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THE ROCK SHELTERS OF CERRO BERNAL AND THEIR PREHISTORIC USE

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In this article we discuss the prehistoric use of rock shelters on the lower slopes of Cerro Bernal, a mountain located on the Pacific coast of Chiapas, Mexico (Figure 2, p. 3). To our knowledge, this is the first systematic investigation of caves and/or rock shelters within the Sierra Madre de Chiapas where Cerro Bernal is located. One obvious reason for this neglect is that the geology of the mountain range is not conducive to the formation of large cave systems, a sort favored by prehistoric people. This means that our present study, while limited in scope, is a pioneer venture. We hope this work will inspire more efforts in the future.

The interest in the archaeological investigation of caves and rock shelters in Mesoamerica has enjoyed an explosion since the late 1980s (Brady and Profer 2005a;1; Lohne 2010). Rockshelter excavations have played an important role in defining late Paleoindian and Archaic period subsistence strategies (Flannery 1980; MacNeish 1967; Piperno et al. 2009; Kauere et al. 2009; Scheffler 2008). This includes now submerged caves and rockshelters along the coast of Yucatan (Gonzalez Gonzalez et al. 2008). Most activity has focused on the Maya region, which is not surprising because of the extensive presence of solution caves here in karstic areas. But archaeologists working in Central Mexico have pursued cave studies as well. There, caves and rock shelters have formed naturally in igneous rocks rather than limestone, and in some cases prehistoric peoples formed artificial caves by excavating pits in volcanic sediments (e.g., Aguilar et al. 2005). These collective cave studies have generated major findings regarding cave use in Mesoamerica.

One important finding is that Mesoamericans have used caves since they first inhabited the region, and continue to do so today. However, the function of caves has changed over this long time span. Early hunter-gatherers peoples used the light zones of caves, as well as rock shelters for habitation, either on a long-term or short-term basis. This practice is carried on even now by the residentially mobile Tarahumara (Lambert 1973). Sedentary agrarian peoples, beginning in the Formative period, used caves almost exclusively as ritual spaces (Bradley 1989; Bessey and Profer 2005; Mayes and Brady 2013; Profer and Brady 2005; Stone 1995). The recognition by prehistorians that caves were used for rituals long before the need to sequester rites from public view during the Colonial period was established using a synthetic approach that incorporated the archaeological record, ethnographic data, ethnographic analogies, mythology, iconography, and epigraphy. We return to this theme at the end of the present article.

In Chiapas, the limited research into caves and rock shelters has been restricted mainly to the areas underlain by limestone, that is, in the central and northern portions of the state (Bonor Villanueva 1989: fig. 54). The only early prehistoric occupations that have been studied in Chiapas caves are in the Santa Maria (Acosta Ochoa 2008; Garcia-Barrera and Santamaria 1982; MacNeish and Peterson 1962) and Los Gripos (cf. Piacentini 1990; Zeitlin and Zeitlin 2000) caves in the Ocozocautla Valley, in
the central part of the state. This work is complemented by investigations at coeval open-air sites located in the valleys of Tecpile (Lorenzo 1991) and Aguacatlanango (García-Bárcena 1982; Guevara Sánchez 1981) in the Chiapas Highlands. The lithic remains from these cave and open-air sites are not highly diagnostic, but they probably date from the terminal Paleoindian through Middle Archaic periods (Zeitlin and Zeitlin 2000: 85). These instances the cave sites were used principally for habitation.

In addition to their early use for habitation, Chiapas caves have a long history of ritual use in pre-Hispanic and later times. Evidence of this can be found in the Chiapas Highlands/Platoano (e.g., Navarrete y Martínez 1977) and the selva (Monteal de la Luna and Montes de la Orotina) (Navarrete y Martínez 1977; Orfici 1999). Bonor Villarejo (1989: 167-186) summarizes the available information about cases in Chiapas. Almost nothing is known about ritual activities in the Sierra Madre de Chiapas, the mountain range paralleling the Pacific coast. However, a strong indication that ritual activity took place in caves during Colonial times is given by Núñez de la Vega, Bishop of Chiapas in 1702, who reported that the Tlacololoyo cave, in the vicinity of Huauchaltán, was a place of idolatry (Aramoni Calderon 1992: 302; Bonor Villarejo 1989: 176). We also know that during the last years of the 17th century, Cerro Bernal was considered to be a sacred landform (Aramoni Calderon 1992: 299). This is not surprising since the mountain dominates the coastal panorama due to its physical separation from the main axis of the Sierra Madre mountain range.

SURVEY OF ROCK SHELTERS

Voorhies conducted the rock shelter survey with the assistance of archaeologist John G. Hodgson during December of 2000 and January of 2001. The survey was carried out in the municipality of Tonalá, Chiapas, Mexico. The express purpose of the study was to look for archaeological remains in the rock shelters of Cerro Bernal that date to the Archaic period (10,000-3500 yrs BP) or earlier. According to her working subsistence-settlement model for Archaic period inhabitants of coastal Chiapas (e.g., Voorhies 2004) Voorhies expected that rock shelters on mountain slopes would produce evidence of use by hunting and/or gathering parties that were participating in the logistical foraging strategy typical of collectors (sensu Binford 1980). This expectation was not realized: we found no evidence of early cave use in the ten rock shelters that we investigated on the seaward facing, lower slopes of Cerro Bernal. However, prehistoric peoples used the investigated rock shelters at later time periods, and this is the subject of the present article.

Archaeology of Cerro Bernal

Cerro Bernal (1050 m) is the highest peak in a small mountain range that runs approximately north-south, in contrast to the principal axis of the coastal cordillera that runs northwest-southeast. The Cerro Bernal range is separated from the principal part of the cordillera by a narrow pass through which the coastal highway (Route 200) now runs. On the opposite, seaward side, the foothills of the range separate the La Joya and Buenavista lagoones by forming a narrow canal that is only 0.5 km wide (Hübiger 1976: anexo 3). This is the only place along the Chiapas coast where foothills reach the coastal lagoon-estuary system without an intervening coastal plain.

Before our study only three archaeological sites were known on Cerro Bernal: Los Horcones, Fracción Mújilar, and Estación Mozarras. Los Horcones and Fracción Mújilar are located on the inland side of the mountain. Both sites contain sculptures with carved designs that strongly resemble those from Teotihuacan (Navarrete 1986; Taube 2000). Navarrete proposed that the Los Horcones platform mound site, which recently has been studied systematically (García-Des Lauriers 2004), was ideally situated so as to control the movement of people and goods traveling along an ancient route that hugged the foothills of the sierra. The Estación Mozarras site is located on the opposite, seaward side of Cerro Bernal. Little is known about this platform mound site
Figure 126. Cerro Bernal study area showing the locations of rock shelter sites and the archaeological site known locally as La Sepultura.

other than a stela, now located in the regional anthropology museum in Tuxtla Gutiérrez (Navarrete 1986: 21) was reportedly found there. The site, which we presume to be the one labeled “La Sepultura” on Figure 126, is situated strategically to control aquatic traffic passing the narrow stretch between the La Joya and Buenavista lagoons (Navarrete 1986: 25; c.f., 1998: 32ff). These lagoons form part of a long intercoastal waterway that runs from Oaxaca, Mexico to El Salvador. Archaeologists have long suspected that this waterway was a major artery of movement in pre-Hispanic times (Navarrete 1998).

During our survey we went with local guides from the village of Mejarras to rock shelters in the hills behind their community (Figure 126). Large boulders that detached from the bedrock in remote geologic time form all of the shelters that we visited. These enormous blocks, called "erratics" by geologists, are positioned to form shelters that are sufficiently commodious or otherwise attractive to have been used by ancient people. All the boulders in the study area are plutonic igneous rocks, such as granites and diorites (or granodiorite; Millerried 1957: 128) that are Precambrian in age. These are the principal rock types of the coastal range, but metamorphic rocks also occur in contact zones (Helbig 1970; Millerried 1957). As noted, a mountain range composed of plutonic rocks does not appear to be favorable for investigating caves and rock shelters because the lithology is very resistant to water action, an
Figure 127. Plan of Cueva Chaperna (TON-2). [The “TON” prefix is short for the municipality of Tonalá.]

important agent in the formation of many caves. Nevertheless, we found that rock shelters are relatively common in our study area.

Although we investigated ten rock shelters during our field study, we conducted subsurface excavations in only four (Chaperna, Tres Cuevas, Los Chinacos, and Casa de Piedra). The other shelters have been reported elsewhere (Kennett and Voorhies 2002) and are not included here. In addition to the rock shelters, we discuss a quarry site immediately adjacent to one of the rock shelters because the two sites have a common prehistory.

**CUEVA CHAPERNA, TON-2**

This rock shelter is located northwest of Mojarras, approximately 1.5 km north of the town’s cemetery at an altitude of 142 m above sea level (Figure 126). The overhang of a single large boulder forms the shelter, which has two chambers. The ceiling dips almost to the floor in the middle of the shelter. At one time a stone wall was built below the low part of the ceiling so that the two chambers were completely separated (Figure 127). At the time of our study the floor of the shelter was relatively flat, dry and littered with fallen rocks (not shown on our map). In addition, the ceiling is very low: in the western chamber the maximum height is only one meter (Figure 128a), whereas in the eastern chamber it reaches 3 m but rapidly decreases toward the interior of the shelter (Figure 128b). There is another stonewall at the back of the western chamber close to the back wall (Figure 127). This wall is well made and consists of two courses of rocks that originally reached the ceiling and enclosed a narrow space at the back of the shelter. The wall is disturbed. Finally, a retaining wall had been built on the slope in front of the shelter forming a narrow terrace.

We found only eight potsherds on the surface of the shelter. However, the presence of these sherds, plus the associated architecture made it immediately obvious that this shelter had been used in the prehistoric past.
Figure 128. Cross sections of Cueva Chaperma along three transects that are shown on Figure 127.

Unit 1

We excavated a test pit near the entrance to the east chamber in the only location where there was sufficient space to work. The 1.0 by 0.70 m pit was oriented with the long axis north-south (Figure 127). We used arbitrary excavation levels of 10 cm but had to terminate the excavation at 0.60 m because at that depth a large rock covered the entire bottom of the unit. A single stratum of unbedded, yellowish brown
fine sediment was encountered. We do not include a drawing of the unit’s sidewalls since we encountered neither stratigraphy nor buried features.

Cultural material was very scarce in this unit. We found only six small, water-worn potsherds. For this reason we have little evidence that indicates when this rock shelter was used. The only available clue is that some sherds of large storage vessels from the shelter’s surface are similar to those from the Late Formative-Early Classic time interval. These sherds resemble those collected by John Clark from a road cut that leads to the archaeological site of Iglesia Vieja (also known as Tonals) that are now curated in the facilities of the New World Archaeological Foundation (NWAF). The Iglesia Vieja site is located in the mountains behind the town of Tonals and may have been occupied during this same period of time (Fendle 1955).

The cramped space in this rock shelter indicates that it could not have been used for habitation on any sustained basis. The fragments of large vessels suggest that the shelter may have been used for storing food or water. While this may seem reasonable given the semi-arid environment of this region and the fact that the cave is dry and well ventilated, the wall at the back of the western chamber is hard to explain if the shelter had been used only for storage. Additionally, the presence of potsherds does not automatically lead to an interpretation of the site as a storage facility. Large domestic vessels are commonly left in caves as offerings in the Maya area, and jars are the most common ritual object in cave assemblages (Brady and Prufer 2005a; Moyes 2000: 68) a practice that first began in the Terminal Preclassic to Early Classic transition (Moyes 2006; Moyes et al. 2009: 178). The deposition of large globular jars is also noted among the Aztecs as offerings to the rain god Tlaloc (Lojão 1998: 180). At the Templo Mayor whole jars with bowls inverted over their mouths were cached in the construction fill.

The small space between the rock wall and the rear of the shelter might have been used for a burial, particularly a secondary burial. Previous studies in the Maya area indicate that burials are common in caves and rock shelters (e.g., Prufer 2002; Saul et al. 2005; Moyes and Brady 2003; Scott and Brady 2005). Since we did not excavate behind the rock wall where any evidence of a former burial would be expected, we are unable to fully test this idea. No bones or artifacts were observed on the surface.

Another possibility is that the shelter was used as a sweatbath, since both caves and rock shelters have been so used in the Maya area. For example, Moyes (2005b) interprets a modified passage in the deep Chochem Ha Cave in Belice as a sweatbath. Moreover, David Webster (2005) reports a rural sweatbath in a rock shelter near the site of Piedras Negras, famous for its numerous and monumental ritualists in the site core. The shelter has a plaster floor and low walls that enrobe a rectangular space. These walls have been interpreted as basal walls for a building that was constructed of perishable materials. Although no firebox was present, a concentration of burned rocks was found inside the structure. Under these rocks the floor was discolored by the heat and water used to make steam on the hot rocks.

Admittedly, we found no compelling evidence that Cueva Chaparrera had been used as a sweatbath. That is, there is no firebox, evidence of burning, heated stones, or benches as far as we are aware. However, the architectural modification of the shelter creates a space that might be suitable for a sweatbath, but this possibility did not occur to us during the field survey so we may not have made all the observations necessary to investigate this possibility. Therefore, we think that this function, although unlikely, cannot be definitively ruled out.

**TRES CUEVAS, TON-4**

The site that we designated Tres Cuevas consists of a cluster of three small rock shelters that are located about 2.5 km northwest of Mejarras (Figure 126). All of these shelters are formed below gigantic erratics. Altivo A is the highest of the shelters in the group and is located at an altitude of 161 m above sea level. It is a small sheltered space below an overhang (Figur...
rock shelters 5; Meyers and 5). Since we wall where any be expected, a. No bones or trace.

shelter was yes and rock days area. For a modified Cave in Belize Webster (2000) shelter tons for its ash in the floor and low ice. These d walls for perishable present, a found inside (floor was to be made.

elling born to stones, however, shelter: for a t occur not nary to we think cannot be

Cuevas & shelters of shelters are 0 A is the # is located. It is a long (Figure

TRES CUEVAS
TON-4
Shelter A Profile, Facing East
Sketch by John Hodgson
December 21, 2000

Figure 129. Shelter A cross section at Tres Cuevas (TON-4).

129). The sheltered area is triangular in shape, but a large boulder on the floor obstructs much of the interior (Figure 130). Several coalescing boulders obstruct entry from the west side, and a retaining wall stabilizes a narrow terrace in front of the shelter. This is the most interesting shelter of the site group because it is the largest, and has a dry and level floor that contained surface material, including a Postclassic potsherd. For these reasons we decided to investigate its subsurface contents. The remaining shelters in the group had no evidence of human use, judging from the absence of surface materials.

Unit 1

This test pit was situated inside Abrigo A with the short axis (0.70 m) abutting a large freestanding boulder, whereas the long axis (1.20 m) extended toward the shelter’s entrance (Figure 130). We excavated 10 cm levels until reaching 1 m below the unit datum at the northeast corner of the pit. There were two strata in the unit (Figure 131). The upper stratum was an unbedded grayish-brown sandy soil, below which was a stratum of unbedded sand. All of the cultural material came from the upper stratum, which extended to a maximum depth of 0.80 m. The sand was culturally sterile and may have been fluvial in origin, in which case it is probably sheet wash.

We found more potsherd (N=178) in this unit than in any other excavation during this field survey. The majority of these sherds resemble those from the other shelters, that is, they appear to date to the Late Formative-Early Classic time period. On the surface we found one Late Postclassic sherd, and it was very eroded. It may have arrived at the site by fluvial transport. We recovered two prismatic blade fragments made from green obsidian originating from the Pachuca mines of Central Mexico. These two blades probably date to the Postclassic period (John Clark, personal communication). Both are medial fragments with heavy use wear. One (FS 01-09) is probably the proximal end of a projectile point because one end has been flaked to form a stem. Voorhies and Gasco (2004: 820f) discuss some styles of Postclassic Period arrowheads from the region.

A sherd- and rock-lined depression was discovered in the unit (Figure 131) along its west side. This pit feature was first encountered at 0.50 m below the unit datum and terminated close to 0.60 m. It is likely that originally the depression was deeper than 10 cm since the upper part of the feature is truncated. In plan
view this feature appeared as a perfect semicircle of sherds extending into the unit from the west wall. The sherds originated from different vessels but most were fragments of the bodies of large, thick-walled, coarse tempered vessels. The diameter of the circle was difficult to determine precisely but it probably is less than 0.50 m. The sherds overlapped one another and completely lined the half of the depression that we excavated. At one place at the bottom of the pit a rock was used instead of a sherd for the lining.

We have been unable to determine the exact function of this small pit. The sherds are not burned and there was no associated charcoal, so we can rule out the possibility that it was a hearth. It may have been used in some way for storage, but paleobotanist John O. Jones found no unusual pattern of phytoliths in two samples that he analyzed from this feature. One sample (FS 01-28; Lab. #2) was taken from the interstices between two sherds from the lining of the pit, whereas the other sample (FS 01-27; Lab. #1) was collected from outside the depression to use for control purposes. Both samples contained large amounts of arboreal phytoliths, such as those from the Marantaceae and Chrysobalanaceae families. These probably derive from the local vegetation and are not due to human activities. Palm phytoliths were surprisingly scarce, and all appear to be from wild forms. In other words, although we cannot rule out a storage function, there is no evidence to support it.

This feature resembles the sherd-lined pits reported by Paillés (1980) for Pajón, a site on the coastal plain of Chiapas. These small pits contain sherds as liners but unlike the pit at Tres Cuevas the sherds showed evidence of burning, and some pits also contained burned clay and charcoal. One pit was dated at 2805 \pm 280 C14 years BP (Paillés 1980: 33). The uncalibrated
Figure 131. West and North wall profiles of Unit I, Shelter A, Tres Cuevas (TON-4).

and uncorrected radiocarbon date equates to 1700-200 BC (Orcal 3:9). Pailles was unable to definitively determine the function of the pits at that site. In some places in the monograph she refers to them as hearths, and elsewhere she calls them ovens (Pailles 1980: 35).

Another distinct possibility is that the shed-lined depression in Abrigo A was used to boil foods using hot rocks. A depression lined with rocks is reported by Collins (1969: 7, fig. 4; 2000: 11ff) from a dry Texas rock shelter. This deep (50 cm), conical pit, with a 90 cm diameter, was first lined with thin limestone slabs, then insulated with a layer of entwined branches and other plant materials, and finally lined with a sheet of leather. Collins (2000) has argued recently that the leather lining would make an excellent, impervious basin suitable for holding liquids. Although it is probable the Texas pit was used for indirect boiling, no directly associated hearth or cooking stones were found. However, igneous and metamorphic stream cobbles that would be suitable to use as boiling stones were found dispersed in this and other regional rock shelters in Texas (Collins 2000: 12). At Abrigo A we also failed to find either an associated hearth or boiling stones that would support the inference that the shed lined depression was a container for stone boiling. Because of this, the function of this feature remains debatable.

A charcoal sample from the 0.50-0.60 m level in the unit was radiocarbon dated to 1,707 C14 years (Table 19). When calibrated and converted to calendrical years this date at one sigma is cal AD 259-402, comfortably within the Early Classic period in the general Mesopotamian chronology.

CUEVA DE LOS CHINACOS, TON-14

Cueva de los Chinacos (chinaco is a local name for bats) is located at an altitude of 153 m above sea level, approximately 150 m south of TON-8 (described below). This was the largest of the rock shelters that we investigated. It has an L-shaped plan that formed where three gigantic boulders (Figure 132) conjoin. The principal or long arm of the shelter measures 15 m, whereas the short segment is 6 m long. The width of the space is approximately 1.60 m, although this varies. The roof is very
Table 19. Radiocarbon dates produced with AMS analysis on charcoal by the Radiocarbon Laboratory, University of Arizona. Calibration based on CALIB 4.3 (Stuiver and Reimer 1993).

<table>
<thead>
<tr>
<th>Site</th>
<th>FS 01-</th>
<th>Laboratory number</th>
<th>Provenience</th>
<th>14 C Age yrs BP</th>
<th>1 Sigma (cal years)</th>
<th>2 Sigma (cal years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TON-4</td>
<td>24</td>
<td>T14270A</td>
<td>0.50-0.60 m</td>
<td>1,707 +/- 38</td>
<td>AD 259-402</td>
<td>AD 241-424</td>
</tr>
<tr>
<td>TON-14</td>
<td>129</td>
<td>T14271A</td>
<td>Rock lined pit, 1.30-1.40 m</td>
<td>1,797 +/- 36</td>
<td>AD 137-318</td>
<td>AD 129-339</td>
</tr>
<tr>
<td>TON-14</td>
<td>123</td>
<td>T14273A</td>
<td>Rock lined pit, 1.30-1.40 m</td>
<td>2,195 +/- 54</td>
<td>363-172 BC</td>
<td>392-65 BC</td>
</tr>
<tr>
<td>TON-8</td>
<td>70</td>
<td>T14274A</td>
<td>0.80-0.90 m</td>
<td>1,652 +/- 46</td>
<td>AD 344-430</td>
<td>AD 258-535</td>
</tr>
</tbody>
</table>

The principal corridor, dipping steeply toward the interior of the shelter and was strewn heavily with rocks, especially toward the entrance. These rocks may have once been used to wall off the entrance.

The principal entrance is from the west, where one can simply walk unimpeded into the shelter. However, at some point in the past, this entrance appears to have been blocked by boulders and cobbles that have been moved to one side (Figure 132). The northern entrance to the shelter is much more difficult to navigate because of the slope and the abundant rocks that are present.

We excavated two test pits in the principal corridor of the shelter (Figure 132).

### Unit 1

We placed one test pit in the interior of the shelter close to the mid-point of the principal corridor (Figure 132). This unit, measuring 1 by 2 m, has the long axis parallel to the length of the corridor. The unit datum at the northeast corner of the pit, was 4.5 m from the west entrance to the shelter. We used 10 cm levels for our excavations within each of two strata.

The upper stratum is a black soil that varies between 0.30 and 0.40 m in depth (Figure 133).
Figure 132. Cueva de los Chinacos (TON-14) plan view.

Figure 133. Wall profiles of Test Pit 1, Cueva de los Chinacos (TON-14).
the presence of humans in the region since they come from plants that favor open disturbed habitats. One single phytolith of Zea mays was found in the sample from the bottom of the pit. Admittedly this is a slender piece of evidence at best but it could indicate that corn was present in this rock-lined pit. As the cave was dry and well ventilated during the dry season at least, it seems a likely place to store corn.

The age of the rock lined pit is difficult to determine on the basis of recovered potsherds because only a few are diagnostic: most are small and undecorated body sherds. Two sherds from the upper excavation levels date to the Postclassic period. Otherwise the sherds appear to be Late Formative-Early Classic in age. We also obtained two radiometric dates from this unit (Table 19). The dates, cal AD 137-318 and 363-172 cal BC at one sigma, agree with the age ranges inferred from the analysis of the potsherds.

Unit 2

Unit 2 was 1 by 2 m in size, and was oriented with the long axis parallel to the main corridor of the shelter. This unit was placed in a well-lit zone, near the west entrance to the cave (Figure 132). We had hoped to recover a larger potsherd collection for dating purposes than we had from the first unit, but we found even fewer sherds (N=10) than in Unit 1. We also found a fragment of a prismatic blade in the 0.50-0.60 m level. This is a medial fragment of striped gray obsidian thought to have come from the Orizaba source in Central Mexico (Clark, personal communication). As can be seen in Figure 134, there is an overlying black soil that is underlain by yellowish-orange sandy silt. These strata are identical to those described for Unit 1. We did not encounter features in this unit.

Discussion

The principal item of interest in this rock shelter is the large stone-lined pit that had been constructed in prehistoric times. The function of the pit is not entirely clear to us. Possibilities that we have considered include a burial pit; a water storage feature; or a storage area for foodstuffs, probably maize.

The burial pit possibility is based simply on the fact that a stone-lined ossuary pit was found at the Mayahak Cab Pek rockshelter in Belize (Saul et al. 2005). That pit is approximately 3 m in diameter, judging from its plan drawing (Saul et al. 2005: fig. 16.11), and an unknown depth. Minimally, it contained the remains of two adults and three children. The bones of these people were mixed with bones from other animals (Saul et al. 2005: 316). At Cueva de los Choncos we failed to find any human or other faunal remains whatsoever. However, it must be kept in mind that bone preservation in this somewhat acidic soil environment cannot reasonably be expected.

We considered the possibility that this feature might have been used as a reservoir to store water if it had been lined with some impermeable substance such as leather or plaster. This idea was based in part on the morphology of the rock shelter that made it seem possible that water might flow into the shelter from the north entrance and have been dammed by a rock wall at the east entrance. If such were the case, a large pit positioned on the floor could have collected the water flowing into the shelter. However, we failed to discover any evidence of an impermeable lining that would support this idea. Although a leather lining would probably not survive, if plaster had been used we would expect to find some remains of it. Even more problematic is the fact that there were no laminations in the sediment filling the pit or on the shelter floor that would indicate it was water deposited. On this basis we consider this idea to be unsupported.

A storage pit for maize remains a possibility, although we concede that the evidence for this inferred function is not strongly compelling. The relative dryness of this rock shelter, at least during the dry season when capillary action within the cave sediment is minimal, would seem to make food storage a distinct possibility. The single maize phytolith tells us that maize was present in the shelter. We know, however, that in the Maya lowlands maize and other wild and domesticated plants...
were brought into deep caves as ritual offerings (Morehart 2005). In Morehart's study the context of the recovered food remains (burials, hearth-like features and the surfaces of artificial terraces) was very clearly ritual, which is not the case in Cueva de los Chinacos.

Pit storage for food items has been documented and sometimes assumed for caves and rock shelters elsewhere in Mesoamerica, and significantly in semi-arid regions such as this study area. For example, at Guádal Nacazt, a high altitude rock shelter in Oaxaca, small unlined pits clearly were used for access storage during the Early Archaic period (Flannery 1986: 13) and large unlined pits, thought to be for storage, were constructed in the back of the shelter during the Postclassic period (Flannery et al. 1986: 90). The Concållas rock shelter in the Tehuacan Valley also contained many pits that the excavators considered to have been for storage, in addition to other types of pits interpreted as having other functions. Small, basin and bell-shaped pits were filled with plant remains and large, sometimes clay-lined pits also often had only plant remains but sometimes were filled with trash. Together these features interpreted as storage pits span all occupations from Late Paleoindian to the Early Postclassic periods. This means that these pits were built and used during the Early Classic period, that is, coeval in time with the Los Chinacos pit (Fowler and MacNeish 1972: 232-233). However, none of the features mentioned above is rock-lined, like the pit at Los Chinacos. Interestingly, one plaster-lined pit at the El Riego cave in the Tehuacan Valley was interpreted by the excavators as having been used to soak bark for preparation of bark cloth.
CASA DE PIEDRA, TON-S

This rock shelter is approximately 3 km northeast of the village of Mojarras (Figure 126) on the lower slopes of the southern side of Cerro Bernal. It is situated on a low divide between two drainages at an elevation of 133 m above sea level. The headwaters of the stream to the west originate from a pool nestled within a huge outcrop of water worn granodiorite. This pool, which is fed by a perennial spring, is only 80 m from the site. We think that this nearby water source has ideological as well as practical implications, as we discuss below.

A long, triangular shaped overhang that juts out from a gigantic boulder forms the shelter (Figure 135). This overhang, which is reminiscent of a long zoomorphic snout when viewed from the west, covers a roughly triangular shaped area that is approximately 25 m² in size (Figure 136). The ceiling formed by the overhang varies between 3.20 m and 2.40 m above the present day floor, with its lowest point toward the front of the shelter. The rear wall of the shelter, which is part of the same boulder as the overhang, is 5.20 m wide and nearly vertical. The hollow in front of the shelter has been stabilized with a low rock wall that forms a narrow terrace, thus enlarging the level space in front of the shelter. On the west side of the shelter we observed a relatively square flat area that seems to be outlined by rocks (Figure 136). We did not investigate this area further.

It is possible to enter the shelter from either side. However, on the northwest side there is a large boulder that is nearly perpendicular to the back wall of the shelter, and between one and two meters outside of the drip line. Smaller rocks have been positioned so that they close the crevice at the north end of the shelter between these two boulders (Figure 136) thus allowing access on this side of the shelter only along the narrow terrace. Several boulders are scattered on the floor within the drip line on the opposite, southeast side of the shelter, but they do not form any clear pattern, as would be expected if they were part of a wall. It seems unlikely that these rocks have fallen from above, so they may have been moved there intentionally in order to create an enclosed or restricted space. In any event, today they impede access from this side of the shelter, requiring a visitor to skirt around them.

The level floor of the shelter consists of fine sediment. Large rocks are abundant on this surface (they are not all shown on Figure 136), but the only observable surface artifacts during our first site visit were a few potsherds and two modern coins. We collected these surface materials, along with some other sherds in the immediate vicinity of the shelter. The surface sherds appear to be both Late Postclassic and Early Classic in age. We also found a ceramic net weight on the surface that dates to the Postclassic period (cf. Voorhies and Gasco 2004: 79ff).

Several archeological features are also present in the shelter. When we began work we noticed that two boulders were modified by human action, and that there were the remains of a recent campfire in the shelter. One of the modified boulders, at the southeast corner of the shelter, is a rock with a flat abraded upper surface. This is probably a modern whetstone for honing machetes. The other modified rock is more intriguing, because it is probably prehistoric. It contains an artificial oval depression that initially we thought was a metate, but which we now interpret as a halilin.

Haltzen (or more correctly, halinos) are receptacles for collecting water that are often found within caves and rock shelters (Bonor Villanueva 1989: 43). The oval depression has been worked into the upper surface of a block of rock that is positioned under the shelter’s roof. The long axis of this basin is oriented NE 50° and is 38 cm long, 31 cm wide, and has a maximum depth of 10 cm. The lip of the depression is lowest on the west side and appears worn, as though water flowed over it. The surface of the depression is very smooth, rather than being rough, as is required for a grinding stone. The rock containing the depression has several additional interesting features, including several flat surfaces with high luster, and several areas in high relief. These features are depicted in the accompanying drawing (Figure 137). The polished surfaces may be due to recent machete sharpening, or to more ancient abrasive action.
Figure 135. Cross section of Casa de Piedra (TGN-8).

Figure 136. Plan of Casa de Piedra (TGN-8).
On close inspection the areas of high relief appear to be natural and the result of differential weathering of inclusions.

Although the carved depression may well be a halte, it seems impossible that it could receive water dripping from the shelter’s ceiling given its current position. It is not under the dripline, and the ceiling slopes in such a way that rain water would inevitably drip toward the front of the shelter. Of course, this rock may not be in its original position.

A badly weathered painted panel is on the rear wall of the shelter. Here, the rock has been prepared by percussion to provide a flat, vertical “canvas” (cf. Figure 135). Indentations that resulted from percussion blows are especially evident at the western end of the panel. The first painted designs were rendered in a greenish-black pigment. It is still possible to discern a chain of diamonds, two circles, and some other unclear motifs drawn in the black paint. The chain of diamonds is located along the top of the panel and is nearly horizontal, although it dips slightly toward the right. The two circles are immediately below this motif. They are adjacent to one another but the one on the right is slightly lower than the one on the left. Each circle has a diameter of approximately 16 cm. The left circle has an inverted “Y” within it that at first gives the impression of a peace sign. This could be an early version of the “aqaw” glyph. Pruner and his colleagues (2006: 207) illustrate a similar motif from Stela 23 from Uxeník, which is dated to AD 455, within the Early Classic period.

The right circle also has an interior design but it is more difficult to discern. It appears to be bisected by four lines that may join a smaller circle in the center of the large circle. These circular symbols are quite intriguing because they resemble the circular glyphs that occur on carved stone monuments in the region (Garcia-Dursi Lauwers 2004, 2007; Navarrete 1986; Tashe...
In particular, Navarro (1986: fig. 13) illustrates two carved stelae from Fraccion Majuara, a site on the opposite side of Cerro Bernal, with a flower-like design within a circle that is associated with number glyphs. This design resembles that of the right hand glyph in the painted panel under discussion, but we are not certain they are the same motifs. Below the circles and to the left of them is another area with black lines but we are unable to discern the motif because of severe weathering.

These designs in black paint were subsequently painted over with a white colored substance that forms a roughly rectangular panel that is 1 m high and 1.70 m wide. Designs in a dark red paint (Munsell: 5R 3/6) were then applied to this surface. It is difficult to discern the pattern of the designs except for two areas where lines appear to radiate from a central point. One of these occurs slightly above and to the right of the right-hand circle described above, whereas the other is just below it. In these cases it is impossible to tell if the patterns are part of an original design or rather simply the effects of weathering. Other traces of red paint occur over the entire painted panel.

Chemist Marvin Rowe performed a trace/major element analysis on a tiny sample of this white substance used to prepare the surface for the second phase of the artwork. This sample (FS 01-81) was taken from a corner of the panel described above. The results of this study are shown in Table 20. Although Voorhies suspects that one component of this substance may be later, the elemental analysis does not really resolve this issue. More work is needed here to identify this material.

We excavated two small test pits in the floor of the shelter in places where there were no large surface boulders to obstruct our work. These are described in the following section.

Unit I

This 1.0 by 2.0 m excavation was placed in the interior of the shelter close to its entrance (Figure 136). The long axis of the pit was approximately parallel to the retaining wall and the datum was established at ground level in the northeast corner of the pit. The unit was dug in arbitrary levels of 10 cm within each of two strata. Excavation ended at a depth of 0.90 m below the pit datum.

The upper stratum consists of unbedded, organic rich dark brown (Munsell 10YR 4/4) soil. It contains many large rocks and some artifacts. This stratum is highly disturbed by roots and animal burrows. The dark brown soil is deeper on the western side of the pit where it continued below the bottom of the excavation (Figure 138). Below the brown soil we encountered a stratum of unbedded yellowish-brown (Munsell 10 YR 5/8) sandy clay that contains only a few small rocks and is culturally sterile.

In the field we observed a distinct difference in the rocks in the dark brown soil compared with those in the sandy clay stratum. The upper stratum contained abundant granodiorite blocks that were freshly fractured on all surfaces and within the cobble size range. The granodiorite

Table 20. Results of elemental analysis of substance used to prepare the rock surface for artwork. Analyst: Dr. Marvin W. Rowe, Department of Chemistry, Texas A & M University.

<table>
<thead>
<tr>
<th>Element</th>
<th>Minor (%)</th>
<th>Trace (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>2.02</td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td>1.94</td>
<td></td>
</tr>
<tr>
<td>Sodium</td>
<td>0.70</td>
<td></td>
</tr>
<tr>
<td>Lanthanum</td>
<td>133.6</td>
<td></td>
</tr>
<tr>
<td>Lutetium</td>
<td>0.16</td>
<td></td>
</tr>
<tr>
<td>Samarium</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>Uranium</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>Ytterbium</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>Cerium</td>
<td>25.0</td>
<td></td>
</tr>
<tr>
<td>Cobalt</td>
<td>7.8</td>
<td></td>
</tr>
<tr>
<td>Cesium</td>
<td>4.3</td>
<td></td>
</tr>
<tr>
<td>Europium</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>Arsenic</td>
<td>None detected</td>
<td></td>
</tr>
<tr>
<td>Barium</td>
<td>None detected</td>
<td></td>
</tr>
</tbody>
</table>
Figure 138. Profiles of four walls of Test Pit 3, Casa de Piedra (TON-8).

had medium-sized crystals, exactly like those of the nearby outcrop of site TON-10 (see below). In contrast, the lower stratum contained few rocks, some of which appeared to be small spalls that had weathered from the overhang and others were water worn cobbles and pebbles of fine-grained granite. Clearly, the formation processes of the two strata are significantly different, as we explain in the next section.

The artifacts that we recovered from the unit include a faceted hammerstone (FS 01-44) of granodiorite (cf. Clark 1988: 176), a granodiorite mano (FS 01-175), the poll end of a greenstone chisel (FS 01-25), two chisel or wedge fragments made of granodiorite and schist, two fragments of patches made of granodiorite and gneiss (FS 06-40 & FS 01-44), and one medial prismatic blade fragment of green obsidian (FS 01-42). We found a piece of glass and a 20th century coin in the 0-0.30 m level.

These artifacts give some indication of the age of the deposits. The majority of sherds probably date to the Late Formative-Early Classic time range, but some Late Postclassic sherds and modern materials were present.

A coin, dated 1985, was in the top level (0-0.30 m), and sherds possibly dating to the Late Postclassic were present in the 0.10-0.20 m and 0.30-0.40 m levels. John Clark examined the blade of green obsidian that came from the 0.50-0.60 m level. He identified the source as the Pachuca quarries in Central Mexico and thinks that the blade must be Postclassic in age. This means that Postclassic period material is mixed with early material in this unit to a depth of 0.50 m.
Unit 2

The second excavation unit was placed at the rear of the shelter along the back wall (Figure 136). The unit measured 1.50 by 0.80 m, with the long axis parallel to the wall. We excavated in 10 cm arbitrary levels, within the natural strata, to a depth of 1.20 m below the datum (at the northeast corner) (Figure 139). The strata are the same as those in Unit 1. All the recovered artifacts came from the upper dark brown stratum. We found a flake of coarse-grained greenstone (FS 01-138), a prismatic blade fragment of black obsidian (FS 01-117), a flake of dark gray obsidian-like material, and a faceted granite hammerstone (FS 01-55). Sherds were present to the 0.80 m level. The majority of sherd s date to the Late Formative-Early Classic time period, with one sherd possibly from the Late Postclassic in the first excavation level, and a Postclassic crater bowl (poloigae) fragment in the 0.10-0.20 m level. John Clark examined the obsidian blade from the 0.20-0.30 level. He attributes its source to Central Mexico, either from the Zinacanteco or Zaragoza quarries, and its age to be Postclassic. This means that Postclassic material is mixed with earlier material in the unit to a depth of 0.30 m.

We submitted a piece of charcoal to the Radiocarbon Laboratory at the University of Arizona for AMS dating. The result of cal AD 344-430 at one sigma (Table 19) agrees well with the analysis of potsherds because it falls within the Early Classic period.

Comparisons and Interpretations

In order to interpret the use of Casa de Piedra over time we have evidence from several different sources: the features within the shelter, excavation results, and oral history about recent cave use. We start with the features, which in this case includes the rock painting and the modified rocks on the floor of the shelter.

Careful scrutiny of the painting on the rear wall of the cave shows that it was repaint ed at least once after its initial creation. The two surviving glyph-like, circular designs from the early painting phase raise the possibility that numbers had accompanied them in order to record calendrical dates. However, so far we have been unable to discern numbers (bars and dots) below the glyphs where they would be expected based upon comparable dates on carved stone monuments in the region (e.g., Navarrete 1986). It is tempting to surmise that this artwork was applied during the Late Formative-Early Classic period, the earliest known occupation of the site. The Early Classic C14 date compares well with the design of the possible ajaw glyph. Later, the black designs had been completely covered with a coat of white substance that formed the backing for new art work painted in red. We have been unable to discern a pattern in these later designs with any confidence because the surface is so badly weathered. We note, however, that Stone (1995: 52) observes that Chiapas rock paintings commonly used red pigment to create designs either with thick outlines or in-filled areas. Perhaps this was the technique followed here.

A conjecture would be that this second painting event coincided with the Late Postclassic period, which is when the second known use of the cave occurred.

Another clue about the past history of this shelter derives from the depression worn into a rock that is positioned under the overhang. We have become convinced that this is a handm, rather than a metate as we once thought. The word handm comes from the Yucatec Maya and means water and two meaning stone (Boror Villarejo 1989: 43). Boror Villarejo thinks that the term in Yucatec Maya encompasses both movable and immovable rocks used to collect water. These features are quite common in the caves of Yucatán where they often remain in position to catch water seeping into the caves. In other cases, ceramic vessels serve the same purpose. In the Maya region the water from handmas is almost certainly sacred. Boror Villarejo notes that Colonial sources mention virgin or ceremonially pure water that was used in rituals. Although not explicitly tied to sources in caves and shelters, this sacred water is said to have been "...brought from the hollows of the trees or of the rocks in the forests" (Tozzer 1966: 395) and elsewhere to come from "the woods where a woman had never penetrated" (Tozzer 1966: 155).
The excavations also shed light on the shelter's history. The lower stratum, consisting of a matrix of yellowish brown sandy clay, is culturally sterile and contains rock inclusions derived from both slope wash and exfoliation from the outcrops in the immediate area. We observed the same soil type in all the shelters that we excavated. In contrast, the dark brown soil matrix of the upper stratum is anthropogenic; it is organic-rich and contains formal artifacts, as well as freshly fractured rocks. These latter objects seem to be the debitage from quarrying activities at the nearby site TON-10. In other words, the upper stratum is actually cultural fill that has been brought to the shelter from a nearby source in order to raise and level the floor.

We think that the deposition of floor fill must have occurred during the Postclassic period for the following reasons. The stratum is unbedded, which suggests that it was laid down in a single depositional event. This event...
coincided with the construction of the retaining wall, and after the natural ground surface had been partially excavated in connection with the wall construction. That this construction probably occurred during the Postclassic is indicated by the presence of Postclassic artifacts mixed with earlier artifacts in the fill. Although we found no Postclassic material in the lowest portions of this stratum, the stratigraphic evidence indicates that the fill was deposited all at once as we have explained above.

There is an additional clue about the temporal relationship between the fill and the rock painting that needs to be discussed. We think that the repainting of the rear wall of the shelter took place at the same time of the fill deposition because one faceted hammerstone (FS 01-44) has a splatter of a white waxy substance that looks exactly like the material used to prepare the wall for the second painting. This is an important point because it suggests that the space was modified in the Postclassic period. The modifications included the leveling of the floor, the painting of the back wall, and possibly the construction of the retaining wall.

Modern use of the site is documented by the whetstone on a boulder in the SE corner of the shelter, the modern surface material, and the coin and glass found in the first level of Unit 1. Oral history about the site reveals that approximately 25 years ago a man named Victor Martinez, who hailed from Mapastepec, lived in the shelter for two years while tending his cattle. Reportedly he returned to Mejia over the weekends to be with his family. However, he was murdered by federal police who suspected he was a cattle rustler.

Other than the ethnographic data, there is no evidence to support the inference that this shelter was a habitation site during the Classic period. In fact, it has the earmarks of a constricted ritual space. To begin, the presence of paintings on the rear wall suggest that the rock shelter was an important venue. Despite the fact that the painting has not been fully interpreted, its mere presence is significant. The caves containing paintings in the Maya Lowlands, such as Jolja in Chiapas (Bassie-Sweet et al. 2000), and at the famous Naj Tunich cave in Guatemala (Bundy 1989; Stone 1995), are all elite pilgrimage sites. And, although many caves in the Maya area have drawings, few contain glyphs, so the possibility of their occurrence at Casa de Piedra is intriguing. Second, the constructed space bounding the painted wall suggests that a restricted area was in some way esoteric or exclusive.

We mentioned above that the overhang, when viewed from the west, has a certain resemblance to a zoomorphic head, thus raising the possibility that this appearance may be due to modification of the boulder. At Palma Sola, in the vicinity of Acapulco, Cabrera Guerrero (2010) has shown how large boulders and outcrops were modified slightly to resemble zoomorphic heads when they are viewed from certain angles and often under specific light conditions. A prime example is the “Jaguar de Acapulco” (Element 8), undeniably a feline head, which can only be perceived when viewed from one perspective. Cabrera Guerrero (2010: 4-5) contends that this and other modified rocks at Palma Sola appear to have been modified intentionally to create optical illusions. In fact, the feline head had gone completely unnoticed despite considerable work at the site until Cabrera Guerrero initially detected it in a photograph. Inspired by Cabrera Guerrero’s discovery, we considered the possibility that the overhang at Casa de Piedra had been intentionally modified in order to enhance the resemblance to a zoomorphic head. However, close inspection of the overhang failed to reveal evidence of modification.

Despite the absence of carving, it remains a possibility that this rock shelter was perceived as being the mouth of the earth monster. That is, it would be very much in keeping with Mesoamerican cosmology for ancient people to have considered the rock shelter as a mysterious and spirit animated place.

Additionally, the proximity of the site to the spring cannot be overlooked or underestimated. The relationship of caves and water is one of the most fundamental aspects of the ideological conceptualization of caves in Mesoamerican thought (Ashmore and Brady 1999; Moyes and Brady 2003). Finally, the Casa de Piedra
rock shelter is adjacent to a bedrock quarry, an association that seems unlikely to have been coincidental and to which we now turn.

**CANTERA DE GRANOSORITA, TON-10**

This granodiorite bedrock quarry lies only 30 m to the northwest of TON-8, at an altitude of 130 m above sea level. Although granodiorite occurs widely throughout the Sierra Madre (Müllerried 1957), this outcrop is notable for its large horizontal exposure, and the exceptionally good quality of the rock. Moreover, the outcrop has long parallel fractures perpendicular to the upper surface (Figure 140a). These could serve as break lines in the extraction of sizable blocks of rock from the bedrock. Quarrying debris is strewn around the outcrop, especially on the uphill side (Figure 140b). The debris consists of freshly fractured rocks.

Although we persist in interpreting this location as a quarry site, we have been unable to determine why stone was removed. Initially, we thought that the quarry might have been used to acquire stone for metates, since deep basin metates made on granodiorite are common on the slopes of Cerro Bernal. Upon investigation, we have ruled this out, however. This is because we failed to find evidence of broken metate blanks and because the number and size of the discarded rocks are not what is expected at a quarrying site for metates (Cook 1982; Hayden 1987; Nelson 1987). At metate quarries the debris is abundant and consists of waste material ranging from sand (1/8 to 1/4 mm) to boulders (≥ 256 mm) in size. At TON-10 all the debris consists of large pieces from cobble (64 to 256 mm) to boulder in size, but small-sized debris is conspicuously absent. Moreover, rocks suitable for metatea occur widely on the lower slopes of Cerro Bernal so it is hard to fathom why a quarry might have been needed.

Another possibility is that large pieces of rock were extracted from this site perhaps to be used for monuments. The natural fractures make this an ideal place to procure rectangular blocks of rock, such as those needed for carved stone stelae. The most likely suspect seemed to be that the raw material for Los Horcones Stela 3 might have been obtained from this location. This spectacular carved stone monument is shaped like a pillar and is especially tall. It now measures 4.75 m in height but the top is broken off so originally it was even taller. It is 0.40 m wide and has a cross section that is approximately square (Navarro 1986: 4). In addition, the granodiorite in the monument is unflawed, like that at the quarry site. Moreover, the stela seems to have no surviving cortex, furthering the possibility that it was formed on a block of quarried stone. However, we have ruled out the idea that the stone for Stela 3 was extracted from this quarry because the rock types are not identical.

We are unable to say with certainty how blocks of rock were detached from the bedrock at this site. Quarrors for the extraction of large blocks of stone are of two general types. One involves prying blocks of stone from the top or the face of bedrock exposures. This is a relatively easy process that is facilitated by natural fractures and bedding in the bedrock. The second method involves carving the blocks out of the bedrock usually by tunneling all around the block that is to be removed, including undercutting the bottom of the block. Bedded sedimentary rocks lend themselves to the first method, whereas plutonic igneous rocks are often quarried with the second method, because they are not so inclined to natural fractures and the size of the block to be procured. At TON-10 we found no evidence of blocks being carved out of the living rock so it seems possible that they were prised loose using levers or pry bars taking advantage of the natural fractures. Proctor (1985, 1986) has observed this technique in Peru with the quarry men using only sticks.

We think that minimal stone dressing was carried out at this quarry. This is because the debris that is scattered around the outcrop and in the fill in the floor of TON-8 consists only of relatively large blocks of stone rather than a wide range of sizes as would be expected at a chipping station (cf. Nelson 1987). Ethnarchaeological studies at quarries where
Figure 140 a. Photograph of bedrock quarry Cantera de Granodiorita (TON-10) showing deep parallel fractures; b. Quarry debris at Cantera de Granodiorita (TON-10).
stone is extracted for metates (e.g., Cook 1982; Hayden 1987; Nelson 1987) show that stone blocks are worked into metate blan-ks near the quarry site in order to reduce the effort expended in cartage. At this site, however, once suitable blocks of stone were obtained, they were probably transported to another location where dressing and carving took place.

Also, this quarry was not used extensively for the extraction of stone. The amount of debris is not great nor has a great amount of rock been removed. Therefore, it is probable that after rock was procured for a few monuments at best, the granodiorite quarry fell into disuse.

We carefully explored the area around the outcrop in order to look for additional evidence of prehistoric use. In a small crevice we discovered a broken polished and reused greenstone celt (FS 01-37) that was probably cached there. This is the same type of celt that we found in Unit 1 at TON-8.

The Artifacts from TON-8 and TON-10

We found 12 formal artifacts in our excavations at Casa de Piedra (TON-8) and an additional one on the surface of Cantera de Granodiorita (TON-10). We describe them together here because of our impression that the two sites have a shared history. The reasons for this inference are discussed in the final section.

We recovered a faceted hammerstone from each of the two test pits in TON-8. John Clark (1988: 170) originally defined this formal tool type as a water worn cobble with several flattened surfaces. Clark’s samples came from the site of La Libertad in highland Chiapas. There he found several pairs of faceted hammerstones, one in each pair was faceted on coarse-grained rocks with a rough texture; the other one was made of fine-grained rock types and had a smooth texture. Our two samples resemble the coarse-grained faceted hammerstones of granite from La Libertad. We have classified one of our samples as granite (FS 01-55) and the other as granodiorite (FS 01-44). It is worth noting that granite and granodiorite are very similar plutonic rock types.

Clark thought that the faceted hammerstones were used for shaping other objects of stone by percussion and grinding. At La Libertad the objects that were manufactured may have been manos and metates, according to Clark (1988: 170). This might have been the case at TON-8, but we have no direct evidence of the manufacture of grinding stones at the site, as we mentioned. There seems to be no doubt, though, that these hammerstones were used in specific fashion to work stone. Our faceted hammerstones are about twice the size and weight as those reported by Clark, suggesting their use in coarser types of work.

The use of hammerstones in stone working is well documented in the literature on traditional methods of stone working. For example, the Dani of New Guinea in the 20th century used large, heavy hammerstones in their quarrying activities (Hampton 1999). So, too, did ancient Egyptians working quarries of hard stone such as granite and granodiorite (Aston et al. 2000: 7). These are stone spheres that are harder than the bedrock being excavated. The Indians also practiced this method of carving out blocks of stone using hammerstones (Proctor 1965, 1986). In addition, hammerstones were used to dress the blocks once they had been detached from the bedrock. Proctor experimented with this method of dressing stone blocks and found it to be relatively quick and easy. The faceted hammerstones that we recovered from TON-8 are very similar to the hammerstones found at both the Egyptian and Indian quarries and we are certain that they were used in stone working.

Two trapezoidal tools that we suspect are wedges for splitting rock come from Unit 1. Although both are fragments, it is clear that originally they were at least 11 cm long and probably much longer, and at least 6 cm wide. One is made of schist (FS 01-44) and the other of granodiorite (FS 01-40). They are unpolished, although shaped like an ax blade, they could not have had a sharp cutting edge because of their coarse grained lithologies. The surviving poll fragment shows end battering; the other sample is a medial fragment. Although it might seem unlikely that a soft rock type such as schist could be used as a wedge, soft material such as antlers and wood have been so used (Nelson 1987: 124) according to the ethnographic record.
We collected a polished greenstone celt from Unit 1 at TON-8 and another from the surface of TON-10. Originally these tools were trapezoidal in shape but they are smaller, made of finer material, and polished, unlike the wedges just described. However, the quality of the stone is not high and these are clearly functional tools. Both are fragments that were broken in the mid-section, and both had been reused. These tools probably were used initially for woodworking (e.g., Clark 1988: 139ff), but after breakage they may have been employed in stone working. Both have abraded facets that suggest use as abraders. The original cutting edge has survived on one celt is very dull. This same artifact has been reshaped to form a thin edge along what was originally a lateral side. Hayden (1987: 96ff) found that prehistoric celts were used by the highland Maya to peck milling stones. This could also have been their function at the TON-8 site, even though we did not find any metates. Even if they were not used to peck milling stones, it seems probable that the celts were used for stonework after they no longer served for woodworking. One greenstone flake (FS 01-118) was probably produced during celt sharpening.

We found two punch fragments, one of granodiorite and the other of gneiss, in Unit 1. These are from long cylindrical stones that were shaped by abrasion. Clark (1988: 14ff) found similar tools at La Libertad. The lithologies of the punches from La Libertad are fine-grained, whereas the two punches from TON-8 are coarse-grained, but both have the telltale nicks on the sides characteristic of this tool type. Clark makes a strong case that punches were used in indirect percussion to work obsidian (Clark 1988: 148). Although we found two fragments of obsidian blades, we did not find anydebitage or cores to support the inference that blade manufacture occurred on site. These tools may have been used as abraders (as in a rat tail file) in addition to their use as punches.

The granodiorite handstone (FS 01-135) from Unit 1 is typical of such tools from Mesoamerica. It is basically a waterworn cobble that has been ground flat on the two opposing broad faces. It is also end battered. We suspect that this is a general-purpose food-processing tool used for grinding and pulverizing. It is very similar to the handstones that Voorhies (2004) has found at sites dating to the Archaic period (7500-3500 years BP) on the south coast of Chiapas. However, this tool type is not a reliable temporal marker. Similar tools are used today in Chiapas kitchens.

Discussion of Sites TON-8 and TON-10

We think that the TON-8 ritual site and the nearby hard stone quarry site (TON-10) are best interpreted together. The two sites are in close proximity, and quarry debris, along with tools for stone working, were used in the floor fill of the rock shelter. Therefore, the sites must have been either contemporaneous or the quarry preceded the occupation at the rock shelter. Unfortunately, we have no definitive evidence regarding when the quarry was in use. However, we know that the slopes of Cerro Bernal were occupied principally during the Early Classic period, at the same time that large stone monuments were being erected in the region. This observation supports the view that the two sites were first formed during the Early Classic period, but, of course, this is not conclusive.

One possible interpretation about this pair of sites is that rituals were performed at the cave to propitiate the earth from which rock was to be wrested. In prehistoric Egypt, for example, the expeditions that were mounted to acquire large stones for building and sculpture were often commemorated by the creation of rock carvings and inscriptions at the quarries (Aston et al. 2000: 5). The Egyptian situation is instructive also because these expeditions to procure construction and sculptural stone were controlled by political leaders who sanctioned and sponsored them. For example, the opening of a new quarry was an official event with the date and purpose of the stone being inscribed on stelae (Arnold 1991: 31).

Clearly, the prehistoric people in the Cerro Bernal region were not politically centralized to the degree of the ancient Egyptians, nor was the scale of stone procurement at TON-10 remotely
DISCUSSION

This investigation of rock shelters on the loway, seaward facing flanks of Cerro Bernal has been an exploratory endeavor and, as such, has produced some surprises and many questions for future research. We were surprised to find so many rock shelters created by the positioning of huge boulders in this area, and we documented ten of these. All of these sheltered spaces are small, and most contained no surface indications of prehistoric use. However, surface indications, including architecture and artifacts, revealed that these shelters had been used in the prehistoric past and we investigated these further with subsurface excavations. We found that these four shelters were used during the Late Formative-Early Classic time interval when we suspect that a relatively large number of people lived on the slopes of Cerro Bernal. In addition, three of these shelters were used during the Postclassic period.

Despite such a small sample of rock shelters their archaeological features are varied and seem to indicate that shelters had several different functions. However, we are not in complete agreement about this. Voorhis and Kenttö think that the small shed-lined pit at Tres Cuevas was most likely used for food preparation, such as stone boiling of food, and that the large, rock-lined pit at Cueva de los Chinasos was used for food storage. Moyes finds such interpretations dubious because of the relative lack of comparative evidence in Mesoamerican societies either ethnographically or archaeologically. She also points out that archaeologically, without consideration of context, differences between storage and ritual offerings may be difficult to discern. However, as we discussed previously archaeological examples of storage pits in Mesoamerican caves and shelters do exist, and dry caves are commonly used for storage elsewhere in the world so this idea deserves further investigation.

Snyth (1991: 3) observes how little is known about domestic storage behavior in Mesoamerica and the difficulty this poses for archaeologists who need a reliable way of recognizing storage behavior in the archaeological record. Gorencki (1988), whose research area is Australia and New Guinea, makes the point that rockshelters are used for utilitarian purposes by both hunter-gatherers and people with food producing economies both in the past and today. He also emphasizes the fact that ethnarchaeological studies of such uses are almost non-existent.

We all agree, however, that Casa de Piedra had a ritual function. The presence of the prepared and painted wall at Casa de Piedra, coupled with the surrounding constructed space restricting access to the feature, indicates that by the Late Formative-Early Classic period a shrine was created in this location. Although it is less certain why this location was chosen to construct a shrine, comparative studies combined with the archaeological evidence available to us provide some strong possibilities.

As we mentioned in the introduction, archaeologists are beginning to understand the diversity of rituals associated with Mesoamerican caves. Evidence from the archaeological record is producing a wider variety of rites than were previously imagined based on ethnographic analogy alone, and is providing vital information regarding how these spaces were used. Political rites in caves are reported in Classic period epigraphy (Brady and Colás 2005; Colás 1998), Rain rituals (Andrews 1965, 1970; Moyes 2001, 2006, 2009; Riisolo 2001), rites of foundation (García-Zambrano 1994; Moyes 2005a; Moyes and Prüfer 2005, n.d.), termination rites (Brady and Colás 2005), accession rites (Helmske and Asen 1998, Helmske
of ancestral people. The seven-lobed cave of Chicomostoc was the ancestral cave of emergence among the Aztecs and is often pictured in ethnohistoric texts (see Heyden 1973; 2005). These places of emergence are strongly related to Maya notions of the Underworld, which is the underground realm from which all of creation originates.

For both ancient and modern indigenous peoples in Mesoamerica, the earth is a powerful force in the universe representing the nexus of all creation and destruction. It is both sacred and considered to be a living entity. While earth is represented in many landscape features (rocks, trees, rivers), one of its most powerful symbols is the mountain with a cave. This is well-illustrated by modern Q'eqchi' Maya belief, where both mountains and people possess wānq'awal (“personhood”) (Brady and Prüfer 2005b; Wilson 1995: 53).

Another important finding is that caves are integrally connected with water and fertility (Ashmos and Brady 1999; Benor Villarreal 1999: 41-46; Brady 1989, Moyes and Brady 2005, 2013). Rain is considered to be a terrestrial phenomenon, originating from caves, along with clouds, lightning, and wind. We can understand the origin of the concept when we consider that water from deep springs within the earth is often observed flowing from caves. In Mesoamerican religion, water emerging from the earth symbolizes fertility. We see this demonstrated at the Teotihuacan Pyramid of the Sun dating to AD 100. A man-made tunnel or “cave” stretches from the base of the central stairway to beneath the center of the pyramid (Manzanilla 2000: 98). In antiquity, water was channeled through a system of ditches into the tunnel so that it would flow out the entrance—the “cave’s mouth”—completing the image of a fertile sacred mountain (Heyden 1973, 1975; Millon 1983). Even earlier, a similar concept is illustrated among the ancient Maya in the murals at San Bartolo dating to 100 BC (Saturno et al. 2005). The north wall has a mural that depicts a creation event occurring at the mouth of a cave. In the event, maize stalks and water are being handed out of the cave mouth. The cave is illustrated as the opening of the jaw of an
anthropomorphic earth monster (much like those in later Aztec drawings) whose upper tooth is depicted as a stalactite.

We consider it likely that water-related rites were performed at the Casa de Piedra shrine because of its proximity to the perennial spring and the presence of the possible huchín within the constructed space. This is an appropriate ritual theme when we consider the general conceptualization of caves and rock shelters in Mesoamerica. We have speculated also that the adjacent rock quarry may be another reason that this location was imbued with special significance and have even noted that the shelter may have appeared to be zoomorphic and animate to ancient viewers. While these thoughts are unabashedly speculative, we hope that they spur further work into this neglected topic.

ENDNOTES

1. The Concepción site is variously referred to as a rock shelter and as a cave by Fowler and MacNeish (1972).

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