Abstract

Ancient Maya caves were used exclusively as ritual spaces and artifacts found in them are votive offerings or were deposited during ritual performances. Most Mesoamerican cave sites have been heavily looted destroying artifact assemblages and disturbing contexts. In spite of these challenges, caves still contain a great deal of information and new methods of recording provide new data for analyses, hence new interpretations. In this paper we take a "High Definition" approach in our analysis of small finds using a case study of the ancient Maya cave at Las Cuevas in Belize, CA. Spatial analyses using GIS reveal the contexts and structure of rituals occurring within the site allowing us to better understand the nature of ritual practice. Our results have broad implications in understanding how ancient Maya ritual practice articulates with larger socio/political processes.
Looting has been a long-standing problem and frustration for archaeologists (Coggins 1969, 1970; Sheets 1973) and to discover an un-looted site is a rarity. The Spanish Conquistadors might be thought of as the first looters in their search for gold and are credited with creating a legacy of looting that continues in to the present. Even the advent of antiquities laws, looting has escalated as populations rise and move into previously forested areas. As far back as 1969 Clemency Coggins reported that there was an "in-calculable increase in the number of monuments systematically stolen, mutilated and illicitly exported from Guatemala" (p.94), and in 1973 Payson Sheets declared that "the pillaging of archaeological sites throughout the world for salable items is increasing at an alarming rate" and called for action by the Society of American Archaeology (p.317). One cannot help but wonder why his call has never been answered or why archaeologists passively accept looting as a given evil. It may be that they have thrown up their hands in frustration because, though laws against looting are in place in many countries including Belize, they typically have no teeth or only affect exporters, middle men, or people on the buying not the selling side of the equation and the local people that do the actual looting are usually not the targets of legal action. Because there is little that archaeologists are prepared to do or can about the grim situation, we are faced not only with building arguments about the past from the dimly lit archaeological record, but also by working with a damaged and incomplete record as well.

Nowhere is this brought better into focus than at ancient Maya caves sites. Ancient Maya caves were used exclusively as ritual spaces (Brady 1989; Moyes and Brady 2012; Brady and Prufer 2005) and artifacts found in them are votive offerings or the results of ritual performances that were left at the site (Brady and Peterson 2008). Caves in Belize typically have few sub-surface
deposits these tend to be thin. Artifacts are typically placed on floors or on natural shelves like candy on a counter. Caves, like tombs, are large protected treasure troves that contain (or contained) artifacts and whole vessels as well as small finds. Luckily, looters are interested in items that can be sold on the black market and have little use for broken objects or those with little economic value. Moyes has worked in both looted and unlooted (such as the Main Chamber of Actun Tunichil Muknal or Chechem Ha Cave) sites so she has witnessed both pristine and looted contexts. After years of research, and taking artifact inventories, she observed the types of artifacts that interested looters. After all, looting is a business and transporting and selling artifacts time is consuming and laborious on some level. Like other thieves, looters want to make a quick and easy buck. A good example is the looting of Chechem Ha Cave, a tourist site was discovered by William Pleitez, the son of the landowner Antonio Morales. The entrance of the cave had been sealed by the ancient Maya, so when it was first found, it was in pristine condition. The cave contained a large number of whole or partial large Late Classic jars, polychrome plates, monochrome black and red dishes, as well as small finds and animal bones (Moyes 2006). The family recognized the economic potential for tourism and the cave was gated and locked. Luckily, the polychrome vessels were collected by the then Department of Archaeology and taken to Belmopan for storage. Moyes recorded the cave in 1998 and was planning to finish the artifact inventory in 1999. Between summer field seasons the cave was looted and 18 whole vessels were stolen. Luckily, these had been photographed and many were mapped. The thief was very selective, taking only the monochrome black and red bowls and dishes, which were quite portable and had resale value on the black market. This makes the point that looted Maya cave site assemblages are likely to retain broken objects that
have no market value or are of little use to looters. Such objects might include things like metate fragments, shell, animal bones, beads, and potsherds.

Ceramics are typically the most common artifact found in the cave assemblages. For instance, in the Main Chamber of ActunTunichilMuknal (Moyes 2001: 78) ceramics comprised 78% of the assemblage. Many ceramics found in caves have been broken and the pieces stacked or scattered within a restricted area. This has been well-documented for the Main Chamber at Actun Tunichil Muknal (Moyes 2001). The chamber has little sedimentation, therefore almost all of the cave's artifacts sit on the surface, though some are covered with a calcite crust. Moyes' study included refitting of the ceramic assemblage. She found that in many cases, sherds from the same vessel were stacked together and placed in niches or small alcoves (pp. 73-75). This agrees with James Brady's work at NajTunich cave in Guatemala, where he noted that some portion vessels were invariably missing (1989:86).

Additionally, because no broken vessel totally refit and the missing pieces were not found anywhere in the cave, she was able to demonstrate that parts of vessels were almost always removed from the site following ritual breakage. This detailed research also made it clear that single potsherds were brought into the cave as offerings. Single sherds of rare or distinctive ceramic types were easily identified in field recording, but did not refit with each other or any other vessel, indicating that these sherds were imported into the cave as offerings.

These data suggest that aside from being the most common artifact in most assemblages, ceramic sherds are an important class of artifact in and of themselves. At Chechem Ha Cave, there were
2074 ceramic entities consisting of sherds, whole, and partial vessels. Only 51, or about 2.5%, were whole vessels (Moyes 2006: 187). Although as archaeologists we like discovering whole vessels and indeed polychrome images on vessels are interesting for study, we rarely contemplate that, when evaluating assemblages, whole vessels account for little statistically. Therefore, the large and intact vessels collected by looters may have minimal influence on artifact counts, statistical, and even spatial analyses.

So, despite the challenges of investigating looted sites, caves still contain a great deal of data and information. However, archaeologists studying these sites are often left with small artifacts that require a "high definition" approach as discussed by J. Gowlett (1997). High definition views the archaeological record with a high resolution, focusing on details. The approach traces its roots at least to the nineteenth century and has given rise to methods such as broad horizontal excavations and tracing of ‘operational chains,’ a fundamental concept in Leroi-Gourhan's interpretation of social behavior (Leroi-Gourhan and Brezillon 1972). Gowlett warns that greater resolution means achieving results based on a far smaller scale or at far greater expense of time and money. In other words, this approach is expensive, time consuming, and labor intensive. We intend to illustrate here that if we are willing to make the investment, our efforts will pay off.

We contend that scatters of potsherds in caves are good indicators of activity areas and are valuable in chronology building. In this paper we examine potsherds as a unit of analyses in our study of cave at Las Cuevas. We employ a Geographic Information System (GIS) for a density analysis. By examining sherd densities in the entire cave system, we reveal the structure of
rituals occurring at the sites, allowing us to better understand the nature of ritual practice in the cave. Our results have broader implications in understanding how ritual practice articulates with larger socio/political processes.

**Las Cuevas**

Las Cuevas is a mid-sized center located in the Chiquibul Forest Reserve in western Belize, 14km southeast of the mammoth polity of Caracol (Figure 1), under investigation by the Las Cuevas Archaeological Reconnaissance (LCAR) and the Belize Regional Cave Project (BRCP) both directed by Holley Moyes. The site has 36 structures situated around two plazas (Plazas A and B), a ballcourt, and a sacbe leading into a hillside as well as an elite *plazuela* group set on a platform just to the north of Plaza A (Moyes et al 2012; in press; Figure 2). The surface architecture surrounds a 15m deep dry cenote (sinkhole) with a huge cave entrance at its base on the west side. A 335m cave system runs beneath Las Cuevas Plaza A and directly underlies Structures 1, 3, and 4 as well as the plazuela group. Based on 25 AMS dates, the structures, as well as the use of the cave, date to between AD 641-985 at the 2 sigma range. Ceramic cross-dating places all building phases at the site into the later part of the Late Classic period (Tepeu 2/ Spanish Lookout), which agrees well with the radiocarbon dates. Additionally, the ceramic types found at the site are typical of the Petén, Belize Valley and points south, suggesting influences from afar, though we are awaiting the results of compositional analyses to determine if they are actually manufactured and imported from elsewhere (Kosakowsky et al. 2012).

The cave has been looted for years. Locals have reported that they saw large jars in the cave at one time and our colleague Maureen Carpenter told us that as recently as 20 years ago
she also saw vessels in the Entrance Chamber. In the 1960s a character named "Little John" lived in the cave entrance and one of our local employees remembered seeing him with "beautiful things" from the cave to be sold on the black market. In his 1958 report, Adrian Digby, the first archaeologist to work at the site, mentioned large vessels still in the cave in 1957. Since then, all whole vessels have been removed.

The Cave at Las Cuevas

To enter the cave, one descended into the central cenote from Plaza B. People were channeled through two restricted entrances defined by linear structures (Arskey and Moyes in press). The area behind the structures was filled and leveled and a few remnant steps suggest that there was a formal path leading down the southwest slope to the cave entrance below. Natural bedrock outcrops were modified using uncut limestone boulders to form terracing. Our excavations demonstrated that there were buried terraces at the base of the path just in front of the cave. The massive entrance measuring 28m wide, opens into a cathedral-like chamber measuring 108m in length, 40m in width, and 17m in height. The Entrance Chamber was heavily modified with monumental architectural constructions including terraces, retaining walls, stairs and platforms that are topped with layers of thick plaster (Moyes 2012; Moyes et al. 2012; Figure 3). A cenote containing a river that surfaces then disappears underground, lies at the center of chamber. The cenote is lined with cut stone block retaining walls, and stairways descend to the spring at its base. We mapped 73 separate platforms both surface and subsurface, suggesting that the cave was used for large and well-organized ceremonies and that could be viewed by many observers and supported a large number of participants.
The entrance to the tunnel system lies at the back of the chamber on the northwestern wall, which forms a natural constriction. A constructed wall (Wall 1) spans the 6.2m wide constriction blocking it totally (Figure 4). A formal entrance or “doorway” measuring 0.75m in width and 1.1m in height allows only one person to enter at a time, and forces one to bow or duck when entering Chamber 1 from the Entrance Chamber. Loose limestone boulders strewn on the exterior of the wall suggest that the entrance was blocked off at some point in the past.

The tunnel system is comprised of rooms and passages that circle around on themselves ending up in a window that looks out onto the Entrance Chamber. As one moves through the system there are three blockages, two additional walls, and a natural morphological restriction (Figure 5). The first blockage is between Chambers 3 and 4. Blockage 1 is constructed with small to medium-sized limestone boulders and speleothems. It further restricts a small 3.3m wide opening with a 0.7m ceiling height forcing one to crawl through a squeeze into Chamber 4. Upright flat stones and a fallen stalactite form an entryway on the northwest side of the entrance. Another blockage, Blockage 2, occurs as one exits Chamber 4 and enters Chamber 5. Here, there is a 2.5m wide natural constriction with a ceiling height of 1m, plugged by piled up limestone boulders to further restrict the entrance.

A natural constriction occurs as one exits Chamber 5. A long narrow tunnel measuring 23m in length and 1-2.3m in width must be traversed in order to enter Chamber 6. The ceiling height is high enough to allow one to walk through the tunnel. The next construction, Wall 2 divides Chambers 6 and 7. Wall 2 was constructed in the 5m wide natural constriction and reaches from floor to ceiling, measuring 1.5m at its highest point. It is 0.5-0.6m thick, and on the north side there is a constructed doorway measuring 0.5m in width and 0.8m in height allowing
only one person to enter at a time. The wall is constructed of small to medium limestone boulders and speleothems. It is nicely laid and held in place by mud mortar. Finally, Chamber 7 contains two constructions. At the back of the chamber there is a natural 4.4m opening into Chamber 8 along the west wall. This was completely blocked off from floor to ceiling at one time by Wall 3. The wall is constructed of well-laid small to medium-sized limestone boulders and is 2.5m in thickness. Looters have collapsed the rock to allow entry to Chamber 8 and loose rocks lie on the floor on either side of the blockage. We suspect that this entrance was completely blocked to force ritual participants to enter Chamber 8 via a small constructed crawl space, Blockage 3, beneath a drop in the ceiling on the north side of Chamber 7. This constriction is 1.1m in width, with a very low ceiling height of 0.7m. The 2.5m crawl has both a constructed entryway and exit fashioned with upright flat stones and speleothems that constrict the entrance to 0.5m in width.

Chamber 8 terminates with a sheer drop off from the window looking onto the Entrance Chamber. The window measures 5.5m across and has a ceiling height of 3.15m, with a view to the cave mouth and cenote as well as the platforms and terraces on the north side of the cave. On the floor of the window there is a great deal of charcoal but only a handful of potsherds, suggesting that performative activities occurred there as opposed to the deposition of offerings. One can imagine a grand oration being presented from this high vantage point.

Moyes (2012) suggested elsewhere that the tunnel constructions created a narrative for the ancient users, representing levels of the underworld and marking the descent into the underworld
realm, culminating by emerging back into the light high above the cenote at the cave’s entrance. The numerous restricted entrances suggest that only the privileged could make this journey.

To address this hypothesis, we analyzed small finds within the tunnel system. These included both objects and charcoal scatters. Assuming that objects deposited at the site were votive offerings or were used in ritual, we would expect a drop in artifact density as fewer and fewer participants moved through the system. Charcoal represents a different behavior suggestive of ritual burning, though charcoal scatters could result from a person standing in one place with a torch spitting charcoal flecks or could be the remains of informal hearths. Either way, burning represents a different ritual practice than depositing artifacts.

**Density Analyses**

Although the site was heavily looted there were still a large number of small artifacts on surfaces within the tunnel system. These consisted of ceramic sherds, obsidian blades, jute, marine shell, beads, groundstone fragments, lithics, animal bone, and a few fragments of human bone. More than 99% of the assemblage was comprised of ceramic sherds. Many of these were embedded into the muddy matrix of the chamber floors, particularly in Chambers 2 and 3, creating a "sherd carpet" (Figure 6). In the 2011 field season, we placed a 1m x 1m excavation (Unit 2) in the sherd carpet of Chamber 3 to test whether it extended below the surface or was strictly a surface scatter (Moyes et al. 2011:18-20). Artifacts were present only in the top 5cm. of the unit and sterile soil was encountered below, confirming that the sherd carpet was a surface scatter.
The Las Cuevas density maps reflect two summer four-week field seasons (2013-2014) of spatial data collected throughout the cave system. To record the artifacts we laid a physical 2m x 2m grid in the cave. The corners of the grid squares were recorded with a total station and imported into the GIS so that each grid was georeferenced to ensure accuracy. Shayna Hernandez and her crew mapped the grid squares in quadrants, recording each artifact and assigned unique identification numbers to diagnostic sherds and special finds. These maps and associated archaeological elements, such as charcoal scatters were digitized using Esri ArcMap version 10.1, allowing for a high degree of positional accuracy (<1m) in terms of actual spatial locations within the cave chambers. The resulting point files contained 70 artifacts and 36,000 ceramic sherds spread throughout the chambers. Charcoal scatters were also mapped and an estimated percentage of charcoal within the sediment matrix was recorded using a particle size chart (after Fitzpatrick 1980). Therefore our density analysis reflects both size of scatters and amount of charcoal in the matrix.

Density analysis was conducted through ArcMap’s Kernel Density tool, which utilized a mathematical formula to determine average density based on a predetermined neighborhood area. In the case of the Las Cuevas data, the density magnitude was established to reflect the normal value over any given two square meter area within the cave, matching the conventional grid system. Density analyses were run on two separate shapefiles—one containing charcoal data and the other a combination of all artifacts observed within the cave system. Both density models were displayed employing a manual classification scheme that highlighted both moderate and high concentrations throughout each chamber.
Artifact density peaks in Chambers 1 and 2. It begins to drop off in the west part of Chamber 3 before decreasing dramatically in the more distant chambers and dropping off almost completely in Chambers 7 and 8 (Figure 7). Alternatively, charcoal density increases as one travels farther into the system, with higher concentrations in Chambers 4, 6, 7, and 8. Artifact density was much higher comparative to charcoal. However, both density models depict clearly defined activity areas.

Based on these results, an inverse relationship is evident between the density distributions of the artifacts and charcoal throughout the various chambers. When we think about this in terms of ritual behavior, we find that different behaviors occur closer to the tunnel entrance than in deeper cave chambers. The decrease in artifact density as one moves through the system supports our idea that restrictive blockages correlate with fewer participants reaching the end of the tunnel where artifacts precipitously decrease in Chamber 8. The increase in charcoal density in the most remote areas suggests to us that as participants progressed through the tunnel, they increasingly performed burning rites. There is a large dense charcoal scatter in the window of Chamber 8 that looks out onto the Entrance Chamber platforms. Fires to light the window may have been set here to light up a performance such as a dance or oration for the benefit of those sitting or standing on the platforms.

**Conclusion**

The broader implications of this research are that ritual performance at Las Cuevas was tightly controlled and organized— from the descent into the cenote to the journey through the tunnel system. The magnitude of the architectural modifications and the number of people that the
Entrance Chamber could accommodate suggests that state-sponsored ceremonies occurred at the site. Yet, it appears that not everyone could embark on the path through the tunnel system and that this was reserved for special participants. The person who made the ritual journey was rewarded with an opportunity to stand at the top of the cave and perform or address the populace below. This would have been a rare privilege and an expression of ritual power that only few could attain. For this reason we suspect that the cave was used for initiations of ritual specialists or even accession rites for political office holders. This in turn suggests that Las Cuevas was not just a ritual venue but one of political power as well.

References Cited

Arksey, Marieka and Holley Moyes (in press). Ancient Maya Ritual Pathways, Performing Power Outside the Cave at Las Cuevas, Belize. Papers of the 48th Annual Chacmool Archaeological Conference, Breaking Barriers, University of Calgary, Alberta, Canada.


Moyes, Holley, Mark Robinson, Laura Kosakowsky, Barbara Voorhies, Rafael Guerra, Fabrizio Galeazzi, and Josue Ramos, 2011. Sleeping Next to the Giant: Preliminary Investigations of the Las Cuevas Site, Chiquibul Reserve, Belize: A Site Report of the 2011 Field Season, On file at The Institute of Archaeology, National Institute of Culture and History, Belmopan, Belize


Figure 1. Map of western Belize showing location of Las Cuevas (Courtesy of LCAR).
Figure 2. Site map of Las Cuevas site core showing surface structures and the underlying cave system (Courtesy of LCAR).

Figure 3. The Entrance Chamber was heavily modified with platforms, stairs and terraces (Courtesy of LCAR).
Figure 4. Wall 1 blocks the entrance to the tunnel system. Note the constructed doorway (Photo by Holley Moyes, Courtesy of LCAR).

Figure 5. Map illustrating the blockages and walls in the Las Cuevas Tunnel system (Courtesy of LCAR).
Figure 6. Sherds scattered in Chambers 1, 2, and 3 are embedded in the sediment matrix forming a "sherd carpet" (Photograph by Moyes, Courtesy of the LCAR).

Figure 7. Density map illustrating artifact and charcoal scatters (Courtesy of LCAR).