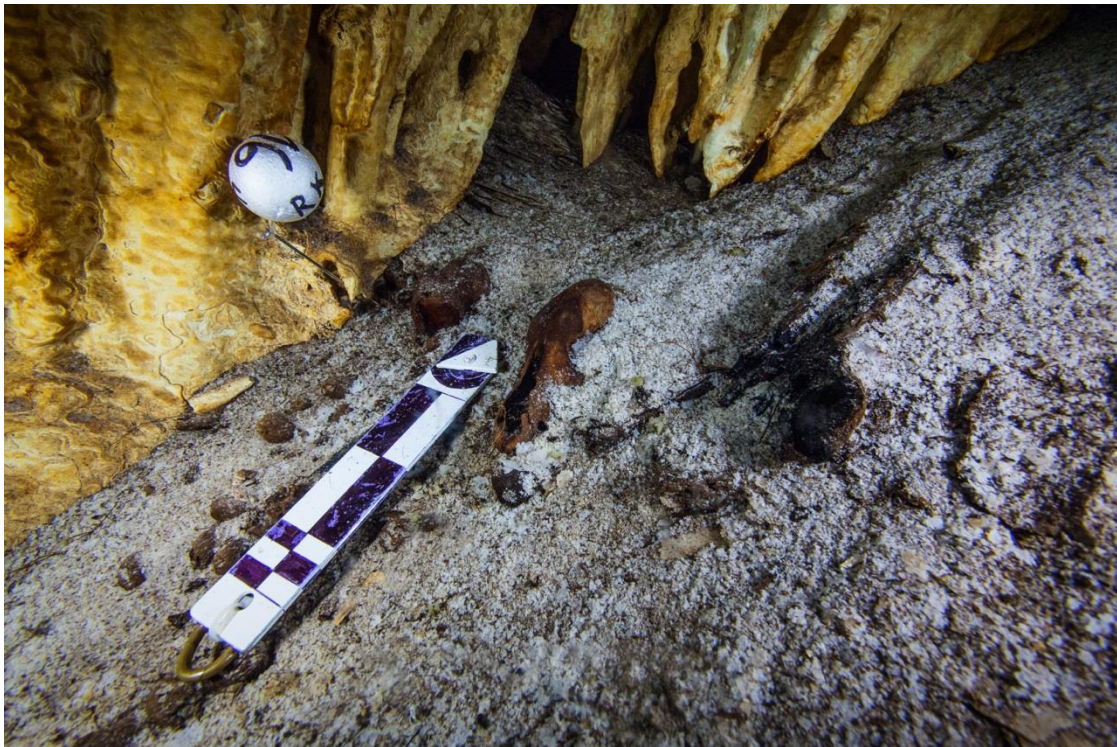
**Figure A20 – Evidence 12 and 13: Ceramic sherd, human rib and tooth from the southwest slope of Chamber One. Photo by Rait Kütt.**



**Figure A21 – Evidence 14: Phalange (top) and metatarsal or metacarpal (bottom) from the southwest slope of Chamber One. Photos by Rait Kütt.**



**Figure A22 – Evidence 15: Femur from the southwest slope of Chamber One. Photo by Rait Kütt.**



**Figure A23 – Evidence 16: Canine cranium from the southwest slope of Chamber One. Photos by Rait Kütt (top) and Bradley Russell (bottom).**



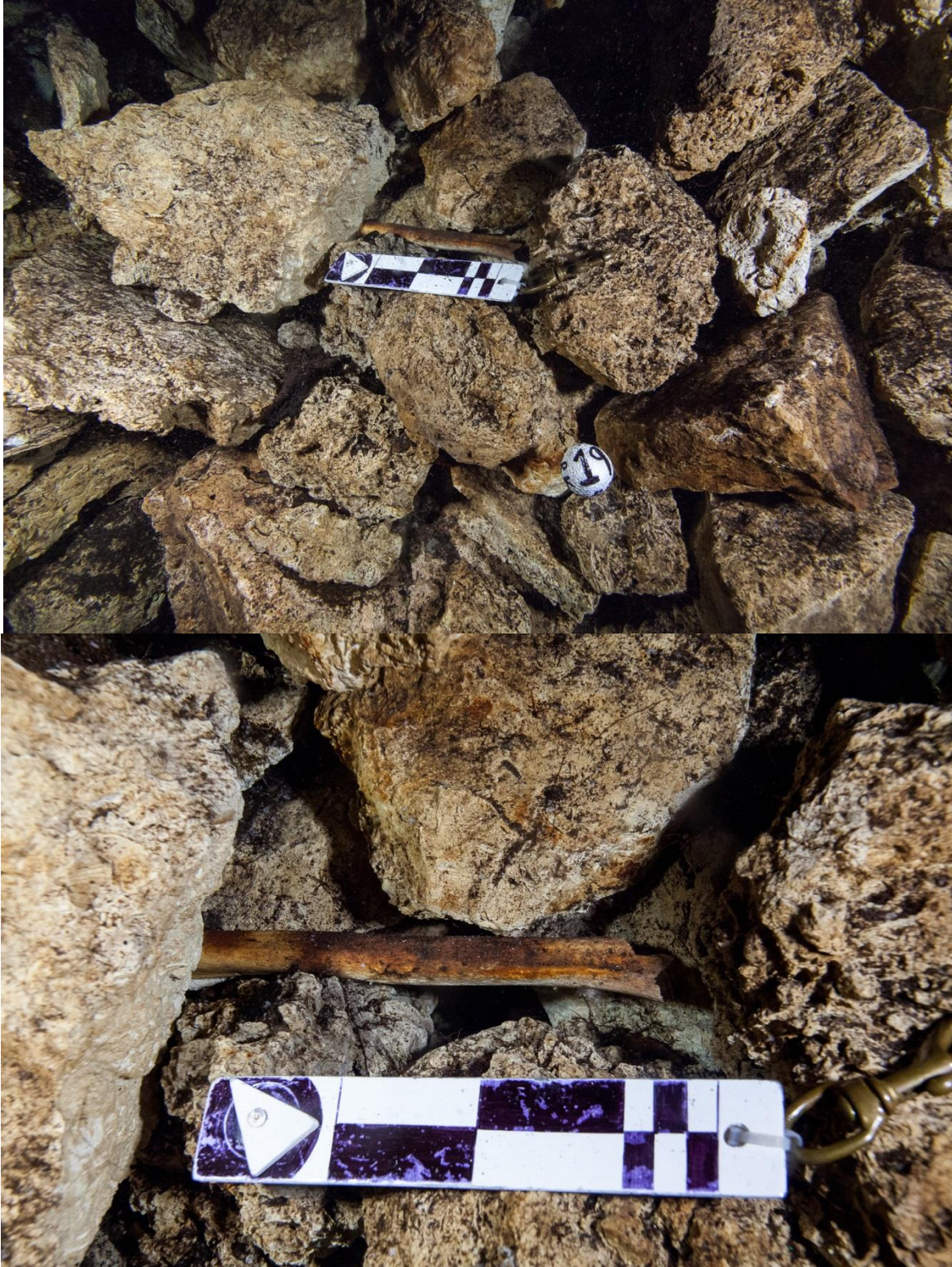
**Figure A24 – Evidence 17: concentration of bones including mandible, humerus and clavicle from small room at top of the southwest slope of Chamber One. Photos by Rait Kütt.**



**Figure A25 – Evidence 18: Damaged skull with detached occipital bone from top of “cow rock” in Chamber One. Photos by Bradley Russell (top) and Rait Kütt (bottom).**



**Figure A26 – Evidence 18: Damaged skull with detached occipital bone (top) from top of “cow rock” in Chamber One. Photos by Bradley Russell.**



**Figure A27 – Evidence 19: Femur from bottom of Northeast debris slope in Chamber One, near entrance to chamber 2. Photos by Rait Kütt.**



**Figure A28 – Evidence 20: Two views of “red skull” from base of northeast slope of Chamber One. Photos by Bradley Russell (top) and Rait Kütt (bottom).**



**Figure A29 – Evidence 21: Two views of apparently female skull from near base of northeast slope of Chamber One. Photos by Rait Kütt.**



**Figure A30 – Evidence 22: Femur from crevasse at northeast end of Chamber One. Photo by Rait Kütt.**



**Figure A31 – Evidence 23: Badly damaged skull from rocks at base of northeast slope of Chamber One. Photo by Rait Kütt.**



**Figure A32 – Evidence X: Peccary mandible from southwest debris slope of Chamber One. Photos by Bradley Russell (top) and Rait Kütt (bottom).**



**Figure A33 – Evidence 25: Two views of well-preserved skull at base of debris slope in Chamber Two. Not clear cranial deformation. Photos by Rait Kütt.**



**Figure A34 – Evidence X: Sternum from debris slope of Chamber Two. Photos by Rait Kütt.**



**Figure A35 – Evidence 27: Skull from middle of debris slope in Chamber Two. Note large dental caries in canine and premolar. Photo by Rait Kütt.**



**Figure A36 – Evidence 28: Concentration of bones (including sternum) and ceramics from base of debris slope in Chamber Two. Photos by Rait Kütt.**



**Figure A37 – Evidence 29: Skull from middle of debris slope in Chamber Two. Photo by Rait Kütt.**



**Figure A38 – Evidence 29a: Largely buried by apparently well-preserved skull from near top of debris slope in Chamber Two. Photo by Rait Kütt.**



**Figure A39 – Evidence 30: Two views of skull, femur and pelvis from near top of debris slope in Chamber Two. Photos by Rait Kütt.**



**Figure A40 – Evidence 31: Two views of apparently young, female skull from middle of debris slope in Chamber Two. Photos by Rait Kütt.**



Appendix B – Bone Samples Collected



Figure B1 – Bone Sample 1, femur (anterior view) from Chamber One. Photo by Bradley Russell.



**Figure B2 – Bone Sample 1, femur (posterior view) from Chamber One. Photo by Bradley Russell.**



Figure B3 – Bone Sample 2, femur (anterior view) from Chamber One. Photo by Bradley Russell.



**Figure B4 – Bone Sample 2, femur (posterior view) from Chamber One. Photo by Bradley Russell.**



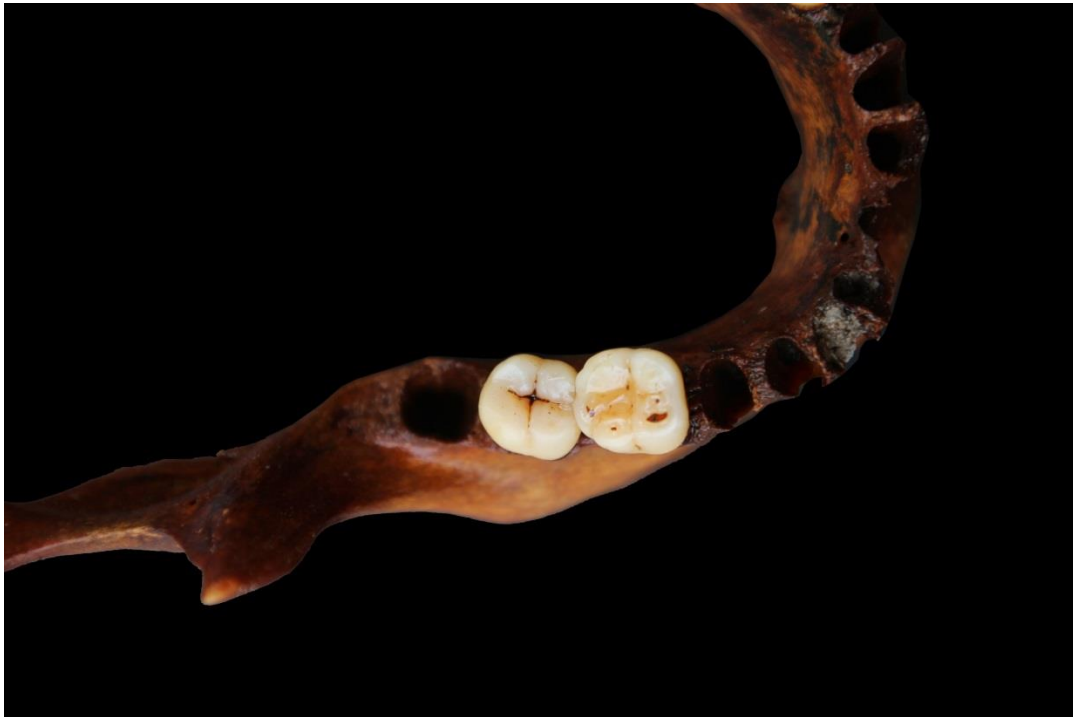
Figure B5 – Bone Sample 3, mandible (superior view) from Chamber One. Photo by Bradley Russell.



Figure B6 – Bone Sample 3, mandible (anterior view) from Chamber One. Photo by Bradley Russell.



**Figure B7 – Bone Sample 3, mandible (superior view, left) from Chamber One. Photo by Bradley Russell.**



**Figure B8 – Bone Sample 3, mandible (superior view, right) from Chamber One. Photo by Bradley Russell.**



**Figure B9 – Bone Sample 3, mandible (lateral view, left) from Chamber One. Photo by Bradley Russell.**



**Figure B10 – Bone Sample 3, mandible (lateral view, right) from Chamber One. Photo by Bradley Russell.**



**Figure B11 – Bone Sample 4, tibia (anterior view) from Chamber Two. Photo by Bradley Russell.**

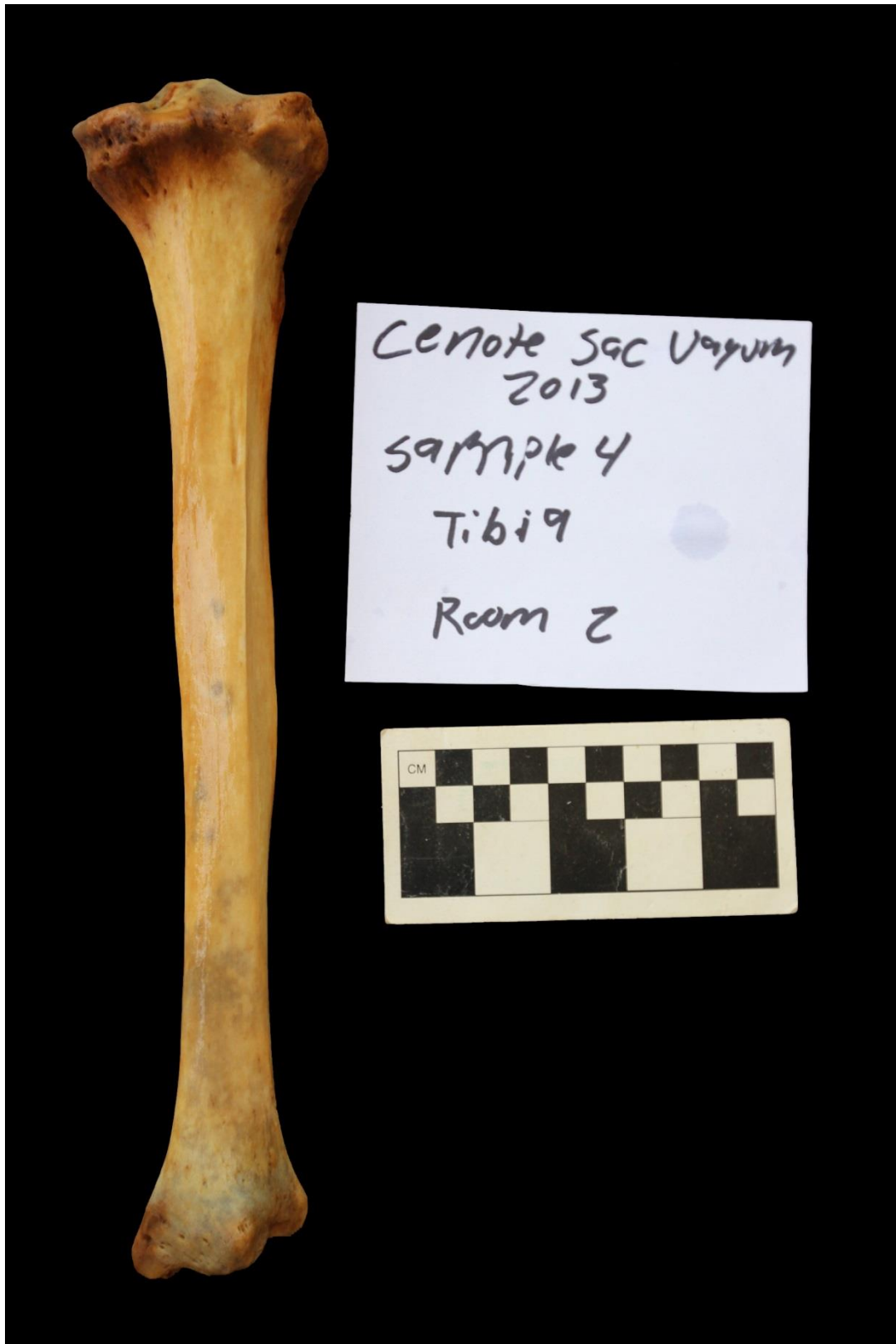


Figure B12 – Bone Sample 4, tibia (posterior view) from Chamber Two. Photo by Bradley Russell.



Appendix C – Ceramic Samples Collected



Figure C1 – Ceramic Sample 1, Preclassic Sabán burdo olla from Chamber One, exterior (left) and interior (right). Photo by Bradley Russell.



**Figure C2 – Ceramic Sample 2, Preclassic Unto negro estriado olla from Chamber One, exterior (left) and interior (right). Photo by Bradley Russell.**



**Figure C3 – Ceramic Sample 3, Preclassic Tzutzquil crema a bajo olla from Chamber One, exterior (left) and interior (right). Photo by Bradley Russell.**



**Figure C4 – Ceramic Sample 4, Postclassic Mama rojo olla from Chamber One, exterior (left) and interior (right). Photo by Bradley Russell.**



**Figure C5 – Ceramic Sample 5, Preclassic Chunhinta cajete from Chamber One, exterior (left) and interior (right). Photo by Bradley Russell.**



**Figure C6 – Ceramic Sample 6, Postclassic Mama rojo olla handle from Chamber Two, exterior (left) and interior (right). Photo by Bradley Russell.**