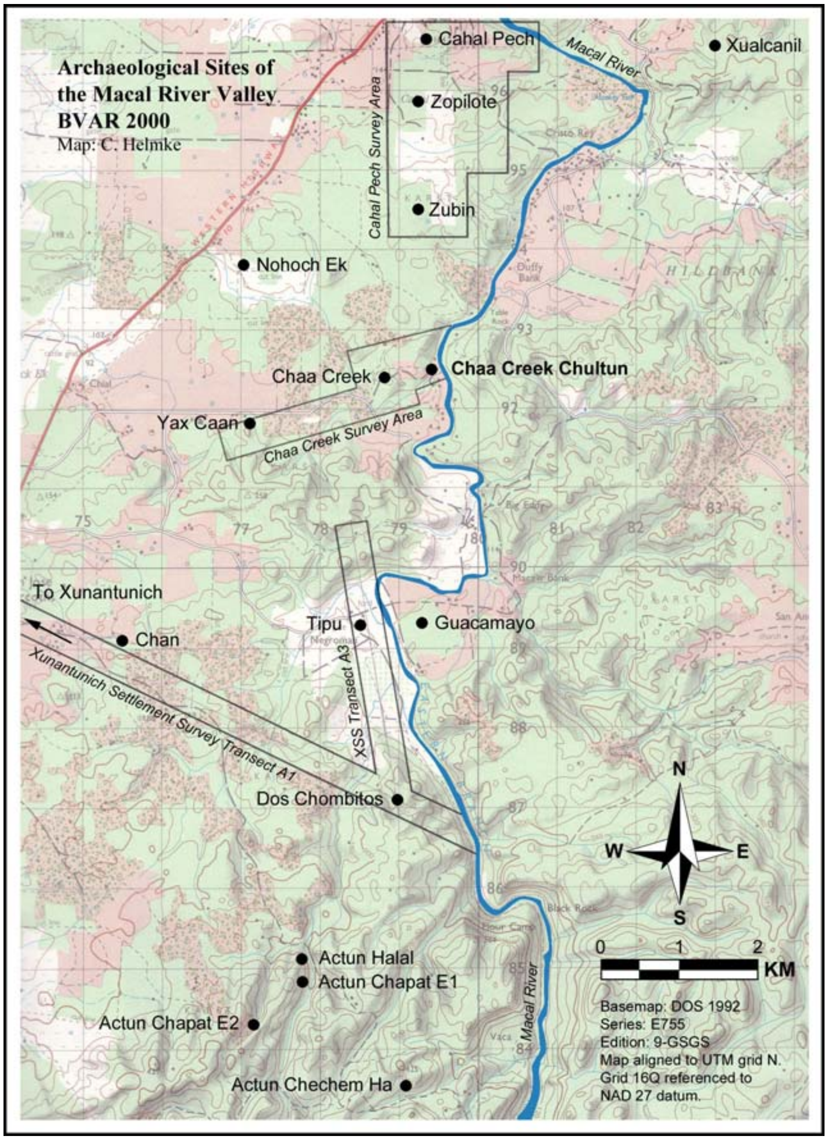
The Western Belize Regional Cave Project
A Report of the 1999 Field Season



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CAMERON S. GRIFFITH — Bloomington, Indiana, 1999

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PRELIMINARY INVESTIGATIONS AT THE YAXTUN GROUP, BAKING POT

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INTRODUCTION

The site of Baking Pot is located on the southern bank of the Belize River, 8 kilometers northeast of San Ignacio town and five kilometers upstream from Barton Ramie (Figure 1). It is one of several medium-size centers found along the upper Belize River valley (Willey et al. 1965) and is relatively equidistant from Cahal Pech to the southwest and Blackman Eddy to the east (Figure 2). Unlike most other sites in the area, however, its location on farmland owned by the Belize Government has served to protect the site from looting.

In 1992, the Belize Valley Archaeological Reconnaissance Project (BVAR) began investigations at Baking Pot as part of a larger study of the Upper Belize River Valley. Previous work by the BVAR project concentrated on several sites such as Cahal Pech, Xualcanil, Zubin, and Pacbitun (as well as settlement groups in the peripheries of these larger centers). The primary purpose of these investigations was to gain a better understanding of the regional settlement hierarchy. In 1992, the BVAR Project shifted its attention to Baking Pot and has since then focused much of its research on household groups at this site. During the 1999 field season, the project's focus on household archaeology included excavations of a formal patio cluster (the Yaxtun Group) near the site core. The primary interests of the research at this settlement cluster are threefold. The first is to salvage cultural remains (architecture, artifacts and features) of the terminal phase of occupation before they are destroyed by modern farming activity. The second goal is to determine the chronological development of the patio group. The third goal of excavations is to ascertain the status of the occupants in relation to other house mounds and plazuela groups at Baking Pot and within the Belize Valley in general. This paper provides a preliminary report of the investigations at the Yaxtun Group in 1999.

PREVIOUS RESEARCH AT BAKING POT

Oliver Ricketson of the Carnegie Institution led the first significant archaeological investigations at Baking Pot in 1924. Focusing entirely on Group 1 (Figure 1), Ricketson trenched Structure G in an attempt to find cut stone architecture, ceramics to date the site, and grave goods fit for display in an American museum. He also cleared the adjoining structures, M and J, and placed a few small units in Structure B and Structure E. A small mound (Mound I) was also excavated because Ricketson (1931:5) felt that the workmen needed some archaeological experience prior to excavating the larger structures.

Mound I was found to “reveal nothing of importance” (ibid:5). Although a cut-stone retaining wall about 60cm high surrounded the building, no plaster floors were found and few artifacts were recovered. Ricketson further noted that “trenches through the retaining walls into the center of the mound revealed no burials or other features of importance” (ibid:5). Instead of the “quality” artifacts he hoped to recover, he discovered “a broken maul, a few coarse sherds, and a few flints” (ibid:5). Failing to recover the types of materials he sought, Ricketson shifted his attention to the larger mounds in Group 1.

During the initial trenching of Mound B, no masonry architecture was found. This held true for all of the structures excavated by Ricketson at Baking Pot, with the exception of Structure G (ibid:5). His investigations of the latter mound led Ricketson to suggest that Structure G was a burial mound and not “a substructure for a building, [as] is indicated by the even slope of its sides up to a maximum height at the center, and by the absence of worked stone or any evidence of building foundations on the top” (ibid:7).

Although Ricketson believed that Baking Pot had a large population from the “almost innumerable house-mounds with which the clearing is dotted” (ibid:24), he maintained that Baking Pot was never a major Maya center. He came to this conclusion based on what he thought was the lack of stelae at the site (an assessment recently proven incorrect) and because of the “relatively small size of the plazas, when compared to those of the more important Peten sites; and also the general absence of cut stone either for temples or veneering” (ibid:25). Because of the limited nature of his work, Ricketson was also unable to accurately determine the temporal extent of occupation at the site. Deploringly, he also failed to backfill his excavation trenches thereby allowing rain and the elements to hasten the erosion of already fragile structures.

In 1949, in response to reports that construction crews in search of road fill were threatening the monumental structures in Group II, A. H. Anderson cleared the retaining walls of the primary structure in the southern section of the site core. Unfortunately, Anderson never published any information on his work, and thus we know little of the information he may have collected at Baking Pot.

Several years later, Gordon Willey of Harvard University conducted limited research at Baking Pot during the spring of 1956. Willey’s investigations, however, did not focus primarily on the site but were part of a larger regional (Belize Valley) settlement study with primary interests in the Barton Ramie area. Willey’s research at Baking Pot consisted of four test excavations for the purpose of “obtaining stratigraphic pottery samples and examining the vertical structure of some of the small, house-type mounds which in outward appearance are identical with those at Barton Ramie” (Willey et al. 1965:305). Three of the test units were in house mounds, about 100 to 200m west of Group 1. The fourth test unit was placed in the center of Plaza 1 in Group 1 (ibid). Willey was able to propose a chronology for prehistoric Maya occupation of the site. He noted that ceramic remains suggested that the site was

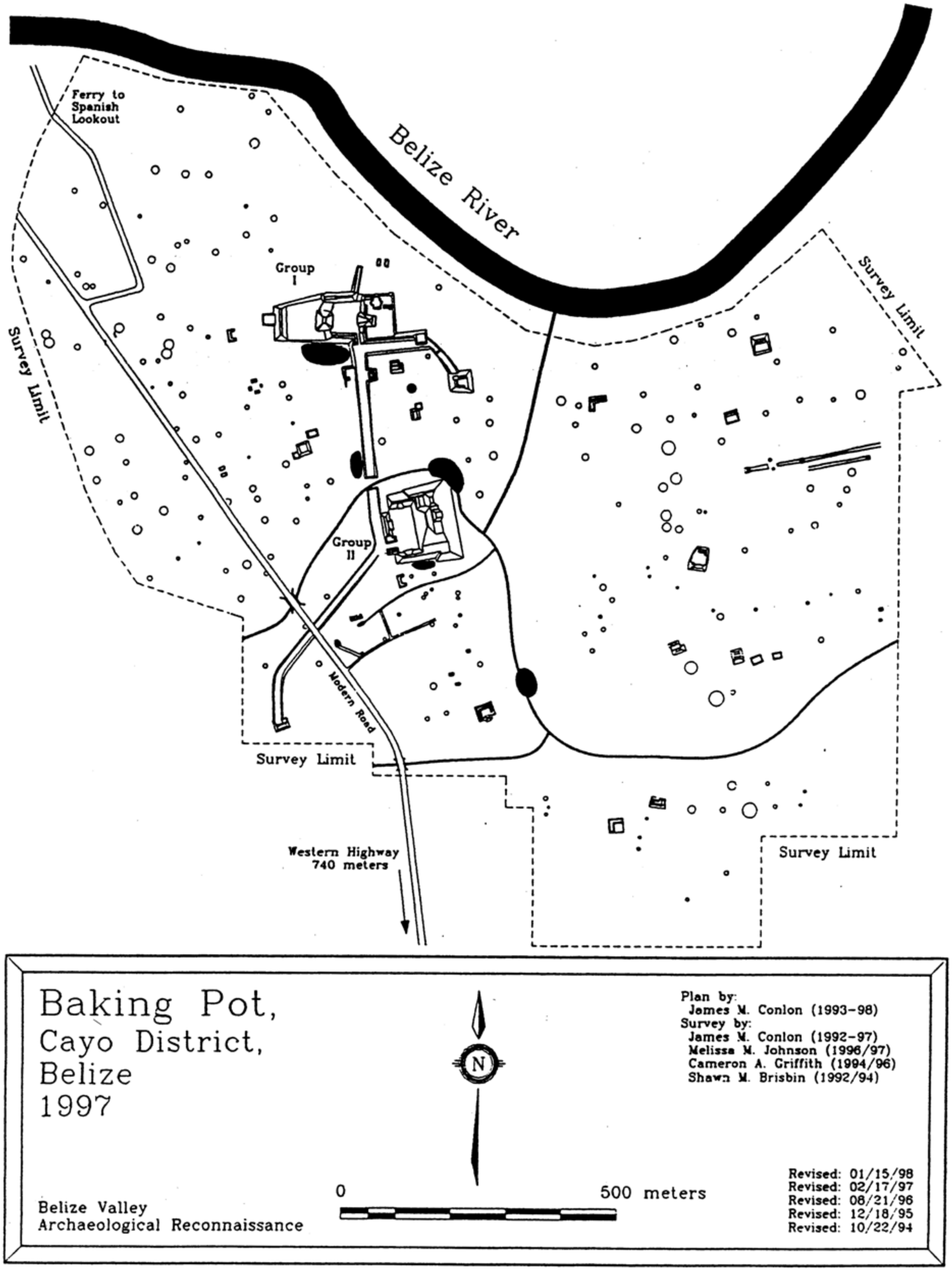

Figure 1: Map of Baking Pot

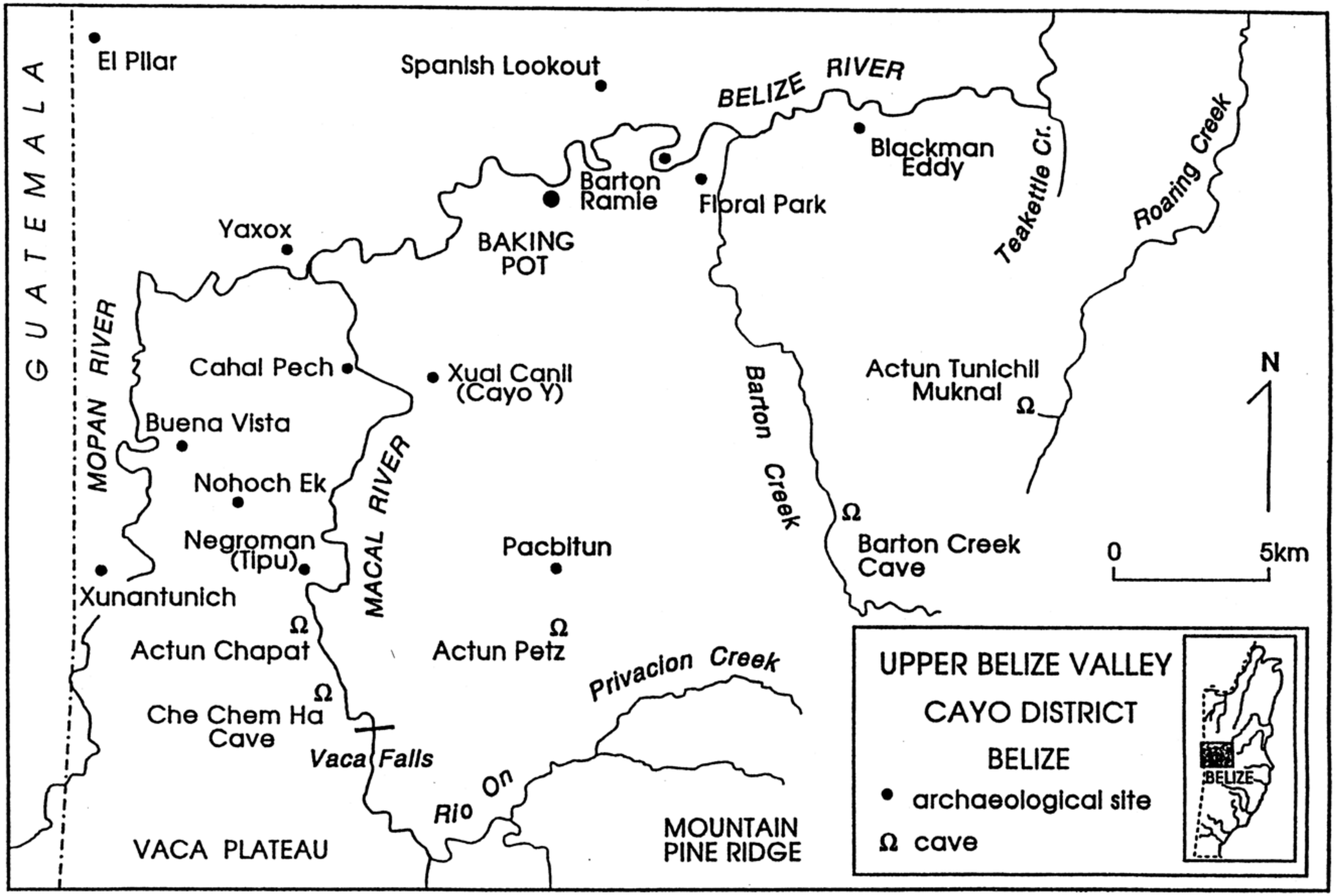

Figure 2: Location of Baking Pot within the Belize River Valley

occupied from the Late Preclassic period through the Early Postclassic (300 B.C. - A.D. 1200), with most of the monumental construction occurring during the Late Classic (A.D. 600 - 800) period (ibid).

Following Willey's limited excavations at the site, William and Mary Bullard of the Royal Ontario Museum conducted a single season of investigation at Baking Pot in 1961. At this time the Bullards focused specific attention on Group II of the site core, excavating on Structure II-A, Structure II-D, and the Group II ballcourt (Bullard and Bullard 1965). The aims of the 1961 excavations were threefold. First, they sought to "obtain a collection of exhibitable artifacts well documented by provenience" (ibid:11). Secondly, Bullard and Bullard wanted to excavate Structure A, to determine the construction of the building and to test the mound core "in the hope of bringing to light any buried construction or caches" (ibid:11). The third goal of the 1961 excavations was to clarify the wall lines of Structure A, but this goal was thwarted due to complex rebuilding phases as well as the fact that some portions of the temple had been removed by the quarrying operations in 1949 (ibid).

The Bullard's excavations noted that Structure A rose 17 meters above the plaza floor and that it probably did not support a vaulted superstructure. Excavations also revealed two rooms near the base of the pyramidal structure. Bullard and Bullard refer to these rooms as a small shrine or oratory rooms (ibid:12). Room 1 was built at the base of the structure, while Room 2 is slightly above Room 1, at the base of the main stairway (ibid). The Bullards suggested that the rooms might have been buried by modifications during the last occupation phase. They further suggested that although Structure A was modified often, it was built exclusively in the Late Classic, primarily during the Spanish Lookout phase (A.D. 700-900).

Almost thirty years after the Royal Ontario Museum's research, the Belize Valley Archaeological Reconnaissance Project began investigations at Baking Pot in 1992. The project initially focused attention on a peripheral plazuela group, known as Bedran, located about two kilometers west of the site core (Conlon 1993). The primary goals of this operation were to acquire data that could be used for determining the diachronic development of the plazuela group and secondly, to provide a basis for intragroup comparison (ibid:188). During these investigations, Conlon found evidence for occupation spanning from the Early Classic to the Late Classic period, after which the site was abandoned (ibid).

Other investigations at Bedran focused specifically on the eastern mound of the settlement in an effort to determine the function of the structure (Powis 1993:212). The discovery of several burials and caches along the primary axis of the mound subsequently led Powis to suggest that the structure may have served as a family shrine. In addition to the burials and caches, this possible function was also supported by the presence of "rare architecture in the form of a round platform, the number of associated features, and the quantity and quality of ritually deposited artifacts" (ibid:220). The location of family shrines on the eastern side of plazuela groups is a relatively common feature in the Maya lowlands (ibid), thus suggesting that the configuration of the Bedran Group reflected this lowland tradition. The eastern shrine, along with the other structures in the plazuela, appear to have been initially constructed during the Early Classic, with modifications and use extending into the Late Classic period.

Work at the Bedran site continued during the 1993 field season, and in 1994 the causeway connecting Group I and Group II of the site core was tested in an effort to determine its date of construction. Excavations by Cheetham (1995) suggested that the causeway was built during the Spanish Lookout phase of the Late Classic. In 1995, Conlon tested two mounds flanking the southern entrance of Plaza 2 in Group I to ascertain whether the two structures (Mounds E and F) formed a ballcourt (Conlon 1996). Previous research had noted two courts at the site, one to the north of Group 1 and another at the western entrance to Group II. During preliminary investigations by the BVAR Project in 1994, Awe (personal communication 1999) noted that the southern access to Group I appeared to be flanked by two structures of similar size and north/south orientation and suspected that the structures probably represented a previously unrecognized ballcourt. Conlon's investigations were therefore an attempt to validate or negate this assumption. Following his investigations, Conlon concluded that the two structures did indeed appear to form a ballcourt, but due to the limited nature of the excavations, little could be said about the actual style of the architecture.

During the 1996 field season, research focused on the monumental architecture in Plaza 2 of Group 1 (Awe 1997) and on another formal patio cluster known as the Atalaya Group (Moore 1997). Since that time, work at Baking Pot has continued, with the focus of excavations shifting from monumental architecture to the study of household archaeology. During the 1997 field season, Moore continued his study at Atalaya (Moore 1999), and during the 1997 and 1998 field seasons, Piehl focused on excavating two separate house mounds at the site (Piehl 1998, 1999). Both found evidence for construction spanning from the Early Classic to the Late Classic periods.

RESEARCH DESIGN AND ORGANIZATION

During the 1999 field season, three separate loci were selected for excavation at Baking Pot. Jennifer Piehl of Tulane University supervised two of the operations and the author and Dr. Jaime Awe supervised the other. Piehl's research focused on two mounds at different distances from the site core and sought to determine the status of the occupants and to identify activity areas. The third locus chosen for investigation was a large plazuela about 100 meters southeast of Group I. This large plazuela designated the Yaxtun Group, is the focus of this report.

The Yaxtun Group consists of three, possibly four, structures that were erected atop a large platform. The mounds are roughly aligned with the cardinal directions. The northern and western structures were tested during the 1999 season, with the southern structure and a possible eastern structure slated for investigation during the 2000 field season.

The overall objectives of the BVAR project are "to gather data that will aid in understanding complexity, morphology, evolution, and interaction at the site of Baking Pot, and regionally within the Belize Valley" (Awe 1997; Moore 1997:49). The research interests at the Yaxtun Group reflect the overall goals of the BVAR project. During the 1999 season work at the Yaxtun Group also aimed at gaining an understanding of the temporal development of the plazuela, to assess the nature of terminal phase occupation and, if possible, to record activity areas in an effort to determine structure function.

To achieve these objectives, several excavation units were opened at each of the two mounds under investigation. Because our field season was too short to completely and horizontally excavate any of the structures, to gain a maximum amount of data we decided to place a 2 x 6 m trench across the northern mound (Structure 198) and to expose the eastern face of Structure 199. In each structure and the plaza, units (ranging in size from 1 x 1 m in Structure 199 to 2 x 2 m in 198) were also excavated to sterile level to determine the chronological sequence of construction. Other units were placed to clear the terminal and penultimate phases of architecture but did not continue to sterile levels. The units were excavated by cultural levels which were either defined by plaster or tamped clay floors. The results of these excavations are presented below.

EXCAVATION RESULTS

Structure 198

Located at the northern end of the plazuela, Structure 198 is the tallest mound in the plazuela at 2.8 m in height. Its long low shape further suggests that it may have originally served as a building platform that supported a perishable superstructure. These characteristics, and the location of the mound on the north side of the plazuela, contrast with the spatial and architectural configurations noted at the Bedran and Atalaya Groups. At both of these previously excavated plazuelas at Baking Pot, the largest and tallest platforms were located at the southern edge of their respective plazas. As noted below, it is possible that these differences may reflect temporal changes at the site of Baking Pot.

Preclassic Occupation

Excavations during the 1999 field season uncovered at least 5 construction phases in Structure 198. The earliest phase was represented by a low building platform that likely supported a wattle and daub building. The surface of the platform consisted of a poorly preserved plaster floor that had been laid over small river cobbles that were used as ballast above an alluvial soil fill. These materials and type of construction reflect a pattern that is typical at Baking Pot and its occurrence in Preclassic levels at Yaxtun suggests that it persisted throughout the occupation of the site. No features were associated with the earliest platform floor, and only a few potsherds and lithic debitage were recovered in the construction fill.

The second phase of modification also appears to have been completed during the Late Preclassic. The construction techniques employed in this platform differ slightly from its precursor in that a 6 cm thick tamped clay floor represents the surface, with no cobbles for ballast. This was the only tamped clay floor in either Structure 198 or Structure 199. As with the previous floor construction, no features were associated with the floor and most artifacts removed from the fill were ceramic.

Evidence of the final Late Preclassic construction phase was a poorly preserved plaster floor. Built into this floor was a hearth 1 m long by 1 m wide. Characterized by a layer of red clay covered by 2 - 4 cm of thick charcoal lens, the hearth was subsequently filled in with limestone blocks prior to the construction of the next architectural phase. Despite careful excavation and screening of the hearth, no ceramics or animal bones were found in association with the feature. Charcoal was collected for radiometric dating, but results are not yet available.

Late Classic Occupation

Structure 198 underwent major modification during the Late Classic period. During this time, over 80 cm was added to the fill, and a retaining wall of well-cut limestone blocks bordered the platform. The surface of the platform is represented by a well-preserved plaster floor, which is 4 cm thick at maximum. Within the construction fill of the platform several Early Classic sherds were recovered but most of the ceramics consisted of Spanish Lookout types, thus suggesting a construction date within the Late Classic period. Along the eastern section of the excavations an intrusive pit was uncovered. The outside layer of this intrusive feature included a band of burnt clay with small flecks of charcoal lining the inner side. Unfortunately, the charcoal was not abundant and therefore only a small sample was recovered. Within this feature there were also a few Early Classic polychrome pottery fragments. Hopefully, dating of the charcoal will provide a more accurate date for this possible termination cache and for the construction of this phase of modification.

Despite the fact that only a small section of the architecture from the penultimate phase was uncovered by the 1999 excavations, the use of imported limestone blocks, (the nearest limestone outcrops to the valley are between 2 to 3 kilometers away), the presence of polychrome pottery, and the overall size and quality of architecture indicate that the occupants of the Yaxtun Group may have enjoyed a relatively high status within the local community. A cut-stone wall, six to seven courses high, and a central outset that possibly had a central stairway bordered the platform. Unfortunately, the stairway appeared to have been dismantled during the terminal construction phase, thus inhibiting an accurate reconstruction of this section of the architecture.

Postclassic Occupation

The last phase of construction consists of a very poorly preserved plaster floor, approximately 10 cm above that of the penultimate phase. It appears that modifications at the summit of the structure consisted only of a re-plastering of the previous Late Classic floor. The sherds found in the fill of this floor are of very late date, and include types ranging from the Spanish Lookout to New Town ceramic complexes. Diagnostic pottery included fragments of a Cayo Unslipped: Cayo Variety "pie crust" olla rim as well as a cached Plumbate vessel. Especially interesting for the study of status and wealth of the occupants was the discovery of a Panel B from a Pabellon Molded-Carved vessel.

The terminal architecture is quite crude in contrast to the penultimate structure. Only a single line of crude limestone and alluvial boulders outline the perimeter of the platform. In some cases it also appears that cut limestone blocks from earlier structures were scavenged for construction. It is possible that during this phase the occupants of the plaza group were unable to harness the manpower necessary to import cut stone from the distant limestone hills and made do with materials more easily available to them.

Abandonment

The abandonment of Structure 198 occurred during the Postclassic. Seven scroll feet from Augustine Red: Augustine Variety and Paxcaman Red:Paxcaman Varity vessels, along with 8 other vessel feet from the Early Postclassic period were recovered above the terminal phase construction. Although we were greatly concerned about the destructive effects of plowing in the pasture where these structures are found, this activity exposed an abundant number of Postclassic materials. In addition to the ceramics noted above, other Postclassic artifacts included side-notched obsidian arrow points, spindle whorls, and several net sinkers.

Ritual Activity

Excavations within Structure 198 uncovered several features associated with ritual activity. Under the penultimate phase plaster floor, a cached rounded vessel was found. In the fill of the penultimate phase were also the remains of a termination cache. A charcoal layer surrounded by clay was found extending from floor #3 to floor #4. Inside this feature were several painted Early Classic sherds, but because of the patchy nature of the charcoal layer, excavators did not separate cultural remains from this area until it became evident in the side wall. Outside of the penultimate phase of architecture, on the plaza floor, were several cached sherds including approximately half of a Plumbate vessel. Also unearthed in this small area were several fragments of a three-pronged censer.

Structure 199

Structure 199 is located on the western side of the plazuela group. Smaller than Structure 198, this structure is raised about 50 cm above the plaza floor level. The terminal structure is approximately 8.4 m long and 3.5 m wide. At its northern end, Structure 199 joins with Structure 198 forming an L-shaped construction.

Late Classic Occupation

Excavations in Structure 199 revealed that this platform has a much shorter construction history than Structure 198. The earliest occupation is of Late Classic date. The earliest construction phase is represented by a low platform with a poorly preserved plaster floor above alluvial clay fill. Few chipped stone artifacts along with pottery sherds were recovered from the fill.

The second construction phase was represented by a possible plaster floor that was poorly preserved. This suggests that like Structure 198, the only modification to the original Structure 199 platform may have been a replastering of the previous surface. Like the previous level, little more than Late Classic ceramics were removed from this context.

The latest floor recorded on Structure 199 was by far the best preserved. This surface was similar to the penultimate Floor #4 of Structure 198. Both were constructed of thick layers of limestone plaster and appear to be coeval in date. Within this phase of construction several artifacts, including a shell adorno, mano and metate fragments, and obsidian blade fragments were recovered.

Along the eastern limits of the excavation, the entire terminal phase retaining wall of the platform was exposed. Like the platform floor, the architecture was similar to the penultimate phase of 198. It consisted of a retaining wall that was constructed of well-dressed limestone blocks that rose approximately 80 cm above the plaza floor. The retaining wall was approximately 6 to 7 courses high and its juncture with Structure 198 suggests that the two platforms were of similar height during this phase of occupation. Unlike Structure 198, however, it does not appear that Strucuture 199 was modified during the Postclassic period. It is clear, however, from the artifacts on the surface of the mound that the dwelling may have been in use during that time.

Abandonment

The abandonment phase of Structure 199 dates to the same period as Structure 198. Postclassic ceramics and a spindle whorl were found on top and in front of the structure. Three jade beads, several mano and metate fragments, and jaguar teeth were found on the plaza floor in front of the structure, as were two fragments of a Pabellon Molded-Carved vessel. One of the jades was a fragment of a small ear spool, and the other two are beads that were probably part of a necklace. Along the outer edge of the retaining wall (at plaza level) we also discovered several pedestal bases of red slipped ceramic vessels that appeared to have been purposely cached or deposited in that location during abandonment of the plazuela.

At the juncture of Structures 198 and 199 there was a cache of highly eroded, ash tempered sherds probably dating to the Terminal Classic - Early Postclassic period. It appears that the two structures may not have been joined together until late in this construction phase, because the wall of Structure 198 extends beyond the point where it connects with Structure 199. It is possible that the two structures were joined to limit access into the plaza.

Structure 199 contained very little evidence of ritual activity. This, however, may in part reflect the limited extent of our excavations. Much more of the interior of Structure 198 was excavated, which may account for the greater evidence for ritual activity there than at Structure 199. Hopefully, excavations planned for the upcoming season will help to verify these preliminary observations.

The Plaza

Preclassic Occupation

Excavations in the plaza, directly in front of Structure 198, revealed three phases of construction. The first plaza floor was represented by a layer of ballast with no evidence of a plastered limestone surface. Cultural remains below the first floor consisted of numerous shells of the freshwater snail (*Pachychilus glaphyrus* and *Pachychilus indiorum*) locally known as jute, and of ceramics that were exclusively of Late Preclassic date (Sierra Red, Laguna Verde Incised, Never Delay Impressed, Paila Unslipped, Sapote Striated). Most of the pottery was concentrated in a large cache discovered 1.6 meters below modern ground surface. The pottery included 6 partially reconstructable vessels that were nested on top of each other.

Late Classic and Postclassic Occupation

The second (penultimate) and third (terminal) plaza floors were dated to the Late Classic and were constructed in the typical ballast-and-plaster method. Above the third plaster floor we encountered a large concentration of animal bones and approximately 375 land and marine shells. It appears that these materials were simply thrown down from the Postclassic platform onto the plaza area. A similar pattern was noted above the plaza floor in front of Structure 199, but the overall quantity of faunal remains were less than in front of Structure 198.

DISCUSSION

It was noted above that the primary objective of the research at Baking Pot is to contribute to the understanding of the nature and role of prehistoric populations at major sites in the Belize Valley. Investigations focus on micro-settlement analysis in order to determine the evolution of courtyard groups, the function of structures within these groups, and the overall status of their occupants within the site hierarchy. Because previous research has recorded evidence for Postclassic activity, considerable effort is also aimed at understanding the nature of terminal phase occupation. The research at the Yaxtun Group, though preliminary, provides important new information that aids in addressing these questions.

Survey of the Yaxtun Group noted that the plazuela consists of three, and possibly four, mounds that were erected on a raised platform some 100 meters southeast of Group 1 of the site core. Excavations on the northern (Structure 198) and western (Structure 199) mounds produced evidence that suggests the plazuela attained its final configuration by the gradual addition of structures above the large raised platform. While this type of evolution through accretion reflects the traditional pattern of plazuela development noted at most lowland Maya sites, it is important to note that it is not always the norm. Allan Moore's (1999) research at the Atalaya Group at Baking Pot, for example, noted that the four mounds of that formal patio cluster were all constructed contemporaneously in the Late Classic period and that the group may have originally been planned to have a formal configuration. In comparison, the evolution of the Bedran Group mirrors that of Yaxtun, but while the latter was first occupied during Late Preclassic times, the earliest evidence for construction at Bedran dates to the Early Classic. The Yaxtun Group also differs from Bedran and Atalaya in terms of their dates of abandonment. Both Bedran and Atalaya produced evidence for Terminal Classic activity but none produced conclusive evidence for Early Postclassic occupation. This data is significant because it serves to demonstrate that the development histories and trajectories of peripheral settlements often differ from one locus to another, and that these differences must be factored in by settlement studies.

The data recovered from Structures 198 and 199 suggest that both likely served residential purposes. The size and morphology of both structures reflect the forms of building platforms that supported perishable superstructures. The presence of daub fragments with pole impressions suggests that the walls of the buildings were made from poles that were covered with clay. A relatively diverse number of household objects recovered by the excavations support this interpretation. At Barton Ramie, Willey et al. (1965) noted that mano and metate fragments, utilitarian chert bifaces, obsidian blades, spindle whorls and utilitarian pottery were among the typical artifact types recovered in households. The artifact assemblage from Structures 198 and 199 included these types with the addition of netsinkers and arrow points.

Determining status and wealth from archaeological data is often a tenuous exercise. In their study of settlements in the Belize Valley, Willey et al. (1965) suggested that the majority of the small mounds were residential, and all of the plazuela groups were upper class residential structures. More recently, Ball and Taschek (1986) designated certain artifact types as status indicators in their study of households at Buena Vista. They argued that items such as olive shell tinklers, pendants, medallions and jadeite were typically found in affluent households. An examination of the cultural remains from the Yaxtun Group in reference to both Willey's and the Ball and Taschek's status indicators would lead us to assume that its occupants enjoyed relatively high status and wealth. They had access to exotic items such as jade, obsidian and marine shell, and lived in homes constructed with large cut limestone blocks that had to be brought in from the foothills over two kilometers away. The fragments of one, possibly two, Pabellon Molded-Carved vessels with Primary Standard Sequences lends support to this assessment because this type of pottery and other ceramics with functional glyph bands have primarily been recovered in high status dwellings at lowland sites (Helmke, this volume).

Another interesting result of the research at the Yaxtun Group is that the excavations recovered substantial evidence for Postclassic occupation. With the exception of Tipu, few sites in the Belize Valley have produced data from the Postclassic period, thus remains from this phase of occupation at the Yaxtun Group add to the limited picture of late Maya activity in the region. Postclassic remains from Yaxtun include the terminal phase architecture of Structure 198, and several artifacts that were recovered from both Structures 198 and 199. The Early Postclassic phase of Structure 198 suggests some interesting changes in construction between Late Classic and Postclassic times. In place of dressed cut-stones, most platforms have retaining walls that were constructed of crude limestone blocks, river boulders, and a few dressed limestone blocks that were likely scavenged from earlier structures. Changes in ceramic styles are also manifested with the introduction of new types (i.e. Tohil Plumbate: Variety Unspecified, Daylight Orange: Darknight Variety, Augustine Red: Augustine Variety, Paxcaman Red: Paxcaman Variety, Ixpop Polychrome: Ixpop Variety). Particularly diagnostic of these vessels are modeled supports in the form of scroll feet and hour glass forms. Non-ceramic artifacts that make their appearance during this phase include side-notched arrow points that appear to have been produced from obsidian blade fragments. Grooved stones and ceramic net sinkers are also common, and there appears to be an increased frequency of spindle whorls during this time. Whether the latter reflect increased production of cotton, changes in the local economy, or craft specialization has yet to be determined. Future research will hopefully provide more clues to these and other questions.

CONCLUSION

Preliminary investigations at the Yaxtun Group of Baking Pot suggest that that the plazuela group was first occupied by the ancient Maya in the Late Preclassic period. By Late Classic times the settlement had developed into a formal patio cluster with the subsequent construction of several structures above a large platform. The plazuela was eventually abandoned towards the end of the Early Postclassic period. Cultural materials discovered on Structures 198 and 199 suggest that these two mounds may have originally served as residences for individuals of relatively high status among the population of the site. How they relate to the elite within the site core, however, cannot be ascertained at this time. Further excavations during the 2000 field season should help clarify this and other important questions regarding the inhabitants of the site.

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TERMINAL CLASSIC MOLDED-CARVED CERAMICS FROM STRUCTURES 193, 198 AND 199, BAKING POT, CAYO DISTRICT, BELIZE

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INTRODUCTION

This technical report describes the transitional Terminal Classic to Early Postclassic (ca. AD 850 - 950) sherds of molded-carved vases recovered from residential structures in the immediate vicinity of the epicenter of Baking Pot. The data presented herein are part of a growing database on identical ceramic specimens from at least 25 sites in both Belize and Guatemala. An overview of intersite distribution is included so as to give an estimate of spatial distribution. Detailed information is presented on the physical characteristics of the Baking Pot sherds in anticipation of a new type designation. This new type and associated varieties will incorporate the Baking Pot data to formulate the range of variability within the type. In addition, broad descriptions of the iconographic program and epigraphy are presented. The temporal distribution is also assessed on the basis of style and site-specific associations.

COMMENTS ON TYPE, MODE, AND PASTE

The molded-carved specimens in question are particularly diagnostic of the surface treatment, decorative modes and form of the vessels from which these sherds derive. The elaborate panels and the decorative modes of these vessels are so distinctive that these can be sorted immediately in the field. The types that are defined by contemporaneous and stylistically similar decorative modes and similar surface treatments are the Pabellon Molded-carved (Smith & Gifford 1966; Adams 1971; Sabloff 1975:194-198; Culbert 1993: Fig. 98c1) and Sahcaba Modeled-carved types (Smith & Gifford 1959; Smith & Gifford 1966; Sabloff 1975; Culbert 1993: Fig. 145a).

Stylistically similar specimens have been identified in Belize but have not been assigned to these existing types. This reluctance is based on the recognition that these specimens differ sufficiently from the two established types so as to fall under another designation. The two established Peten types differ from the Belizean specimens in numerous ways including paste characteristics, form, and the presence of viable glyphic texts. It should be noted that the Fine Orange paste utilized in the production of Pabellon vases was not utilized for the Belizean vases (see Sabloff 1982). The specimens in question were tentatively designated as “Belize Modeled-carved” (Awe et al. 1984; Awe 1985: Fig. 100; Graham et al. 1980: 166; Graham 1987: 79; Walsh 1985: 137). Nonetheless many salient differences exist between these Peten type:varieties and the Molded-carved specimens from the eastern Peten and Belize (see Helmke et al. 1998; Helmke 1999: 2-3). Although over 500 sherds of these vessels have been unearthed in Belize since the 1930s these specimens have never been properly classified into a ceramic type.

When Smith and Gifford established the Pabellon and Sahcaba types for the Uaxactun material they identified the surface treatment as Modeled-carved (Smith & Gifford 1959, 1966). In his analysis of the Altar de Sacrificios material of the same type, Adams suggested an alteration of the surface treatment designation to Molded-carved (Adams 1963, 1971). This modification was based on the observation that the decorative scenes were predominantly produced with the use of a mold or template and that the finer details were subsequently applied by a combination of gouging, carving, and incising (Gifford & Kirkpatrick 1996). In keeping with this change, the designation of Molded-carved has been maintained by other ceramicists in their analyses (e.g. Ball 1977; Adams & Jackson-Adams 1991). Although less definite, evidence does suggest that Belizean examples were produced by similar means and thus the Molded-carved designation is applied to these specimens also (e.g. Graham 1980: 164; Helmke 1999a). Consequently the Molded-carved designation will be used to designate the surface treatment of the vases although no discrete type has yet been officially established.

Belize Molded-carved ceramics enjoyed a wide distribution in the Terminal Classic throughout Central and Northern Belize as well as in the Eastern Peten. Although several varieties are beginning to be identified on the basis of iconographic, epigraphic, and paste constituents, all Belize Molded-carved specimens have the same vessel shape and all have the same set of decorative modes (Helmke n.d.b). One variety has been distinguished on the basis of the standardized iconographic program and hieroglyphic text that adorn them and have been provisionally referred to as “Caves Branch Variety” (Pendergast 1982, 1990; Helmke n.d.b). Analysis of this “variety” reveals that these specimens cross-cut four of the five wares identified at Barton Ramie for the Spanish Lookout Complex (Helmke n.d.b). With the exception of Uaxactun Unslipped all other wares are represented among the Altun Ha specimens, which represent the largest Belizean collection of this material (see Gifford 1976: Fig. 13; Helmke n.d.b).

Interestingly all the molded-carved sherds from Str. 198 appear to be related to the Pine Ridge Carbonate Ware, while the sherds from Str. 193 and 199 may be of Vinaceous-Tawny Ware. Thus although the sherds are fragments of vases that had exactly the same shape and decorative modes, identical iconographic programs and glyphs, and analogous surface treatment, these sherds cannot be assigned to a single type. This is due to the fact that the type:variety system relies on paste attributes in the definition of types (see Gifford 1976: 9 - 34 passim). In the Baking Pot context (and at several other sites) the use of paste attributes for the isolation of types splits up identical specimens on the basis of one technological attribute. The information that can be gleaned from the intrasite and regional analysis of pastes and ceramic groups has been elegantly presented by Ball (1993). Nonetheless in the same effort he makes a strong point for single-paste variant assemblages being the result of multiform, multitype, ceramic groups that may have been fired together as a single lot (Ball 1993: 245, Figs. 1 & 2). Thus, although the focus on paste variants in the construction of ceramic groups must remain an important although indirect approach in the identification of ceramic production “communities” (Ball 1993: 245), the importance of form and mode-oriented studies are again relegated to the background. The type:variety system provides an uneasy compromise between the emphasis placed on paste and the ceramic group versus an emphasis on the combinations of mode and form.

Although it seems likely that vases of the "Caves Branch Variety" would have been next to indistinguishable to the ancient Maya consumer, the type:variety system imposes that these identical vessels are split up into separate types on the basis of paste. From the perspective of the archaeologist and the ancient ceramic manufacturer the distinction between pastes is of great relevance. From the perspective of the ancient Maya consumer, however, these vessels must have been perceived as forming a synonymous assemblage. Adding weight to this consideration is the fact that the vessel type of all "Caves Branch Variety" vases is designated by a unique "vessel type" (in epigraphic terminology) glyphic collocation read *ak'utu'*, that has only been identified on vessels of this "variety" (for comparison see Houston et al. 1989). Thus although it remains difficult to fit these molded-carved vases into the type:variety system, it seems clear that the Maya had a readily available semantic category that disregarded paste attributes. Since the Maya were grouping all these vessels under the same heading it may be beneficial to keep all Belizean Molded-carved vases together in the same type, particularly since it is the ancient Maya that archaeology seeks to understand. Perhaps the only solution is to define "varieties" of the Belize molded-carved "type" on the basis of vessel form, modes, iconographic programs, and glyphic texts while allowing paste attributes to serve as the single characteristic of "sub-varieties."

INTERSITE DISTRIBUTION (Figure 1 and Table 1)

Belize Molded-carved ceramics were widely distributed in the Terminal Classic (AD 850 - 950) throughout Central and Northern Belize as well as in the Eastern Peten (Figure 1). Below are listed all ceramic specimens of the tentatively designated Belize Molded-carved type. More than 20 fragmentary molded-carved vases and 164 sherds thereof have been documented for 22 different sites in Belize. These sites are listed from east to west in Table 1.

Intensive archaeological investigations conducted by Juan Pedro Laporte in the foothills of the Maya Mountains in the southeastern Peten (Laporte et al. 1993) are discovering related if not identical ceramic specimens (Dorie Reents-Budet, pers. comm. 1998).

CONFIGURATION OF THE DECORATIVE MODES (Figure 2 and Table 2)

All Belize Molded-carved vases have a cylindrical to barrel-shaped body profile with a slightly constricting orifice. Lip is always rounded. Rim is direct and insloping or slightly incurved. Base can be either nearly flat or concave. Basal break where the body and the base meet is pronounced and angular. Supports are always tripod hollow oven feet containing ceramic rattler balls. A single circular vent perforates each tripod support. These vents were

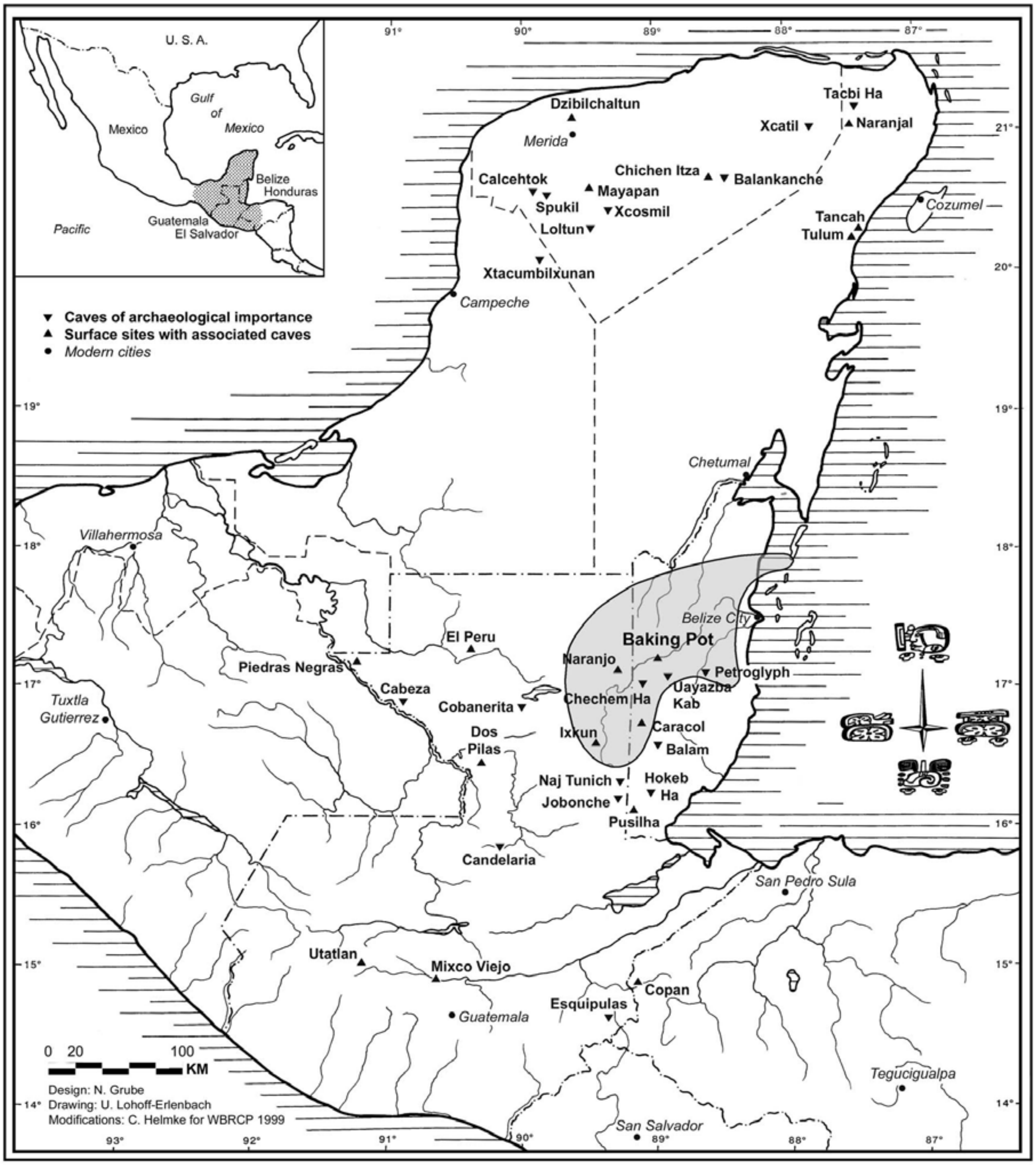


Figure 1: Distribution sphere of "Belize Molded-carved" specimens in the Terminal Classic. Note the location of Baking Pot near the center of that sphere.

n	Site Name	Frequency	Reference
1	Xunantunich	1 vase	MacKie 1985
2	San Lorenzo	2 sherds	Chase 1992; LeCount 1996, 1999
3	Buenavista del Cayo	2 sherds	Ball pers. comm. 1999
4	San José	1 sherd	Thompson 1939
5	Lamanai	1 vase	Graham 1987; Graham et al. 1980
6	Caledonia	2 vases	Awe 1985
7	Mountain Cow	4 sherds	Healy pers. comm. 1999
8	Caracol	1 vase; 2 sherds	Chase 1994; Walsh 1985
9	Actun Balam	12 sherds	Pendergast 1969
10	Baking Pot	10 sherds	Piehl 1998; Audet & Awe this vol.
11	Pacbitun	1 vase; 34 sherds	Helmke n.d.a; Bill 1987; Cambell-Trithart 1990; Sunahara 1994
12	Actun Tunichil Muknal	1 vase	Helmke et al. 1998
13	Structure ATM-M1	1 sherd	Song et al., this volume.
14	Pook's Hill 1	3 sherds	Helmke this volume.
15	Chanona Cave	1 vase	Graham et al. 1980
16	Actun Chek	1 vase	Graham et al. 1980
17	Actun Lubul Ha	sherd	Helmke 1999b; Graham et al. 1980
18	Barton Ramie	1 sherd	Gifford 1976
19	Valley of Peace	1 vase	Awe pers. comm. 1996
20	Maintzunun	1 vase	Graham 1987
21	Altun Ha	9 vases; 89 sherds	Helmke n.d.b; Pendergast 1979-1990
22	Marco Gonzalez	2 sherds	Helmke pers. observ. 1998
	Identical specimens have also been discovered in Guatemala at:		
23	Ucanal	1 vase	Reents-Budet & Awe pers. comm. 1996
24	Ixlu	1 sherd	Helmke pers. observation 1998
25	Uaxactun	1 sherd	Smith 1955

Table 1: Intersite distribution of Belize Molded-carved specimens.

removed with a solid and sharp tube after the foot had been attached and all three vents face outward.

Decoration and modal attributes divide the vase horizontally and vertically into discrete zones. Five bands define the vertical zones while two large panels define the horizontal zones. Among the five horizontal bands are three moldings which are identical to the *atadura* columns of Puuc architecture (Kubler 1990: 234) and identical to the upper facade moldings of Postclassic Temple/Shrine structures of Quintana Roo (Shelby 1999: Fig. 3). The three moldings on the Molded-carved vases frame the main glyph band and the decorative panels, respectively. From the rim to the base, and from left to right, the structure of these vases is shown in Figure 2.

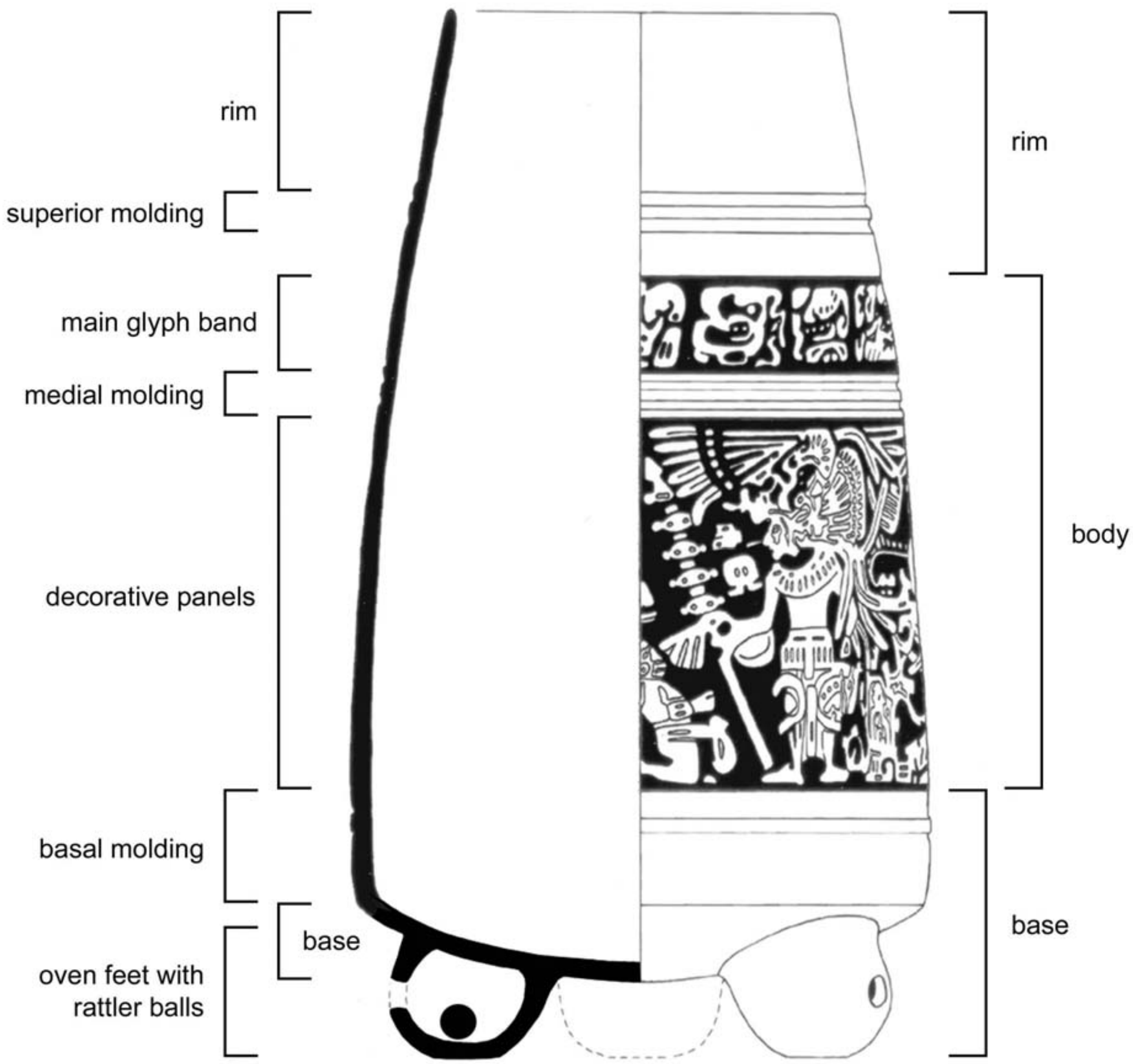


Figure 2: Configuration of the decorative modes of molded-carved vessels.

VERTICAL	vs.	HORIZONTAL
Top		**Left**
1) rim	=	continuous
2) molding, superior	=	continuous
3) main glyph band (PSS)	=	A1-O1 or A1-P1
4) molding, medial	=	continuous
5) decorative panels	=	Panel A, Panel B
6) molding, basal	=	continuous
7) base	=	flat / concave
8) oven feet with rattler	=	tripod
Bottom		**Right**

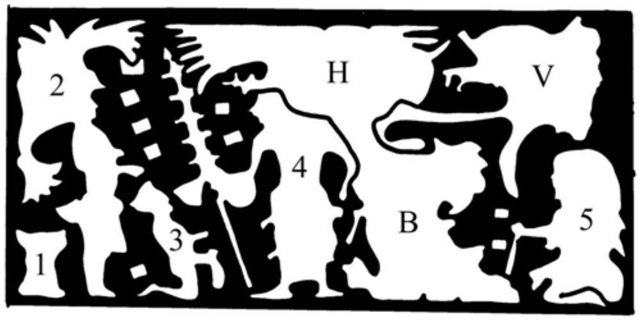
Table 2: Summary of the configuration of decorative modes and terminology employed.

THE ICONOGRAPHIC PROGRAM (Figures 3 and 4)

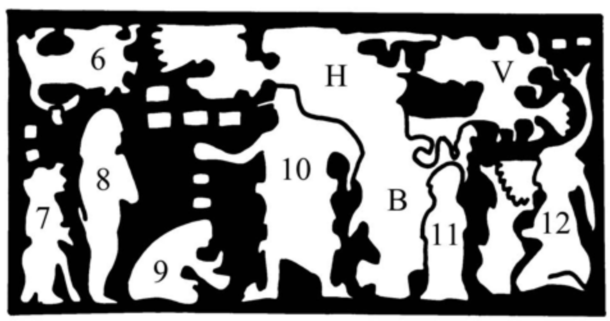
Only the broad strokes of the iconographic programs will be presented here as a detailed description of the iconography has been presented elsewhere (Helmke et al. 1998). Panel A represents an outdoor scene involving the presentation of a kneeling captive to an elaborately dressed lord. The lord or main figure of the panel is not glyphically identified as holding a royal title but his regalia includes a small Jester God figure attached to the front of his headdress, a small circular ceremonial shield and a war-staff lance. On stelae these items are usually only represented with members of the royal family. The warfare event represented in this panel appears to be tied to a vision quest as is indicated by the pointed hipcloth worn by the lord (associated with bloodletting at Yaxchilan; see Tate 1992) and the vision serpent that dominates the right portion of the scene.

Panel B represents a vision quest that is related to a bloodletting ceremony involving another or the same kneeling captive. The figures in both panels are identified by different name glyphs but both panels depict a sequence of events that is in keeping with the content of Late Classic texts and the murals of Bonampak. These references indicate that bloodletting rituals frequently occurred after warfare events and were intimately related to the capture of elite members of antagonistic lineages. The presence of a mirror, a vision serpent, and two dwarves in the second scene suggest supernatural overtones. Houston has suggested that the presence of a particular type of dwarf in Late Classic scenes to be associated with rituals specifically commemorating period-ending rituals (Houston 1992: 527). Based on stylistic attributes, comparison to similar scenes, and ceramic associations it seems likely that the scene in Panel B represents an actual ritual that took place at a period ending early in Cycle 10.

The widespread distribution of vases with these same exact scenes throughout the eastern Peten and much of central and northern Belize suggests that the historical events and individuals involved in these who inspired these scenes may not have been recognized by all who owned these vessels. Nonetheless the scenes depicted thereupon likely commemorated the

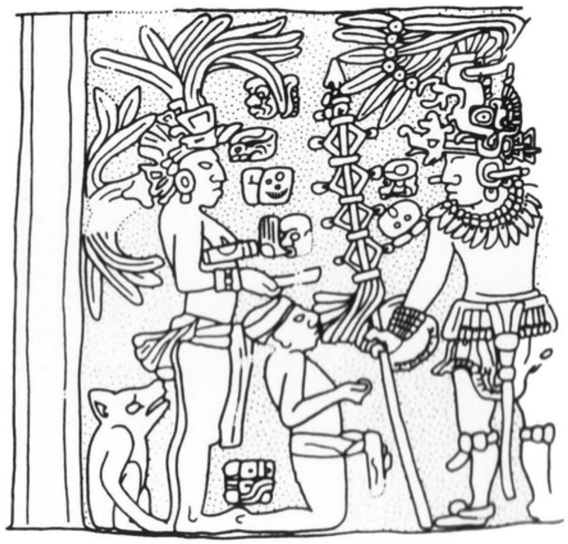


Panel A: Figures 1 - 5:
1: dog
2: warrior
3: kneeling captive
4: lord (main figure)
H: headdress of lord
B: backrack of lord
5: kneeling individual
V: vision "centipede"

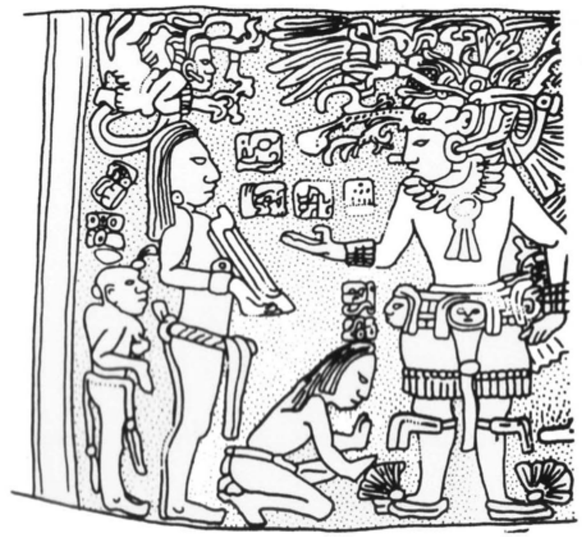


Panel B: Figures 6 - 12:
6: floating ancestor
7: dwarf
8: attendant with mirror
9: crouched captive
10: lord (main figure)
H: headdress of lord
B: backrack of lord
11: dwarf
12: kneeling individual
V: vision "centipede"

Figure 3: Schematic rendition of the so-called "Caves Branch" iconographic program.



Panel A



Panel B

Figure 4: Preliminary drawings showing parts of Panels A and B as represented on the Ucanal Vase. Drawings by Helmke based on photographs by Dorie Reents-Budet. No scale provided.

general practices of captive-taking and associated rituals.

THE EPIGRAPHY (Figure 5)

Again only a brief summary of the epigraphic contents is presented here. Of the three types of PSSes associated with Belize Molded-carved vases only the Ucanal/Actun Tunichil Muknal PSS will be described here. A complete and in-depth analysis of the texts on the "Caves Branch variety" vases was presented elsewhere (Helmke et al. 1998). The glyphs can also be divided into two large components: 1) The principal text represents a specific version of the Primary Standard Sequence with a standardized nominal section, and 2) the subsidiary or auxiliary texts that are included in the decorative scenes.

The auxiliary texts flank many of the individuals represented in the decorative scenes and designate these individuals by title and by name. The PSS is more revealing and is composed of a formulaic section thought to dedicate the vessel itself. Although the structure of this segment is not unique it is composed of a unique set of glyphic allographs. This in turn indicates a specific regional variant or "dialect" of the PSS that is restricted to these types of molded-carved vases. The nominal section violates the standard Classic period procedure by failing to record a particular patron or owner of the vase(s). Instead a highly standardized and identical (save of few substitution sets) nominal section appears on all the "Caves Branch Variety" vases. This segment records that these vessels were conceptualized as a distinct type of vessel from the more commonly represented *kakaw* drinking vases (designated as *yuch'ib'*). In addition the PSS records that these vases were produced for "young lineage members" (*ch'ok kelem*) of a "proud matrilineage" (*na olom ukawal*). In conclusion this lineage is said to hold the highly exalted warrior titles unsatisfactorily read as "Western tree opening" (*ochk'in kalomte'*) (Helmke et al. 1998). This last entry is a standard pair of collocations most frequently associated with rulers. The possible deletion of the personal names of individuals suggest that the nominal section was meant to be compatible and applicable to all the individuals who owned such vessels. The wide distribution of these vases bearing near-identical nominal sections is otherwise difficult to explain.

The PSS texts that embellish the Belizean specimens have been found to form equally standardized sets that are usually associated with specific iconographic programs. Despite this standardization the PSS typically associated with the "Caves Branch Scenes" (described above) has been found on Altun Ha vases with different iconographic programs. In addition, another instance has been noted where the opposite also holds true. Two additional types of PSSes associated with Belize Molded-carved vases have been identified in the Altun Ha collection although these are too fragmentary to comment on their content (Helmke n.d.b).

CONTEXT AND CERAMIC ASSOCIATIONS

Consistently all Belizean molded-carved ceramics are found to constitute part of

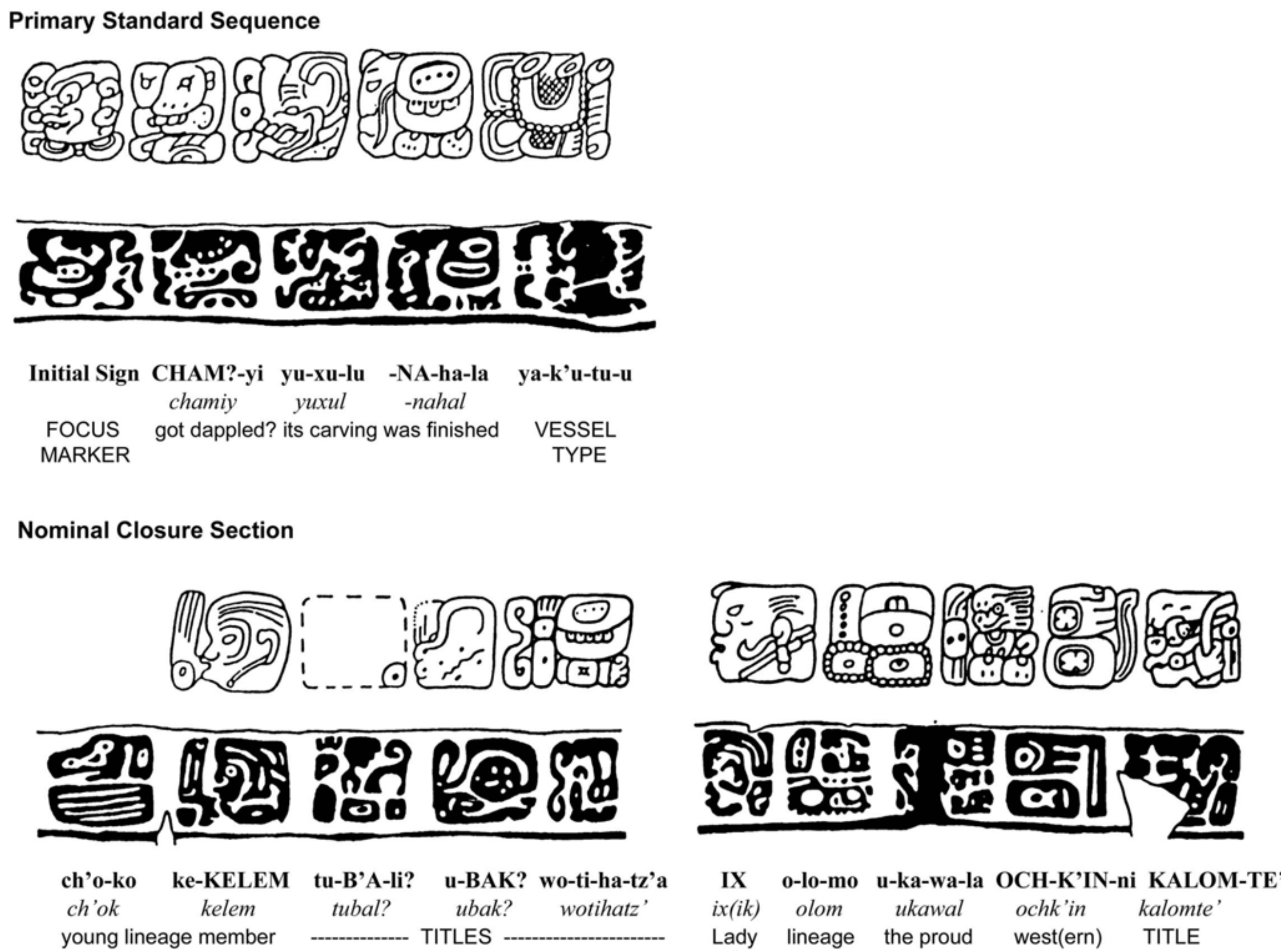


Figure 5: Comparison between two variants of the Primary Standard Sequence that is inscribed on Belize Molded-carved vases. The upper example represents the PSS of the Ucanal Vase, the lower is the PSS of the Actun Tunichil Muknal Vase.

deposits of the terminal phase occupation, which usually post-date the terminal architectural modification. As such they have been assigned under the heading of “abandonment occupation” (e.g. Baking Pot, Xunantunich, Caracol, Pook’s Hill, Structure ATM-M1) and in instances where continued occupation relies on meager artifactual deposits these sherds have been assigned to “post-abandonment occupation” (e.g. Altun Ha). The sherds recovered from Str. 193 and 199 can easily be assigned to the “abandonment” contexts as they were recovered from an admixture of collapse debris and humus overlying the terminal architecture (Piehl 1998; Audet & Awe, this volume). Notable exceptions to this broad and sweeping generalization are the specimens recovered from transitional Terminal to Early Postclassic architectural fill. Despite the existence of such contexts they are extremely limited and as far as can be discerned only two such examples exist. Prior to the discovery of the sherds contained in the fill of the penultimate architecture of Str. 198 at Baking Pot (Audet & Awe, this volume), only the badly deteriorated vase found cached in Str. A-I at Maintzunun was known (Graham 1985: 217, 219, 229 no. 1; 1987: 79; Graham et al. 1980: 165). Although this vase disintegrated as it was retrieved from the core of the structure, its identification as a molded-carved vase is secure (Elizabeth Graham pers. comm. 1998). These vases do not appear to have been common at Lamanai but it would seem logical to expect to find them there in sealed contexts on account of its nearly unbroken sequence of occupation. Nonetheless the Lamanai specimens identified thus far “are found mostly as surface scatters over Late Classic buildings, and only occasionally in Terminal Classic middens” (Graham 1987: 79). Thus even the Lamanai specimens are also correlated to a type of “abandonment occupation.”

All molded-carved specimens are associated with sherds that are diagnostic of the Terminal Classic (AD 800 - 900). At virtually all sites these vases have been associated with Roaring Creek Red dishes. Although several other types are found in high frequency with the molded-carved vases, the Roaring Creek Red type has been singled out. This close association may be due to functional complementarity although this suggestion remains speculative at present. Several examples of Roaring Creek Red dishes are found with tall pedestal bases, which following an observation made by Graham and Pendergast (Graham 1987: 78) can be used for temporal placements. They suggest that the height of the base increases through time and thus may be indicative of gradual temporal variation (see Graham 1987: Fig. 2d, f, h). In addition the depth of the dish or basin supported by the pedestal decreases not only relative to the height of the pedestal but also in terms of actual depth. These characteristics suggest that a microseriation can be developed which is reflective of a temporal sequence. Regardless of the height of the pedestal, Gifford had noted that the Roaring Creek Red type itself is a late Spanish Lookout occurrence at Barton Ramie (Gifford 1965: 373). Thus based on the co-occurrence with the Roaring Creek Red type it may be possible to fine-tune the temporal placement of molded-carved ceramics after AD 800.

In addition to the Terminal Classic ceramic associations, most contexts also include a small Early Postclassic component. As these occur outside of sealed contexts within overburden it is usually assumed that these are late inclusions that are disassociated from the previous occupation. Consequently the molded-carved sherds have been relegated to the Terminal Classic and their lateness has remained unaccounted for. The Baking Pot data reveal this association and the Postclassic penultimate and terminal architectural modifications confirm the Early Postclassic occurrence of molded-carved vases. At Altun Ha the majority of deposits in which molded-carved ceramics occur include a small assemblage of Early Postclassic ceramics. As these contexts are non-stratified and mixed the association prevents conclusive temporal observations. Although small Postclassic deposits can be expected at most residential sites in the Belize Valley, their near-systematic association with molded-carved pushes the upper range of these vases into the early facet of the New Town complex.

DATING (Table 3)

The archaeological context in which Molded-carved vases are discovered demonstrate that they are almost exclusively found in deposits of terminal occupation. The ceramic associations at sites in the greater Belize Valley suggest strongly that these vases date to the transitional phase between the Terminal Classic (AD 850 - 950) and the Early Postclassic (AD 1000 - 1200).

Beyond ceramic associations other methods can be used to gauge the temporal occurrence of the Molded-carved vases. A stylistic appraisal of the iconographic program and specific iconographic attributes therein can be used to correlate these elements to the Long Count-inscribed monuments of the Central Lowlands. In addition the three decorative moldings also bear a temporal significance. As was noted above these moldings also occur on the facades of masonry structures. In those contexts the moldings have been designated as Types 1a and 1c (Shelby 1999: Fig. 3). Dating of these structures suggests that moldings of Type 1a and 1c are predominant during the Terminal Classic to Early Postclassic transition (i.e. AD 850 - 1200), decreasing notably in frequency during the Middle and Late Postclassic (AD 1200 - 1500) (Shelby 1999: Fig. 7). It is of great interest that the date assigned to these vessels on the basis of ceramic associations duplicates the dating obtained for the three-unit moldings.

Inspection of the style of the iconography of the decorative panels indicates that comparable programs are represented on the Terminal Classic stelae of the Peten Lakes area. The most similar iconographic programs are represented on the latest monuments from Ucanal (Stela 3), Ixlu (Stela 1 and 2), Tikal (Stela 11), and Jimbal (Stela 1). These stelae have been dated between the tenth *Tun* of the tenth *Baktun* (10.0.10.0.0??) and the second *K'atun* of the tenth *B'aktun* (10.2.10.0.0). Using the standard Goodman-Martínez-Thompson correlation one obtains a range of dates between AD 840 and AD 879 (Helmke et al. 1998). Unfortunately with the close of the 9th century, no additional monuments were erected in the area. Thus the range in dates provided by the style of the iconography should be taken as a lower end range since the iconographic record was abruptly ended, and thus does not serve as a yardstick beyond its cessation.

The overlap in all these sequences secures the time span during which the usage of Belize Molded-carved vases peaked. The range established has been tied to many ceramic sequences and to two style dates that securely delimit the time period during which these vases were used. This period ranges from AD 850 to at least AD 950 and can confidently be applied

AD	Archaeological Time Periods	Uaxactun Smith 1955	Xunantunich LeCount 1996	Pacbitun Healy 1990	Baking Pot Barton Ramie Gifford 1976	San Jose Thompson 1939	Altun Ha Pendergast 1979 - 1990	Style Date Helmke et al. 1998	AD
1050								10.11.0.0.0	1050
					LF				
	Early								
							???		
	Post-								
1000								10.9.0.0.0	**1000**
	classic								
					New				
					Town				
950							**Kayab**	10.6.0.0.0	950
		???	**???**	**???**	**EF**	**???**			
900									**900**
	Terminal								
					LF			10.2.10.0.0	
	Classic								
		Tepeu 3	**Benque**			**San Jose**	**Pax**		
850	(LC3)								850
			Viejo IV			**V**		**10.0.10.0.0**	
					Spanish				
				Tzib					
					Lookout				
800								9.18.10.0.0	**800**
						San Jose			
							Muan		
			Benque			**IV**			
	Late								
750			**Viejo IIIb**		**EF**			9.16.0.0.0	750
	Classic	**Tepeu 2**							
	(LC2)								
700							**Kankin**	9.13.0.0.0	**700**
			Benque						
					Tiger	**San Jose**			
			Viejo IIIa	**Coc**					
650	Late				**Run**	**III**		9.11.0.0.0	650
		Tepeu 1							
	Classic								
							Mac		
	(LC1)								
600								9.8.0.0.0	**600**

Table 3: Intersite distribution of Molded-carved specimens according to ceramic complex.

to all the specimens that have been discovered outside of clear stratigraphic contexts. Although the upper range has still not been satisfactorily determined, the usage of the Belize Molded-carved vases may have persisted as late as AD 1200. This possibility still needs to be tested further.

FUNCTION

The Maintzunun specimen raises the question of the function of these vessels. As late as 1987, based on the specimens uncovered in caves and the Maintzunun specimen, Graham was inclined to suggest that these vases "may have functioned solely in a ritual context" (Graham 1987: 79). With the growing number of sherds documented over the past decade, their functional appraisal has altered. Again the situation appears to be one of a broad generalization that is interrupted solely by sparse exceptions. The vast majority of molded-carved sherds are found in association of the domestic assemblage of residential structures and less than 10 % of the material is recovered from pyramidal or apparently ritual function structures. Data from San José and Pacbitun reveal two instances wherein these vessels are found as burial furnishings (Thompson 1939; Cambell-Trithart 1990). Again, these are rather exceptional occurrences. Nonetheless the elaborateness of these vases coupled with their deposition in two burials and at least five caves cannot rule out their *secondary* ritual function. Unfortunately the contents of these vases is omitted from the Primary Standard Sequence, which may have shed light on the *primary* function of these vases. The glyphic label assigned to these vases, distinguishes them from the ubiquitous cacao-drinking vases and it can thus be tentatively assumed that molded-carved vases served a different purpose. Unfortunately the negative evidence does not provide any clues.

STATUS

It has been argued elsewhere that these vases may serve as effective status indicators (Helmke 1999a). This model has been derived from a detailed comparison of intrasite contexts in which the vases occur. The architectural context with which the vases are associated was reduced to measurements of the height and surface area of the supporting platform. Interestingly with a total height of 2.10 m and an approximate surface area of 120 m^2 in the Terminal Classic (Carolyn Audet pers. comm. 1999), the Yaxtun supporting platform falls squarely within the size range derived from the Altun Ha data (Figure 6). It has been determined that the architectural platforms with which molded-carved sherds are associated at Altun Ha, range in terms of height between 0.90 and 2.90 m and the surface area ranges between 60 to 220 m^2 (Helmke 1999a). Molded-carved sherds transgress the dichotomy established by Abrams for ancient Maya architecture as "simple" and "improved house form" (Abrams 1994). Based on this characteristic alone it can be suggested that molded-carved vases were utilized by individuals outside of the upper elite. Nonetheless, the absence of molded-carved material from upper elite residences (save one sherd from Str. 23 at Pacbitun; see Helmke n.d.a; Bill 1987) is, however, a better indication that these vases were exclusively

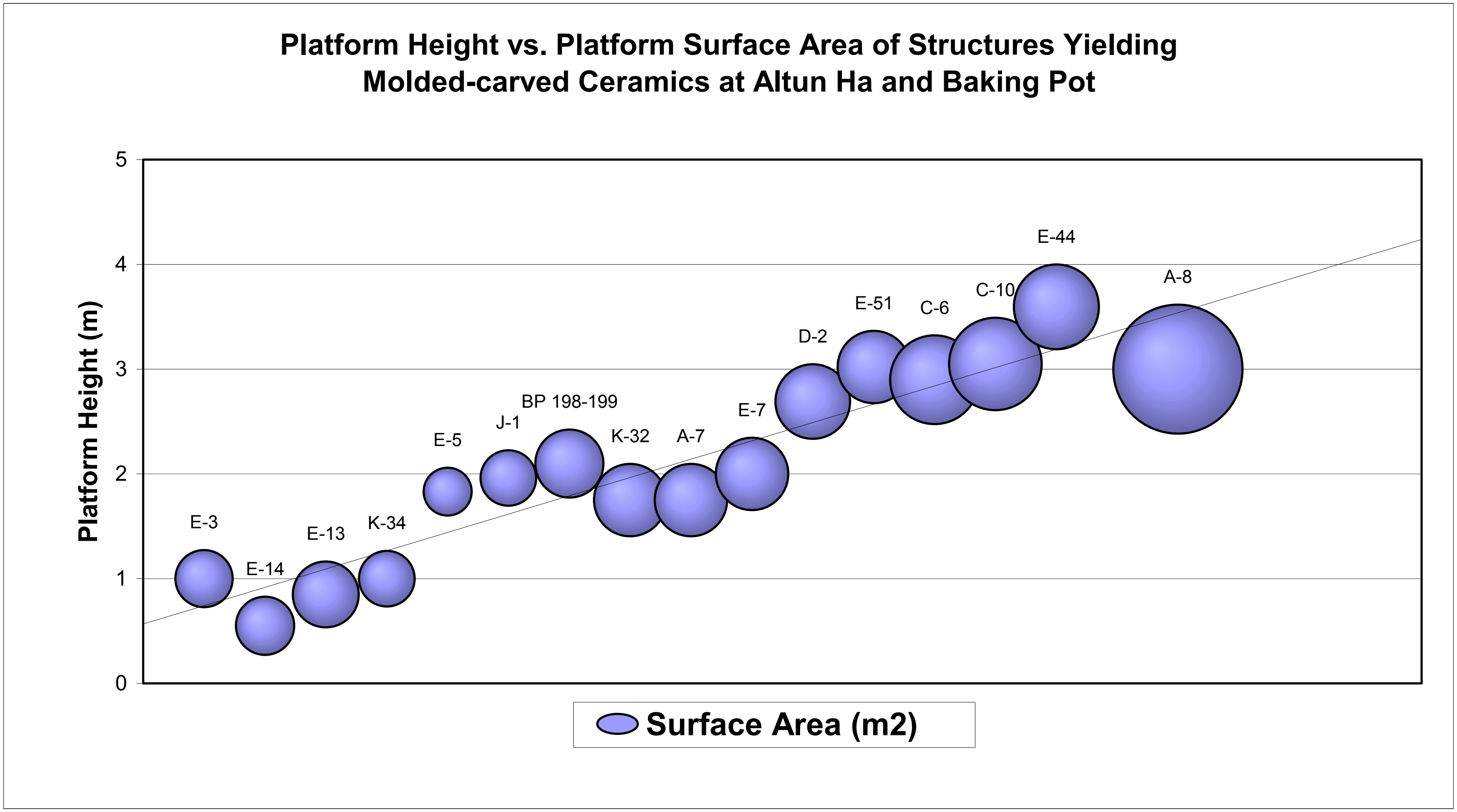


Figure 6: Comparison between the physical characteristics of structures yielding molded-carved specimens at Altun Ha and Baking Pot.

utilized by non-royal segments of the society. If architectural size and complexity is indeed representative of social status then it can be said that the vases were utilized by several segments in the social hierarchy, although a range in the lesser non-royal elite seems best represented. The complete absence of these sherds in common “house mounds” that are lower than 0.90 m is also indicative that the lowest social segments did not have access to these vases.

‘TYPE’ DESCRIPTION

In this section the ceramic attributes of the Baking Pot sherds are described. The specimens are grouped by ware and additional attributes are described in detail. The structure of data presentation duplicates the structure adhered to in the description of the Altun Ha molded-carved collection (Helmke n.d.b). Terminology and detail of the descriptions is a combination of Gifford (1976) and Pendergast (1971). All sherds were numbered from 1 to 10 and their individual provenience is presented below.

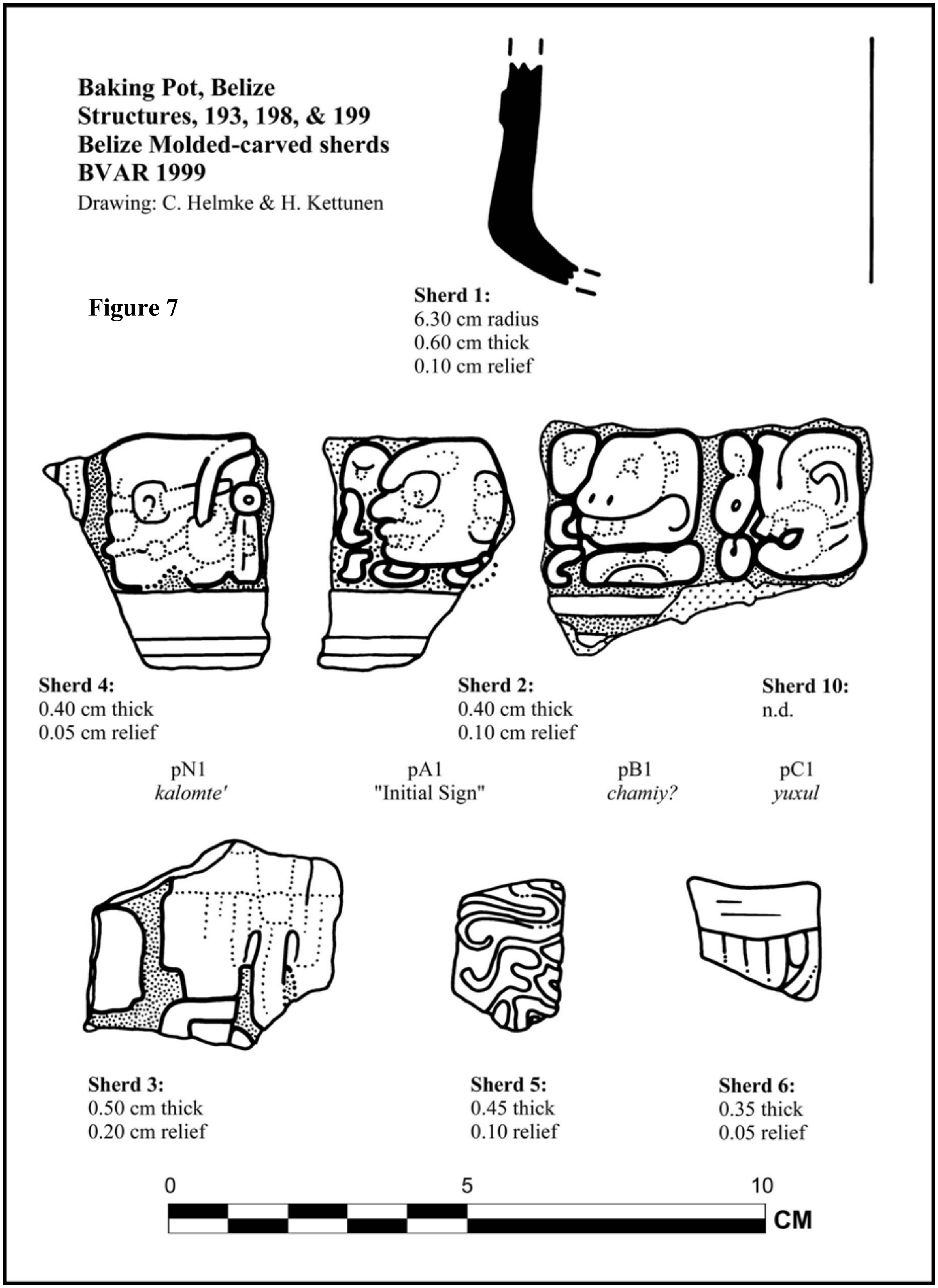
Sherds from Baking Pot, Str. 198

Type:	Belize Molded-carved
Variety:	Caves Branch
Group:	Unspecified
Ware:	Pine Ridge Carbonate
Complex:	Transitional Spanish Lookout / New Town
References:	Awe 1985; Graham et al. 1980; Graham 1987; Helmke n.d.b.
Sphere:	Tepeu 3
Dating:	ca. AD 850 - 950
Sherds:	9
Illustration:	Figures 7 and 8

Proveniences:

Sherd 1: Structure 198, Unit 3, Level 2, Lot 36.
Sherd 2: Structure 198, Unit 3, Level 2, Above Floor 2 of plaza.
Sherd 3: Structure 198, Unit 3, Level 1, Lot 17.
Sherd 4: Structure 198, Unit 3, Level 2, Lot 25.
Sherd 7: Structure 198, Unit 3, Level 2, “Fill of terminal structure.”
Sherd 8: Structure 198, Unit 13, Level 1, “In front of south retaining wall.”
Sherd 9: Structure 198, Unit 7, Level 1, Lot 28

Form: Cylindrical to barrel-shaped body profiles, medium thick sides; rim and neck not recovered; concave bases; basal break between walls and base prominent. Although no tripod support fragments have been recovered examples from other sites have hollow oven feet with ceramic rattler balls, and a slightly constricting orifice.
Size: Three radii have been reconstructed from the sherds. In all instances the curvature preserved on the basal break was used to reconstruct the diameter. Since rims were not


Baking Pot, Belize
Structures, 193, 198, & 199
Belize Molded-carved sherds
BVAR 1999
Drawing: C. Helmke & H. Kettunen
Figure 7
Sherd 1:
6.30 cm radius
0.60 cm thick
0.10 cm relief
Sherd 4:
0.40 cm thick
0.05 cm relief
Sherd 2:
0.40 cm thick
0.10 cm relief
Sherd 10:
n.d.
pN1
kalomte'
pA1
"Initial Sign"
pB1
chamiy?
pC1
yuxul
Sherd 3:
0.50 cm thick
0.20 cm relief
Sherd 5:
0.45 thick
0.10 relief
Sherd 6:
0.35 thick
0.05 relief
0
5
10
CM

Baking Pot, Belize
Structure 198
Unit 3, Levels 1 & 2
Belize Molded-carved
BVAR 1999
Drawing: C. Helmke & H. Kettunen

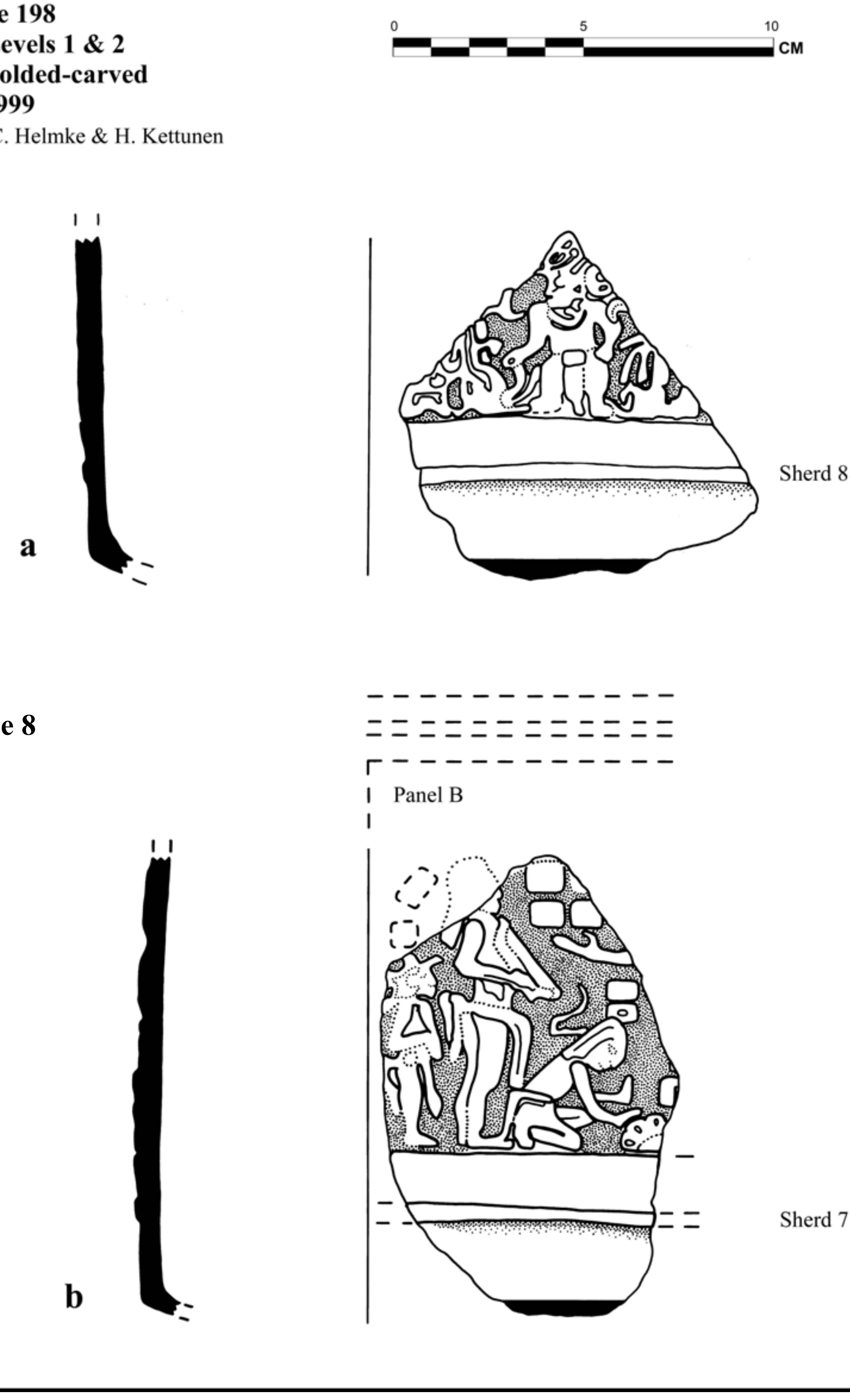


Figure 8

recovered these diameters could not be determined. Maximum diameters of the base range between 5.90 cm and 7.40 cm and measure on average 6.53 cm (n= 3). Thickness of the walls ranges between 0.40 cm and 0.55 cm and measure on average 0.48 cm (n= 6). Relief of carving of the decorative scenes ranges between 0.05 cm (incised details) and 0.20 cm (gouged/excised backgrounds) and measure on average 0.12 cm (n= 12). Height of basal moldings ranges between 3.70 and 4.00 cm (n= 3). Height of medial moldings is 1.80 cm (n= 2).

Surface:

Exterior: Surfaces are typically hard and difficult to scratch with fingernail. Slip is evenly applied to the exterior although it is differentially preserved. Slip was applied from basal break upwards to the rim but only on the foreground of the bas-relief decorations. As slip may have been applied with a brush, the background of carved/gouged/excised decorative panels and glyphs are unslipped. Slip is generally thin to medium and ranges from hard and glossy to a slip that is matte, brittle, and chips off easily with fingernail. Directly beneath the slip is a very thin layer in which the paste that has adopted the same color as that of the slip. This is probably due to the discoloration since the remainder of surfaces are all of the same coloration as the unslipped base color. This hard layer is preserved on the sherds whose slip has weathered off.

Surface shows many tooling marks. The central ridge of the moldings is usually very uneven and show rough tooling marks above and below the central ridge. This suggests that the ridges of the moldings were excised out of the paste rather than produced by a mold. Only one example shows an impeccably linear ridge which may have been produced by a mold. Slip covers entire exterior surface, which indicates that molding and tooling precedes slipping. The slip preserved on the moldings tends to be glossier and harder than the slip on the panels and glyphs. Perhaps this is due to the absorption rate of slip on well-burnished surfaces such as the moldings. However, incising and excising of the background have not removed any slip and thus were produced prior to the application of the slip.

Some of the larger temper inclusions are seen on the exterior surface. It seems likely that these inclusions protruded from the paste and were ground down during burnishing/smoothing of the surface. Very small nearly parallel grooves on the exterior of the base suggest drag marks left from finger tips.

Incising of the details of the glyph were executed by a literate and skilled artisan or by an extremely detailed template, as the glyphic sherds are practically identical in all respects to the glyphs in the Ucanal sequence. Preservation of the molded-carved scenes and glyphs ranges between partially eroded to fairly weathered.

Interior: All interior surfaces are unslipped. All surfaces are hard, very uneven, and rough tooling marks are prevalent. These deep pre-firing scars suggest that a sharp tool was used to thin and smooth the interior surfaces. Apart from these features the interior ranges between unsmoothed and well-burnished in small patches only. Small to minute erosive pits are prevalent on all sherds and cover most interior surfaces. Black fire-clouding is present only on one sherd along the interior basal break. Some of the larger quartzite (possibly feldspar) temper inclusions that protrude out of the interior surface were ground down during post-firing polishing/smoothing.

Paste: All pastes range between medium-hard and hard. None are truly oxidized throughout and all display a combination of two or three bands in cross-section. Two-banded pastes have thicker exterior bands (measuring on average 0.38 cm) and thin interior bands (measuring on average 0.05 cm). The exterior bands are usually of a similar color as the exterior surface, while interior bands are of the color of the unslipped base color. Three-banded pastes include an unoxidized core between the two bands already described. Three-banded sherds are typically thicker than two-banded ones. Only one sherd is almost completely oxidized (Sherd 4) but the center of the sherd is again differentiated by an indistinct core of slightly different color. Ratio of clay matrix to inclusions gives the sherds a fine to very-fine textured appearance. Inclusions of notable size are infrequent and calcite temper is very small to minute.

Temper: Calcite flecks (0.03 to 0.05 cm) or powder are the principal temper ingredient. These occur in varying frequencies but always constitute the most prevalent inclusion over other types. Additional calcite inclusions are minute to very small. Small chips of quartzite (possibly feldspar) range between 0.05 and 0.20 cm in diameter but measure on average 0.12 cm (n= 20). Hematite nodules range in size between 0.35 and 0.15 cm in diameter and 0.24 cm on average (n= 7). White anhedral quartzite sand grains are present but in lesser numbers and measure on average 0.20 cm. These inclusions typically occur together although some may be missing from exposed paste cross-sections.

Color: Slip color ranges from light orange to a deep dark orange. The hard surface underlying the slip is generally of the same color as the slip although as a lighter hue. Unslipped base color and interior surfaces are predominantly tan to buff colored.

Decoration: All sherds from this paste group are derived from Belize Molded-carved vases with "Caves Branch Scene" decorative panels and associated "Caves Branch PSSes." Glyphic elements preserved include either portions or complete representations of the A1, D1, N1, and O1 collocations represented in the Ucanal example of this PSS. The three sherds depicting portions of the decorative scenes only represent figures of Panel B. Portion of Figures B (dwarf 1), C, (attendant with mirror), D (kneeling captive), E (main figure), and F (dwarf 2) are all represented. The sherd representing Figure D is very similar in all respects to a specimen from Pacbitun (Kay Sunahara Petrological Sample, R.O.M.). None of the figures represented are duplicated on any of the sherds. Thus there is no overlap between any of the iconography or glyphic material represented.

Sherds from Baking Pot, Strs. 193 & 199

Type:	Belize Molded-carved
Variety:	Caves Branch
Group:	Unspecified
Ware:	Vinaceous-Tawny
Complex:	Transitional Spanish Lookout / New Town
References:	Awe 1985; Graham et al. 1980; Graham 1987; Helmke n.d.b.
Sphere:	Tepeu 3
Dating:	ca. AD 850 - 950
Sherds:	3
Illustration:	Figures 7 and 8

Proveniences:

Sherds 5 & 6: Structure 199, Units 10 & 8, Level 1, under collapse debris on plaza floor.
Sherd 10: Structure 193, unavailable at time of study.

Form: Apparently cylindrical vase. Too fragmentary to comment. For a description of more complete specimens see above.
Size: Thickness ranges between 0.4 and 0.5 cm. Relief ranges between 0.08 and 0.20 cm and measure on average 0.13 cm (n= 4).
Surface: Detail of carved designs are heavily eroded but composition of decorative elements is still readily apparent. Only one sherd has small patches of a thin slip still adhering to foreground areas. Backgrounds of decorative scenes appear to have remained unslipped. Exterior shows no pronounced signs of tooling. This deletion may be due to erosion . Interior surfaces unslipped, well-smoothed, well-burnished. Several Vinaceous-Tawny sherds from Altun Ha had a thin orange wash applied to their interior surfaces; apparently to reduce porosity of the paste (Helmke n.d.b). No such attribute was detected on the Baking Pot sherds.
Paste / Temper: Ash-tempered without readily visible or noticeable inclusions. Exterior surface color may be the result of coloration from the application of the slip. Nonetheless the paste is hard but somewhat chalky, but less hard than the calcite sherds described above. Minor calcite grains <0.03 cm in diameter occur. Paste of both sherds is clinky. Near-uniform color throughout cross-section. A thin 0.05 cm thick layer defines the exterior surface and is the same color as the base color underlying the slip.
Color: The patches of preserved slip are light orange. Interior base color is tan and unslipped. Paste is a near-uniform tan throughout, which is the same color as the interior. Base color underlying the slip and is light orange verging on pink.
Decoration: Sherd 10 represents collocations B and C of the Ucanal PSS. This suggests that the sherd was derived from a "Caves Branch Variety" vase. The remaining sherds apparently do not represent part of "Caves Branch Variety" vases. One represents an unidentified section of plumage the other may represent part of a headdress. Nonetheless, the sherds represent decorative elements present on vases of the Belize Molded-carved "type."

NUMBER OF VASES

As none of the preserved decorative elements on the Baking Pot sherds overlap, this characteristic cannot be used to estimate the number of vases these few sherds were derived from. Three diameters could be reconstructed on the basis of the basal break. These measurements were found to be sufficiently disparate and thus must have been derived from three vessels of slightly different size. Based on the ware determinations it seems logical to suppose that at least two vessels were present. Close inspection of the individual paste characteristics indicates that at least three groups can be identified among the carbonate ware sherds. Thus taking all these determinations into consideration it can be suggested that the Baking Pot sherds were derived from at least three and perhaps four vases.

CONCLUSIONS

Having presented a synthesis of the iconographic program, the epigraphic content, as well as detailed the temporal and spatial distribution of the Belize Molded-carved type it becomes apparent that although these vases represent a small constituent of site-specific ceramic assemblages, they provide insightful data on the ancient Maya of the Terminal to Early Postclassic transition.

Comparing these vases to other assemblages one notes that only shades of orange are represented at Baking Pot. In addition only concave bases are present, while several specimens have nearly flat bases (e.g. Altun Ha and Pook's Hill). Also the Vinaceous-Tawny sherds lacked the thin wash present on the counterparts from Altun Ha. These three characteristics will be kept in mind during a review of micro-regional differences in the type, and may be significant. The paste variation described for the Baking Pot sherds fall neatly within the range of variation documented for the Altun Ha collection.

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ANCIENT MAYA SETTLEMENT AT BAKING POT, BELIZE: RESULTS OF THE CONTINUALLY EXPANDING SURVEY PROGRAM IN THE SEARCH FOR THE END OF THE FINAL FRONTIER

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INTRODUCTION

The Belize Valley has encountered (and endured) numerous archaeological research projects over the last several decades that have employed various survey techniques. Generally, these methods have tended to concentrate on either localized survey of smaller sites (e.g. Nohoch Ek, see Coe and Coe 1956; Willey et al. 1965), Melhado (Willey and Bullard 1956), Floral Park (Glassman et al. 1995; Willey et al. 1965), or transect type surveys focused on larger centers of the valley (e.g., Pacbitun, see Healy 1990; Richie 1990, Sunahara 1994), Xunantunich (Ashmore 1994, 1995; Ashmore et al. 1993; Ashmore et al. 1994; Neff et al. 1995; Yaeger 1992; Yaeger and Connell 1993). Other, seemingly more ambitious archaeological survey projects have included areal, or regional analysis, though these too have been limited in valley wide applicability to site intercomparability by their extrapolation of small locational and narrow transectual type survey data (e.g., Ball and Taschek 1991; Fedick 1989, 1994; Fedick and Ford 1990; Ford 1990, 1991; Ford and Fedick 1992; Taschek and Ball 1999). All of these projects and their survey component have provided archaeologists with a much richer database to analyze settlement in the Belize Valley, albeit with their inherent shortcomings and incompatibility for intersite cross comparison (Ashmore 1994:12; Conlon et al. 1994:227-229; see also Chase and Chase 1987:49). Even today, after all this research, we still have no actual broad based view of settlement from a concentric perspective at any of the larger, primary centers, in the Belize Valley, except for Cahal Pech (Awe and Brisbin 1993; Brisbin 1995).

With the surface survey component of the Western Belize Regional Cave Project winding down this past year, and the connection of Actun Yaxteel Ahau to the Cahal Uitz Na survey (Conlon and Ehret 1999), once again it was possible to expand the settlement survey at Baking Pot (Bullard and Ricketson 1965; Ricketson 1931; Willey et al.1965). Settlement survey at Baking Pot by BVAR has been an on-again, off-again, process for the last eight years (Conlon 1995 and 1997). The basic tenant of the long term goal of survey at Baking Pot has remained the compilation of an extensively areal perspective of settlement at a large center in the Belize Valley (Conlon 1995:83 and 1997:7). Settlement survey research within the BVAR Project has concentrated on employing a total coverage program of larger centers within the Belize Valley (specifically Cahal Pech and Baking Pot) in order to see how settlement morphology is distributed over the broadest area of a principal center within the region, not just within its localized central core, or the small window of extended settlement that transect type survey has typically provided at other sites. Such a survey would enable a more rigorous examination of the settlement data for a singular principal site. This past field season we concentrated on surveying the settlement clusters of North Caracol Farm (Conlon 1995:97; Golden and Conlon 1996), North East Baking Pot, and Naxima (Conlon et al. 1994:235) at Baking Pot as components of a broader data set for examining site center settlement in the Belize Valley. This report presents the results of the 1999 field season of survey and a brief discussion concerning earlier comments and observations in previous reports to update our analysis.

SURVEY RESULTS

Several goals were accomplished during the 1999 survey field season. First, the transect following the Spanish Lookout ferry road south from Baking Pot, and the Western Highway westward, finally reached the Bedran and Naxima Groups two kilometers west-southwest of Baking Pot. Survey here has captured little settlement to date and, therefore, is absent from the updated plan of Baking Pot (see Ehret and Conlon, this volume, Fig. 1). Second, as part of the excavations conducted at Baking Pot, units were surveyed at Mound 194 and the Yaxtun Group, both located near Group I, and also at Mounds 129 and 131 in the south-southeast limits of survey. Finally, as our primary goal, the settlement clusters of Northeast Baking Pot and North Caracol Farm were successfully reached by transect and their settlement recorded, which is further described herein.

Northeast Baking Pot

The mounds at Northeast Baking Pot (NEBP) are clustered on the highest portion of a ridge defined by old and dry river channels south and immediately north of the cluster (ibid). The old river channel in the south has a very gradual rise toward the settlement cluster in the north and, subsequently, appears to have been a controlling factor for non-settlement in this zone. The ridge top effectively separates NEBP physically (by discontinuity of occupation) from the settlement continuum of Baking Pot core, easily distinguishing it as a separate zone of habitation. To the north the land assumes a flat alluvial plain posture that was likely unsuitable for habitation owing to its low elevation relative to the Belize River. Though this plain was potentially seasonally inundated, this may not have precluded its seasonal agricultural use by the ancient inhabitants of NEBP. At the same time, it is not presently clear to what degree this land may have been north of the Belize River at the time of ancient occupation, and thus, unusable by the inhabitants of NEBP.

Mounds at NEBP range in distance 1100 - 1400 meters from the center of the main sacbe at Baking Pot, and range from 0.10 meters to 1.90 meters in height. All of the mounds in this grouping have been ploughed two to three times per season over the last four years, except Mound 244 which remains intact. There are no distinguishable plazuela groups, though Mounds 244 and 248, in the north center of the settlement cluster, may have been a focus of settlement based on their comparatively larger size and greater heights within the settlement cluster. Mounds in the southwest of the settlement cluster are the next largest and tallest suggesting some prominence of focus here as well.

North Caracol Farm

The North Caracol Farm settlement cluster (NCF) is another zone of settlement easily recognizable by its separation from the rest of Baking Pot by Garbutt Creek (ibid Fig. 2). The eastern bank of Garbutt Creek is higher than its west bank all along NCF's settlement, providing a relatively dry occupation zone. At the north end of Garbutt Creek, in the area that includes the ballcourt (Mounds 16 and 17) and a few other mounds, the land dips down to where the creek meets the Belize River in an area where seasonal inundation is highly likely today. Perhaps conditions were drier in this region in ancient times, permitting settlement in lower lying areas.

Mounds at NCF range in distance 1300 - 1800 meters from the center of the sacbe at Baking Pot and range in height from 0.10 to 5.5 meters. All the mounds of NCF have been ploughed at least four times a year over the last nine years. Mound 1 is the tallest (5.5 meters), and largest single mound at NCF, suggesting its dominance within the group as its main focal point. Unlike NEBP, NCF has a total of five platform groups with smaller mounds on top. The largest of these platforms are mounds 20 a, b, c, located on the eastern rim of a barrow pit. Mounds in the southwest of the settlement cluster are located closest to Baking Pot, while the ballcourt mounds in the extreme north, nearest the Belize River, are the most distant from Baking Pot centrally.

Baking Pot

The expanding settlement data is easily incorporated and conveyed in the zonal summary developed several years ago (Conlon 1997:8) with NEBP and NCF designated as Zones E and F respectively (Table 1). Both Zones E and F display the lowest mound densities of settlement at Baking Pot (0.42 and 0.53), well below the overall average of 0.94 mounds per hectare. Incorporation of NEBP and NCF into the Baking Pot settlement data lowers earlier estimates of overall mound density from 1.47 to 0.94, and population density from 7.36 to 4.69. These new estimates are closer in line with those from the neighboring center of Cahal Pech (0.72 mound density and 3.59 population density). The relatively high densities for Spanish Lookout suggest that its landholdings may have extended beyond the presently surveyed boundary.

This is partly demonstrated in the effect on densities when unoccupied area (no mounds evident) is factored out of zonal data (Table 2). While all three density totals rise (Baking Pot 43%, Cahal Pech 60%, and Spanish Lookout 18%), Spanish Lookout rises less dramatically overall (1.62) and comes closer to approximating the total for Baking Pot (1.34). This lower rise does not necessarily indicate Spanish Lookout's settlement is more densely grouped than, or more closely clustered as, either Baking Pot's or Cahal Pech's. The comparison of results from Baking Pot and Cahal Pech suggest that there is a possible "under surveying" of the extents of Spanish Lookout by 20 to 40 percent. This will only become evident upon completing a survey from NCF to Spanish Lookout.

Zone	Area	Mounds	Population	Mound Density	Population Density
A	60.09	105	525	1.75	8.74
B	19.33	35	175	1.81	9.05
C	68.80	77	385	1.12	5.60
D	25.59	20	100	0.78	3.91
E	75.86	32	160	0.42	2.11
F	92.27	49	245	0.53	2.66
Total	338.74	318	1,590	0.94	4.69
SL	56.39	77	385	1.37	6.83
CP	156.15	112	560	0.72	3.59

Table 1: Mound and Population Densities for Baking Pot, Spanish Lookout, and Cahal Pech, Belize.

For Tables 1 and 2

Area = hectares
Population = Mounds X 5 people
Mound Density = Mounds/Area
Population Density = Population/Area

E = Northeast Baking Pot (NEBP)
F = North Caracol Farm (NCF)
SL = Spanish Lookout
CP = Cahal Pech

Zone	Area	Mounds	Population	Mound Density	Population Density
A	57.87	105	525	1.81	9.07
B	17.63	35	175	1.99	9.93
C	52.52	77	385	1.47	7.33
D	18.81	20	100	1.06	5.32
E	30.00	32	160	1.07	5.33
F	58.79	49	245	0.83	4.17
Total	236.62	318	1,590	1.34	6.72
SL	47.50	77	385	1.62	8.11
CP	97.78	112	560	1.15	5.73

Table 2: Mound and Population Densities, minus unoccupied area, for Baking Pot, Spanish Lookout, and Cahal Pech, Belize.

AGRICULTURAL PRODUCTION AND CONSUMPTION AT BAKING POT

One of the more discerning ways to determine site core limits at Baking Pot has included the employment of agricultural production and consumption requirements. This type of analysis enables the classification of different types of settlement zones, such that can be classified as urban, suburban, or rural. The definition of zone types is simple and is based upon surplus consumption, equilibrium, and surplus production capabilities respectively for the three aforementioned zone types. Earlier analysis from previous survey has demonstrated the three types of zones existed within 1 kilometer of the Baking Pot core (Conlon 1997:11; Conlon and Moore 1997:91 and 1998). Also, overall, Baking Pot was either in an equilibrium mode of production/consumption at maximum production, or, a slight surplus consumer at minimum production levels, necessitating more extensive agricultural lands than surveyed or trade produce to meet sustenance requirements (Conlon 1997:16; Conlon and Moore 1997:95 and 1998). Comparison with Cahal Pech, a hypothesized net producer of agricultural products, suggested surplus foodstuffs could have been obtained from here by Baking Pot core residents (Conlon 1997:15).

The new survey data from the 1999 field season suggests at maximum production mode (Yield B/Population B) only Zones A and B of Baking Pot are in a food shortage situation, indicating their truly urban character (Table 3). Zone C swings between shortage and surplus in minimum and maximum production modes, suggesting it was likely a transitional, suburban zone, adjacent to, and intermediary between, the Baking Pot urban zone (A and B) and the rural hinterlands of surplus agricultural production (zones D, E, F).

Zone	Area	Mounds	Yield A	Yield B	Population A	Population B	Population
A	60.09	105	68142	108162	310	492	525
B	19.33	35	21920	34794	100	158	175
C	68.80	77	78019	123840	355	563	385
D	25.59	20	29019	46062	132	209	100
E	75.86	32	86025	136548	391	621	160
F	99.33	49	104634	166086	476	755	245
Total	345.80	318	384131	609732	1746	2772	1590
SL	56.39	77	63946	101502	291	461	385
CP	156.15	112	177074	281070	805	1278	560

Table 3: Estimates of Potential Agricultural Yield and Sustainable Population.

Yield A = Area X 1134 kilograms
Yield B = Area X 1800 kilograms
Population = Mounds X 5 people

Population A = Yield A/220 kilograms
Population B = Yield B/220 kilograms

Spanish Lookout seems to be similarly suburban in character as Zone C, vacillating between shortages and surpluses in minimum and maximum production modes. However, as suggested earlier, its land holdings may have extended beyond its present surveyed area, unlike the defined and circumscribed Zone C. An additional 34%, or another 19 hectares of land (as hypothesized above in the "under survey" of 20 - 40%), easily found to the west of Spanish Lookout, would alleviate food shortages for the inhabitants of this settlement cluster at minimum production levels. At these levels of production Spanish Lookout would not be defined as suburban, but rather a rural zone, surplus food producer.

By no means are we, at this time, associating urban with city or rural with farm. The present use of the terms urban, suburban, and rural is simply invoked to quickly convey what are zones of potential net food consumers and net food producers. The present expanded survey of Baking Pot suggests that the extensive lands of the NEBP and NCF settlement clusters would have been able to fulfill their own sustenance requirements, and those of the larger Baking Pot production shortfall, negating Baking Pot's previously hypothesized agroeconomic interaction with Cahal Pech. Coupled with previous analytical estimates of agricultural production at the Bedran settlement cluster southwest of Baking Pot (Conlon 1993:199; Conlon and Awe 1995a and 1995b; Conlon 1997) there were more than enough net food producers within two kilometers of Baking Pot to sustain a larger population then present mound counts, and the generated population estimates for the limits of the areal survey, suggest.

DISCUSSION

Overall Baking Pot's sustenance requirements for its estimated population (Population, 1590) is easily met even at minimum production levels (Population A, 1746). In the end these estimates are only agriculturally based, specifically maize based production and consumption levels (c.f. Spencer et al. 1994:135). We have not included potential sources for foodstuffs outside agriculture, including fishing, hunting, gathering, garden plots and trade. Furthermore, and probably more importantly, owing to the different zonal distribution of urban, suburban and rural populations, are questions surrounding the dynamics of surplus producing settlement clusters. Do these settlement clusters represent autonomous landholding units? How are they internally governed and externally related socially, politically and economically? How is agricultural production internally governed at these settlement clusters? What are the benefits of a surplus producer? Who ensures surplus production, and why? How are the surplus foodstuffs distributed and redistributed? Are all foodstuffs destined for intrasite distribution?

These are a completely different set of questions that are not easily, or readily, synthesized in tabular form. On the other hand, it has been suggested that settlement clusters, such as the Bedran Group, may have had a loose affiliation, possibly economically contractual, and possibly social, with the premier inhabitants of the Baking Pot core (Conlon and Awe 1995b:75; Conlon et al. 1995:59; Conlon et al. 1994:255; Golden and Conlon 1996:30; see also Iannone 1993:233 and Powis 1993). Bedran could have delivered some of its agricultural surplus to the urban zone of Baking Pot for redistribution (Conlon 1993:199 and 1997:15; Conlon and Awe 1995b:74), specifically to, and by, the inhabitants of the

Atalaya Group (Conlon and Moore 1997:91 and 1998). It seems not incongruent, then, to suggest that Atalaya was a locale wherefrom additional collected surpluses from other agricultural surplus producing groups, such as NEBP and NCF, were redistributed throughout the urban zone of Baking Pot. This is not to suggest that Bedran, NEBP and NCF had equally similar relationships (politically or socially) with Baking Pot. Future research at NEBP and NCF that involves delineating these types of settlements (i.e., "rural") chronological development may elucidate how these relationships may have differed.

CONCLUSION

Baking Pot had an urban population residing within 500 meters of its core, and a suburban population 500 to 1,000 meters from its core. Beyond a kilometer settlement clusters appear to be self-sufficient agricultural surplus producers. They inhabit twice as much land than required for meeting their own sustenance requirements, where sufficient foodstuffs could have been produced to offset deficiencies encountered by the urban and suburban populations living nearer the center of Baking Pot. Furthermore, settlement clusters beyond 1 kilometer from Baking Pot were not only self sufficient agriculturally, but likely represented entities with, and controlling, their own land holdings.

Finally, owing to low levels of settlement to the south, and disturbances by the modern town of Esperanza to the west, areal survey at Baking Pot appears to be nearing an end. Minor areal coverage incorporating Spanish Lookout to the east, and somewhat more extensive survey in the west around Bedran and Naxima, are future goals that will complete total areal coverage around Baking Pot. Altogether, though, the results from these future endeavors may not drastically alter the overall view of Baking Pot "central", particularly the settlement cluster delineation (zonal assignation) and mound/population density figures, presented here. The ascertaining of the chronological development of settlement clusters beyond a kilometer from Baking Pot may, however, prove vital for discerning the ebb and flow of social, political and economic intrasite relationships.

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RESULTS OF THE SURFACE COLLECTION PROGRAM AT BAKING POT: THE NORTHEAST BAKING POT AND NORTH CARACOL FARM SETTLEMENT CLUSTERS

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INTRODUCTION

The site of North Caracol Farm (NCF) lies approximately two kilometers to the east of the major center of Baking Pot, in Cayo, Belize. The site was originally reconnoitered by Jaime Awe in 1993 in preparation for assessing potential future investigations at the site of Baking Pot. While the site was not the focus of any organized archaeological work in 1994, interviews with farm workers indicated the tenant at that time (Dyck of Spanish Lookout) had been cultivating the area for at least four seasons. A follow up interview in 1999 suggested that the fields had been plowed at least four times a year for the last eight years, and possibly more. The removal of limestone blocks from the field, to avoid damaging plows, was common practice every season. By the beginning of the 1995 field season, none of the sites terminal architecture remained undisturbed, but a small scale surface collection program, directed by Charles Golden, was undertaken. The 1995 research revealed a grouping of approximately thirty mounds, the largest rising approximately six meters, and a potentially long time span of occupation from Preclassic to Postclassic periods (see Golden and Conlon 1996).

The surface collection of six platforms at NCF in 1995 was successful in providing a broad base for the distinguishing temporal limits of occupation and potential differentiation of mound functions, although only a sketch map of the site was able to be completed in 1995. In light of the continuing agricultural use of the land, and the ongoing destruction of the site, a further surface collection program was conducted here, and expanded to include the adjacent site of Northeast Baking Pot, in conjunction with the planned survey of these settlement clusters in 1999. Even though surface features have been badly disturbed there appeared to be great potential for further contributions via a more comprehensive surface collection program then initially conducted in 1995.

METHOD

Due to the severe damage incurred by the terminal phases of architecture of the structures the original primary context of objects recovered during surface collection would be difficult, if not impossible, to determine. Long streaks of artifacts can be seen extending beyond mounds where they have been turned up and dragged away by plowing activity. Artifacts lying between mounds were thus left uncollected as they could not be securely assigned a point of origin. At North Caracol Farm, where platforms exist that supported potentially several distinguishable mounds, the overall platform mounds were considered individual entities for purposes of differentiating between the numerous platform groups. By collecting artifacts found only on the platforms themselves, however, it was possible to acquire a gross knowledge of artifact provenience and mound/structure chronology. This technique established parameters which yielded broad data categories regarding differential occupation types and periods at the site.

The field collection was mostly restricted to mound surfaces themselves but occasionally to the plow dragged scatters at the near base of mounds. At North Caracol Farm students were instructed to collect all sherds because of their lack of familiarity discerning diagnostic ceramics from nondiagnostic ones. Owing to a more experienced crew and excellent visibility conditions at Northeast Baking Pot the ceramic field collection was restricted to sherds that were readily recognizable as diagnostic, eliminating the collection of weathered or unslipped sherds. At both settlement clusters, other “significant” artifacts (those that stood out as “special” by shape/form, material, etc.,...), particularly portable ones (smaller size) were collected and taken to the project lab for analysis and curation. Large, heavy artifacts, and typically common items, such as ground stone manos and metates, were counted but not collected. The presence of more common artifacts such as duab and riverine shell were noted, but not collected. As this was a visual (walking) surface collection program none of the sample was screened.

CHRONOLOGY

Northeast Baking Pot (NEBP)

At NEBP, 18 of 32 mounds were surface collected (56% of settlement cluster) (Figure 1). Early occupation was ephemeral, indicated by one mound (Mound 235) in Hermitage phase (5% of sample) and, similarly, the next phase indicates only the addition of a second mound (Mound 240) in the Tiger Run phase (11% of sample). The remainder of the sampled mounds contained predominantly Spanish Lookout phase types (18 of 18 mounds, 100%) and early facet New Town phase (17 of 18 mounds, 94%) occupation. By the late facet of the New Town phase occupation decreased to only 10 mounds of the sample (56%) (Table 1).

North Caracol Farm (NCF)

At NCF 14 of 39 mound platforms were surface collected (36% of settlement cluster) (Figure 2). “Occupation” of mound platforms is more difficult to discuss for NCF than for NEBP. Only short-lived (1 or 2 phases) mound platforms display continuous phase evidence (e.g., Mounds 3, 5, 12, 13, and 17). Of the mounds tested that have long sequences of occupation the Mount Hope (missing in 7 of 8), Tiger Run (missing in 6 of 9), and Hermitage (missing

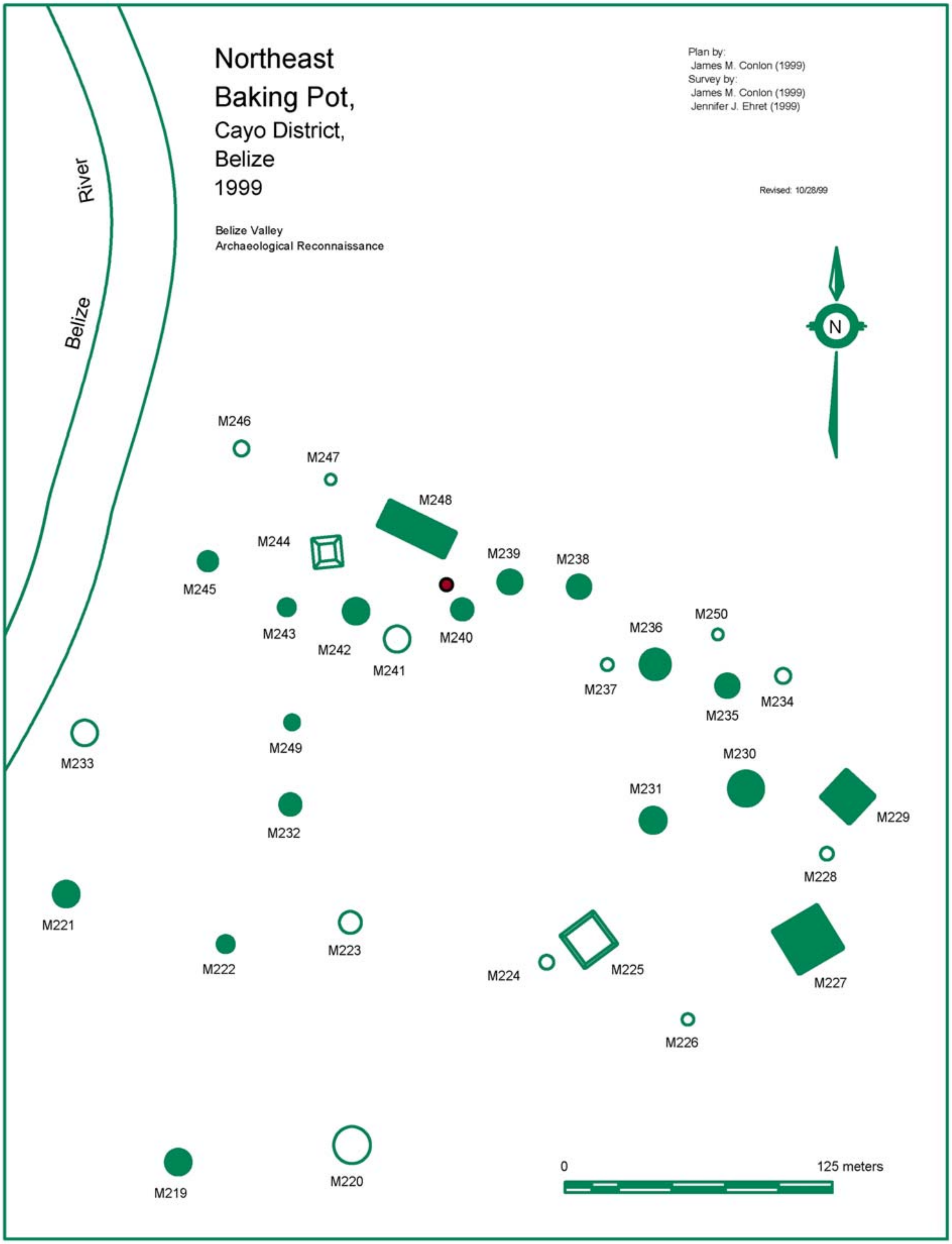

Figure 1: Northeast Baking Pot, mounds tested by surface collection (shaded), 1999.

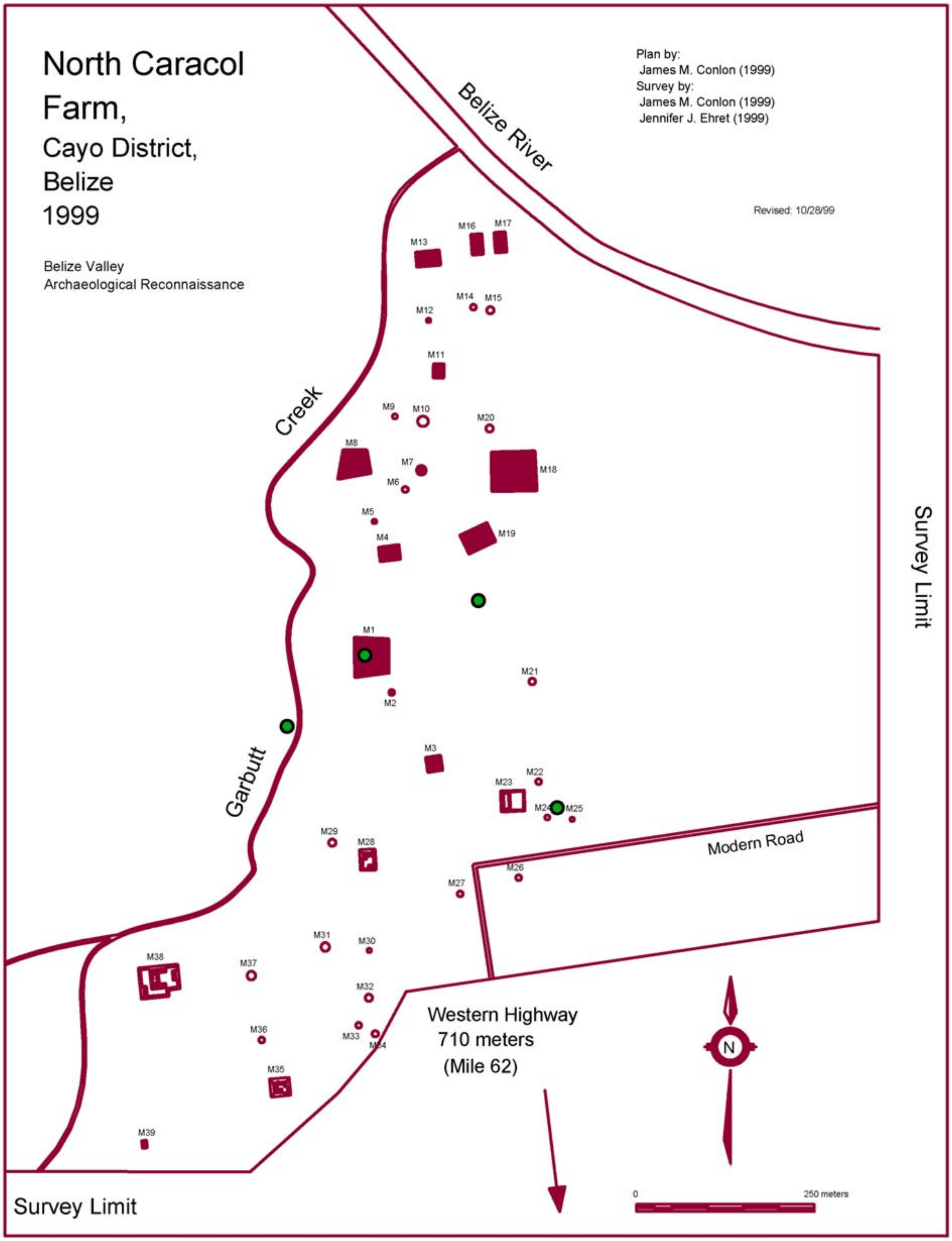

Figure 2: North Caracol Farm, mounds tested by surface collection (shaded), 1999.

Mound number →	235	240	243	222	230	232	248	249	219	221	227	229	231	236	238	239	242	245
New Town (AD1250-1500									■	■	■	■	■	■	■	■	■	■
New Town (AD900-1250)	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Spanish Lookout (AD650-900)	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Tiger Run (AD550-650)	■	■																
Hermitage (AD250-550)	■																	

Table 1: Ceramic phases identified at Northeast Baking Pot, 1999.

Mound number →	5	1	16	4	18	7	19	8	11	3	12	13	17	2
New Town (AD1250-1500)				■	■			■						■
New Town (AD900-1250)			■	■			■	■	■			■	■	
Spanish Lookout (AD650-900)		■	■	■		■	■	■	■	■	■	■	■	
Tiger Run (AD550-650)						■		■		■				
Hermitage (AD250-550)		■				■	■		■					
Floral Park (AD150-350)		■		■	■	■	■	■						
Mount Hope (50BC-AD250)									■					
Barton Creek (400-50BC)	■	■		■		■	■	■						
Jenney Creek (900-400BC)	■	■	■	■	■									

Table 2: Ceramic phases identified at North Caracol Farm, 1999.

in 4 of 8) phases are the main periods with limited ceramic evidence for occupation. In order to discuss settlement development at NCF we have assumed a “continuous occupation” scenario from earliest inception to final ceramic phase evidence.

The NCF settlement cluster began with five mounds (36% of sample) in the Jenney Creek phase and increased to eight mounds (57% of sample) by the Barton Creek phase. Settlement remained constant at 57% of sample until one mound was added (64% of sample) in the Tiger Run phase. The Spanish Lookout phase represents NCF’s height of occupation at 12 mounds (86% of sample). The New Town phase provides evidence of a continuing, constant, decline in occupation by four mounds in both the early (57%) and late (29%) facets of the phase (Table 2).

OTHER ARTIFACTS

Northeast Baking Pot

As stated above, other artifact types were recorded and/or collected during the ceramic surface collection. Again, this was not an exhaustive effort, and not every artifact was taken back to the project lab. The quantity of sampled mounds at NEBP (18) was greater than NCF (14), however, fewer non-ceramic artifacts were recorded. Based on the chronological data, this might be because the site was not occupied, to any great extant, prior the Spanish Lookout phase, or because of the less excessive amount of plowing experienced at NEBP. The results summarized in the following tables are further described herein (Tables 3 and 4).

Daub

Daub was noted, but not collected, on 11 of the 18 mounds we sampled. Taking into consideration the disturbed nature of the mound surfaces, the presence of daub suggests that the ancient mounds at one time supported a perishable superstructure. The absence of daub on 7 of the mounds does not necessarily imply these mounds did not support perishable superstructures, merely we lack the evidence for it at this time.

Chert tools

The predominate chert tool type was the biface. Chert tools were found that were both whole and fragmented. Bifaces were found on 6 of 18 mounds sampled, however no mound produced more than 1 example. Chert biface “choppers” were found on 3 of the 18 mounds sampled and these are thought to have been used for agriculture (Willey et al. 1965:426). Chert stemmed points were not found at NEBP, and only 1 laurel-leaf point was found (Mound 222). Human bone was also recovered from Mound 222, and this supports a tentative hypothesis that laurel-leaf points were placed in ancient burials (or caches) that have been disrupted by modern plowing.

	Mano	Metate	Obsidian	Riverine Shell	Marine Shell	Human Remains	Daub
219			6a	X			X
221			7	X		X	X
222			2	X	Xd	X	X
227			10b	X			X
229	1	1	11c	X		X	X
230	1			X	Xe	X	
231				X		X	X
232	1	1	3	X			
235	1	2	14			X	
236							
238	2	2				X	X
239	1	4	1				X
240			6	X			X
242				X			
243			2				X
245			2	X			X
248		1	2	X			
249			1				
Total	7	11	67	12	2	7	11

a - micro point
b - amorphic eccentric
c - small/exhausted core
d - conch fragment with drill hole
e - olive shell, perforated
M229 - biconically drilled green stone bead

Table 3: General artifact summary (X = present/unquantified), Northeast Baking Pot, 1999.

	Biface	Bifacial Chopper	Laurel Leaf	Stemmed Biface
219				
221	2a			
222			1	
227	1			
229	1			
230				
231				
232	1	1		
235	1	1		
236	1			
238				
239	1			
240	3b			
242				
243				
245	1c	1		
248				
249				
Total	12	3	1	

a - unifacial micro point
b - one micro point and one notched micro point
c - notched micro point

Table 4: Summary of modified chert from Northeast Baking Pot, 1999.

Special finds in this category were collected and taken to the project lab for analysis. Special Find (SF) #3 is a biface awl from Mound 221. SF #5 is a laurel-leaf point from Mound 222. SF #9 is a chert flake micro point/arrowhead from Mound 229. SF #19 is a biface from Mound 236.

Obsidian

All obsidian was collected and taken to the project lab for analysis. The predominate obsidian artifact was the prismatic blade. Prismatic blades and blade fragments were recovered from 13 of the 18 mounds sampled. The greatest quantities (5 or more) were recovered from Mounds 219, 221, 227, 229, 235, and 240.

SF #1 is a notched micro point/arrowhead from Mound 219. SF #6 is an obsidian eccentric from Mound 227. SF #8 is an obsidian core from Mound 229. SF #13 is a prismatic blade/flake micro point/arrowhead from Mound 239.

Ground stone

Manos and metates were the only forms of ground stone recorded at NEBP, and 12 of the 18 sampled mounds did not produce any ground stone at all. In most cases the artifacts were fragmented, and the artifacts were not collected but rather quantified and left *in situ*.

Metates were the predominate type of ground stone, and examples were noted at 6 of the 18 sampled mounds. Mound 239 had 4, the largest concentration at NEBP. Mound 232 had one intact metate. Mound 235 had a complete but fragmented metate adjacent to two apparent burial pits. Manos, although fewer in quantity, were recorded at 6 of the 18 mounds as well. The were no special finds in the ground stone category.

Riverine Shell

Riverine shell was recorded at 12 of the 18 sampled mounds at NEBP. The shell was predominately *jute*, but bivalves and *Pomacea* were also noted in lesser quantities.

Marine Shell

Mounds 222 and 230 had the only examples of marine shell at NEBP. The marine shell examples have all been modified. SF #4 is a drilled conch shell (pendant?) from Mound 222, and SF #11 is a perforated *Oliva* fragment from Mound 230. Again this is believed to have been a pendant.

Bone- Human and Faunal

Both bone types were more prolific at NEBP than at NCF. This might be due to the fact that NEBP has experienced less modern plowing, and therefore the bones have not succumbed to the prolonged pulverization and subsequent continued exposure as at NCF. Unidentified faunal material was recorded at Mounds 227, 242, 243, and 248. Small fragments of human remains were recorded on Mounds 221 (arm), 222 (femur), 229, 230, 231, 235, and 238 (arm and femur). Mound 235 had two shallow (ca. 10-30cm) 1m-in diameter “excavated” holes. These are presumed to be looted burial pits that were partially refilled. A broken, yet complete, metate lay between the two excavations, and a cluster of human remains was scattered around one pit. These were the only human remains that were complete enough to collect for analysis. Their exposure must have been recent.

Other

SF #2 is a sherd of a Belize Red type vessel from Mound 219 with two small drill holes in it. This could be a repair mark or a sherd modified into a pendant. SF #7 is a 1.5cm-in diameter drilled jade/green stone bead collected from Mound 229.

North Caracol Farm

The following summarizes both in tabular and descriptive form the results of the NCF surface collection program conducted using Jennifer Piehl’s field student crew (Tables 5 and 6). Again, collection was not an exhaustive effort, and not every artifact was taken back to the project lab, though recognizable artifacts were recorded in the field.

Daub

Daub was noted, but not collected, on 10 of the 14 mounds we sampled. Taking into consideration the disturbed nature of the mound surfaces, the presence of daub suggests that the ancient mounds once supported a perishable superstructure. The absence of daub on 4 of the mounds does not necessarily imply that these mounds did not also support perishable superstructures, but the evidence for so remains lacking.

Chert tools

The predominate chert tool type was the biface. Chert tools were found that were both whole and fragmented. Bifaces were found on 11 of 14 mounds sampled. Mounds 8, 11, and 18 produced that largest quantity. Chert biface choppers were found on 8 of the 14 mounds sampled and again, these are thought to have been used for agriculture (Willey et al. 1965:426). Chert stemmed points were only found on 3 of the 14 mounds, and laurel-leaf points were found on 6 of the 14. We hypothesize the laurel-leaf points were placed in sub-floor simple burials or caches which, over time, have been exposed by modern agricultural plowing. Laurel-leaf points were found on Mounds 1, 4, 11, 17, 18, and 19. Mounds 1, 11, and 17 also had human bone, and this lends support to the grave good hypothesis and suggests laurel-leaf points from Mounds 4, 18 and 19 may have been cached items.

Special finds in this category were collected and taken to the project lab for analysis. SF #’s 1 and 2 are a biface and laurel-leaf point from Mound 1. SF #4 is a unifacial stemmed point from Mound 3. SF #10-12 are 3 bifaces from Mound 7. SF #'s 14 and 16 are 2 of the 5 bifaces on Mound 11, and SF #15 is an awl from Mound 11. SF #18 is a biface from Mound 16. SF #19 is a laurel-leaf point from Mound 17. SF #'s 22, 24, and 25 are bifaces from Mound 18, which also produced SF #'s 21, 27, and 26, two unifacial prismatic flakes and a laurel-leaf point (respectively). SF# 23 is a chert eccentric also from Mound 18. SF #'s 30 and 31 are laurel-leaf points from Mound 19. Mound 23 was not sampled however a student assistant picked up a biface when returning to the truck at the end of the day and this was collected and became SF #32.

	Mano	**Metate**	**Obsidian**	**Riverine Shell**	**Marine Shell**	**Human Remains**	**Daub**
1		1	5a	X			X
2		1	5				
3		2	3				X
4	2	1	3	X			X
5		1					
7			7b				
8	4	1	16	X			X
11	8	8	14			X	X
12	1	2					X
13	1	3	1			X	X
16	4	3	1				
17	3	1	1			X	X
18	7	7	27	X	X		X
19	3	4	5				X
Total	33	35	88	4	1	3	10

a - one flake
b - micro point

Table 5: General artifact summary (X = present/unquantified), North Caracol Farm, 1999.

Obsidian

All obsidian was collected and taken to the project lab for analysis. The predominate obsidian artifact was the prismatic blade. Prismatic blades and blade fragments were recovered from 12 of the 14 mounds sampled. The greatest quantity (5 or more) were recovered from Mounds 2, 7, 8, 11, 18, and 19. Mound 18 had 27 blades and fragments representing 31% of the overall sample from NCF.

Special finds in this artifact type included obsidian micro points/arrowheads and notched prismatic blades. SF #8 is notched micro point/arrowhead from Mound 7. SF #13 is a notched prismatic blade from Mound 11. SF #36 is a small (exhausted) obsidian core from Mound 19.

	Biface	**Bifacial Chopper**	**Laurel Leaf**	**Stemmed Biface**
1	1		1	
2	1	1		
3	1	3		1
4	1	1	1	
5	3			
7	1			1
8	6			
11	6	1	1	
12		2		
13	1	1		
16				1
17		2	1	
18	8		2	
19	1	2	2	
Total	30	13	8	3

Table 6: Summary of modified chert from North Caracol Farm, 1999.

Ground stone

Manos, metates, and other ground stone was recorded on all but one mound (Mound 7) at NCF. In most cases the artifacts were fragmented, and, due to the weight of the stone and their commonality, were not collected but quantified and left *in situ*. Metates were the predominate type of ground stone, with all but the aforementioned Mound 7 producing examples. Mounds 11 and 18 had 8 and 7 metate fragments respectively, 43% of the sample at NCF.

Manos were less prolific, with examples being recorded at only 9 of the 14 sampled mounds. Interestingly, Mounds 11 and 18 had 8 and 7 mano fragments respectively, corresponding to the number of metates found at each. Mounds 11 and 18 represent 45% of the sample of manos at NCF.

SF #3 is a metate from Mound 1. SF #5 is a granitic adze/celt from Mound 4, and SF #17 is an adze/celt from Mound 11. SF #20 was an interesting fragment of a nubbin-footed basaltic “mini metate” which, stylistically, looked more of northen influence (see Gifford 1976:289 re: Yucatecan intrusion). The mini-metate, which may be likened more to a mortar, had a stylized tiered “skirt” surrounding the base of the grinding surface. One grooved stone “maul” was recorded on Mound 1.

Riverine Shell

Riverine shell was recorded at only 4 of the 14 sampled mounds at NCF. The shell was predominately *jute*, however bivalves and *Pomacea* were also noted in lesser quantities (3 examples of each). *Jute* represented 90% of the riverine shell recorded at NCF.

Marine Shell

Mound 18 had the only examples of marine shell recorded at NCF. These were collected and brought to the project lab for analysis. SF# 28 are two small fragments of conch, and SF #29 is a *Oliva* fragment that had been modified into a pendant by perforation.

Historic Material

Historic period ceramic and glass was collected at 3 of the 14 mounds samples at NCF. Mound 8 had 2 small fragments of historic period glass. Mounds 16 and 17 (the presumed ball court) each produced both historic period glass and ceramic. Due to the disturbed nature of the mounds it is presently unknown whether there was historic occupation of the area, or whether the artifacts were disposed rubbish.

Bone- Human and Faunal

Mound 1 produced the most enigmatic collection of bone. Examples of a robust human femur, as well as deer, and another unknown animal are apparently represented (Howard Hecker, personal communication). Mounds 11, 13, and 17 also produced hints of human remains including a fragment of a femur (Mound 17). Unfortunately the human remains at NCF have endured generations of modern plowing and the fragments we recorded were too destroyed to make any assessment of age or sex.

Other

A stone incised spindle whorl (SF #34) was recovered on Mound 1, and a ceramic spindle whorl (SF #33) was recovered from Mound 11.

DISCUSSION

The most obvious distinctions between the two settlement clusters are the discrete variations in surface morphology and chronological development. On the surface, NCF differs morphologically from NEBP, with a number of large platforms supporting patio groups. The mounds at NEBP appear to have been platforms supporting a single superstructure, and these by no means approached the monumental size of several of the NCF platforms. NCF started earlier and broader than NEBP but growth was stymied during the Late Formative and Early Classic periods. NCF was less able to attract settlers in the Spanish Lookout phase than NEBP and unable to hold its existing population in the early facet of the New Town phase (NCF down 50% and NEBP down 6%), though each faired roughly similar fates in the late facet losses (NCF down 50% and NEBP down 41%).

Overall NCF follows a generally more typical Belize Valley line of evolutionary ebb and flow from beginning to end whereas NEBP burgeons suddenly and dramatically. We feel NEBP's sudden and large settlement expansion is not readily explained by population growth alone (though it may provide a partial explanation). Settlement throughout the valley, indeed most of the Maya Lowlands, is often characterized by a population increase in the Late Classic period (e.g., Ford 1986 and 1990). However, if population increase was uniform throughout the settlement at Baking Pot then NCF would be expected to incur a similar percentage increase (9 fold) in settlement. That is, NCF would have to grow from 9 platforms in the Tiger Run phase to 81mounds in the Spanish Lookout phase to equal NEBP's expansion. This is clearly not the case and further underscores our assumption that NEBP's expansion was not population increase related.

As previously stated, the modern history of agricultural plowing may be a significant factor in these chronological distinctions. Long-term plowing at NCF would logically have "shaved" more cultural layers from those mounds, thereby disrupting more deposits. The apparent small initial occupation and subsequent rapid expansion of settlement at NEBP is startling. However, some of this perceived burgeoning may be accounted for by less prolonged plowing at NEBP. NEBP has not been as intensively plowed as NCF and, therefore, some Spanish Lookout phase mound inceptions may have earlier ceramic phase representations that have not been brought to the surface as yet (untested mounds may also provide evidence of earlier time spans). At present we only have the data at hand, and therefore, the Spanish Lookout phase at NEBP exhibits a huge settlement increase, too much for population increases alone to account for, from the original inhabitants of Mounds 235 and 240. The inability of population increase alone to adequately explain NEBP's growth begs two interrelated questions: where did these settlers come from, and why?

By the very phrasing of the question we have assumed the settlers of NEBP to be "migrants." But exactly where from? Could they be relocated inhabitants from Baking Pot itself, the Belize Valley region, or even from further abroad? If they were from Baking Pot then why move to this particular locale? There was certainly plenty of land available one kilometer to the south of the site center (Conlon 1997:11). If their settlement was planned, or forced, by core-elite this may offer an explanation as to why differential mounds/structures are not found at NEBP. The initial founders (Mounds 235 and 240) landholding powers may have been usurped by this migratory influx. Even though Mound 235 did reveal some important differences in content it, as well as the rest of the group, does not provide ready evidence of special function structures, and certainly monumentality is lacking.

The apparent expansion of Baking Pot at NEBP could also be, contrary to expansion, explained as a nucleation of settlement around the center from peoples outside the sites environs (see Gifford 1976:289). In this scenario one needs to understand why “outsiders” would flock to NEBP. By Classic period times fresh water foodstuffs do not appear to have been as extensively used by the ancient inhabitants of nearby Barton Ramie (Willey et al.1965:527, see also Healy et al. 1990:171). Yet, 67% of the mounds tested at NEBP showed evidence of such riverine resources (e.g., *jute*, *pomacea*, bivalves). So, the reasons for NEBP's settlement increase may not be so much owing to site center focused expansion or nucleation but a focus on raw resources that the Belize River could provide. A greater reliance upon natural resources is also evidenced by the increased frequency of micro points (for hunting) and decreased frequency of manos (33% versus 64%) and metates (33% versus 93%) found at NEBP in comparison with NCF. This is further contrasted by the low incidence of land clearing tools, such as bifacial choppers, recovered at NEBP (17%) in comparison to NCF (57%).

The general pattern that emerges is one of an agriculturally based Classic period population supplanted or transformed into a resource based, hunter-gatherer society, by Postclassic times. The rise of the “new economy” likely began, or at least had its underpinnings, in the Spanish Lookout phase as evidenced at NEBP (cf. Willey et al. 1965:570). The overall picture of settlement at Baking Pot suggests that by the end of the Late Classic period population was at an equilibrium, or, even in an agricultural surplus production mode (see Conlon and Ehret, this volume). However, owing to factors that hypothetically included any, or all, of numerous extensive floods, inconsistent yields owing to occasional droughts, or worse, prolonge and extended dry seasons, intensive agriculture on a large scale became unreliable. An agricultural surplus redistributive system, likely sanctified by primary core dwelling elite, and managed by secondary periphery dwelling elite (cf. Freidel and Scarborough 1982), collapsed. Furthermore, the roughly equivalent frequency distribution of the occurrence of obsidian between NEBP and NCF suggests that elite peoples did not necessarily factor in the importance of its distribution in Postclassic times. As the food supply became unreliable, and the managers became suspect, populations eschewed this system and reverted to individual household means for producing and procuring sustenance (cf. Gifford 1976:288 re: singular household pottery production). This in part, may answer the question of why a migratory population would choose to settle in the relatively vacant land of NEBP, rather than join an existing and established middle type of settlement, such as NCF represented.

On the surface, the lands nearest the center of Baking Pot were apparently already densely populated (see Conlon 1997:11 and Conlon and Ehret, this volume). The NEBP migrants of Spanish Lookout times may simply not have been able to inhabit zones closer to Baking Pot. On the other hand, they do not appear to have been individuals that preferred to have “in filled” areas nearer Baking Pot. Indeed, the rapid settlement at NEBP appears as though a group of families moved here *en masse*. This group of families would have been able to retain some identity of their former selves as a larger cohesive settlement unit, with a degree of autonomy, from both Baking Pot and NCF. The evidence from NEBP and NCF suggests a deemphasis on agriculture and a reversion to hunting and gathering for sustenance. The settlement mosaic at NEBP, and likely Baking Pot as a whole, was very much a village/hamlet type in Postclassic times (see Willey et al. 1965:578-580 and Bullard 1973:241).

CONCLUSION

A better understanding of Baking Pot is certainly predicated on an understanding of an array of various sized settlement clusters within close proximity. Medium sized sites in the Belize Valley (e.g., Nohoch Ek, Zubin, Cayo Y (Xual Cunil), Floral Park, and Ontario) attest to the multiplicity of settlement morphology and the concomitant complexity of settlement hierarchy in this region. The expanding database on these minor centers, with its ever increasing diversity, requires greater concentration of efforts on obtaining data that enables delineation of intrasite relationships. The results of surface collection at NEBP and NCF provide important insights into several possible routes for investigation and analysis of major center activities that can complement minor center studies. By the same token, site focused research at Baking Pot can also support more insights into broader regional relationships such as roles played by Classic period Xunantunich, Naranjo, Tikal-Peten towards the west, south to Caracol, and even north to the Yucatan's Terminal Classic and Postclassic periods.

A more thorough surface collection program should be carried out in 2000 to prevent further loss of data to the plow. It would be prudent to complete a 100% surface collection at both sites to see if the variations demonstrated here remain constant between the two sites. All mounds at NEBP and NCF should be tested through systematic surface collection at the very least, and, if manageable, a test pitting program. Until then, the hypothesized whys and wherefores of NEBP's migrant settlers will remain unresolved.

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GPS MAPPING IN THE MACAL VALLEY, 1999

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INTRODUCTION

At the invitation of Jaime Awe, Director, and Cameron Griffith, Co-Director, of the Western Belize Regional Cave Project, I spent portions of two days, June 21 and June 22, 1999 doing GPS mapping for the project. There were three separate but related objectives of the GPS mapping.

Objectives

1. Preliminary mapping of features and contours at the site of Oxmulkab located at approximately 17º01'30" N 89º05'40" W (UTM 16 N, NAD 27 Central America, N 1883500 E 277000).

2. Determination of the locations of two entrances of a cave, Actun Chapat, that is a focus of archaeological research of the project.

3. Gathering GPS data at the location of a property survey monument for the purpose of converting the GPS data gathered into UTM coordinates.

GPS mapping

A description of the principles and methods of GPS data processing applicable to archaeological mapping is included below as "Appendix: Gathering and processing GPS data for archaeological mapping."

EQUIPMENT

A Trimble 4000SE GIS Surveyor was used as the GPS base station. A Trimble 12-channel GPS Pathfinder ProXL with a TDC1 Datalogger was used as the rover. A beta version of Trimble Pathfinder Office 2.5 was the software package used. The equipment and the software were provided by Trimble Navigation of Sunnyvale, CA.

Base station reference position

The base station was located at a convenient but arbitrary location on the unnamed archaeological site. The base station reference position for all base files recorded was set as the average position recorded in the file for June 21, 1999. The autonomous accuracy is that set by the Department of Defense for the L1 signal as 100 meters (2dRMS).

Personnel

The survey was conducted by W. Poe with the assistance of S. Hayes and C. Griffith.

METHODS AND RESULTS

Three different methods of GPS field survey were used for the three objectives defined above. These methods are described in greater detail in the appendix.

Objective 1: Preliminary mapping of features and contours at the site of Oxmulkab

A continuous kinematic method was adopted for mapping the site. The objective was to produce a map in a very short period of time that would serve as a foundation for the development of a proposal for further exploration of the site. The total amount of field time, not including transit, devoted to this objective was about 6 hours. During a data recording period of 5 hours 20 minutes a total of 3343 positions were recorded, some of these positions were associated with features, but the vast majority were recorded automatically at 5 second intervals as out-of-feature positions intended for topography. Of these positions, 3076, or 92%, have horizontal 95% precisions of 10 cms. or better and vertical 95% precisions of 30 cms. or better. 2669 positions, or 67%, have horizontal 95% precisions of 7.5 cms. or better and vertical 95% precisions of 22.5 cms. or better. These positions have more than sufficient precision to produce a reliable 0.5-meter contour interval map of the site. The precisions refer to the accuracy of the GPS data relative to the location of the base station.

The portion of the site mapped was that which is now cleared for pasture to within perhaps seven to ten metes of the tree line. With any closer approach to the tree line lock on the carrier signal was lost. It is clear that the majority of the currently cleared pasture area was devoted to agricultural terracing. Except for the terrace walls most of the visible structures are close to or within the tree line. Theodolite mapping will be necessary to incorporate many of the structures into the map. No effort was made to determine the extent of the site. Maps showing the results of this work are appended to the report.

Objective 2: Determination of the locations of two entrances of Actun Chapat

This objective was to define the position of two mouths of the cave, Actun Chapat, in very general terms. Both mouths are on hillsides surrounded by dense canopy. The western entrance is vertical and positions near the mouth can be occupied. The eastern entrance, however, is a horizontal opening in a cliff face and the cliff face itself creates a formidable shadow for satellite signals.

The positions and the precisions cited below are with reference to the base station location. Unless coordinates can be provided for the property survey monument occupied as described below, these coordinates values are within 100 meters.

Western entrance

Three locations were logged near the western entrance of the cave, two within a meter to the south-southeast of the lower lip of the cave mouth, and one some meters to the north-northwest of the upper lip of the cave mouth. There is moderate canopy around the cave entrance and the hills on both sides of the narrow valley create a significant curtain to block signal reception.

The receiver recorded from only four satellites and the PDOP was very high, from 22 to 25. This high PDOP is reflected in the very large 95% precisions recorded. At the south-southeast locations the following coordinates were recorded. All coordinate values are UTM 16N NAD27 (Central America).

Easting	Northing	MSL	Hr 95% precision	Vt 95% precision
277197.14	1884374.38	222.82	8.48 m	16.40 m
277198.30	1884373.12	221.38	9.38 m	18.92 m

At the north-northwest location the following coordinates were recorded

Easting	Northing	MSL	Hr 95% precision	Vt 95% precision
277190.67	1884388.20	246.98	8.92 m	17.48 m

A rounded value between these positions provides a reasonable coordinate value for the cave entrance of E 277195 N 1884380 or N 17°02'05" W 089°05'35".

Eastern entrance

The eastern entrance to the cave is in a cliff face with significant canopy cover. No signal could be obtained from the ledge near the entrance. C. Griffith recorded positions in a relatively clear zone near the bottom of the narrow valley. The distance from the cave mouth to the recorded position was not measured. Griffith estimated the distance to be approximately 50 meters. The PDOP was between 4.7 and 5.1 with four to five satellites available. At that location the following coordinates were recorded:

Easting	Northing	MSL	Hr 95% precision	Vt 95% precision
277630.06	1884512.26	171.53	1.5 m	4 m

277631.02	1884512.55	173.09	1.6 m	4 m
277635.38	1884512.61	186/39	1.6 m	3.7 m

Objective 3: Gathering GPS data at the location of a property survey monument for the purpose of converting the GPS data gathered into UTM coordinates

A property survey monument was located near the road and occupied in a classic static mode for 45 minutes gathering 540 positions. Conditions were good with a maximum PDOP during the occupation period of 4.8 and with eight satellites available. The location of the monument is approximately 900 meters from the base station location.

Easting	Northing	MSL	Hr 95% precision	Vt 95% precision
277912.00	1883299.236	259.85	0.10 m	0.22 m

As with the other locations recorded in this project, the coordinates cited below are precise with reference to the base station to the degree noted, but the absolute accuracy of the coordinates is within 100 meters horizontally. If a records search can determine the correct coordinates for this marker, then a correct value for the base station reference position can be calculated and the data can be differentially corrected again with an absolute accuracy of the map reflective of the accuracy of the property survey marker coordinates and the precision of the GPS data.

APPENDIX: GATHERING AND PROCESSING GPS DATA FOR ARCHAEOLOGICAL MAPPING

Accuracy and precision

When used in the context of GPS mapping with Trimble's Pathfinder Office™ software and receivers, the term *accuracy* can refer to two different attributes. On the one hand the term refers to the confidence with which the absolute location of the receiver is known. If the base station is placed on a point of known location then the accuracy is determined by the confidence with which that location is known. If, however, the base station is placed on a point the location of which is unknown, then the base station reference position is determined autonomously and the accuracy is that defined by the department of defense for the L1 signal, 100 meters (2dRMS). On the other hand, the term *accuracy* refers to a capability of a particular GPS receiver and is usually expressed as a constant plus a function of the length of the base line between the base station and the rover expressed in parts per million (ppm).
The term *precision* refers to the confidence with which the base line between the base station and the rover is known. The precision of a position is expressed as a unit length that is the error of the position in the northerly direction, the easterly direction and the vertical direction from the position's displayed coordinate. The precision of a feature is expressed as the average

horizontal and the average vertical precisions of the positions that comprise the feature. Precisions are expressed at a confidence level, 68%, 95% or 98%, representing respectively one, two and three standard deviations of the distribution of the data. In this report all precisions are expressed in centimeters at the 95% confidence level.

Differential code and carrier phase processing

There are two methods of differential processing that can be used to process GPS data, code processing and carrier phase processing. Traditionally mapping grade single frequency GPS receivers were used to collect data that was code processed and produced precisions that were better than 1 meter plus 2 ppm times the base and the rover given appropriate conditions of satellite geometry (PDOP) and signal to noise ration. Dual frequency survey grade GPS receivers were used with by land surveyors to collect data that was carrier phase processed producing far greater levels of precision.

Single frequency mapping grade GPS receivers are very practical for archaeological mapping purposes. Relative to dual frequency survey grade receivers they are economical, portable and rugged. They are very rapid to use to gather data that will be code corrected. This degree of precision is sufficient for a great number of archaeological projects, but it is insufficient for such tasks as the mapping of monuments, determination of alignments of structures, the fitting of a local site grid to the Universal Transverse Mercator Grid system, or the generation of positions for fine scale topography.

Software developments now make it possible to use the carrier phase method of data processing with single frequency receivers to achieve typical horizontal precisions of 2 to 2.5 centimeters and vertical precisions in the neighborhood of 5 to 7 centimeters. There are, however, more stringent requirements for data collection if one wished to use this method.

Differential Code Correction

GPS receivers generate the identity codes for the satellites synchronously with the transmission of the codes by the satellites. For code processing the critical measure is the time offset between the satellite transmission of the L1 signal and the receiver reception of the signal. The receiver shifts its generated code in time to match the code received from the satellite. The time difference multiplied by the speed of light is the distance of the receiver from the satellite. The position of the receiver is determined by solving the intersection of four spheres, the centers of which are the known locations of four satellites at a given epoch and the radii of which are the distances from the satellites to the receiver. With differential correction, relatively short base lines, and good satellite geometry this technique can produce sub-meter precision.

Differential Carrier Phase Processing

Carrier phase processing is an inherently more precise measuring device. The length of transmission of one bit of the code is 293 meters, whereas the L1 carrier frequency has a length of 19 centimeters. In both cases the signal is digitized and is phase modulated.

The distance from the satellite to the receiver can be thought of as being measured in a certain integer number of wavelengths of 19 centimeters each plus a fractional cycle. Since the signal is digital the fractional cycle is measured as the elapsed time since that last phase shift. The receiver can determine the fractional cycle or phase to within a hundredth of a cycle or about 2 millimeters[i]. The unknown number of full cycles between the satellite and the receiver is called the *integer ambiguity*.

The phase processor software is able to determine very precisely the location of the rover antenna by resolving this ambiguity. A search volume for the true position is created based upon the average and the standard deviation of the code solution. A least-squares approach is used to discover the unique set of assignments of integers to the satellite carriers that result in a single stable position. The three unknowns, the X, Y and Z coordinates of the rover receiver ought to be soluble from the carrier signals of three satellites.

However, instead of the carrier signals themselves, the program uses the differences between the carrier waves of pairs of satellites received by the base and by the rover receivers. These are called *double differences.* These are used because in the double difference expression the clock errors of the satellites and the receivers drop out of the equation. It requires signals from four satellites to produce three double difference equations. In order to be able to test statistically for the best solution the data must be over-determined. Thus data from a minimum of five satellites is required for a carrier solution. The solution is strengthened with a greater number of satellites.

For single frequency receivers to collect an adequate quantity of data to resolve the integer ambiguity the base and the rover must maintain carrier lock on a minimum of five satellites for a minimum period of about 45 minutes. The number of satellites cannot be less than five, although it does not need to be the same five satellites throughout the period.

Since all of the data are processed after the survey it is not necessary to resolve the ambiguities prior to gathering other data. The algorithm that the carrier phase software uses for resolving the integer ambiguity does not depend upon the rover remaining in the same location for the 45 minute period, only that it maintains the carrier lock. A great deal of planning and care in execution of the survey is required in most instances in order to avoid loss of carrier lock as the rover receiver is moved from place to place in conducting the survey. Fortunately planning software is available to aid this part of the process. The satellite signals are very weak and maintaining lock on the carrier phase is particularly difficult with any degree of canopy cover. While this method of data processing is very precise, it is only practical in very open situations.

The accuracy of carrier phase processing is also a function of the distance between the base station and the rover. For much acceptable code processing the base and the rover may be as much as 300 kilometers apart and still produce sub-meter results. With carrier phase processing the two must be much closer together. If the base is more than about 50 kilometers from the rover, the carrier solution will probably be no better than the code solution. For horizontal 95% confidence level precisions in the neighborhood of 2 centimeters or less it is necessary to occupy a position with the rover very near the base station, such as a few meters, for some significant period of time, such as 20 minutes, during the course of the survey.

FIELD PROCEDURES

All field procedures for data gathering assume the following conditions:

- PDOP ≤ 4
- Signal to noise ratio ≥ 6
- Rover satellite elevation mask of 15°
- Synchronized measurements between the base station and the rover. The usual data synchronization interval is 5 seconds. For code processing the base station receiver can be set to a multiple of the rover interval and the software will interpolate the intermediate correction. For carrier phase processing the synchronization must be identical.

Code

If only code processing is to occur, carrier mode can be turned off on the datalogger, the mode can be set to manual 3D, and files can be opened, closed and reopened as convenient.

Carrier

For all of the data gathering for carrier phase processing, the carrier mode must be turned on, the mode must be set to overdetermined 3D. Files need to be left open to maintain continuous carrier lock and a file may not be reopened.

Static

In the classic static method of gathering GPS data the rover, as well as the base station receiver remains stationary on a point for some significant length of time. With single frequency receivers a minimum occupation of 30 - 45 minutes is recommended. Change in the satellite geometry enhances the resolution of the carrier phase ambiguity. A separate file is created for each station so occupied.

Intermittent kinematic

The intermittent kinematic method is often called stop-and-go kinematic. Characteristic of this method is the successive occupation of a number of points with the rover receiver while maintaining continuous carrier lock not only during the occupations but throughout the process of moving as well.

As with the static method, with single frequency receivers, it is recommended that the file be open for a minimum of 45 minutes in order to use the change in the satellite geometry to aid in the resolution of the integer ambiguity.

To be successful with this method the lines from point to point must have a good view of the sky. Careful planning and care in moving the rover receiver is also very important to the success of this technique.

The author has been able to secure horizontal 95% precisions of 2 cms or less and vertical 95% precisions of 5 cms. or less on a series of points by initially occupying with the rover a point only a few meters from the base station for a period of 20 minutes, then occupying each successive point for as little as 5 minutes.

Continuous kinematic

If the precision demands of the survey are not so great as to require the intermittent kinematic technique, it is possible to use a fully kinematic method that simply does not stop. This technique can be productive for such purposes as gathering topographic data for contour mapping. As with the intermittent kinematic method, it is crucial to maintain a clear view of the sky. It also remains important to keep the file open for a minimum period of about 45 minutes. This method is sometimes referred to as ambiguity resolution on the fly (AROF) or simply on-the-fly (OTF).

Using this method the author typically obtains horizontal 95% precisions of 7.5 cms. or less and vertical 95% precisions of 22.5 cms. or less.

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[i] The frequency of the L1 signal is 1575.42MHz. At the speed of light, 300,000 km/sec, it thus travels 190.425 mm for every shift in phase. It shifts in phase once every 0.63 nSec and the receiver clock can resolve to 0.01 nSec.

POTS FROM BELOW: A PRELIMINARY EXAMINATION OF THE CERAMICS FROM ACTUN CHECHEM HA, BELIZE

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INTRODUCTION

Actun Chechem Ha (also known locally as Vaca Falls Cave) is located on a large steep hill on the western bank of the Macal River, northwest of the Vaca Falls (Awe 1998; Awe et al. 1997). The site was discovered by a local farmer in 1989, was explored by the Belize Department of Archaeology the same year and mapped by Erin Hardy and David Arveschoug in 1991 (Williams 1992). Investigations by the Belize Valley Archaeological Reconnaissance Project began in 1996 and were followed by a preliminary survey in 1997. The Western Belize Regional Cave Project conducted the first systematic investigation of the cave in 1998 and 1999. These efforts consisted of extensive surveying and mapping of the cave and recording of all surface finds.

This report provides a description of the cave and associated cultural remains. Preliminary results on the diachronic and form distribution of ceramic containers by discrete clusters are also presented. Comments are subsequently made on some of the modal features displayed by the ceramic remains, and suggestions for future analysis are provided.

SETTING AND LOCATION

Actun Chechem Ha is located in the western Cayo District within private lands owned by Antonio Morales and Lea Castellanos. The principal trail leading to Actun Chechem Ha starts at Poisonwood Creek (which gives the cave its name) where the landowners have established their residence and tourist facilities. At that point the creek plummets off a steep cliff, forming a waterfall over 25 m high. From the summit of that waterfall there is a clear view of the Macal River Valley below. From there the trail winds through milpas and then up a steep hill. During the months of milpa burning, ancient Maya agricultural terraces are visible in the ravine through which the trail runs, indicating that a substantial population once resided in the vicinity of the cave. On the northern flank of the ravine, facing west, lies the entrance to Actun Chechem Ha (Figure 1). The entrance measures approximately 1.5 m high by 2.5 m wide. As the name of the cave implies, the surrounding

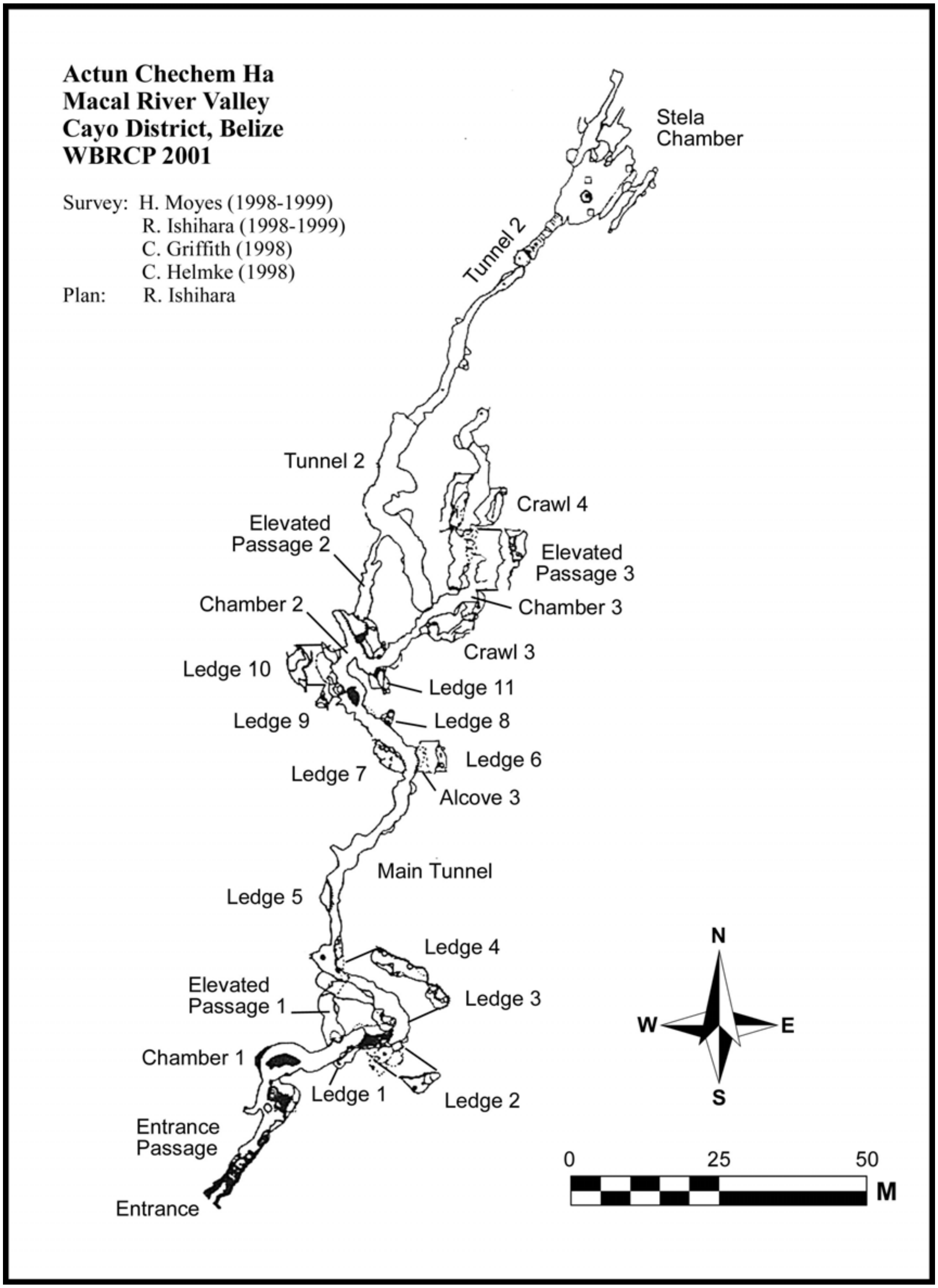

Figure 1: Map of Actun Chechem Ha.

tropical forest contains poisonous Chechem trees (Arvigo and Balick 1993:88-89; Record and Hess 1949:44-45, 62, 70, 106-107, 164).

Ceramic vessels and sherds dominate the artifact assemblage in Chechem Ha Cave. Though other artifact types are found in the cave, they are underrepresented in comparison to ceramic material. An early reconnaissance of the cave recorded that the assemblage of artifacts consisted of: 1 mano fragment, 1 stone "stela" monument (see Awe et al. 1997:93, 95, Fig. 9), several censer sherds representing at least 3 incensarios, and hundreds of ceramic vessels and sherds. If the excavated material from the Entrance Chamber is included, then the assemblage includes 6 slate fragments and 1 basalt fragment.

Because of the few non-ceramic artifact classes represented, investigations have focused on ceramic analysis as a means to understanding Maya activity at Chechem Ha. A close analysis of the ceramic vessels can shed light on the time period during which Chechem Ha was used. In addition, an examination of the temporal and spatial distribution of the ceramics may help elucidate the nature of cave use. It is hoped that a contextual analysis of the artifacts, one of the primary project objectives outlined by the WBRCP (Awe 1998:9-10), will aid in distinguishing use of different areas of the cave.

SITE DESCRIPTION

Entrance Passage and Chamber 1

Inside the cave entrance, a narrow passage of mud and large cobbles of limestone slopes downwards for approximately 14 meters. This is the "Entrance Passage" where data collection commenced. The Entrance Passage leads to the "Entrance Chamber," or Chamber 1 (CH 1), which is a small chamber measuring 12 m by 10 m at its widest, with a portion of the eastern cave wall reaching towards its center. At the junction of Chamber 1 and the Main Tunnel is a large boulder with a niche (approximately 50 cm from the modern cave floor) on the south side. It is noteworthy that a slick, seemingly polished soda straw speleothem is cached within the niche, which is closed off with two rocks placed in the front part of the niche.

The Entrance Chamber is one of the few "wet" places in the cave. Beside a cone-shaped formation in the center of the chamber there is a point in the ceiling where drip water enters the chamber, which forms a depression and puddle on the mud floor during periods of heavy rain. According to the landowners, this summer's rainy season had been the wettest time inside the cave since 1989 (William Pleytez, personal communication 1999). During this time, the usually hard floor of the Main Tunnel can become extremely muddy and slick as far as 65 m into the cave from the entrance.

Excavations were conducted in the southeastern area of Chamber 1, where limestone cobbles covered the floor. A 1.5 x 2.5 m unit was opened with a 1.0 m x 1.5 m extension. The purpose of these units was to investigate the possibility of Pre-Classic activity in this area, where "early" material was found in surface finds (Awe 1998:6; Awe et al. 1997:95).

Main Tunnel

Thirty meters into the cave at the twilight zone ends and the dark zone begins. At this same point, the Entrance Chamber ends and the main tunnel of the cave begins. The entire length of Actun Chechem Ha, including branching passages, is approximately 350 m. The main passage is approximately 2 m wide on average but has a height in excess of 5 meters in most places. A mud-and-guano floor runs throughout the cave. Along this main passage, or Main Tunnel (MT), are small niches in the cave wall by the floor, many of which contain sherds. The whole vessels all appear on higher ledges or elevated passages, and the majority of the artifacts are found in areas other than the main passage. There are numerous ledges at varying heights up to 7 m from the floor along the vertical walls of the main passage.

Elevated Passage 1

Just a few meters into the dark zone, on the north side of the passage, at a height of 3.4 meters above the floor is "Elevated Passage 1," or EP1. This passage contains many large, complete ollas. It is 18 meters long, extending above Ledge 4 and crossing over the Main Tunnel, and ends at a point overlooking the Main Tunnel a few meters from Ledge 5.

Ledge 1

Ledge 1 is to the south of Elevated Passage 1, directly across the Main Tunnel. Ledge 1 (L1) is a narrow ledge at approximately the same elevation as EP1 containing a few medium-sized ollas and a stack of sherds. One of the ollas appears to be supported by stones, an observation made in other areas of this cave. The sherd stack consists of a large olla body sherd with 7 sherds placed on it. Some of the sherds are charred and have residue. Residue samples were collected.

Ledge 2

At approximately 3 m past Ledge 1, an uneven floor of white limestone cobbles is exposed in the Main Tunnel, stretching for approximately 5 m. At the eastern end of this floor is Ledge 2 (L 2) at a height of 1.5 m above the floor. This ledge is better described as a "crawl" since the vertical space measures approximately 0.5 m. Only 3 sherds were found within the "crawl".

Ledge 3

Across the Main Tunnel from Ledge 2, just after the bend is Ledge 3 (L 3), approximately 4 x 3 m in size. A 0.7 m-diameter pit was found that contained 2 speleothems, 2 small body sherds, and an unidentified specimen, possibly decayed wood. Since the ledge is clear of any formations, the speleothems found here must have been deposited intentionally.

Ledge 4

Ledge 4 (L 4) is located adjacent (northwest) to Ledge 3 at a height of 2.4 m from the floor of the Main Tunnel. This ledge has several small pits, lined or encircled with limestone rocks, that contain sherds, charcoal, and residue. The pits vary from 0.4 m to 1.0 m in diameter. Most of the sherds have remnants of charring, with many on the interior of the sherd.

Ledge 5

Ledge measures 5 meters by 2 meters, and is elevated 6 m off the chamber floor. A "lip-to-lip" cache of two black-on-orange bichrome dishes with medial ridges was placed here. Both dishes have a stepped-fret motif on the rim interior with a central figure. The interior of the superior dish depicts an unidentified animal, perhaps a "frog," while the interior of the bottom dish has a spiral design. Both dishes date to the first sub-phase of the Late Classic (ca. A.D. 600-700) based on comparison to ceramic materials from Barton Ramie (see Gifford 1976:208-209). A brown, complete bowl with a bottom inset was also found. This vessel also dates to the Late Classic 1 phase (see Gifford 1976:210-211, Fig. 127; Reents 1980:103, 106, 109, Fig. 10b). Most of the sherds and the whole vessels are charred on the exterior. There is a half-circle of stones on one end of the ledge, suggesting the presence of a hearth in antiquity.

Alcove 3

Alcove 3 is located directly underneath Ledge 6. It is approximately 5 m in width. At the entrance end of the alcove is a complete, Early Classic (ca. A.D. 250-550) polychrome bowl with basal flange that is broken into two pieces. Ten jar rim sherds and 7 body sherds are found against the wall. On either ends of the alcove, where the alcove meets the chamber wall, are 2 holes measuring approximately 3 cm in diameter. Above these holes upward flaring char marks are visible. The pattern of the charring suggests that these holes may have served as torch holders. The two holes are at heights of 1.28 m and 1.37 m above the floor. The diameters of these holes are in keeping with the wooden shafts reported from a Rio Frio cave (Ford Young, personal communication, as cited in Pendergast 1974:53), and are also comparable to the minimum diameter of torch fragments recovered from Entrance II of Actun Chapat (Awe 1998:6). The Chapat cave site is also located on the Western flank of the Macal Valley, 2 to 3 kilometers north of Actun Chechem Ha.

Ledge 6

Ledge 6 lies west across from Ledge 7 at a height of 4.6 meters. The ledge measures 1.5 meters in width by 5 meters in length. Previous reconnaissance of the cave indicated that three of the four medium-sized, complete ollas on this ledge had Mount Maloney Black bowls placed right side up over the mouths of the jars as lids. Between that reconnaissance and this season's investigations these bowls were looted. During previous reconnaissance, a desiccated maize cob (*Zea mays* L.) was found in one of the Mount Maloney Black bowls, and was sampled. Rocks and sherds are placed underneath two of the jars possibly for support. A red-slipped tripod dish that originally formed part of the L6 deposit was also looted.

In addition to disturbance on this ledge by looting, there is evidence of other kinds of disturbance. A partial black-on-orange bichrome bowl was found on this ledge. A photo taken in 1991 by Karen Bassie-Sweet, however, does not show the bichrome vessel, suggesting some modern displacement and shifting of artifacts (Karen Bassie-Sweet, personal communication 1999).

Ledge 7

Ledge 7 (L 7) is one of the largest ledges measuring 7 m by 3 m at a height of 4.5 m. Nine whole ollas, 1 whole Mt. Maloney Black bowl with mending holes, 1 complete brown bowl broken in two with partially drilled mending holes, a few polychrome sherds. One of the ollas and the Mt. Maloney Black bowl contained a concentration of red Annatto (*Bixa orellana* L.) seeds (see Arvigo and Balick: 12-13). More than one-third of the sherds and vessels are charred on the exterior. In the wall, at either ends of the ledge are two small holes (0.15 m x 0.15 cm x 0.15 m; 0.3 m x 0.2 m x 0.25 m) with charred smudges above them suggesting that these may have been used to hold torches. From an examination of photos taken in 1991 it appears that there has been relatively little movement of artifacts in the cave within the past eight years. (Karen Bassie-Sweet, personal communication 1999)

Ledge 8

Ledge 8 (L 8) measures 2 meters by 2.5 meters, and is more like a niche than a ledge. It consists of an upper area and a lower area. Only a few sherds were located, most in a stack, though it should be noted that the stacking of sherds may be modern disturbance. In one area, there is a concentration of charcoal. Fire activity was also identified in the form of charring found on the overhangs in two areas. Seed remains are found on some sherds in addition to the charring of both sherd interiors and exteriors.

Ledge 9

Ledge 9 (L 9) is a small ledge (a triangular area 2 m by 2 m) where only one person can fit. Not many artifacts are found here: 2 complete ollas (one has rock supports), 1 complete Mount Maloney Black bowl, a basal sherd of a vase, and 1 complete red tripod dish. There is a niche 0.65 m by 0.5m at the front of the ledge with 14 sherds inserted vertically in the loose matrix. A few rocks (spalls) are placed in the front of the niche.

Ledge 10

Ledge 10 (L 10) is one of the largest ledges measuring 6 m by 2.5 m. There are large quantities of broken pottery including numerous large polychrome sherds. This ledge is another of the few "wet" areas in the cave with numerous small-sized stalactites, i.e. soda straws, with active drip water. In particular, one part of the wall, where there is a niche with a low ceiling, there is a thick curtain of soda straws. Sherds appear to extend to the back of the niche, but in order to preserve the cave ecology we did not attempt to reach them. In a small shelf in the corner is a stack of soda straws, which may or may not be modern. It is noteworthy that a wood fragment, most likely a torch fragment with one end heavily charred white, was found well preserved under a sherd. A sample was taken. As this is one of the few wet areas in the cave, perhaps the humid environment provided an ideal locale for the preservation of this wooden artifact.

Chamber 2

Chamber 2 (CH 2) is located approximately at the center of the cave, and contains the largest active stalactite. A crystal (4 cm by 0.4 cm) was found in a hole in the wall 1.9 meters above the floor. The rectangular-shaped hole is located in the cave wall that juts out into the middle of the chamber, facing northwest (for a discussion of crystals see Brady and Prufer 1999). The area in front of the stalactite had been excavated out by non-archaeologists, and the excavated remains of a pile of speleothems and some sherds were found adjacent to it. Several jar rim and body sherds, and a few bowl sherds are found.

Ledge 11

Ledge 11 (L11) is located at the eastern end of Chamber 2. A sloping floor inclines 2.4 meters to the ledge. Jar sherds and a polychrome base sherd, are found along with a reshaped circular, flat sherd 12 cm in diameter with a crescent-shaped chip missing. Similarly modified body sherds recovered at the site of Caledonia have been interpreted as lids for jars with narrow orifices, or lids for small incensarios (Awe 1985; see also Helmke 1999).

Elevated Passage 2

Starting in the area behind the stalactite, a 16m long passage, namely Elevated Passage 2 (EP 2), connects Chamber 2 to Tunnel 2. Though the passage is fairly long, only a few sherds are found.

Tunnel 2

At the end of the Main Tunnel, 2.2 meters above the floor, is the entrance to Tunnel 2 (T2). Tunnel 2 runs perpendicular to the Main Tunnel for a distance of 16 meters, and joins with Elevated Passage 2. It is in this first portion that most of the artifacts of Tunnel 2 are found. The most common artifacts in this area are Mount Maloney Black bowls placed inverted over the mouths of jars. In one instance, two bowls are placed inverted one on top of the other on the mouth of a jar. The easily weathered black slip on these bowls is beautifully preserved on the interior of these particular specimens. A Late Classic II (ca. A.D. 700-800) black-on-orange partial vessel with a cormorant motif painted on the interior is found here. Although looted within this past year, there was a brown or black-slipped tripod dish located in a small shelf in the ceiling 1.6 meters above the floor.

After 16 meters, the passage bends almost 90 degrees and runs in a northeast direction for approximately 60 meters until it reaches the Stela Chamber at the end of the cave. Only scattered sherds are found throughout the rest of Tunnel 2. In an unnamed alcove, another wood fragment was found (Holley Moyes, personal communication 1999).

Stela Chamber

At the end of the tunnel system, approximately 20 m below the level of the main entrance, is the “Stela Chamber”. The chamber measures 9 meters wide by 15 meters long by more than 20 meters high. The “stela,” consists of a limestone slab, measuring 78 cm high, and varying in thickness from 8 to 10 cm. The width of the "stela" varies from 40 cm wide at the base to 47 cm wide at the center, to 22 cm wide at the top. A circle of stones 1.9 meters in diameter surrounds the stone monument. A 40 cm long speleothem (a broken off stalagmite or stalactite) with a small cavity at the top, containing ashes and charcoal, was placed adjacent to the stela on the east side. Five excavation units were placed in the Stela Chamber. The placement of these units was designed to sample as large a surface area of the chamber as possible. Although these excavations were extensive, only two undiagnostic body sherds were recovered. Despite the paucity of artifactual evidence recovered from the excavations, a large assemblage of small fauna remains were retrieved. The analysis of the faunal material has begun but awaits formal publication (see Hecker 1999).

The landowners report that they collected the fragments of censers originally located in the Stela Chamber. The fragments were found in a small ledge on the southeast wall accessible from a crawl space at the bottom of the cave wall. Cursory examination of the censer fragments in 1995 suggested that only one censer was present (Awe et al 1997:93), but a closer inspection in 1999 revealed that the sherds are derived from at least 3 different incensarios. All of the censer sherds can be assigned to Pedregal Modeled and related ceramic types (Adams 1971:57, Awe 1985:263-267, Sabloff 1975:114-116, see also Gifford 1976:Fig. 204L). If, as reported, the censer fragments were found in direct association with the “stela”, then the presence of this ceramic type indicates that the Stela Chamber was used during the Terminal Classic (ca. A.D. 800-900). Since the fragments were not observed *in situ*, however, this association remains speculative.

Investigations at the major centers of Minanha (10 km south), Caledonia (21 km south), and Caracol (33 km south), have also uncovered the remains of Pedregal Modeled censers (Awe 1985:263-267; Chase 1994:Fig. 13.6e; Chase and Chase 1987:Fig. 9a, 19; Healy et al. 1998:264; Iannone 1999; Nadine Gray, personal communitcation 1999). The form, decorative modes, paste, and iconography of the censers from Minanha and Chechem Ha are nearly identical. Further analysis, in particular petrographic examination of this ceramic type, may indicate a related source of production on a micro-scale, but even without such analysis, the intersite distribution of this ware indicates that this ceramic type enjoyed a wide distribution as a specialized ritual ware on a macro-scale.

In addition to the censer fragments, less than 10 sherds were noted in the eastern side passage of the chamber. One modified body sherd, of a jar, was also found along the wall of the chamber’s northern end. The edges of that sherd had been modified to form a disk measuring approximately 28 cm in diameter, and all surfaces were covered with a black soot-like substance. As the censers retrieved from the chamber have a similar diameter it is possible that this modified sherd served as a lid for one of the censers (see Helmke 1999). A similar specimen was also documented in the assemblage of Ledge 11.

Chamber 3

Chamber 3 (CH 3) is the area a few meters east past the entrance to Tunnel 2. Crawl 3 leads out from the southeastern end of the chamber. Elevated Passage 3 may be accessed on the northern side of the chamber. 11 sherds were found along the cave wall.

Crawl 3

Crawl 3 (CR 3) is accessible from Chamber 3 or with more difficulty from the Main Tunnel across from the entrance to Tunnel 2. This narrow crawl-through passage seems to have been excavated out, judging from the matrix piled along the sides of the crawlway. The crawlway is only large enough for one person to pass, and opens out into a chamber large enough for two maybe three people. Within this area a medium-sized olla was placed over 5 heavily charred river cobbles. Burning activity is evidenced by the presence of charcoal, ash, and charred sherds. A miniature vessel containing a heavy resin-like residue, possibly copal, was found (*Protium copal* Engler) suggesting that the vessel may have functioned as an incense burner. Some red Annatto seeds (*Bixa orellana* L.) were found in a jar as well. Personnel from the Belize Department of Archaeology retrieved three polychrome vessels believed to be from the Crawl 3 area. These vessels are now stored in Belmopan. One of these Late Classic II vessels (ca. A.D. 700-850), a polychrome tripod vase, has an Earth Monster-Water Dragon design painted on its exterior (DOA Acc. No. 28/188:001-1), while a polychrome tripod dish has a waterfowl-motif painted on the interior (DOA Acc. No. 28/188:001-3).

Elevated Passage 3

Elevated Passage 3 (EP 3) is a 22m long passage accessible from Chamber 3 or from the dead end of the Main Tunnel. There are a few complete jars present; one was found with maize cob remains (*Zea mays* L.) that were sampled in 1998. Charcoal scatter in the matrix, smoke-blackened cave wall above a hole containing a piece of charcoal, and charred sherds indicate extensive burning activity in this area. Crawl 4 (CR 4), a small area where one can barely sit up, is located within this passage. Only 4 body sherds are found here.

METHODOLOGY AND DATA COLLECTION

The data sheet used in Actun Chechem Ha is based on that used at Actun Tunichil Muknal (one of the caves in the Roaring Creek Valley investigated by WBRCP) in previous seasons. All whole vessels, all diagnostic sherds (including rim sherds and polychromes), and body sherds over 20cm in size were subjected to analysis. Wherever possible, rims and body sherds were reconstructed in an attempt to reconstruct as accurate vessel count as possible.

Each vessel was given two numbers: an identification number and the catalog number for the Belize Department of Archaeology. The user ID number is comprised of 8 digits. The first digit represents the type of sherd—1 for rim, 9 for body, or 2 for an appendage. The second digit represents vessel form—1 for jar, 2 for bowl, 3 for dish, 4 for vase. For the vessel forms, definitions given by Sabloff (1975:22-27) were followed. The next 3 digits correspond to the serial number of the artifacts starting at 001. The last 2 digits show the number of sherds present from the same vessel.

Percentage of vessel present, percentage of flowstone coverage, and size were recorded but these items were ultimately this appraisal was subjective. Presence of charring and fire clouding on the interior and exterior were also recorded. Also, any residue or plant remains were observed, and samples were collected where sufficient material was present. The item was labeled "object" wherever an object such as slate, rock, or speleothem was found in association with the sherd or vessel. The presence of kill holes was also recorded.

The dimensions of the vessels were measured in situ. A ceramic radius template was utilized to obtain quick rim diameter estimates. Rim and body thickness were measured using calipers. Width and height of the vessel were only recorded for whole vessels or sherds representing substantial portions of the vessel. Base, rim, and lip shapes referring to Sabloff's (1975:24) descriptions were marked. If a flange, angle, or ridge were present, then the corresponding item was checked. For jars, the neck length was recorded; a high neck is defined as more than 5cm high, and a low neck as less than 5 cm.

Surface decorations were noted and illustrated. Slip color on both interior and exterior were observed as well as paste color. Munsell Soil Color Chart numbers (Munsell 1954) were only given to polychromes due to time limitations. Surface finish was also examined, but evaluation of this attribute remains somewhat subjective. Paste color and degree of oxidization were also recorded. Finally, temper inclusions and their sizes were observed. Calcite and quartzite were the main inclusions, while hematite and mica were also observed. Hematite is identifiable by the fact that it is usually a spherical dark red inclusion. Grog, bits of crushed sherds mostly orange or orange-red, was also found. A simple scratch test was conducted for the temper to discern between calcite and quartzite since calcite will scratch with metal.

Due to the relatively small size of the cave, a 1 x 1 m grid system was established throughout the entire cave to allow recording detailed proveniences of the artifacts. This may be an uncommon treatment for surface finds, but due to controlled management of the cave by the landowner, we believe that much of the proveniences (especially in areas of difficult access) recorded this season reflect a fairly accurate picture of ancient Maya placement of the artifacts. Examination of photos from previous years has revealed little evidence of modern movement other than the more recently looted artifacts (Bassie-Sweet, personal communication 1999).

All provenience data recorded (except for artifacts retrieved from the excavation units in Chamber 1 and the Stela Chamber) are from surface contexts. With the exception of the Entrance Chamber and the Stela Chamber, the remainder of the cave does not exhibit accumulation of significant amounts of matrix. Indeed, only limited bat guano and silts have been deposited in alcoves and ledges of the main passage. Consequently the material documented on the surface must represent the near totality of artifactual remains present in the cave.

All data was recorded inside the cave since none of the surface finds were collected. Occasionally, polychromes were brought outside the entrance or down the hill to the camping area for illustration and field analysis. Headlamps and flashlights were the main sources of lighting. Slip and paste color observations, measurements, and most illustrations were conducted at each area under these lighting conditions. No thorough washing of the pottery was undertaken, but water from a spray bottle and a toothbrush were occasionally used. Photographs as well as digital photographs were taken at each area. Generally, a wide perspective photo of the entire area and photos of individual sherds and vessels were taken.

Though impossible, our intent was to, wherever possible, minimize the modern movement of the artifacts. In this respect, Ledge 10 presented a problem. The ledge contained a great quantity of sherds, most in extensive stacks covered by powdery limestone deposits. To minimize movement, the sherds covered by the deposit were not recorded.

ACTUN CHECHEM HA THROUGH CERAMIC ANALYSIS

In 1999, while examining the ceramic artifacts in the field, it became apparent that jars comprised a large percentage of the entire assemblage. Tabulation of the vessel forms verified this preliminary observation (Table 1). Similar distributions of vessel forms are reported from Laberinto de las Tarantulas (Helmke et al. 1999), Actun Tunichil Muknal (Helmke 1999), Petroglyph Cave (Reents-Budet and Macleod 1997:51), Eduardo Quiroz Cave (Pendergast 1971), and Actun Polbilche (Pendergast 1974). Vases and plates are rare in Actun Chechem Ha as they are in the assemblages of the sites referred to above.

Examination of the ceramics by area revealed that certain areas in the cave contained heavier concentrations of pottery (Table 2). These clusters of artifacts suggest extensive use of these specific areas. Areas of high concentrations of ceramic artifacts are the following: Chamber 1 (sub-surface finds), Elevated Passage 1, Ledge 7, Chamber 2 Area, Ledge 10, Tunnel 2, Crawl 3, and Elevated Passage 3.

			JAR		BOWL		DISH		VASE		PLATE
			RIM	BODY	RIM	BODY	RIM	BODY	RIM	BODY	RIM
	ENT PASS		4		1						
	CH 1	surface	2(1)		1		2				
	EP 1		**19(10)**	**11**	**6**		**4(1)**				
	L 1		5(4)	4							
	L 2		1	2							
	L 3			2							
	AL 3		10		7(1)					1	
	AL 2		3	1							
	L 4		1	7	1	1					
	L 5		1	1	1(1)		2(2)				
d	L 6		4(4)		3(2)		1(1)				
d	**L 7**		**16(10)**		**6(2)**		**2**				
	CH2	**MTpreCH2**	**11**	**1**	**9**						
	Area	**MTSacredB**	**12**	**2**	**6**	**3**		**1**			**1**
		CH 2	**9**	**6**	**2**	**1**		**1**			
		AL 5	**2**	**2**	**1**						
d	AL 6		2	8			1				
d	L 11		2	3		1		1			
	CH 3		2	5	2(1)	1	1				
	L 8			1	2	2	1				
d	L 9		2(2)	1	1(1)		1(1)			1	
	L 10		**75(1)**	**50**	**12(1)**	**4**	**8(1)**				
	CR 3		**7(4)**	**9**	**8(3)**	**2**	**3(2)**		**1**		
	T2		**19(14)**	**7**	**10(7)**	**2**	**7(3)**				
	EP 2		3	2	1		1				
	EP 3		**5(2)**	**4**	**1**		**2**				
d	CR 4			5							
	MT		13	7	5	1	3	2			1
			230	142	86	18	39	2	1	2	2

* the # in ( ) is the number of whole vessels included in the count.

CH 1 (Units 5 and 5 extension)

Diagnostics		1	3	12	**3**
Non-diagnostics	surface		316		
	level 1		241		
	level 2		187		
	level 3		4		

*the vessel forms for the non-diagnostic sherds are unidentified.

Table 2: Rim and body sherd count by area at Actun Chechem Ha.

In the field, the Main Tunnel was not divided into sections despite the fact that the passage stretches for almost the entire length of the cave. However, from organizing the data, it was recognized that there was a cluster of sherds in the Main Tunnel in the vicinity of Chamber 2. In the immediate area before reaching Chamber 2, the main passageway widens and forms a room-like area with a large boulder in the center taking up a third of the width of the room. It was decided to sub-divide the Main Tunnel and to re-name this area "Main Tunnel—Area 1," or "MT-Area 1" for short. In an area in the Main Tunnel, 2 meters before the passage widens into the small chamber of Area 1, there is another cluster of sherds. Because this portion of the Main Tunnel precedes Chamber 2 (excluding Area 1), the name was revised to "Main Tunnel—pre-Chamber 2," or "MT-preCH2." In actuality, the areas of MT-preCH2, MT-Area 1, and Chamber 2 do not have clear morphological boundaries between each other; thus, they presumably have some close relationship in accordance to activity and time period. Therefore, it was decided to combine these areas into one larger component as the "Chamber 2 Area." Also, because Alcoves 4 and 5 extend directly from Area 1, these two alcoves were included as part of the Chamber 2 Area. (Alcove 4 only contains 15 small, non-diagnostic sherds). Finally, limited activity can be assumed of on Ledge 1 and Alcove 3 due to the relatively low quantity of artifacts. Further research may determine whether usage patterns in these areas differ.

Subsequently, the relative numbers of recorded sherds and whole vessels by area was examined. In Chamber 1, although the rim sherd count is not very high, the non-diagnostic sherd count soars indicating use over an extended period of time. Judging simply by vessel count (assuming that rim sherd count may approximate vessel count) Ledge 10 seems to have served the setting for the most activity. Approximately one-third of all jars in the cave are found on this high ledge. The largest number of bowls and dishes are also found on this ledge.

Ledge 10, the area with the highest concentration of jars, is also the area containing the largest number of basal flanged polychrome vessels. Nine out of the 28 basal flanged polychrome bowls and dishes are found on Ledge 10 (Table 3). Possible Early Classic use of this area can be tentatively placed, since basal flange polychromes are diagnostic to this time period.

In an initial investigation of Chamber 1, sherds dating to the Middle Preclassic period were identified by Awe (Awe et al. 1997:93). Since excavated material verifies the Preclassic use of the Entrance Chamber, an interpretation similar to that posited by Reents (1980) could also hold true for Actun Chechem Ha. Reents (1980) concluded that the penumbral areas in the vicinity of the entrances were utilized during the Early Classic, while in the Late Classic periods the dark zone areas were utilized more intensively, which resulted in a proportionately decreased usage of the entrances. At Actun Chechem Ha, it may be possible that the Entrance Chamber was predominantly utilized in the earlier periods and then later, the deeper recesses of the cave were used. A closer examination of the typology will help to test this hypothesis in the case of Chechem Ha.

At this point, what can be stated – judging from the large jars and the censer fragments – is that Chechem Ha was intensively utilized until the Terminal Classic (Late Facet of the

Spanish Lookout complex) (ca. A.D. 800-900). Most of the whole jars at Chechem Ha, are large and thick-walled and are thus related to the Alexanders Unslipped: Beaverdam Variety, which in turn indicates a Terminal Classic date (Gifford 1976:226, 284-286). The largest concentration of these large jars is in Elevated Passage 1, on Ledge 7, and in Tunnel 2, which are all in separate areas of the cave. Consequently, it seems clear that by the Late Classic (A.D. 700-900), the Maya were utilizing all parts of the cave's dark zone. However, not all jars are of this large size, and there is a great variety in rim and neck forms. As these modal discrepancies may embody temporally sensitive varieties, distinct time periods of use may be distinguished on that basis. A more detailed examination of the jars that occupy over 60 % of the entire assemblage may help to unveil the diachronic patterns of Chechem Ha's usage.

Approximately 350 ceramic vessels were recorded in Actun Chechem Ha of which 82 are complete, intact vessels. Based simply on quantity of pottery vessels, it is difficult to envision the use of this cave on a single visit. Again the distribution of identified ceramic types, points to a scenario in which the cave was used over a long time span (ca. 300 B.C.-A.D. 900). From the various assemblages in each area, it can further be inferred that different areas were utilized at different times for perhaps a variety of uses. A further examination of the ceramics through a modal-form typology must be conducted in order to yield relevant attributes of function. A complete typology, time period of use, and spatial distribution within the cave remains an objective for future study.

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PRELIMINARY INVESTIGATIONS AND GIS SPATIAL ANALYSIS IN ACTUN HALAL, BELIZE

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INTRODUCTION

Investigations by the Western Belize Regional Cave Project (WBRCP) in 1999 documented a previously unreported cave site in the Macal River Valley. This cave site contains petroglyphs similar to those that have been identified in other cave sites in Belize by members of the WBRCP. The petroglyphs are predominantly simple faces rendered in the soft flowstone of the cave. This paper provides a description of the preliminary investigations in Actun Halal and the results of an initial GIS spatial analysis conducted on the available data. An outline for future archaeological research and GIS analysis at this site for the next field season is also presented.

DISCOVERY, LOCATION, AND PHYSICAL DESCRIPTION

Actun Halal, which translates to Dart Cave, is located in the Macal River Valley, approximately 1 kilometer north of the eastern entrance of Actun Chapat (see Poe, this volume). Project members were informed of the existence of the cave by a number of parties, including William Pleytez, landowners Ken and Phyllis Dart, and former landowner Gilberto Puc.

Actun Halal is a relatively small cave with two clamshell-shaped entrances. Although the cave does have a small dark-zone component the majority of the cave's surface area is within the light-zone of the entrances. Thus Actun Halal more closely resembles a rock shelter than a true cavern. Entrance 1 faces east and measures 8.5 meters in width and approximately 5 meters in height. Entrance 2 faces north by northeast and measures 4.75 meters in width and approximately 4 meters in height. The passage between the two entrances is 26 meters long and varies in width from 4.5 to 8 meters (Figure 1).

The floor of the cave is dusty, light-brown dirt mixed with bat guano. Numerous ceramic sherds are present on the surface, and in Entrance 2 there is a small concentration of shattered glass and fragments of metal cans. Two areas with concentrations of charcoal and ash suggest that at least two modern campfires were recently burned in the cave. The floor is also covered with leaves, cohune nuts, and heart of plum seeds. The floor just within the dripline in Entrance 2 is a downward slope (25º) that is 4 meters long. The slope has numerous breakdown rocks, speleothems, and humus. One of the rocks at the south end of the slope appears to be cut limestone.

There are flowstone formations throughout the cave, although there are significantly more stalactites and stalagmites in the area around Entrance 2. In the northwest end of the cave there is a flowstone "waterfall," where the entire wall is covered with thin, vein-like formations of sparkling calcium carbonate. During the reconnaissance 5 petroglyphs were identified carved in the formations of the flowstone "waterfall."

To the south and west of the flowstone waterfall there is a small chamber (Chamber 1) that may be accessed from two small, constricted passages. The flowstone that separates these two passages contains a carved petroglyph. Chamber 1 measures 3.5 meters north-south and 4 meters east-west. The ceiling of Chamber 1 is approximately 1 meter high. Apart from the openings that permit access from Entrance 2 of the cave there are two small passages leading out of chamber 1 (collection zone 9, Figure 2). One passage is to the north, which leads to Chamber 2, and the other is to the west, which is too tight to permit human access. At the time of reconnaissance Chamber 2 was filled with bees, which prevented mapping of this feature.

RECONNAISSANCE AND ANALYSIS

Due to time constraints the investigations in Actun Halal were limited. A detailed map was produced and a surface collection of artifacts was performed. The petroglyphs were documented, photographed, and sketched. A preliminary analysis of ceramics recovered from the surface collection was conducted and a preliminary GIS spatial analysis was performed following the field season.

The Petroglyphs

Six petroglyphs were identified in Actun Halal (P1-P6). All five of the petroglyphs in the flowstone waterfall area are simple faces similar to those found in other caves in Belize (Bonor and Klemm 1995; Helmke and Awe 1998) and elsewhere in the Maya area (Brady 1997a, 1997b; Stone 1995). The sixth petroglyph (P6) is slightly different as it is larger and more elaborate. The time constraints of this preliminary reconnaissance mission prevented detailed illustrations of the petroglyphs. All of the petroglyphs were carved relatively low, ranging from 90 cm to 140 cm from the surface. Table 1 presents the height from surface for all of the Halal petroglyphs.

Petroglyph	P1	P2	P3	P4	P5	P6
Height (meters)	0.90	1.27	1.40	1.20	0.84	1.20

Table 1. Height from cave surface (in meters) of the Halal Petroglyphs

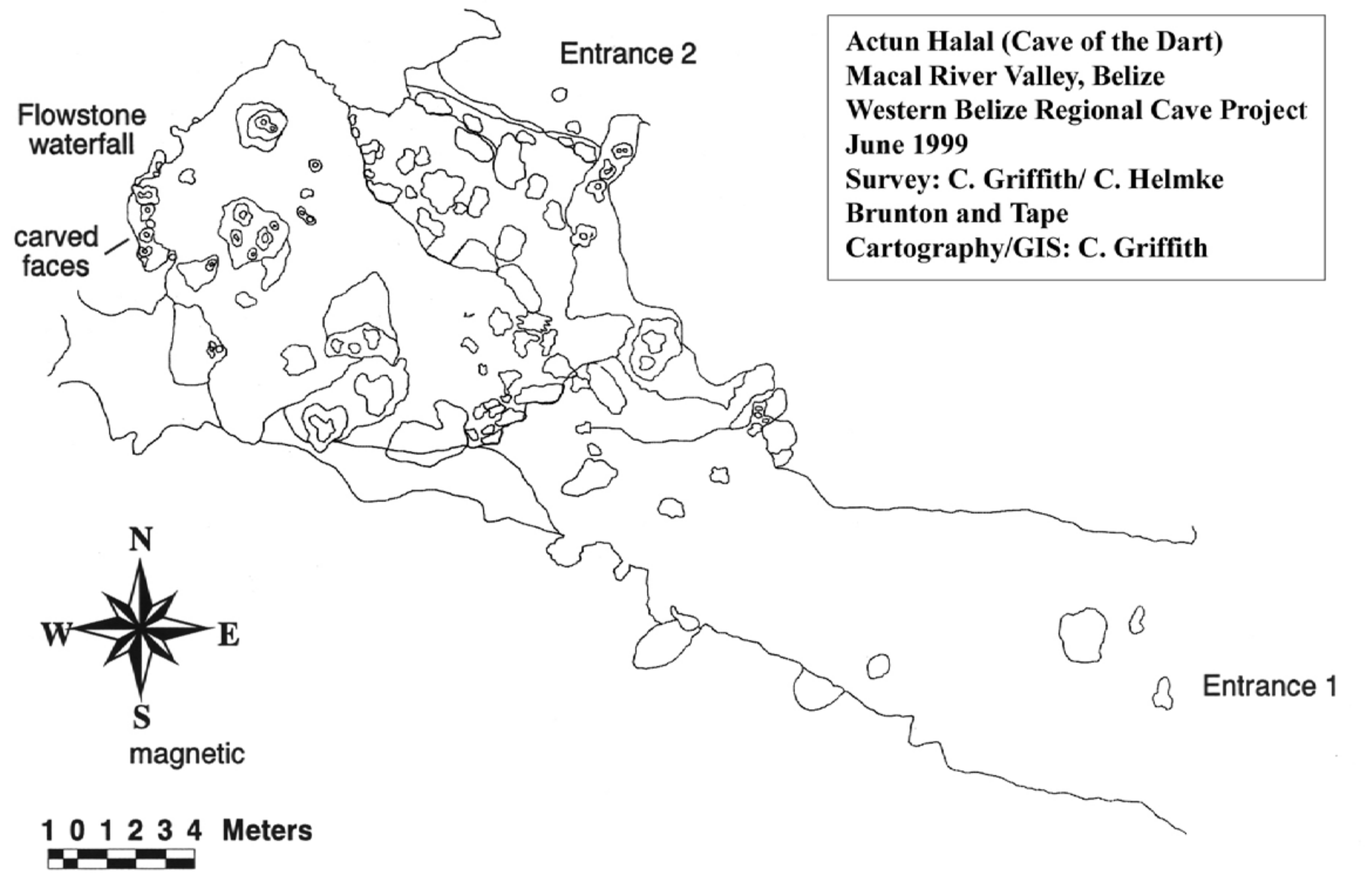


Figure 1. Digitized map of Actun Halal

Surface Collections

A surface collection was conducted as a part of the preliminary efforts in order to ascertain a general temporal context for the cave. The cave was divided into nine sections (1-9) in order to reflect any possible differences in the prehistoric utilization different areas within the cave (Figure 2). A total of 349 ceramic sherds were recovered, as well as two lithic artifacts. The lithic pieces are one mano fragment that appears to be fashioned from a speleothem and one very crude adze with cortex still present on the body of the tool. The breakdown of the ceramics collected is presented in Table 2.

Ceramic Analysis (Helmke)

The surface collection yielded 349 ceramic sherds. All were retrieved from a total surface area of 300.5 m^2. The artifacts that were present on the surface at Actun Halal represent one of the lowest concentrations of cultural materials documented for surface contexts in the caves investigated by the WBRCP.

The assemblage as a whole is highly fragmentary and most sherds are highly weathered. Small erosive pits on the surfaces of many sherds are prevalent. This characteristic indicates that the sherds were exposed to the elements and as a result the soluble tempering elements of the paste have leached away. Many of the diagnostic sherds are smaller than 5 cm wide and some are extensively coated by dripstone formations. All these attributes reveal why only 20 % (n = 69) of the assemblage could be assigned to ceramic complexes while less than 8 % (n = 27) of the assemblage could identified as to type:variety. In addition only 6 % (n = 19) could be positively identified as fragments of ollas, although these could not be identified as to the type:varieties they represent. Thus, the vast majority (ca. 75 %; n = 261) of the assemblage is undiagnostic as to vessel form, ceramic group, or type:variety (Figure 5).

All identified sherds from Actun Halal represent types that commonly occur in the Belize Valley. The typology constructed by James Gifford (1976) for the ceramics of Barton Ramie (a site 28 km distant) was used exclusively in the analysis of the Actun Halal material. With the exception of the Tinaja Red type which was established by Smith and Gifford (1966) for the Uaxactun ceramics, all other types were established by Gifford (1976) in his analysis of the Barton Ramie assemblage.

The relative increase of identified types according to sequential ceramic complexes seems to suggest a temporal trend. Although the increase of Tiger Run types (A.D. 600 - 700) in comparison to the earlier Hermitage types (A.D. 300 - 600) is relatively slight (i.e. +2.9 %), there remains an increase nonetheless. This suggests that the temporal distribution of ceramics follow the now commonly identified trend of intensification of cave usage as the Classic Period (A.D. 300 - 900) proceeds (Awe 1994a, 1994b). As with all the caves studied by the WBRCP the peak of usage appears in the Late Classic (A.D. 700 - 900). Chart 2 in Figure 5 clearly illustrates how the Late Classic ceramics dominate the assemblage. How accurately the presence of ceramic remains can be used to gauge the intensity of cave usage is not entirely clear and still requires a great deal of attention.

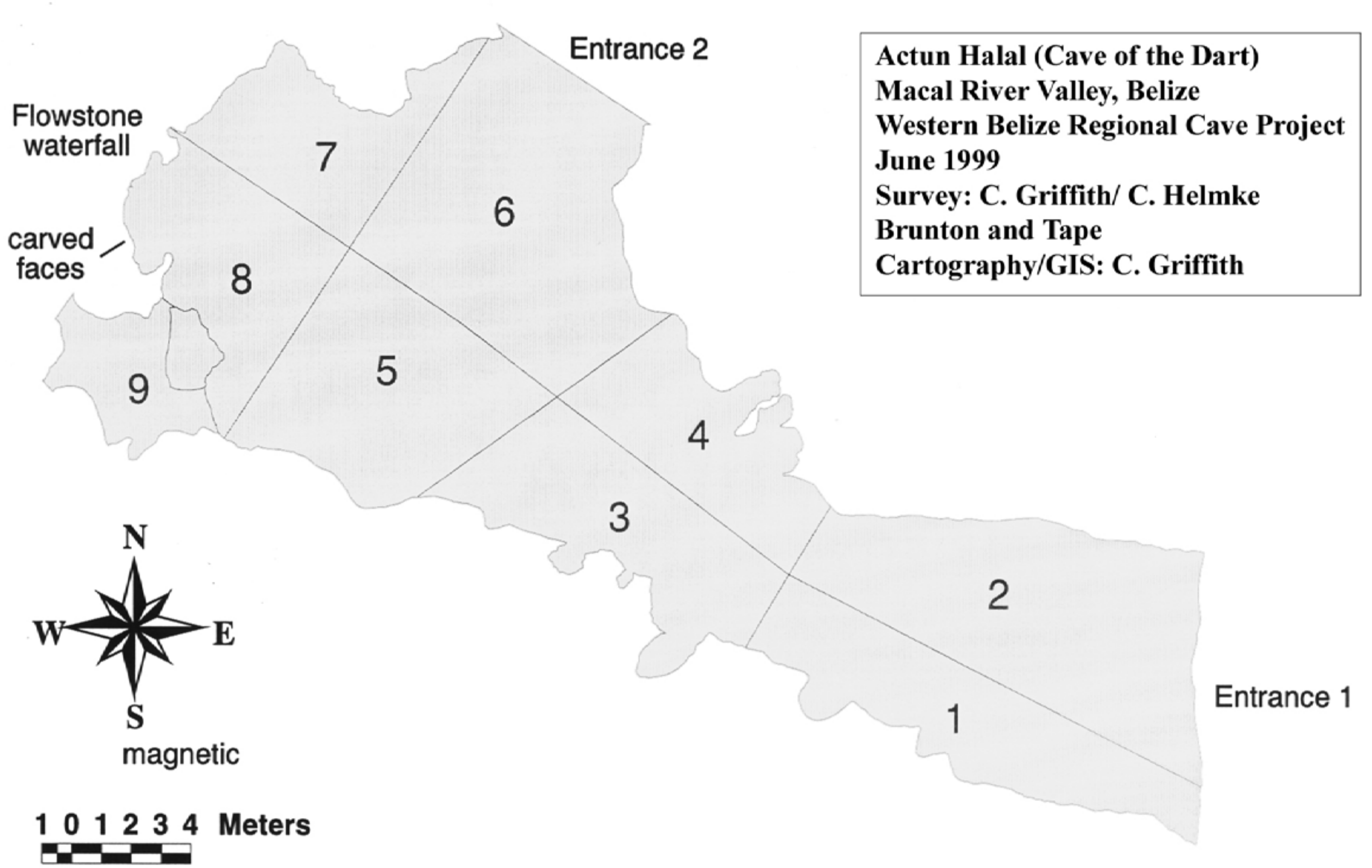


Figure 2. Surface collection zones, by number, in Actun Halal

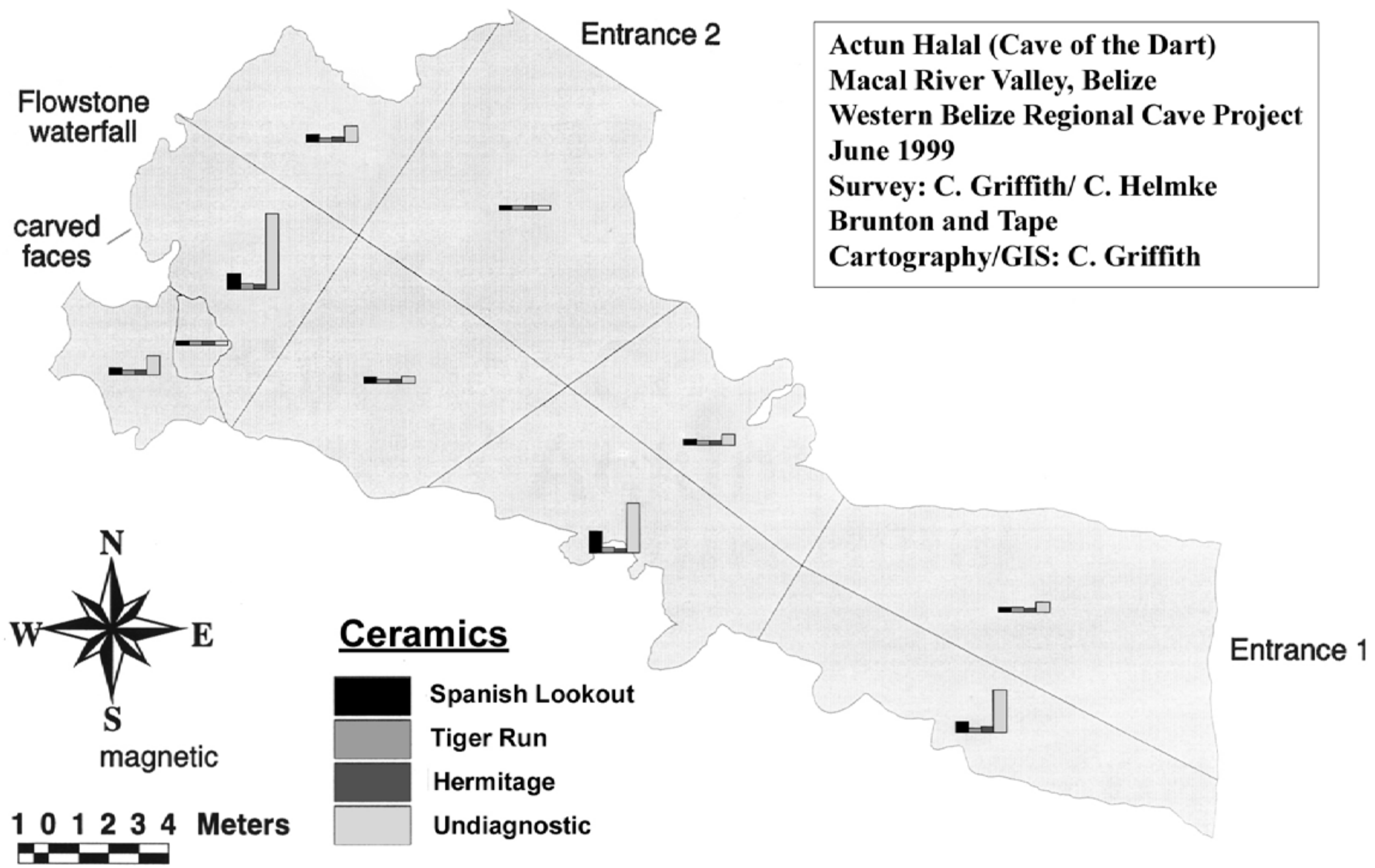


Figure 3. GIS derived ceramic frequencies by collection zone

	A	B	C	D	E	F	G	H	I	S	%
UNDIAGNOSTIC	50	8	60	9	4	0	15	95	20	261	74.785
RIM / MODE SHERDS											
Spanish Lookout											
Tinaja Red			1							1	0.2865
Garbutt Creek Red rim	2		1					1		4	1.1461
Rubber Camp Brown	1									1	0.2865
Mount Maloney Black											
(B/1&2: LC 1)					1					1	0.2865
(B/3&4: LC 2)										0	0.00
(B/5&6: LC 3)			1		1			1		3	0.8596
Cayo Unslipped			1				3	2		6	1.7192
Alexanders Unslipped				1						1	0.2865
Alex. / Cayo Unslipped							1	2		3	0.8596
Tiger Run Complex											
Mt. Pine Red								1		1	0.2865
No type medial ridge		1								1	0.2865
Zibal Unslipped			1					1		2	0.5731
Hermitage											
Socotz Striated								1		1	0.2865
Eastern Branch Plain?							1			1	0.2865
Hoya Punctated?									1	1	0.2865
BODY SHERDS											
Spanish Lookout											
Fugitive Black Ware	1		2					3	4	10	2.8653
Roaring Creek Red?								1		1	0.2865
BH Ash-tempered	3		10				1	1		15	4.30
Vinaceous-Tawny	1	1	7		1			3		13	3.7249
Tiger Run Complex											
Sotero Red-Brown			1							1	0.2865
Orange-walk incised									1	1	0.2865
Hermitage											
Mopan Striated	1									1	0.2865
OLLA BODY SHERDS											
Striated	1								1	2	0.5731
Punctated	2									2	0.5731
Incised	1									1	0.2865
Burnished									1	1	0.2865
With carbon									1	1	0.2865
Shoulders	4	2	4					1	1	12	3.4384
TOTAL	67	12	89	10	7	0	21	113	30	349	100
%	19.20	3.44	25.50	2.87	2.01	0.00	6.02	32.38	8.60	100	

Table 2. Surface Collection Type:Variety by Collection Zone

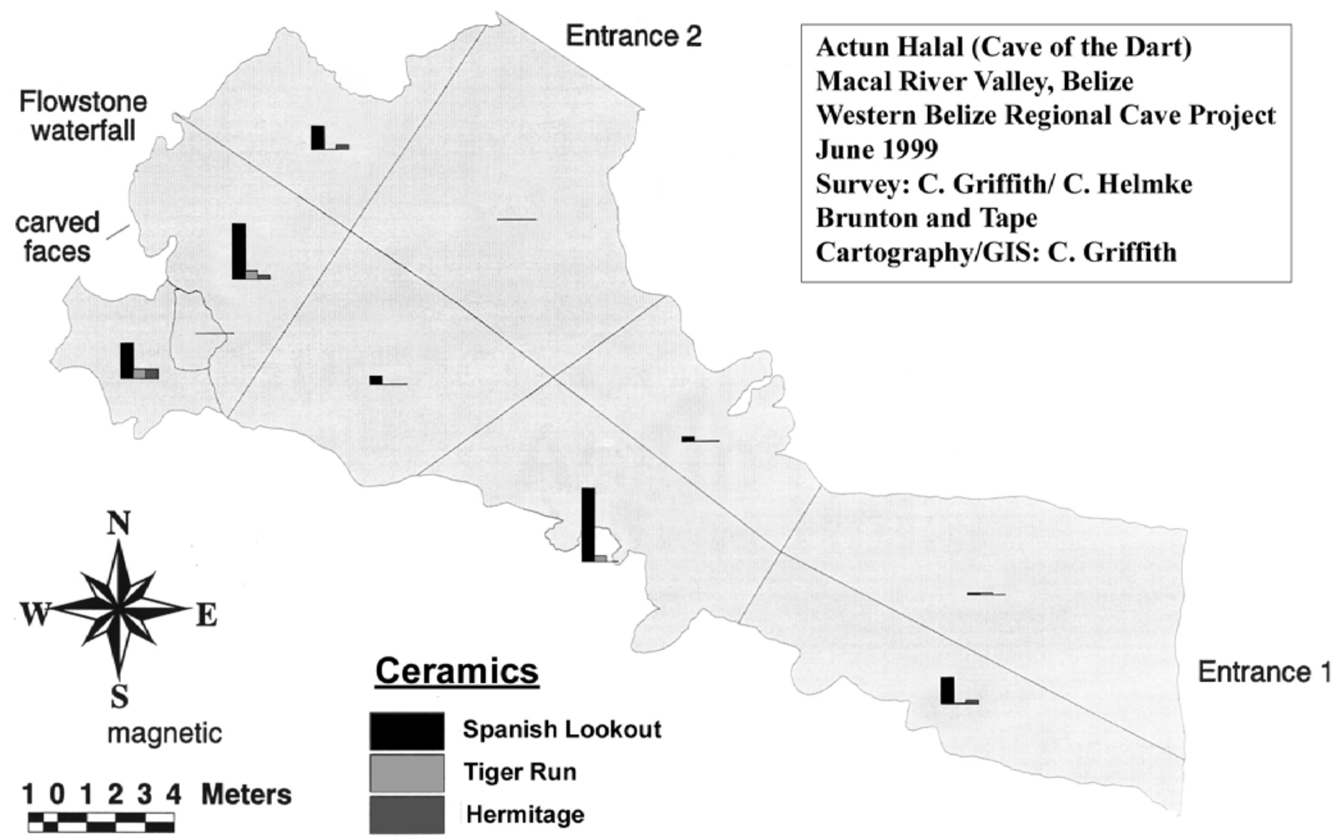
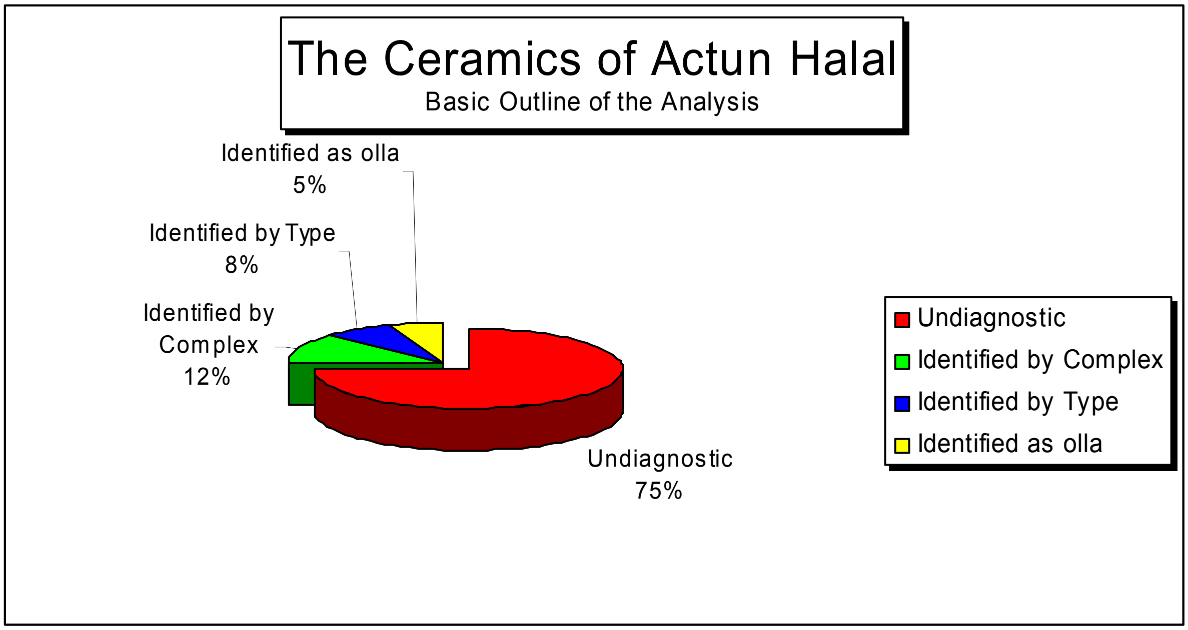


Figure 4. GIS derived ceramic frequency bysurface area per collection zone



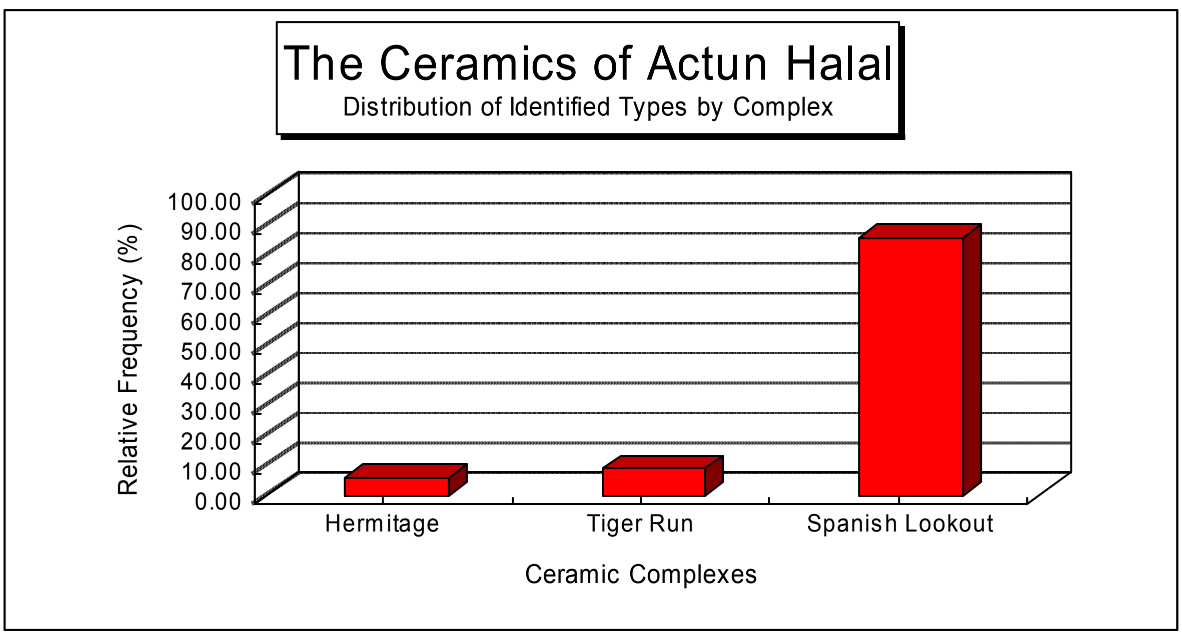


Figure 5. Breakdown of the surface collection ceramic assemblage in Actun Halal.

The microseriation developed by Lisa LeCount (1992) for the various types of rim profiles of Mount Maloney Black bowls at Xunantunich was employed in the analysis. The proximity of Xunantunich to the caves of the Macal Valley suggested that the microseriation may be applicable to these sites also. The seriation, however, needs to be extensively tested in these contexts to determine if the chronological associations posited by LeCount are functional in these specialized contexts. Unfortunately, too few Mount Maloney sherds were recovered to make any statements on the temporal implications of the rim types represented at Actun Halal.

Although 4 sherds were identified as Terminal Classic (A.D. 850 - 1000) the assemblage is too small to comment on the usage of the cave during that period. The overlap between Late Classic and Terminal Classic types is particularly problematic and as yet it cannot be stated if most intense usage occurred during the Late Classic II (A.D. 700 - 850) or the Late Classic III (A.D. 850 - 1000) phases.

Questions of post-depositional processes must be addressed in conjunction with the ceramic analysis. As all the ceramics were collected from surface contexts the possibility remains that earlier material lies underneath the Late Classic deposits on the surface. This could explain the high frequency of Spanish Lookout types in the surface collection assemblage (nearly 86 %).

The surface collections conducted in the entrances to Actun Uayazba Kab and the Upper Entrance Chamber of Actun Tunichil Muknal, both of which are caves from the Roaring Creek Valley investigated by the WBRCP, revealed surface assemblages characterized by high frequencies of Early Classic types (Griffith 1998). These trends may be due to the fact that these contexts were heavily altered by looting. These illicit activities may in fact have disturbed the earlier materials from buried contexts and thus skewed the distribution of types represented in the surface collections. A few looter pits were noted in Actun Halal but these are more shallow, fewer in number, and less extensive than the ones documented for the Roaring Creek Valley caves cited above. The extensive looting at these sites may have resulted in the high frequency of pre-Late Classic (i.e. pre-A.D. 700) ceramics recovered on the surface of these sites. Excavations planned for the 2000 field season are designed to determine the distribution of ceramic types from stratified deposits in Actun Halal.

GIS Spatial Analysis (Griffith)

A preliminary spatial analysis of Actun Halal and the ceramics collected within was performed in order to: 1) explore the basic techniques of this process, and 2) to discern spatial patterns (if any) in the surface collection ceramic assemblage (see Allen et al. 1990). This analysis involved the scanning, registration, and digitizing of the cave map, the tabulation of ceramic totals by complex for each collection zone, the creation of a vector polygon spatial dataset for the collection zones, and linking the ceramic dataset to the vector coverage. Each process is described below and the possible error introduced by each is discussed.

Scanning

The hand-drawn map of Actun Halal was scanned in the SPEA GIS lab at Indiana University. The scanner is a large roller-scanner capable of handling large maps. The map was scanned in at 200dpi grey scale and manipulated with the SPECTRA software package. Scanning is a particularly problematic process as many variables that are difficult to control enter the equation. Over time maps can stretch, become wrinkled, and fade. This can warp or distort the map, resulting in a final scan that is slightly different than the original. The map of Actun Halal was relatively new, having been produced in the summer of 1999. However, the humidity of the jungle climate in Belize and transport episodes from Belize to the U.S. and from place to place on campus may have affected the map to a small degree. Other problems that come in to play with scanning are the resolution of the scan and the quality of the scanner. The lower the resolution and the lower quality of the scanner will result in a less than accurate representation of the original. These problems are exacerbated in maps with smaller scales, as slight distortions will affect larger areas. The SPEA scanner is a high quality instrument and the resolution of 200dpi is fairly high. The scale of the Actun Halal map was 1:50, which is large enough that the level of distortion in the scanning process was quite likely very minimal in this instance.

Registration

The scanned Halal map was registered in ARCINFO based on the internal coordinates of the map. As GPS coordinates are not yet available for Actun Halal it was not possible to link the map coordinates with UTM coordinates. Thus, determining an exact location for the cave in Belize was not feasible. During registration a certain amount of error is expected. When the map is registered to a coordinate system, the ground control points (GCPs) will not line up exactly with the points on the map that are entered as registration points. This error factor (RMS error) may be viewed by the user, and controlled to a degree, yet it is error nonetheless. The RMS error for the registration of the Actun Halal map was 0.337, 0.002 (img, cov) which is quite low.

Digitizing

The Halal map TIF was digitized using ARCINFO. The error introduced by the digitizing process can be extreme. In the case of the Actun Halal map the digitizing process was quite difficult. The walls and features of the cave are very uneven, resulting in many squiggly and jagged lines. Following these lines in the digitizing process required the use of multiple vertices per arc. The scale at which you digitize (how "zoomed in" you are on the map) determines how closely the digitized arcs match up with the lines on the map. The steadiness of the hand of the person digitizing also introduces error. The digitizing process was performed with a great deal of care in order to avoid a high degree of error.

Vector Coverage

The various collection zones were digitized and built as polygons into a separate coverage. The polygons in this coverage were all assigned their respective collection zone numbers in the attribute "zone." By creating this vector coverage ARCINFO automatically calculated the area in square meters for each collection zone. This convenient element of the software eliminated the painstaking and time-consuming use of a polar planimeter.

Database

The key data from the surface collections is presented in Table 2. The data from the surface collection of ceramics was converted to a comma-delineated file in Microsoft Excel. This data file was then linked to the vector collection zone coverage by the common field "zone." This link now infused each surface collection polygon with its pertinent ceramic data, thus facilitating aspects of the ceramic analysis.

GIS Informed Ceramic Distribution Analysis

Although none of the materials collected were retrieved from sealed contexts, the surface distributions of ceramics according to the arbitrarily designated collection zones were considered in an attempt to discern trends or patterns in the spatial distribution. Plotting the distribution of ceramic remains by zone, the only pattern to emerge was that the largest number of diagnostic components was collected from Zones 3 (7 %) and 8 (5 %) (Fig. 3). Temporal distributions by zone were not obvious based on the GIS analysis. Distribution of diagnostic sherds by ceramic complex and by collection zone mimics the overall temporal distribution of the Actun Halal assemblage: few Early Classic sherds and a predominance of Late Classic sherds. Systematically, the larger the component retrieved from a zone, the higher the frequency of diagnostic sherds. In order to assess the distribution of sherds by zone the surface area encompassed by each zone needs to be taken into account.

Figure 4 demonstrates the frequency of ceramic complexes per zone relative to the surface area of that zone. While significant patterns did not emerge with regard to the Tiger Run and Hermitage ceramic complexes in this regard, there were interesting results for the Spanish Lookout complex. Zones 3, 7, 8, and 9 all exhibited a relatively high percentage of Spanish Lookout ceramics by area. Interestingly, Zones 7 and 8 encompass the petroglyphs and the more dramatic travertine formations in the cave. This could indicate that this area of the cave was the focus for ritual activity. Zone 9 is in the penumbral zone and has very constricted access. The high distribution of sherds here could relate to relatively minimal effects of looter activity, i.e. the removal of sherds. However, Zone 9 is also close to the petroglyphs. Zone 3 is an anomaly. The other zones in the entrances and middle of the cave do not exhibit the striking high frequency of Spanish Lookout sherds per square meter. This difference is intriguing, and will be used to guide investigations in the upcoming field season.

CONCLUSION

Although the data currently available from Actun Halal are sparse, a preliminary GIS analysis of the data and a ceramic analysis have yielded important information. The overwhelming majority of the ceramics (85 %) are from the Spanish Lookout complex, dating to the Late Classic period (A.D. 700-900). A small portion of the assemblage (5.8 %) is from the Hermitage ceramic complex, dating to the Early Classic period (A.D. 300-600). The Tiger

Run ceramic complex is also represented by a few sherds (8.7 %). This complex dates to the Middle Classic period (A.D. 600-700; Gifford 1976).

The GIS spatial analysis of the Actun Halal surface collected ceramics has revealed a pattern that will help direct the upcoming excavations in the cave in the summer of 2000. If mortuary contexts are encountered during these investigations the incorporation of these data into the GIS spatial database will likely yield powerful results. If it is possible to create GIS datasets for other caves in the region it will be possible to compare and contrast the mortuary contexts from these different sites using GIS analyses. This will hopefully help discern heretofore undocumented patterns in the cave mortuary practices of the ancient Maya.

It should be noted that the vessel forms and type:varieties represented at Actun Halal are the types most commonly found in Western Belizean cave sites. Thus, the Actun Halal ceramic assemblage is a relatively typical Classic Maya (A.D. 300 - 900) cave deposit in western Belize. If discrete types and vessel forms are representative of specific functions, then it can be suggested that the activities that took place in Actun Halal are very similar to those that took place in other nearby caves.

FUTURE RESEARCH

Previous research commitments prevented further investigation of Actun Halal during the 1999 field season. However, the preliminary analysis of this cave site indicates that a more detailed investigation would be propitious to the regional approach of the WBRCP. In particular, an investigation of the similarities in the artifact assemblages, the petroglyphs, as well as the overall similar morphology between Actun Halal and Actun Uayazba Kab may reveal region-specific patterns in cave use by the ancient Maya. Excavations will be designed to search for similarities between the sub-surface contexts of Actun Halal and Actun Uayazba Kab.

Actun Uayazba Kab contains plaster floors, human burials, petroglyphs, and pictograms (Ferguson 1999; Gibbs 1998; Griffith 1998; Helmke and Awe 1998). The excavation units placed in Actun Halal will be informed by the findings in the excavations of Actun Uayazba Kab, and will be designed to look for similar materials. The remainder of the cave (Chamber 2) will also be explored and mapped. If human remains are discovered in Actun Halal, efforts will be focused upon comparing the mortuary assemblage of Actun Halal to Actun Uayazba Kab and other cave sites with similar arrangements.

The spatial analysis of the ceramic assemblage by surface collection zones has provided an interesting pattern. Zone 3 appears to be somewhat anomalous with regard to the distribution of Late Classic ceramic types. This raises some interesting questions. Are there significant flowstone or other features in this area that were overlooked during the reconnaissance and mapping efforts? Or does this disparate distribution point to a possible *subsurface* difference in the utilization of this cave by the ancient Maya?

One of the latest trends in Maya archaeology is the study of sacred geography. In particular a number of researchers have been analyzing the relationship between surface sites and caves. As some Maya sites are actually located on top of cave passages (Dos Pilas in Guatemala, for example) it has been argued that the cave either influenced or *dictated* the location of this surface site. A GIS analysis of cave locations in relation to surface sites would be an excellent way of addressing this issue. By creating a spatial database of cave site and surface site locations, a cost surface could be generated demonstrating the relative accessibility of certain caves to various surface sites. This database could include certain artifact assemblages as well as mortuary practices for cave sites and surface sites. An analysis of these assemblages in relation to the cost distance from caves to sites may help in determining which sites utilized which caves, and which caves were likely not visited or used by the populace of certain sites. As the concept of sacred geography and cave sites is rapidly coming to the fore in Maya archaeology, such a study would be timely, and would be a way to scientifically analyze the interaction between subsurface and surface locales.

Acknowledgements

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SALVAGE EXCAVATION OF YAX CAAN CHULTUN #1, BELIZE

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INTRODUCTION

During the 1999 field season the Western Belize Regional Cave Project investigated and excavated a small, single-chambered chultun in west central Belize. This small, single-chambered subterranean feature was named Yax Caan chultun #1 after the resort where the chultun is located. Excavations revealed 22 fragmentary and whole vessels, limited lithic material, seeds, and a fragment of a turtle plastron. The nature of the assemblage suggests that the final function of the chultun was related to ritual activity. Chronological assessments based on the ceramic material indicate that the chultun was utilized during the Late to Terminal Classic Period (A.D. 600 - 900). This paper details the excavation of the Yax Caan chultun #1 and discusses the artifact assemblage, chronological affiliations, and potential functions of the chultun.

CIRCUMSTANCES OF DISCOVERY

During a visit to the Green Heaven Lodge in western Belize, members of the Western Belize Regional Cave Project (WBRCP) were informed by the landowners of the presence of a possible ancient Maya chultun on the premises. A brief and immediate reconnaissance revealed a small chultun entrance that had been uncovered during the construction of the lodge in the previous year. The Belize Department of Archaeology was notified of the discovery and Allan Moore, the acting Commissioner of Archaeology, suggested that the WBRCP undertake salvage operations at the site. Dr. Moore's suggestion was timely, and the circumstances fortuitous, as the WBRCP had just concluded salvage operations at another chultun discovered at the nearby Chaa Creek Resort (see Lee et al., this volume). The investigations of these separate operations will be compared in future analyses as both chultunob are located in the same valley.

The owners of the land and the Green Heaven Lodge generously provided room and board for WBRCP project members during the course of the salvage operations. The feature was named the Yax Caan chultun #1 (Yax-Green, Caan-Heaven) after the modern name for the resort (the numeral 1 was included to facilitate future research in the area as the landowners reported the likelihood of another undisturbed chultun on the premises). The proprietors of the resort hope that they will eventually be able to attract tourists to the chultun.

In accordance to the WBRCP's continued commitment to archaeology in the public context, project members discussed various options with the owners. These included establishing a shelter over the chultun entrance, creating a small structure on the site to serve as an information "bodega" or museum, and the registration of previously recovered surface finds with the Department of Archaeology. Further efforts towards developing public interest in the site are planned for the following field season by the WBRCP in conjunction with the Belize Department of Archaeology and the landowners.

CHULTUNOB: BACKGROUND AND PREVIOUS RESEARCH

Precolumbian Maya chultunob have received increased attention by many archaeologists over the past decade (Aylesworth 1993; Connell 1994, 1995; Gray 1997, 1998; Hunter-Tate 1994; Keller 1995; Powis 1992). Despite this growing interest, there is yet to be a consensus on a singular or predominant function of chultunob. One of the difficulties in determining the nature of the use of chultunob is the fact that despite a general continuity in form, size, and cultural associations, not all chultunob appear to have been used for the same purpose. Moreover, the use and perception of chultunob by the Maya may have changed over time (Aylesworth 1993:86). As such, discussions concerning the use of chultunob have identified primary and secondary uses (ibid:86).

Most interpretations have associated the primary function of chultunob with food storage (Maudsley 1883 *in* Puleston 1971:324; Peters 1983; Puleston 1982, 1983) and water storage (Tozzer 1912). Recent discussions have argued that chultun morphology does not necessarily support the water collection proposal, as their design would have hindered water retrieval and their limestone composition, without the addition of a plaster lining, would have drained any water intended for containment (Smith 1950:85). Other proposals indicate that chultunob functioned as storehouses for surplus foodstuffs, such as various grains and the Ramon nut (Maudsley 1883 *in* Puleston 1971:324; Peters 1983: Puleston 1971:324, 1982, 1983), as chambers for the ripening of fruit (Miksicek 1990:80), and as storage areas for products during pickling and alcohol fermentation processes (Dahlin and Litzinger 1986:723). Additional suggestions for chultun function have included their use as sweatbaths (Ricketson and Ricketson 1937:123) and as rooms for fine weaving which necessitated high levels of humidity (Puleston 1971; Ricketson 1925:390). The proposition of food storage is currently the most accepted hypothesis as to chultun function, however, there are still those who do not agree (Aylesworth 1993:86; Dahlin and Litzinger 1986; Reina and Hill 1980).

Another function hypothesized for chultun use is that they were used as burial chambers. This hypothesis has developed as more and more human remains have been discovered in chultunob (Welsh 1987:17; Hunter-Tate 1994; Ricketson and Ricketson 1937; Ruz 1965; Powis 1992; Aylesworth 1993; Gray 1998). Whether this was a primary or secondary function of chultunob remains debated, and likely varied from chultun to chultun, as well as over time. Hunter-Tate, in her investigations of the chultunob of Caracol, found that all the chultunob at Caracol contained human interments (Hunter-Tate 1994: 73-75). Dahlin and Litzinger (1986:723) suggest that the secondary use of chultunob as burial chambers and refuse pits likely occurred following the discontinuation of their primary use as storage areas.

Recent research has explored the possibilities of ritual and ceremonial practices associated with chultunob, as demonstrated by the relative continuity in chultun form, size and associated objects (Gray 1997). Like natural caverns, chultunob may have been perceived by the ancient Maya as representations of, or entrances to, the underworld. This connection is based predominantly on the subterranean nature of chultunob, but is also derived from similarities in the patterns of artifact types and placement, as well as the presence of human remains, both as offerings and interments. Ceramic materials associated with chultunob and cave deposits are typically fragmentary or whole vessels, particularly ollas (for a discussion of chultunob at Tikal see Puleston 1971). Interestingly, deposits in both caves and chultunob have often been described as refuse pits, as the artifacts located in each are often predominantly located directly beneath their orifices (Brady and Rodas 1995; Dahlin and Litzinger 1986; Joyce et al. 1928; Joyce 1929; Pendergast 1969).

LOCATION AND PHYSICAL DESCRIPTION

Yax Caan chultun #1 is located in the Cayo District of Belize, approximately 175 meters south of the Green Heaven Lodge resort. The lodge is located on the south side of the Chial road that branches off the Western Highway that runs between San Ignacio Town and San Jose Succotz. The chultun is situated approximately 30 meters up a gentle sloping hill (+/- 20 degrees) and the surrounding vegetation is low lying scrub brush, chaya, thorn bushes, and weeds. The entire area was under milpa cultivation for quite some time prior to its purchase by the proprietors of the Green Heaven Lodge. The land was formerly owned by Mr. Ebelio Itza who had maize growing in the low lying areas where the resort structures now stand, and beans planted on the hill where the chultun is located (Dominique Agius, personal communication 1999). Prior to that, Mr. Marciano Can owned the land and he had the side of the hill planted in maize for a number of seasons (Marciano Can, personal communication 1999).

The owners of the land reported that there are mounds on the ridge of the hill south of the chultun. Due to time constraints the mounds were not examined by project members. Based on the descriptions of the site it appears to be a plazuela group with the long axis oriented north-south, following the orientation of the ridge. At least one plaza is present and the structures bounding that plaza were said to be both pyramidal and range structures. There is also a low-lying platform abutting the base of the hill on the southeastern flank. According to the owners of the resort a bulldozer went straight over the platform, over the crest of the hill, and just missed the larger mounds (Dominque Agius, personal communication 1999).

During the development of the resort the owners accumulated a small collection of surface finds. The collection consisted of metate fragments, spherical grooved stones, several fragmentary obsidian blades and perhaps 200 sherds. Most sherds were identified as Late Classic (A.D. 600 - 900) Cayo/Cambio Unslipped ollas. A handful of Early Classic (A.D. 300 - 600) sherds were also present. Most of the sherds from the surface collection were, however, identified as ceramic types of the Tiger Run and Spanish Lookout complexes (A.D. 600 - 900), and most were utilitarian (see below). During the investigations the ceramic materials from the surface collection were sorted by form and ceramic type identifications were preliminarily assigned. Time constraints, however, hindered a detailed tabulation and analysis of these materials. A visual examination of the surrounding area indicates that a few small house mounds were located at the base of the hill near the cabañas where the pool is now located. Unfortunately, these features were not noticed until the bulldozer went over them. It seems probable that the bulk of the artifacts forming the surface collection were originally associated with these low house mounds.

During the initial inspection of the chultun it was noted that the capstone had been removed, ostensibly during the excavation of a shallow conduit for a water pipe leading to the resort. The entrance measures approximately 1.45 m E-W and 0.65 m N-S. The entrance cut into the soft limestone hill, which now lies beneath a 20 - 25 cm layer of dirt and humus. The surface in the interior of the chultun was comprised of live weeds, humus, sticks, and other vegetative debris. A number of large rocks were located around the entrance to the chultun, two of which appeared to be rounded limestone fragments of the capstone(s).

METHODOLOGY AND EXCAVATIONS

Given its relative size and the salvage nature of the investigations, excavation of the chultun commenced as a single excavation unit. Levels were excavated using geological picks and trowels and by naturally and culturally defined strata. Levels 1 and 2 were visually screened, as matrices associated with these levels were a combination of looters' backdirt and accumulated humus and littermat materials. All other levels were screened through 1/4-inch screens. Carbon and matrix samples were also collected. Artifact clusters and features were mapped and photographed *in situ*. A running profile bisecting the chultun on an east-west axis was rendered, and several plan views of the excavation levels were completed. The unit datum was located 20 cm above surface level.

Level 1

Level 1 was composed of brown, dry, loose and poorly sorted granular dirt (0.5-1.0 mm sized granules) of medium coarseness. Small limestone inclusions, 2 - 5 cm in diameter, were also present in the matrix. These likely spalled off from the chultun walls or capstone. Level 1 included disturbed matrices from a small looter pit in the southeast corner of the chultun, as well as soil deposited from the hillside by erosion. In addition to the soil, the top layer of the chultun was comprised of sticks, leaves, charcoal pieces, and rootlets. Two large roots and an ants nest were also located within the chultun's orifice. A piece of blue vinyl from a shoe was also recovered from the looter pit, suggesting a relatively recent disturbance. The matrix along the walls of the chultun was more loosely packed than in the rest of the chultun, and continued to a deeper depth relative to that of the central aspect of the level. The level ended when the loose soil below the orifice was removed, exposing a more compact level. The loose matrix associated with Level 1 around the edges of the chultun could not be entirely removed with Level 1 because of the elevated nature of the majority of

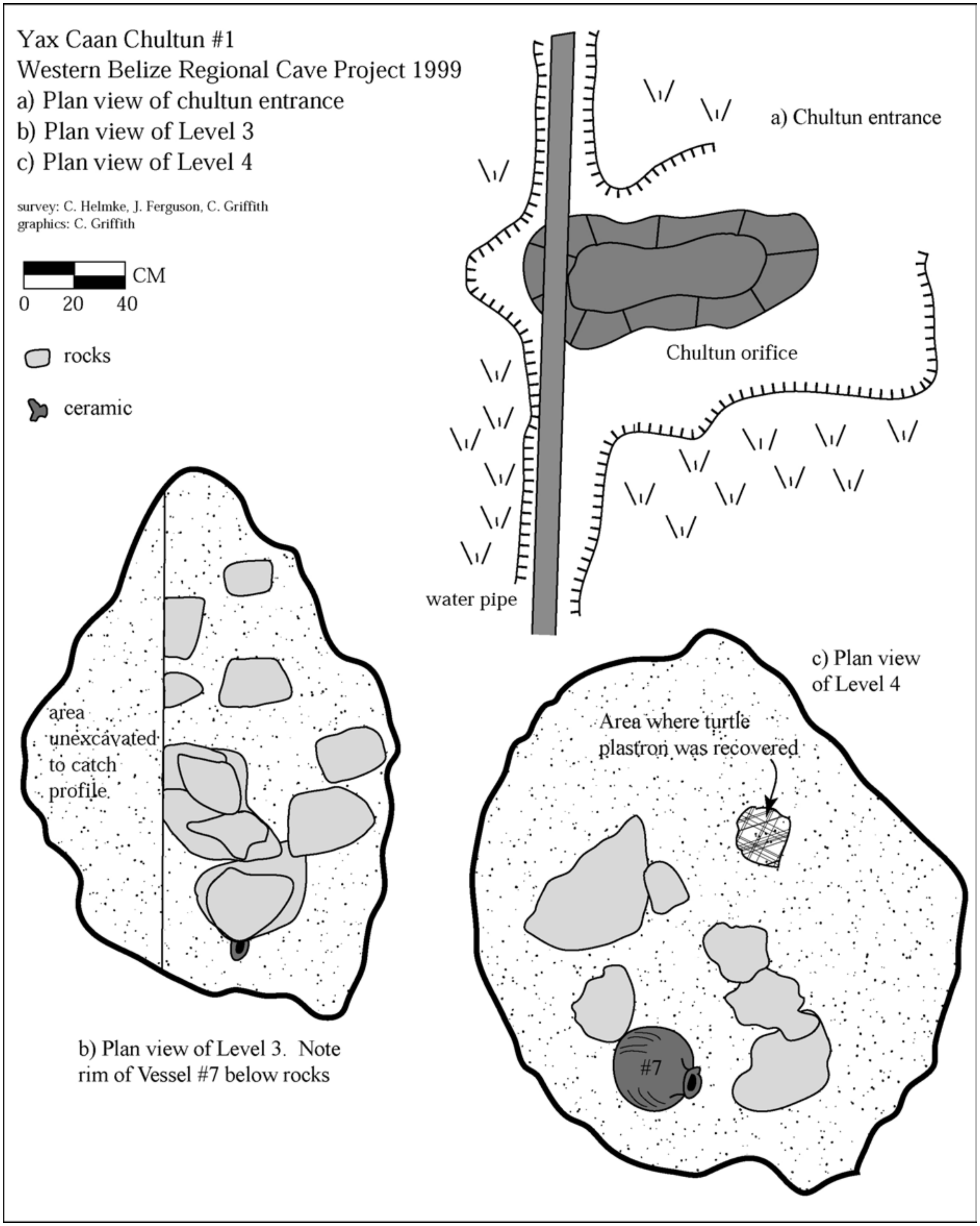

Figure 1: Plan Views: Entrance, Level 3, and Level 4.

the level. No cultural artifacts were recovered from this level. Level 1 ranged between 4 and 30 cm in depth, and was excavated to a total depth between 93 and 111 cm bd (below datum).

Level 2

Because the overall shape and size of the chultun was unknown, and recognizing that the investigations could potentially be limited by time restrictions, we decided to bisect the chultun along a north-south axis at the 130 cm mark along the orifice's baseline. Excavations concentrated on the larger, eastern portion of the chultun. Should it have been necessary to end our investigations prior to completing the excavations, this approach would have at the very least yielded a diachronic understanding of the chultun. This approach also facilitated the visualization of the stratigraphic profile of the chultun.

The matrices associated with Level 2 were similar to those of Level 1, but were composed of a more compact dry, poorly sorted, granular sand-like dirt, with limestone pebble and rock inclusions. The rocks ranged between 5 and 8 cm in size. Cultural artifacts recovered from Level 2 included 2 chert flakes and a weathered, undiagnostic ceramic sherd. The loose dirt at the edges of the chultun associated with Level 1 was completely removed in concert with that associated with Level 2. Level 2 was terminated upon detection of a change in matrix at depths ranging from 101 and 116 cm bd. This level ranged between 3 and 11 cm in depth.

Level 3

Similar to Levels 1 and 2, the excavation of Level 3 was restricted to the downsized unit area (at the 1.3 meter mark), rather than the whole chultun. The matrix associated with Level 3 was similar to that associated with typical architectural construction fill within structures located in the Belize Valley, as it was composed of a mixture of compact rock, marl and dirt similar to that of a ballast fill. The rocks ranged between 5 and 10 cm in size. The compact nature of the level facilitated the detection of matrix changes. Upon excavation, it became clear that this rock layer actually capped a layer of matrix similar to that of the previous levels. The matrix was a dry, coarse, poorly sorted, dark dirt, with limestone pebble inclusions as well as a number of larger 10 - 15 cm sized limestone rocks. Excavations removed the dirt from around the larger rocks, essentially pedestaling them. The rocks were concentrated in the area below and around the orifice, and hollow areas were present around the rocks throughout the chultun. The level was terminated at the base of the medium-sized rocks, at a depth ranging from 119.5 cm to 138 cm. The thickness of this level ranged between 17.5 cm and 34 cm. Three ceramic sherds, three chert flakes, and one daub fragment, were recovered from this level.

Level 4

Level 4 was composed of dry, compact, granular dirt with limestone pebble inclusions and rocks that averaged between 5 and 8 cm in size. The large limestone rocks exposed and pedestaled through the excavation of Level 3 were associated with Level 4, as they were in direct contact with other rocks in Level 4. Approximately 8 cm below these were more rocks, and the combination of this rock concentration and the collection of 24 chert flakes in the same vicinity led us to believe that we had happened upon a burial crypt. Concentrations of lithic flakes are often associated with burial deposits in the Belize Valley (Awe 1992; Welsh 1988). The dirt around the rocks was darker gray in color, presumably as a result of the decomposition of these rocks. Many carbon chunks and flecks were also associated with this level. The removal of the rocks from the southern area of the unit revealed a large ceramic sherd and a large olla (Vessel #1). As excavations progressed northward the removal of additional rocks exposed 5 more vessels, including an inverted tripod dish (Vessel #6), a cup (Vessel #5) that was placed inside a fragmentary olla (Vessel #4) and two other fragmentary ollas (Vessel #s 2 and 3). Vessel #3 was also inverted. Upon reaching the vessels the vertical excavation of Level 4 was halted. All of these vessels were approximately at the same level, but continued well below this, and thus were considered to be associated with Level 5. One vessel, an intact Tinanja Red olla exhibiting a kill-hole (Vessel #7), was found well above these vessels and was associated with Level 4.

The excavation of Level 4 initially concentrated on the downsized unit area, but upon reaching the rims of the ceramic vessels, excavations expanded horizontally to the rest of the chultun. The excavation of Levels 2 and 3 in the previously unexcavated section of the chultun again yielded a paucity of artifacts. Other artifacts found in Level 4 included 26 ceramic sherds, 48 seeds, and a fragment of a turtle plastron. This plastron fragment was found above the rocks in the southeast area of the chultun, below the orifice. An additional 14 vessels were exposed through the excavation of Level 4, however, all were more or less sitting on the floor of the chultun, and were thus associated with Level 5.

Level 4 was terminated upon exposure of the vessels and the identification of a deeper depression along the chultun’s south wall. The depression was outlined by several crumbling or decomposing rocks. Level 4 ranged in depth between 27 cm and 50.5 cm and was excavated to a total depth between 164 and 170 cm bd.

Level 5

Level 5 was the level in which the majority of the vessels were found, and as many of the vessels were sitting on the bottom of the chultun, this was the final level of the excavation. However, the Maya also excavated a deeper depression into the south end of the chultun, which ran along its length from east to west. The depression measured approximately 140 cm in length, and between 20 and 40 cm in width. The depression was filled with a matrix consistent with that seen in the previous levels: dark, compact, poorly sorted coarse dirt, with limestone pebble inclusions. There was also a concentration of marl in the southeast area of the depression. The depression area of Level 5 was excavated to a depth of 194 cm bd, and the level thickness ranged between 8 and 10 cm. As the depression did not yield any artifacts and the matrix remained constant it was considered a part of Level 5.

Artifacts recovered in association with Level 5 included 21 vessels (Vessels #1-6 and 8-22, most were fragmentary), as well as 39 seeds, 1 *Pomacea* shell, 1 lithic flake, carbon, 36

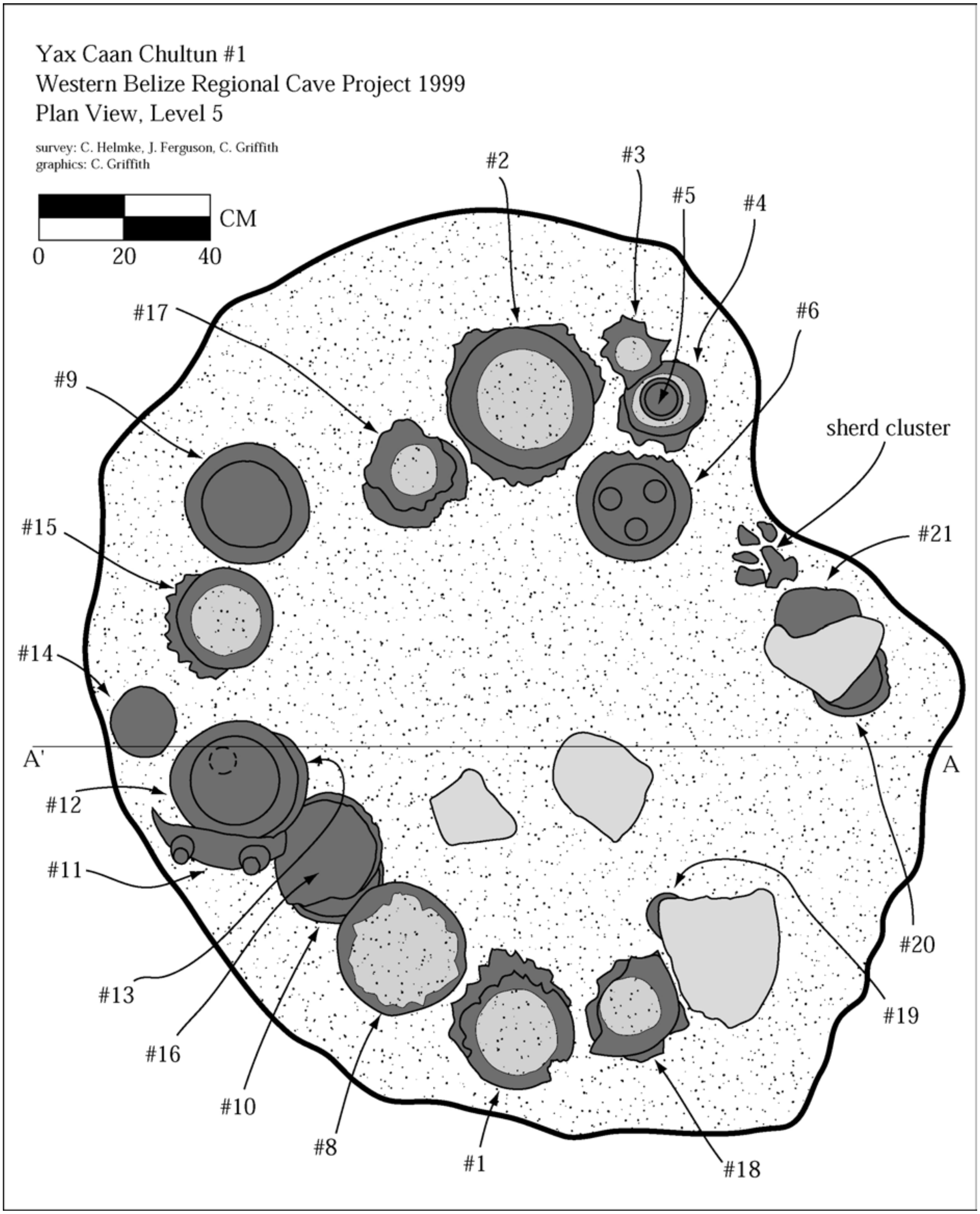

Figure 2: Plan View, Level 5. Vessel numbers indicated.

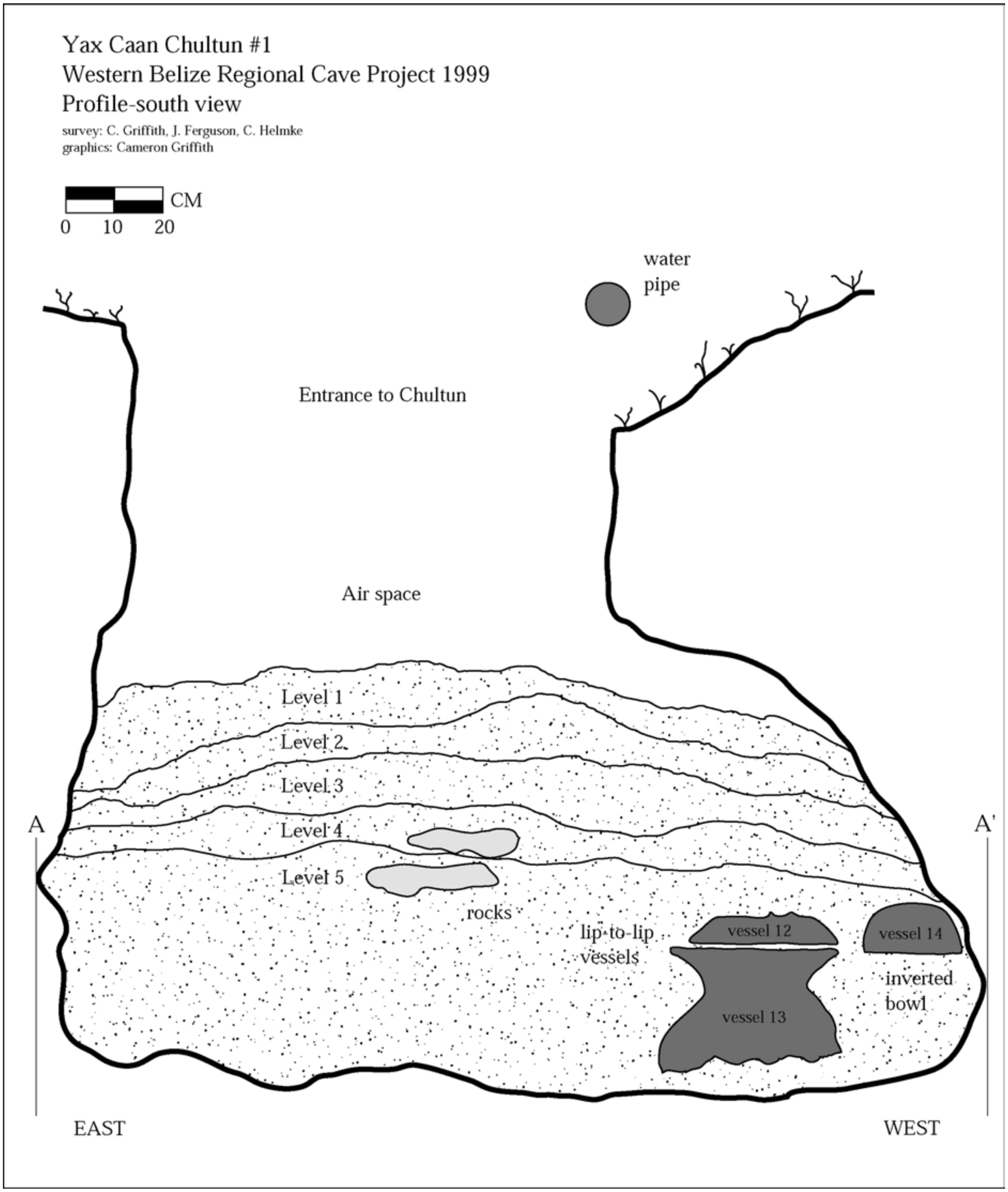

Figure 3: Profile of Yax Caan Chultun #1 with excavation levels.

ceramic sherds, and a cluster of an additional 12 sherds associated with Vessels 20 and 21. Twenty-seven land snails were also recovered from the matrix removed from Vessel #14. Matrix samples were taken from within Vessels 1, 5, 8, 9, 12 and 14.

CERAMIC ANALYSIS

Function

The function(s) of chultunob have not been satisfactorily established following decades of scholarly inquiry (see above). The materials recovered from the Yax Caan chultun #1 may thus prove useful in examining the function of that particular chultun. If the Yax Caan chultun #1 served a primary storage function, one would expect to find a predominance of storage jar (olla) forms. Indeed the predominant vessel form of the assemblage is the jar form, yet only one complete jar was found (Vessel #7). This specimen displayed an obvious kill-hole, and all other jars were represented solely by complete necks. So few jar body sherds were recovered from within the chultun that it seems most likely that the jars were smashed (deliberately or otherwise) outside of the chultun. After this the neck fragments would have been placed within the chultun. As all ceramic specimens were placed in an obvious pattern along the walls and since the chultun was subsequently filled in with construction fill, it seems relatively clear that this arrangement does not represent a utilitarian function of the chamber.

Instead, the ceramics exhibit characteristics of materials found cached in construction fill, other chultunob and caves. Olla necks have also been found cached in Chultun 3 of Group F at X-ual-canil (Gray 1998:53). Based on this interpretation as well as on the architectural context in which the Yax Caan ceramics were found, the designation of a "termination cache" may be fitting (Coe 1959; Freidel and Schele 1989). If the jar necks represent a discrete characteristic of ritual assemblages, it seems as though the ceramics recovered from the Yax Caan chultun #1 do not represent a utilitarian function of the chultun but rather represent terminal ritual activity conducted within the chultun. The discrepancy between "function" and "activity" as represented in the archaeological record is one which is relative to the number of discrete activities that can be isolated, and the type or category within which these can be classed. In the case of the Yax Caan chultun #1, the terminal activity can be isolated. Unfortunately, the identification of the final activity provides little information on the function(s) of the chultun prior to that activity. It may very well be that the only function of the chultun was to accommodate the ritual activity represented by the final artifact assemblage.

Chronology

At the present time it is impossible to place the Yax Caan chultun #1 deposit within a site-specific chronology as the neighboring residential structures have not been the subject of controlled excavations. Nonetheless, ceramic materials of the small surface collection conducted in close proximity to the chultun by the owners of the Green Heaven Lodge, indicate that Early Classic ceramic types are represented. However, these earlier materials form only a small fraction of the assemblage, which is dominated by Late Classic types. It is possible that the surface collection is representative of the frequency of ceramic types present at the nearby residential structures, since this assemblage was produced completely at random. This observation, however, remains entirely speculative at present since it is unclear where the material was recovered.

The most salient characteristic of the Yax Caan chultun #1 ceramics is the fact that all identified ceramic types are Late Classic. The forms, slips, surface decorations, and paste characteristics of the assemblage are all those of ceramic types from the Late Classic Spanish Lookout complex at Barton Ramie (Gifford 1976). Despite similarities to the Barton Ramie assemblage, the Yax Caan chultun #1 ceramics can also be compared to the ceramics of Xunantunich and to ceramics recovered from smaller sites located on the Chaa Creek property. Samuel Connell (UCLA) investigated the latter sites as part of the Xunantunich Archaeological Project. Results of those investigations were provided in the interim reports of the UCLA-based XAP project. Comparison to the material of Xunantunich (LeCount 1992, 1996; Thompson 1940) indicates that the Yax Caan ceramics form a pure Late Classic deposit.

Refining the temporal placement of the Yax Caan ceramics to Late Classic I (A.D.600-700), II (A.D. 700-800), or III (A.D. 800-900) sub-phases remains problematic in the absence of absolute dates obtained via obsidian hydration or C14 dating. Although Gifford (1976) created a major dichotomy between Late Classic I (Tiger Run) and Late Classic II-III (Spanish Lookout) through the synthetic construction of heterogeneous complexes, several ceramic types appear to crosscut these complexes. The continuity of some surface decoration modes between Tiger Run and Spanish Lookout (e.g. Rosario Incised vs. Dolphin Head Incised), or the continuity of the medial ridge mode from Mountain Pine Red to Belize Red, as well as the continuity of Fugitive Black ware from Teakettle Bank Black to Mount Maloney Black are just a few examples of continuity crosscutting the complexes established at Barton Ramie. Despite these continuities, all the ceramic specimens from the Yax Caan chultun #1 have been assigned to the Spanish Lookout complex and thus likely restricted to the Late Classic II and III sub-phases. The exclusion of the Late Classic I phase is based on 1) the transitional nature of types associated with that sub-phase, 2) the fact that none of those types have been recovered from primary contexts at Xunantunich (LeCount 1992:133), and 3) based on the absence of forms or modes typically associated with that phase, in the Yax Caan chultun #1 assemblage.

Several attributes of the ceramic assemblage from the Yax Caan chultun #1 may provide helpful clues in determining to which sub-phase that deposit belongs. The continuity of Late Classic types into the Terminal Classic creates difficulties in assigning certain assemblages to either LC II or LC III. Situations such as these are confounded when truly Terminal Classic types are absent, as is the case of the Yax Caan chultun #1 ceramics. The continuity of Late Classic types into the Terminal Classic is a problem that has been encountered at Caracol (Chase 1998) as well as at Seibal in creating a distinction between the Tepejilote and Bayal phases (Sabloff 1975:15-17, Fig. 7e). Chase (1998, in press) has convincingly argued that the Terminal Classic ceramic types of Caracol may be associated exclusively with the elite of that period, while the continuous Late Classic types in use at that period may have been associated with lesser social strata. Despite the useful sociopolitical inferences that may be gleaned from that interpretation, the model also implies that no satisfactory temporal distinction can be established between LC II and III, in assemblages that lack LC III types.

Nonetheless, salient attributes of the Yax Caan chultun #1 ceramics that may be temporally diagnostic are reviewed below. The presence of British Honduras Ashware confirms the LC II - III placement, but the preponderance of that paste mode still remains unclear in terms of chronological placement. Gifford (1976:226) and Thompson (1940:11) were inclined to suggest that ash-tempering was at its peak in the Terminal Classic (LC III), yet recent analyses undertaken by LeCount (1992:135) suggests that ash-tempering in fact declines during LC III, but has its peak during LC II. As the Yax Caan chultun #1 is considerably closer to Xunantunich than to Barton Ramie, these observations are highly relevant. The presence of ash-tempered vessels in the Yax Caan deposit in no way resolves the sub-phase placement. The presence of 3 Benque Viejo Polychrome tripod dishes in the assemblage, however, suggests a LC II placement, as elaborate polychrome decoration appears to predominate during LC I-II at Xunantunich (LeCount 1992:133-134), but "virtually disappears from the assemblage" during LC III (ibid:134). Furthermore, the presence of two Tinaja Red jars suggest a late date based on the temporal occurrence of that type at Seibal and Uaxactun (Sabloff 1975:16; Smith 1955). Smith (1955) places Tinaja Red: Tinaja Variety in the Tepeu 3 complex (A.D. 800-900), which is followed by Adams (1971:23) who places that variety in the equivalent Boca complex (A.D. 750-900). Other varieties of this type have been assigned to the Late Classic at Altar de Sacrificios (A.D. 550-750) and Seibal (A.D. 750-900) (Adams 1971; Sabloff 1975:159-160). Based on the temporal occurrence of that type at other sites and the identification of the Yax Caan Tinaja jars as Variety Unspecified, these can be dated to between A.D. 750 and 900.

The Garbutt Creek Red bowl and the 3 Mount Maloney Black bowls can be placed within the microseriation developed by LeCount for the latter type at Xunantunich (LeCount 1992, 1996). Based on the lip orientation and form as defined by LeCount, the Mount Maloney Black bowls can be assigned to the LC II phase. If this microseriation is also applied to the Garbutt Creek Red bowl, which is a similar vessel form to the Mount Maloney Black but with a red slip, then this vessel can also be assigned a LC II date.

DISCUSSION

The bulk of the artifacts recovered from the Yax Caan chultun #1 were ceramics, most notably 23 fragmentary and whole vessels. All of the vessels date to the Late to Terminal Classic (ca. A.D. 750 - 900), and the variability in ceramic types was not extreme. In total, there were 13 ollas (one complete and twelve fragmentary), 4 tripod dishes, 1 cup, and 5 bowls each of varying sizes and forms. Based on minimal surface decoration and vessel form, all of the vessels with the exception of the tripod dishes are considered utilitarian wares. While some might consider the fundamentally utilitarian nature of the assemblage as evidence of food storage (Dahlin and Litzinger 1986; Puleston 1971), the fact that the majority of the vessels were terminated, and/or inverted, does not support this assumption.

The majority of the vessels are represented by the olla form, which is typically considered to be utilitarian in nature, yet of these only one was intact, albeit with a kill-hole in the body of the vessel. The other vessels were represented only by the necks. As there were only a few small sherds recovered from the chultun, hardly enough to comprise the portion below the neck of even one of the fragmentary ollas in the assemblage, it is clear that the necks were placed in the chultun following the above-ground breakage of the vessels. The inclusion of several vessels ineffective for bulk storage (i.e., tripod dishes, shallow bowls) and the fact that eleven of the twelve olla forms were represented only by the necks of the vessels would also seem to invalidate such an assumption. Recent research into ceramic assemblages typically considered to be utilitarian in nature has revealed some of the problems inherent in the evaluation of vessels normally considered to be merely “household” forms outside of residential contexts (Brady et al. 1992).

The assemblage of artifacts associated with the Yax Caan chultun #1 indicates that the location of artifacts was not the result of haphazard dumping, but of intentional placement. The careful arrangement of fragmentary and complete vessels in an oval pattern following the perimeter of the chultun as well as the fact that many vessels were inverted indicates that their deposition was associated with ritual practices.

The archaeological data derived from the Yax Caan excavations did not reveal evidence of use prior to that associated with the terminal phase of utilization. Without evidence suggesting an earlier, different use of the chultun, we do not feel it appropriate to speculate on the possibility of earlier uses. It may very well be that the Yax Caan chultun #1 was constructed solely for one purpose, and that the utilization of the chultun was consistent until the entrance was closed off by the Maya.

One curious feature of the chultun assemblage was the presence of several seeds in Levels 4 and 5. Those associated with Level 5 were found at a depth of 179 cm bd, and were concentrated along the chultun’s south wall in the area of the depression. The seeds appear to be of 3 different plants. The Belizean archaeologist participating in the excavation and mapping of the chultun suggested that one of the seeds is referred to locally as “Indian Shot,” a plant related to the bird of paradise or haleconia plant. These seeds are very hard and small, grow on trees, and may have been used in association with blow darts (Rafael Guerra, personal communication 1999). Other seeds were believed to be decomposing allspice seeds (Rafael Guerra, personal communication 1999). The smaller, angular orange seeds recovered were of an unknown plant. It is unclear whether these seeds were a part of the offertory assemblage, or if they washed into the chultun from the surface and ended up deep in the chultun deposits through water percolation processes. The significance of these seeds is otherwise unclear. It is hoped that a botanical analysis in the future will shed more light on the nature and origin of these materials.

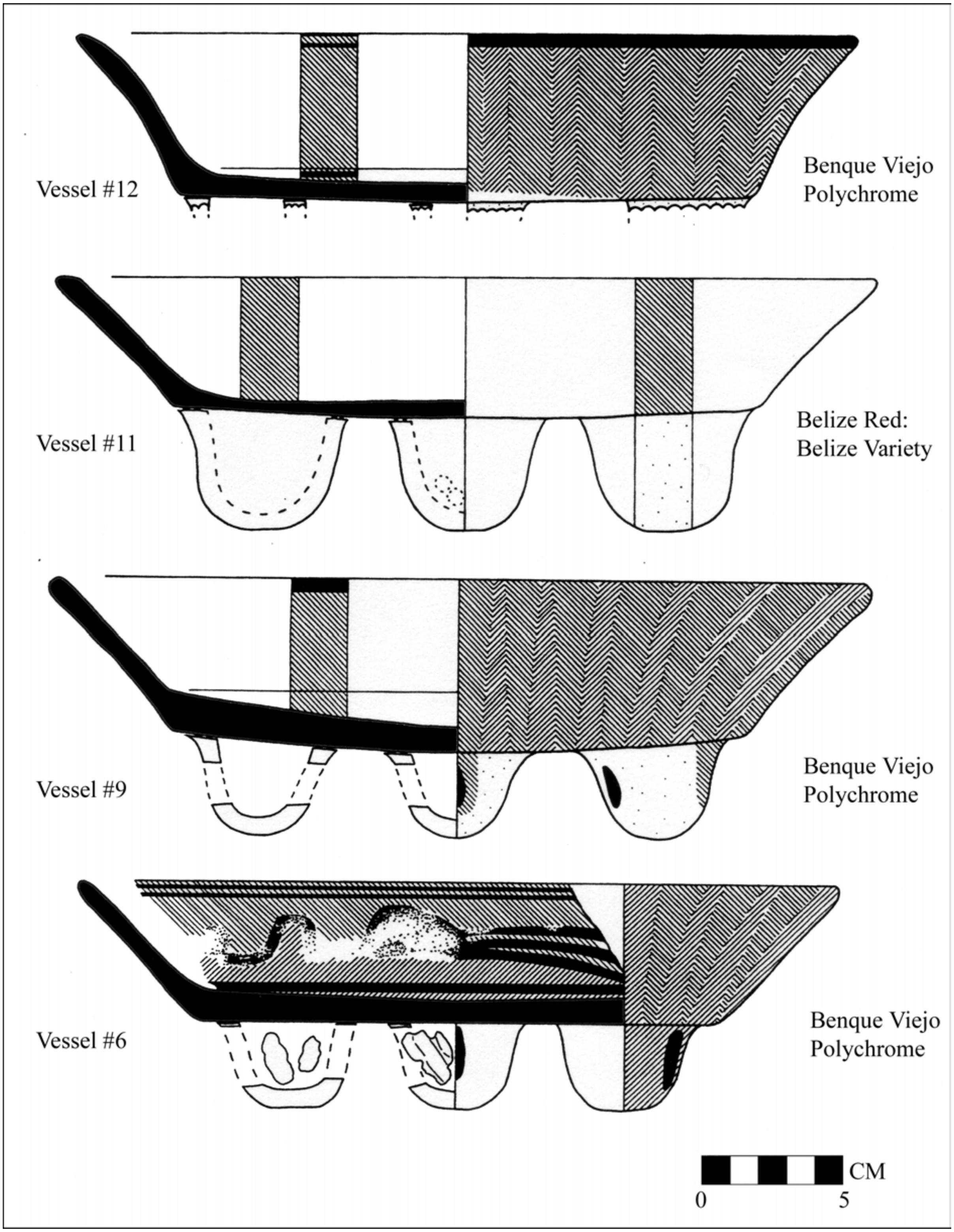

Figure 4: Tripod Vessels #'s 6, 9, 11, and 12.

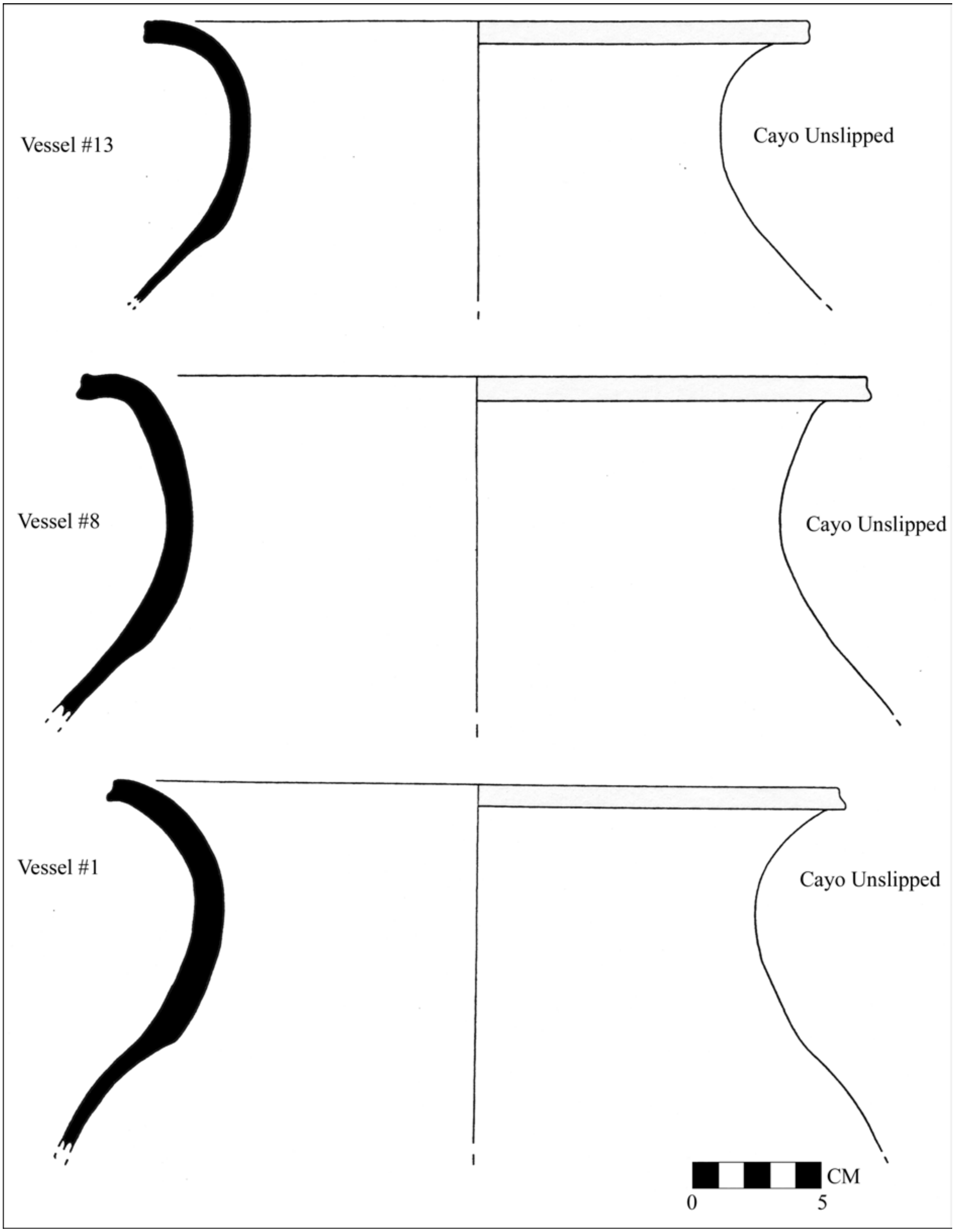

Figure 5: Olla neck fragments. All Cayo Unslipped:Variety Unspecified (Buff).

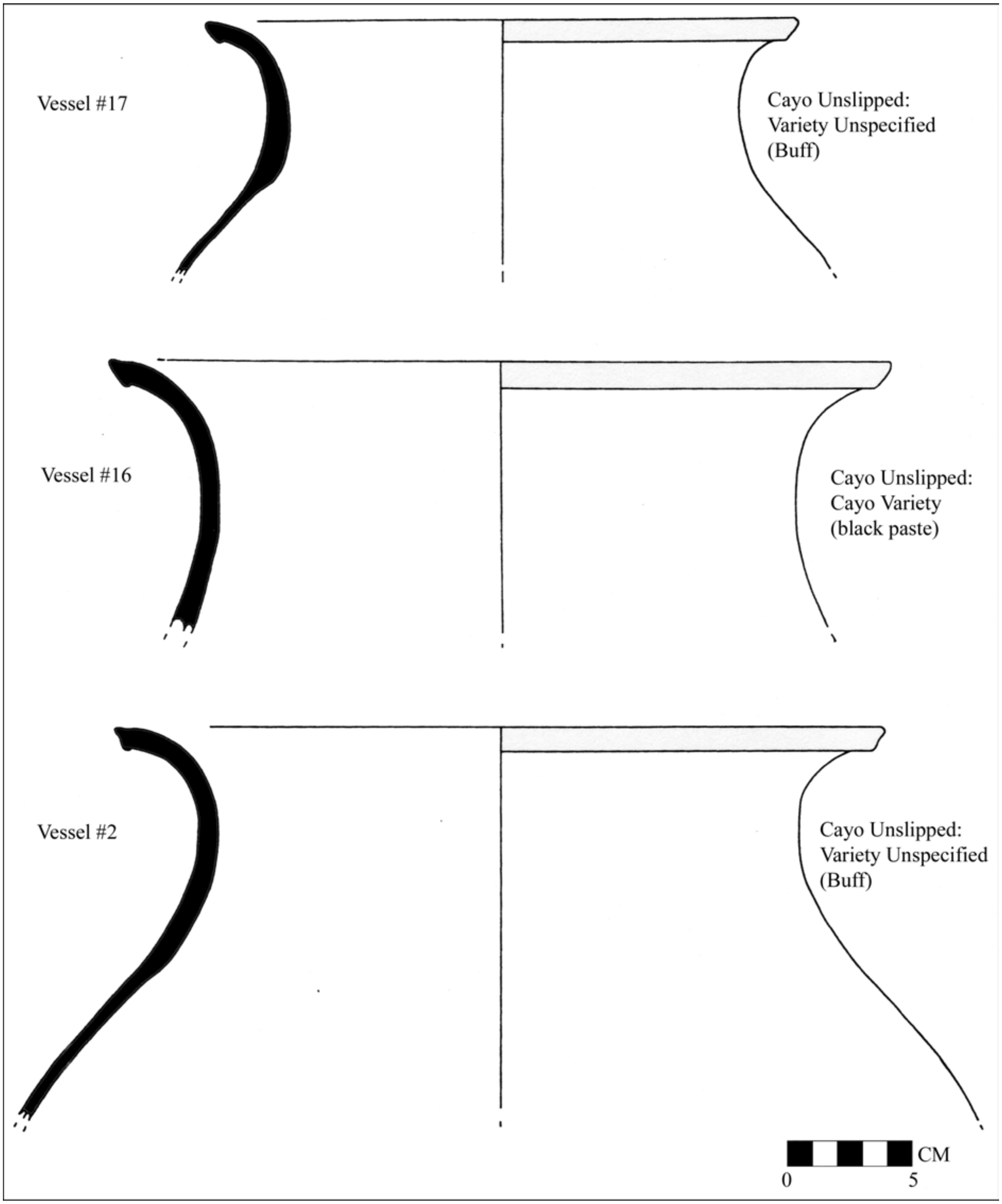

Figure 6: Olla neck fragments; Vessels 2, 16, and 17.

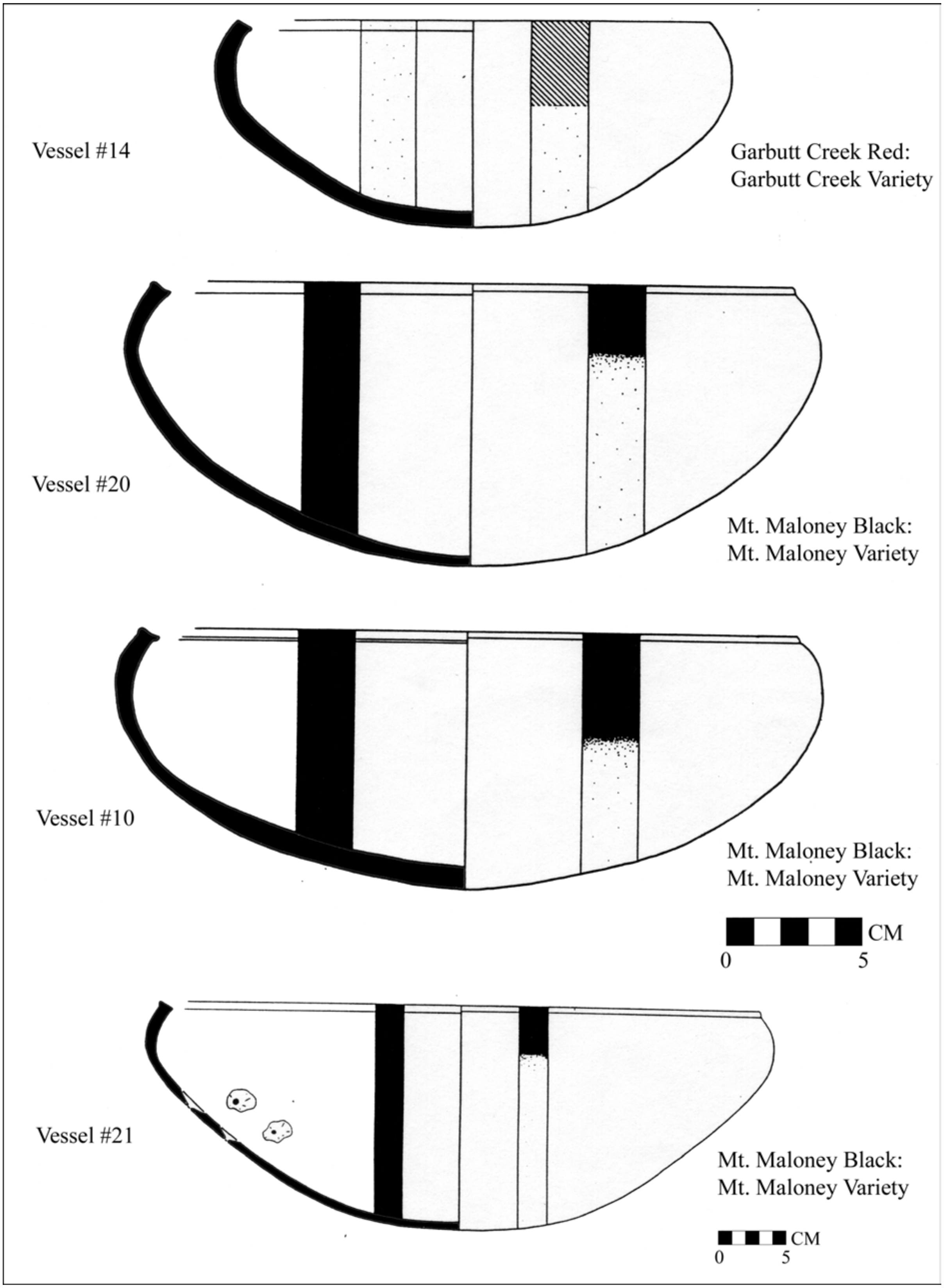

Figure 7: Bowls; Vessels #'s 10, 14, 20 and 21.

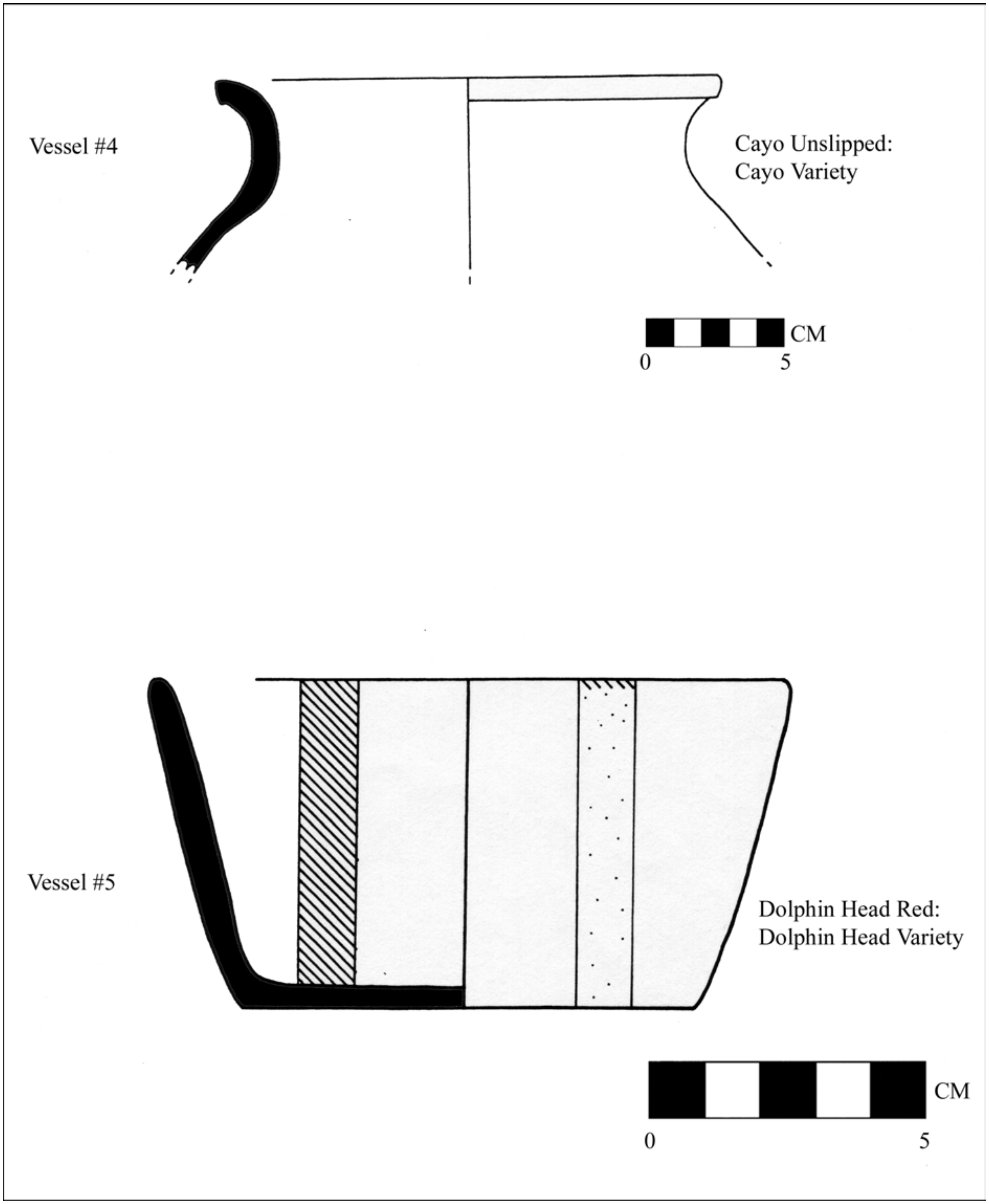

Figure 8: Vessel #'s 4 and 5.

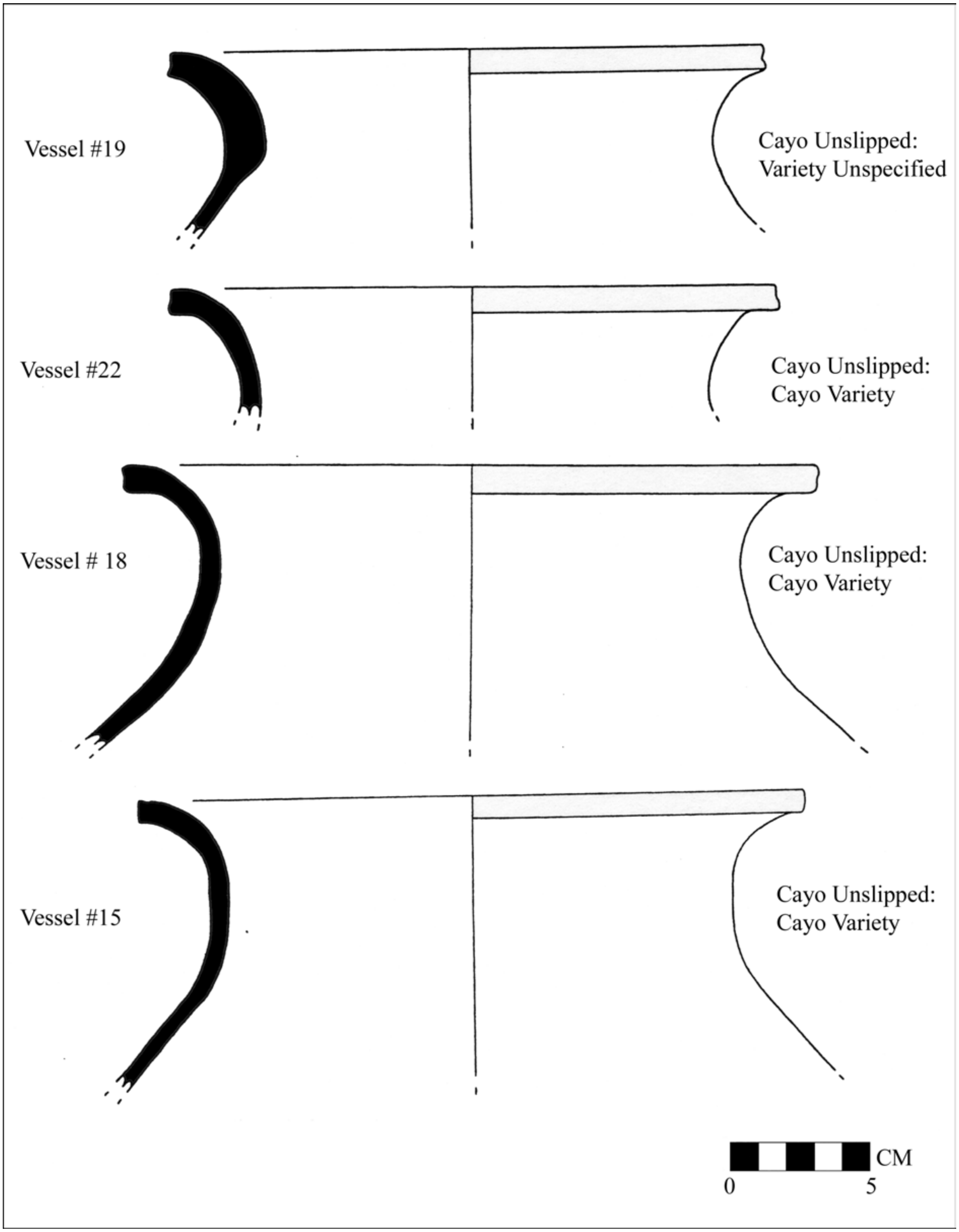

Figure 9: Olla neck fragments; Vessel #'s 15, 18, 19 and 22.

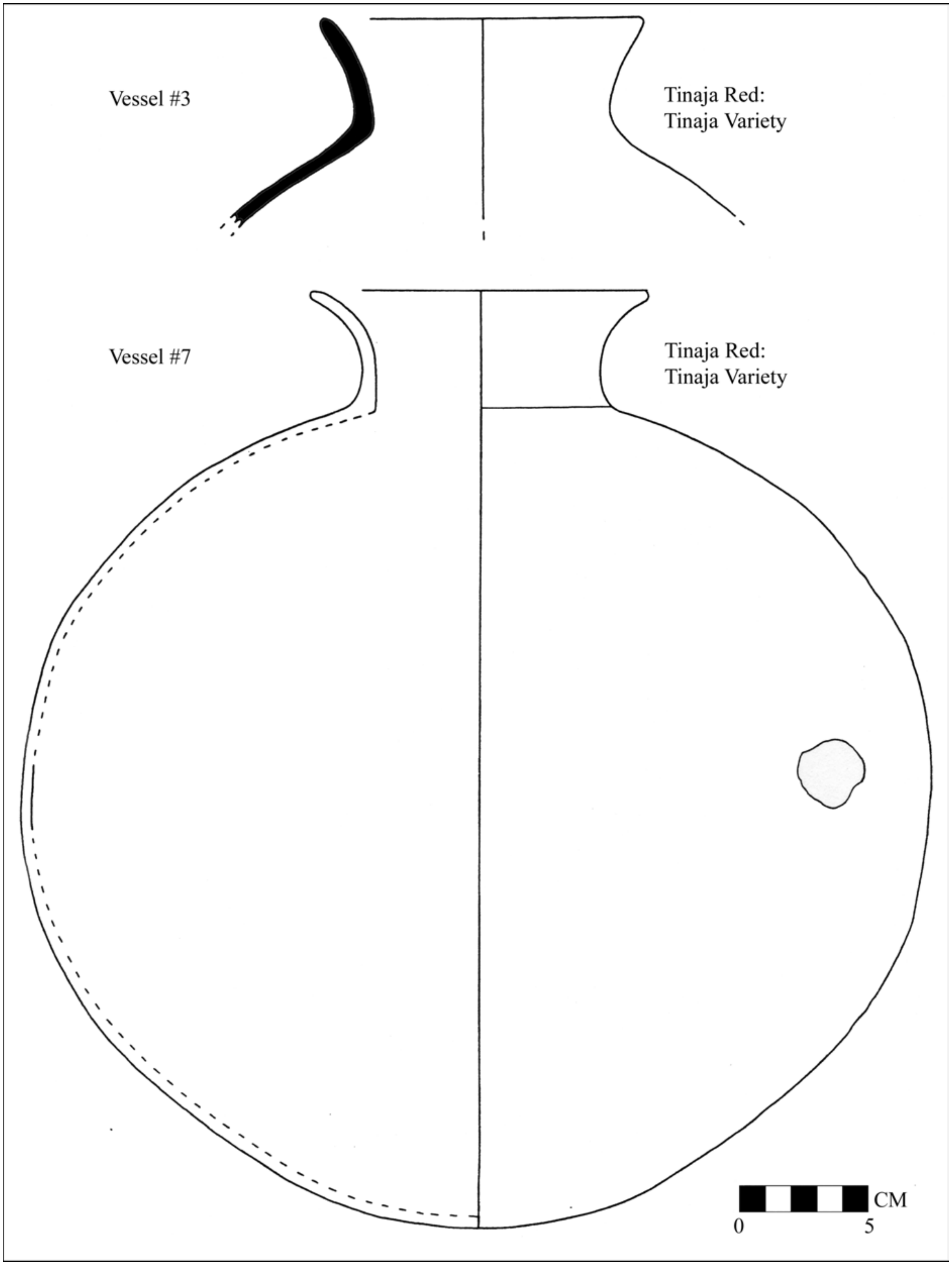

Figure 10: Ollas: neck fragment (Vessel #3) and complete vessel with kill-hole (#7).

Another noteworthy observation was that one of the feet of the Belize Red dish (Vessel #11) was found away from the rest of the vessel in a small niche in the wall of the chultun. The special placement of only one portion of the vessel indicates that the vessel had been broken, intentional or not, prior to or at the time of the ritual activity carried out in the chultun. This particular placement may suggest some significance in the "caching" of an appendage of a vessel. It is interesting that the "cached" foot is the only foot of the three that contains rattles. Neither of the other feet have rattles in them, and these feet have no slits from which the rattles could have fallen out. Comparative data from other chultunob may shed light on this type of artifact deposition.

During the course of the excavation we noted the similarity of the chultun's ceramic assemblage to ceramic depositional contexts in the caves of western Belize. Many caves contain ceramic vessels, some intentionally broken by the Maya, and some fully intact with kill-holes. It is noteworthy that one of the Benque Viejo Polychromes (Vessel #6) bears a cormorant in black paint on the interior wall of the vessel. Six other vessels with a similar motif have been found in caves in Belize (Reiko Ishihara, personal communication 2000). The subterranean nature of chultunob, as well as the similarity of the associated artifact assemblages to those found within caves, could mean that chultunob served as artificially constructed underground chambers that were used for ritual purposes in lieu of a visit to an actual cave.

CONCLUSIONS

The forms, condition, and orientation of the vessels in the Yax Caan chultun #1 suggest that the final function of this chultun was not to store water or foodstuffs. Moreover, the lack of objects associated with weaving and textiles such as spindle whorls suggests that the chultun was not utilized as a locus in the production of fine weaving. The ovoid configuration of the nearly complete and whole vessels and the presence of lip-to-lip vessel orientation lends support to the suggestion that the chultun was likely associated with ritual or ceremonial practices. While the chultun may have been utilized for other purposes prior to the deposition of the final assemblage, sufficient data do not exist to propel such an argument beyond mere speculation.

The ceramic assemblage of the Yax Caan chultun #1 is dominated by olla forms, yet all consist solely of neck pieces, except one intact vessel which has a kill-hole. The lack of other olla fragments indicates that the necks alone were deposited purposefully as a part of a dedicatory or ritual offering. As they are also found in cave contexts (Stone 1995) it would seem that olla necks represent a discrete element of ritual deposits. The presence of such an assemblage in the Yax Caan chultun #1 likens the activity conducted within the chultun to cave rituals. Thus, it is quite possible that chultunob functioned as artificial mini-caves for important and necessary rituals that, due to time constraints, prohibitive distance from caves, or other reasons, could not be conducted in natural caverns.

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REPORT ON SALVAGE EXCAVATIONS OF AN ANCIENT MAYA CHULTUN AT CHAA CREEK RESORT, CAYO DISTRICT, BELIZE

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INTRODUCTION

In July 1999, an ancient Maya *chultun* (bottle-shaped subterranean chamber) was discovered by workers at the Chaa Creek Resort, located just south of San Ignacio town on the western banks of the Macal River in the Cayo District of Belize (Figures 1 & 2). The cut limestone cap of the chamber was discovered when a trench was excavated for power lines. Upon the discovery of the chamber, a report was made to the Belize Department of Archaeology. Members of the Western Belize Regional Cave Project were present in the Department that day, and volunteered to undertake a salvage excavation of the chultun.

Upon arrival at the chultun, located immediately adjacent to the resort's gift shop, we discovered that it was a three-chambered chultun and observed the presence of human remains in two of the chambers. Excavation of these chambers took place over the next five days, and resulted in the documentation and removal of one burial, as well as ceramic, lithic, and animal remains.

CHULTUNOB

Chultunob are a frequent feature of Maya sites, and are found throughout the Maya area. Due to the subterranean nature of these features, however, they often go undetected by archaeological research programs, and are particularly prone to destruction by modern development. As a result, they are most likely underrepresented in the archaeological record. The data obtained from chultun excavations have been used to support a number of hypotheses about the function of ancient chultunob. Unfortunately, the evidence is frequently ambiguous, and may support a number of proposed functions.

Chultun features have been noted at Maya sites for over 100 years, but a century of investigation and debate has done little to further our understanding of these subterranean chambers. At various points in the history of archaeological research,

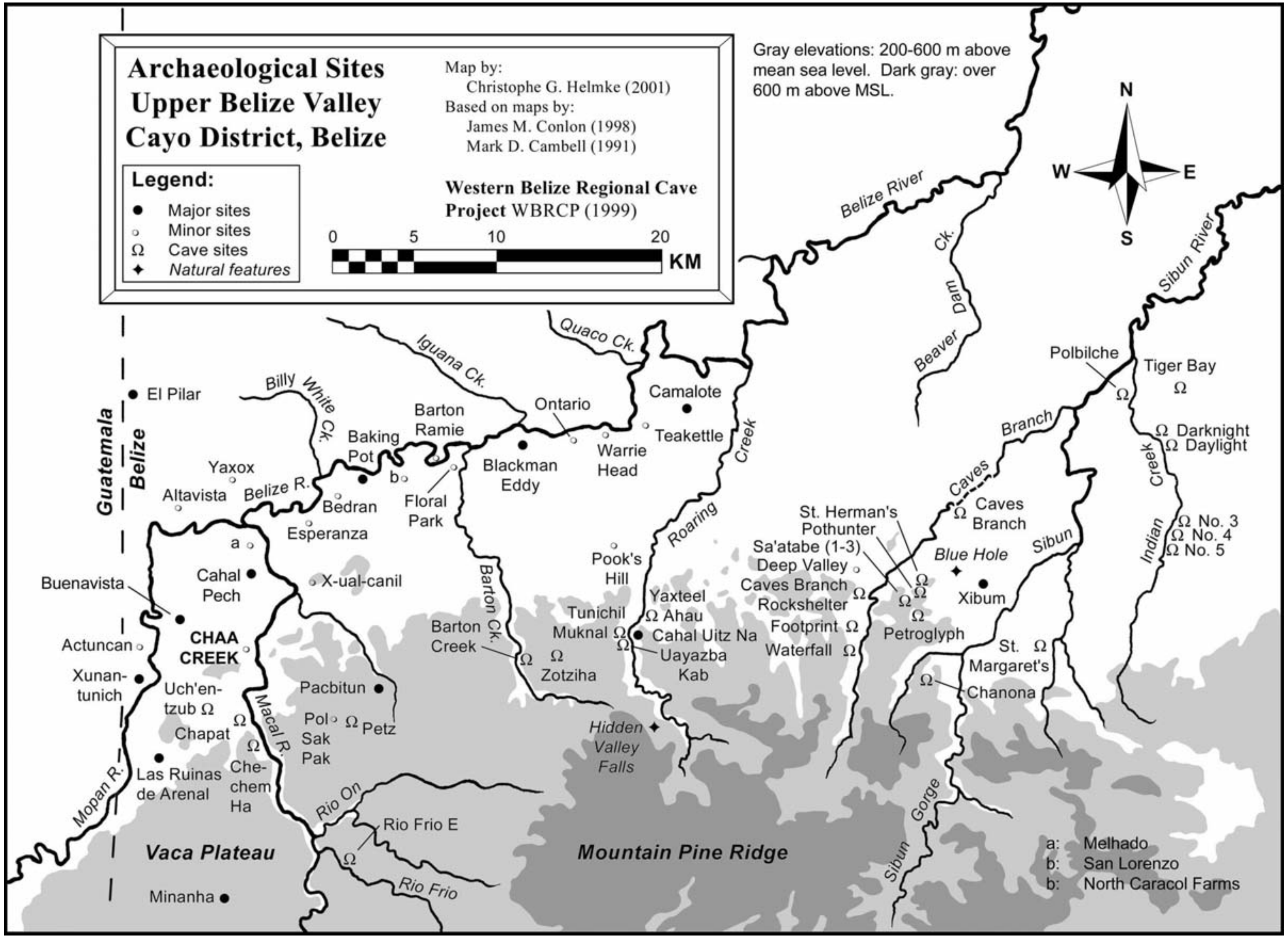

Figure 1: Map of the upper Belize River valley showing distribution of ancient Maya sites and the location of Chaa Creek to the west.

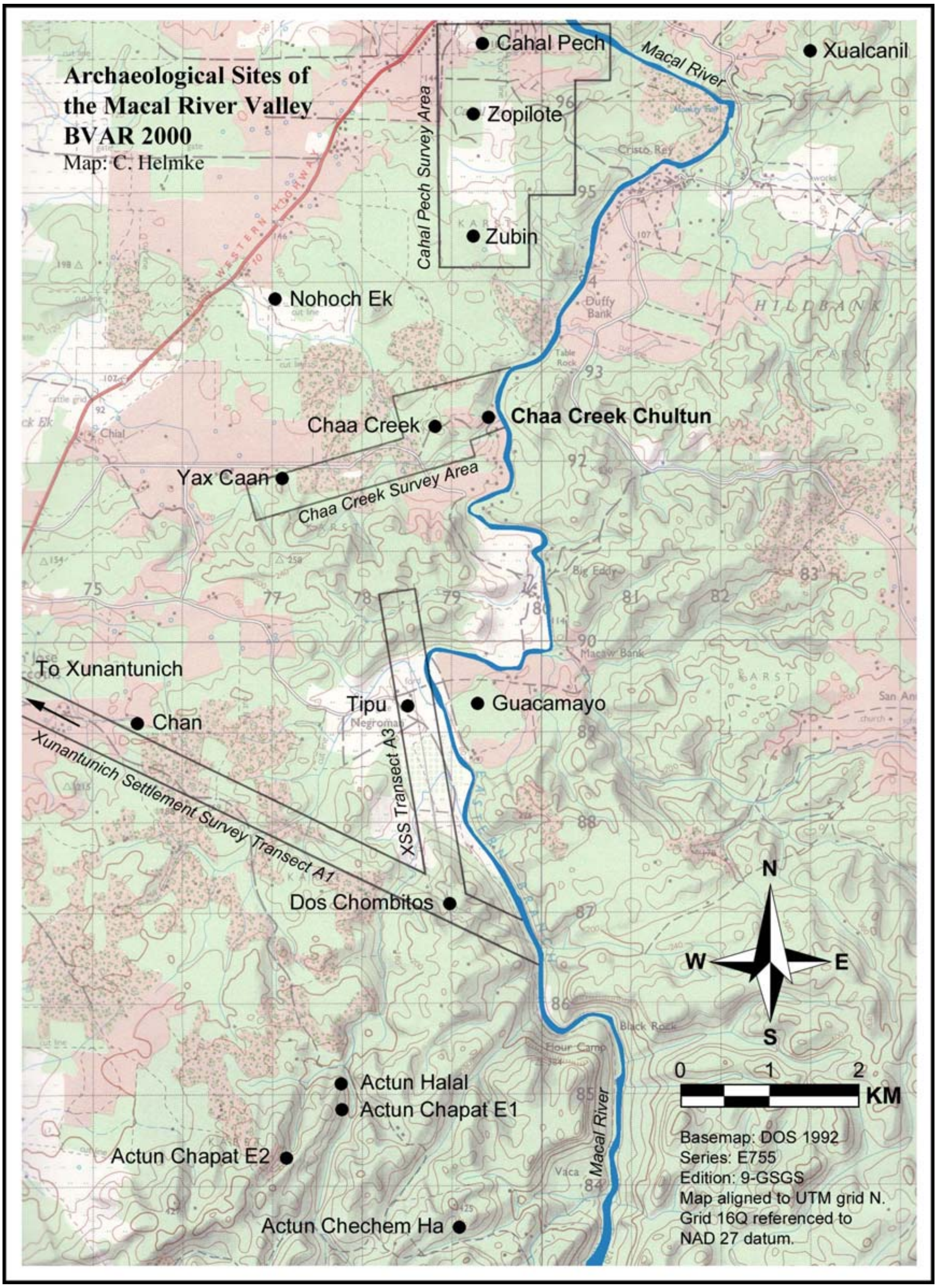

Figure 2: Map of the Macal River valley showing location of the Chaa Creek Chultun in relation to other nearby archaeological sites.

chultunob have been thought to serve a variety of functions. Maudslay (1889-1902) suggested that the underground chambers served as sweat baths. Spanish ethnographic accounts from central Mexico indicate that the Aztecs used sweat baths as ritual sites, and investigations at some Maya sites have found architectural structures that are thought to have been used for similar purposes. These structures have very distinctive elements, however, including basins to hold water, benches for participants in the rituals, and places for heated stones to create the correct temperature and humidity. These elements are absent in chultunob (Ichon 1977).

One of the most enduring interpretations for chultunob is that they were used as cisterns for the storage of water (Matheny 1971; Iannone et al. 1994). Matheny (1971) has found underground chambers that were sealed inside by firing the limestone interior of the chultun. This process prevented the water from percolating through the limestone bedrock. Iannone et al. (1994) excavated a chultun at Zubin, a peripheral monumental group at the site of Cahal Pech in Western Belize, and found what appears to be a system to channel water into the chamber (Grey 2000). Other chultunob at Cahal Pech were also generally located downslope from hilltop settlements, thus advantageously positioned to collect runoff water. A similar pattern has been noted in the dry northern regions of the Yucatan Peninsula. Indeed, the largest numbers of chultunob in the Maya area have been discovered in the Puuc region which straddles the states of Campeche and Yucatan. The relative aridity of this area has resulted with the excellent preservation of these underground features and most of them still retain well-preserved plastered surfaces. This feature, the fact that the Puuc region lacks surface water, and because most ancient households were associated with one or more chultun, led archaeologists working at places like Sayil and Uxmal to argue that the evidence strongly suggests that the chultunob were used as cisterns (McAnany 1990; Sharer 1994:378, 478). Given the close correlation between chultunob and houses, the archaeologists were also able to estimate the population of the ancient city of Sayil by counting the number of chultunob and by measuring their water capacity.

While the evidence is compelling in these instances, in many other examples the insides of chultunob are not sealed. If they were unsealed in antiquity they therefore have been unsuitable for water storage. In some cases, these chambers are also located in close proximity to perennial water sources that make water storage an unlikely explanation for those particular chultunob.

Several researchers have argued that chultunob were used to store foodstuffs (Puleston 1965, 1971; Tozzer 1913; Miksecek, 1981). Arguments have been made for the storage of maize, ramon nuts, or cacao. These hypotheses have led to numerous debates about whether or not the environment in chultunob is suitable for food storage, whether this storage was long or short term, what kinds of food were stored within them, and what the cycles and seasons of certain crops were. Puleston (1965) argued that the ramon nut, considered to be an alternate food source in times of shortage, could be stored in the hot, humid conditions inside chultunob more successfully than could maize. He performed studies where he constructed chultunob, and then stored various crops inside to determine how well they would be preserved in those conditions. He found that ramon could be stored for up to 14 months in chultunob. Miksecek (1981) argued that the environment within chultunob naturally created a CO_2 rich environment that would permit corn to be stored for longer periods, and that smoking corn, a practice observed ethnographically in Mexico, would further extend the life of stored crops.

These debates continue unresolved. The application of methods such as palynological, macrobotanical, and residue analysis to matrix and ceramic materials from a chultun context may answer some of these questions. Even this kind of evidence cannot be considered conclusive, however, since the reasons for placing vessels in chultunob cannot definitively be determined, nor can residue analysis say whether the residue came to be in that vessel from its terminal use, or from some previous vessel function.

Dahlin and Litzinger (1986) have suggested that chultunob may have served as sites for the pickling of fruits and vegetables and the fermentation of alcoholic beverages. Dahlin and Litzinger studied chultunob at the site of Tikal, looking at the location and distribution of chultunob at the site. They have suggested that the frequency and pattern of distribution of chultunob does not support a storage hypothesis. They suggest that if chultunob were used for storage, one would expect to find them at rural, agricultural residential structures, and in great numbers around elite centres where agricultural surplus would be stored. Instead, they have found that chultunob occur in a less frequent distribution, and that they tend to be located in proximity to less affluent residential barrios. They concluded that chultunob were built and used by individuals who produced fruits and vegetables preserved through microbial (fermentation) processes, and also alcoholic beverages used at public gatherings and events. This hypothesis, while intriguing, remains difficult to prove. While their research does show that the humidity and temperature that generally exist within chultunob is conducive to fermentation, that does not mean that this was the reason that chultunob were constructed.

A study conducted by Hunter-Tate (1994) at the site of Caracol in Belize, found that all the chultunob investigated contained burial remains. Chase and Chase (1994) have argued that chultunob may have been Late Preclassic and Early Classic precursors to the tombs found in public architecture in the Late Classic. Still, Hunter-Tate does not go as far as to suggest that burial was the primary function of chultunob at the site.

In a review of funerary practices in the Maya lowlands, Ruz L. (1965) mentions the discovery of chultunob in a number of funerary contexts. Beneath Structure Q-95 at the site of Mayapan, a chultun was found beneath a funerary well that had been constructed within a pyramidal structure. The capped chultun located at the bottom of the well contained remains of four identifiable individuals; one male, one female and two juveniles. Over 40 burials were found in the well above, and an altar near the top of the well suggested that these 40 individuals were sacrificial victims. Successive construction phases continued to accommodate the well over time, suggesting the longevity of the ritual practice. While this may suggest a form of ancestor veneration ritual honouring the individuals initially interred in the chultun, it still does not answer the question of whether or not the chultun was constructed as a burial place.

Each hypothesis has produced its own camps of supporters and critics, and in general, each of these groups has been able to provide some kind of support from the existing evidence for their individual positions. The result has been a kind of intellectual stalemate, and a general acceptance that chultunob must have served different uses in different places and/or changed functions over time. Most researchers seem to accept, however, that burial of the dead could not have been (in the majority of cases) the primary purpose for the construction of chultunob despite the fact that a significant number of the chultunob excavated contain human remains.

Gray (pers.comm. 2000) has conducted a detailed functional study of chultunob and suggests that the function of these chambers likely changed over time. Her research on chultunob in the upper Belize River valley is examining the possibility that ritual activity may more clearly define these other chultun uses. These functions include ancestor veneration, short-term storage and fermentation for feasting activities, and burial practices (considering possible associations between cave use by the ancient Maya and chultunob as man-made underground chambers).

This report discusses the case of the Chaa Creek Chultun, providing a description of the excavation, as well as the results of a preliminary analysis of the human and artifactual material, and then a discussion of the possible function of this feature in light of the hypotheses of chultun function discussed above.

MORPHOLOGY

The chultun discovered at Chaa Creek consists of three chambers or lobes (Figure 3). Chamber 1 serves as an antechamber to Chambers 2 and 3, and entrance to the chultun is gained through a circular opening in the ceiling of Chamber 1. The entrance measures 60 centimetres in diameter and when discovered was 34 centimetres below the existing ground surface, capped with a fitted limestone cap (Figure 4). Though a portion of the cap was destroyed as the chultun was discovered, when archaeological investigation began, a little more than half the cap remained *in situ* (Figure 4). The entrance is off-centre, beginning 1 metre south from the northern extent of Chamber 1, and 20 centimetres north of the southern extent of the chamber. A large, faced slab of dolomitic limestone that measured 80 centimetres in length was found inside Chamber 1, approximately 10 centimetres north of the entrance, resting directly upon the bedrock flooring. This slab probably served either as a step to facilitate access to the chultun, which may have displaced subsequent to cessation of primary usage, prior to sealing. Conversely, this slab may have served as an activity surface, a possibility supported in part by the presence of a chert core, immediately to the north (Figure 6). Chamber 1 measures 2 metres across from east to west, and 2.1 metres across from north to south. Chamber 1 is the most circular of the three chambers.

Chamber 2 is accessible through a roughly square, silled orifice north-west of the entrance to Chamber 1 (Figures 3 & 4). Chamber 2 is more kidney-shaped than Chamber 1, but without sharply defined corners. Chamber 2 measures 1.6 metres from east to west at the widest point, and 1.9 metres from north to south. The orifice between Chamber 1 and Chamber 2 measures 64 centimetres wide in Chamber 1, then widens to 84 centimetres in Chamber 2, and is approximately 39 centimetres in height.

Chamber 3 is accessible through another roughly square, silled orifice directly north of the entrance to Chamber 1 (Figures 3 & 4). Chamber 3 is similar in shape to Chamber 2, being more kidney-shaped than round. Chamber 3 measures 2 metres from east to west at the widest point, and 1.5 metres from north to south. The orifice between

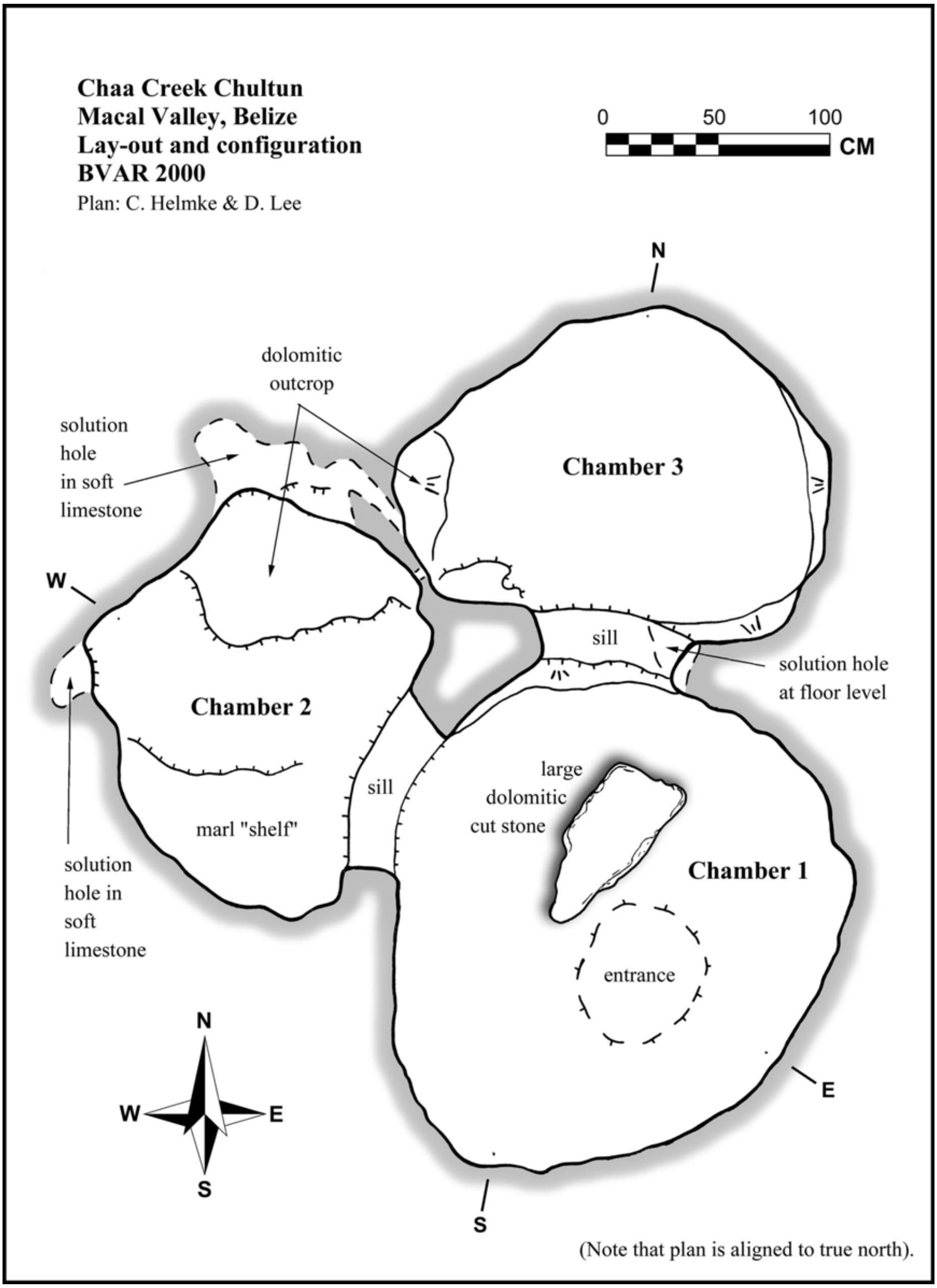

Figure 3: Morphological plan of the morphology Chaa Creek Chultun. Note that for the sake of clarity all soil matrices and accretive cultural features have not been represented.

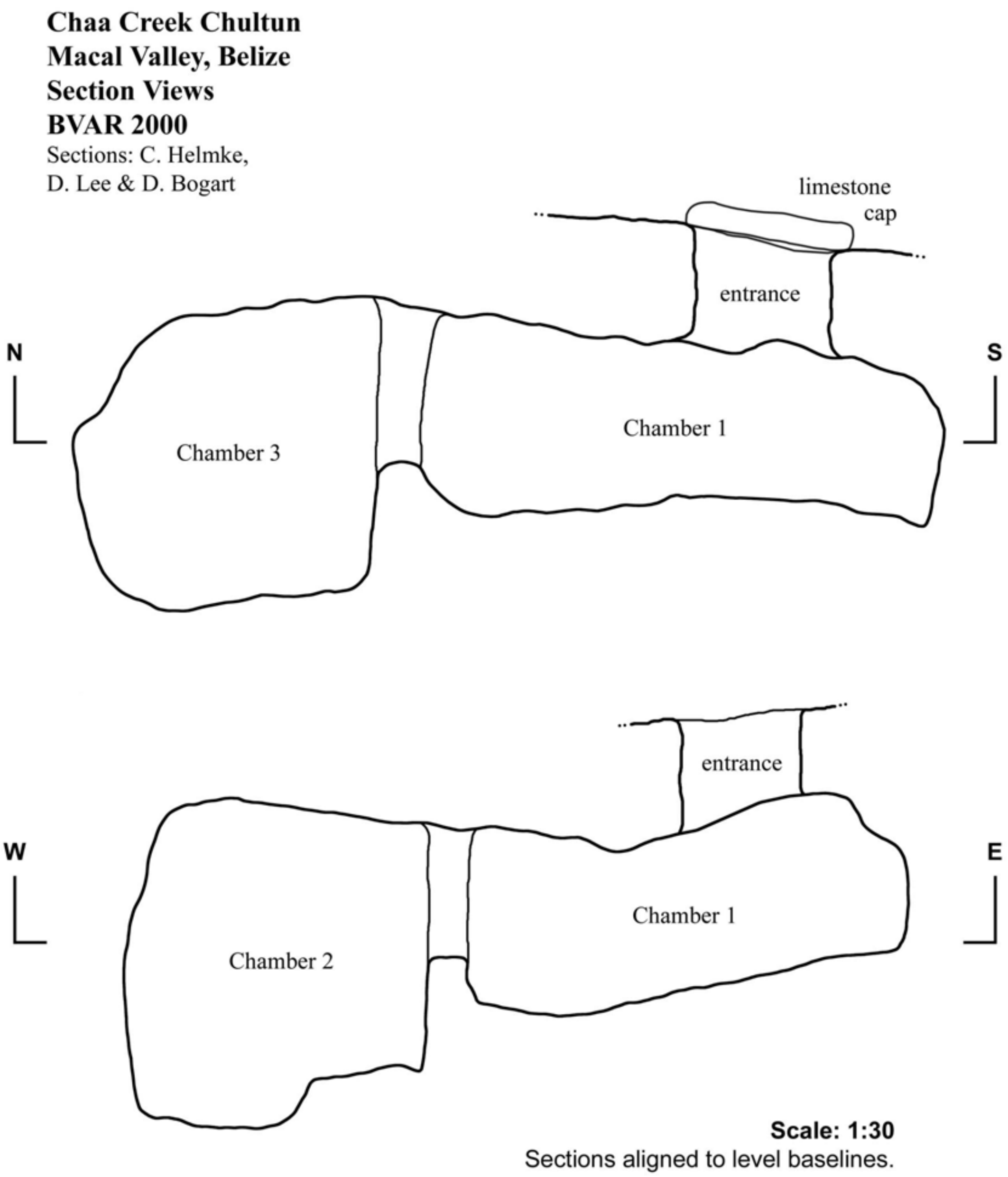

Figure 4: Sections revealing the internal morphology of the chultun. Figure at the top represents the N-S cross-section; the lower figure represents the E-W cross-section. For the sake of clarity all soil matrices and accretive cultural features are not represented.

Chamber 1 and Chamber 3 measures 60 centimetres wide in Chamber 1, then widens to 80 centimetres wide in Chamber 3, and is approximately 52 centimetres in height.

EXCAVATIONS

The excavation of the Chaa Creek Chultun consisted of three separate elements, carried out simultaneously, due to the salvage nature of the work conducted. A unit measuring 1.5 metres square was placed above the opening to the chultun to completely expose the entrance and the surrounding bedrock surface. At the same time, data and baselines were established inside the chultun, and the interior space was mapped in detail (Figure 5). The third element was the excavation of the matrix within the chultun, the majority of matrix being located in the entrance antechamber (Chamber 1).

The surface excavation revealed that, once capped, the chultun had been covered with a small crude platform. While the surface of this platform was highly disturbed, the construction fill of the platform yielded ceramic and lithic artifacts. Within the chultun, excavation followed cultural levels guided by any material that might have been intentionally deposited. The excavation of Chamber 1 was also divided into halves along the north-south axis (Figure 6). This was done to permit entrance and egress from the chultun without further disturbing any archaeological materials, and to permit work in Chambers 2 and 3 to be carried out simultaneously.

Immediately beneath the chultun entrance was an area of darker, organic matrix that had apparently fallen from the entrance upon opening. On the east side of the chamber, spread out in a circular pattern from the wall was a pile of marl collapsed from the side of Chamber 1. The matrix of Level 1 was a mixture of pulverized limestone, alluvial matrix and artifacts.

The base of Level 1 may have served for some time as an activity surface. This hypothesis is based upon the presence of a large olla sherd containing charcoal fragments west of the large limestone slab in Chamber 1, and a chert core and associated debitage clustering northeast of the slab. The sherd, the surface of which was also burned, may have been used either for illumination or used as part of votive practices (Figure 6). While this evidence is sparse it was considered sufficient to warrant a change in level designation. Since matrix was also present beneath the human remains in the other chambers it seems probable that these remains were also placed in the chultun after the partial filling of the chambers with construction fill (Level 2) and perhaps contemporaneous to the activity surface.

Level 2 was consistent with architectural construction fill. The level contained the largest percentages of lithic material found in the chultun excavation, the majority of the material coming from the base of the level, on or near bedrock (see the discussion in the lithics section, following). The dolomitic slab rested on bedrock at the base of Level 2 (Figure 7).

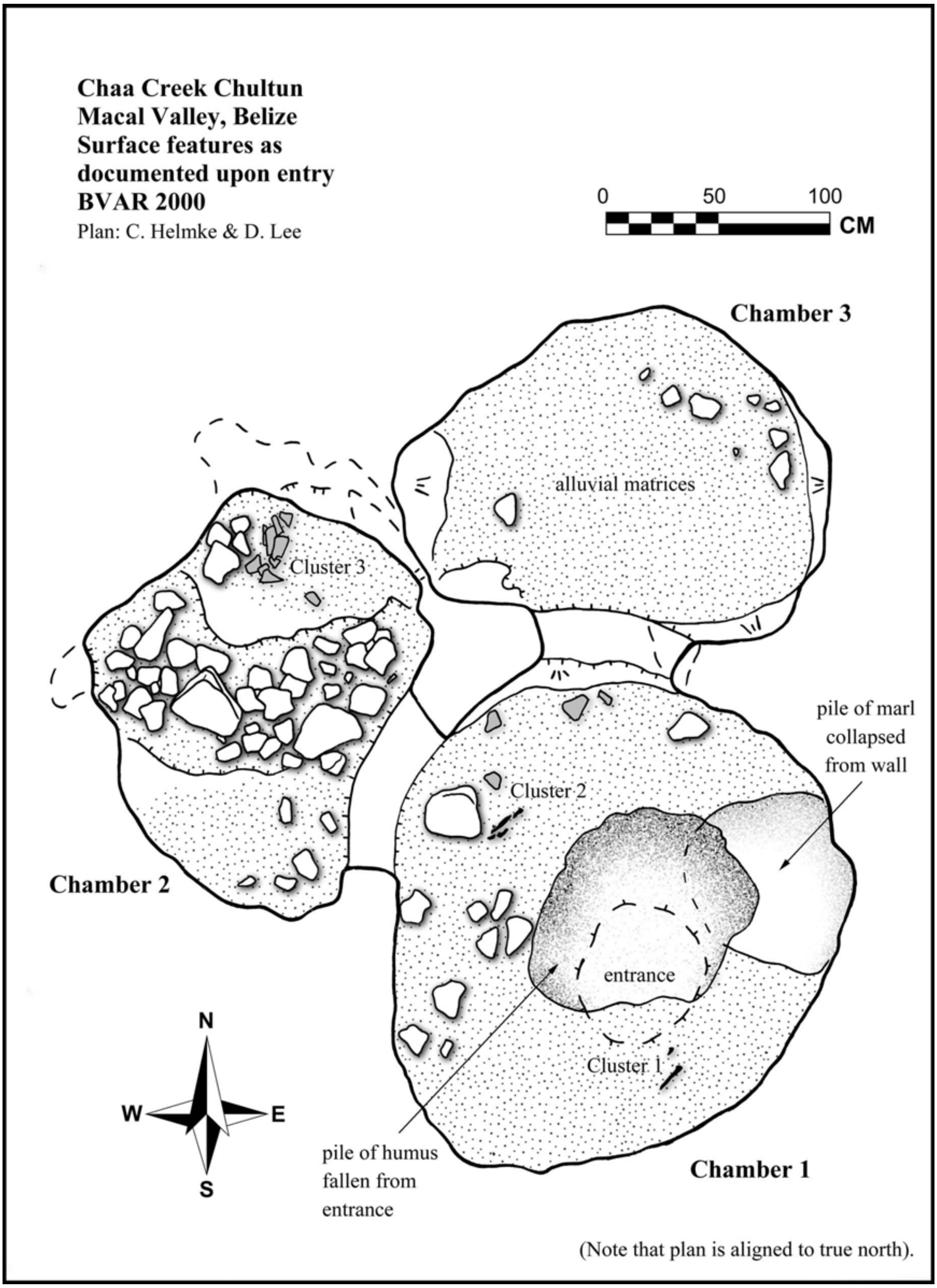

Figure 5: Plan view of the surface features as documented upon entry into the chultun.

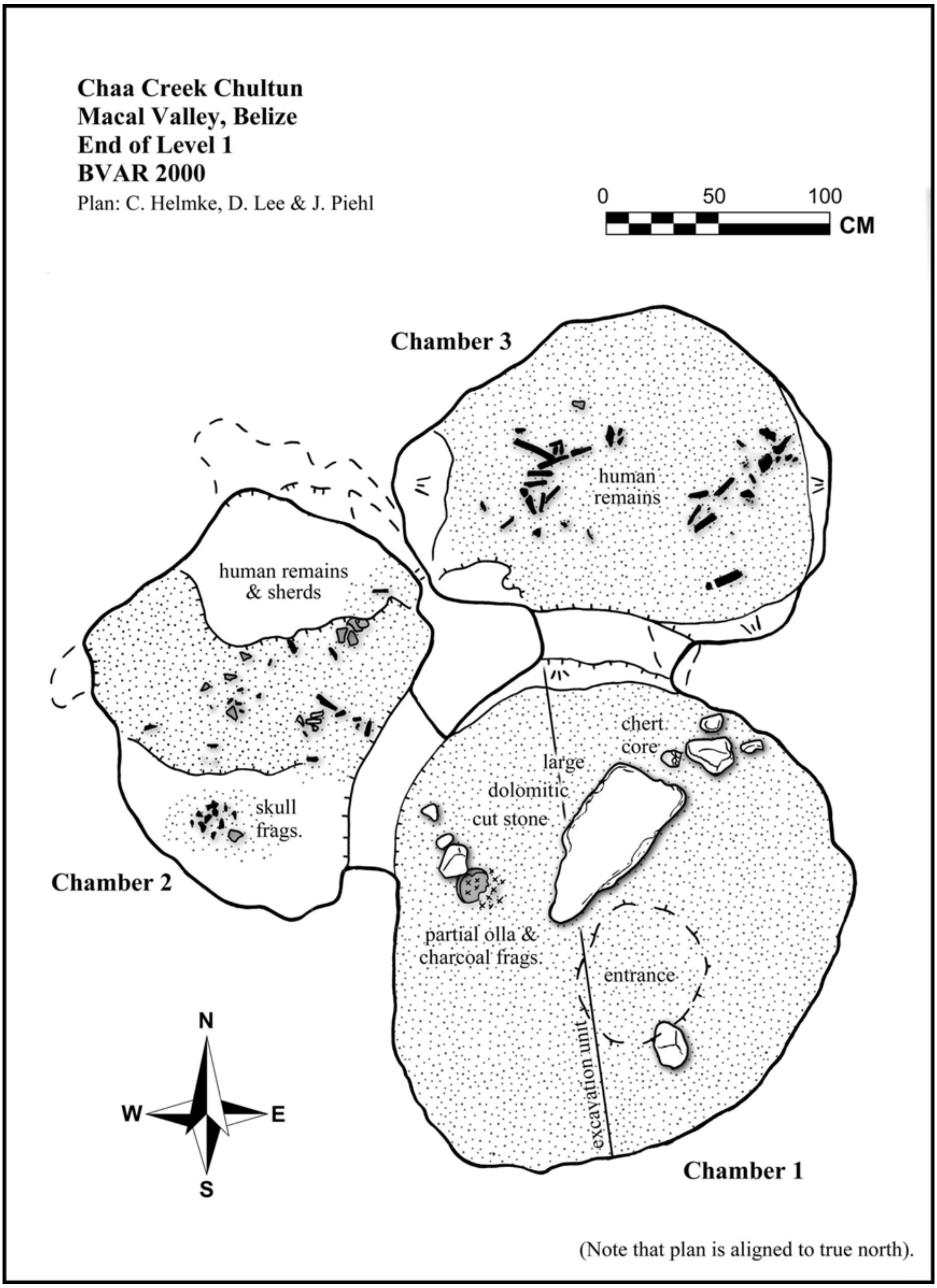

Figure 6: Plan of the end of Level 1 features in all three chambers. Note that the interstice between Levels 1 and 2 may represent an ancient activity surface. Note the N-S line in Chamber 1 delineating the bisection excavations.

The intention of designating cultural levels within the chultun (similar designations were made in the other two chambers), was to avoid missing any divisions or phases of activities within the chultun. Evidence recovered from excavation indicates that activity within the chultun was carried out on the excavated bedrock surface inside, and that at some later time, matrix was placed in Chamber 1. While an activity surface is suggested by the pattern of materials at the base of Level 1, the authors acknowledge that this evidence is not entirely conclusive. Based on the overall patterns of deposition evident, however, we think it reasonable to suggest two distinct periods of activity, one carried out on the bedrock surface with an unknown primary function of the chultun, and a second period of activity that took place after the chultun was partially filled. This second period of activity ended with the interment of the individual found in Chambers 2 and 3.

ARTIFACTS

Ceramics

The artifact assemblages from chultunob are varied. Some chultunob contain multiple complete and partial vessels, others contain burials with grave offerings, and some contain few artifacts. The artifact assemblage from the chultun at Chaa Creek is small. The chultun contained a scattering of ceramic sherds and lithic flakes. No discrete stone tools were found within the three chambers, nor is there any evidence of intentional deposits of ceramics or other artifacts. The ceramics removed from the chultun were located primarily in Chamber 1, where most of the matrix accumulation was located, and is consistent with the kind of ceramic and lithic material found in architectural fill at most Maya sites.

The ceramic material from the chultun was examined in an effort to define the temporal setting for activity in and around this feature. A total of 1049 sherds were excavated from the surface unit and the chultun. Of these 285 are from the surface unit, 715 are from Chamber 1, 40 from Chamber 2, and 9 from Chamber 3. On average, approximately 11 percent of these sherds are diagnostic. The analysis of this material indicates that the assemblage within the chultun is predominantly of Hermitage and Tiger Run complexes, dating to between 300 and 700 A.D. (Gifford 1976). Material from the Mount Hope and Floral Park complexes (Late Preclassic) was also present within the chultun, but in small percentages. A small percentage of Late Classic phase ceramics were found within the chultun in Chamber 1 only, and are perhaps the result of wash from the structure above, or may represent a reopening of the chultun.

The ceramics from the surface unit are primarily of the Spanish Lookout complex, dating to between 700 and 900 A.D. Some Late Preclassic material was found in the surface unit in low percentages, as is often the case in architectural fill context.

Lithics

The lithic assemblage from the chultun consists of 490 artifacts, all chipped stone, mostly of chert. Chert artifacts consist of 42 primary flakes, 146 secondary flakes, 211 tertiary flakes, and 69 utilized flakes. In addition to these there are 12 identifiable tools,

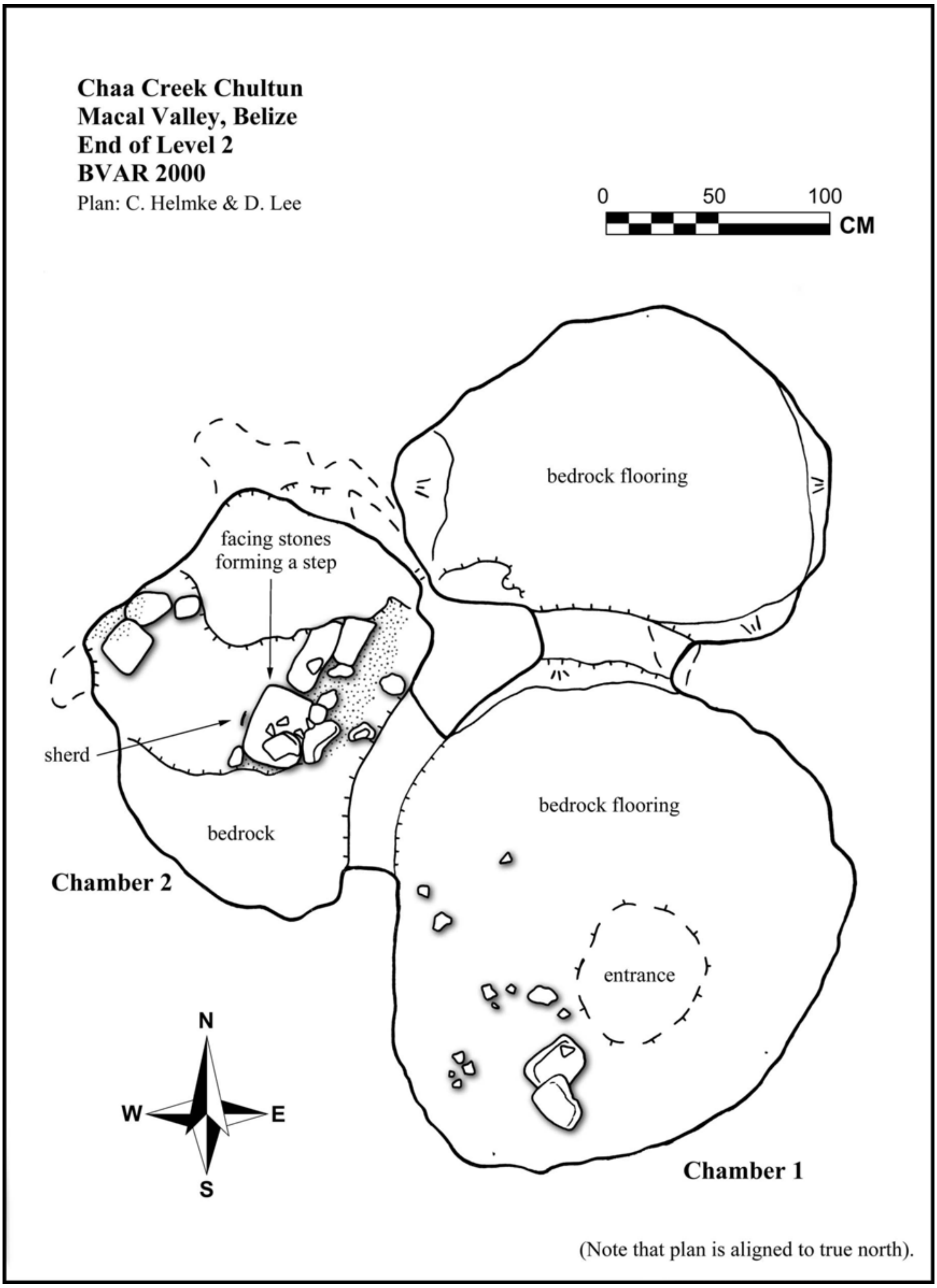

Figure 7: Plan view of the end of Level 2 in all three chambers. The end of this level coincides with the bedrock flooring in all chambers, with the exception of the dry-laid 'step' uncovered in Chamber 2.

all blades or blade fragments, 1 chert drill, 1 chert core, and 1 utilized flake that appear to have been heat-treated.

Obsidian artifacts are also present, though in small numbers. A total of 7 prismatic blade fragments were recovered, along with 4 small flakes of obsidian. Additionally, 4 fragments of quartzite were collected, but these show no apparent signs of modification. No groundstone artifacts were found in the chultun.

The surface unit yielded a total of 171 flakes, one chert blade fragment (distal), and 5 obsidian artifacts (2 proximal blade fragments, 2 midsections, and 1 flake). Chamber 1 level 1 had 70 flakes, the chert drill, 1 complete chert blade, one chert blade fragment, the chert core, and 3 obsidian flakes (chips). Chamber 1 level 2 had 227 flakes, 8 chert blade fragments, and the heat-treated utilized flake.

The majority of chert artifacts come from the lower half of the fill in Chamber 1. Lithic artifacts were not found in Chambers 2 or 3. Possibly the lithic assemblage found here is a result of the chultun's construction, indicating that waste from the chultun's excavation was consolidated in Chamber 1. It is also possible that the fill was intentionally placed in the chultun, fill that contained these lithic artifacts. If this is the case, perhaps the slightly higher concentration of chert flakes at the bottom of this level is a result of the combination of construction debris and later deposition of fill. It is also necessary to consider the possibility that flood action from the Macal River may have saturated the fill within the chamber enough to result in settling of the heavier stone artifacts.

The absence of any groundstone artifacts does not contradict any of the suggested uses for chultunob, since there is no evidence that these chambers were centres for everyday activity. The absence of any manos or metates may be significant in the consideration of the hypothesis that chultunob functioned as artificial caves. Manos and metates are a common part of cave artifact assemblages, since caves seem to be the focus of fertility ritual, in particular agricultural fertility (Awe pers.comm. 1999). If some chultuns are intended to serve as focal points for cave-related ritual, one would expect to find similar assemblages of artifacts. This does not seem to be the case for the Chaa Creek chultun.

ANIMAL REMAINS

Remains of several species of fauna were found within the chultun. A total of 610 specimens were collected. Of these, 333 are *Pachychilus indiorum*, and 21 are *Pachychilis glaphyrus*, commonly known as jute shells, a freshwater snail recognized as a food source in ancient times. A species of freshwater bivalve identified as an ancient Maya food source, *Nephronais ortmanni*, is also present in the assemblage. Due to the fragile nature of these shells, it is more difficult to determine the number of individuals represented by these fragments. 69 lunules, the attachment of the two halves of the bivalve, were collected. Since two such attachments are present in each individual shell, the minimum number of individual shells from these fragments is 35. *Pomacea flagellata arata*, another freshwater snail, were also found. A total of 5 fragments were collected. Fragments of *Oliva* shell (5), a marine shell sometimes drilled and worn as adornments or "tinklers", were found. There was no clear evidence, however, that these had been modified. A single fragment of conch shell (*Strombus*) was also collected. Fragments of a rodent (3 teeth, 1 vertebra, and 2 long bone fragments) were also collected.

The majority of the faunal remains (231 *P. indiorum*, 20 *P. glaphyrus*, 96 *N. ortmanni* fragments minimum of 24 individual shells, and 3 *Oliva* fragments) were found in the surface unit excavation. A smaller number of these shells were found in Chamber 1 (98 *P. indiorum*, 1 *P. glaphyrus*, 147 *N. ortmanni* fragments minimum of 8 individual shells, 2 *Oliva* fragments and the *Strombus* fragment). The remains of the rodent were found in Chamber 2. With the exception of the rodent remains (likely modern in origin), there were no faunal remains found in Chambers 2 or 3.

The faunal remains from the chultun are fairly typical of Maya household waste assemblages. Unfortunately, it is difficult to attribute all of these remains to cultural activity. The close proximity to the river, as well as the possibility of frequent flooding episodes may have affected the assemblage within the chultun. The fact that the remains within the chultun are confined to Chamber 1 compounds this problem. If the chambers within the chultun had been used for ritual activity, and if this ritual involved some sort of feasting, it is possible that this activity, or the consolidation of the waste, might have been confined to Chamber 1, with Chambers 2 and 3 serving other functions. If on the other hand, the material came to be deposited in the chultun either as a result of flooding activity, one would also expect the remains to be confined to Chamber 1. The information from the freshwater shells, therefore, remains somewhat inconclusive. The presence of the marine shells, the *Oliva* and *Strombus*, must have been the result of trade activity from the Caribbean coast, and is a good indicator of ancient activity.

HUMAN REMAINS

The human remains discovered within the chultun represent the interment of a single individual in Chamber 3. The humidity within the chultun and possible episodic flooding have contributed to the fragmentation and deterioration of the bone. Other taphonomic processes include possible disturbance and transport of small bone fragments by rodents (evidenced by the fragmentary rodent skeleton found in Chamber 2). The majority of the human remains were found within Chamber 3, but small clusters of bone fragments were also located at the margins of Chamber 1, in Chamber 2, and in a limestone gap connecting Chambers 2 and 3. Water action, faunal activity, and possibly disturbance during a reopening event can explain the displacement of the human remains.

The individual was interred on the excavated bedrock surface of Chamber 3. An examination of Figure 8 suggests that the individual was placed in a seated position at the western end of the chamber facing east, and later fell forward over his folded legs. The arrangement of the leg bones suggests that the individual was cross-legged, rather than in an extended position. This is supported by the presence of femur fragments west of tibia and fibula fragments, and by the angulation of the lower left and right legs. Also, the presence of the pelvis among leg bones in the southwestern area of the interment is more consistent with a seated position than with an extended position, in which the pelvis would be closer to the center of the interment. Fragments of the hand in the northwestern area of the interment also suggest some decomposition of the seated individual before the upper body slumped forward, to the east. The greater organization of skeletal elements in the west than in the east supports the suggestion that the lower body remained in its interred position, while the upper body did not.

Few skeletal indicators of sex are preserved, but the right greater sciatic notch of the os coxa scores the individual as a probable male. Several elements present a sequence of epiphyseal union for the individual, indicating that he was between 16 and 22 years of age. Occlusal wear on the dentition is minimal, supporting this age estimate. Observed pathology is limited to healing woven bone indicating nonspecific infection on the right and left metatarsals and foot phalanges. The lack of degenerative skeletal changes, such as osteoarthritis, supports the young age estimate for this individual. Dental pathology includes hypocalcifications and some enamel hypoplastic pitting on the first maxillary incisor, and the maxillary premolars. This indicates nonspecific stress in childhood during the formation of these teeth, and may include episodes of malnutrition, undernutrition, disease, or parasite load.

DISCUSSION

The most widely accepted hypothesis of the function of chultunob is that these bottle-shaped chambers carved into bedrock served primarily as storage chambers, and then, at the end of their usefulness for storage, served as convenient burial sites. This perspective is supported by the fact that chultunob are frequent features at sites throughout the Maya area, and yet not all chultunob contain burials (see Griffith et al., this volume), as one would expect if interment was the primary reason for the construction of these chambers. In addition, there is evidence that the Maya were often opportunistic in selecting burial locations. Burials have been found in middens, and under or within architectural features such as floors and benches. This may imply that the Maya took advantage of convenient burial locations in some instances, rather than constructing specialized burial structures. If we assume, then, that chultunob were constructed for some purpose other than burial, and then later used as convenient interment sites, then what was the primary purpose of chultunob? More specifically, what was the purpose of the Chaa Creek chultun?

The artifactual evidence from the Chaa Creek chultun offers little in the way of assistance. There were no complete vessels inside the feature, nor was there any complete or even semi-complete tool kit to provide some inference to the chambers' function. The majority of artifacts found in the chultun were located in Chamber 1, and were consistent with the kinds of artifacts that would have been deposited by placing architectural fill into that chamber. The paucity of artifacts in Chambers 2 and 3 further supports the idea that the majority of artifacts in the Chaa Creek chultun were placed inside when architectural fill was heaped into Chamber 1.

Supporters of the food storage hypothesis have not yet resolved some problematic issues regarding preservation in the hot, humid atmosphere of chultunob (frequently several degrees hotter than the outside temperature, and near 100% humidity), nor have they been able to produce any solid evidence about what kinds of food might have been stored in these conditions. The hypothesis that chultunob were used for water storage is difficult to ascertain in this case since the walls of the chamber did not have any preserved plastered surfaces, and the proximity to the Macal River, a perennial water source, makes the storage of water at this site unnecessary. In fact our investigations

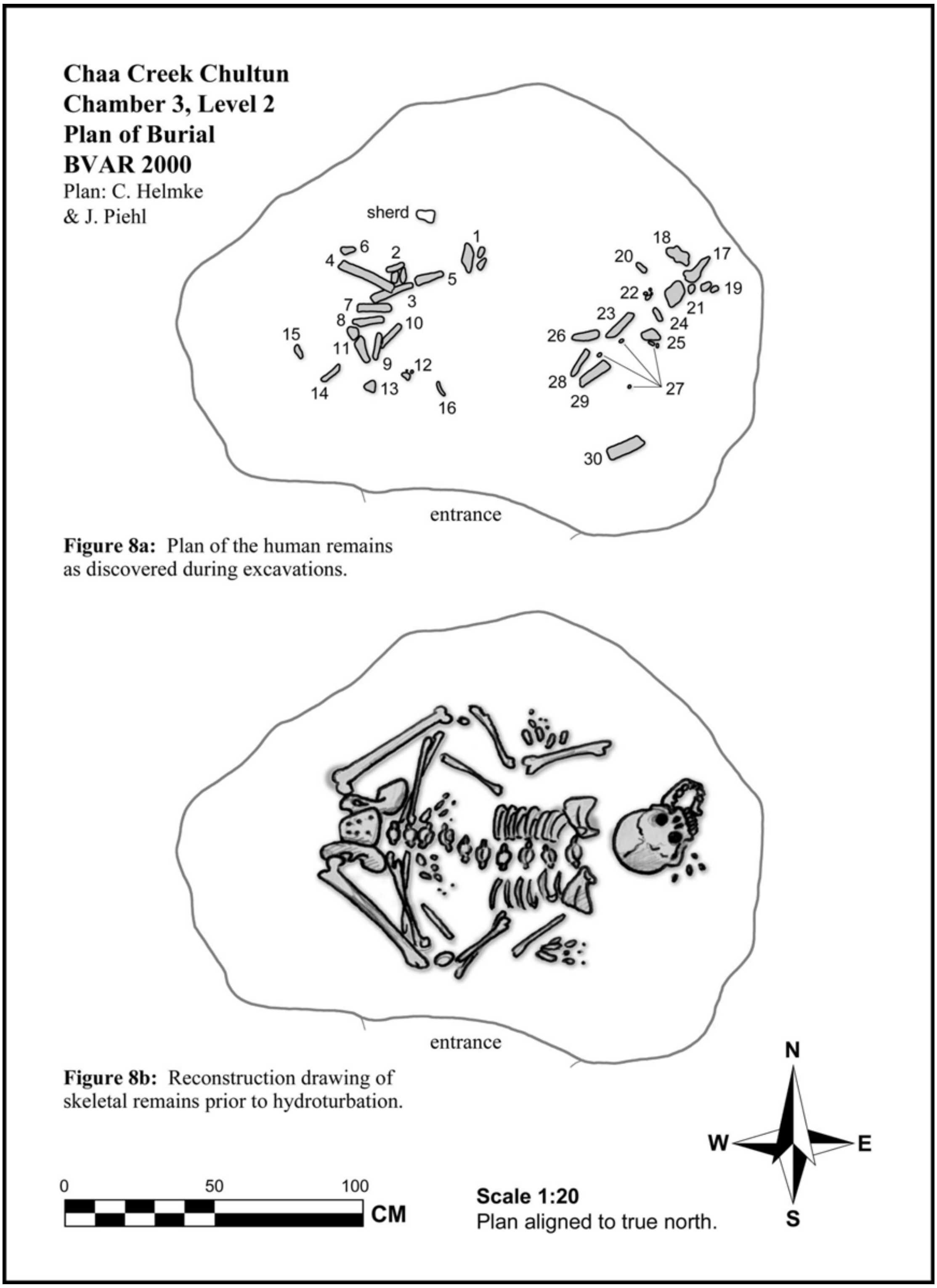

Figure 8: Plan view of the primary burial within the Chaa Creek Chultun.

show that this chamber was prone to intermittent flooding episodes. While chultunob in the Yucatan were predominantly used as cisterns, we can essentially, though not entirely, rule out the possibility that it could have originally been used for water storage.

The morphology of the chultun, particularly the carefully formed entranceways from Chamber 1 to Chambers 2 and 3, indicates that great care was taken in the construction of this chultun. Many chultunob are simple bottle-shaped pits (a factor that led Willey to hypothesize that these chambers may have first been mining sites for marl that were then conveniently used as burial sites). Others are shoe-shaped with the main portion of the underground chamber proceeding laterally from the entranceway. Some of these contain sills that separate the entrance antechamber from a secondary chamber inside. Others can have multiple chambers off of the entrance antechamber. Such morphological variation may coincide with differing primary functions, although all forms of chultunob have been used secondarily for interment of human remains.

Dahlin and Litzinger (1986) state that the sills forming restricted doorways to secondary chambers in chultunob, are important to the function of chultunob. In their article suggesting that chultunob were ideal for microbial fermentation, they state that the sills on the floor and ceiling serve to separate the inner chamber from the entrance antechamber, and prevent water from entering the secondary chamber. They also suggest that the restricted air flow would permit humidity and temperature in the inner chamber(s) to remain more constant and prevent changes in the interior atmosphere of the chultun that would occur when someone was entering to tend to fermenting material. This constant temperature would be necessary to insure proper fermentation.

The fermentation hypothesis might be supported by the morphology of the Chaa Creek chultun, in that the restricted doorways to Chambers 2 and 3 would serve to prevent water in the antechamber from entering. The square shape of the doorway in the curved wall of the chultun might also effectively prevent drip water from entering Chambers 2 and 3. Excavators of the chultun will also attest to the lack of airflow within Chambers 2 and 3 (despite the presence of an electric fan in Chamber 1, a luxury that became necessary once the breathable air was exhausted). Unfortunately, no other evidence to support fermentation exists in the Chaa Creek example. Without residue evidence from ceramics supporting fermentation (evidence that remains elusive anywhere in the Maya area at the time of this reporting), the fermentation hypothesis remains conjectural.

Finally there is the possibility that the chultun was constructed to serve a ritual function, and was a kind of “artificial cave” serving as a connection to the underworld. This may be the case in certain contexts. The example at Mayapan, where a vertical passage to a chultun interment was incorporated in successive architectural phases and then used as a sacrificial well would seem to support this idea. Indeed, in that case it might be argued that the pyramidal structure was built over the chultun in the same way that many pyramidal structures are built over caves. In these instances, it has been posited that the pyramid serves as an artificial mountain over the cave, reenacting a creation story. In the case of the Chaa Creek chultun however, we have only the interment of a single male to offer as evidence of this feature as a ritual site. That alone is not enough.

Unfortunately, then, little can be said about the function of the Chaa Creek chultun, except that at some point, one of these chambers was used to bury an adult male. This interment probably represents a secondary use of the chultun. The use of only one chamber for mortuary purposes, and the construction of doorsills with an apparently specialized function suggest some previous, primary function.

The artifactual evidence from the surface unit and the chultun may provide some clues as to possible activity scenarios for the chultun at Chaa Creek. The ceramics found in the surface unit above the chultun date to the Late Classic period. The material within the chultun contains a higher percentage of earlier material than in the surface unit, but Chamber 1 still contains material from the Late Classic (Spanish Lookout complex; cf. Gifford 1976). Chultunob are most commonly found in association with, or containing artifacts that date to, Late Preclassic and Early Classic contexts. One possible scenario, then, is that the chultun was originally constructed during the Late Preclassic or Early Classic period, and was used for its constructed purpose after that time. It is possible that, at the end of the chultun's usefulness, all materials dealing with its original function were removed, and the individual was interred at the time of disuse. It is also possible that the chultun was abandoned in the Early Classic and capped, then reopened later to inter the individual. At that time fill may have been placed in Chamber 1 and the cap replaced, prior to the construction of the platform that covered the chultun.

If the first of these scenarios is correct, then the burial inside likely dates to the Early Classic period and is associated with the people who first constructed the chultun. If the second scenario is correct, it would account for the presence of the Late Classic material in the antechamber (Chamber 1), and the interment likely dates to the Late Classic period. Unfortunately, this cannot be resolved with the evidence at hand.

CONCLUSION

The Chaa Creek chultun is an excellent example of the enigmatic nature of chultun features. In many cases, little or no artifactual evidence is present to help archaeologists reconstruct the primary functions of these features. While the corpus of information continues to grow, there is still much that is not known about chultunob. If archaeologists' suppositions are correct, and the function of chultunob varied over time and space, then it is possible that we will never know all of the functions of chultunob.

Acknowledgements

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ARCHITECTURE FROM WITHIN: A REPORT ON THE INVESTIGATION OF ENTRANCE II, ACTUN CHAPAT, BELIZE.

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INTRODUCTION

While architectural constructions in caves have been noted from caves across the Maya area, reports of their existence are far and few between. This may simply be due to the fact that architectural constructions are simply not prolific expressions of Maya cave use. Or perhaps their low numbers are more the result of research error, in that they were overlooked, or unreported. Considering many of these constructions incorporate the natural topographic features of the cave into their construction, and have often been built with unmodified materials originating in the cave, such as ceiling spalls and stalagmites, the potential of a researcher to overlook these constructions is great.

Over 200 caves have been documented in Belize, however, fewer than 10 have been intensively examined by archaeologists and report architecture within them (McNatt 1996:91). The site of Actun Chapat thus presents a wonderful opportunity to conduct a case study in the examination of architecture within Maya caves, as it houses perhaps the largest corpus of subterranean architectural constructions in western Belize. To date, such artificial constructions as a bench, walls, stairs, raised platforms, and terraces have been identified within Actun Chapat. The largest and most abundant type of construction in this cave is artificial terraces, of which there are over 30. Interestingly, the majority of these constructions are located in the natural light zones, or within close proximity to either of the two entrances to the cave.

The goal of the research at the cave site of Actun Chapat is to identify and examine regularities and disparities in the distribution of artificial constructions (i.e., walls, raised platforms, artificial terraces, rock outlines, stairs and hand holds, bridges, altars, benches, etc.), and their associations with specific cave loci (i.e., rooms vs. crawl spaces, vs. entrances, vs. breakdown areas, vs. water areas), and with different artifact types, including faunal and human remains.

BACKGROUND

Of the caves in Belize for which there are reports available, only the following eight caves have architectural constructions reported within them: Rio Frio Cave (Pendergast 1970), Eduardo Quiroz Cave (Pendergast 1971), Petroglyph Cave (Reents-Budet and MacLeod 1997), Las Cuevas (Digby 1958a; 1958b *in* McNatt 1996:91), Actun Kabal (McNatt 1996; Stone 1984 in McNatt 1996:92), Actun Tunichil Muknal (Griffith 1998), Actun Uayazba Kab (Ferguson 1999a) and Actun Chapat.

The cave site of Actun Chapat is located approximately 12 kilometers south of the modern town of San Ignacio, in the Macal River Valley of the Maya Mountain foothills (Figure 1). Preliminary reconnaissance of the site was conducted by members of the Belize Department of Archaeology in 1982, and identified such architectural features as walls, raised platforms and artificial terraces, as well as human remains, and ceramic artifacts dating between 300 B.C. and. 900 A.D. (Awe 1998:8). Further archaeological research at the site has since been reinitiated by the Western Belize Regional Cave Project (WBRCP) under the direction of Dr. Jaime Awe and the author, which has revealed additional artificial constructions such as stairs, a bench, and a platform. As mentioned, of those investigations in which architecture in Belizean caves have received attention, fewer than 10 have been intensively analyzed (McNatt 1996:91). Actun Chapat thus represents an interesting forum in which to contextually study the ritual significance and role of architecture within caves and of the caves themselves, in that it houses perhaps the largest corpus of architectural constructions in western Belize. The goals of the 1999 investigations of Actun Chapat were to systematically test each type of artificial construction, determine the types and sequences of construction, identify whether or not certain construction types are restricted to particular locus, and similarly whether particular artifacts, and by extension activities, were associated with specific types of constructions and areas of the cave. This paper will report on the investigation of artificial constructions located in the Entrance II investigation area during the 1999 field season. No conclusions will be offered, as research remains in the preliminary stages, however, a discussion of significant observations is provided.

It should be noted that on going looting and increasing popularity of cave tourism in western Belize threatens the possibilities of obtaining a cogent understanding of Actun Chapat's architecture and the significance and purpose of its use by the Precolumbian Maya. Investigation of Actun Chapat is thus of immediate importance.

1999 INVESTIGATIONS

As mentioned above, previous reconnaissance of the cave had been initiated in 1982. These initial investigations identified two possible activity areas (significantly, both are closely associated with both of the caves entrances) in which evidence of cultural activities in the form of artifact scatters and artificial constructions, were identified. Since Actun Chapat is very large (with passages extending over 500 m in length), and due to the limited length of the field season, it was decided that the 1999 investigations would concentrate on the activity areas associated with Entrance 2, the sinkhole entrance to the cave. Investigations at Entrance 2 included surface collections, salvage and test excavations, as well as reconnaissance and survey.

A continuation of cave reconnaissance and survey was conducted under the direction of Cameron Griffith and Christophe Helmke. Their continuing efforts will ultimately result in the creation of a comprehensive map of Actun Chapat and its cultural and topographic features. Additionally, the identification of additional artificial constructions, artifact concentrations,

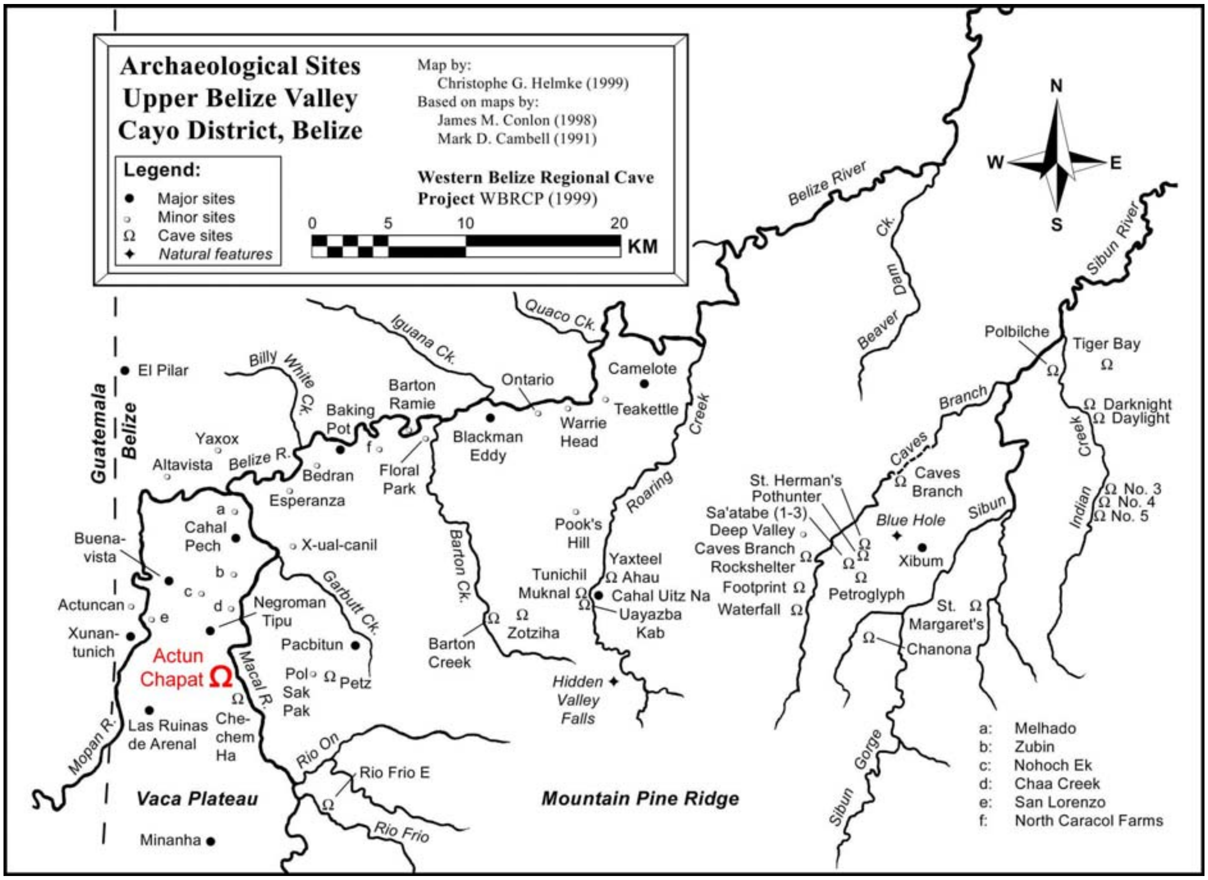

Figure 1. Actun Chapat within the Belize River Valley.

and activity areas were, and continue to be identified. Due to the size of the cave, mapping of this cave is still underway.

The 1999 investigations of Actun Chapat focused on the area adjacent to Entrance 2, or the sinkhole entrance of Actun Chapat, and on the southern side of the passage leading east away from Entrance 2 to the center of the cave. The region of investigation expands south and east of the entrance, and includes a large flat area (Area 1), a breakdown area (Breakdown), and three areas housing over fifteen artificial constructions (Areas 2, 3 and 4). The beginning of the artificial constructions serve to bisect Area 1 from the southern, and elevation portion of the investigation area (Area 2). Area 3 is defined by the steep, south-western "wall" of this region of the cave, which is essentially composed of a series of rising architectural terraces. Area 4 is located east of the breakdown, and the terraces in this area do not meet or join those associated with the other terraced areas. Artifacts and artifact clusters/activity areas were encountered throughout the investigation area. Additional artificial constructions were identified on the northern side of the passage leading away from Entrance 2 to the center of the cave, but were not investigated during the 1999 field season.

The terrace constructions were defined by an obviously artificially constructed retaining wall, and a flattened surface at their apex. Some terraces had two levels that were not separated by a built retaining wall, but were simply defined by a change in elevation, or by the natural topographic features of the cave. Because of the lack of an artificial construction, these areas were defined as the same terrace, but were distinguished as upper or lower terraces, or the north or south ends of the same terrace (i.e., Terrace 4, upper and lower, Terrace 8 north, south). All of the artificially constructed terraces were built from materials naturally occurring in the cave, including speleothems and cave rock. It is unclear whether or not the materials used in construction were harvested, i.e. mined or collected from living formations, or simply scavenged from throughout the cave. Based on the absence of cut marks, or any other evidence of shaping of the materials, it is likely that they were simply scavenged. The faces of the terrace retaining walls were not, and could not, have been plastered due to the nature of their construction materials. The surface of the terraces at the upper elevations (Areas 3 and 4) exhibited plastered floors. The surfaces of the terraces in lower areas exhibited poorer preservation and were less obviously plastered. It is possible that the surfaces of these terraces were simply of a tamped earth type of flooring. Interestingly, the terraces in the area of investigation were more or less oriented towards Entrance 2. Only on a very sunny day are the terraces subject to sunlight through the sinkhole entrance. Terrace 10, the highest and most secluded terrace was never subject to sunlight.

Additional artificial constructions in the area of investigation included two eroding staircases, one leading from Area 1 to Terrace 2, and one that lead from Terrace 3 to Terrace 11. A bench made out of the same construction materials as the terrace retaining walls is interestingly enough located on Terrace 11. Another feature found within the light zones and also occurring in darker areas in the area of the passage towards Entrance 1, was a series of biconically drilled holes, at varying levels, within the natural flowstone or rock formations of the cave. The purpose or function(s) of these holes has yet to be ascertained.

METHODOLOGY

Detailed notes, level records, wall profiles, floor plans, and photo logs were kept. Carbon and soil samples were also collected from both surface areas and excavation levels where appropriate. Artifact analysis was preliminarily initiated, and will continue into the 2000 field season. All artifacts classified as "special finds" were individually photographed, drawn, catalogued, and submitted to the Department of Archaeology at the end of the 1999 field season.

Surface Collections

Before excavations commenced, reconnaissance of the Entrance 2 investigation area was initiated, and several activity areas, or artifact clusters were identified and numbered (CL 1 through CL 26), as were Looter's pits (LP1 through LP15). It is unclear whether all artifact clusters represent Precolumbian activity areas, or are the product of recent looting activities, and the amassing of unearthed artifacts by looters. Those clusters associated with flowstone features (such as CL. 4, 5, 7, and 16) are perceived to have been initiated in Precolumbian times, based on their location and artifact assemblages, but may very well have had looted items added to them. Sketch maps of a small sample of the artifact clusters were drawn.

Surface collections conducted in Actun Chapat included the collection of artifacts visible at surface level in a select number of artifact clusters (CL 1-4, 6-7, 9-10, 14-16, 20, 26); on those readily visible on Terraces 1 and 2 in Area 2; on each of the terraces in Area 3 (Terraces 4 through 11), as well as Terraces 13 and 15 in Area 4. Some of the surface collections on the terraces were subdivided according to the morphological structure of the constructions and cave features (i.e., Terrace 4, and 7-9). Artifacts within or immediately adjacent to the looter's pits 2, 3, and 13-15 were collected separately from the general surface collections of their associated terraces.

A large north-south, east-west running grid system, encompassing four quadrants (NE, SE, SW, NW) of between 6 and 10 2x2 meter collection units, was laid over the large flat, open section of Area 1, and systematically collected. To easily identify these "units" separately from excavation units, these grid squares were designated by letters. Area 1 showed strong evidence for having been subject to relatively high traffic and disturbance. Ceramic artifacts were strewn all over, and many exhibited recent breakage from having been stepped on. Modern footprints and garbage was also observed in this area. Two artifact clusters were located within the gridded area and were collected separately from their associated units (Clusters 1 and 2). The matrix surrounding the artifacts was essentially a very dry, soft and loose fine dirt (1/8-1/16 mm granules), comprised mostly of bat guano. Limestone inclusions and pebbles were also present. Charcoal and organic materials (leaves, hart plum nuts) were detected in Area 1, as were sticks used by looters to assist in their digging activities. Some collection units also included limestone rocks ranging in size from 5 cm to 90 cm. Many of these seemed to come from looter's pits to the east and west of the gridded section (LP's 1, 5 and 13), as well as from a large looter's trench (LP 4) located in Area 3 that cut through Terraces 2 and 3, whose fill was eroding down into Area 1. The only non-ceramic artifact collected from the gridded section of Area 1 was a metate fragment in Quadrant SE, Unit E.

The predominant artifact type recovered from surface collections of the gridded area, terraces, artifact clusters and around looter's pits were ceramic sherds of various sizes and types. The majority were fragments of large olla jars. No complete vessels were recovered, however a number of complete necks and rim sections were recovered. Other artifacts recovered in surface collections included faunal bone (both worked and unworked), metate fragments, projectile points, limestone and wood spindle whorls, a worked pumice stone, chert tools and cores, olivella shell tinklers, a mother of pearl bead, and a piece of slate. It became quite clear that there was no way we could house all of the artifacts recovered in surface collections in our lab, let alone analyze them, and thus we left many areas uncollected. All special find materials were collected.

During the final day of survey in an area east of Entrance 2, on a high steep slope adjacent to the passage to Entrance 1, the mapping crew came upon a cluster of a different kind, that which contained human remains. The bones were located in an area measuring approximately .90x1 meters, and surrounded by a rock "enclosure". The remains were that of a semi articulated, 1 to 2 year old infant, and included tibia, fibula, and femur bones, skull fragments, rib bones, and an inominate bone. Included amongst the bones were a handful of polychrome and olla ceramic sherds, a collection of bat skulls, as well as carbon and ash.

EXCAVATIONS

Due to limitations in labor and time, unit placement was somewhat subjectively assigned. The placement of excavation units took into consideration which activity areas/artifact clusters were identified as containing the most comprehensive data (both on a quantitative and qualitative basis), and which areas were most likely to reveal the foremost information on locational and architectural details, including variations and regularities in patterns of association.

Excavations consisted of a series of nine vertical test units. Units were primarily 1x1 meter units, with the exception of two of the three salvage excavations (Units 2 and 9) which measured 1.4x1.9 meters and .75x.75 meters respectively. All units were excavated by geological picks and trowels, and screened through 1/4 inch screens. Levels were excavated by culturally and naturally defined strata, to sterile levels, either the cave floor or a substantial level of natural cave accumulation, which was void of cultural materials and composed mainly of ceiling spall. Some arbitrarily defined levels were used in instances where it was deemed necessary to do so. Depths of excavations ranged between 5 centimeters and 2 meters below surface level. Provenance was measured from unit datums, which were secured to the larger cave survey datums, and plotted on the extensive map of the cave. Most units were placed along a north-south axis in order to facilitate mapping, however, Units 3, 4 and 5 were not placed along a north-south axis, so that specific features could be incorporated into the excavations more completely. In the instances of Units 4 and 5, the goal of unit placement was to catch architectural features, while Unit 3 was placed so to abut the western wall of the cave, and in order to fully encompass a looter's pit containing human bone.

Unit 1 (Area 3, Terrace 2)

Unit 1 was located in Area 3, on Terrace 2, but was placed so to bisect the terrace's retaining wall, and thus partially encompassed a portion of Terrace 1. The unit was set along a north-south axis, and thus the retaining wall essentially bisected the unit on a southwest to northeast angle (Figure 2a). As such, we excavated the unit in two sections, separating the section located in front of the wall (the northwest section) from that behind the wall, which also encompassed the bulk of the terrace (the southeast section). The unit was placed in such a fashion so to determine the nature of the walls composition and construction, and in order to determine the chronological sequence of its construction, and its relation to the lower Terrace 1. The retaining wall was comprised of angular cave rocks, ranging in size between 10 and 30 cm. The wall itself ranged between 30 and 35 cm in height (Figure 2b). Terrace 2 was not surface collected, however, a surface collection of the area encompassed by the unit was collected. The unit datum for unit 1 (CHPD3) was located 260 degrees from the southwest corner of the unit, at a distance of 89 cm.

Seven naturally and culturally defined stratigraphic levels were excavated in Unit 1, to a depth ranging between 88 and 122.5 cm dbd (Figure 2c). Level changes were determined

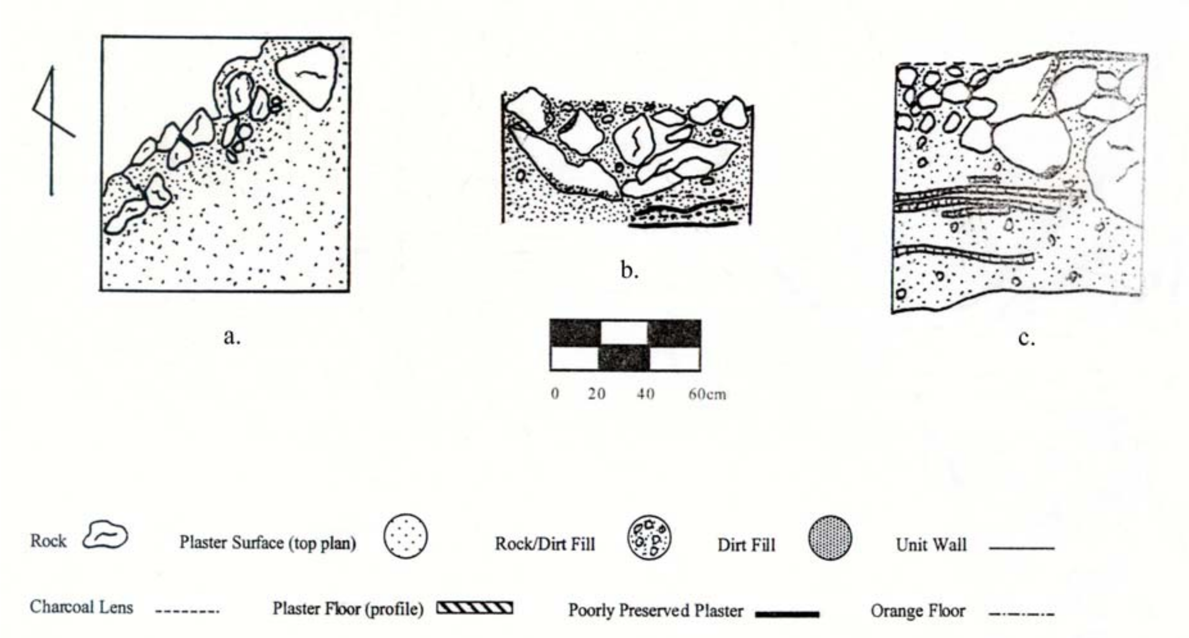

Figure 2. a) Top Plan of the retaining wall of Terrace 2 (Unit 1, Level 2, Floor 1); b) Stratigraphic profile of the retaining wall of Terrace 2, Unit 1 (before excavations); c) Stratigraphic profile of the Eastern wall of Unit 1.

through alterations in compactness, coloration and consistency of matrices. Six flooring episodes were identified in this unit, all of which exhibited evidence of burning in the form of dark, sooty patches or lenses above the floors, and the presence of charcoal. The flooring episodes were comprised of a *sascab* or plaster type of material, with that associated with the final construction phase being the least well preserved, and appearing more as a tamped earth surface. Flooring episodes were not preserved evenly or equally throughout all areas of the unit. Floors 6 through 2 were more or less placed one on top of another, with thin limestone dirt and charcoal lens dividing them. Between sections of the retaining wall and floor 2, on which the wall sat, and above the larger core fill within the bulk of the terrace and the final flooring episode (Floor 1) a ballast type fill, typical of that associated with surface site architectural constructions, was detected. The ballast type fill was composed of small cave rocks and sandy dirt.

The artifacts recovered from Unit 1 were predominantly ceramic sherds, but also included a ceramic disc, a secondary decortification flake, a slate fragment, and a piece of wood. Matrix and carbon samples were taken from most levels. Most of the sherds were badly weathered, and thus undiagnostic, especially those at the upper levels. Some sherds from Level 2 exhibited blackening from a burning episode associated with Floor 1. Diagnostic ceramics from Level 3 (Floor 2) dated to the Tiger Run complex of the Barton Ramie sequence (A.D. 575-675), while those associated with Level 4 and 5 (Floor's 3 and 4) dated to the Hermitage and Barton Creek complexes (A.D. 300-575 and 300-100 B.C., respectively). The earliest level containing diagnostic ceramic types was Level 6 (Floor 5), which exhibited ceramics dating as early as the Jenny Creek phase (1000-300 B.C.).

Excavations revealed that the retaining wall, and thus Terrace 2 were built on top of Floor 2, which was in fact the last flooring episode of Terrace 1 in this area. Floors 6 through 3, and possibly 2 represent a superimposed sequence of previously utilized flooring episodes associated with the lower, Terrace 1. Construction materials included cave rocks, sandy dirt as well as small speleothems and soda straws. The retaining wall was constructed by the simple placement of cave rocks one on top of the other. No plaster materials were used to bind the placement of the rocks. Based on the relative dating of associated ceramic artifacts, construction of Terrace 2 took place in the during the Late Classic period, however the utilization of Terrace 1 began potentially as early as the Late Formative or Early Classic periods. Upon completion of our investigations, the retaining wall was rebuilt by Jim Puuc, one of the Maya archaeologists on the project. Visitors to the cave would never know by examining it that it had been partially dismantled during excavations.

Unit 2 (Area 3, Terrace 3)

Unit 2 (1x1m unit) was centrally located in Area 3 within the centre of Terrace 3. This unit was established so to provide information on construction materials and techniques, and of the chronological and construction sequence of Terrace 3 in relation to the lower Terrace 2. Unit 2 was placed on a north-south axis, with the unit datum (CHPD2) being located 160 degrees from the southwest corner of the unit, at a distance of 80 cm. Like Terrace 2, Terrace 3 was not surface collected, however, a collection of artifacts from the area encompassed by Unit 2 was completed prior to excavation.

Five naturally and culturally defined stratigraphic levels were excavated in Unit 2. Unit 2 was excavated to a depth of 127 cm dbd at its most extreme. Level changes were determined through alterations in compactness, coloration and consistency of matrices. Three flooring episodes were identified in this unit. The western section of Floor 2 was the only flooring episode that exhibited evidence of burning. All three of the flooring episodes were superimposed one on top of the other at the top of the terrace. Below Floor 3, and within Level 4, larger cave rocks (core fill) and ballast type fill was encountered, and evidentially used to fill in the natural undulation of the cave floor here. This naturally undulating cave formation was first encountered in the southern section of the unit in Level 4, and proved to expand across the unit as excavations continued, eventually making it impossible to excavate the unit beyond Level 5, due to the restricted nature of the excavation area (Figure 3).

There was a paucity of artifacts associated with Unit 2, and as in Unit 1, ceramic sherds dominated the artifact assemblage of Unit 2. Two unidentified faunal bones were also recovered from Level 1 and 4. Those that were recovered were predominately undiagnostic body sherds. One rim sherd was recovered from Level 5, which appears to belong to an Early Classic, Hermitage complex, potentially a Minanha Red type variety. A carbon sample was taken from Level 2, and a matrix sample was taken from Level 3.

Unfortunately, due to the nature of the cave formations within the area encompassed by Unit 2, excavations could not determine whether Terrace 3 was built atop of Terrace 2, or whether Terrace 2 abutted Terrace 3. We do know however that three superimposed flooring episodes existed atop Terrace 2. The presence of multiple floors suggests that this area may have had relatively frequent human traffic, causing the need for repetitive refloorings of the terrace. Dating for Terrace 3 is not secure by any means, seeing as how only 38 ceramic sherds were recovered from the entire unit, and only 1 of those could be assigned to a potential time period. However, this one sherd was located in the lowest levels of the unit, and coincides with the initial construction data retrieved from Unit 1, suggesting that Terrace 3 may also have been instigated during the Early Classic period.

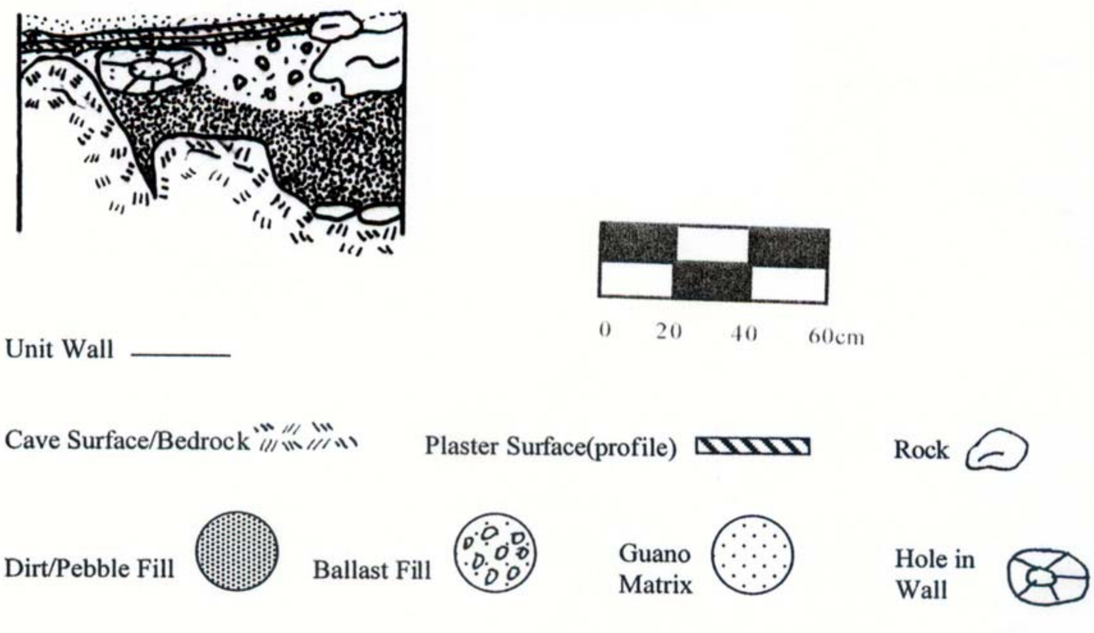

Figure 3. Stratigraphic profile of the western wall of Unit 2.

Unit 3 (Area 2, Terrace A, LP2)

Unit 3 was initiated as a salvage excavation, as examination of Looter Pit 2 prior to surface collection revealed the presence of adult human remains in the looter's back dirt and around the pit itself. Human bones identified from LP2 included a metatarsal, a flange, and a rib bone. On the off chance that the looter's left a burial partially in tact, we initiated a salvage excavation of the area. A surface collection of the area was completed prior to the placement of the unit, in attempt to define where the perimeters of the unit should be, and so not to further damage any more of the numerous artifacts scattered around the looter's pit. Artifacts recovered included numerous ceramic sherds, a biface, a chert core, an obsidian blade fragment, faunal bone and a piece of wood.

Unit 3 was placed so to encompass LP2, and abutted the western wall of the cave in this area. The unit thus followed the undulation of the cave wall on it's western side, and measured 1 meter on its south side, 1.40 meters on its eastern side, and 90 cm on its northern side. As such, the unit was not placed on a north-south axis. Six culturally and arbitrarily defined stratigraphic levels were identified in Unit 3. Unit datum CHPD4 was located 44 cm north of the unit, at a 295 degree angle, and 42 cm above ground level. The unit was excavated to an average depth of 86.5 cm dbd, where the cave floor was encountered. Levels 1 through 4 were entirely disturbed levels, the product of looting activities. Carbon and ash ran throughout the matrices, which were fine grained reddish-brown colored dirt, with limestone inclusions. While the looter's pit also penetrated Level 5, the remnants of a plaster flooring episode (Floor 1) were detected in a few patches (Figure 4). Level 6 was the only level whose matrices were not disturbed. Unfortunately, this level also had comparatively few artifacts associated with it.

While this unit was excavated with the hope of recovering in situ human remains, this did not come to fruition. A total of 331 different bones and bone fragments were recovered, including vertebrae, ribs, and flanges. No evidence of a burial crypt existed, as no large rocks were recovered. Moreover, there was no natural or artificial indentation in the cave floor in which the body may have originally be placed, as is common with burials in rockshelters (see Ferguson 1999a) and *chultunob* (see Lee et al. and Griffith et al., this volume). Nonetheless, it is evident from the abundance of human remains that a burial was once located in this area, along the western wall of the cave. Burials and human offerings are often located along the perimeters of caves (Gibbs 1998; Ferguson 1999a). The human remains have yet to be analyzed by an osteologist.

This unit also yielded the greatest diversity and quantity of artifacts. Interestingly, the number of artifacts per level decreased as the excavation of levels progressed. It would appear that many of the artifacts interred were placed in the area in association with the human remains, however, we will never know their exact association. Recognizing the Maya propensity for discarding ritual artifacts at surface level throughout cave loci, some of these artifacts may very well represent such practices. Due to the lack of a secure provenance, relative dating of the interred individual will not be conclusive. Ceramic analysis will nonetheless be performed during the 2000 field season.

Unit 4 (Area 3, Terrace 11, Bench 1)

Unit 1 was a 1x1 meter unit placed so to most effectively encompass the bench's architecture, and cause the least amount of damage to the bench. Thus, only a portion of the bench was excavated. The unit was thus not placed on a north-south axis, but was placed so to test the architecture, and a portion of Terrace 11's plaster flooring located in front of the bench. A profile of the bench was drawn from the within the area of Unit 4 (see figure 5a). Unit datum CHPD5 was located at a 248 degree angle, south of the southeastern corner of the unit, 64 cm above the surface of the bench. The unit was excavated to an average depth of 136.5 cm dbd.

Knowing the ancient Maya propensity for interring individuals in benches, it was thought that such an interment may be encountered in Bench 1. However, this was not to be the case. Eight ceramic sherds (one of which was a polychrome piece) and a biconically drilled *nephronaias* shell ornament were recovered from a surface collection of the entire bench

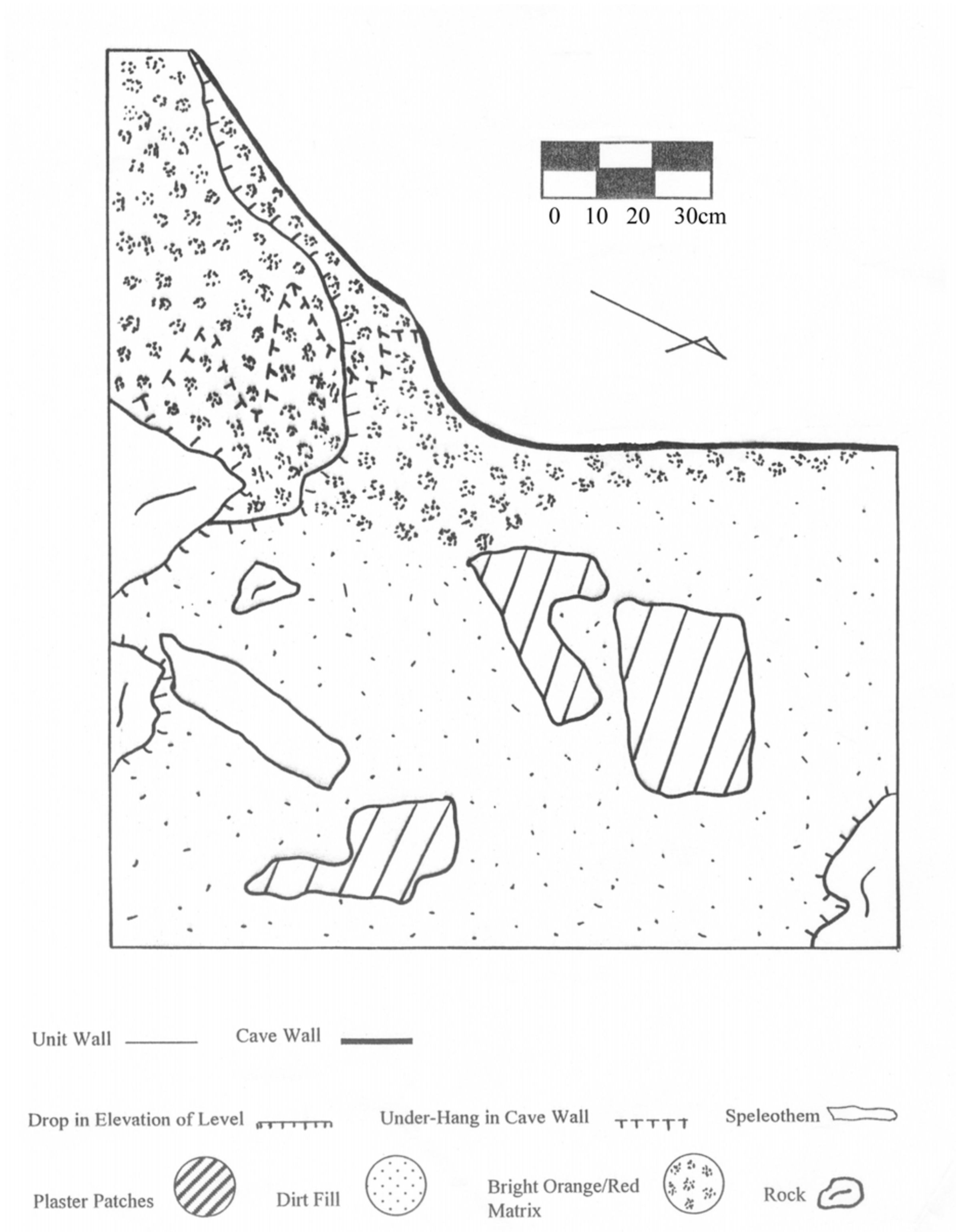

Figure 4. Top plan of Unit 3, Level 5, showing patches of a plaster surface (Floor 1).

surface. A crude limestone biface was also found to have been placed in a gap amongst the construction materials in the face of the north end of the bench.

Bench 1 was found to have been constructed similarly to the terrace retaining walls, using speleothems and cave rock, both in its fill and more finely faced walls. The bench met with the retaining wall of Terrace 4 (lower), and thus it in essence served as the back of the bench. The Maya evidentially also utilized the natural cave formations in this area as part of the construction materials, as they partially manifest the framework of the architecture, including end or arm features. The use of cave materials in the bench's fill made it difficult to determine where the cultural fill ended, and the natural cave material began. We thus dug for quite a depth until we were absolutely sure we had encountered a sterile, natural level.

Excavations revealed that the bench was erected in one phase of construction, and capped with a plaster surface, as was evident from the patches of plaster remaining on its seat (see figure 5b). Only two, undiagnostic ceramic sherds were recovered from the excavations, and thus the chronology of bench's construction is unknown. The plaster surface associated with the top of the bench was free of any evidence of burning, unlike many of the plaster floor surfaces. The bench was reconstructed under the direction of Jim Puuc upon completion of our investigations.

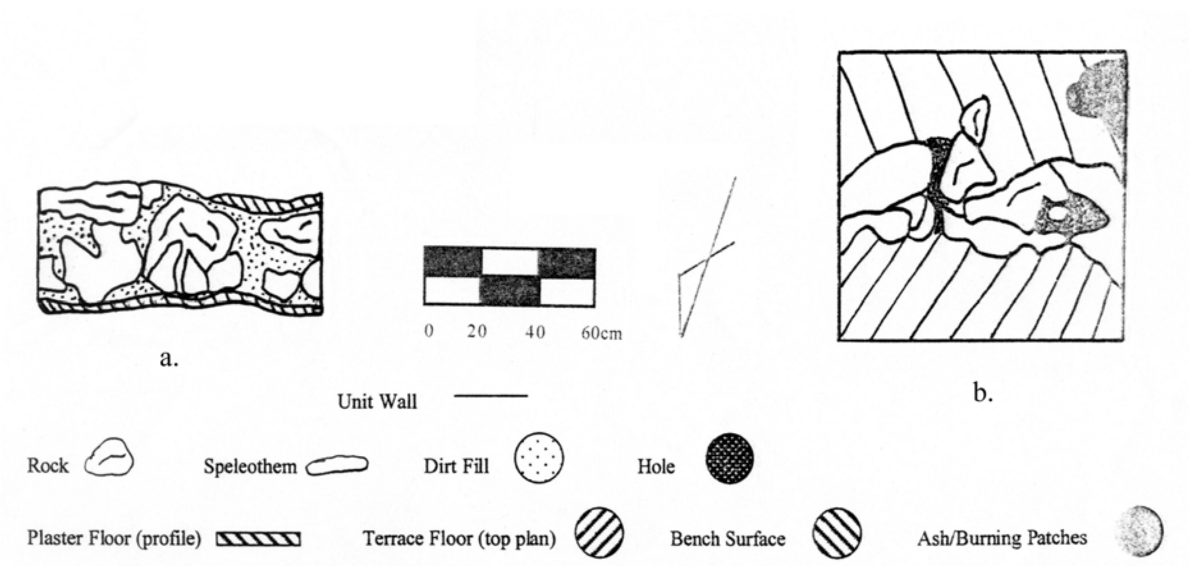

Figure 5. a) Stratigraphic profile of Bench 1, Terrace 11, Unit 4 (before excavations); b) Top plan of Unit 4, Level 2 (bench surface and terrace floor).

Unit 5 (Area 3, Terrace 5, Platform 1)

Platform 1 is the only such construction in the Entrance 2 investigation area, and as such, a 1x1 meter test unit was initiated here so to test the composition and chronology of this construction. Unit 5 was not located on a north-south axis, but instead was oriented to the architecture present in the area of investigation. The unit datum for Unit 5 is located 27 cm south of the southwest corner nail, 21 cm above ground level.

Platform 1 is located approximately 50 meters southeast of the sinkhole entrance, to which it is directly oriented. The platform is situated at the back of Terrace 5, in a small alcove. The area remains active, as the platform and surrounding flowstone continues to be calcified. The absence of guano in this area further attests to the active nature of this area. During the wetter parts of the field season, we were able to witness the dripping of water in this area. The absence of evidence of burning on Platform 1 may be due to the activeness of this area, or perhaps, like Bench 1, burning was not associated with such artificial constructions.

The platform consisted of a row of stones, no more than 10 cm in height, placed in an alignment across the back area of the terrace, so as to demarcate the small alcove. The fill within the area confined by the artificial wall, and within the area of the unit consisted mainly of flowstone, but also included speleothems, soda straws and cave rocks. The wall and the fill were found to be sitting on an earlier level of flowstone. The top of the platform was plastered over at the level of the top of the rocks (Figure 6). Platform 1 was raised in one phase of construction. Between 2 and 10 cm of fill was removed in the excavation of Unit 5. The only artifacts recovered from this excavation unit were twenty-seven ceramic sherds. These ceramics remain to be analyzed.

I believe it is significant that the only platform in the Entrance 2 investigation area, directly faces the sinkhole entrance. In fact, on a sunny day, one does not need light on these terraces. Moreover, the active nature of the surrounding area may also be significant. Active areas in other caves within the WBRCP research area have had many surface artifacts associated with them (see Moyes and Awe 1998; Griffith 1998). The absence of surface artifacts in this area may be the result of two things: the first, the cave has been subject to heavy looting activities over the years, and any vessels or specialty artifacts once located in the area were likely removed. The second possible reason for the absence of surface artifacts in the area coincides with the active nature of the area, and the potential for artifacts to have been washed away during particularly wet seasons. These artifacts may also have been looted from their resulting secondary positions. It should be noted that these suggestions are not facts, but simply hypothetical ideas.

Unit 6 (Area 3, Terrace 10 (upper))

Terrace 10 is the highest terrace, and point in the Entrance 2 investigation area, and, as mentioned earlier, is the only terrace from which the sinkhole entrance is not visible, and thus it never receives sunlight. In hopes of determining whether or not the secluded location of Terrace 10 precipitated a differing function from that of the other terraces within Area 3, or in the Entrance 2 investigation area altogether, we initiated the excavation of a centrally located 1x1 meter test unit in Terrace 10. Unit 6 was set upon a north-south axis. Unit datum CHPD7 was located 18 cm above ground level at a 165 degree angle, and at a distance of 37 cm from the southeast corner of the unit. Unit 6 was excavated to a depth of 146 cm dbd. Three stratigraphic levels were encountered during the excavation of Unit 6. The only cultural stratum identified in Unit 6 was that associated with Level 2, which was represented by the remnants of a plaster floor (Floor 1) and the associated ballast-type fill. Floor 1 exhibited evidence of burning in the form of charcoal flecking and grey ash. The floor was best preserved in the southern portion of the unit. Both Level 1 (essentially bat guano) and Level 3 were natural levels (Figure 7). Level 3 was comprised of a dry river-like matrix with chert and limestone pebbles throughout. At first this level was thought to have been a different kind of fill, and thus excavations continued on the chance that an earlier phase of construction (i.e., a lower, earlier terrace) would be found. It turned out that this matrix was a naturally occurring one that is also found elsewhere in the cave at higher elevations.

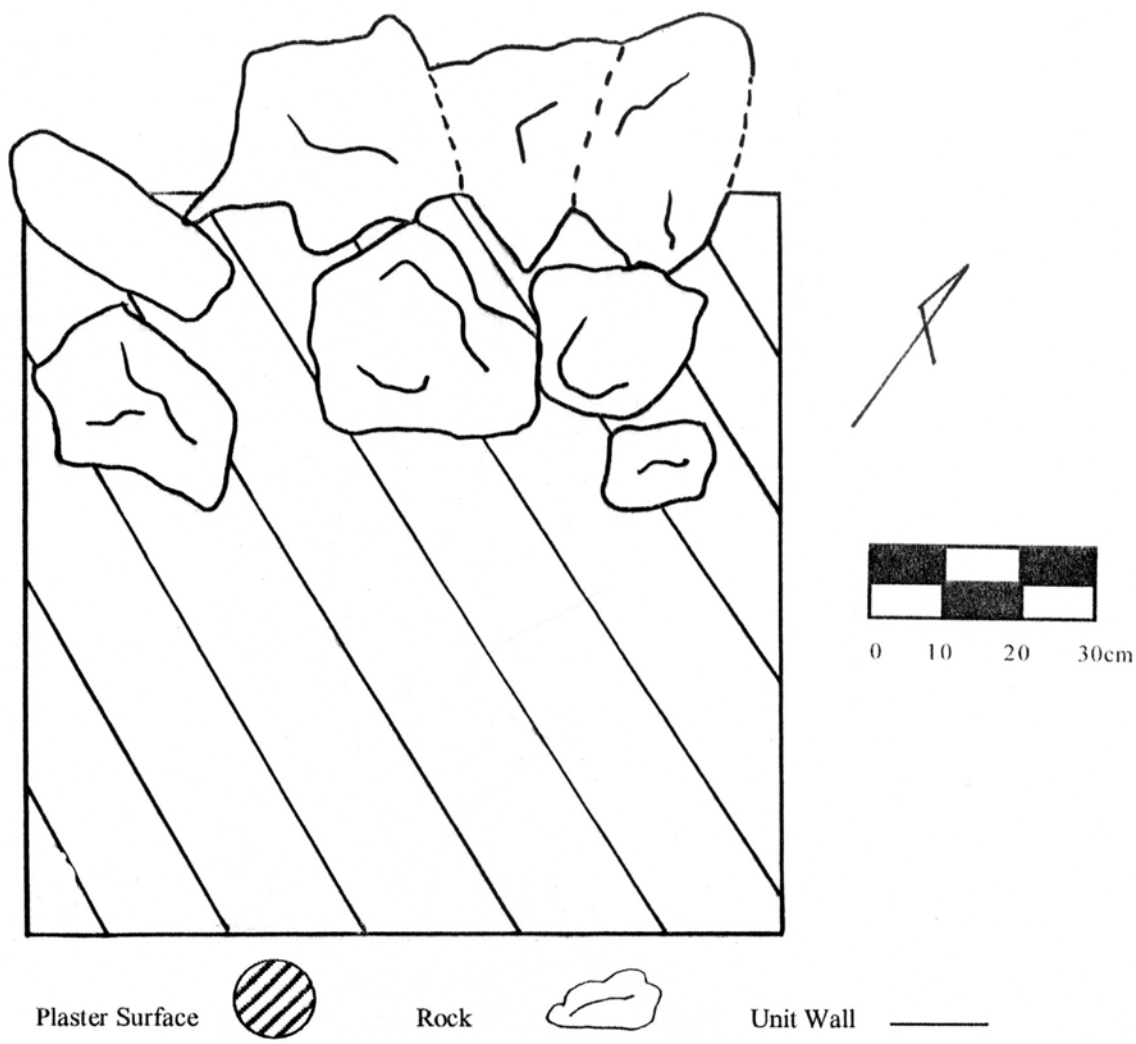

Figure 6. Top plan of Unit 5, Platform 1, Level 2, Floor 1.

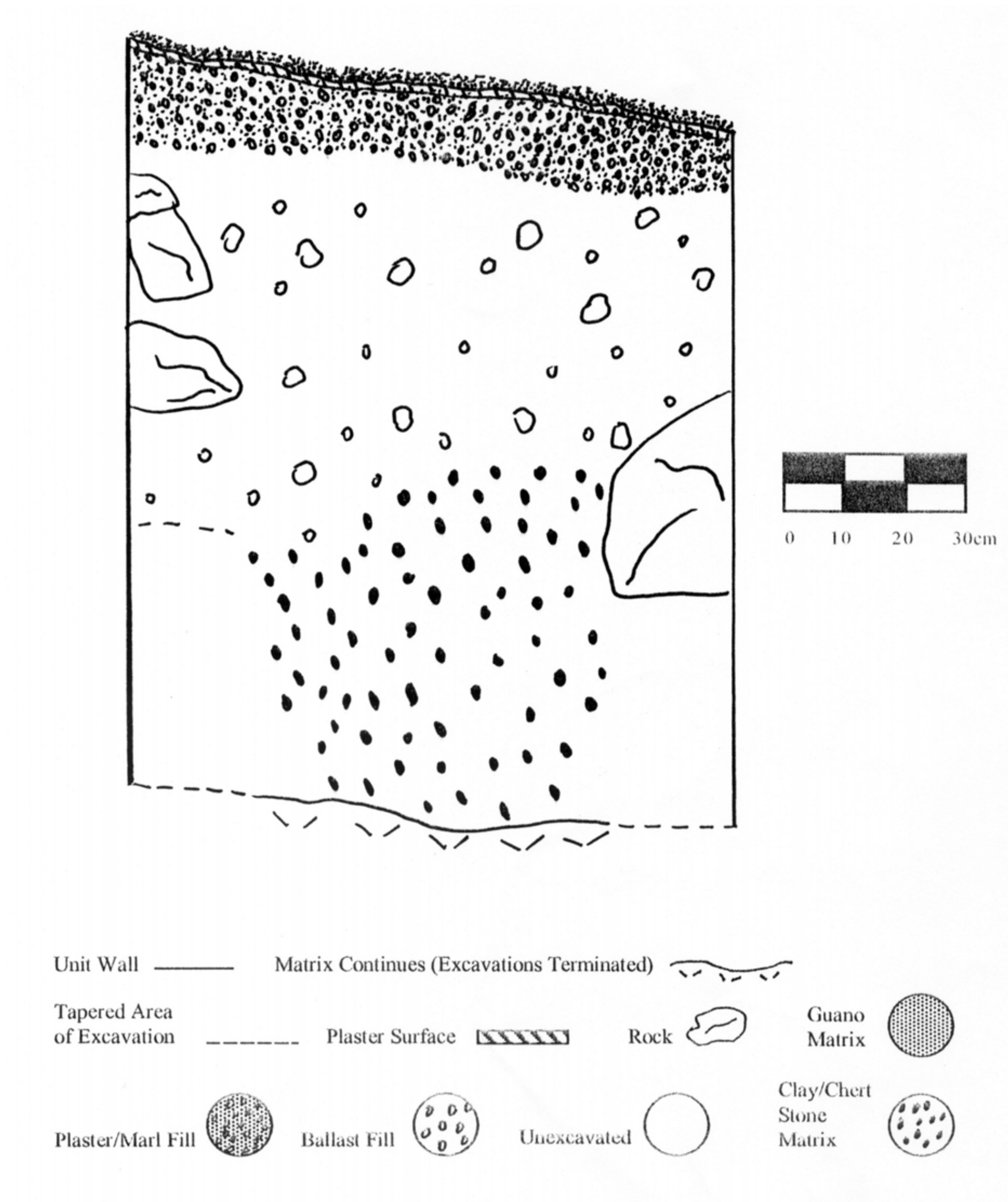

Figure 7. Stratigraphic profile of south wall, Unit 6.

The paucity of artifacts from the surface level (2 ceramic sherds), and from Floor 1 (1 ceramic sherd was embedded into the plaster floor), and the complete absence of artifacts from Level 3 suggests that this terrace may have been the last one constructed in the area.

Unfortunately, due to the lack of datable artifacts associated with the Unit 6 excavations, the chronological association of Terrace 10 is unknown. Due to the secluded nature of Terrace 10, and the long processional climb required to get to this terrace, I cannot help but wonder whether the function of this terrace, and its surrounding alcove, was similar to that of the small temple rooms atop of the large pyramidal structures at many surface sites.

Unit 7 (Area 3, Terrace 8 North)

Unit 7 was a 1x1 meter unit located near the edge, or retaining wall of Terrace 8 North. Terrace 8 was divided into north and south sections, as dictated by the topographic features of the cave at this point. Stalagmites and breakdown physically divided the platform, which otherwise more or less ran across the entire area of Area 3. The unit was set on a north-south axis. Datum CHPD8 was located 38 cm south of the southern unit wall, 32 cm above ground level. This unit was excavated in order to gain further insights into variations in terrace compositions, constructions and utilizations.

Seven stratigraphic levels were identified, included three flooring episodes as the upper levels (Levels 2-4). Unit 7 was excavated to a depths ranging between 164 cm dbd, and 170 cm dbd. Neither flooring episodes 1 or 2 were preserved throughout the entirety of the unit. Floor 2 exhibited an obvious concentration of ash and charcoal, both in a circular pattern in the centre of unit, and along the northern edge of the unit, indicating a burning event had occurred in direct association with Terrace 8 (Figure 8a). Floor 3 also exhibited a burnt portion of floor along the western wall of the unit (Figure 8b). More artifacts were recovered from Unit 7 than from Unit 6, and including a total of 95 ceramic sherds and 32 faunal remains (the majority of which were bat bones, and likely naturally deposited). The remainder of stratigraphic levels encountered in Unit 7 were identified by changes in matrix, either in color or consistency, or in both. These levels generally resembled those found in Unit 6 of Terrace 10 (upper), in that they were predominantly comprised of chert and river cobble-type rocks. However, these matrices also included a larger number of speleothems than that encountered in Unit 6, and which ranged in size from that typical of soda straws (5-10x.5 cm) to as large as 30x10 cm. No artifacts were recovered from Level 5 through to the termination of the Unit. Two faunal bones were associated with Level 5, but these were likely the result of natural depositional processes, rather than having been culturally placed. Excavation continued to such an extreme depth, despite the absence of artifacts, in order to determine if Terrace 8 was built on top of the lower Terrace 7, and thus at a later date, or conversely, whether Terrace 7 simply abutted the retaining wall of Terrace 8. Due to the absence of a deeper flooring episode, it is suggested that Terrace 7 abuts Terrace 8's retaining wall, and thus does not continue underneath it. As such, Terrace 8 may well have been constructed at the same time as Terrace 7. Relative dating evidence based on ceramic data cannot confirmed or deny such an hypothesis at this time, as ceramic analysis has not yet been completed for Terrace 8.

Unit 8, Area 1, LP1

Unit 8 was a salvage excavation initiated in an attempt to locate the second half of a carved wood mirror backing recovered from Actun Chapat during the Department of

Archaeology's 1982 reconnaissance of the cave. The original piece was found in this area, after having been dug up by a looter. At the time of the 1999 investigations, this original looter's pit was no longer visible, as another, more recent looter's pit (LP1) had been dug adjacent to it, and its backdirt served to fill the pit created by the original looting episode, and thus concealing its exact location. Determination of where to initiate this salvage excavation was made under the advisement of Jaime Awe, who was present at the 1982 reconnaissance and was there when the mirror backing was discovered.

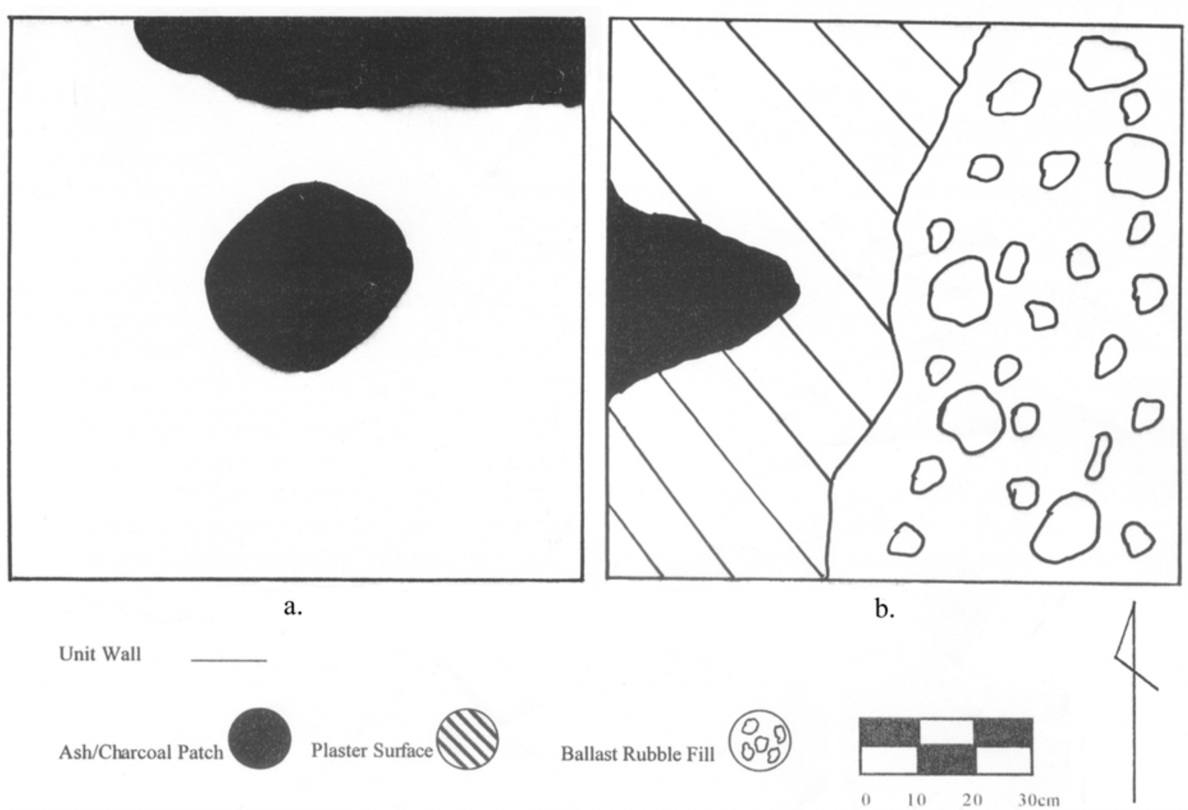

Figure 8. a) Top plan of Unit 7, Level 3, Floor 2; b) Top plan of Unit 7, Level 4, Floor 3.

Unit 8 is located southeast of the sinkhole entrance, in a small breakdown area west of the flat area gridded for surface collection. The close proximity of this looter's pit to this flat area has caused us to believe that, it is likely that many of the sherds recovered from the flat area actually came form LP 1, or perhaps the earlier, now concealed looter's pit. Unit 8 was placed south and slightly west of LP 1. The original LP ended up being partially encompassed by the southern section of the unit. A fairly recently utilized fire pit was also located at surface level in this area.

Four stratigraphic levels were encountered (Figure 9). Levels 1 and 2 were disturbed. Level 3 was comprised of a fairly thick (between 2 and 7 cm) ash lens than ran throughout most of the unit area. This lens may have been thicker prior to the looting activities, which may help explain the charcoal flecking found throughout disturbed levels 1 and 2. Both Levels 3 and 4 were for the most part undisturbed, with the exception of the looter's pit that penetrated the southwest corner of the unit. Because of the looseness of the matrices in the cave, and the constantly changing hues and strengths of light in this area (due to the nearby sinkhole entrance), it was difficult to clearly define the matrix boundaries of the looter's pit from the in situ matrices of Level 4. Thus, the ceramics collected for Levels 3 and 4 may include types from these disturbed matrices. Then again, the ceramics encountered in the fill of levels 3 and 4 may very well have been the result of the Maya having "reused" some of the ceramics previous left on the surface. Recognizing the ritual and cosmological significance of items left at surface level in caves, it is unlikely that this was the case, but instead the mixture of ceramics dating to various time periods was instead the result of the disturbed matrices associated with the early looter's pit. Ceramics retrieved in this salvage excavation range in date from the Early Classic, Hermitage phase to the Late Classic, Spanish Lookout phase. The second half of the mirror backing was never recovered.

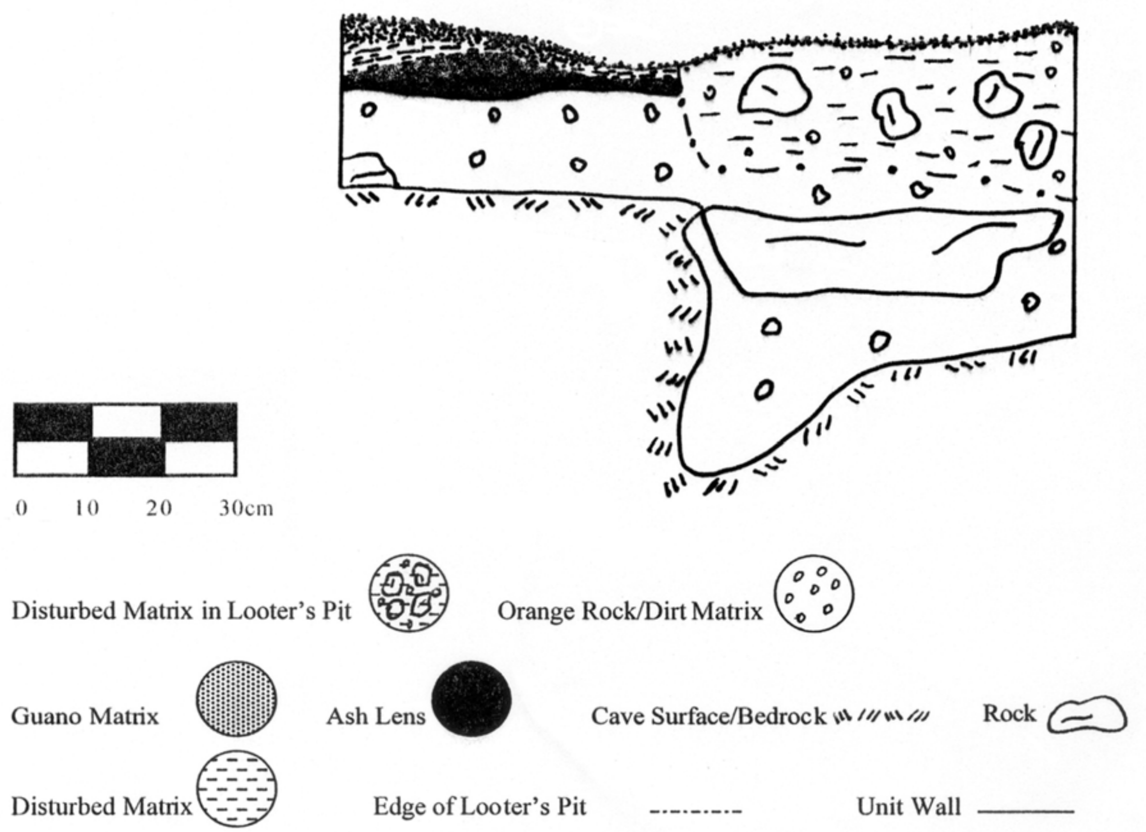

Figure 9. Stratigraphic Profile of the southern wall of Unit 8.

Unit 9, Area 4, Terrace 15 (Upper), LP15, Cluster 14

Area 4 is located east of Area 1, and Entrance 2, in an elevated area surrounded by stalagmites. Terrace 15 is not visible from the main investigation area, but roughly faces northeast, and the passage leading to Entrance 1. It is also the only terrace on the southern side of the passage. The Terrace is the most easterly located artificial construction in the general vicinity of Entrance 2. Terrace 15 is situated on a ledge approximately 15 feet above ground level, which was augmented by the construction of the two-tiered terrace. A small retaining wall separates the two tiers, and while this normally would have caused the tiers to have been designated as separate terraces, we decided to label them as one, based on their small surface area, and the height and steepness of their location. Due to its unique position, we figured that the mid-terrace retaining wall function more as a construction pen, rather than as a different architectural platform.

Originally this area was not scheduled to be tested during the 1999 investigations, and thus a surface collection of the cluster of artifacts (CL14) associated with Terrace 15, and its associated looter's pit (LP15) was undertaken. However, the presence of numerous ceramic sherds, many of which were polychrome pieces, suggested that a cache (Feature 1) had been interrupted by a looting episode, and thus it was decided that a small salvage excavation would be initiated. Interestingly, a small carving of a monkey is located on Terrace 15, at approximately knee height on the south cave wall, west of the alcove associated with Terrace 15 upper.

Unit 9 was a 75x75 cm unit, situated on a north-south axis, and centrally placed on Terrace 15 upper so to partially incorporate the LP15 in its southwest corner. The unit datum (CHPD10) was located south of the southern unit wall, 20 cm above ground level. Three stratigraphic levels were encountered during excavation as was the remnants of a cache (Feature 1). Unit 9 was excavated to a maximum depth of 71 cm dbd. The decision to place the unit in this location was made in anticipation of learning about the internal composition and chronology of this high terrace, and to gain insight into the caching episode. Which quite obviously a great deal of the cache had been disturbed, it was hoped that Unit 9 would find parts of the cache in situ. Prior to making the decision to place an excavation unit on Terrace 15 upper, a surface collection of the upper Terrace (Cluster 14) was performed. Due to the number of ceramic sherds in the area, not all could be collected, and thus a subjective collection of sherds perceived likely to be diagnostic (based on decoration, form, and functional attributes) was undertaken. A more comprehensive surface collection was conducted in the area of the unit prior to excavations. Carbon and matrix samples were collected.

After having exposed the extent of the looter's pit, it became clear that despite the number of ceramics, the pit did not actually penetrate the surface very far, however, it had broken through a beautifully preserved plaster floor (Floor 1, Level 2). The cache was not defined by a formal construction but was simply a highly concentrated collection of ceramic sherds, that included 3 olivella shell tinklers, and 2 faunal bones. The cache did extend beyond the area of the looter's pit (Figure 10a and 10b). Charcoal and ash flecking occurred throughout the level, however, unlike the plaster floors associated with Terraces 2, 3, 8 North, and 10, there is no evidence of the floor having been burned. Moreover, no other Terrace had a caching event associated within it, or as many artifacts associated with it. Unfortunately, the looter's pit had displaced the majority of the cache located within Level 2, and thus it will be impossible to determine if any of the artifacts recovered during surface collections were actually objects intentionally left at surface level, or whether they were the resulting of the looting activities. Ceramic analysis of the artifacts recovered from the in situ deposits of the cache (Feature 1) will be completed during the 2000 field season. Level 3 was devoid of artifacts or charcoal, and was comprised of the same river cobble, chert sandy matrix encountered elsewhere in Actun Chapat. Whether this was a fill used to flatten the otherwise undulating state of the cave floor, or was a naturally occurring deposit, is unclear.

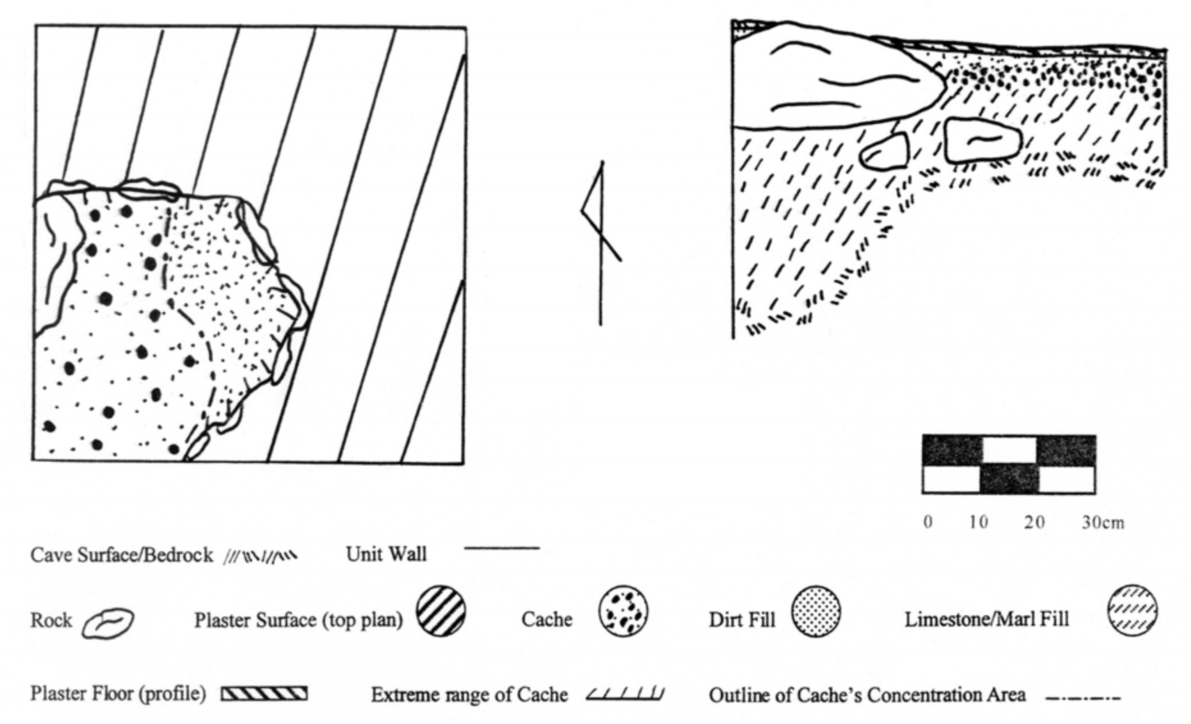

Figure 10. a) Top plan of Unit 9, Level 2, Floor 1, Feature 1 (cache CHP99/F1); b) Stratigraphic profile of the southern wall of Unit 9.

DISCUSSION

As a result of our initial investigations of Entrance II in Actun Chapat, a number of interesting observations can be made, from which a few preliminary conclusions can be offered. Due to the high level of recent traffic and looting in the cave, it is impossible in many cases to determine if the artifacts recovered in surface collections were positioned in their place of discovery by the Precolumbian Maya, or whether their placement was the result of looting activities. Thus, associations with artifact clusters and loci are tenuous. Nonetheless, while in situ provenance may not be absolute, the relative location of surface artifacts and cave loci is perceived as a minimal form of provenance, in that it is highly unlikely that the looter transported them to a distant location.

The paucity of diagnostic ceramic types retrieved from within the artificial constructions, hinders the comprehensive assessment of their temporal designation. In spite of the small sample size, we have been able to determine that terrace construction in Entrance II was initiated during the Early Classic period, with few additions or refurbishing events occurring after this time. Despite the cessation of architectural construction in the Entrance II investigation area, the presence of ceramic types dating to the Late and Terminal Classic periods in the surface collections indicates that cave use continued beyond the Early Classic period. One can thus see why the inability to determine looted from intentionally placed surface artifacts is particularly problematic when assessing the temporal sequence of cave use.

At surface sites through the Belize Valley region, cultural materials are frequently interred within the architectural construction levels. Thus, the paucity of artifacts located within the construction fill of the artificial constructions within the Entrance II investigation area is in and of itself interesting. The lack of cultural debris within the Actun Chapat constructions should not be considered a consequence of their assumed ritual significance and association and the desire not to taint such structures with what is essentially garbage. We know that ritual structures at surface sites (i.e. ballcourts, see Ferguson 1999b) also contain cultural debris within their construction fill, and thus this was not a concern of the Precolumbian Maya. This notwithstanding, the lack of cultural materials in the architecture may have been associated with the ceremonial nature of the cave itself, in that the discarded objects left at surface level within the cave were regarded as offerings, and not has discarded waste. As such, the objects left within the cave and their placement were likely afforded a certain amount of reverence, and were thus not readily disturbed for interment.

The burning episodes associated with many of the terrace floors are significant. Unfortunately, their discovery was by mere happenstance, and thus we really do not know with what regularity or distribution such features occur. Modern day Cakchiquel cave rituals have been noted as including the burning of offerings left in a circular fashion on the cave floor. The area around the circular offertory was swept clean upon completion of the ceremony (Karl Taube, public lecture, SUNY-Albany, March 3, 2000). The lack of surface artifacts in association with the burning episodes, and on a majority of the terraces, and the circular nature of at least one of the fully exposed burning episodes (Unit 7, Level 3, Floor 2, Terrace 8 North), may be indicative of such a ceremony, and the subsequent cleaning of the area. Future investigations of terrace constructions in Chapat will include the exposure of such features prior to excavation, so that their distribution and relationship can be ascertained and more readily deconstructed.

While we are not yet in a position to offer any concluding remarks about the function of the architectural constructions within the Entrance II investigation area of Actun Chapat, it is likely that the terraces were constructed in order to support some sort of ritual activities. In a discussion concerning the religion of Cuchumatan, Oliver La Farge (1947:128) has noted that during the mid-twentith century, individuals known as Prayer markers (Shaman or ritual specialists) each had their own specific, special place within a cave, and at which they would offer their prayers. Such places included "a flat ledge in the rock", and were known as mesas (La Farge 1947:128). Perhaps each terrace was an artificially constructed mesa, each associated with a different individual, or perhaps a different ritual or prayer. Investigations in the 2000 field season and further analysis of the recovered artifacts may suggest even more intriguing possibilities for the different uses of the architecture in Actun Chapat by the Precolumbian Maya.

Acknowledgements

I would like to thank Allan Moore and the Department of Archaeology for their continued support and encouragement. It is an honor and privilege to be allowed to return to Belize every year, and be allowed to conduct research in this wonderful country. I would also like to thank Dr. Jaime Awe for his continuous inspiration, and for allowing me to participate on the WBRCP. Jim Puuc also deserves special mention and thanks. Jim made my job ten times easier, and many a day run smoother. A number of people have been instrumental in my investigations, and deserve particular mention here: Cameron Griffith, Christophe Helmke, Jessica Surdam, Reiko Ishihara, Chris Irwin, and all of the fabulous 1999 field school students, were invaluable to the Entrance II investigations. Thank you all for your assistance and enthusiasm. I would also like to thank the numerous other members of the WBRCP, whose continuous banter and support is highly appreciated. Finally, I would like to thank Lea Castellanos, William Pleytez, and Antonio Morales for allowing us to live with them during the work week, as well as Mr. and Mrs. Dan Silva, Lenny Wragg and the entire staff of the Cahal Pech Village for providing the nicest living accommodations in San Ignacio!

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FASHIONABLY LATE: A POSTCLASSIC CENSER FROM THE ROARING CREEK VALLEY, BELIZE

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INTRODUCTION

This paper examines the temporal placement of an elaborately incised orange ware censer from the Roaring Creek Valley of Central Belize. Based on comparisons to ceramics discovered at other sites in Belize it is clear that the vessel represents a key element in the chronology of the Precolumbian occupation in the Roaring Creek Valley. The iconographic program represented on the censer is described and interpreted. Similar examples are used to define the stylistic idiosyncrasies of the iconography and ceramic attributes of the Roaring Creek specimen.

SETTING

The Late Preclassic to Late Classic (300 BC - AD 850) occupation in the Roaring Creek is well-attested on the basis of the large quantity of temporally diagnostic artifacts documented in the cave sites located in that valley. The few test-pits that probed surface platform architecture revealed a contemporaneous sequence of occupation. Although Postclassic occupation (AD 1000 - 1500) in the Central Maya Lowlands is not uncommon *per se*, most sites appear to have been heavily depopulated by that time. Consequently few central lowland sites possess significant Postclassic ceramic assemblages. The discovery of a Postclassic censer in the Roaring Creek Valley extends the length of occupation considerably, thereby revealing an exceptional chronological sequence totaling well over a thousand years.

The Yaxteel Ahau Censer, as it will be referred to, was not recovered during archaeological investigations. Instead the vessel was recovered by a local inhabitant who allegedly found it several years ago in the large western entrance to Actun Yaxteel Ahau (Figure 1). Once the existence of the vessel was brought to our attention, it was photographed and a complete archaeological illustration was produced. Subsequently the drawing was submitted to the Department of Archaeology in Belmopan to register the existence of the specimen.

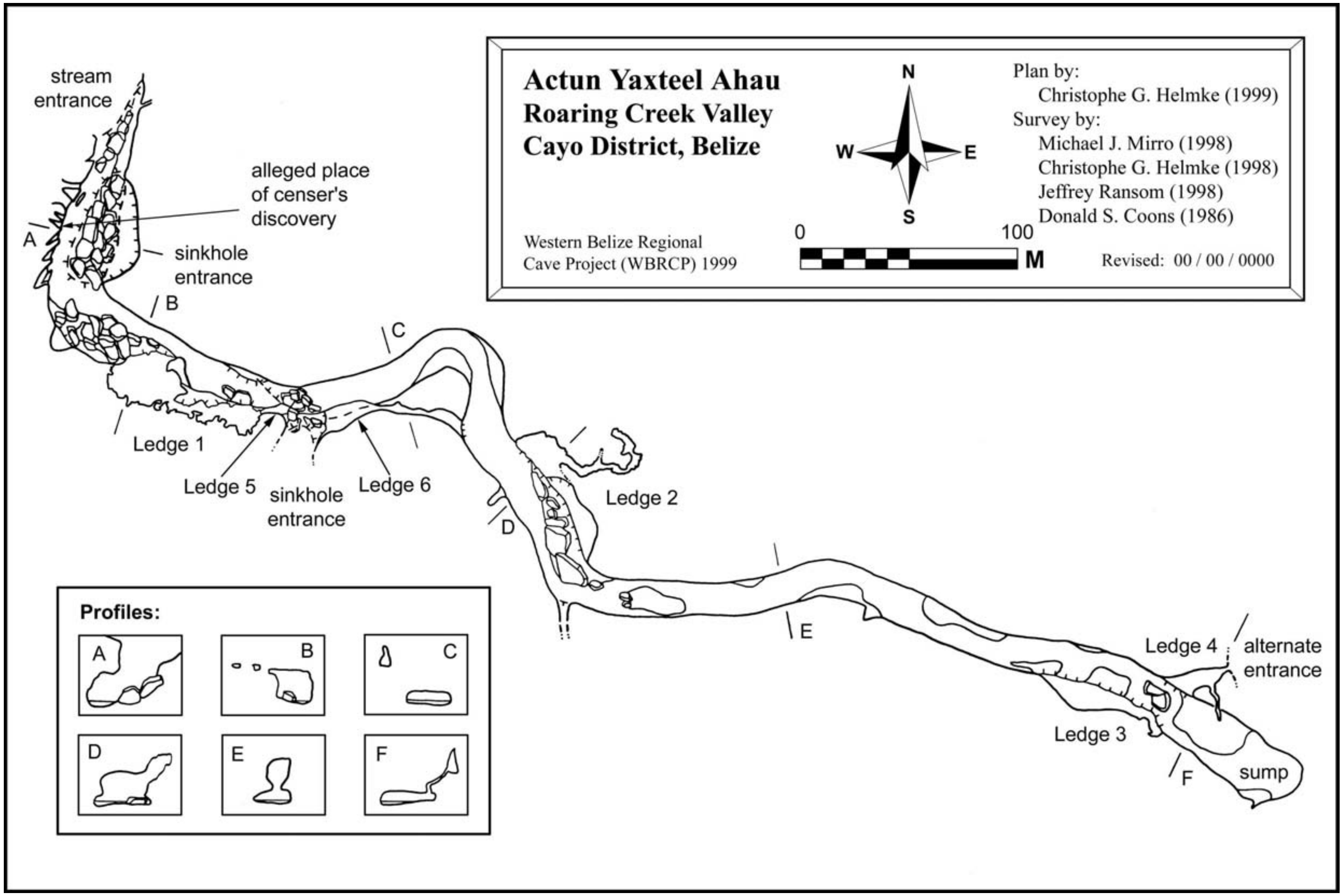


Figure 1: Map of Actun Yaxteel Ahau indicating the location where the censer was allegedly discovered.

DESCRIPTION

The Yaxteel Ahau Censer

The Yaxteel Ahau Censer (Figure 2) is a stocky hour glass-shaped vessel with constricting orifice and a tall pedestal base. The rim is short, pointed, direct, and flares outwards. From the rim, the body is sharply recurving extending outwards to its widest point at a pronounced break in the upper body. This break is placed close to the shoulder. The width of the body constricts below the break and comes together in a sub-spherical base. This base is deeply concave in relation to the jointure to the pedestal base that upholds the censer. The pedestal flares outwards and its rim is backed by an outwards beveling. The exterior is completely slipped as is the interior of the rim. The remainder of the interior and the area below the pedestal were left unslipped. The shoulder and pedestal base are elaborately embellished by incised lines framing intricate iconographic elements. The censer is completely intact save a chip on the lip of the pedestal that appears to have been induced during the removal of the vessel, which was said to have been wedged in place. A thin calcite coating extends over the part of the censer that was exposed.

Intersite Comparison: Quantitative and Qualitative Differences

These descriptions of the vessel are next to identical to that of its counterparts, namely the Buk Phase censers discovered at Lamanai and Marco Gonzalez. The physical dimensions of the Yaxteel Ahau Censer are tabulated and contrasted with similar specimens from Lamanai and Marco Gonzalez (Tables 1 and 2). The data for the Lamanai and Marco Gonzalez censers are derived from published illustrations (i.e. Graham 1987: Fig. 5a, c; Graham & Pendergast 1989: Fig. 7a-d, f).

	AYA	LA 95/1	LA 95/6	MG a	MG c	MG d	MG b	MG f	Mean
Total H	25.5	32.2	24.8						27.5
Rim H	1.5	1.7	1.6	2.4	3.0	1.6	1.6	1.4	1.9
Shoulder H	4.7	5.8	3.6	7.2	11.6	5.4	8.0	4.0	6.3
Body H	11.0	14.0	10.8	18.0					13.5
Max. H of pedestal	8.3	10.6	9.2						9.4
Max. body D	24.7	28.8	22.4	34.4	57.2	34.8			33.7
Max. D of pedestal	24.1	28.8	18.0						23.6
Max. rim D	20.4	20.6	15.2	30.8	44.0	20.0			25.2
Max. orifice D	17.1	19.6	15.6	24.4	38.4	14.8			21.7

Table 1: Metric comparisons of physical attributes of the Actun Yaxteel Ahau censer against specimens from Lamanai and Marco Gonzalez. Note that a high positive linear correlation coefficient was obtained between the arrays of the Actun Yaxteel Ahau censer and the two specimens from Lamanai, averaging to 0.98.

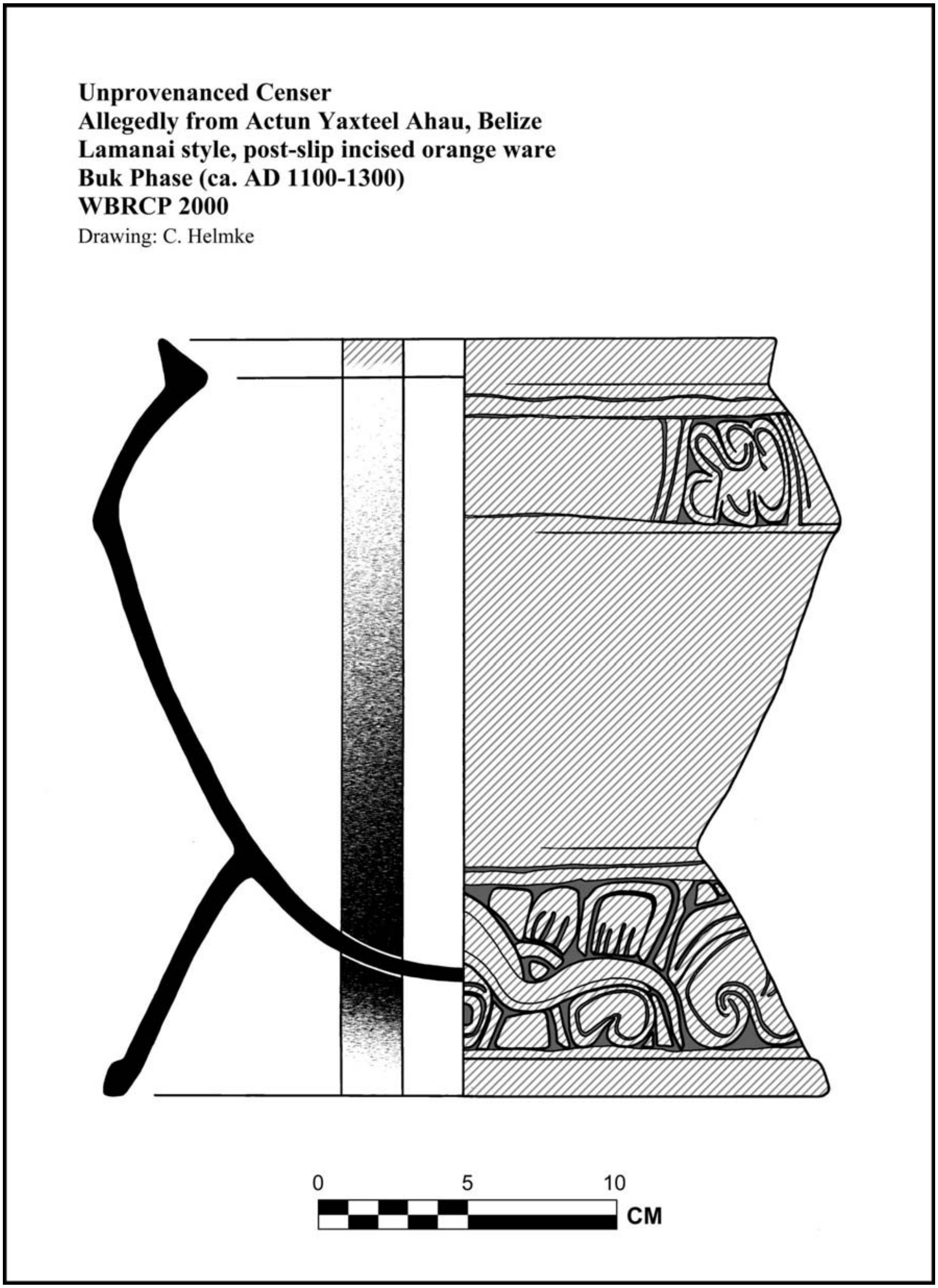


Figure 2: The Actun Yaxteel Ahau Censer.

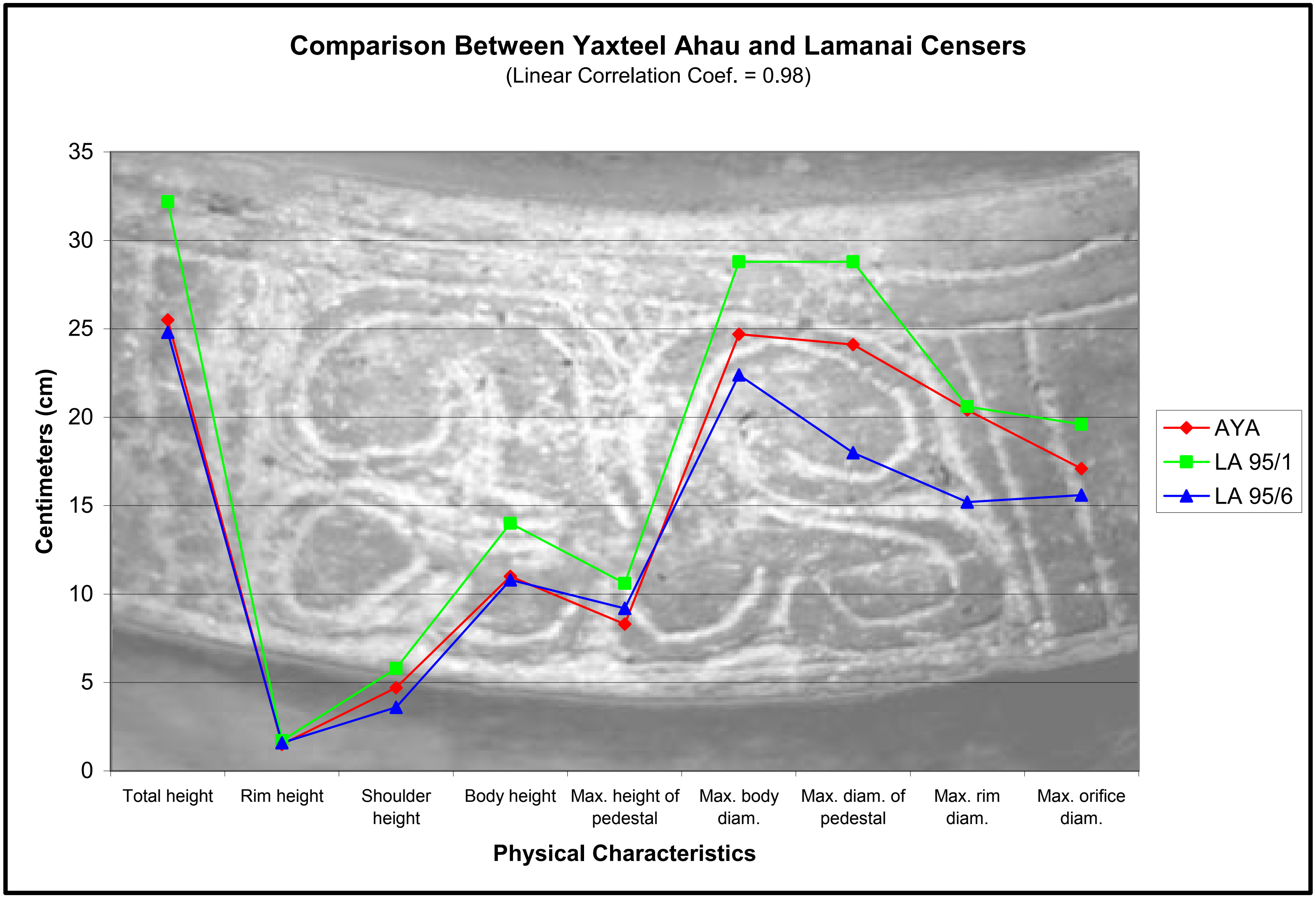
	AYA	LA 95/1	LA 95/6	MG a	MG c	MG d	MG b	MG f	Mean
Total H	100.0	100.0	100.0						100.0
Rim H	5.9	5.3	6.5						5.9
Shoulder H	18.4	18.0	14.5						17.0
Body H	43.1	43.5	43.5						43.4
Max. H of pedestal	32.6	32.9	37.1						34.2
Max. body D	96.9	89.4	90.3						92.2
Max. D of pedestal	94.5	89.4	72.6						85.5
Max. rim D	80.0	64.0	61.3						68.4
Max. orifice D	67.1	60.9	62.9						63.6

Table 2: Relative metric comparisons of physical attributes of the Actun Yaxteel Ahau censer against specimens from Lamanai and Marco Gonzalez, scaled to 100 %.

Based on the tabulation of the physical characteristics (Tables 1 and 2) it is apparent that the Yaxteel Ahau Censer bears a greater similarity in overall dimensions to the specimens from Lamanai, than to those from Marco Gonzalez. The Marco Gonzalez censers –although fragmentary– are considerably larger and taller. It should be remarked that the tallest censer from Lamanai (Pendergast 1981: Fig. 20) which measures 50.0 cm tall, was not included into the table, as insufficient data was available at the time of writing. Based on the Lamanai and Marco material it seems probable that two size ranges existed for these censers; the Yaxteel Ahau Censer, evidently falling into the smaller of the two categories. Although it could be expected to find a great deal of variation in the physical dimensions, the measurements are very close. Indeed, the height of the rim is extremely standardized and is the attribute that displays least variation for censers of all size classes. Figure 3, clearly shows that all measurements fall within the same range. This argues beyond a doubt that all the censers are of the same type. A trend can be observed, however: all the height measurements are next to identical, leaving the bulk of variation in the domain of diameter measurements.

Another great similarity is in the paste characteristics. As was pointed out by Graham and Pendergast (1989: 11) the firing practices at Marco Gonzalez "generally appear to have paralleled those inferred for Lamanai; the presence of a dark, unoxidized core characterizes the pottery of both sites." The section of the paste exposed in the chip off the base of the Yaxteel Ahau Censer is also dominated by a large dark gray core. The systematic paste composition of vessels thought to be produced at several locations thus indicates that the firing practices were as standardized as the vessel form itself.

Despite the great similarities in the paste and quantitative assessments, several qualitative differences exist. In personal conversations with Dr. David Pendergast and Dr. Elizabeth Graham (who are the most acquainted with these specimens) various


Comparison Between Yaxteel Ahau and Lamanai Censers
(Linear Correlation Coef. = 0.98)
Centimeters (cm)
35
30
25
20
15
10
5
0
Total height
Rim height
Shoulder height
Body height
Max. height of pedestal
Max. body diam.
Max. diam. of pedestal
Max. rim diam.
Max. orifice diam.
Physical Characteristics
AYA
LA 95/1
LA 95/6

less-quantifiable variations were brought to our attention. The differences between the Yaxteel Ahau Censer and more "standard" Lamanai censers lie in the following: 1) the treatment of the crocodilian/reptilian motifs in the shoulder decoration; 2) in the form of the joint between body and shoulder, with a somewhat greater shoulder rise and a slightly different contour in the joint; 3) the curvature of the shoulder surface; 4) in the proportions and shape of the neck and lip (David Pendergast and Elizabeth Graham pers. comm. 1999).

DATING

A correlation between radiocarbon dates and the preliminary analysis of materials excavated at Lamanai indicate that transitional Terminal Classic to Early Postclassic ceramics (AD 850 - 1000) were largely replaced by Middle Postclassic ceramics around AD 1140 (Graham 1987: 81). By AD 1150 it appears that the ceramic type constituents of this horizon were extensively standardized (Graham 1987: 81). It is estimated that this standardization may have taken a century or so to come about, and consequently it is suggested that the first types of this horizon appeared by AD 1050 (Graham 87: 81). The beginning of the Middle Postclassic at Lamanai can thus be fixed at AD 1100. The end of this phase is difficult to determine but many changes in form and mode appear as of AD 1300 (Graham 1987: 82). The Middle Postclassic ceramics from Lamanai that occur between AD 1100 and 1300 have been grouped together into a phase called Buk. It should be noted, however, that the phase subsequent to Buk is not characterized by an inventory of types replacing an earlier one, but is marked instead by a slow decrease in the relative frequency of occurring types (Graham 1987: 82). Consequently, ceramic forms that first appear in the Middle Postclassic may also occur in Late Postclassic contexts. As this intersite comparison has the purpose of assigning a temporal placement for a vessel from another site, which lacks documentation of primary context and its artifactual associations, it is best to determine the temporal interval to which this vessel is most likely to belong.

In her essay on Terminal Classic to Historic Maya ceramics, Graham notes several of the characteristics of Buk phase vessels. Among these two are of particular importance. The first is "the preference for lustrous, orange slips" and the second recognizes the prevalence of "elaborate post-slip incised decoration, usually limited to bands around vessel rims, shoulders, or walls" (Graham 1987: 82). These two attributes typify the Actun Yaxteel Ahau Censer as belonging to the Middle Postclassic ceramic horizon.

To Graham's list of attributes should be added another: the predominance of the pedestal mode in the Postclassic. Although this mode has antecedents in the Late Classic (Graham 1987: 78), the height of pedestal bases in relation to overall vessel height reaches it maximum in the second part of the Postclassic. The combination of form and decorative modes of the Actun Yaxteel Ahau Censer indicates a direct correlation with the near identical specimens from Marco Gonzalez and Lamanai. Nonetheless an appraisal of the distribution of the individual modes exhibited by these specimens at various lowland sites enables to anchor the modes within other lowland ceramic seriations.

The association between pedestal bases and censer forms was widespread during the

Late Classic in the Miseria Applique and related censer types, which has been recorded at many sites, including Uaxactun (Smith 1955: 13o), Seibal (Sabloff 1978: Figs. 331-335), Caracol (Chase 1994: Fig. 13.6d), and Becan (Ball 1977). Postclassic expressions of the Miseria Applique type have also been discovered in Balankanche Cave (Andrews IV 1970), and at Macanche as Gotas Composite (Rice 1987). Of most interest, however, are the Puxteal Modeled censers discovered in the Tayasal-Paxcaman zone (Chase & Chase 1987: Fig. 11a, c), and those found associated with the intrusive Burial 5, which was excavated into the floor of the rooms at the summit of Temple I (Str. 5D-1) at Tikal (Adams & Trik 1961: Fig. 42). Although the Puxteal Modeled censers have undecorated pedestal bases, these are almost identical in cross-section and relative proportions to the pedestals of Buk phase censers of Lamanai, Marco Gonzalez, and Actun Yaxteel Ahau. Chase and Chase (1987) date this type to the Middle and Late Postclassic, while Adams and Trik (1961) assigned a chronological placement between AD 1200 and 1450. Based upon the great overlap of dates assigned, it seems clear that the pedestal of the Yaxteel Ahau Censer can by itself, serve to place the vessel within the middle of the New Town complex (ca. AD 1100 - 1300). The presence of the censer in the Roaring Creek Valley thus reveals the existence of Middle Postclassic occupation, although it remains nebulous at the present. Only the search, identification, and excavation of Postclassic residential sites in the Roaring Creek Valley can argue for continuous occupation in the valley since the Late Preclassic.

ICONOGRAPHY

The Yaxteel Ahau Censer

Along the shoulder are three incised symbols. These are reminiscent of the smoke scrolls and even the glyphic sign for cloud (*muyal*) (Stuart & Houston 1994: Figs. 50, 51). As the censer was most certainly designed to emanate the smoke of burning *copal* incense, the presence of these iconic markings along the shoulder is perfectly fitting.

The iconographic scene incised on the pedestal base is by far more complex. The scene is dominated by two typical Postclassic "dragons" each represented bellowing on the opposite side of the vessel. These creatures share a great deal of similarity to the vision serpents represented in Classic period art. The differences between the Postclassic and Classic renditions are based on the use of modified iconic markings. One of the serpents is shown in association with a circular design containing flayed or cross-hatched incisions. This element undoubtedly represents the surface of a water lily pad. The serpent on the opposite side is associated with what appears to be "water stack" (Schele & Miller 1986: 47, Fig. 28). Both of these iconic elements are used to represent the surface of bodies of water. In this context as represented on a censer for ritual purposes, in association with vision serpents, the body of water most likely designates the surface of the watery Underworld. The vision serpents themselves, indicate that the scene is a supernatural one. These creatures are a physical manifestation of a "psychoduct" or conduit through which communication with deities and deceased ancestors was possible (Schele & Miller 1986 *passim*). Most representations of these vision serpents in Classic contexts are shown emanating from the billowing clouds of an ignited offering of auto-sacrificial blood and *copal* incense. This suggests that vision serpents were manifestations perceived during vision trance states.

Taken as a whole the iconography represented suggests that the censer can be understood as a microcosmic representation of ancient Maya cosmology. The *muyal* signs near the rim signal the heavens while the water lily and water stack represent the underworld, the vision serpents serving to link these realms.

DISCUSSION AND CONCLUSIONS

The important discovery of a Buk phase censer in the Roaring Creek Valley raises a number of interesting questions and has several significant implications. First, this discovery greatly expands the spatial sphere of this type's distribution. Second, it serves as an important horizon marker for the culture-history of the area. Third, the censer marks a radical departure in terms of cave usage in the area.

In order to account for the presence of Buk censers at Lamanai and Marco Gonzalez, but their absence at sites located along the lower New River and along the bay of Chetumal, Pendergast and Graham (Graham and Pendergast 1989) suggested that overland trade routes (rather than riverine trade routes) connected Lamanai and Marco Gonzalez. If land routes were favored in the Middle and Late Postclassic, the connections between Lamanai, Marco, and the Roaring Creek, may have also been maintained via land routes. This may explain why Maya guides leading missionaries from Chetumal to the Belize Valley in the Early Historic period in the 17th century also traveled along land routes from the southern source of the New River by foot to the Belize River, then known as the Tipuj River.

Following the Terminal Classic (AD 830-950) the Roaring Creek Valley appears, much like other Lowland areas, to suffer from mass depopulation. Consequently, the archaeological evidence for ensuing periods is radically diminished. With the exception of a handful of sherds that are attributable to the Early Postclassic (AD 950) at the site of Pook's Hill 1 (i.e. fragmentary effigy supports related to Papacal Incised) and Actun Yaxteel Ahau (i.e. sherds tentatively identified as Ixpop Polychrome; Mirro and Awe 1999; Gifford 1976: 298-300), no evidence exists to suggest continued occupation in the Roaring Creek Valley. The presence of a Middle Postclassic censer thus serves to extend the evidence of human presence in the valley by some centuries. Thereafter, however, no additional evidence for human occupation has been discovered to date. The Late Postclassic to Early Historic site of Hubelna is, however, documented in Ethnohistoric documents. This site is said to have been located along the Yaxteel Ahau River, now known as the Roaring Creek. The site in question, however, appears to represent a settlement of Yucatecan refugees fleeing Spanish persecution further north. Consequently, this site does not appear to represent the end of continuous occupation in the Roaring Creek Valley.

The predominance of Terminal Classic artifacts in caves indicates the peak phase of usage. Dramatically lower amounts of artifacts postdating the Terminal Classic in caves thus seem to suggest that the decrease in documented and datable cave activities is a function of the proportionate population decline in the area. Some small-scale and periodic continued usage is implied, however (at least at Actun Yaxteel Ahau) where Early and Middle Postclassic ceramic specimens are known. Whether these remains are the product of pilgrimages from other areas, or are the last evidence of locals using caves in their vicinity remains unknown. Comparison to surface sites such as Tikal and Rio Azul, which are known to have the focus of occasional veneration in the Postclassic following their complete abandonment, a similar model may be construed for the case of Actun Yaxteel Ahau.

Acknowledgments

We would like to thank the Department of Archaeology and particularly the Commissioner, Dr. Allan F. Moore for his support of our investigations. Archaeological investigations in Mesoamerica may be seen as a marathon which tries to compete against the rampant looting of antiquities. On occasion we find ourselves in predicaments challenging our ethical views, when faced with looted artifacts. We acknowledge the members of the Department for their understanding of the delicate situation surrounding the Actun Yaxteel Ahau Censer. We would also like to compliment Megan L. Bassendale who secured excellent photographs of the censer. Raphael Guerra is also thanked for his invaluable assistance in the field. Lastly we would like to thank the informant (who prefers to retain anonymity) for disclosing the existence of the Actun Yaxteel Ahau Censer.

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COMMENTS ON THE CERAMICS RETRIEVED FROM THE LABERINTO DE LAS TARANTULAS, ROARING CREEK VALLEY, CAYO DISTRICT, BELIZE

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INTRODUCTION

The cave known as the Laberinto de las Tarantulas was first explored by the Western Belize Regional Cave Project personnel in 1996. An article by Awe, Griffith and Gibbs (in press) summarizes the data collected in the 1996 exploration. The reconnaissance conducted by the WBRCP between 1996 and 1997 is summarized in the progress report of the WBRCP 1997 season (Awe et al. 1998). In 1998 the WBRCP set out to continue exploration of the cave in conjunction with the initiation of mapping operations. The primary goals were to map the length of the cave and conduct an extensive inventory of the cave's cultural material. Due to time constraints the map of the cave could not be completed in 1998. Although the project planned to finish the mapping during the 1999 season, no personnel returned to the cave. A summary of investigations conducted in the cave in 1998 provides a more complete description of the site and the context of artifacts (Helmke et al. 1999). Three ceramic artifacts were collected during the 1998 season. All three (3) specimens were collected from surface contexts on July 18, 1998 (Figure 1). Michael Mirro, Christophe Helmke, and Cameron Griffith supervised the surface collection respectively. Christophe Helmke drew all vessels. The present report provides a detailed description of the three ceramic specimens recovered from the cave in 1998.

CERAMIC DESCRIPTIONS

Vessel 4, Passage 1 (southern end of passage)

Type:	Tinaja Red: Tinaja variety
Group:	Tinaja
Ware:	Peten Gloss
Complex:	Spanish Lookout
Established:	Smith and Gifford 1966.
Sphere:	Tepeu; Tepejilote; Bayal; Boca
Dating:	ca. A.D. 830 - 950
Sherds:	8
Illustration:	Figure 2a

Form: Bowl with everted sides (out-curving) with slightly thickened rim and rounded

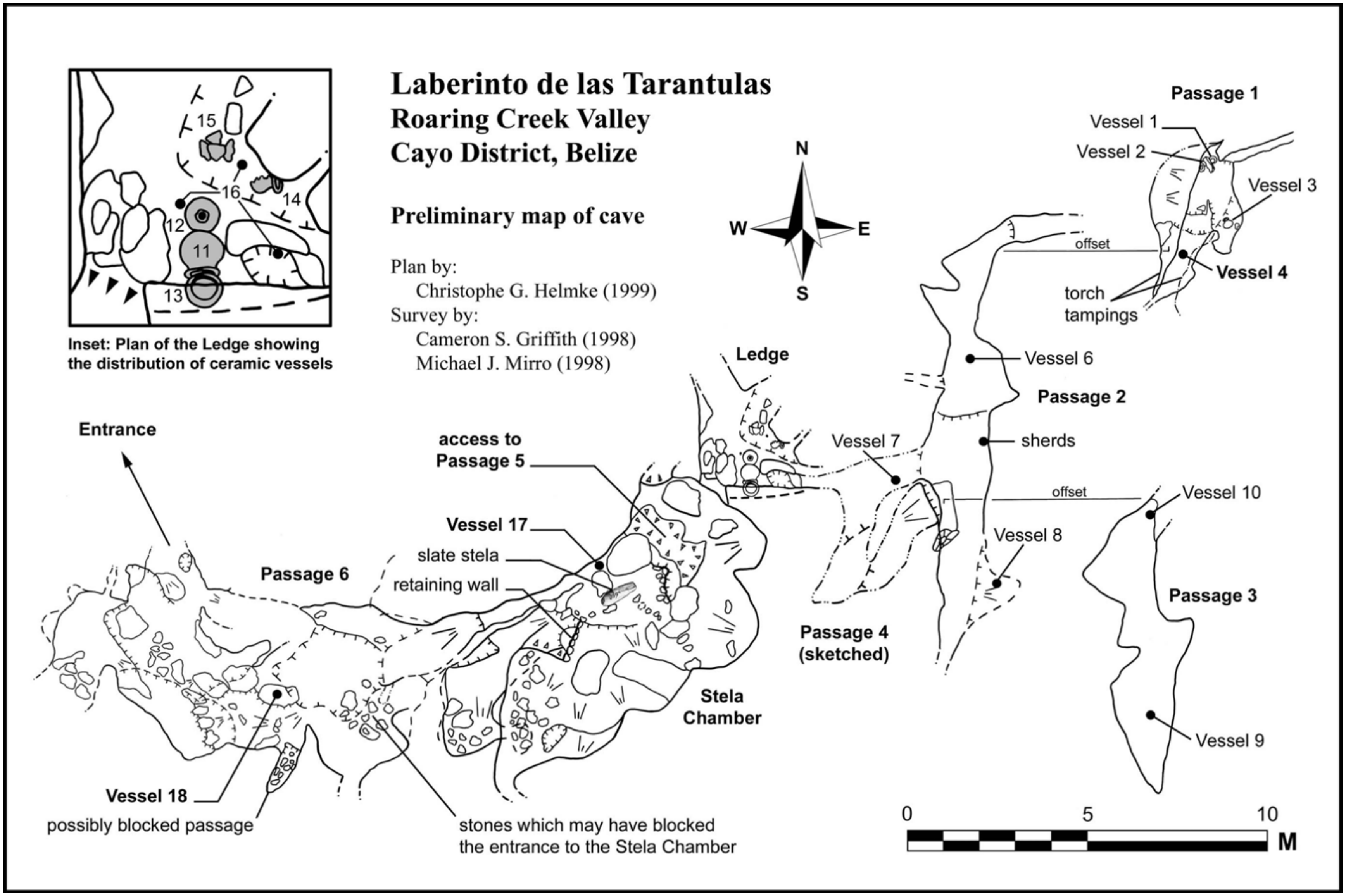

Figure 1: Preliminary plan of Laberinto de las Tarantulas indicating the provenience of the three ceramic specimens recovered (i.e. Vessels 4, 17 and 18).

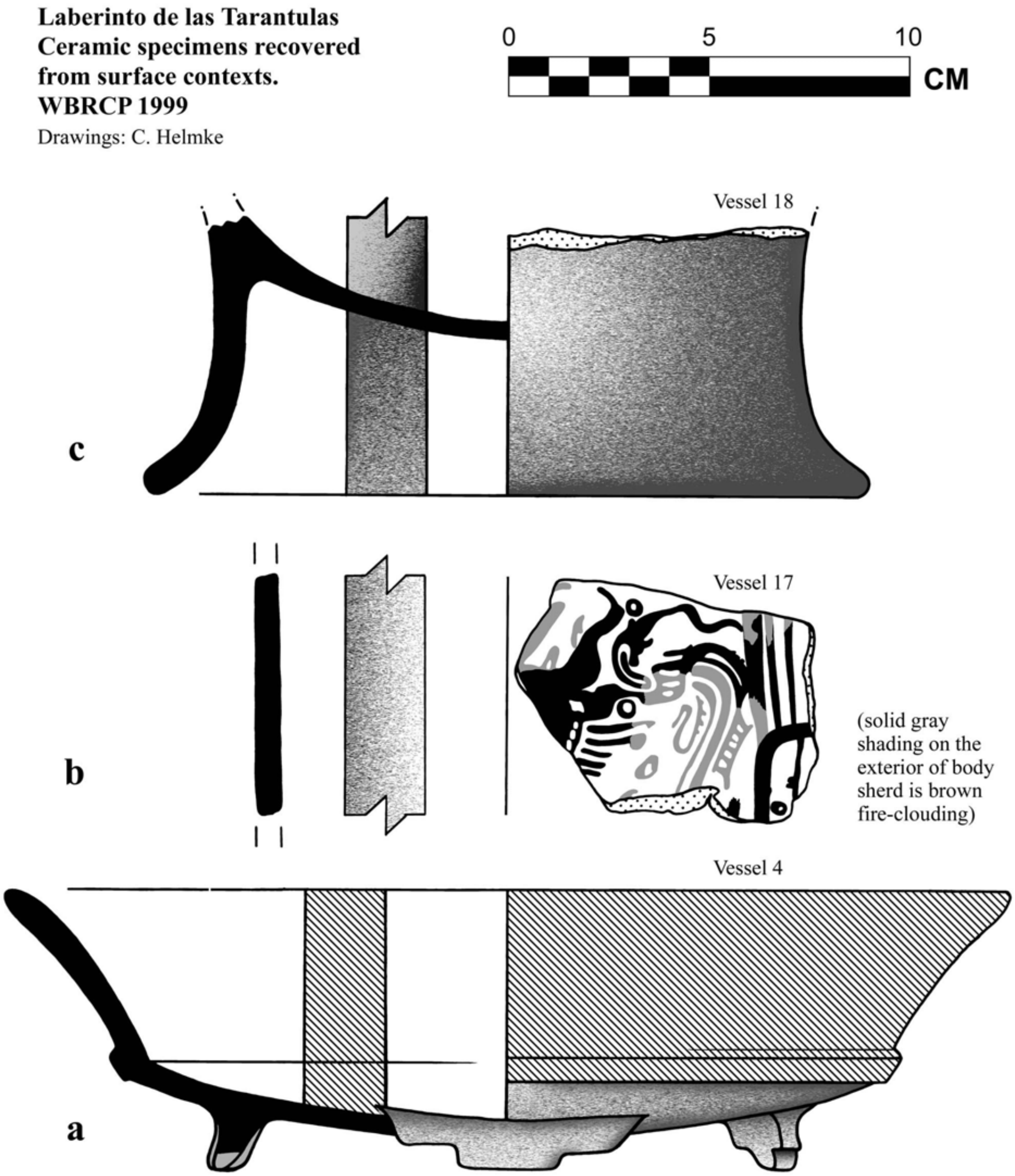

Figure 2: (a) Fragmentary Tinaja Red: Tinaja Variety tripod dish; (b) body sherd of a Cabrito Cream Polychrome vase; (c) highly eroded brown ware pedestal base, possibly Roaring Creek Red: Kanaan Variety.

lip. Base below basal break is concave (sub-spherical). At medial/basal break is a squared ridge 0.7 cm high running along the entirety of the vessel. Wide (ca. 6.2 cm), short (ca. 1.2 cm), and stocky tau-shaped supports uphold the bowl. Although only one support is preserved, the foot scar of a second is also present on another sherd. Configuration of these two supports indicates that three supports were present. Rim diameter = 24.9 cm. Maximum height excluding feet = 6.2 cm; including feet = 7 cm. Thickness of rim and sides ranges between 0.55 and 0.50 cm. Thickness of base ranges between 0.35 cm (near basal break) and 0.50 cm (near center).

Modal Comments: The rim of the vessel, with the ridge, is reminiscent of late Tiger Run Mountain Pine Red dishes and early Spanish Lookout Roaring Creek Red dishes. When one considers the transitional specimens recovered at Pook's Hill and Altun Ha (Helmke notes, Feb. 1998, R.O.M.) these similarities become more evident. If one examines the rim sherds of the Tarantula specimen without articulating the basal fragments, the rim sherds could easily have been misidentified as a Late Mountain Pine Red dish, or a transitional specimen between Mountain Pine Red and Roaring Creek Red. Greater care must be exercised during the re-examination of similar sherd material from other contexts in the Roaring Creek Valley.

The curvature of the rim is not perfectly circular but otherwise the vessel is skillfully produced. The tau-shaped feet appear to have been hastily applied. The process is clear: a thin slab support was appliquéd to the base, the juncture extensively blended onto the base, then a hard, sharp tool was used to cut out the lower corners of the tau. Joseph Ball suggests that tau-shaped supports are added to Tinaja Red vessels after A.D. 830 (personal communication 1998).

Surface: Interior is completely slipped although much of the slip from the interior base has eroded. This suggests that the slip was applied more thinly there, or that the dish was used as a "grinder bowl." The exterior is slipped from the ridge (inclusive) upwards to the rim, while the base below the ridge is unslipped. Many smoothing lines and small striations (possibly temper drag marks of small inclusions) are apparent on the base. These run parallel to the curvature of the base, suggesting these were produced during the smoothing of the base. A few small blotches of slip are present on the exterior base. These appear to be accidental as there is nothing to suggest that the base was completely slipped. This is noteworthy since the specimen is very well preserved. The feet appear to have been appliquéd after the extensive smoothing of the base. This comment is based on the observation that the distribution of the clay from the blending of the support onto the base during the appliquéing process covers the smoothing marks of the base. Crazing does occur but only on the lower half of the rim's interior. Slip is very glossy and somewhat "velvety" to the touch. Near the rim on the exterior, the slip has fired to a light brown, possibly a result of a firing accident or unequal firing temperatures. This characteristic occurs frequently on Mountain Pine Red vessels in the Roaring Creek Valley. This is surprising as one would expect the slip of the Tarantula specimen to be more similar to that of Roaring Creek Red than its antecedent Mountain Pine Red.

Paste: Fine-to-medium textured paste. Minute calcite inclusions predominate and occur throughout the entire length of the body profile. White anhedral quartzite is present but rare (largest inclusion measures 0.1 x 0.125 cm). Also infrequent, but in higher proportions, are small hematite nodules that measure on average 0.05 cm in diameter. The largest calcite fleck noted is 0.075 cm in diameter. The paste resonates as a high tone "clinky."

Intersite Comparison: Of interest are the similarities that this specimen shares, in terms of modal attributes, with transitional Mountain Pine to Roaring Creek Red specimens from Altun Ha and overall similarities to the slip of Mountain Pine Red. Near-identical specimens to those recovered from Tarantula cave were recovered from Altun Ha's Str. E-14 (Pendergast 1990:143, Fig. 64b) and Str. F-8 (Helmke notes, Feb. 1998, R.O.M., Lot RP 296). These specimens date to the Terminal Classic and all associated vessels date to the Late to Terminal Classic. Vessels with an identical body profile and vessel shape, but with short oven feet instead of the tau-shaped slab feet occur in the Achote Black type at Tikal (Culbert 1993:Fig. 98b, 98c2). These are dated to the Eznab Complex A.D. 850-950. Thus the temporal placement is secure. It is possible that these specimens demonstrate modal carry-overs from Tepeu 1, though more extensive comparative research will be required to support this idea.

Vessel 17, Stela Chamber (along northwest wall)

Type:	Cabrito Cream-polychrome: Cabrito variety
Group:	Palmar Group; Zacatel "Series"
Ware:	Peten Gloss
Complex:	Spanish Lookout
Established:	Cabrito Variety of Zacatel Cream-polychrome was established by Smith and Gifford 1959. Based on the identification of a large and distinct assemblage of Cabrito variety ceramics from Buenavista del Cayo and surrounding sites, Ball has offered Cabrito Cream-polychrome as a type designation (e.g. Ball 1993:250).
Sphere:	Tepeu
Dating:	ca. A.D. 700 - 900
Sherds:	2
Illustration:	Figure 2b

Form: Apparently cylindrical vase. Diameter is ca. 12.4 cm. Thickness ranges between 0.5 cm at the top and 0.6 cm at the base. Base or rim fragments not recovered.

Modal Comments: Although no fragments of the base have been recovered the majority of these vases have flat or nearly flat bases. Complete specimens retrieved from the palace structure at Buenavista del Cayo indicate that the orifice of cylindrical Cabrito vases constrict slightly and thus rims are slightly incurving (Ball 1993:Fig. 5).

Surface: Interior was only roughly smoothed and is unslipped. The exterior is extremely well burnished. A thin white clay wash underlies, the cream slip. Black designs were subsequently painted onto the cream slip. All painted designs appear to have been applied when the cream background slip was still wet, as can be seen from the blurred and lightly bleeding edges between the cream and black slip. The black slip has fired to a dark brown in two distinct patches, resulting in two color-combined clouds. These appear to be the result of the firing process. It is unclear whether this was intentional, but it seems to be accidental as the clouding does not follow the design and affect multiple designs.

The upper left hand corner (as drawn) of the second sherd is charred. Whether this is modern or ancient is unclear. It may be ancient as no evidence of recent fires was documented in the vicinity of the cluster from which the sherd was retrieved. In addition, apparently ancient charcoal flecks were noted littering the floor of the Stela Chamber and the Upper Passages, the latter being completely undisturbed at the time of discovery (Helmke et al. 1999).

Decorative Scene: The scene appears to represent the uppermost portion of a headdress with plumage extending from the left to the right, suggesting that the individual once portrayed may have faced to the left. The headdress is similar to the one worn by 18 Rabbit on Stela A (Mon. CPN 1) at Copan (Baudez 1994:Fig. 4b). The stela was dated to A.D. 731 (Baudez 1994: 19) a date congruent with that of the ceramic specimen. The headdress is also superficially similar to the one worn by the GI figure depicted on as fragmentary Chinos Black-on-cream vase from Buenavista del Cayo (Ball 1993:Fig. 7b).

Paste: Paste is very fine and ash-tempered. Minute calcite inclusions present, although they figure very low in numbers. The paste is fully oxidized throughout and is a light tan color, the same as the base color exposed on the exterior (below slip, below wash) and as the unslipped interior. No inclusions of notable size were seen and thus the paste appears to be predominantly ash-tempered. Although the surfaces are a little friable the paste is hard when compared to the pastes of British Honduras Volcanic Ash.

Intersite Comparison: The related Zacatel Cream-polychrome type, is represented solely by four sherds at Barton Ramie (Gifford 1976:251). Although all these sherds were identified as calcite-tempered, Ball identifies a variety of Zacatel based on Becan materials that is ash-tempered (Ball 1973:162-163). In terms of paste and surface treatment attributes, a similar specimen was recovered in a surface context from the Hideaway Chamber in Actun Tunichil Muknal (Griffith 1998:Fig. 4b). This specimen was also identified as a Cabrito Cream-polychrome (Joseph Ball, personal communication 1998).

Ball has argued that Cabrito Cream-polychrome can be used as an effective status indicator since he notes that sherds of this type "appear to be all but absent from lower-order settlement units such as rural plazuela groups, patio groups, and isolated mounds, and indeed may prove to be entirely missing from such contexts" (Ball 1993:250). Consequently Ball has suggested that the presence of Cabrito Cream-polychrome ceramics can be used to assess the presence of individuals of royal or exalted status (Ball 1993:250; Ball, personal communication 1998). Following on this suggestion the distribution of this material in the Roaring Creek Valley needs to be assessed prior to full endorsement of this interpretation. The Cabrito specimens in the Roaring Creek Valley have been found at Tarantula as well as in

Actun Tunichil Muknal (Griffith 1998:Fig. 4b) and in an on-floor deposit of the special function Structure ATM-M1, located at the mouth of Tunichil Muknal (see Song, Zubrzycki and Helmke, this volume). Since these specialized contexts cannot adequately be used to indicate the status of the ancient cave users, the data from settlement sites must be relied upon. It is hoped that the excavations of the Pook's Hill plazuela may shed some light on the Cabrito Cream-polychrome question in the Roaring Creek Valley (see Helmke, this volume).

Vessel 18, Passage 6 (along northern wall)

Type:	Unidentified. Possibly Rubber Camp Brown: Unidentified Variety
Group:	Dolphin Head Ceramic Group
Ware:	Unidentified brown ware, related to Pine Ridge Carbonate. Based on cross-section and ware this base could have been derived from a Late Classic III Rubber Camp Brown dish.
Complex:	Spanish Lookout
Established:	Gifford 1976: 233-235, Fig. 143.
Sphere:	n.a.
Dating:	ca. A.D. 850 - 1000
Sherd:	1
Illustration:	Figure 2c

Form: Pedestal base of a dish. Max. base radius: 9 cm, max. height of base: 6.5 cm, with concave base. Thickness of the pedestal is fairly uniform ranging between 0.65 cm (base) and 0.80 cm (top). Base is very uneven and thickness ranges between 0.35 cm and 0.55 cm.

Modal Comments: If size/height of pedestal bases are any indication of the time period during which a vessel was produced, then this specimen is considerably late, possibly transitional Terminal Classic to Early Postclassic (A.D. 850 - 1000) (cf. Graham 1987: 78). This specimen may only be superseded, among all other known specimens in the Roaring Creek Valley, by the pedestal bases in the Main Chamber of Actun Tunichil Muknal, and by a Lamanai-style Buk Phase (ca. A.D. 1100 - 1300) incised red ware censer that is allegedly from the entrance to Actun Yaxteel Ahau (Awe and Helmke, this volume).

Surface: The interior and exterior are both unslipped, and light tan, verging even on a light pink. Nonetheless a "brown ware" specimen as pointed out by Joseph Ball (personal communication 1998). He is reluctant to assign it to a particular type but agrees that the base falls squarely in the Terminal Classic (A.D. 850 - 1000). The surfaces are very hard and the paste is oxidized throughout. The center of the paste is gray-tan, while the exterior and internal bands are tan-pinkish. Paste is fine textured and very few inclusions are larger than 0.05 cm in diameter. The surfaces are extremely well burnished. The exterior is very smooth with many smaller (< 0.05 cm) calcite inclusions appearing on the surface. The interior shows horizontal smoothing marks, but all is well executed. One hematite nodule (> 0.075 cm) can be seen protruding out of the interior surface (approximately halfway up the base). The paste of the sherd is "clunky."

Intersite Comparison: This specimen is similar in form to the two red/orange slipped pedestal bases documented near Skeletons 2 and 3 in the Main Chamber of Actun Tunichil Muknal. Having seen the Buk phase censer from Actun Yaxteel Ahau I would be inclined to suggest that high pedestal bases with deeply concave bases may represent the remains of simple slipped or unslipped and non-decorated Vaca Falls type censers with Buk/early facet of New Town ceramic affiliations (see Gifford 1965:Figs. 321, 232). Gifford (1965:373) indeed notes that the Roaring Creek Red and Vaca Falls Red types occur predominantly during the last facet of the Spanish Lookout, which he associates with San José V (A.D. 800 - 900). The base of the Tarantula specimen is, however, not as deeply concave as the Buk specimen documented. Conversely it is very similar to Roaring Creek Red dishes with high pedestal bases from Actun Polbilche and Altun Ha (i.e. Pax/Kayab phase red ware basins). In the case of the Polbilche specimen the sides of the pedestal are not everted, nor is the lip rounded and outwards flaring. The Polbilche specimen has rounded sides with flat and squared lip. Despite the differences in morphology of the pedestal base cross-section, the depth of the base and the manner in which a Roaring Creek Red rim would articulate with the Tarantula base, suggests that the base was that of a dish. Note for example the similarities to the two Roaring Creek Red dishes with high pedestal bases from Altun Ha (one with a black painted rim from Str. C-10, the other from Str. E-7) (see Pendergast 1982:93c; 1990:Fig. 46j).

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A REPORT ON THE 1999 EXCAVATIONS OF STRUCTURE ATM-M1 IN THE CAHAL UITZ NA PERIPHERY, ROARING CREEK VALLEY CENTRAL BELIZE

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INTRODUCTION

Continuing in its goal to assess the significance of caves to the spiritual and social landscapes of ancient Maya, the Western Belize Regional Cave Project (WBRCP) undertook excavations of a surface structure (Str. ATM-M1) near the eastern entrance of Actun Tunichil Muknal in the Roaring Creek Valley, central Belize (Figure 1). Due to the close proximity of this structure at the Roaring Creek field camp to Actun Tunichil Muknal, an artifact-laden wet cave previously investigated by the WBRCP (see Awe 1998; Gibbs 1998; Griffith 1998; Helmke et al. 1998), excavations were undertaken to ascertain any possible relationships between the structure and the cave. This paper discusses the results of such excavations and puts forth possible functions for Structure ATM-M1 and its construction history.

Previous reconnaissance and excavations in the Roaring Creek Valley by the WBRCP have provided significant data about Maya cave use in the Classic period (see Awe 1998; Awe et al. 1998). Principally, work at Actun Uayazba Kab, Actun Yaxteel Ahau and Actun Tunichil Muknal have produced evidence suggesting who might have used the caves, the nature of activities that occurred within them, and the time periods of cave use. In addition, reconnaissance during the last four years led to the rediscoveries of a cave, Actun Nakbeh, and a substantial surface site, Cahal Uitz Na (Awe and Helmke 1998; Conlon and Ehret 1999), located only 500 meters from the eastern entrance of Actun Tunichil Muknal (see Figure 2). Actun Nakbeh is notable for being situated at one end of a 250-metre sacbe that leads directly to Cahal Uitz Na (Figure 2).

In 1996, it was noted that there were numerous structures in the immediate vicinity of the eastern entrance to Actun Tunichil Muknal (see Figure 3) (Awe et al., 1998). In particular, a substantial structure measuring 2 meters high was located approximately 20 meters North Northwest of the cave entrance and 500 meters west of the Cahal Uitz Na site core (Figures 2 and 3). In order to assess the function and possible relationship of this structure to Actun Tunichil Muknal, excavations were carried out during the 1999 field season. Structure ATM-M1 ceramics were analyzed by C. Helmke, forming the basis for a

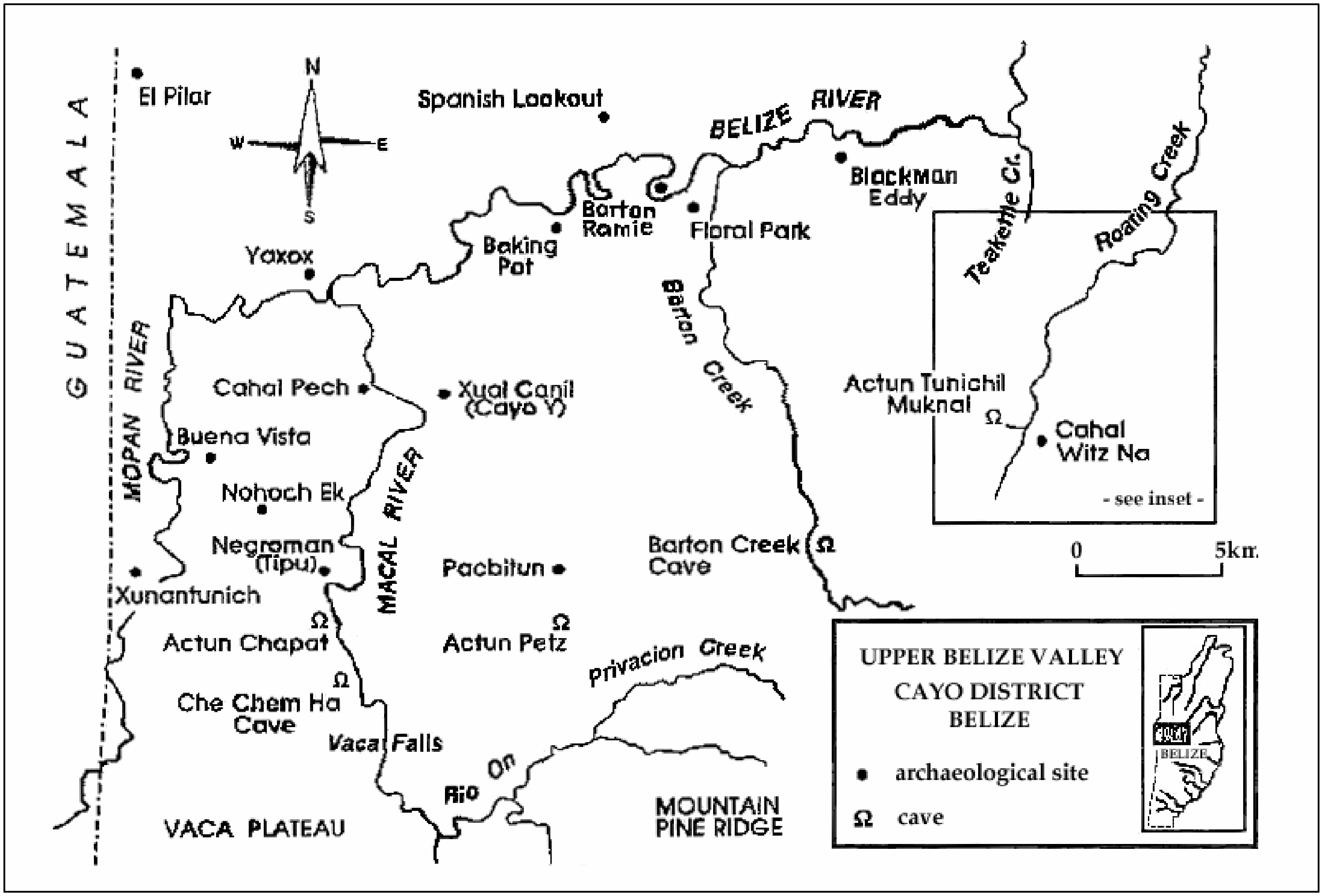

Figure 1: Map of the Upper Belize Valley indicating the Roaring Creek Region.

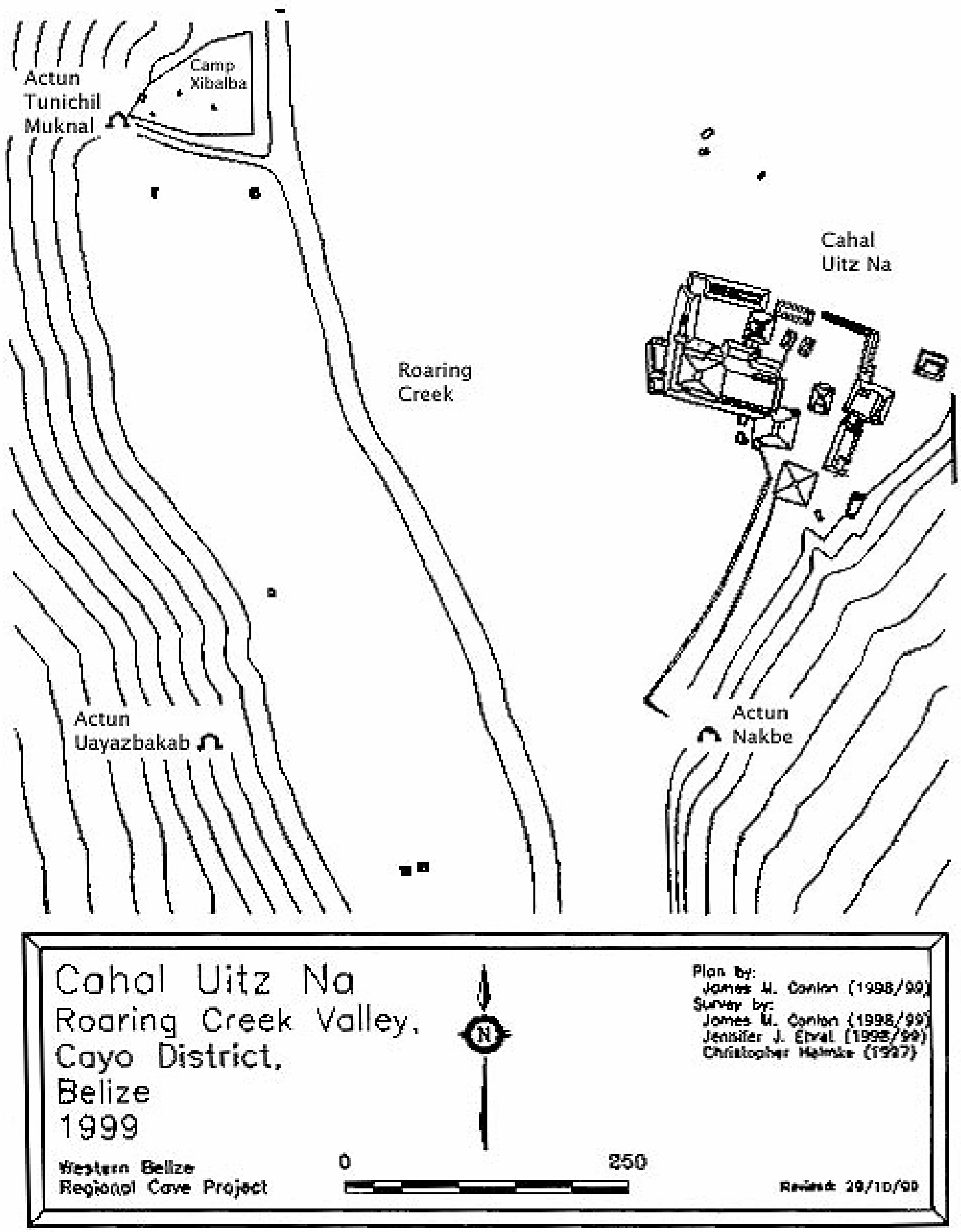

Figure 2: Map showing Actun Tunichil Muknal in relation to Cahal Uitz Na.

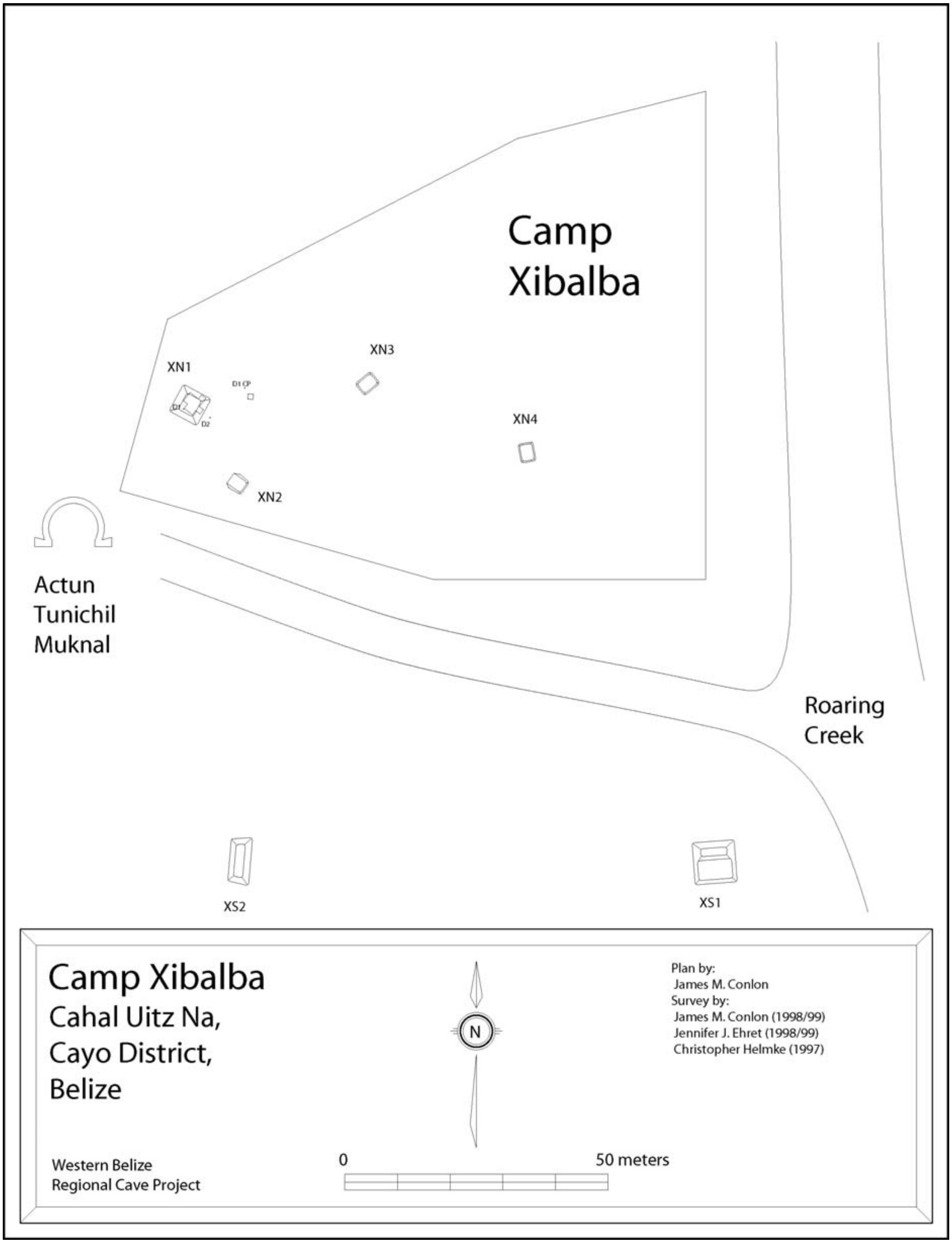

Figure 3: Map illustrating mounds outside eastern entrance of Actun Tunichil Muknal and Roaring Creek.

chronology of the structure. It should be noted that prior to assigning a designation for the structure in line with the WBRCP system of nomenclature, structure ATM-M1 was referred to as Structure XN-1.

DESCRIPTION

To our knowledge, Structure ATM-M1 exists within a settlement of at least six low mounds located east of Actun Tunichil Muknal, between steep mountainside and the flood zone west of the Roaring Creek (Figure 3). (Importantly, however, as an intensive survey of the immediate vicinity of Actun Tunichil Muknal [i.e. the Cahal Uitz Na periphery] has not been completed, the full nature of settlement in this area is unknown). Excluding Str. ATM-M1, identified mounds are low platform in type, i.e., less than 1 meter high, and thus, presumably, household structures. They are all located within 100 meters to the east of Str. ATM-M1, but there is no distinct pattern to their orientation (Figure 3). On the southern side, 70 meters away from the eastern entrance to Actun Tunichil Muknal, there is another mound (Str. ATM-M2) that appears to be the same size as Str. ATM-M1.

Structurally, the mound resembles a large rectangular residential platform (Figure 4). However, due to its proximity to Actun Tunichil Muknal, and its relatively larger size compared to other mounds in the vicinity, it was also hypothesized that Structure ATM-M1 may have served some "special" function associated with the cave. Thus, initial research questions revolved around the mound's function: whether it was residential, or "special-function", i.e., ritually-oriented.

In total, Structure ATM-M1 is approximately 2 meters high, although base-to-platform heights vary due to differential terrain and utilization of the natural environment (Figure 5). It is located on a natural, elevated outcrop of bedrock that positions it above the entrance of the cave. In this way, the structure is opportunistically built on, and against, the natural slope of the mountainside. Lengthwise, it is aligned 10 degrees east of True North, and it is lined up with the eastern entrance of Actun Tunichil Muknal. Prior to excavation, the top platform measured 2.5 meters long (north-south) by 1.9 meters wide (east-west). The base of the mound, lengthwise, measures 8.2 meters from northwest to southwest, and 7.8 meters from northeast to southeast, while widthwise, it is 4.16 meters (north west to north east) and 4.69 meters (south east to south west), respectively. Variations in base dimensions are attributed to differences in terrain, bioturbation, as well as post-abandonment rockfall from the mountainside.

Prior to excavations, the structure was densely obscured in vegetation and undergrowth, with large fallen trees atop. Significantly, the structure had no signs of looting. However, there was significant evidence of bioturbation, particularly alteration of the eastern, or "front", side of the mound by large ceiba tree roots, which affected one quarter of the mound.

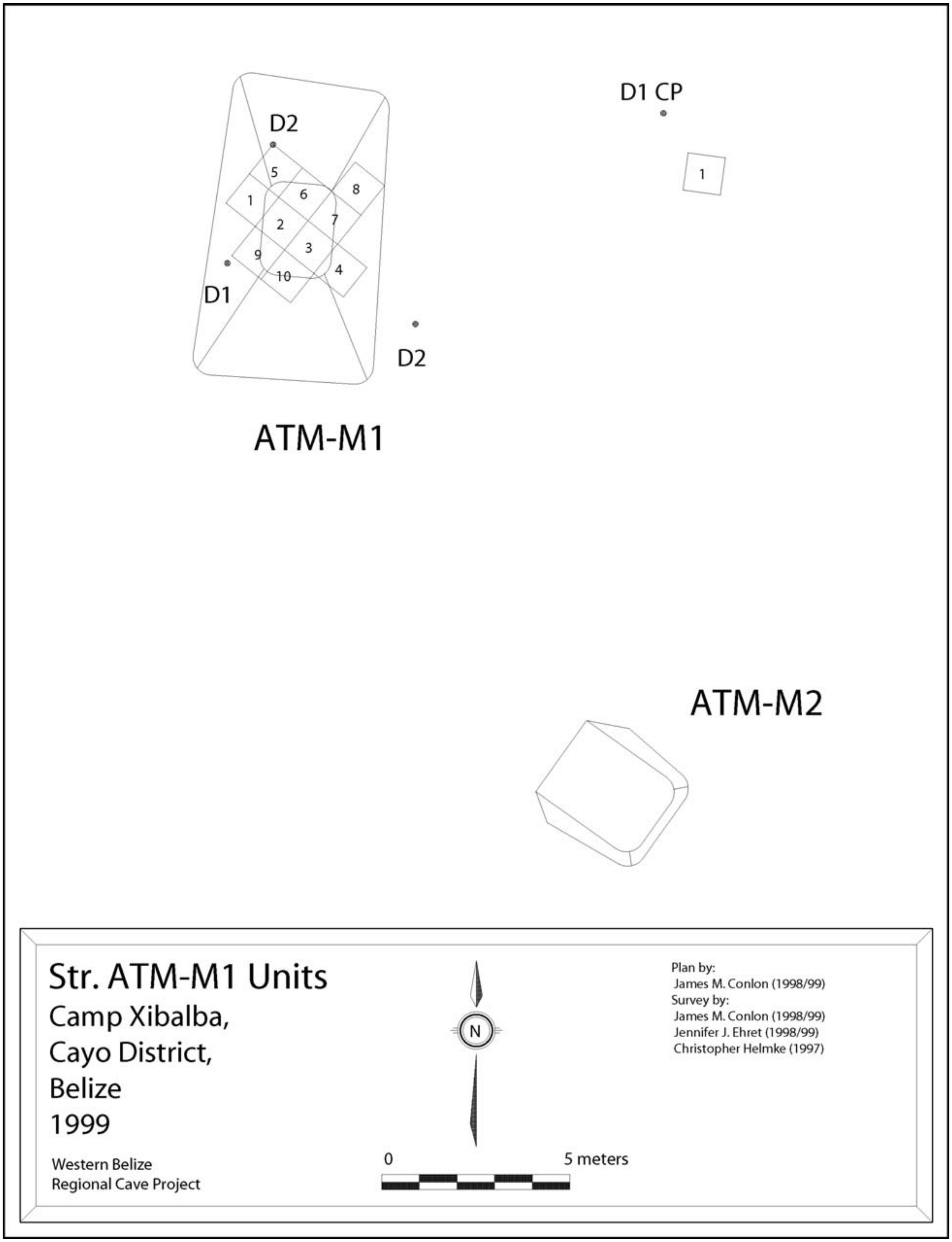

Figure 4: Map illustrating Str. ATM-M1, excavation units and datums.

EXCAVATIONS

In order to get a good perspective of construction phases and chronology, a 1 x 4 meter trench was initially established for Str. ATM-M1. This trench generally bisected the long axis of the structure and ran west to east, from the back slope (closest to the mountainside), across the top platform, and halfway down the front slope (Units 1A, 1B, 1C, 1D) (see Figure 4). However, once we reached the bottom of Level 2 in Units 1B and 1C, the original trench was extended northward in order to completely record and collect a ceramic deposit discovered in the central area of the structure (described in detail below). To continue uncovering architectural features, additional 1 x 1 meter extensions further to the north, as well as south, were excavated (see Figures 4 and 7).

All architectural walls and front steps were left intact throughout excavations. To recover earlier stages of construction, only excavations within the superstructure and platform, i.e., through floors, were undertaken. Levels were demarcated according to natural and cultural distinctions, and six levels were identified, extending to two meters below surface (see Figure 6).

All excavated matrix and fill was sifted through ¼ inch wire screens to ensure as complete a recovery of artifacts as possible. The artifacts were divided into four broad categories: ceramic, lithic (any object of stone/mineral content that is a product of human manufacture or usage), fauna (unmodified bone and shell) and "special finds". Including whole vessels and formal tools, "special finds" are also those artifacts considered "unusual, exotic, or rare, either based on artifact type or material composition" within the Maya material culture corpus (Song and Dickau 1995: 219). According to established BVAR guidelines (see Song and Dickau 1995), "special finds" are divided into material categories such as (modified) bone and shell, ceramic, greenstone/jade, lithic (including quartz, hematite and pyrite), obsidian, and slate. In addition to these artifacts, carbon and matrix samples were also collected from various contexts. Detailed descriptions of the excavations follow below.

Surface

Surface dimensions of the mound are illustrated in north-south and east-west profiles (Figure 5). As stated above, Structure ATM-M1 appears to have been built on top of a natural incline at the base of the mountainside. This accounts for differences in slope between the eastern ("front") and western ("back") sides of the mound, as well as a steeper and greater height on the southern side (facing the cave entrance) compared to the north, which slopes toward the camp plaza. Attesting to the very good condition of the structure, despite jungle overgrowth, numerous cut stones representing the terminal architecture (low superstructural walls) were apparent on the surface. A substantial quantity of smaller uncut limestone and river cobbles were also evident across the entire mound. These are presumably the remains of collapsed daub walls, in addition to rockfall from the mountainside.

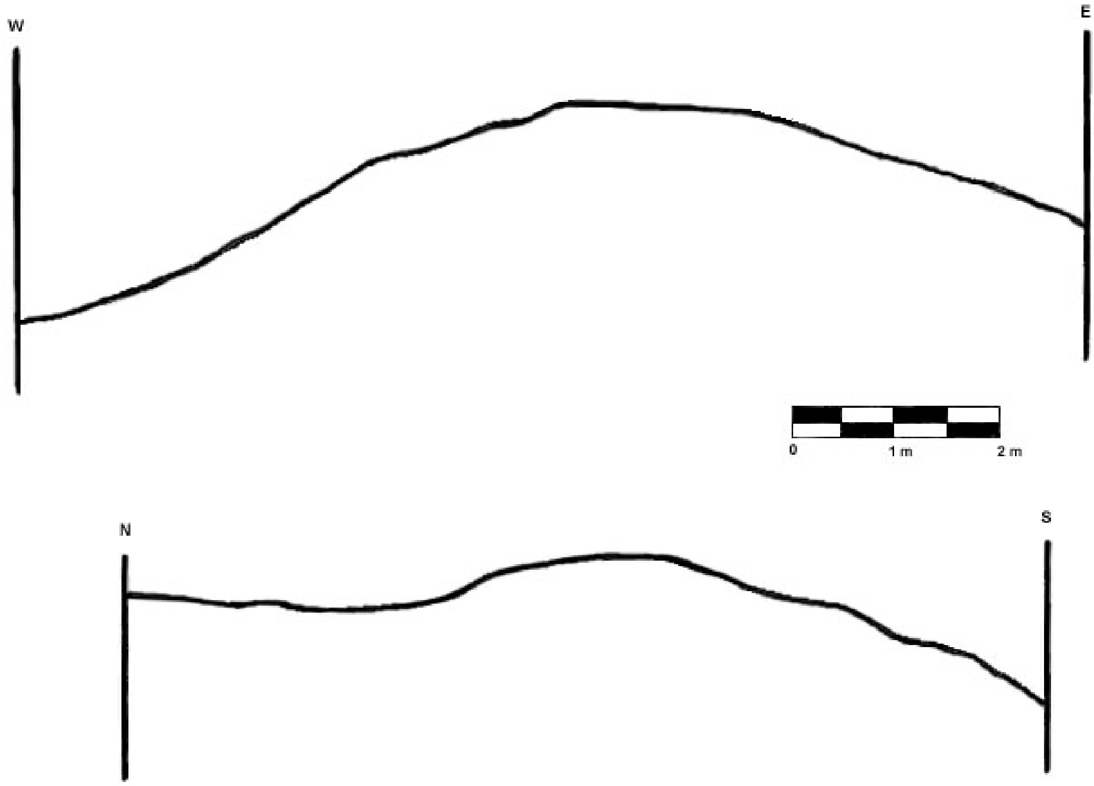

Figure 5: North-South and East-West profiles of ATM-M1 surface dimensions.

A surface search of Str. ATM-M1 produced half a quartzitic mano fragment (RR99-L-003); a modified piece of slate measuring 12.8 x 7.8 x 3.4 cm (RR99-SL-002); and a slate slab propped erect against tree roots to the east. The slate slab is 30 cm at its widest point, 33 cm at its greatest length, and 3.5 cm thick. Measurements are generally uniform for the slab, which appears to be the result of human modification, and thus, the artifact can be identified as possibly being a burial capstone (more likely) or an uncarved stela fragment.

Level 1

Level 1 consisted of a humus layer of decomposed vegetation and underlying rocky collapse. The first 5 cm of matrix was a loose brown soil, while from 5 to 20-25 cm, the soil was generally red brown with elements of clay. In total, brown and red-brown soils made up 30% of the matrix composition. Approximately 70% of Level 1 were the remains of collapsed terminal phase architecture and it was composed of rocks measuring 3 to 10 cm in diameter. This rock component included degraded limestone, river cobbles, slate fragments and ballast-size rocks.

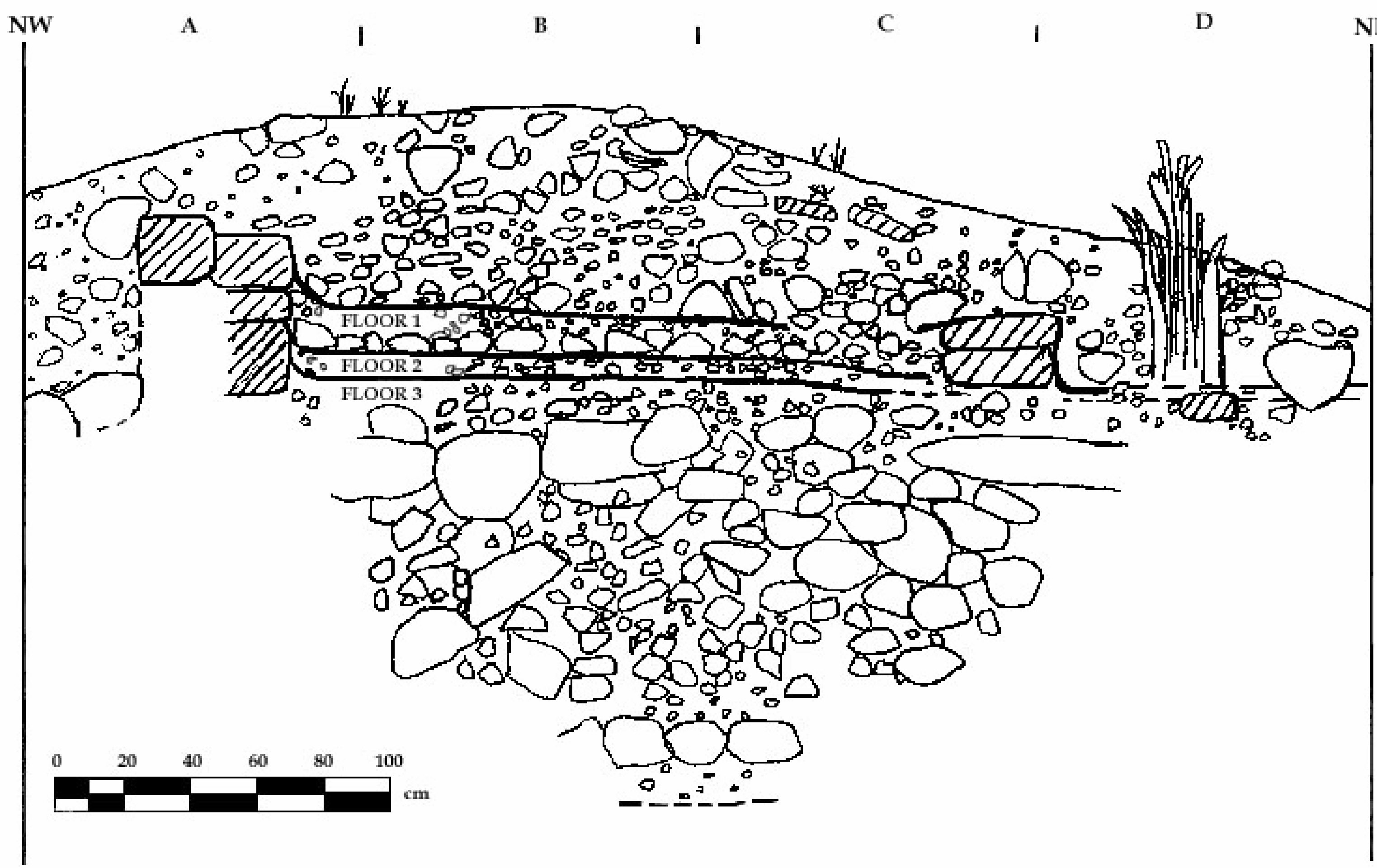

Figure 6: North profile, illustrating all six levels and extent of excavations.

Artifacts from Level 1 include: 180 ceramic sherds (12 rim sherds, 160 body sherds), 6 lithics (4 chert flakes, 2 slate flakes/chips), 1 ovoid chalk (soft limestone) ball, 4 faunal remains (freshwater *jute* snails, or *Pachychilus indiorum*) and 5 special finds. These particular artifacts include 1 mano fragment (RR99-L-004), 1 modified slate fragment (RR99-SL-003) and 3 obsidian blade fragments (RR99-OB-004/005/007). Although artifacts were found throughout all units, more than 50% were concentrated within units 1B, 1C, 2B and 2C, including all of the special finds. This simply corresponds to the central region of the structure, where there was no architecture except floors, and thus, more fill.

Notably, a molded carved ceramic sherd was found in Unit 1C at this terminal phase. Examination of this dark red slipped sherd with basal molding suggests that it belongs to a transitional Terminal Classic / Early Postclassic molded-carved vase (A.D. 850-1000). Thus, the most recent stratigraphic layer of Structure ATM-M1 dates to later than A.D. 850. This post-A.D. 850 date represents the period of post-abandonment, as abandonment of the structure probably occurred soon after the deposition of the ceramic cache on Floor 1 in Level 2 (see below).

According to Helmke (this volume), the presence of a molded-carved sherd at this level suggests that the structure was abandoned before the Stelae Chamber of Actun Tunichil Muknal became an important locus of ritual activities. This is based on the fact that a nearly complete molded-carved vase was found in the Stelae Chamber 250 meters from the eastern entrance of the cave in 1997 (see Helmke et al. 1998).

Level 2

The matrix of Level 2 predominantly consisted (80%) of larger cut and uncut limestone rocks and river cobbles measuring 10 to 20 cm in diameter, which appeared to be more abandonment collapse; 15% red brown soil with elements of clay; and approximately 5% loose red brown soil in the lowest 5 cm (above Floor 1). This level generally ranged from 20 to 61cm below surface across excavation units.

At this level, terminal phase architecture became more apparent, with the eastern superstructural wall identified first, followed by the western side, then northern and southern walls. Toward the bottom of this level, in the centre of the structure, a large concentration of ceramics was encountered lying on the terminal floor (Floor 1). This deposit, Feature 99-1, is discussed further below.

Excluding the finds from Feature 99-1, artifacts recovered from Level 2 consist of 480 pottery sherds (50 rim sherds, 430 body sherds), 6 lithics (2 large flat slate fragments, 2 chert flakes, 1 chert fragment with possible heat cracking and a small chert block) and 5 *jute* snail shells. Special finds from this level, outside of Feature 99-1, include 1 cut and polished small mammal bone bead (RR99-B-001) (see Figure 12a), 2 mano fragments (RR99-L-005/007), 1 metate fragment (RR99-L-010), and 1 clear crystal fragment (RR99-QZ-002). Carbon was also collected from a small concentration above and east of the level of Feature 99-1 (RR99-C14-002), as well as from a 6 to 8 cm wide deposit above Floor 1, 65 cm east of the feature (RR99-C14-002/003) (see Figure 8).

In Unit 2B, remnants of red specular hematite (RR99-HEM-001) were identified on several patches of Floor 1 plaster, located 10 cm from the northern interior partition wall (Figure 7). This glittery silver and red hematite, which was evident across an area roughly 10 cm wide, was clearly painted and incorporated into the plaster surface of the floor, as opposed to being a deposit of crushed hematite residue. Poor preservation of the terminal phase floor and proposed lengthy duration (see below) seem to account for the limited presence of hematite paint on this floor.

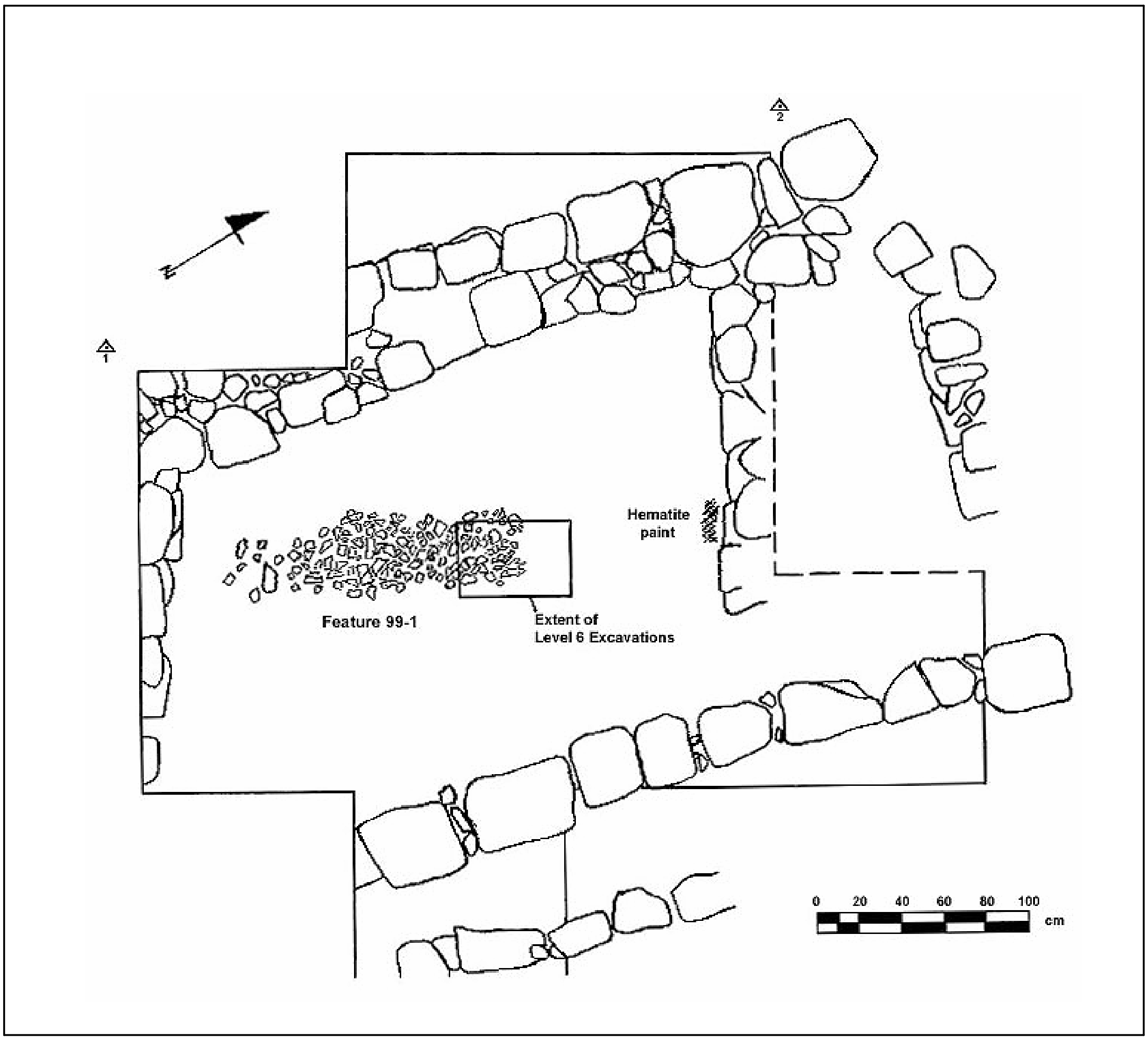

Figure 7: Top plan of entire excavated structure (ATM-M1).

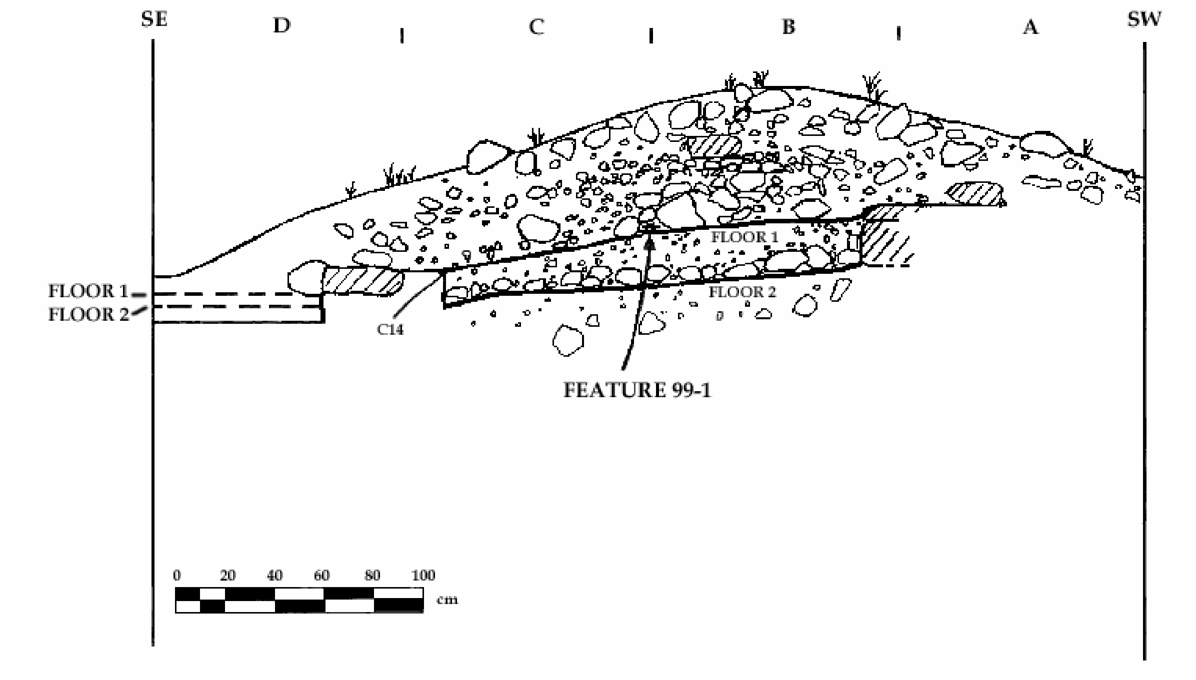

Figure 8: South Profile illustrating Feature 99-1, Floors 1 and 2 and C-14 deposit.

Feature 99-1

Based on the nature of Feature 99-1, this artifact cluster is considered the remains of an open-air "termination deposit" or "termination cache" (see Awe 1992; Garber 1989; Schele and Freidel 1990; Schele et al. 1993). Overlying most of the feature was a layer of rocks measuring 10 to 35 cm in diameter. The feature is distinguished as a concentration of mostly ceramic sherds along the primary axis of Structure ATM-M1 (Units 1B/C, 4B/C) on Floor 1, which represents the terminal phase architecture (see Figure 7). In total, 375 ceramic sherds were densely concentrated in an area roughly 130 x 40 cm in area (0.52 m^2), and approximately 5 cm thick in cross-section (see Figure 8). Most sherds were found conjoined and lying directly on the plaster floor surface. In addition to ceramics, Feature 99-1 also contained a 90% complete chert biface (RR99-L-009) (Figure 12b), 1 *jute* and 6 miniature (land?) snails (*awaiting ID*). Matrix from this deposit (RR99-MTX-001) was also collected for future paleobotanical analysis, which might enhance interpretations of the nature of the deposit.

During excavations, the feature was notable for having several large pieces of a polychrome tripod dish (16 sherds) (Figure 9). This ash ware vessel (RR99-C-001) is a Cabrito Cream-polychrome plate dating to the Late Classic period and it is noteworthy for several reasons. First, the interior walls of the plate were likely painted with a fully viable Primary Standard Sequence (PSS), although only two glyphs have been recovered. Of these,

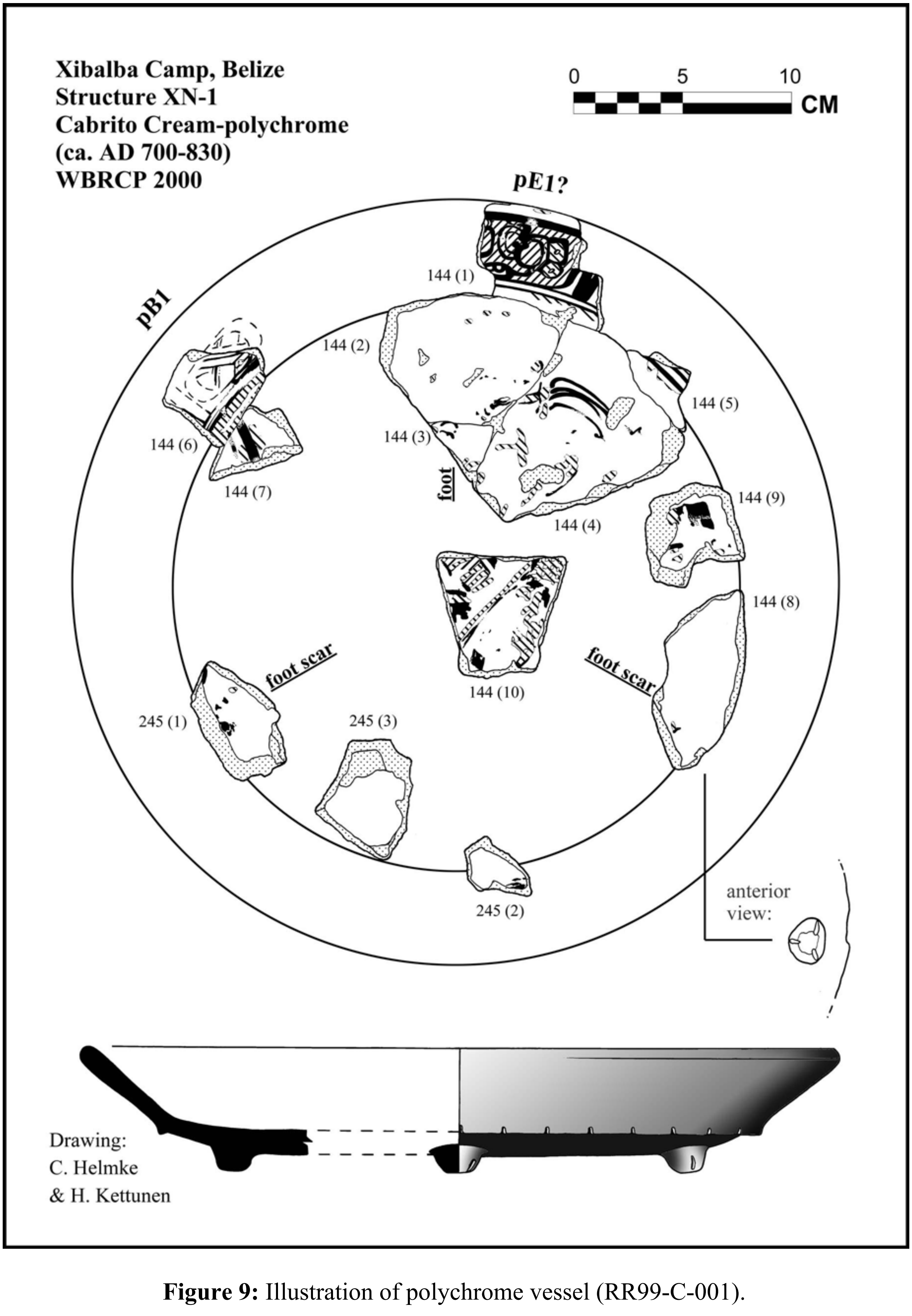

Figure 9: Illustration of polychrome vessel (RR99-C-001).

only one is fully preserved, that of a leaf-nosed bat (Figure 10). As Helmke (this volume) points out, PSS texts that include leaf-nosed bat are associated with Uaxactun-style vessels and Ik'-style vessels of the Motul de San Jose area.

Of further significance, this vessel with a bat image represents the only known fully viable glyph found in the Roaring Creek Valley (Helmke, this volume). According to Helmke, these two facts, in addition to the plate's cross-section and McRae Impressed type basal ridge, suggest a strong Peten influence or place of manufacture, and possible importation of the vessel into the Roaring Creek Valley.

Figure 10: Leaf-nosed bat glyph from Vessel RR99-C-001 (Feature 99-1).

All told, diagnostic sherds from Feature 99-1 represent the remains of at least 6 vessels and 3 isolated sherds. These include 2 fragmentary Dolphin Head Red bowls and sherds of other or another bowl; 1 Dolphin Head Incised dish; 1 fragmentary Rosario Incised dish; 1 Cabrito Cream-polychrome plate; and at least 1 neck of a Cayo Unslipped olla. Isolated sherds were represented by 1 Garbutt Creek Red bowl sherd, 1 Rubber Camp Brown bowl sherd, and 1 Belize Red dish sherd. Since this deposit precedes the deposition of Level 1, it can be assumed that Feature 99-1 was deposited prior to A.D. 850 (i.e., A.D. 800), the lowest range of time to which the molded-carved type (in Level 1) can be dated (Helmke, this volume). Level 2 can generally be dated to around A.D. 750.

Notably, these vessel types contrast with most Late Classic ceramics found in caves throughout the Roaring Creek Valley, including Actun Tunichil Muknal (see Helmke et al. 1999). In particular, the ceramic assemblage of Feature 99-1 lacks the unslipped jars and deeply incurving bowls that typify cave ceramics (Helmke, this volume). The Peten-influenced Cabrito Cream-polychrome vase and Rosario Incised dish further distinguish this collection from cave ceramics. Thus, ceramic evidence leads Helmke to conclude that the remains of Feature 99-1 are probably not ritual in nature, as dissimilar ceramic material deposited in Actun Tunichil Muknal have been interpreted to be the remains of ritual activities (Awe 1998). Instead, Helmke suggests that Feature 99-1 resembles an on-floor de facto refuse midden, rather than a “termination deposit” or “cache”, which reflects ritual behavior. He further suggests that the ceramics may have been used as serving vessels for a meal or a feast.

Alternatively, we categorize Feature 99-1 as an open-air “termination cache”, based on several reasons. These include its location directly on the terminal floor, which was distinctively decorated with specular hematite; the dense concentration of ceramics in a delimited central area of Str. ATM-M1; lack of significant non-ceramic “refuse” material; inclusion of a Cabrito Cream polychrome tripod dish with glyphic text; and finally, its deposition in a structure which appears to be non-residential in nature. Further analysis of this feature is elaborated in the Discussion section below.

Level 3

This level consisted of the plaster matrix of Floor 1, as well as the underlying construction material. Floor 1 was poor to moderate in preservation. Except for adjacent areas of the southern superstructural wall and northern interior partition wall (see Level 4), plaster matrix of Floor 1 was recognizable across most of the structure. The underlying matrix consisted of limestone marl and ballast rocks measuring 3 to 15 cm in diameter. Level 3 terminated at the surface of another plaster floor, Floor 2, and in total, it ranged from 61 to 74 cm below surface. Since Feature 99-1 in Level 2 post-dates the fill material of Floor 1, Level 3 must pre-date A.D. 800, i.e., A.D. 700 (Helmke, this volume).

Recovered artifacts include ceramics (22 rim sherds and 192 body sherds), fauna (4 *jute*), lithics (2 slate fragments, 2 chert flakes, a modified (?) river pebble, and a quartz fragment) and special finds. These include 2 mano fragments (RR99-L-006/008), 1 obsidian blade fragment (RR99-OB-008), and a large piece of modified slate (RR99-SL-004). This slate artifact measures 27.5 x 9.5 x 5.5 cm, is rounded at one end, and is noteworthy for a longitudinal groove measuring approximately 13 x 3 cm and about 0.5 to 1 cm deep (Figure 13). The groove was likely utilized for hafting, and considering the dimensions and shape of the artifact, as well as its bashed and worn appearance, it is interpreted to either be part of a hoe or post-hole digger.

Northern Interior Partition Wall

This architectural feature was discovered upon excavation of a parallel 1 x 3 meter extension north of the original 1 x 4 meter unit, with the intention of recovering more of Feature 99-1 on Floor 1 (Level 2). Attesting to the good preservation of the structure, it was characterized by an intact east-west interior facing made up of at least 13 stones measuring 20 to 50 cm wide (Figure 11). From above, it is one to two stones in width.

This line of stones was originally interpreted to be the northern superstructural wall of Str. ATM-M1, but upon further excavation eastward, it was found to terminate approximately 40 cm *before* the eastern wall. More plaster surfacing of Floor 2 was also detected between this southeastern corner of the interior wall and the eastern superstructural wall. Consequently, excavations east of this corner proceeded northward, whereupon the true northern wall of the superstructure was located.

Later, this well-preserved wall was thought to represent a low, wide, bench within the superstructure. Remains of plaster were even present along the top surface of this line of stones. Excavations within the "bench" structure were eventually conducted to explore its contents, in the event that a cache or human interment was deposited within. However, upon excavation of the "bench", and the corridor between the "bench" and the eastern superstructural wall, no
enclosing "bench" facing was apparent (see Figure 7). Rather, matrix from within resembles the fill of Levels 1 to 4 elsewhere in the superstructure. (Although, unlike elsewhere, no remains of Floor 1 were detected between this line of stones and the northern wall.). In addition, while plaster characterizes the top surface of the stone wall, no remains of plaster, or even a flat layer of stones across the top, were detected anywhere else. This line of stones also does not parallel the northern superstructural wall.

At the level of Floor 2's surface (Level 3), remains of plaster floor were found in the corridor between the interior partition wall and the eastern wall, as well as between the partitioning wall and northern superstructural wall. The placement of the partitioning wall stones directly on Floor 2 indicates that its construction can be dated to this re-plastering of Floor 3, or the second architectural phase for Str. ATM-M1 (see below). The height of this wall above Floor 2 is approximately 45 cm. Similarly, the east-west wall evident in the most southern extent of excavations (see Figure 7), which is interpreted to be a matching partition wall, rests directly on Floor 2, with only ballast and core fill underneath. This second interior wall rises 35 to 45 cm above Floor 2.

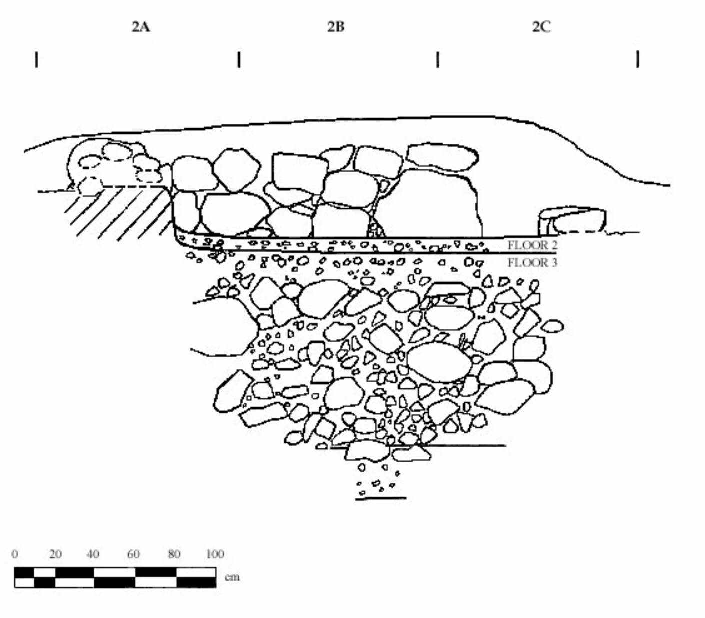

Figure 11: Profile of northern interior partition wall.

Artifacts collected from between the partition wall and the northern superstructural wall (Levels 1-4) include 70 ceramic sherds (65 body sherds, 5 rim sherds), 1 chert flake, and 3 special finds, namely a chert biface point (RR99-L-012), an obsidian blade fragment (RR99-OB-010), and a pecked mano-like stone artifact (RR99-L-013). The ceramic types are analogous to those found in Levels 1 to 3 throughout the rest of the structure.

Level 4

Level 4 primarily consisted of limestone plaster from Floor 2, as well as some underlying ballast rocks. Based on ceramic evidence, its construction can be tentatively dated to A.D. 650. Preservation of the floor was poor to moderate, with plaster evident across most of the structure, albeit patchy and degraded in areas. Floor 2 was only 6 cm thick, spanning from 74 to 80 cm below surface, and it was actually a re-plastering of Floor 3 (see Figure 6).

Artifacts recovered from this level were mainly ceramic, specifically 20 rim sherds and 87 body sherds. The only other artifact was a cut conch (*Strombus*) spine fragment (RR99-SH-001). The nature of its modification and lack of embellishment suggest that this artifact is probably debitage from shell manufacture.

Level 5

Level 5 comprised the thickest layer of Structure ATM-M1 and it represents the initial construction of the platform. This phase includes Floor 3 and its underlying core fill for the platform. The level extended from 80 to 180 cm below surface, or 1 metre thick in cross-section (see Figure 6), and it was excavated across an area of approximately 2.5 x 1.7 meters. Accounting for reduced excavation area at the bottom of Level 5 and along the interior partition wall, 3.8 m^3 of fill is estimated to have been removed from this level, with most volume attributed to core boulders.

Other than the 2 to 3 cm thick plaster floor, which represents the surface of the initial manifestation of the raised platform, this level was predominantly core boulders measuring 20 to 80 cm wide, interspersed with ballast-size rocks, soil and a substantial amount of ceramic sherds (71 rim sherds and 847 body sherds). Ceramics from the fill date to *circa* A.D. 600 (Helmke, this volume). Other remains incorporated in the core fill were fauna (12 *jute* and 1 unmodified conch [*Strombus*] fragment), lithics (2 chert flakes, 1 wasted chert core and 1 opaque quartz fragment), and half of a possible mano (RR99-L-011).

Level 6

Due to the tenuous nature of Level 5 core fill, and time constraints at the end of the field season, only a small area of Level 6 was excavated. This 53 x 35 cm area was located in the approximate centre of the structure and incorporated portions of Units 1B, 1C, 2B and 2C (see Figure 6). Excavations in this level spanned 180 to 200 cm below surface, with a matrix of dark brown soil.

The level was distinguished from Level 5 core fill by a layer of relatively uniform, flat, rocks measuring approximately 20 cm in length overlying darker brown compact soil mixed with occasional small rocks (Figure 6). This layer of dark soil is interpreted to be the original tamped dirt floor, which marks the initial utilization of the space. The tamped floor is assumed to represent the initial preparation (levelling) of the space just prior to construction of the core rubble platform. [Alternatively, this tamped floor may represent a utilization phase (of unknown nature) some time prior to the construction of the platform, but the limited excavations of Level 6 preclude a firm statement.]

While minimal, excavations in this level turned up 7 small ceramic sherds, which all likely derive from the same vessel. One diagnostic sherd identifies it as belonging to a red ware flanged bowl dating to the Early Classic horizon, which marks the earliest that this space was utilized (see Helmke, this volume). The construction of the platform thus dates to the Early Classic or later. If one postulates that Level 6 simply represents the preparation phase for the platform construction of Level 5, then this level is dated to the same period, i.e., *circa* A.D. 600.

Significantly, an almost complete obsidian blade measuring 5.4 cm long was recovered near the bottom of this level (RR99-OB-009), located in the central region of Structure ATM-M1 (Figure 12c). While sampling at this level is not extensive due to the nature of Level 5 fill and time constraints, the presence of this blade at the earliest phase may have ritual significance (see Discussion below).

ARTIFACTS

All told, approximately 13 m^3 of matrix and fill were excavated from above and within Str. ATM-M1. Excluding two surface "special finds" mentioned above, 2435 artifacts were recovered from this volume, namely:

2351	Ceramic sherds (96.55%)
26	Lithics (1.07%)
33	Faunal (1.36%)
25	Special Finds (1.03%)

The following is a breakdown of artifacts and their percentages according to excavation level:

Level 1:	195 ceramics (92%)	7 lithics (3.3%)	4 faunal (1.9%)	6 special finds (2.8%)
Level 2:	915 ceramics (96.3%)	9 lithics (0.95%)	12 faunal (1.26%)	14 special finds (1.47%)
Level 3:	228 ceramics (95%)	6 lithics (2.5%)	4 faunal (1.7%)	2 special finds (0.8%)
Level 4:	88 ceramics (98.9%)	0 lithics	0 faunal	1 faunal special find (1.1%)
Level 5:	918 ceramics (98.1%)	4 lithics (0.4%)	13 faunal (1.4%)	1 special find (0.1%)
Level 6:	7 ceramics (87.5%)	0 lithics	0 faunal	1 special finds (12.5%)

For elaboration of the ceramics, please see the report by Helmke (this volume).

Non-formal lithics recovered from Str. ATM-M1 include 12 chert flakes (2 with use wear), 1 chert block fragment, 1 wasted chert core, 2 opaque quartz fragments, 1 small ovoid chalk ball, 1 possibly modified pebble and several slate fragments. Other than noting their abundance in fill material (many not collected), which reflects the local geology, the slate fragments and "chips" that were collected during excavations are here considered "archaeologically insignificant" due to their unmodified nature.

However, one slate artifact is noteworthy. This is the large slate hoe or post-hole digger (RR99-SL-004) described above in Level 3 (Figure 13). The longitudinal groove indicates that it was likely hafted, and this fact, including its large size and shape, suggest its excavating function. Here, its adjacent position alongside the eastern superstructural wall, directly beneath the topmost stone (in Unit 1D) within the fill of Floor 1, suggests that it was utilized as supporting fill because of its large size and appropriate shape.

Other "formal" lithic tools include 1 small metate fragment (RR99-L-010); 4 mano fragments (RR99-L-003/005-007), plus 3 possible mano fragments (RR99-L-004/008/011), which are likely just river cobbles; 1 chert biface (missing part of base) (RR99-L-009) (Figure 12b); 1 chert biface point (RR99-L-012); and 6 obsidian blade fragments (RR99-OB-004/005/007-010). Remaining special finds include 2 possibly modified slate fragments (RR99-SL-002/003), 1 clear crystal fragment (RR99-QZ-002) and 1 pecked mano-like stone artifact (RR99-L-013).

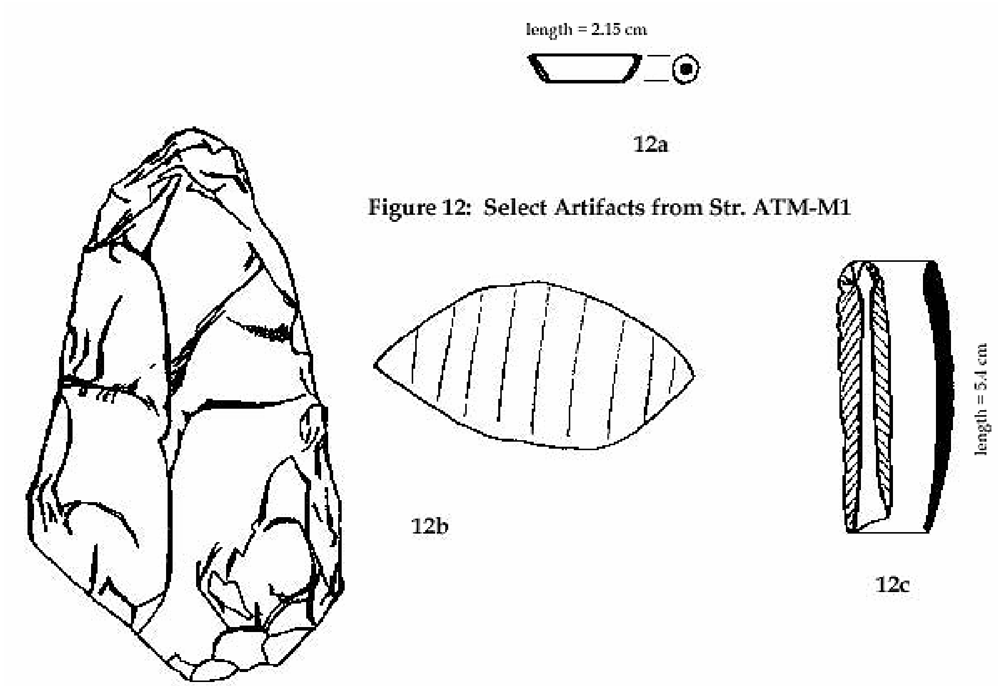

Figure 12: Select Artifacts from Str. ATM-M1

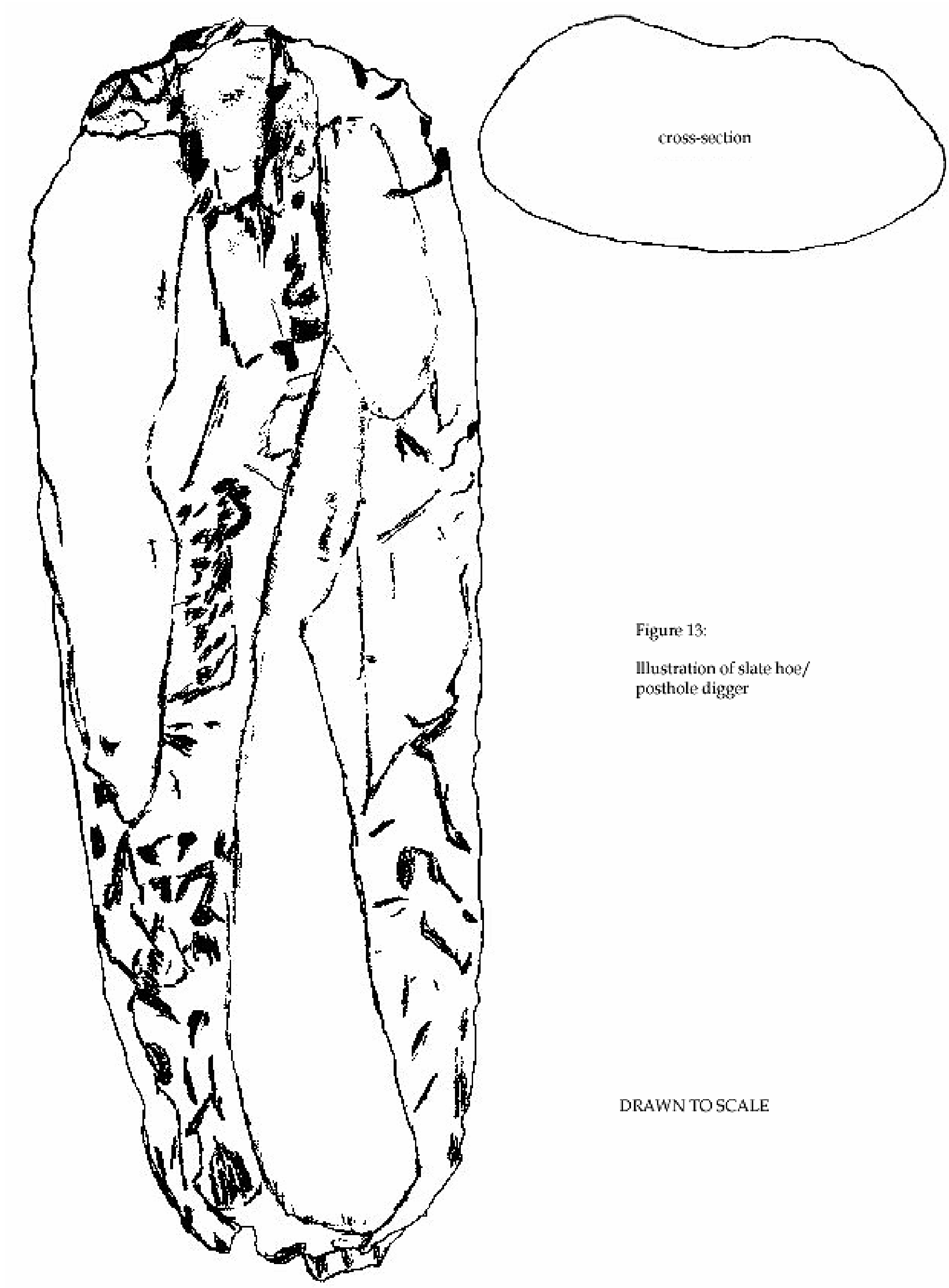

Figure 13: Slate hoe/Posthole Digger. Note: while drawn to scale initially, Figure 13 is represented here at ¾ (75%) scale.

As indicated by the artifact totals, the relative quantity of faunal material is surprisingly low considering the wealth and diversity of faunal resources in the Maya Lowlands, and their inevitable incorporation into the archaeological record. Except for one small tubular bone bead (see below), faunal remains are, notably, only shell in nature. These include 26 freshwater *jute* snails, all of which are the smooth, non-sculptured, species (*Pachychilus indiorum*); 6 miniature snails from Feature 99-1 that may not be archaeologically meaningful; 1 unmodified conch (*Strombus*) fragment; and 1 cut conch spine fragment (RR99-SH-001). Of the 26 *jute* snails, all but 4 have their spires broken off, suggesting that they were dietary items prior to deposition.

Despite screening of all excavated fill and matrix, no faunal bone remains were recovered, with the exception of one cut and polished tubular bone bead (RR99-B-001). This bead measures 2.15 x 0.53 cm and presumably derives from a small mammal. Both ends are tapered in cross-section (Figure 12a).

CONSTRUCTION HISTORY

While utilized over a relatively short duration (200 to 250 years), Str. ATM-M1 underwent several distinct phases of architectural modification before it was abandoned sometime prior to A.D. 850. However, interestingly, the physical extent of the platform and superstructure remained constant through the three phases. According to original observations, the superstructure measured approximately 4.4 x 2.8 meters. It is likely, however, that the length of the superstructure exceeds 4.4 meters (see below). As for the platform, if it extended beyond the superstructure, the exact dimensions are unknown due to excavations only within the superstructure (except for portions of two 1x1 meter units discussed below).

As stated above, it is assumed that the initial use of the space can be traced to the tamped earth floor of Level 6, which was likely prepared for the construction of the core-filled platform of Level 5. Based on the ceramics from the core fill, this initial construction took place around A.D. 600-650. At this time, Str. ATM-M1 was an approximately 1 meter high platform with superstructural walls running approximately north-south and east-west. At the "back" or western side of the structure, the superstructural wall rose at least 25 to 30 cm (2 courses high) above the level of the initial platform surface (Floor 3). Poor preservation of Floor 3 along the interior of the eastern wall does not permit such a clear assessment, but the "half-walls" in the "front" of the superstructure appear to be slightly lower (i.e., 15 to 25 cm). Notably, however, if the appearance of the terminal phase walls reflects the same height as the initial construction, then the superstructural walls at this stage were as high as 40 to 45 cm above Floor 3 in the back. These low half-walls would have acted as aboveground foundation structures for wattle and daub wall construction.

Due to time constraints and large boulders, no substantial excavations outside the structure were conducted, other than limited excavations directly beyond superstructural walls in the front and back of the structure. In the easternmost unit (1D), the edge of the first descending front step of the structure was uncovered, which appeared as a line of cut stones paralleling the superstructure (see Figure 7). Remains of plaster were also evident extending from the exterior facing of the eastern wall in Unit 1D down and across toward the step (see Figure 6). However, the plaster was not preserved along the edge half of the step. Further excavations down and below the first course of stones of the step were not undertaken, but it is believed that this access feature characterizes all architectural phases.

Likewise, limited excavations were made outside the western superstructural wall in Unit 1A, at the back of Str. ATM-M1. From excavations reaching a depth of approximately 60 to 65 cm below surface (to Level 4), only matrix, artifacts, ballast-size rocks and the beginning of core-size boulders were encountered. The core boulders originate from a level analogous to Level 5 core fill, and thus, they belong to the supporting platform structure.

Examining the architectural top plan (Figure 7), it appears that while the eastern and western walls represent the original superstructure built for the platform, only the most northern wall represents architecture from the same phase. Excavations through Floor 2 between the partition wall and this northern superstructural wall indicate that it is at least three courses high, and part of the first construction phase. Despite only uncovering 2/3 of this wall, it clearly runs perpendicular to the eastern and western walls. This is unlike the interior partition wall, and the non-perpendicular wall evident in the southern extent of excavations, which was earlier thought to be the southern superstructural wall.

Re-evaluation suggests that this most southern wall, which parallels the northern interior dividing wall, serves a similar partitioning purpose. Thus, the true southern limit of the superstructure exceeds the extent of excavations evident in Figure 7, and the entire superstructure probably measures more than 4.4 meters long. Construction of the two partition walls resulted in a three-roomed superstructure. The question is why these partition walls do not bisect the western superstructural wall in a perpendicular manner, but rather, skew more southward (see Figure 7).

Both of the east/west-running interior partition walls date to the second construction phase of Str. ATM-M1, which began with a re-plastering of Floor 3 with Floor 2. This manifestation of a superstructure with two interior walls dates to approximately A.D. 650-700. At this time, poorer preservation suggests that the height of the superstructural walls above the floor is reduced compared to the first construction phase (Floor 3/Level 5), but it is likely that the wall height in this period is analogous with the initial phase.

The third, and last, architectural manifestation of Str. ATM-M1 involved the construction of a third floor (Floor 1) plastered against and up along a superstructural back wall measuring 15 to 30 cm high (above the level of Floor 1). Based on ceramic data, this period dates to approximately A.D. 700 to 800, or no later than A.D. 850. In addition to the terminal nature of this architectural phase, the longer period of utilization may account for the poor preservation of the painted hematite plaster floor.

At this stage, the distinction between back and front sides of the structure is clear, with the eastern side of Str. ATM-M1 being the access point. In this construction phase, only the western back wall of the superstructure was built up, so that the eastern wall was relatively lower in height. While Floor 1 extended up along the western "half-wall", its plaster was level with the top of the large flat stones of the eastern wall, where the plaster was overlain (see Figure 6). The topmost stones of the eastern wall are broad and flat in the central area of the structure, when compared to superstructural wall stones elsewhere. These stones (evident in Unit 1D) are the threshold stones of the doorway. While Floor 1 ends at the level of these stones in the central doorway, in the back and sides of the superstructure, as well as on either side of the doorway, superstructural walls probably rose to a height comparable to the back wall (i.e., up to 30 cm).

The western "back" wall of this architectural phase is noteworthy for very good preservation of the plaster facing on the stones, as well as a lower bench-like feature in the central region of the structure (Figure 14). Plaster was found extending from Floor 1 up the wall, and down and across a low section evident in Units 1B and 4B (with a height of 15 cm above Floor 1). The higher section of wall (30 cm above Floor 1) north of this low section matches the height of the northern partition wall. It is suggested that this low section represents a sitting area at the back of the structure.

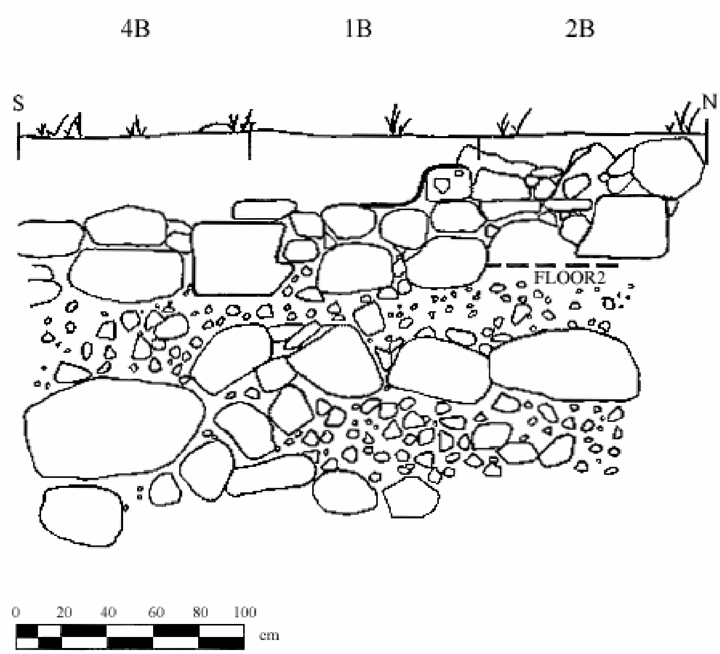

Figure 14: Profile of western "back" wall, illustrating low bench section.

DISCUSSION

Numerous characteristics of Str. ATM-M1 at Roaring Creek camp point to a non-residential, "special" function for this structure. This statement is based on combined consideration of the nature of the mound and the total assemblage of artifacts, architecture and features excavated this season, rather than any one trait. These include: 1) its proximate location outside the eastern entrance of Actun Tunichil Muknal; 2) its relatively large size compared to other mounds in the vicinity; 3) the construction of a low-walled stone superstructure atop a raised platform; 4) decoration of the terminal floor with specular hematite red paint; 5) deposition of a substantial ceramic "cache", including a polychrome tripod dish with glyphic text, along the centre of the aforementioned hematite-painted floor; 6) relative lack of utilitarian (i.e., residential) artifacts (e.g., manos, metates, cutting implements); and 7) relative lack of faunal refuse associated with either a residential household or a craft-production site (since no faunal bones and only 26 dietary shell remains (*jute)* were recovered from 13 m^3 of excavated matrix).

Of the features outlined above, several discoveries merit elaboration:

The painting of Floor 1 with specular hematite paint strongly indicates a non-residential nature for Str. ATM-M1. Hematite is an important ore of iron that is often used as a deep red pigment when ground to powder form. It can be extracted from rocks commonly found in Maya environments, without any mining involved. (Interestingly, pyrite is an associated mineral of hematite.) Architecture decorated with hematite paint is found across the Maya Lowlands, generally in non-residential or "elite" structures. Stelae are likewise decorated with red hematite paint (i.e., Copan). Its occurrence, and ubiquity of red-painted ceramics, reflects the symbolic importance of the colour red in Maya cosmology and ideology (see Schele and Miller 1986, among others). Most notably, red is associated with blood and the direction east.

However, specular hematite paint is less frequently utilized than regular hematite, which produces a simple matte-like red pigment. This form of hematite, also called *specularite*, is a micaceous or flaky type of hematite that produces sparkling silver gray and red pigment when ground. As discovered this summer with Floor 1 of Str. ATM-M1, the effect of specular hematite is quite eye-catching and dazzling. Unfortunately, its occurrence is not well documented in Maya literature. To the authors' knowledge, only Copan is known to have specular hematite-painted architecture, specifically in structures of ritual and ceremonial importance. Additionally, glittering red Late Classic Copador pottery from Copan is decorated with specular hematite paint, as are similar ceramics from western El Salvador (Longyear 1944, 1952).

Hematite, both in its regular and specular form, is also found archaeologically as deposits of red powder, particularly in burials and caches. In these cases, it was probably scattered as part of a ritual ceremony, symbolizing the offering of blood (Schele and Freidel 1990). While this form of hematite, and its associated symbolism, may differ from the use of hematite as paint, the general restriction of even hematite paint to ceremonial or elite structures reflects its overall significance. Furthermore, the glittery nature of *specular* hematite, particularly in the glow of firelight, must have produced an effect within the superstructure of Str. ATM-M1 that rivalled the crystalline formations and flowstone of Actun Tunichil Muknal (particularly the Sepulchre Chamber).

Other than the previous description of Feature 99-1, it is noted again here for its significance to the role of Structure ATM-M1. Rather than being an "on-floor de facto refuse deposit", it is designated a "termination cache" because of its arrangement on the terminal floor beneath large stones of abandonment, and its inclusion of a polychrome tripod dish. The fact that this dish is the only example yet discovered in the Roaring Creek Valley with glyphic text indicates that activities more significant than a simple midden collection took place at the structure. As characterized by Schele and Freidel (1990), termination caches commonly include concentrated ceramics, jade, marine shell, and hematite. Whether or not Feature 99-1 represents the remains of a feast, or an event of "terminating" the structure by destroying pottery, its deposition in Structure ATM-M1 is significant.

In contrast, the almost complete obsidian blade found in Level 6 may represent a ritual of dedication, rather than termination. This 5.4 cm long blade (RR99-OB-009) (Figure 12c) was deposited on the tamped ground prior to construction of the core fill platform, and, like Feature 99-1, it was located in the approximate center of Structure ATM-M1. As commonly known, obsidian blades were often the instrument of bloodletting. Moreover, the act of bloodletting is associated with ritual or sacred events, particularly dedication rituals (Awe 1992; Schele and Freidel 1990; Schele et al. 1993). The act of offering blood to the ground, in addition to the associated ritual artifacts, is a way to impart a "soul" to the structure (see Schele and Freidel 1990). While the evidence is not overwhelming, due to the limited nature of excavations in Level 6, this obsidian blade may be interpreted to mark such a dedicatory event when the space was first consecrated.

In terms of the second research objective, that is, determining if a relationship exists between this surface structure and Actun Tunichil Muknal, the evidence does not point to a definitive connection. Archaeologically, a direct association can be based on an assumption of artifactual similarity and contemporaneity. In this case, ceramic evidence should mirror each other in type and type frequency. However, this is not the case for Str. ATM-M1 ceramic types, which are generally dissimilar from those within Actun Tunichil Muknal and other caves in the Roaring Creek Valley (Helmke, this volume).

Nevertheless, at the same time, the ceramics from Str. ATM-M1 concur with the pottery types characteristic of Late Classic sites throughout the Belize Valley, each of which reflect varying aspects of ritual behavior. Is it accurate then to compare surface site assemblages with cave artifacts? An assumption of association based on artifact similarity does not account for the obvious contextual, and spiritual, differences. Thus, it is highly likely that the artifactual evidence of ritual in caves was purposely differentiated from ritual evidence at surface locales. Presently, we suggest a connection between Structure ATM-M1 and Actun Tunichil Muknal based on circumstances of ritual behavior (Feature 99-1) and the nature of Structure ATM-M1's architecture and location (see Conclusion).

Despite the ceramic type differences, the dating of ceramics from Str. ATM-M1 can be compared to the assemblage within Actun Tunichil Muknal. In this case, ceramic evidence suggests that utilization of the structure was contemporaneous with activities occurring in the Main Chamber, the Sinkhole Tunnels and the Hideaway Chamber (Helmke, this volume). However, most of the activity in the Upper Entrance Chamber precedes the construction of Str. ATM-M1, while use of the Stelae Chamber post-dates it (Helmke, this volume). From this evidence (also see Awe et al. 1998; Griffith 1998; Conlon and Ehret 1999; Moyes and Awe 1998), the following history of the cave and Str. ATM-M1 can be proposed:

During the Early Classic, inhabitants of the Roaring Creek Valley, including those from Cahal Uitz Na, 500 meters away, visited Actun Tunichil Muknal to perform fertility rituals and gather water at the eastern entrance of the cave. Shortly after, the Upper Entrance Chamber, which is proximally located near the entrance, was explored and it became an important locus of ritual activity. Some activity also occurred in the Sinkhole Tunnels. Simultaneously, settlement in the immediate vicinity of the cave entrance grew, as the rich soils of the Roaring Creek floodplain provided ideal agricultural conditions. Low mounds in this area represent the residential structures of these inhabitants. Structure ATM-M1 was erected at the beginning of the Late Classic (A.D. 600) to accommodate increasing activity at the cave entrance and also within the cave. While the Upper Entrance Chamber declines in usage, Structure ATM-M1 functions during a period of increased exploration of the cave's depths, namely visits to the Main Chamber, Sinkhole Tunnels and Hideaway Chamber for ritual activities. These areas of activity continue for much of the Late Classic, until both the structure and these chambers become abandoned, *circa* A.D. 800-850. Nevertheless, limited activity continues in areas of the cave that are somewhat inaccessible, namely the Stelae Chamber. This is occurring at a period of decline (Terminal Classic), however, as indicated by surface evidence (Str. ATM-M1) and the cessation of activity in other cave sections. The cave and the rest of the site are soon completely abandoned by A.D. 1000.

CONCLUSION

To the authors' dismay, there is a paucity of literature regarding this type of structure in the Maya region. Other than WBRCP investigations (also see Awe et al., 1998), only Brady (1989, 1997) and Ruppert and colleagues (1954) have noted an association between cave entrances and nearby surface structures. In those cases, for Cueva de Sangre, Naj Tunich and Balankanche, only the presence of mounds or exposed architecture were noted. The nature and arrangement of surface architecture at each of these cave entrances suggests functional associations, but lack of excavations precludes firm statements. Ultimately, the lack of documentation is due to the limited nature of cave archaeology in general, the remoteness of such caves and associated structures, and/or the destruction of mounds due to looting and/or development (i.e., Balankanche, Naj Tunich).

Conversely, excavations of Structure ATM-M1 in the Roaring Creek Valley have provided meaningful insight into the nature of architecture and activities in the immediate vicinity outside Actun Tunichil Muknal. All told, three phases of construction and utilization occurred over a 200 to 250 year period of the Late Classic. As artifactual and architectural evidence do not reflect household or craft production activities, it is posited that Str. ATM-M1 was utilized for other "special" functions, namely a sentry or caretaker's post (see Brady 1989). The structure's position on high ground above the cave creek, and within sight of the cave entrance 20 meters away, would have ensured its safety from flooding waters, as well as guaranteed its monitoring purpose.

Artifactual evidence, particularly the decoration of the terminal floor with specular hematite paint and the deposition of a ceramic "termination cache" with glyphic pottery, suggest that important functions took place at Str. ATM-M1 in the Late Classic. Specifically, the caretaker or guard stationed at Str. ATM-M1 might have been responsible for protecting and restricting access to Actun Tunichil, as well as possibly performing pre- or post-cave ritual ceremonies. Because of this role, the individual or individuals utilizing the structure probably assumed noted status. (Unfortunately, no human interments were discovered within the structure that might shed light on their identity.)

Owing to the ritual nature of deposits within Actun Tunichil Muknal, and considering the solemn practices of present-day Maya outside cave entrances, it is not unreasonable to suggest that rituals associated with the cave (e.g., agricultural fertility) were also performed directly outside. In particular, based on the types of vessels deposited in Feature 99-1, feasting may have been one important aspect of these cave-related rituals.

Importantly, we note that further work on surface structures associated with cave entrances needs to be done. This includes additional testing of Str. ATM-M1 and other mounds in the settlement vicinity, as well as structures outside other cave entrances. With more manpower and time, investigating the area between the entrance of Actun Tunichil Muknal and Structure ATM-M1 would have been a fruitful undertaking. Testing of this lower area might recover additional evidence of cave-related rituals, refuse middens, or other deposits of ritual paraphernalia (caches). Additionally, the paths currently used by WBRCP members to access the cave and creek waters may overly ancient sacred pathways between the structure, settlement, and the cave. Tackling these questions will enhance the current understanding that the Maya viewed their presence, settlements and geography as integral parts of a sacred landscape that was central to their ideology.

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As we have experienced, living at the field camp can be challenging at times. However, we have been blessed with the best support crew available. These individuals, who have made life in the jungle the most extraordinary and memorable experience, include Valentin Ku, Ventura "Tigre" Chi, Jose Mai, Agapito Chuc, Felix Uck, and Fermindo. In addition to building our camp facilities with an innovative brilliance surpassing the Swiss Family Robinson, they have been wonderful friends, co-workers and advisors on issues as varied as excavation techniques to Mexican "literature" and rancheria music.

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AN ANALYSIS OF THE CERAMIC REMAINS FROM STRUCTURE ATM-M1, ROARING CREEK VALLEY, BELIZE

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INTRODUCTION

This technical report serves to outline the results of the preliminary analysis of the ceramic material from Structure ATM-M1, Roaring Creek Valley, Belize (Figure 1). It functions as a supplement to the report on the excavations of Structure ATM-M1 by Song and Zubrzycki (this volume). The research questions guiding the investigations introduce the report. Presented as a synopsis, these provide the reader with the basic biases operating within the research. The various construction sequences of the structure are dated on the basis of comparisons between ceramic seriations established for other lowland Maya sites. Regionality and the manner in which idiosyncrasies are expressed in the ceramics of Structure ATM-M1 are also addressed. The vessels comprising Feature 99-1 will be examined as a discrete assemblage (see Song and Zubrzycki, this volume). All data generated on the basis of the sherd material is listed in tabular and graphic form throughout the report.

RESEARCH QUESTIONS: A SYNOPSIS

The Western Belize Regional Cave Project (WBRCP) has been seeking to identify the proverbial "nature" of ancient Maya cave rituals over the last four years (see Awe 1998). Specifically, investigations conducted by the WBRCP have focused on sites located in the Roaring Creek Valley of central Belize. In 1999, a series of excavation operations were initiated on a platform mound located only 20 m north of the Eastern entrance to Actun Tunichil Muknal (see Song and Zubrzycki, this volume) (Figure 2). This mound was initially designated as Structure XN1 in accordance with the the survey conducted over the last two years (see Conlon and Ehret 1999) but renamed Structure ATM-M1. These excavations were conducted in order to address the function of the ancient Maya building. The collapsed and mounded architectural features visible on the surface seemed to indicate that the mound was comparable to typical lowland "house mounds" (see Ashmore 1981: 47-48; Willey et al. 1965). From the onset, two alternate hypotheses were formulated: 1) the platform mound served a prosaic and utilitarian function as a common residence; versus 2) the platform mound was used for "special purposes" possibly related to ritual activities conducted within Actun Tunichil Muknal (see Awe et al. 1998: 188-189). The excavations recovered numerous contextual, architectural and artifactual data which address these queries. Principal among the artifact assemblage are the remains of ceramic containers. These are the subjects of this technical report. A clear understanding of this assemblage contributes to our knowledge of Structure ATM-M1 and assists in the mental processes involved in the identification of the structure's

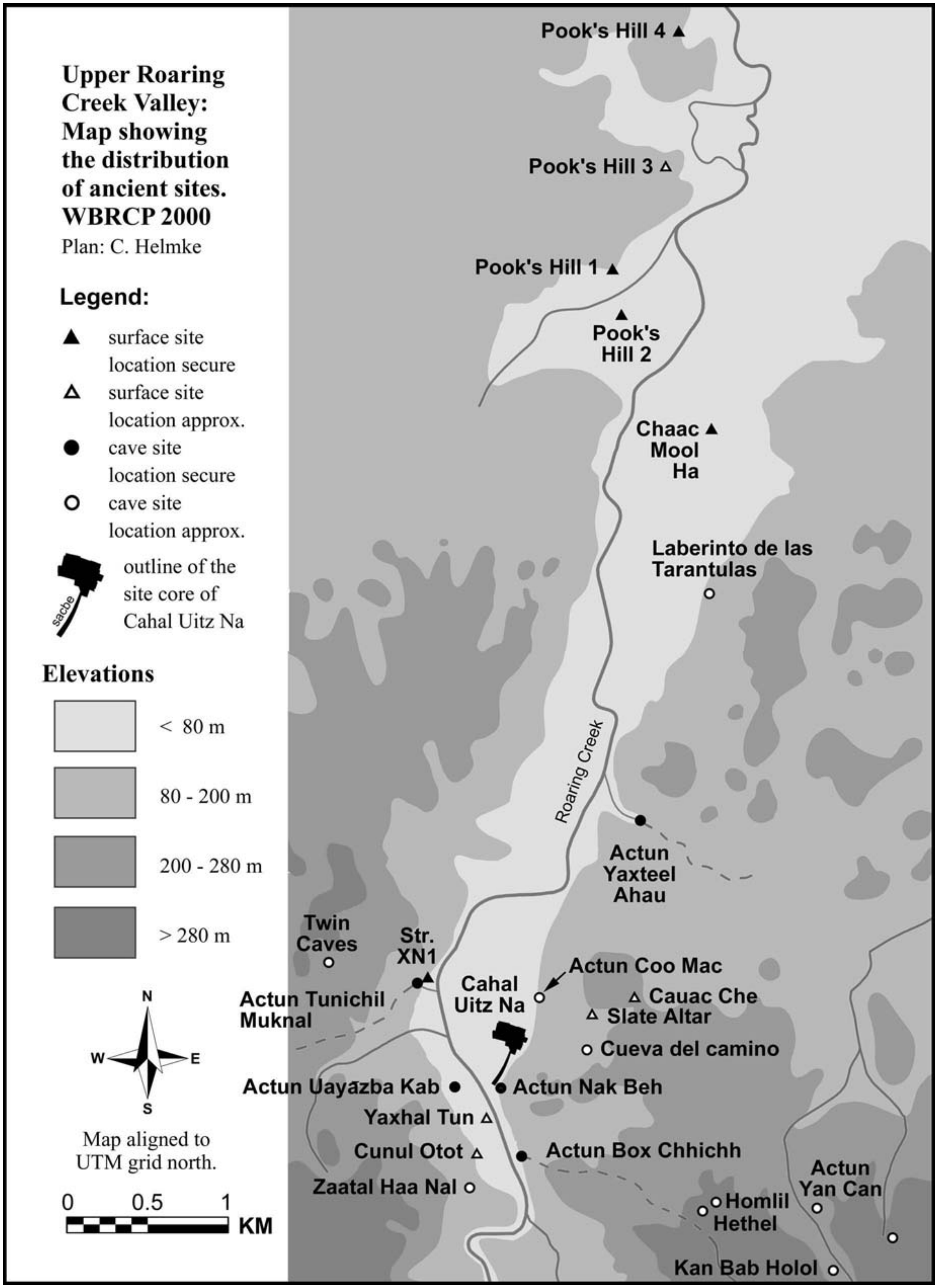

Figure 1: Map of the Roaring Creek Valley indicating the location of Str. ATM-M1 (XN1).

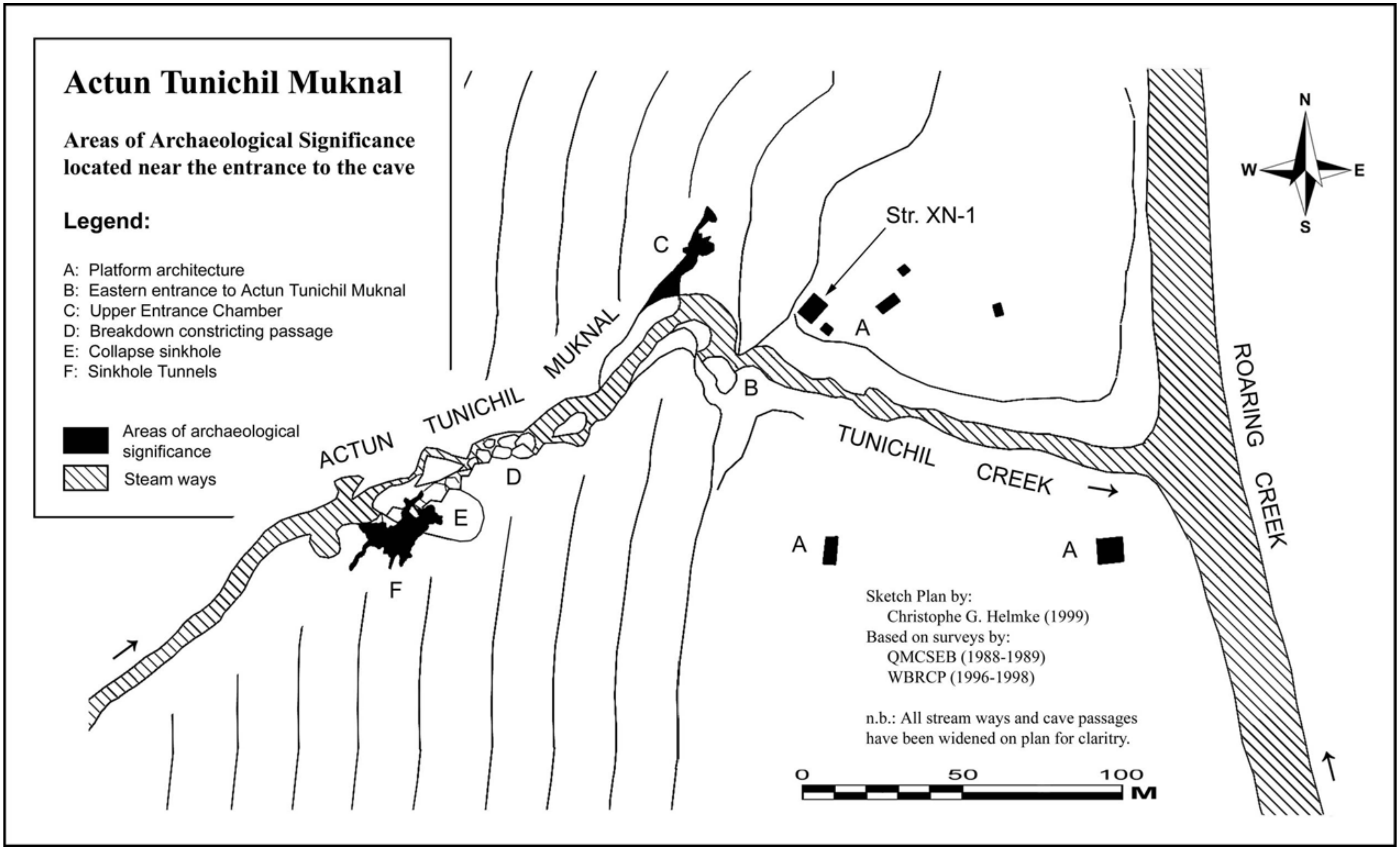

Figure 2: Map of archaeological areas of significance located proximate to the eastern entrance to Actun Tunichil Muknal.

role. Defining the function of Structure ATM-M1, in turn, brings the "cavescape" of the Roaring Creek Valley into sharper focus.

THE TEMPORAL PLACEMENT OF CERAMIC COMPLEXES

The vast majority of types identified during the course of the analysis were established by James Gifford (1976). Nonetheless, the nomenclature of the ceramic phases or complexes of the Uaxactun sequence (Smith and Gifford 1966) is employed in the analysis. This preference is based on the recognition that some of the types established for the Barton Ramie materials do not cluster temporally within the complexes constructed to contain them. Indeed, certain types are found to crosscut the complexes and thus, each type is placed into the sequence established for Uaxactun. This allows one to distance the Barton Ramie types with their manifestation in the Roaring Creek Valley. The Uaxactun sequence is thus used purely as a frame for temporal placements. The broad modal characteristics of each of the Uaxactun phases were never explicitly outlined nor were discrete criteria used to separate each phase from another (see Lincoln 1985). Consequently the Uaxactun sequence serves as a useful chronology. Unless it is clearly specified that a specimen from Structure ATM-M1 has a distinct association to the types of the contemporaneous phase at Uaxactun, the Uaxactun phases are used exclusively as chronological phases.

One trend that can be remarked in the ceramics of Str. ATM-M1 is the presence of Tiger Run types and Spanish Lookout types in the majority of contexts. This association may suggest, at first sight, that the structure was constructed at a time transitional between the two complexes. Nonetheless, it is commonly believed that the admixture of types found in architectural fill indicate that midden materials were used in architectural endeavors. Thus, it could simply be assumed that the structure was constructed in the Late Classic and that all earlier types found in the fill are present due to their inclusion in a midden that was mined for fill. Plotting the identified types into a frequency seriation by level suggests a different explanation, however. The chart suggests that the transition between types from one complex to the next is not as abrupt as the graphic representation of these complexes (see Gifford 1976: Fig. 8). Indeed, if it is assumed that types have a longevity that transgresses the appearance of a subsequent complex, then the trends of the frequency seriation are explained. Of particular importance is the fact that Tzakol, Tepeu 1, and Tepeu 2-3 ceramics from Str. ATM-M1 form textbook examples of "battleship curves."

This pattern has several implications. First, if the mining of midden deposits were the cause for apparently mixed types within sealed contexts, then it could not be expected to have "battleship curves" in graphic representations of these materials. In addition, one could expect to find early materials in all levels with varying frequencies and aberrant distributions. Nonetheless, this is not the case with Str. ATM-M1 or with the Barton Ramie material (see Lincoln 1985).

Second, most types defining the Tiger Run complex can be relegated to late expressions of the Hermitage and early expressions of the Spanish Lookout complexes. For example, the Mountain Pine Red type may represent the latest expression of the Minanha Red type. Another example may be that Teakettle Bank Black is the earliest expression of Mount

Maloney Black. Although these types differ in terms of minor paste attributes, the developmental seriation of modal characteristics and vessel forms may fall within a unified developmental sequence. Thus, many of the types that would appear to be restricted temporally to the Tepeu 1 phase may occur during the Tepeu 2 and 3 phases, although their frequency may decrease noticeably over time.

Third, if modally related types (such as the ones cited above) co-occur in contemporaneous assemblages, then the apparent intra-context temporal discrepancies can be accounted for. It seems more than likely that the principal phase during which types occur are contained in the complexes to which Gifford assigned them. Nonetheless, it should be remembered that although types may display formal and metric attributes that can justify their designation as an independent type, complexes are integrative and accretive groups that rely on more abstract criteria justifying the inclusion of one type, but not the exclusion of another. It thus appears that the stylistic clustering of types into complexes defined by Gifford may not always possess temporal values as clearly as his scheme implies (see also Lincoln 1985).

DATING

Dating of the ceramic remains rests upon comparisons with the typologies established for the lowland Maya sites of Uaxactun (Smith 1955; Smith and Gifford 1966), Barton Ramie (Gifford 1976), Seibal (Sabloff 1975), and Becan (Ball 1977). Individual type:varieties established as part of these four typologies are used as the building blocks of the analysis of Structure ATM-M1 ceramics. The temporal placement of identified sherds rests upon associations with established types and modes and the placement of these in existing sequences of complexes. Attention is paid to the association of apparently contemporaneous materials in order to determine the longevity of particular types in the Roaring Creek Valley.

Sherds representing the remains of ceramic vessels that are not easily assigned to existing types are excluded from the chronological assessment. These will be compared to materials from sites in the Roaring Creek Valley, sites in the greater Belize Valley, as well as material from Altun Ha (Pendergast 1979, 1982). These examinations will provide the basis of descriptions of as-yet-undescribed varieties, types, and their temporal placement once sufficient material has been gathered.

Looking at the material from Structure ATM-M1 as a whole (Table 1), the first pattern that can be noted is that the majority of sherds fall into the Tepeu phase (ca. AD 600 - 900). Indeed, 89.74 % of the identified sherds fall into the Tepeu phase (which loosely corresponds to the Tiger Run and Spanish Lookout complexes of Barton Ramie). The frequency of sherds assigned to Late Classic types, as well as the number of types identified, is highest in the Late Classic. Only 5 Early Classic types have been identified which contrast clearly with the identification of 24 Late Classic types (Table 1). These patterns indicate that the structure was used predominantly, and/or most intensively, during the Late Classic. In addition, the presence of Late Classic sherds in all levels indicates that the *terminus ante quem* of each level date to the Late Classic.

Level 6 is the deepest level reached within the structure. It is within this level that one would most likely find ceramic material preceding the Late Classic date of subsequent architectural phases (Figure 3). Unfortunately, only one diagnostic sherd was retrieved from Level 6, which was situated below the core layer of the platform. This sherd is derived from a red ware basal flange bowl, a mode of the Early Classic horizon. Although the temporal placement of this level is difficult to base on a single sherd, we know that the core must have been deposited during the Early Classic or later. Assigning this level exclusively to the Early Classic is tenuous at best, however.

Phases	**Ceramic Types**	**Feat. 99-1**	**Bench?**	**Level 1**	**Level 2**	**Level 2/3**	**Level 3**	**Level 3/4**	**Level 4**	**Level 5**	**Level 6**	**Plaza Unit**	**TOTALS**
Tzakol	Minanha Red									6	1		**7**
	Pucte Brown						1			1			**2**
	Billum Brown									1			**1**
	Chorro Fluted ??									2			**2**
	Dos Arroyos Polychrome									8			**8**
Tzakol 3-Tepeu 1	Spiked Censer Applique									9			**9**
Tepeu 1	Sotero Red-Brown									5			**5**
	Mangrove Brown-black									1			**1**
	Zibal Unslipped									5			**5**
	Mountain Pine Red			1	1				3	15			**20**
	Mountain Pine Brown				1			1		4			**6**
	Guana Creek Impressed									1			**1**
	Rosario Incised	2			1								**3**
Tepeu 1-2	Mt. Pine Red / Rr. Ck. Red									1			**1**
Tepeu 2-3	Dolphin Head Red	11			3		1	1		1			**17**
	Silver Creek Impressed	6											**6**
	Roaring Creek Red			1	7		1			2			**11**
	Vaca Falls Red				2		1		1				**4**
	Kaway Impressed									1			**1**
	Garbutt Creek Red	1			4		2			2		1	**10**
	Rubber Camp Brown	1	2	1	1		3		1	2			**11**
	Mount Maloney Black				1					1			**2**
	Tialipa Brown						1	1		2			**4**
	Tinaja Red								1				**1**
	Belize Red	1			3		1		1	8			**14**
	Platon-Punctate Incised				2								**2**
	Gallinero Fluted									1			**1**
	Montego Polychrome ?		1										**1**
	Cayo Unslipped	5			6		1		4	8		1	**25**
	Alexanders Unslipped			1	1		1			1			**4**
	Cabrito Cream-Polychrome	20											**20**
	BV Molded-carved ?			1									**1**
Unidentified	Unidentified Polychrome									7			**7**
	Unidentified	0	2	8	18		10	2	4	13	0	4	**61**
	Undiagnostic (body)	326	65	165	434	434	186	14	80	887	6	11	**2608**
TOTALS		**373**	**70**	**178**	**485**	**434**	**209**	**19**	**95**	**995**	**7**	**17**	**2882**

Table 1: Frequency tabulation of identified ceramic types by context.

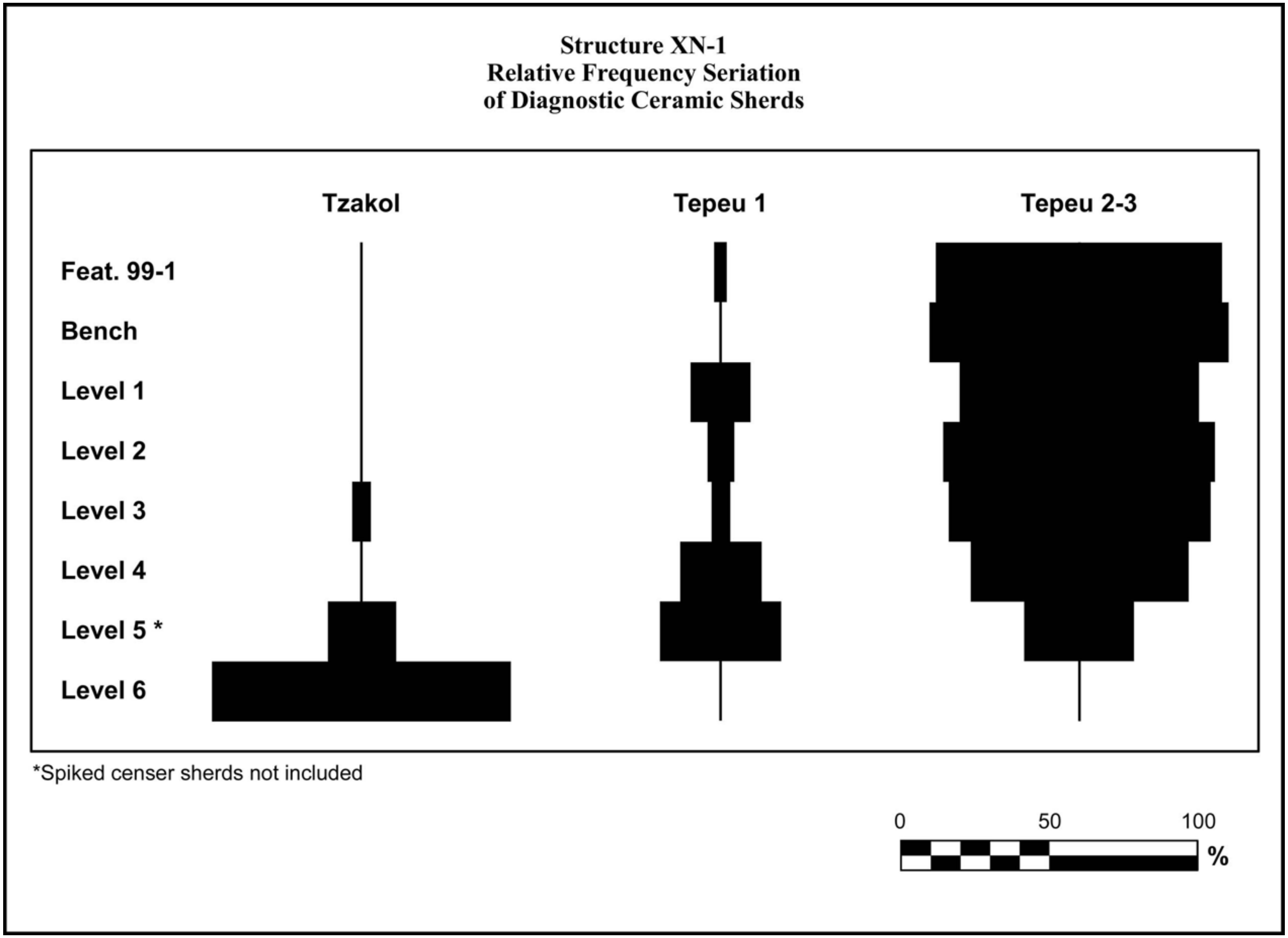

Figure 3: Relative frequency seriation of diagnostic ceramic sherds of the XN-1 assemblage.

Excluding Level 6 from the analysis based on the weakness of its material, we turn to the remaining seven contexts. Four of these contexts (Levels 2 through 5 inclusive) are comprised of fill and ballast separated by a sequence of superimposed plaster floors. Fill contained within a possible bench feature represents another architecturally discrete context. Architectural correlation between the probable bench and the sequence of floors places this feature with Floor 2, or Level 3. A post-constructional "termination deposit" that overlies the terminal phase architecture defines an additional context. Level 1 comprises the overburden and it is partly composed of humus and decayed terminal phase architecture. Based on architectural features such as the floors, the relative sequence of these seven contexts can thus be constructed (Figures 3 and Table 2). As each of the architectural contexts (Levels 2 through 6 inclusive, and the bench) are sealed and overlay one another, a relative chronology of the ceramics is established. The upper range of the temporal span of ceramic types from non-architectural contexts (the "termination deposit" and Level 1) is difficult to define, however, as these assemblages are not sealed.

In Level 5, Tzakol, Tepeu 1, and Tepeu 2 and 3 types occur with almost similar frequencies (Figure 2). The subsequent decline in the frequency distribution of the Tzakol and Tepeu 1 types in later levels suggest that the architecture representing Level 5 was constructed at the transition between Tzakol and Tepeu. This interpretation rests upon the comments made about the chronological value of complexes above. Level 5 can thus be dated to ca. AD 600.

In the absence of more refined methods of dating, we cannot date the time-span during which each subsequent level of construction was built. The upper limit date of the last phase of construction can be dated based on the material contained in Level 1. A transitional Terminal Classic/Early Postclassic sherd of a Belize Molded-carved vase (see Helmke et al. 1998; Helmke 1999ab, n.d.; Awe, Audet and Helmke, this volume) dated to between AD 850 and AD 1000 was identified in Level 1. As the termination deposit in Level 2 (Feature 99-1) precedes the deposition of Level 1, it can be assumed that the feature was deposited around or prior to AD 850, the lowest range of time to which the molded-carved type has been dated. As the feature rests upon the last phase of architecture, the material contained in fill of Level 3 must pre-date AD 800. Thus, if we assume that construction sequences occurred at regular intervals, the 200 year time span between Level 5 and Feature 99-1 can be divided into four equal segments of 50 years each. Consequently, Level 4 can be tentatively dated to AD 650, Level 3 to AD 700, Level 2 to AD 750, and the termination deposit to around AD 800 (Table 2). The possibility remains, however, that the molded carved sherd was deposited later than AD 850, which would push the date of the termination deposit into the Late Classic III phase.

Phase	Date (AD)	Context
LC III / EPC	900	
	850	Level 1
Late Classic III	800	Feature 99-1
	750	Level 2
Late Classic II	700	Level 3
	650	Level 4
Late Classic I	600	Level 5
	550	Level 6
Early Classic	500	

Table 2: Tentative summary of the chronology and construction sequence of Str. ATM-M1.

FEATURE 99-1

In the dating of the architectural phases of Structure ATM-M1, it was surmised that Feature 99-1 was deposited sometime between AD 800 and 850. The specific type constituents can be used to make additional remarks on the dating of the individual vessels comprising this feature. The identification of this deposit as an open-air termination deposit (Song and Zubrzycki, this volume) relies not only on the contemporaneity of the material, but also on the presence of conjoining sherds lying directly on Floor 1, in a cluster aligned with the primary axis of the structure. In the absence of these criteria, the deposit could have been identified as a minor midden deposit. Indeed, the deposit does share broad similarities with on-floor de facto refuse deposits (see Chase and Chase in press for a detailed discussion of on-floor de facto refuse deposits at Caracol). The identification of Feature 99-1 of Str. ATM-M1 thus serves to caution archaeologists of the nature and composition of terminal deposits in the Roaring Creek Valley.

Types identified on this on-floor deposit are: Dolphin Head Red, Garbutt Creek Red, Rubber Camp Brown, Belize Red, Cayo Unslipped, and Cabrito Cream-polychrome. All these types are present in the Late Classic and thus fix the deposit to that phase. Particular notice should be paid to the Silver Creek Impressed sherds (Gifford 1976: Fig. 139j and k) and Rosario Incised sherds (Gifford 1976: Fig. 111j, k and l) recovered from the deposit. These two types were distinguished based on paste attributes and minor stylistic differences of the surface treatment as described by Gifford (1976: 194 vs. 227). At this juncture, it should be remarked that the incised decorations of Rosario Incised and Dolphin Head Red: Incised Variety are nearly identical (Gifford 1976). Identification of the sherds from Feature 99-1 as

Rosario Incised relied again on the written description of paste attributes (Gifford 1976: 196 vs. 227). Certain sherds in the deposit were found to conjoin and with the exception of Rosario Incised, all were found to be contemporaneous. The presence of Rosario Incised sherds in a Late Classic deposit thus urges the conflation of both types into one type spanning the entire Tepeu phase. The paste differences may be used to create varieties of this type. In addition the paste differences may or may not possess value for temporal placement.

The deposit was composed of at least 6 vessels and 3 isolated sherds. Vessels were represented by: 2 fragmentary Dolphin Head Red bowls and sherds of other or another bowl (11 sherds); 1 Dolphin Head Red: Incised Variety dish (6 sherds); 1 fragmentary Rosario Incised/Dolphin Head Red: Incised Variety dish (2 sherds); 1 Cabrito Cream-polychrome tripod plate (20 sherds); and at least 1 neck of a Cayo Unslipped olla (5 sherds). Isolated sherds were represented by: 1 Garbutt Creek Red bowl sherd, 1 Rubber Camp Brown bowl sherd, and 1 Belize Red dish sherd.

Termination caches/deposits are generally assumed to represent a form of ritual behavior. It is thus of interest to compare the materials of Feature 99-1 to the materials deposited in Actun Tunichil Muknal as both assemblages have been interpreted as a result of ritual activities. The assemblage of Feature 99-1 differs from the material found in Actun Tunichil Muknal both in terms of types represented and frequency of types that are present in both contexts. The types that are found both inside and outside of the cave are: Garbutt Creek Red, Dolphin Head Red, Cabrito Cream-polychrome and Cayo Unslipped. If it is assumed that Structure ATM-M1 was used contemporaneously, and in conjunction with, the activities conducted within Actun Tunichil Muknal, one would expect to find the same types and same frequencies of these types. Surprisingly, we do not find such explicit parallels. The Late Classic ceramic assemblages of all caves in the Roaring Creek Valley are dominated by unslipped jars and deeply incurving Late Classic bowls (see Helmke et al. 1999). The jar component of the "termination deposit" represents less than the frequency represented in caves. An additional discrepancy is the presence of Rosario/Dolphin Head Incised, which at present has not been documented within the caves in the Roaring Creek investigated by the WBRCP. The Cabrito Cream-polychrome dish is notable as it occurs in very low frequencies in the Roaring Creek Valley. Thus far two isolated sherds of Cabrito Cream-polychrome vases have been identified: one in the Hideaway Chamber of Actun Tunichil Muknal (Griffith 1998) and the other from the Stela Chamber of the Laberinto de Las Tarantulas (Helmke et al. 1999; Helmke this volume). Additionally, one tentatively identified sherd was recovered in association with the ancestor shrine of the Pook's Hill plazuela. In sum, it can be said that although Feature 99-1 at Structure ATM-M1 is contemporaneous with the majority of cave, it is only partly similar to the ceramic assemblages deposited in the caves of the Roaring Creek Valley.

VESSEL RR99-C-001

The most unique vessel recovered by the Structure ATM-M1 excavations is the Cabrito Cream-polychrome plate (Figure 4) forming part of the "termination deposit" of Level 2 (Table 3). Due to the uniqueness of the vessel, it will be described in detail (Figures 4 and 5; Tables 3 and 4). The specimen identified as a Cabrito Cream-polychrome, but it combines numerous modal features and surface treatment features of other Late Classic polychrome types.

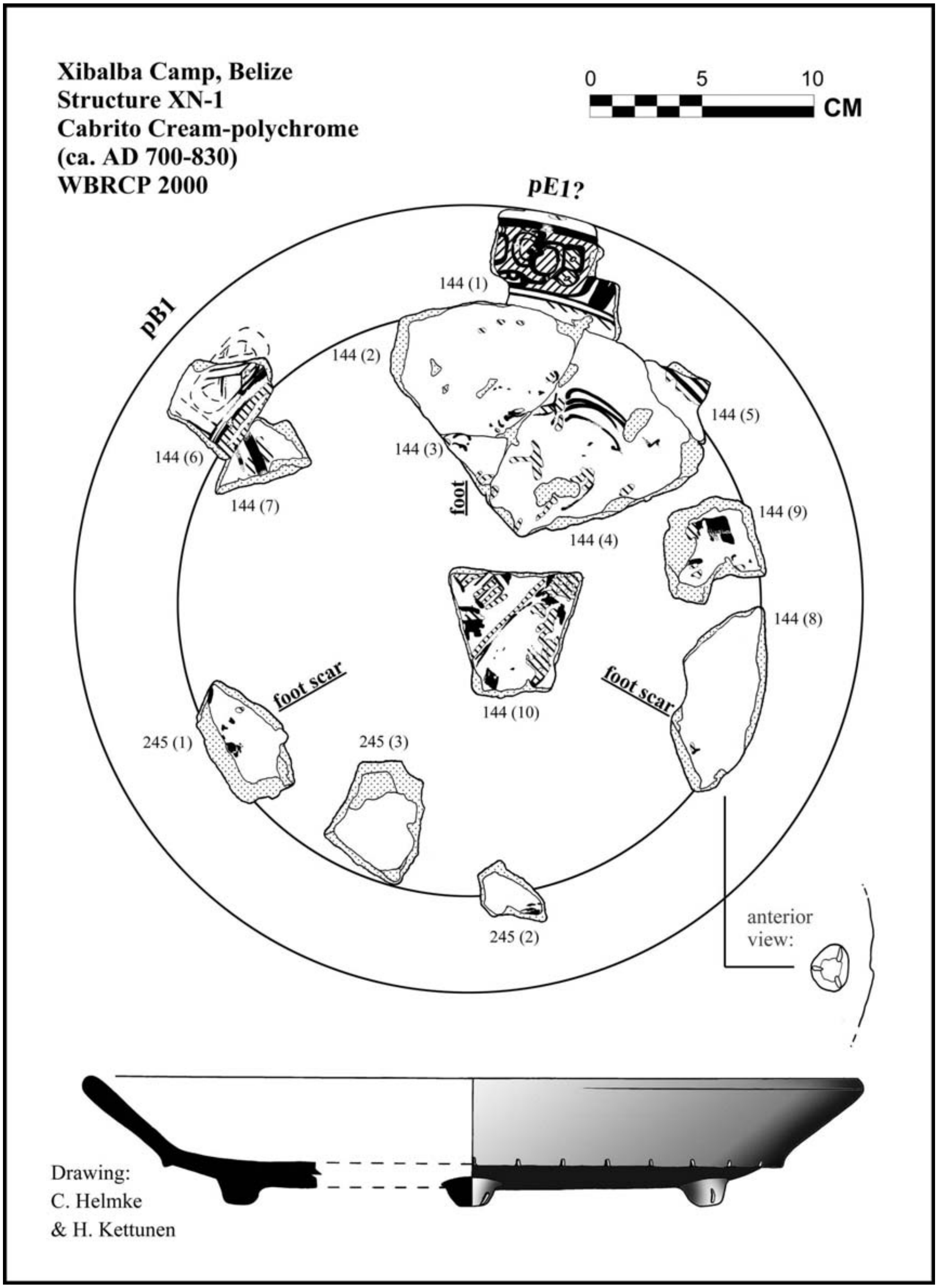

Figure 4: Section and interior view of the Cabrito Cream-polychrome dish.

Context	Inventory No.		Frequency
Unit 1B, Level 2	RR99-STR1-144	=	10 sherds *
Unit 1B/C, Level 2	RR99-STR1-167	=	7 sherds
Unit 4B/C, Level 2	RR99-STR1-245	=	3 sherds *

	TOTAL	=	20 sherds

These 20 sherds represent ca. 40 % of the RR99-C-001 polychrome plate.

* indicates sherds that were drawn.

Table 3: Contexts from which the sherds of Vessel RR99-C-001 were recovered.

Inventory no.	Sherd no.	Quartzite (opaque)	Quartzite (translucent)	Calcite (flecks)	Shell (chips)	Mica (laminar)	Hematite (nodules)	Comments
RR99-STR1-144	1		●	●		●		
	2	●				●		Q = sand
	3					●	●	
	4			●		●		
	5			●		●		
	6	●				●		
	7				●	●		
	8		●	●		●		brown wash
	9	●	●	●		●		
	10		●	●	●	●		
RR99-STR1-245	1	●				●		
	2			●		●		
	3	●		●		●	●	H = 0.8 mm
RR99-STR1-167	1			●		●		foot
	2		●			●		large sherd
	3					●		
	4			●		●		
	5					●		
	6					●		
	7			●		●		

Table 4: Tabulation of temper inclusions by sherd of Vessel RR99-C-001.

Vessel Shape and Modal Attributes (Figure 4)

The vessel has a nearly flat bottom and everted sides with flattened lips. The cross-section of the plate is very similar to the Palmar Orange-polychrome dishes and plates discovered at Seibal (Sabloff 1975) and Tikal (Culbert 1993). The vessel is supported by three short nubbin feet. The shafts of each of these supports are decorated with three deeply incised vertical lines. At the basal break or the juncture between the sides and the flat base is a pointed and impressed ridge. The cross-section and treatment of that ridge is typical of the McRae Impressed type. Certain polychrome plates/dishes of the Peten also display the McRae-type impressed basal ridge. All these characteristics point to a strong Peten influence.

Size

Maximum rim diameter is 34.90 cm. Height excluding nubbin supports is 4.95 cm. Height of nubbin feet is 1.30 cm. Maximum diameter is 2.80 cm. Thickness of walls ranges between 0.90 and 0.70 cm. Thickness of base ranges between 0.80 and 1.10 cm.

Decoration (Figures 4 and 5)

Leaving the impressed ridge and incised nubbin feet aside, the exterior is otherwise left undecorated. The interior was painted red, orange and black on a cream-slipped background. The sides of the plate were embellished with a fully viable Primary Standard Sequence (herafter PSS). Only one glyphic collocation is still fully preserved, and an eroded portion of another collocation is also present. Based on the size of the preserved glyph and the size of the dish, it can be assumed that the original text on Vessel RR99-C-001 could have been composed of as many as 20 glyph blocks. As all documented PSSes range between 4 and 22 glyphs in length (see MacLeod 1990: 7), the reconstructed length of Vessel RR99-C-001's text is in keeping with the PSSes of other Late Classic vessels.

The partially preserved collocation represents the month sign *Zip* (see Coe 1992: 103, Fig, 20.3) with a bar prefix representing the number 5 (see Coe 1992: 91, Fig. 17) (Figure 5). As the calendrical collocation is as wide as the complete collocation represented on another sherd, it is presumed that the coefficient is not above five. As 5 Zip occurs 140 times between AD 700 and 830 (the range to which Cabrito Cream-polychrome has been assigned; cf. Fields and Ball 1994), the Calendar Round date cannot be securely associated with a Long Count date. As 5 Zip can only occur in association with four days (i.e. *Caban*, *Ik*, *Manik*, and *Eb*), the recovery of a sherd bearing the coefficient of the day sign would considerably reduce the number of possible correlations to the Gregorian Calendar. As the Calender Round date would have introduced the text on the Str. ATM-M1 Vessel, the month sign would have assumed the second position in the text (i.e. glyph block position pB1). In addition to the calendrical interpretation of this glyph, Nikolai Grube (pers. comm. 2000), has suggested that this collocation could also represent the Emblem Glyph of the site of Naranjo, Guatemala. Unfortunately the sign is too weathered to confirm this suggestion and the presence of linear features as prefixes to the sign suggest that it is indeed a month sign.

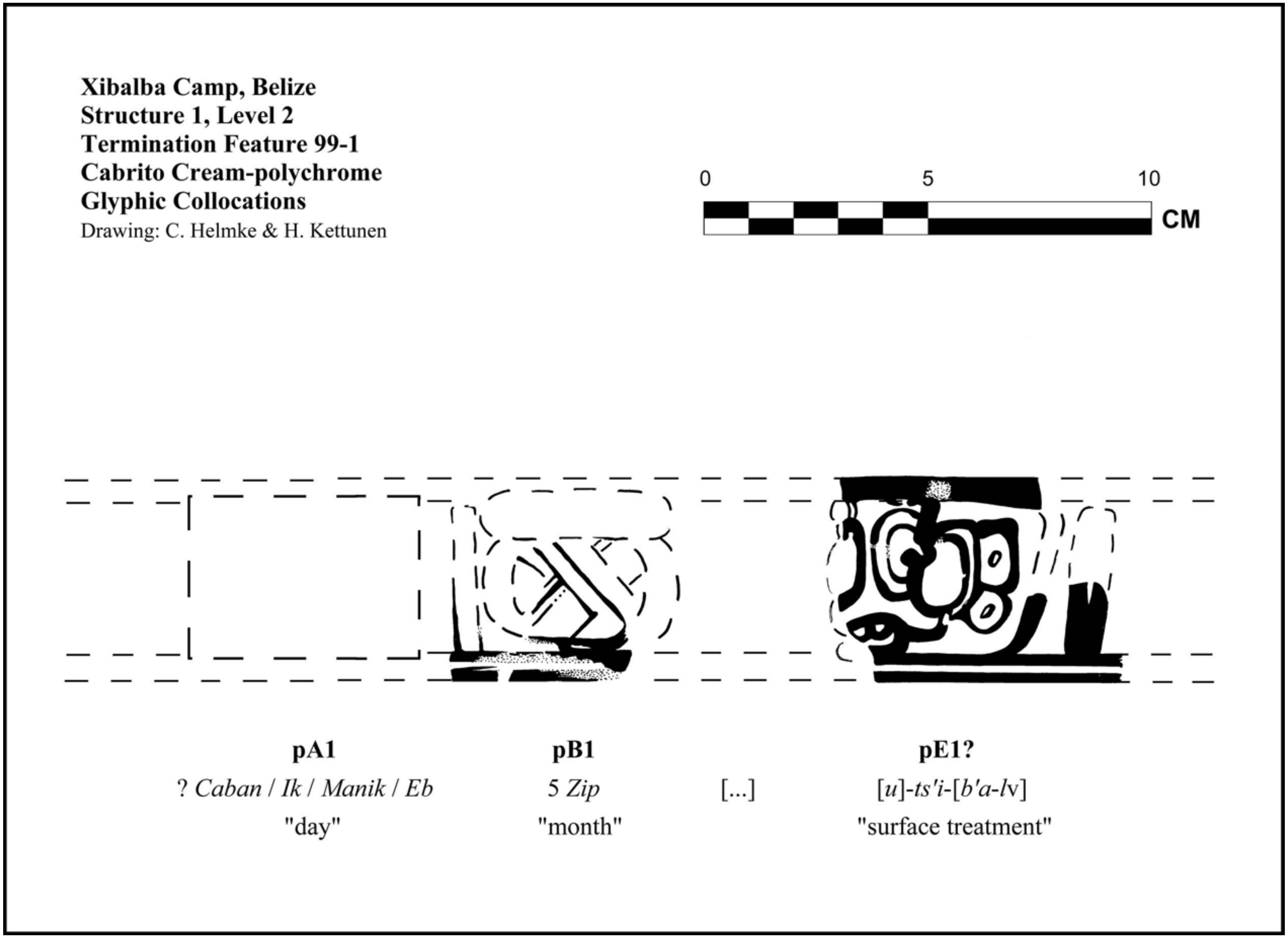

Figure 5: Reconstruction of the glyphic text that adorned the interior rim of the RR99-C-01 dish.

The second preserved collocation represents the profile of a leaf-nosed bat (Figure 5). As the month sign is accounted for, the glyph in question cannot represent the month sign *Sotz*, which is also represented by the profile of a leaf-nosed bat (see Coe 1992: 103, Fig. 20.4). It should be pointed out that several bats are used in the Maya writing system, one serving a calendrical function and others functioning syllabically. Although these are not entirely distinct graphemically, the presence or absence of specific attributes has been used to suggest that several types of bats exist in the script (cf. MacLeod 1990: 211-212). No strict consensus exists among epigraphers as to the exact phonetic value that each bears, but several phonetic values have been offered, each achieving differing degrees of success. In painted PSSes, the non-calendrical leaf-nosed bat serves as a link between the introductory segment and surface treatment sections of the PSS (MacLeod 1990: 508 nos. 13 and 20). Based on substitution sets between the bat main sign and the so-called "Fire Quincux" the bat main sign was originally assigned a phonetic value of **ts'i** (Grube 1991; Stuart 1987). Using this value, the bat has been understood as the main sign of the collocation standing for word *ts'ib'* (i.e. "writing"). This phonetic value was subsequently dismissed by Barbara MacLeod (1990: 235-261, 508 nos. 13 and 20), who suggested that the bat may represent a verbal function (which she read as **yuh**). Since then, the **ts'i** phonetic value originally offered by Grube and Stuart has been revived, which appears to generate more productive readings (e.g. Mora-Marín n.d.). The leaf-nosed bat is thus understood to stand for [*u*]*ts'ib'* or [*u*]*ts'ib'aal*. Although the structure of the PSS is relatively strict, the non-calendrical bat can occur anywhere between the third and sixth position in texts that are not introduced by a Calendar Round (cf. MacLeod 1990: Figs. 4.1d vs. 5.7a). The bat on the Structure ATM-M1 Vessel thus formed a glyph block that may have occupied positions pE1, pH1, or any in between.

Due to severe erosion, even less can be said of the design painted in the center of the plate. The flow of curvilinear and parallel black and red lines suggest that feathers of a headdress are represented. This suggests that at least one richly adorned lord was represented on the plate's interior. Below, and to the side of these feathers, appears another more faint cluster of feathers. Many Late Classic representations on polychrome vessels depict elite individuals sitting cross-legged holding bloodletters that are embellished by a bouquet of quetzal or macaw feathers. Possibly, the individual on the plate was shown holding an elaborate feathered bloodletter. Nonetheless, these suggestions are entirely speculative and can only be verified if additional and better-preserved sherds are discovered in the future.

Exterior

Extremely well burnished. Long shallow striations are visible on the exterior and they appear to have formed during the smoothing process, from the ridges of fingertips. The exterior is completely unslipped. One small patch of dark brown wash (2 x 3 mm) on one sherd (Sherd 8 of RR99-STR1-144) suggests a slipping accident, as there is no other evidence suggesting that the exterior was slipped with a thin brown wash. Exterior burnished surfaces are hard and difficult to scratch with fingernails; it erodes only minimally upon touch.

Interior

Only superficially burnished. Most surfaces are slightly uneven, and in many areas, smaller temper inclusions are visible at the surface, as a result of erosion. The interior polychrome design is not painted on a cream slip, but on a "cream" base color, which is in fact of the same composition as the paste, but of a lighter color. The base color verges on light gray in some areas. The only slip applied to the interior is in the form of the painted designs (with a fine brush) in black, red (maroon), and orange. It appears that these painted designs were executed while the interior of the vessel was still wet.

Paste Cross-section

These descriptions are based on fresh break of a sherd (i.e. RR99-STR1-144/1). Two bands are apparent. Exterior band is a light khaki (tan) color; interior band is a safari yellow/orange (buff) color. These suggest only partial oxidation and thus incomplete firing. Paste is extremely fine-textured as well as dense and temper inclusions are of low ratio to matrix and noticeable by size difference. Erodes only minimally upon touch. Rubbing sherd cross-sections removes minute particles that are smooth to the touch.

Inclusions

Temper inclusions are tabulated in Table 4. Micaceous inclusions predominate and could be considered powder that was mixed in with the ash-tempered clay matrix. "Golden" flecks of laminar mica (see Fry 1969: 209, 268, 1979: 502) or muscovite are visible on all sherd surfaces except those covered with slip/paint on the interior of the plate. Similar mica inclusions have been noted as an ingredient of ash-tempered pastes (Ford and Glicken 1987: 485). The most notable is the inclusion of snail shell fragments. Pastes with snail shell inclusions have been documented in the ceramic materials from Macanché Island and the vicinity of Flores (Rice 1987: 105-107; Cowgill 1963: 281). In commenting on these specimens Prudence Rice points out that: "the presence of freshwater snails and the otherwise relatively uniform fine-sorting of the particles suggests that this pottery may be made from the lacustrine clays common along the margins of most of the Petén lakes" (1987: 105). These observations suggest that the snail shell fragments were not deliberately added to the clay as tempering agents, but were present from the onset.

Comments

Prior to the discovery of Vessel RR99-C-001 no fully viable glyphic collocations had been discovered at any of the sites in the Roaring Creek Valley. The presence of fully viable glyphs on Vessel RR99-C-001 therefore suggests that this vessel may have been manufactured elsewhere and imported to the Roaring Creek Valley. Specific types of PSSes are beginning to be associated with particular production areas and even particular workshops (see Reents, Bishop and MacLeod 1994). Due to the repetitive nature and syntactic integrity of Primary Standard Sequence texts, the Structure ATM-M1 Vessel can thus be tentatively associated with a production area. PSS texts that include the painted leaf-nosed bat can be associated with Uaxactun and Tikal-style vessels as well as the so-called Ik'-style vessels of the Motul de

San José area (MacLeod 1990; see also Reents, Bishop and MacLeod 1994: 172-179). Unlike the monumental texts carved on stone monuments, the glyphic texts of ceramics are rarely introduced by calendrical collocations. However, the vessels of the Ik'-style are "notable for the Calendar Round dates recorded in their hieroglyphic texts" (Reents, Bishop and MacLeod 1994: 224, no. 18). These lines of evidence suggest that the Structure ATM-M1 Vessel may have been produced within a sphere stretching from Motul de San José to Uaxactun. Supporting this interpretation is the presence of snail shell inclusions in the paste, which may tie the vessel directly to the lacustrine clays of Peten Lakes (cf. Rice 1987: 105-107). Neutron Activation analysis of the vessel's paste could be used to demonstrate beyond a doubt that this vessel was imported to the Roaring Creek Valley.

MICRO-REGIONAL MANIFESTATIONS OF CERAMIC TYPES

Many of the types identified from Structure ATM-M1 are almost identical in all respects to the examples from sites in the Belize Valley. Minor differences do exist, however. These discrepancies appear to represent the manifestation of types as they were manufactured in the Roaring Creek Valley. If identified ceramic types are indeed theoretical constructs that the Maya possessed (see Gifford 1976: 9, 10, 32), then the ancient Maya of the Roaring Creek and those of the Upper Belize Valley appear to have had slightly different ideas. Many of these differences solely add data to the range of variability at the variety level. Other data suggest the formation of new varieties to types already established.

By definition, the Garbutt Creek Red type is part of the Pine Ridge Carbonate ware. Three sherds of a typical Garbutt Creek Red bowl were found in Structure ATM-M1 but they were made with an ash-paste. These specimens were recovered from Level 1 and Level 3. The paste composition and red slip may have warranted the placement of these sherds within Belize Red: Belize Variety (see e.g. Gifford 1976: Fig. 162a and b). Nonetheless, the incurving bowls of the Belize Red type have squared lips that differ modally from the rims of the Garbutt Creek Red type (Gifford 1976: Fig. 140). Based on the rim profile, these sherds were assigned to Garbutt Creek Red rather than Belize Red where identical rim profiles are absent.

Examination of more than 20 modally, iconographically, and epigraphically identical Belize Molded-carved vases indicates that paste composition is highly variable ranging from Carbonate, to Vinaceous Tawny, to British Honduras Ash. The finished product these vessels represented are all identical and the principal difference between these vessels is their paste. The paste composition of these vessels would have been invisible at the time the Maya were using these vessels. Thus, the separation of identical vessels into separate types on the basis of paste is indicative only in terms of archaeological analysis. Nonetheless, to the ancient Maya consumer, these differences may have been the least perceptible characteristic. Consequently, I favor modal attributes over paste characteristics.

Similar cases are represented by 1 ash ware Mountain Pine Red dish sherd (Level 5); 2 calcite-tempered Platon Punctate-incised bowl sherds (Level 2); and a fragmentary calcite-tempered Platon Punctate-incised plate retrieved during a surface collection in Actun Yaxteel Ahau (see Gifford 1976: Fig. 163 for identical specimen). These specimens reiterate that several identical vessels (in terms of vessel shape and surface treatment) were produced both from calcite and ash-tempered pastes. Creating new types based on these data is unwarranted due to few sherds available. Creating varieties that include paste groups that differ from the available descriptions of established types is contradictory to the type:variety system. Nonetheless, these difficulties indicate that if the role of modes were to supersede the role of type:varieties, the ceramic specimens documented from the Roaring Creek Valley would be more easily plotted into a hierarchical scheme of analysis.

Another difference identified was the presence of a brown slip applied to the interior of Mountain Pine Red dishes. The exterior of these specimens displays the typical red slip and these specimens conform to all shape and modal characteristics of the types defined by Gifford (1976: 193-195). For ease of reference, these specimens are referred to as Mountain Pine Brown in Table 1. These specimens are present in Levels 2, 3 and 5 and do not replace other varieties of the Mountain Pine Red type. The brown slipped specimens co-occur with the Old Jim Variety and Variety Unspecified. These specimens do not appear to represent a temporal subset of the existing type. Although 6 sherds may seem too few a number to assign a new variety, and sherds of the same kind of vessels occur at the Pook's Hill Plazuela that is located nearly 5 km to the North (Helmke, this volume). In accordance with Gifford, a toponym is given to this variety. The name suggested is "Kanan Variety" ("guardian" in Yucatec Maya, after the field name of Structure ATM-M1) (Barrera Vazquez 1995).

Unslipped censers with applique spikes have been documented at several lowland sites. These have been dated to various time-periods between the Preclassic and Postclassic. Nine unslipped sherds with applique spikes were discovered in Level 5. At first glance, these were thought to be derived from Miseria Applique censers. Notwithstanding, Miseria Applique censers typically have direct and everted sides. The specimens from Structure ATM-M1 were all derived from vessels with globular or sub-globular sides. This modal difference suggested that these specimens might not in fact be related to Miseria Applique. A review of the literature revealed that round-sided spiked censers also occur in Early Classic contexts (in particular at Altun Ha and Becan). In addition, identical material recovered from the Pook's Hill plazuela also suggest a placement of Tzakol 3 / Tepeu 1 for these specimens (Helmke 2000). These temporal placements are based on the fact that these specimens are recovered from sealed contexts dated to ca. AD 550 to 600, which therefore precede the Terminal Classic Miseria Applique type.

CONCLUDING THOUGHTS

The analysis of the ceramic remains from Structure ATM-M1 suggests that this structure was built and used during the course of the Late Classic. The presence of a molded-carved sherd in Level 1 indicates that the structure was falling into disuse around the time the Stelae Chamber of Actun Tunichil Muknal was used an important place of ritual (Awe et al. 1997, in press; Helmke et al. 1998). This observation is based on the presence of a nearly complete Belize Molded-carved vase in the Stelae Chamber of Actun Tunichil Muknal (Helmke et al. 1998). As was briefly mentioned above, the Belize Molded-carved "type" dates to between AD 850 and 1000 (see also Helmke, this volume). Another interesting pattern is that Structure ATM-M1 post-dates most of the usage of the Upper Entrance Chamber. On the basis of contemporaneity and the loci within the cave that exhibit the same ceramic types as those contained within the structure, the Main Chamber, the Sinkhole Tunnels, and the Hideaway Chamber were areas of the cave that were visited during the time Structure ATM-M1 was in use.

A comparative analysis of the ceramic materials from the caves in the Roaring Creek and Feature 99-1 at Structure ATM-M1 demonstrated that both assemblages are somewhat dissimilar in certain respects. The interpretation of Feature 99-1 a termination deposit implies that the Maya maintained a noticeable dichotomy between surface and sub-surface ritual ceramic assemblages. Indeed, the vessels forming the feature are equally as likely, if not more likely, to have been used as serving vessels for a meal or a feast. The material recovered from Structure ATM-M1 does suggests that it was used as a "special function" building, and no clear evidence exists to suggest that the structure served the function of a residence (Song and Zubrzycki, this volume). Based on proximity to the eastern entrance of Actun Tunichil Muknal, the possibility remains that this structure was intimately tied to the activities that were conducted within the cave. Speculatively, it could be assumed that feasting practices played a role in the surface component of cave-related rituals. Such a functional interpretation could help to clarify the similarities and differences in cave vs. surface assemblages.

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ARCHAEOLOGICAL INVESTIGATIONS ON LEDGE 1 OF ACTUN YAXTEEL AHAU, ROARING CREEK VALLEY, CAYO DISTRICT, BELIZE

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INTRODUCTION

Investigations in Actun Yaxteel Ahau are part of an on-going regional cave survey conducted by the Western Belize Regional Cave Project. Intensive fieldwork was started in the 1998 field season and was completed in the 1999 field season. This paper focuses on Lower Ledge 1, which is located adjacent to the main entrance and is the first of six cultural areas found within the cave.

Actun Yaxteel Ahau is of archaeological significance because it is one of two major river caves of the Roaring Creek Valley that contains a plethora of cultural remains. The research is also timely since easy access into the cave has permitted extensive looting. Additionally, a recent increase in the popularity of cave tourism in the area has further degraded the cave ecology and contributed to the disturbance of the archaeological material within the cave. This paper discusses the Lower Ledge 1 area, its cultural remains, and data collection methods. An interpretation of the relationship between three distinct areas of cultural deposition is also discussed.

METHODOLOGY

The 1999 field research conducted in Actun Yaxteel Ahau consisted of a large-scale survey of the Lower Ledge 1 area. A small-scale survey of specific features was also conducted, identifying and describing concentrations of artifacts. In addition, diagnostic artifacts were collected and an examination of taphonomic processes was carried out. Finally, an excavation of the level surface of the ledge was conducted to investigate the possibility of an occupational component within the cave.

Due to the relatively large size of the area, the map of the Lower Ledge 1 was created at a scale of 1:100 (Figure 1). A total of 24 baselines and 25 datum markers were established in order to map this area and link it to the Upper Ledge 1 survey from the 1998 field season. Although the dynamics of the hydrological activity in Lower Ledge 1 are not completely understood it is clear that many of the artifacts have been subjected to some water action and may not be in their original context. However, in parts of the area water action would likely have been minimal. To account for the problem of water action, it was necessary to develop a spatial plan of the general location of artifacts in reference to the Upper Ledge 1 area.

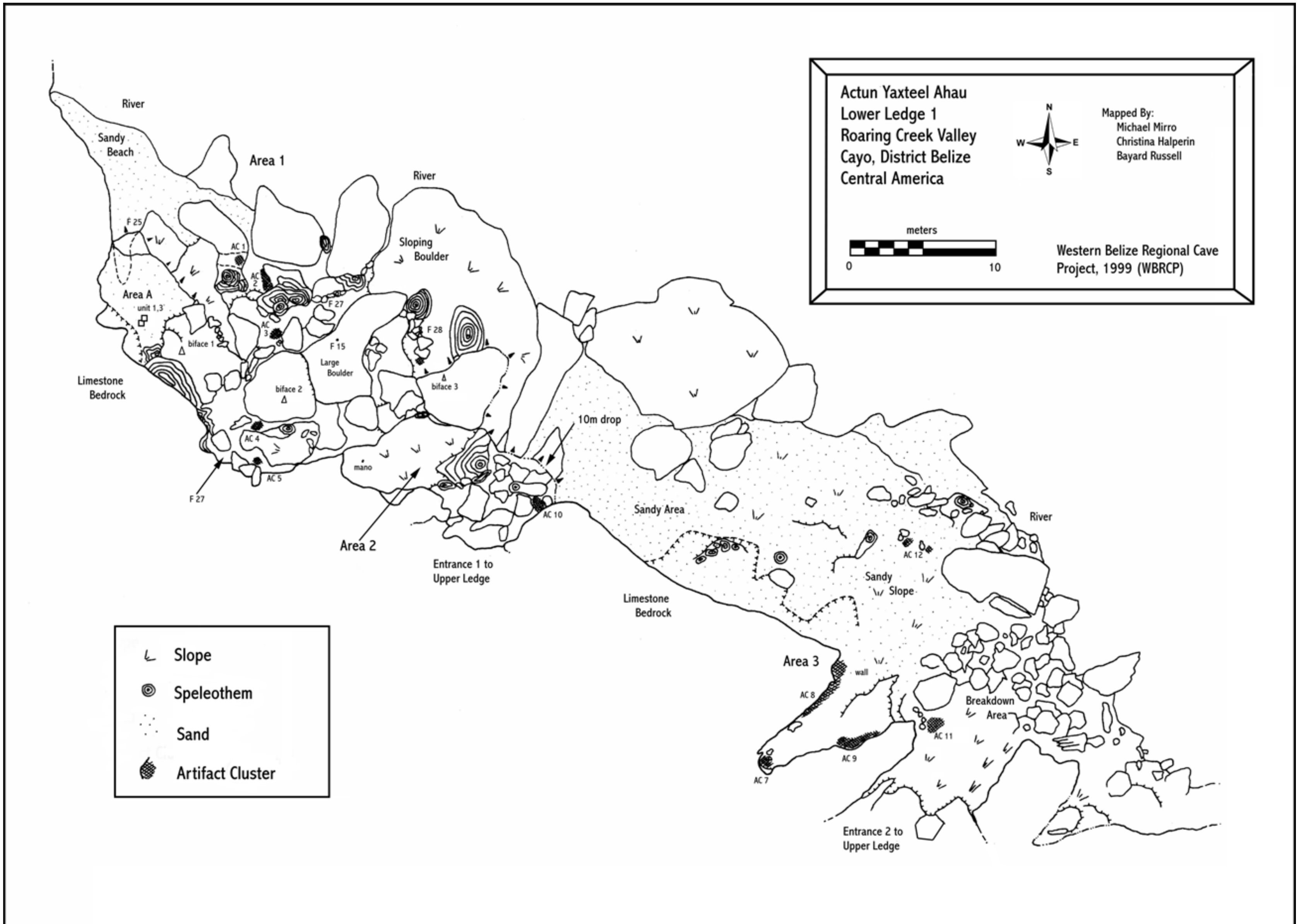

Figure 1: Map of Lower Ledge 1, Actun Yaxteel Ahau

Features in the Lower Ledge 1 area were mapped on a scale of 1:20 and described in detail. They included architectural constructions (some of which incorporated natural cave features), caches of large quantities of faunal remains and ceramic vessels, and artifacts found in primary context. The large-scale map demonstrates the physical relationship between features, artifact clusters, and the cave itself (Figure 1).

All concentrations of two or more artifacts in a small area were designated as an artifact cluster, except in the case of large concentrations of ceramics that were designated as features. A total of 12 artifact clusters were identified in 1999. Each cluster, and its context, was described in detail including relationship to surrounding natural features. Taphonomic processes affecting the artifact clusters were also described.

Two units were placed in a large level terrace area of Lower Ledge 1 to investigate the possibility that this level area might have served as an activity zone. This hypothesis was formed based on the location of the terrace in front of an entrance, and it being the largest level area in this section of the cave. Additionally, ceramic and stone artifacts were visible, embedded in the sands that make up this area. This material also suggested the possibility of relatively intact and stratified cultural deposits that might serve as a relative temporal sequence for the ledge's use.

Using this methodology we collected data for the entire Lower Ledge 1 area. Analysis of the sample collections provided rough temporal coordinates for the artifact clusters and features. This allowed us to assign relative dates to all areas indicating the range of use. Since only small samples were collected, however, it was not possible to determine when the majority of activity took place. Spatially, three distinct zones of cultural deposition were identified on Lower Ledge 1. These areas contain a high density of artifacts and are separated by areas of low density or an absence of artifacts.

LOWER LEDGE 1

Area 1, Lower Breakdown

Area 1 consists of a sandy beach on the bank of the river below a series of sand and stone platforms. These platforms have been formed as a result of alluvial material filling crevasses between boulders ranging between 1 and 15 meters in diameter. The area is bordered on the north by the river, where large angular boulders protrude into the water. To the south, Area 1 slopes upward toward the wall of the cave on the western side and toward Area 2 on the eastern side. Across the river there is a 15 m wide sinkhole entrance that provides light to Area 1 that is approximately 20 m above the river passage.

Area 1 is subject to several natural taphonomic forces. Flooding is the most destructive force acting on this section, evidenced by the deposition of new sediments and erosion of soils from between rocks. Other stresses include creep, sheet, and rill erosion caused by dripwater running off the ceiling and walls, calcification, and recent breakdown. In addition to these

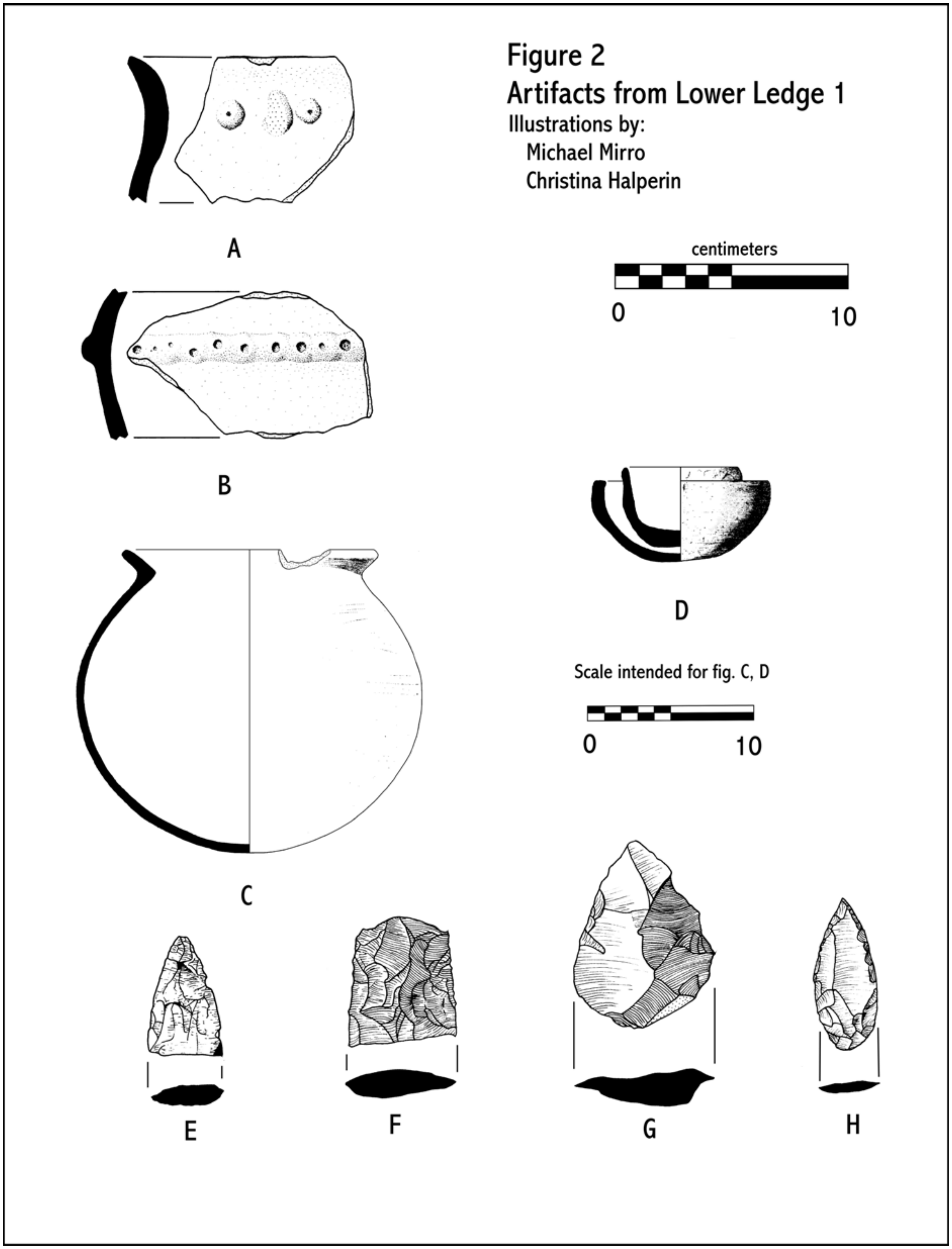

Figure 2: Artifacts on Lower Ledge 1, Actun Yaxteel Ahau.

natural forces modern human travel and looting have caused considerable damage.

The access to the southern parts of this portion of the breakdown from the beach area is restricted to two paths. Several large breakdown boulders form cliffs limiting southward movement. The first path is a series of natural steps formed by alluvial fill behind several 1 to 3 m rectangular rocks. The second access is a path on the east across the top of several large stone slabs. Most of the artifacts in the lower breakdown area lie along these two paths. Area 1, the largest and most complex space, consists of six artifact clusters, two constructed features, a jute cache, and several isolated finds.

The series of natural steps ascend from the water to the southern wall of the passage. At this point it is possible to head both east and west. To the west, over a large boulder, is a 10 by 5 m sandy platform. To the east it is possible to walk up several large stones to an uneven area over looking the entire breakdown pile where several isolated finds and a vessel cache were found.

In the spaces under and between large boulders on the side of the natural steps are five artifact clusters. All of these clusters have been affected by flood and drip water in some way. Although they are not considered in their primary context, the context suggests that they are fairly close to their original points of deposition.

Artifact Cluster 1 is located on the east side of the lower end of the steps. Most of the artifacts rest in a 50 cm high space partially underneath a large boulder. The rear of this space leads down to a pool that resides below the breakdown pile. A number of small rocks and a thin coating of silt on the surface of the artifacts suggest that floodwater inundated this area.

Cluster 1 consists of a chert blade fragment, five pieces of broken slate, two jute shells, and 39 ceramic sherds. A cursory analysis of the ceramics identified sherds from the Spanish Lookout phase including Roaring Creek Red and Garbutt Creek Red rim sherds (Gifford 1976), and a variety of olla rim sherds. Consisting only of a creamy white midsection, the blade fragment measured 4.6 cm in width, 5.3 cm in length, and 1.3 cm in thickness (Figure 2f).

Artifact Cluster 2 is located just to the southwest of Cluster 1 on the other side of the natural steps. The cluster is concentrated in a hollowed out area underneath a large boulder. Numerous small gravels and the blanket of silt on all the sherds indicate that this area is also affected by floodwaters. The cluster consists of several large olla sherds (over 30 cm) extending deep into the sand and a number of other smaller sherds on the surface totaling 35. It is likely that there are more cultural materials below the surface. The sherds vary temporally with representations from both the Early Classic and Late Classic Complexes: Socotz Striated, Roaring Creek Red, Yalbac Smudged Brown, and Mountain Pine Red (Gifford 1976). Also present are an unanalyzed faunal bone fragment, two jute shells and a piece of modified slate.

Artifact Cluster 3, located up slope from Artifact Clusters 1 and 2, contains only ceramic sherds. In the cluster are 20 small sherds (less than 10 cm), eight of which are from a larger recently broken sherd, however, nothing diagnostic was discovered. This cluster is less affected by floodwater from the river however it is, subject to movement from water flow originating above.

Artifact Cluster 4 is at the top of natural steps between two large travertine deposits. It is the smallest of the clusters in this area containing only 14 sherds. Many of these sherds are covered with calcite and are therefore unrecognizable. There is also a thin coating of silt that covers several of them, indicating floodwater action.

The final artifact cluster in this area, Artifact Cluster 5, is also located at the top of the natural steps east of Artifact Cluster 4. It consists of 33 sherds that are strewn under and around several small boulders. All of the sherds on the ground have a thin coating of calcite coinciding with the sherds from Artifact Cluster 4, which is at the same elevation.

South of Artifact Clusters 4 and 5 is one of several features in the lower breakdown, Feature 27. Several hundred jute shells have been cached in and around a small basin formed by drip water. The cache is between two rocks (approximately 1 m in height) and by the southern cave wall. It is necessary to get close and look between these rocks in order to see the cache.

At the time of investigation the basin was dry, but it is apparent that water flow into this area is prevalent. A visible path of water is marked by a white calcite trail as can be seen on the cave wall above the cache area. A few small soda straws and flowstone formations are also visible on this wall. Most of the jute and sherds present in this feature are covered with a thick coat of brownish white calcite as a result of having been exposed to the calcite rich water.

The cache consists of 269 jute shells (*Pachychilus indiorum*) and 20 ceramic sherds. Only one of the jute is complete while the others are missing the apices likely as a result of meat extraction. Most of these shells are longer than 2 cm although their actual size was difficult to measure considering the coat of calcite on the shell. One rim sherd that was not exposed to as much water flow as other sherds in the deposit was typed as a Mountain Pine Red from the Tiger Run Complex.

Next to the cache underneath a large boulder is a complete metate. The metate was placed on its side lying against a partially buried boulder, which is the same boulder the jute cache rests on. A stone approximately 40 cm in length sits on top of the metate partially obscuring it from view. The metate is a turtle back variety and the outer surface is smooth except for a small circular chip less than one centimeter in diameter. Polish is evident on the grinding surface indicating use. The grinding surface is approximately 4 cm deep. The material from which it was made is gray and pink granite. The metate is 42 cm long and 27 cm wide.

From this point in the breakdown, a flowstone formation to the northwest provides access to an open level sandy area. On this access way a primary chert flake was found just below the surface of the guano that covers the ground in the higher areas. It is worked bifacially on one lateral edge. It measures 6 cm in width, 8.1 cm in length, and 1.4 cm in thickness. Approximately 2.5 cm of cortex is apparent on the proximal end (Figure 2g).

The large flat sandy area is designated as Area A. The position of several large boulders has resulted in the accumulation of alluvial debris. This is not, however, a prehistoric event but an ongoing process. Several small gullies bisect the area from the southern wall to the north and several small sink depressions indicate that soil is slowly falling through the stones.

Several artifacts are visible in Area 1. Approximately one fourth of a tan colored granite metate sits upside down in a small depression eroded out by drip water. Also, several small sherds are partially buried near the northern border of this area.

Below the large boulders of Area A, it is possible to see beneath the alluvial build-up. In these spaces numerous sherds are wedged between rocks and partially buried in the sandy soil. On the surface of Area A, a sink depression has formed right above the space where the majority of these sherds are found. Some sherds are also found in the soil near the depression. Therefore, it is apparent that the floor of Area A is slowly collapsing carrying sherds into the spaces between the boulders below.

Since Area A is one of the few large, flat areas in this part of the breakdown, a goal of this season's investigations was to look for a constructed floor surface or evidence of tamping. A 50 x 50 cm test unit, designated Unit 1, was placed between the drip line of the cave wall overhang and the cave wall itself. A 1/4-inch screen was used for the excavated matrix. The first level contained a silty clay matrix and charcoal scattered throughout with concentrated in the southeast and northeast corners of the unit. The next level, Level 2, started when the matrix became firmer and contained less silt. The top of this level had a thin layer of charcoal. Level 2 contained five small ceramic sherds (less than 8 cm), two thin bat or bird bones, and a large rounded stone. This stone was found in the baulk of the unit's northeast corner. At this point an additional unit, Unit 3, measuring 50 x 50 cm was initiated to determine if the stone was an artifact or part of a hearth feature.

Unit 3 overlapped the northeast corner or Unit 1 by approximately 12 cm. While excavating through Levels 1 and 2, it became apparent that there were two visible layers of charcoal instead of one (as was the case in Unit 1) indicating three stratigraphic layers and not two. The size and number of ceramics found scattered throughout Unit 3 Level 2 were similar to those in Unit 1 Level 2: a few small ceramic sherds no bigger than 12 cm. The rounded stone was discovered to be a metate fragment (approximately 1/3 complete). This artifact was made out of dark gray granite. One-eighth of it remained in the unit wall therefore it was not removed from the unit. We excavated around the artifact in both units reaching a sterile, compact clay matrix. This matrix contained small stones scattered throughout. Due to the paucity of cultural material, the excavation ended with this level, Level 3. The layers of charcoal and different consistencies in the firmness of the matrix may indicate temporal periods of Maya use. When taking into consideration the natural geologic cave processes, however, it is also possible that these stratigraphic layers were formed as a result of gradual erosion.

One of the most interesting finds in Area A, Feature 25, was found in a crack in the cave floor. On a small ledge formed by several boulders near the entrance to the crack, a small olla rests sitting on top of a circular lid. It appears that this artifact configuration was intentionally placed in this area as opposed to having been washed in. However, the olla is leaning to the side, possibly dislodged or tipped slightly by water action. A thin coating of silt covers the outside of this vessel and its interior is partially filled with alluvial sand and gravels. The olla is 14.5 cm tall and 14.5 cm in diameter at the widest part of the body. The inside rim diameter is 12.3 cm and the inner neck diameter is 6.5 cm. The outside of the olla is red slipped however this coating has been partially eroded through its exposure to water and particles. A preliminary examination of this vessel by Christophe Helmke identified it as Tinaja Red as described by Gifford (1976). This makes the vessel Late Classic in date.

The outside or the convex side of the lid is slipped while the inside or concave side is not. The lid was complete and broken into two pieces. The lid measures 8.5 cm in diameter and was apparently cut from another vessel.

East of the top of the natural steps, near Artifact Clusters 4 and 5, are two large boulders. Access is gained to the second (larger) boulder by climbing across the first. The second boulder is fairly flat and its height permits a good view of the entrance of the cave and the surrounding area. On top of this boulder, the distal end of a dark gray colored chert blade was discovered sitting in a dry travertine pool that now is filled with guano (Figure 2e). The blade measures 5.4 cm along the central axis and is 3.2 cm wide at the break. The preparation flake scars are fairly small (1.5 - 10 mm).

In a recess beneath one of the large boulders, three complete vessels were discovered (Feature 17). The vessels were found resting upside down. A small olla (Figure 2c) sits on several small stones in a dry pool filled with guano. The olla almost completely fills the recess. On the other side of this boulder, sitting in a depression filled with dry clay, was a small bowl with a crudely manufactured pinch pot underneath. Both of these vessels were also found upside down.

The body of the olla measures 20.5 cm in diameter at its widest point, the neck measures 13.3 cm in diameter. The rim diameter is 14.6 cm and the height measures 18.0 cm. The thickness of the vessel ranges between 0.5 and 0.4 cm. The paste is black on the inside and gray on the outside. There is a small amount of calcite on the outside. The vessel is rough on the outside and finger impressions are still evident near the rim. The inside is slightly rough having been smoothed with a finger. Both the interior and exterior of the vessel are unslipped. The rim diameter, which curves in slightly, is 7.5 cm and the height is 5.1 cm. The bowl, also unslipped, is 11.2 cm in diameter at the rim and is 6.1 cm in height. Both the interior and exterior sides are smoothed.

Among several large boulders east from the breakdown area there are three separate features. This portion of Area 1 consists primarily of five large boulders that border the edge of the river. They are all relatively flat or gently sloping. To access the Upper Ledge without climbing, one must pass through this area.

The first feature, Feature 26, is a set of seven rocks aligned in a linear fashion, with calcified fill behind them on the sloping rock surface. Behind the feature is a small alcove with a flat gravel floor. Within the gravel was a metate fragment 20 cm in length and 2 sherds. These aligned rocks create a level surface. It serves as the easiest pathway from this part of the breakdown to the eastern and southern areas of the breakdown. It may have functioned to delineate a pathway. It may also have served as a kind of platform. No cultural material was found on this surface but this may be a result of flooding. This area would have been subject to flood action since this feature is very close to the water level.

Feature 26 leads directly to another feature, Feature 28. This feature is composed of several large rocks that fill in a void between two large boulders. The large rocks appear to have been intentionally placed to form a "bridge" between boulders. The bridge is not crucial for gaining access from one side to the other since it is not difficult to jump from one large boulder to the next, skipping the large stacked rocks. Since they are not necessary to navigate the cave, it seems likely that their placement was symbolic rather than utilitarian, indicating a pathway leading up to Entrance 1 of Upper Ledge 1.

To the northeast of this "bridge" and associated with Feature 28 is a depression where 25 sherds are nestled in gravel-like sand. Small rocks between 5 cm and 35 cm are scattered within this area. The sherds appear mixed throughout this matrix indicating that more cultural material is buried underneath. Six of the 25 sherds appear to come from the same vessel one of which is a rim sherd with appliquéd eyes and the remnants of an appliquéd nose (Figure 2a). Although this vessel has not yet been typed it is stylistically similar to a Late Classic bowl from Actun Balam (Pendergast 1969:15, Fig.5e). Present also within this assemblage is an unslipped red body sherd with a punctated appliqué that appears to encompass the vessel (Figure 2b).

Beyond Feature 28 and further along the pathway, a bifacially worked leaf-shaped blade (Figure 2h) was found in a small "shelf" of a large boulder. This shelf is approximately 8.0 cm long, protrudes 7.0 cm from the boulder, and is approximately 70 cm above the floor. The center is hollowed out and partially filled with silt. The blade is buried two-thirds of the way by clay with the distal end down. Due to the shape of the boulder it would be almost impossible for something of that size to wash in. The blade is less than 4 mm thick, measuring 6.5 cm long, 2.7 cm wide and is made out of a light brown-gray chert. These types of blades have been interpreted as implements used for sacrifice or bloodletting (Schmidt et al. 1998:168).

Area 2, Upper Breakdown

Area 2 consists of the upper breakdown and forms the southern portion of the western end of the breakdown area located above Area 1. The elevation above the river is generally between 10 and 15 meters, and it is unlikely that floodwaters reached here. Most of the rocks and surfaces are covered with a thin coating of bat guano. There are several areas where drip water has formed white formations on top of boulders. This area is considerably more dangerous than Area 1 because there are deep crevasses between the boulders with drops of approximately 10 m. It is necessary to cross this area to gain access to the Upper Ledge and this is the first area where climbing with use of hands is required. This area is also darker than Area 1 though Area 2 is still within the penumbral zone.

The natural formation processes affecting this area are mainly limited to the slow collapse of various sections of the breakdown, calcification, and creep. This area has been affected by foot travel, however, minimal damage has been done to the area where artifacts are deposited.

Area 2 has very little cultural material. There is one artifact cluster in the southeast corner and a mano in the central area. This mano was placed in a small niche on top of a boulder. It is impossible to see the mano with out first climbing halfway up the large boulder containing the niche. It is clear that the mano was intentionally placed within the niche, as there are no deposits above this point from which the object could have fallen. The mano is gray granite, 18 cm in length and 8 cm in width.

Artifact Cluster 10, in the southeast corner of Area 2, is concentrated in a small chamber below several boulders. This chamber is located just below the entrance to the upper ledge where large concentrations of ceramics have been found. Evidence indicates that the ceramics in Cluster 10 likely came from the entrance area to the Upper Ledge and where deposited in their present location as a result of being pushed off of Ledge 1, or having fallen over the edge.

The chamber containing the cluster has been divided into two sections. Section A to the south and Section B to the north. Section A opens upward accounting for the ceramics to fall into this area. In Section A very few of the ceramics are from the same vessel and many of the sherds are mixed in with a gravelly clay and guano matrix.

Section B is a smaller area not quite large enough for a person to fit. It is to the north and below Section A. In this section soil and small rocks have become wedged between large boulders forming a ledge upon which the sherds are resting. There are many small holes and crevasses that open to the cave floor approximately 8 m below.

While we were examining this section the floor of Section B was constantly changing. Many rocks would settle into new positions or drop away. It is likely that this has been going on for years and that the soils and sherds in Section B are the result of this slow creeping process from Section A. On the cave floor below Section B several metate fragments and sherds have been found scattered, further supporting this hypothesis of ongoing taphonomic processes.

A preliminary analysis of the ceramics from Area 2 has revealed that the majority of these sherds have Early Classic Origin. These sherds include types such as Cabrito Cream Polychrome (Jaime Awe, personal communication 1999), Balanza Black, Pucte Brown, Minanha Red, Dos Arroyos Orange Polychrome, and Cayo Unslipped (Gifford 1976.)

Area 3, Alcove

Area 3 area consists of a small alcove cut into bedrock located a considerable distance from Areas 1 and 2. In Area 3 there are several one course high walls forming possible platforms and a dense concentration of artifacts.

The alcove has been extensively affected by water. A shallow gully that has formed against the west wall drains into this area and has washed artifacts from their original positions. This water is mainly drip water however large floods may have reached the alcove at sometime. Clay and sand have washed down slope toward the river bringing artifacts with them.

The alcove, a small chamber hollowed out of a wall of bedrock, is 10 m deep and ranges between 1 – 4 m wide by 1.5 – 3 m high, and is more constricted in the back. The area is above the cave's normal water level but it is not safe from flood action. Recent floods have wedged organic material in the boulders 5 m below the entrance. The floor is fairly solid clay with occasional rocks dispersed throughout. Additionally, the alcove is located just below the second entrance to the Upper Ledge.

Within the alcove are five artifact clusters, two constructed features and six surface finds. Artifacts in the alcove are generally clustered near the walls, though a few are present in holes formed by dripping water in the central area. Most of the artifacts in the Area 3 alcove can be divided into three artifact clusters. Two of these clusters are located in small erosion gullies.

Artifact Cluster 7 is at the southern end of the alcove and is a dense collection of approximately 100 sherds placed behind two stones measuring 50 x 30 cm. There is also a jute shell with a broken tip, a crab claw fragment, a small fragment of another jute shell and approximately 10 to 15 small stones. These sherds have been subjected to water action for some time as is evidenced by their soft and eroded surfaces. Many of their edges along the breaks have been rounded. The only identifiable sherds are a Dos Arroyos Orange Polychrome (Gifford 1976) and a few olla rims.

It appears that during wet periods water drips directly onto this cluster. Evidence of drip damage includes holes drilled into the clay by falling water. As mentioned previously, a small gully has formed along the western wall of the alcove. Artifacts found within this gully have been designated Artifact Cluster 8.

Cluster 8 consists of sherds, a granite mano, a chert biface, and three unidentified skull fragments. It appears that most of the artifacts came from this area but whether they were on the surface and the clay has eroded from beneath them or the clay was eroded exposing them remains undetermined.

The mano, made of grayish granite, is approximately 18 cm long and approximately 9 cm wide. The grinding surface exhibited extensive polish and pecking scars on one end. The mano was discovered beneath a 1 x 1 m rock in a small recess. The brownish chert biface fragment is located amidst the sherds of Artifact Cluster 8 and is similar to the blade illustrated in Figure 2e. The distal end of the blade was intact, and the fragment is approximately 5 cm long, 3 cm wide and 0.4 cm thick.

The skull fragments were discovered underneath several small stones. It appears that these stones protected the fragments and prevented them from washing away. No formal analysis of the bone fragments was undertaken this year.

Artifact Cluster 9 is located against the eastern wall of the chamber. This cluster extends 60 cm from the wall and is approximately 60 cm wide. Located within the cluster are numerous small stones and approximately 45 ceramic sherds.

The other artifacts that are located in this chamber occur in the southern third of the alcove. Approximately one meter away from the western wall in this area is a second mano. This artifact is broken with a little less than half missing. The fragment is 16 cm long and 7.5 cm wide and there is a small chip on the grinding surface near the rounded intact end. The grinding surface exhibited polish indicating that the mano has been used.

Approximately 1 m south of the second mano a cut shell was found against the wall in the erosion gully. The shell, measuring 10 cm long and 5 cm wide and 0.5 cm thick, is a marine shell of an unidentified species. The interior is whitish mother of pearl while the exterior has remain uncleaned due to the fragility of the shell.

On the entrance slope to this area it appears that the Maya built a one course limestone wall approximately 30 to 40 cm high forming a leveled area inside the alcove. This feature consists of 20 to 25 uncut stones approximately 10 to 50 cm in size. It is built at the top of a slope that drops out of the alcove into a larger more open part of the cave. Water has formed a small gully cutting through the wall dislodging several stones, which have rolled down slope several meters.

There are also several other linear arrangements of stones in the alcove, however, due to erosion it is difficult to tell whether or not there were intentional or natural. One of these arrangements is roughly perpendicular to the previous wall and forms a step up from the aforementioned platform. With further investigation it may be possible to prove whether or not this was architectural in nature. A second linear arrangement of stones occurs below the first wall as well. If this arrangement was intentional it may have formed part of a series of steps leading into the alcove.

Outside the alcove area there are two clusters. Down the slope to the north, near the river, Artifact Cluster 11 contains approximately 40 sherds wedged into the alluvial gravels and stones. Most of these sherds are on the uphill side of larger rocks suggesting that they may have washed down to their current location, possibly from the alcove. The second cluster of artifacts, Artifact Cluster 12, is located just up slope of the alcove on the entrance slope to the Upper Ledge 1 Area. They are imbedded in the clay that is creeping down from a large fracture above. It seems likely that this cluster may have originated from on the upper Ledge 1 area above. From both of these clusters all sherds are heavily eroded, small, and undiagnostic.

DISCUSSION

Investigations of the Lower Ledge area provided comparative material from three cultural areas, and between the Lower and Upper Ledge areas. This section will discuss similarities and differences between the three areas as well as an examination of the Lower Ledge as a continuation of the Upper Ledge. Finally, discussion will focus on the origin of cultural deposits in several of the Lower Ledge areas and the role of the Upper Ledge in this process.

One of the most significant aspects of these three areas is that they are located below and on the route to the entrances of the Upper Ledge. This suggests that certain features may compose part of a pathway to the Upper Ledge and act as either stopping points or preparation points. Area 1 is directly in front of Area 2 and must be crossed to reach the next cultural area. Both Area 2 and Area 3 are located adjacent to the entrances of the Upper Ledge and must be passed in order to access it. Therefore, it is possible that each cultural area on the Lower Ledge is related to the route either to or from the Upper Area.

In Area 1, Feature 26, the linear arrangement of stones leveling off a portion of a sloped boulder and Feature 28, an arrangement of stones placed in a crevasse giving the appearance of a bridge, all may be pathways or designated routes. These features mark the easiest route to access the western entrance of the Upper Ledge. The clustering of artifacts around these two areas may also indicate locations of ritual preparation or action. After Feature 26 and Feature 28 is a small, easy climb into Area 2, a walk up a guano covered slope, and several steps up two boulders lying across a 4 meters deep chasm that accesses Entrance 1 of the Upper Ledge.

It is also possible that access was from the western most area of the Ledge, which is closest to the sinkhole entrance up to Entrance 1, and that descending traffic passed through Entrance 2 to the eastern side of the Lower Ledge. Similar pathways have been identified in pilgrimages taken by contemporary Maya to mountains and sacred areas of the landscape as part of their counter-clockwise ritual circuits (Vogt 1969:390, Bassie-Sweet 1991:176-7).

Area 3, or the Alcove, may have served as a stopping point along the way to the Upper Ledge. However, due to its location east of the clay slope that leads to the eastern side of the Upper Ledge, it is not necessary to enter the alcove in order to climb the slope. The cultural remains in the alcove indicate it may have been an area of ritual activity due to the diversity and number of artifacts. These artifacts include two manos, a chert biface, bone, a marine shell, crude stone walls, and a high concentration of ceramics. Accessing this area requires walking through 1.5-meter deep river water, unlike Area 1, whose river crossing is much shallower.

While it is entirely possible that these areas could have served as loci for individual rituals, we suggest that they were stopping points along the way to the Upper Ledge. The two features in Area 1 are located in areas that force passers to cross these features when accessing the Upper Ledge, and their construction allows easier passage. Also relative to the upper area, there are few artifacts in the lower area, suggesting that this area was not a focus of intensive ritual activity. Considering the Maya use of height as a symbol of importance, the Lower Ledge was likely less ritually significance than the Upper Ledge.

The three areas are similar in their general distribution of artifacts. Outside of a few isolated finds, the majority of the artifacts occur in either niches, alcoves, or near the edge of the room. In Area 1 and 2, all of the complete vessels are located in niches underneath large stones. A metate is located underneath a boulder next to an alcove containing a jute cache. A mano is located in a small niche on the side of a boulder, and a point is placed in a cavity on the side of another boulder. The ceramics are in the small spaces underneath boulders and generally against the walls. This is true in Area 3 as well, where the majority of the ceramics are near the walls of the Alcove chamber. One explanation for the location of the ceramics could be that, since the area was used for so long, each time it was to be used again the artifacts were pushed or swept against the walls to make way for new ritual. The placement of artifacts in niches appears to be common to many caves in the Maya Area and the evidence on Ledge 1 appears to support this practice.

This same trend is evident in the upper area as well suggesting a continuity of practices in both areas. Most of the artifacts are located on the edges of chambers by the walls or in niches and alcoves. The similar distribution of artifacts may indicate that similar activities may have taken place in both locations however on a much smaller scale on the Lower Ledge.

On the Upper Ledge there are three jute caches similar to the one in the Lower Ledge. These features on the upper ledge are all located in either a small niche or basin formed by drip water. The majority of the shells in two of the caches have their tips removed.

A third analogous feature between the Upper and Lower ledge are walls of dry laid stone. In the Upper Ledge area two such walls have been found, one in an area near an alcove and the other leveling a slope and forming a pathway. The first wall, located at the entrance to an alcove, is very similar to the Alcove below in that it forms either a step or a platform at the entryway. One major difference is a lack of artifacts in the upper ledge feature, but both walls are built of similar materials and in the same crude manner. The second wall in the upper section forms the edge of a path crossing a steeply angled slope creating a flat surface for walking. This feature is similar to the one in Area 1 on the sloped boulder that improves walking conditions in an easterly direction.

Artifacts that have been pushed over the edge on to the lower ledge area may have created several clusters. In Area 2, Artifact Cluster 10, most of the artifacts appear to have come from above. The sweeping of unwanted materials over the edge provides a logical explanation to the precarious location and mixed content of the cluster. There are many areas where large concentrations of sherds several cm deep are located on the edges of cliffs or just over the edge on lower shelves in the Upper Area. Unfortunately no collection and analysis of sherds from these areas was undertaken last year, however, upon visual examination, they appear similar to the concentration of sherds from Artifact Cluster 10. Most of the sherds are fairly small, are different vessels, and are mixed with soil and stones. Although the presence of soil can be attributed to the natural movement of breakdown or water flow within the cave, the sherd locations, distributions, size, commingled nature, and quantity suggest that the Upper Ledge is the source for these artifacts.

Outside the alcove in Area 3 is another concentration of sherds that may be the result of artifacts swept over the edge from the Upper Ledge. In the area of the Upper Ledge above Area 3, there are several small ledges below the main section, difficult or impossible to access, and containing high concentrations of sherds. It is quite possible that several of the commingled concentrations of very small sherds, Artifact Clusters 11 and 12 are the result of this process.

There are some striking correlations between the Upper and Lower Ledges in terms of the temporal associations, placement of artifacts, artifact types, shell caches, and crude architectural constructions. While the Upper Ledge has a Preclassic component they both share a broad range of occupation: Early Classic to Late Classic. A preliminary analysis of the ceramics does not indicate that certain parts of the Ledge were used during specific periods. Rather, it appears that all areas have withstood use over a long temporal span. Other similarities such as artifact location, artifact type, shell caches, and dry wall constructions indicate that similar activities were performed in both areas of Ledge 1. Due to vastly lower artifact density however, and the possibility that some of the artifacts came from the Upper Ledge, it is likely that less activity occurred on the Lower Ledge. It is also possible that the Lower Ledge was considered of minor importance.

CONCLUSIONS

The possibility of re-deposition of cultural remains by water action makes precise spatial analysis difficult. It is still possible, however, to posit some generalized conclusions with regard to the spatial distribution of artifacts. The majority of the material found in the Ledge 1 area is near its original position, however, floods, wash, creeping soils, looters, and tourists have affected some of these contexts. Features, while having been impacted by water, also still appear to retain their basic shape and most of their contents. Numerous diagnostic artifacts are clustered around natural and artificial features, suggesting specific activity areas. Several part of the ledge contains deep deposits of sediments and compacted clay. Buried artifacts within these areas may also indicate long periods of usage.

The results of Lower Ledge 1 data collection and analysis provide a broader context for the 1998 investigation of the Upper Ledge 1 area. It is possible that the Lower Ledge played a crucial role in Upper Ledge activities in the form of preparation areas, and may also have served as part of a ritual pathway. Artifact type and frequency from the Upper and Lower Ledges also demonstrate that similar activities were conducted in both areas, with a higher frequency on the Upper Ledge. Preliminary analysis of ceramics indicate a temporal continuity ranging from the Early to Late Classic, which is typical of entrance area usage in the caves of the Roaring Creek Valley.

The 1999 investigations completed the first step toward the goals of the project. A data set has been gathered and brief interpretation on Ledge 1 has been developed. Succeeding steps should include further analysis of the artifacts, comparison of ledges within the cave, and a holistic analysis of the cave in reference to neighboring caves and surface sites. A further investigation of this nature will allow us to more fully assess the functions, activities, and cultural behaviors in relation to time and space.

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ARCHAEOLOGICAL INVESTIGATIONS ON LEDGES 5 AND 6 OF ACTUN YAXTEEL AHAU, ROARING CREEK VALLEY, CAYO DISTRICT, BELIZE

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INTRODUCTION

During the 1999 field season of the Western Belize Regional Cave Project, archaeological investigations of Ledges 5 and 6 of Actun Yaxteel Ahau were conducted. The work performed this season helped to complete an extensive survey and documentation of the cave's cultural materials. Ledges 5 and 6 contain evidence of Maya activity in the form of ceramic and lithic material, as well as features in the form of hearths and intentional cave modification. The detailed recording and description of these finds provides a basis for further interpretations of ancient Maya cave utilization, in particular at Actun Yaxteel Ahau.

SITE DESCRIPTION

Actun Yaxteel Ahau is a one-kilometer long cave that has been formed by a tributary of the Roaring Creek River (Miller 1990). The cave is perennially wet. The cave stream issues from a sump in the rear of the cave and flows through the main cave passage out to the cave entrance. Under the direction of Dr. Jaime Awe, the Western Belize Regional Cave Project has been conducting investigations at Actun Yaxteel Ahau since 1998. The goals of the project include extensive survey and artifact collection for the 6 ledges of cultural significance within the cave. These ledges, labeled 1 through 6, are situated along the sides of the river passage. The investigations conducted in 1999 focused on Ledges 5 and 6 with the stated goals in an attempt to elucidate patterns of ancient Maya cave use both locally and regionally.

Ledges 5 and 6 are located between Ledges 1 and 2 along the cave's river passage. The ledges are visible from the river, however, access to them from this vantage point is impossible as the cave wall is vertical. Ledges 5 and 6 are approximately 10 - 15 meters above the river. Ledge 5 can be reached from Chamber 6 of Upper Ledge 1. This chamber connects to Ledge 5 at its eastern end by a narrow passage overlooking the river below. Although access to Ledge 5 from Ledge 1 is possible, it is strongly discouraged without the aid of proper spelunking equipment. The most feasible access, to both Ledges 5 and 6 is through their individual sinkhole entrances, which can be accessed from outside the cave. The two sinkholes are on opposite sides of a large depression. The sinkhole to Ledge 5 is located on the west and the sinkhole entrance to Ledge 6 is on the east. The sinkholes are both a few meters above the lowest depth of the depression and approximately 16 meters apart.

METHODOLOGY

Tape and compass surveys were conducted on Ledges 5 and 6 on a scale of 1:100. A theodolite was used to tie in the two ledges with each other as well as with the other ledges within the cave. The Ledge 5 map also shows Ledge 1, while the Ledge 6 map also shows Ledge 5. Both maps indicate where cultural features and artifacts are located in relation to the cave morphology. Specific features were mapped at scales of 1:20 or 1:10, photographed, and described. Artifacts were also inventoried and described. Ceramics concentrated in isolated areas were designated as "clusters." The majority of the artifacts were illustrated and/or described within the cave enabling us to leave them where they had been found. Only a small sampling of artifacts was removed for further analysis. These artifacts included diagnostic sherds and items that may be looted if discovered, such as a slate mirror backing from Ledge 6. Where hearth features were found to contain remnants of burning, carbon samples were collected.

Ledge 5

Ledge 5 is composed of a breakdown area to the southwest and a platform and tunnel system to the northeast. Access through the sinkhole is obtained by climbing down a gradual slope composed of a breakdown of rocks, each no larger than a few meters. The breakdown continues to the bottom edge of the ledge. Although the breakdown slope is steep, access to this area from the sinkhole entrance can be accomplished without the use of climbing equipment.

Few artifacts were encountered in this area relative to the southeastern area of the ledge. Small clusters of ceramic sherds were wedged and scattered in the lower area of the breakdown. These concentrations included Ceramic Clusters 11, 12, 13, and 14, whose combined ceramic body sherd count is 40 and ceramic rim sherd count is 6. All sherds were lightly covered with a silt-clay matrix except the rim sherd from Cluster 13, which was buried deep within the matrix and wedged between two rocks. Preliminary ceramic analysis reveals that most of these sherds have Early Classic origins.

A narrow raised pathway along the north cave wall provides access to a platform at the northeast part of the ledge. This pathway is approximately 2.0 m long and constricts to approximately 0.6 m. To the south is a steep drop to the lower area of the breakdown. The pathway leads to the 12-meter long platform, which is restricted by steep drops to the river and breakdown to the south, and the cave wall to the north. Stalactites hang over the center of the platform reducing ceiling height in these areas. The floor is covered with a fine alluvium composed of calcite and guano, small rocks, and broken speleothems. At the northernmost point of this platform is a series of flowstone formations that slope upward to a short tunnel. The tunnel is approximately 7 m in length, and constricts in places to little more than one meter in height, and less than one meter in width. The ground is composed of a silty clay alluvium. The last 3 meters of the tunnel is the only area of the ledge devoid of sunlight.

Cultural materials were found scattered along the platform, flowstone formations, and tunnel. Ceramic Clusters 1, 2, and 3 were encountered along the platform as well as an obsidian blade fragment. This area also contained two features, Feature 1 (F1) and Feature 4

(F4). Feature 1 is located at the southern part of the platform that overlooks the breakdown below. It is composed of three rocks that are approximately 25 cm long. They are formed in a triangular position denoting a hearth formation. Charcoal samples were collected from Feature 1. Feature 4 is located at the easternmost edge of the platform that overlooks a very steep drop to the river below. The feature consists of a small 70 cm niche that contains an alignment of limestone and river cobble rocks. Between the rocks and the flowstone wall is a concentration of charcoal. Less than one meter to the south, at the end of the platform, is another concentration of charcoal (also sampled). Feature 4 may have also functioned as a hearth.

The sloping flowstone area north of the platform contains Ceramic Clusters 4 and 10, and Features 2 and 3. Feature 2 is found in a dry travertine pool filled with guano, charcoal, and silty clay alluvium. Also within the pool is an alignment of rocks (aligned approximately north-south). The rocks in this feature are less than 0.20 m large and are limestone except the southernmost rock, which is groundstone (most likely a metate fragment). Feature 3 sits in a one-meter long niche along the northern cave wall. Within this area is a grouping of 5 limestone rocks, a broken speleothem, 3 small body sherds (4 - 6 cm), and a modified slate fragment approximately 26 cm long. Both Features 2 and 3 have unusually placed limestone and imported rocks. They are isolated from other rocks and artifacts in the area, making their positions appear intentional.

The tunnel area contains Ceramic Clusters 5, 6, 7, 8, and 9. Some of the ceramics appear to have been washed down into niches such as the niche of Ceramic Cluster 9, which is at the beginning and lowest elevation of the tunnel area. Access to the back of this niche was physically impossible. All ceramic clusters are coated lightly with a thin layer of alluvium.

A preliminary analysis of the ceramics from the platform, flowstone, and tunnel areas reveal that they are of Late Classic origin. These areas contained more ceramics than the breakdown area with a combined body sherd count of approximately 219 sherds and a rim sherd count of 40. Although access to these areas is more difficult than to the breakdown area due to the restricted access way and its position farther from the entrance, they can still be reached with a relative amount of ease and without spelunking equipment. The ability to access all areas of the ledge by looters and visitors as well as processes of erosion indicates that all artifacts could be in secondary or even tertiary contexts.

Ledge 6

Ledge 6 consists of two chambers, an entrance chamber and a chamber with extensive crystalline formations, and five passages. The entrance chamber is a raised platform at the edge of the sinkhole entrance. It is approximately 3 m above the level of the depression floor, requiring use of a rope to access it. The floor is composed of a compacted soil and rocks, with a number of stalagmites around 20 cm in height. The ceiling contains numerous large stalactites. At the northwest end of the chamber is a pile of limestone rocks, assigned as Feature 1. Although the function of the feature is unclear, the rocks appear to have been purposefully assembled. At the easternmost point of the chamber is a small ledge approximately 1.1 m long and 0.5 m wide. This ledge is roughly two meters above the ground requiring a vertical climb up the side of the cave wall. The ledge contains a small pit of limestone rocks and a cached broken slate mirror backing. The mirror backing is approximately 75 % complete and is broken into four pieces. It has three visible perforations and linear striations. It is circular in shape, and measures 18 cm in diameter.

The entrance chamber constricts at the northeast forming Passage 1. Feature 3 is located at the entrance to this passage and consists of a cluster of stalactites that were intentionally modified in order to facilitate access to the passage. These speleothems have been broken on different angles, eliminating the notion that they were broken as a result of flooding or other natural processes. The ends of the modified stalactites hang approximately 58 cm above the cave floor allowing crawling access to the passage. Passage 1 is narrow (1 - 3 m in width and height) and slopes downward at a steep angle for approximately 9 m.

At the base of Passage 1 is a landing of flowstone rocks and breakdown that end in a steep drop to the river below. Passage 2 is accessible from this location by climbing the northern cave wall. Passage 2 is also narrow (1 - 1.5 m in width) conscripted by the cave wall to the north, and by a steep drop to the river passage. The ceiling is approximately 5 - 7 m above the passage. The floor is studded with stalagmites, some of which are still active. Charcoal is scattered throughout the area. Feature 2 is found at the beginning of the passage. This feature is a natural 0.8-meter long depression in the passage floor that is filled with a concentration of charcoal. On top of the charcoal is a grouping of rocks. The pit's morphology and the concentration of charcoal, suggest that it was probably used as a hearth. Less than 0.3 m to the north of Feature 2 is an obsidian blade fragment and approximately 0.6 m away lies Ceramic Cluster 2.

Passage 3 is approximately 1 m wide, 5 m long, and high enough to permit standing. Calcite-covered matrix and sherds (Ceramic Cluster 5) and bits of charcoal are scattered along the passage floor. The passage opens to a larger area where the ceiling extends a few meters higher and the edge of the passage drops to the river below. A small one-meter niche, located in the north wall of the passage, contained a few ceramic sherds, designated Ceramic Cluster 7. To the south, datum YAX-L6-24 was placed at the edge of the ledge. A tape measure was dropped down to the river below where a temporary datum was set in order to place Ledge 6 on the large-scale map that documents the 6 ledges of Yaxteel Ahau.

Close to the datum YAX-L6-24 are a few body sherds, designated as Ceramic Cluster 8. From this area begins Passage 4, which slopes gradually to the east and is void of any cultural materials except 5 rim sherds belonging to the same vessel (Ceramic Cluster 9). Passage 4 is approximately 29 m long. The floor contains a breakdown of limestone rocks, which are lightly covered in calcite. At the end of Passage 4 are Features 5 and 6. Feature 5 is composed of an alignment of intentionally placed flowstone rocks. An examination of the ceiling indicated that these stones could not have fallen naturally as no breakage marks are visible. Their north-south positioning may have served to delineate Passage 4 from Passage 5. Feature 6 is a stalagmitic column that has been intentionally broken. The bottom break is completely flat and the top break is jagged. This modification facilitated access to Passage 5, though the passage contained no artifacts.

Access to the second chamber on Ledge 6 is gained by climbing up a raised flowstone at the end of Passage 3. This crystalline chamber slopes upward to the north. Its slope is formed by a series of beautifully covered calcite flowstones that contain countless miniature (approximately 3 cm in diameter) travertine pools. At the upper end of the chamber, the floor is covered with a silty alluvium. Concentrations of charcoal are found with the silty alluvium in this northernmost area.

A cursory analysis of the ceramics indicates that Ledge 6 was utilized during the Early Classic period. Most of the ceramics are clustered in or near the crystalline chamber, which is one of the most difficult areas of the ledge to access. Ceramic Cluster 3 lies to the northwest and Ceramic Cluster 4 lies to the northeast. The ceramics are covered with the matrix making most of them difficult to locate. Among over 100 body sherds and 18 rims sherds are two Dos Arroyos Orange Polychrome basal flange dishes that were both broken.

CONCLUSION

Ledges 5 and 6 represent two of three ledges within Actun Yaxteel Ahau that can be accessed without entering water. Artifacts on these two ledges are fewer in quantity than Ledges 1, 2, and 3, whose distribution clusters away from the vicinity of the sinkhole entrances and are in difficult areas to access. However, it is possible that looting may have affected such spatial distribution. Interestingly, the preliminary analysis of ceramics from Ledge 5 demonstrates a dichotomy of temporal periods with Early Classic material present in the breakdown area and Late Classic material present in the platform and tunnel areas. Other artifacts on Ledge 5 such as the modified slate piece and the obsidian blade fragment may provide clues to the function of the ledge through further analysis and regional comparison. Ledge 6 is of particular interest due to the possibility of primary context beyond Passage 1. Such artifacts cluster in the northern area of the crystalline chamber, which was covered with a thin coating of alluvium. This area would be an ideal area for future excavations. Also of significance on Ledge 6 is the cached slate mirror backing and examples of cave modifications that were used to facilitate access. The findings on Ledges 5 and 6 add to the current database the WBRCP has amassed through investigations at Actun Yaxteel Ahau, and it is hoped that they will aid in furthering our understanding of the role caves played in Maya society.

Acknowledgments

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POOK'S HILL 1, OPERATIONS 1 THROUGH 3: SALVAGE EXCAVATIONS OF STRUCTURE 4A, ROARING CREEK VALLEY, CAYO DISTRICT, BELIZE

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INTRODUCTION

This report relates a synopsis of the investigations carried-out at *Plazuela* 1 of Pook's Hill in July and August of 1999. The report is divided into two principal sections. The first remains essentially descriptive, relates the location and a brief description of the site, as well as a summary of research preceding the efforts of the Western Belize Regional Cave Project (hereafter WBRCP). At the beginning of the interpretative section is the report of investigations conducted. Descriptions of the research objectives and biases then follow. Conclusions advanced herein derive from preliminary analyses of the ceramic, osteological and architectural data, all of which are explored in passim. A more detailed review of the osteological materials is presented in the following report (Bassendale, this volume).

LOCATION

Circumscribed on to the south by the Tapir Mountain Nature Reserve and by the Roaring Creek River on to the east, is the 300 acre Pook's Hill property, owned by Raymond and Vicki Snaddon. The area is now registered as Society Hall but was formerly known as Williamson and August, prior to the founding of the Tapir Mountain Nature Reserve (Vicki Snaddon pers. comm., 2000; BAS 1997). At the heart of their property lies the Pook's Hill resort, which is also managed by the Snaddons. The facilities of the Pook's Hill Lodge are constructed around an ancient Maya *plazuela* group, which takes its name from that of the property and the resort. In archaeological terminology, the ancient site has been designated as PKH1 (i.e. Pook's Hill, *Plazuela* No. 1) as several other *plazuela* groups are also been located on the Snaddon property. The PKH1 *plazuela* is registered in the files of Belizean Department of Archaeology, in Belmopan, as Site No. 31.189.002.

The Snaddon property and the PKH1 *plazuela* group are located in the Roaring Creek Valley, in the Cayo District of Belize. The site lies approximately 13.5 km southwest of Belmopan, and 7 km south of Teakettle village. The site lies less 5 km north of a group of caves that were intensively investigated by the WBRCP between 1996 and 1999 (Figure 1) (see Awe and Conlon 1997; Awe 1998a; Awe 1999). In relation to other ancient sites, the *plazuela* lies 4.8 km north of the major center known as Cahal Uitz Na (Figure 1) (Awe and Helmke 1998; Conlon and Erhet 1999; Erhet and Conlon 1999; Ferguson 1999). The PKH1 site is located in the foothills forming the western perimeter of the Roaring Creek Valley at an approximate elevation of 80 m above mean sea level. The Roaring Creek River lies only 600 m SE and 560 m E of the *plazuela*. A small creek is located less than 100 m

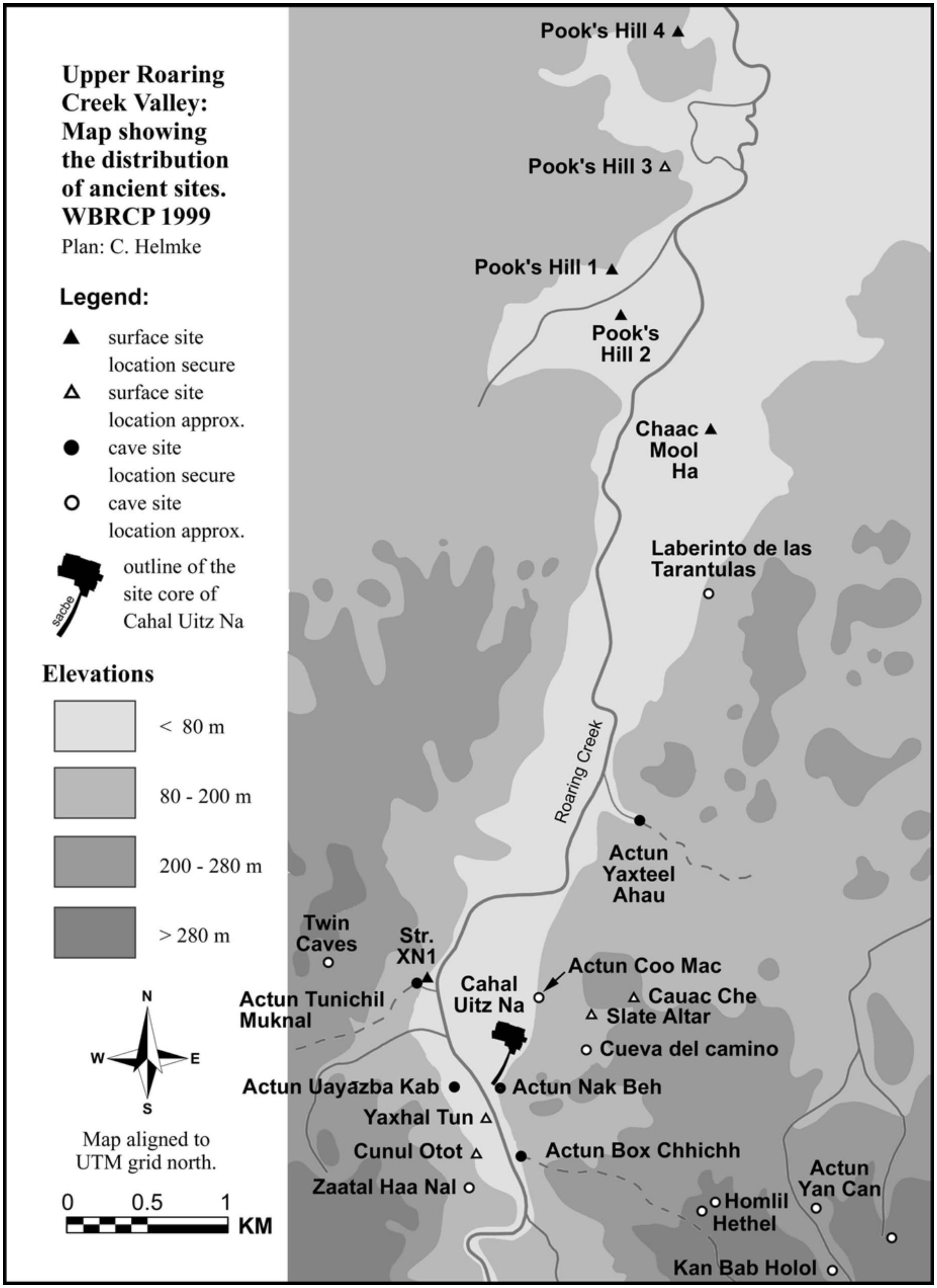

Figure 1: Map of the Upper Roaring Creek Valley showing the location of the Pook's Hill 1 *plazuela* and nearby archaeological sites.

south of the *plazuela* and runs for ca. 600 m until it flows into the Roaring Creek river.

DESCRIPTION OF POOK'S HILL GROUP 1

The Pook's Hill 1 site (Figures 2 and 3) is a formal patio group (Ashmore 1981: 49-54), which is composed of Type 2 structures in the Copan, Honduras typology (Freter 1994; Abrams 1994: 14; see also Willey and Leventhal 1979), or Class 3 structures in the Rio Azul, Guatemala typology (Adams 1999: 29). The *plazuela* has not yet assigned a position in the 10-tier typology developed for sites in Northern Belize (cf. Hammond 1975). Prior to the inception of formal archaeological investigations, it was posited that PKH1 matches the lay-out and configuration of *plazuela* groups at Tikal that are referred to by Marshall Becker as "Plaza Plan 2" configurations (1971, 1986, 1999; see also Welsh 1988). One of the objectives of the 1999 season was to test this hypothesis by searching for assemblages of cultural remains conforming to the "grammar of structural and ritual ideas" exhibited by PP2 architectural groups at Tikal (Becker 1999: 146).

The relatively small plaza (376 m^2) of the group is rectangular and on average is oriented 9.3^o west of true north. The outline of the plaza is defined by the seven structures of the *plazuela*, whose transverse axes are aligned perpendicularly to the cardinal directions by the same overall orientation as that of the plaza. Each side of the plaza is bounded by one or two platform structures (suitable for perishable superstructures), with the notable exception of a diminutive pyramidal structure on the eastern side. The physical characteristics of each of the structures are summarized in tabular form below (Table 1). The structures were numbered from north to east in counter-clockwise fashion, from 1 to 4 (with 1 being assigned to the tallest structure). In cases where two structures define one of the sides of the plaza, larger structures were given an alpha suffix and smaller ancillary structures a beta suffix (e.g. Str. 2A vs. Str. 2B). The eastern, southern, and western structures all have small ancillary platforms abutting and extending to their right (when facing onto the plaza) (Figure 2). Together these seven structures define a small plaza or patio that is incorporated into the flank of a hill. The plaza was apparently leveled in antiquity using fill extracted from the side of the adjacent hill. As a result, the southern and eastern structures are noticeably elevated as these were constructed upon an artificially raised supporting platform. In contrast, the northern and western structures abut and are built directly into the side of the hill.

Based on examinations of the surface features during the survey program, no vault or veneer stones indicative of vaulted architecture (Loten and Pendergast 1984) have been identified. In addition, the low quantity of debris present on the surface precludes the presence of vaulted buildings atop any of the *plazuela*'s platforms. Although no clear indications of postholes have been identified within the group, fragments of briquette (i.e. fired daub) (see Willey et al. 1965: 511-520) have been recovered in association with the eastern structure, indicative of the presence of a perishable wattle and daub building. It should, however, be noted that a posthole feature was identified to the NE of the *plazuela* (described below).

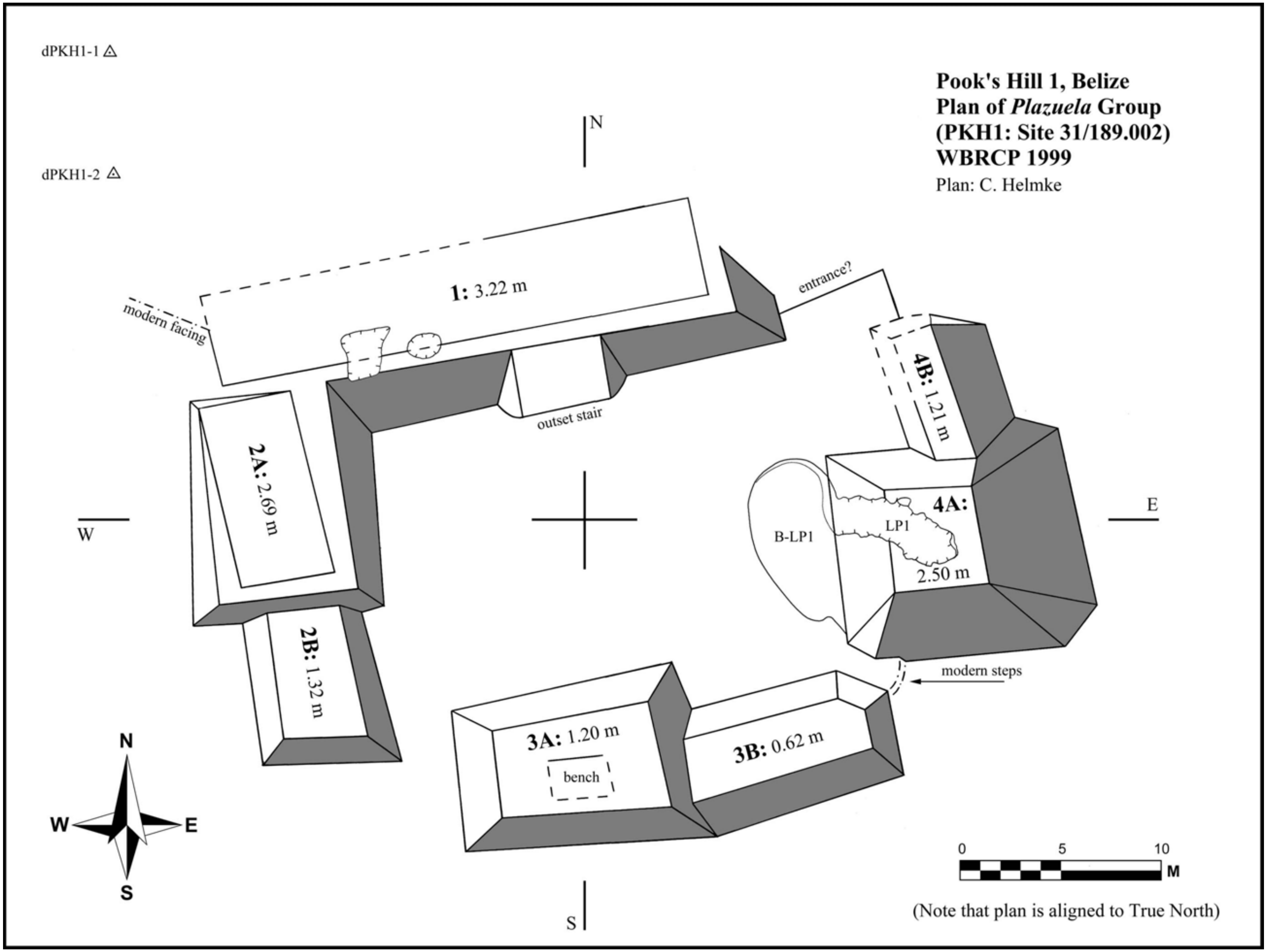

Figure 2: Plan of the Pook's Hill 1 *plazuela*. Note the location of Structure 4A, Looter Pit 1, and its associated spoil heap. Note the section lines also and their point of interstice.

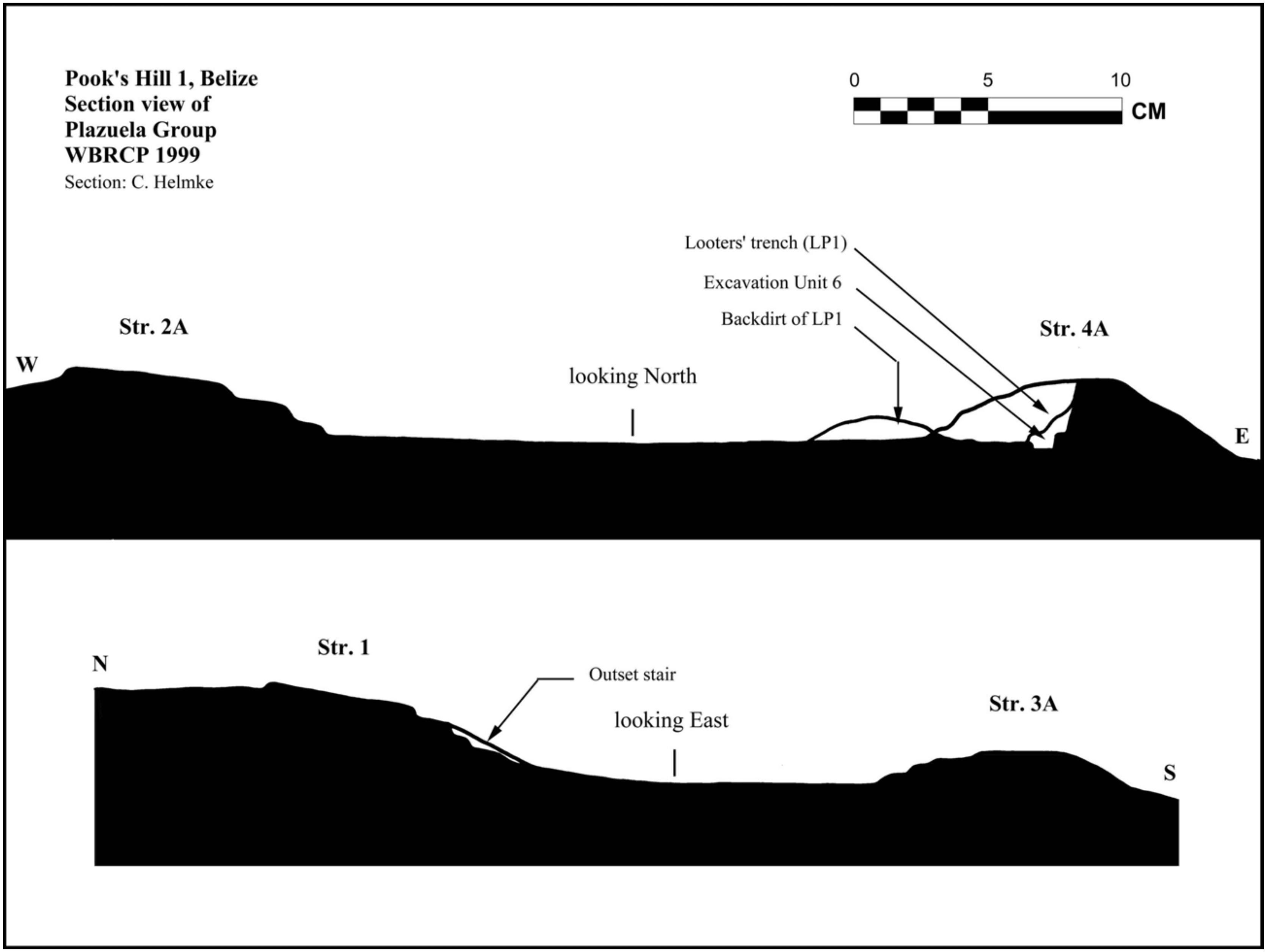

Figure 3: Section views of the Pook's Hill 1 *plazuela*. Note the depth of the looters trench.

Table 1: Physical characteristics of the structures of The Pook's Hill 1 *Plazuela* Group.

	Max. height above plaza	Max. elevation (above assumed)[1]	Surface area of mound base	Surface area of mound summit	Orientations in relation to true north[2]
Str. 1	3.22 m	98.19 m	172.20 m^2	118.34 m^2	8.5^o W
Str. 2A	2.69 m	97.66 m	106.38 m^2	43.24 m^2	1.0^o W
Str. 2B	1.32 m	96.29 m	51.38 m^2	24.45 m^2	7.5^o W
Str. 3A	1.20 m	96.17 m	94.21 m^2	40.18 m^2	10.3^o W
Str. 3B	0.62 m	95.59 m	59.17 m^2	28.15 m^2	10.2^o W
Str. 4A	2.50 m	97.47 m	128.40 m^2	20.25 m^2	4.7^o W
Str. 4B	1.21 m	96.18 m	41.42 m^2	13.50 m^2	13.3^o W
Plaza Platform	0.00 m	94.97 m	375.43 m^2	n.a.	9.3^o W[3]

Notes:

1: Elevations based on the assumed elevation of datum 1 set at 100.00 m amsl.
2: All orientations based on mean orientation of mound base.
3: Orientation based on the mean orientations of all structures.

Looter's disturbances are present in the form of one trench affecting the eastern structure (Figures 2 and 3). Two smaller depressions associated with Str. 1 were initially thought to represent looter's efforts. Closer inspection, however, indicates that the trench penetrating the eastern structure is in fact the only looter's effort at the site. This trench penetrates deeply within the center of Str. 4A. Designated as Looter's Pit 1 (LP1) the trench measures approximately 6 m N-S by 2 m E-W. The looters avoided or missed the primary axis by trenching along the northern stair side and subsequently cut southeastward, towards the center of the structure. The rationale behind the placement and configuration of that trench is unclear at present.

The square ground plan of structures defining the eastern perimeter of *plazuela* groups appears to be sufficient indication that these architectural groups conform to a PP2 configuration (Becker 1999: 139-147). This configuration is closely paralleled by the eastern structure (Str. 4A) of the Pook's Hill 1 *plazuela*. Despite the mounded appearance of Structure 4A, the overall form and height relative to that of other structures within the *plazuela* are attributes included in the list of features that should be displayed by ancestor shrines of formal PP2 patio groups (compare Becker 1999: Table 116, pp. 154-155 with data for Str. 4A in Table 1). In addition, eastern shrines in the Lowlands typically exhibit a 'bulge' of collapse debris on their western sides. This attribute represents the partially collapsed remains of an outset stair leading up the western faces of eastern shrines. Initially, this feature was not detected on the western face of Str. 4A at Pook's Hill. This was due to the fact that this bulge was partially concealed by the backdirt recovered by the looters from the core of Str. 4A.

PREVIOUS RESEARCH

In 1991 the Snaddons acquired the land on which the *plazuela* and resort are located from Seva and Thomas Dietrich Ward, who were managing the Tapir Mountain Nature Reserve on behalf of the Government of Belize (BAS 1997). With the transfer of ownership, the property was renamed Pook's Hill by the Snaddons (Vicki Snaddon pers. comm., 2000). The Snaddons had a road built along an old horse trail and began leveling the area occupied by the lodge with the aid of a bulldozer in April of 1992. Clearing of the vegetation with machetes and chain saws continued in earnest between November 1992 and April 1993. Construction of the resort began after the clearing was established in the latter half of 1993. Since 1992 most of the artifacts uncovered were collected and stored by the Snaddons (Vicki Snaddon pers. comm., 1998).

Hellmuth Schoen, the earlier caretaker of the property (hired by Seva Dietrich Ward), produced a rough sketch map showing the location of "Maya ruins" on the Pook's Hill property. On this sketch map the important topographic features were crudely traced off the 1:50 000 sheet map of the area (perhaps DOS 1980: 649 series). Maya sites were placed by dead reckoning and their size and configuration greatly exaggerated. Most of the architectural features indicated by Schoen have been re-located by the Snaddons since 1991 save the "ceremonial center" (recorded as a "Zeremonialzentrum" on the map) placed within the northeastern confines of the Tapir Mountain Nature Reserve (Raymond Snaddon pers. comm., 1999).

In 1995 a US Peace Corps/USAID Volunteer affiliated with the Department of Archaeology registered the site with the government after producing a plan of the Pook's Hill 1 *plazuela* that integrated GPS coordinates and elevations (René Torres and Vicki Snaddon pers. comm. 1999, DOA files). Although documents in the archives of the Department of Archaeology record the visit, the plan produced could not be located in the archives in 1999.

While visiting the lodge in 1997, Helmke examined the ceramics of Surface Collection 1b (Stratigraphic Unit 2, a.k.a. SU 2), an assemblage recovered by the Snaddons between 1992 and 1996 and identified ceramic type:varieties represented (Awe et al. 1998).

In 1998 Vanessa Bunton of the BRASS project under the direction of Dr. Anabel Ford of the University of California at Santa Barbara, produced a topographical plan of the *plazuela*'s mounded features (Figure 4) (Anabel Ford and Vicki Snaddon pers. comm., 2000). Subsequent to this visit, Dr. Ford assigned broad temporal designations to the ceramics of Surface Collection 1a (SU 1) (Vicki Snaddon pers. comm., 1998). Although the PKH1 *plazuela* has received some archaeological attention over the course of the past decade, these considerations were predominantly superficial. With the initiation of WBRCP investigations at Pook's Hill in 1999, the PKH1 site is now the subject of an intensive program of archaeological investigations.

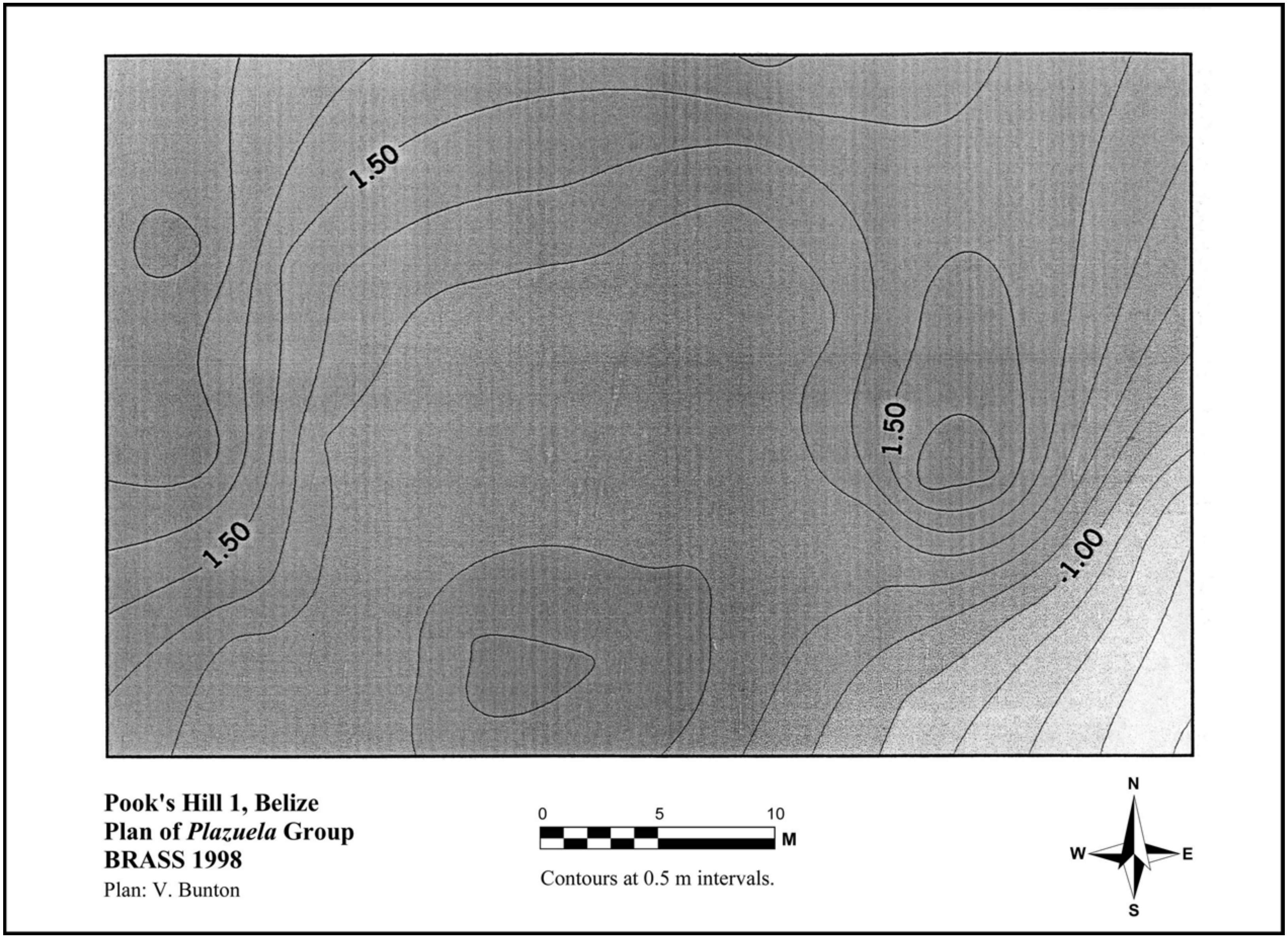

Figure 4: Preliminary topographic plan of the Pook's Hill 1 *plazuela*. Note the location of Structure 4A to the east with its associated spoil heap. Plan courtesy of Anabel Ford / BRASS 1998.

ARCHAEOLOGICAL FEATURES IN THE VICINITY OF PKH1

Posthole Feature

While clearing the western end of Cabaña no. 4 during the summer of 1999, the Snaddons had workmen excavate into the local marl (i.e. deteriorated bedrock and marl, known locally as *caliche* or *saskab'*) to accommodate for the construction of a second bathroom. The excavations penetrated horizontally westward into the *saskab'* for approximately 1 m. As the terrain in that area slopes downward towards the cabaña (from west to east), a vertical profile (nearly two meters high) was also exposed in the process. The exposed baulk demonstrates that the terrain surrounding Pook's Hill is composed predominantly of beige (ca. 2.5YR 8/1) to light yellowish (10YR 6/4) *saskab'* overlain by a thin, ca. 10 to 15 cm layer of dark brown to black humus (10YR 2/2-2/1).

Examination of the baulk revealed another prominent feature. The excavation bisected what appears to be a posthole that was dug into the *saskab'* (Figure 5). The feature is located 24.7 m northeast of Str. 4A and is undoubtedly cultural. An admixture of humus and marl interspersed with ceramic sherds fills the posthole. In cross-section the posthole was seen to be almost rectangular (and thus cylindrical) although the upper edges appear to have partially collapsed due to exposure to the elements. Small patches of rubefied material are also present in the bottom 10 cm of the fill in the posthole. The lower sides of the posthole were of a similar tint. This may be due to fire rubefaction and suggests that the wooden shaft that is presumed to have stood in the pit, burned while still *in situ* (cf. Wauchope 1938: 32). The average diameter of the posthole was determined to be 32 cm and was just in excess of 70 cm deep. Two olla sherds were extracted from the fill of the posthole and were tentatively identified as Late Classic (AD 600-900). This feature could not be excavated in 1999, but it is hoped to sample it during future seasons.

The posthole feature discovered at Pook's Hill has been compared to the physical dimensions of features produced by the mainposts of modern Maya thatch houses as well similar features documented at Tikal. Although the function of the Pook's Hill feature cannot be assessed with confidence, comparisons to Robert Wauchope's (1938) study of modern Maya house construction, states that mainposts range between 12 and 18 cm in diameter (Wauchope 1938: 30) and that these are generally inserted between 75 cm and 100 cm into the ground (Wauchope 1938: 30, 32). He also remarks that the standard depth is 1 *vara* equivalent to 33 inches or 85 cm (Wauchope 1938: 32). Based on comparison to the modern Maya house construction it is thus clear that the Pook's Hill posthole is near identical in terms of its depth but differs noticeably in terms of its diameter.

Diameters and depths of posthole features documented for residential structures in the peripheral group 4F of Tikal (Haviland et al. 1985) are of comparable dimensions to the Pook's Hill feature. The depths of the Tikal postholes were determined by adding the depth the postholes were excavated into the local limestone (data listed in tabular form in Haviland et al. 1985) and adding the mean platform height of the first construction phase associated

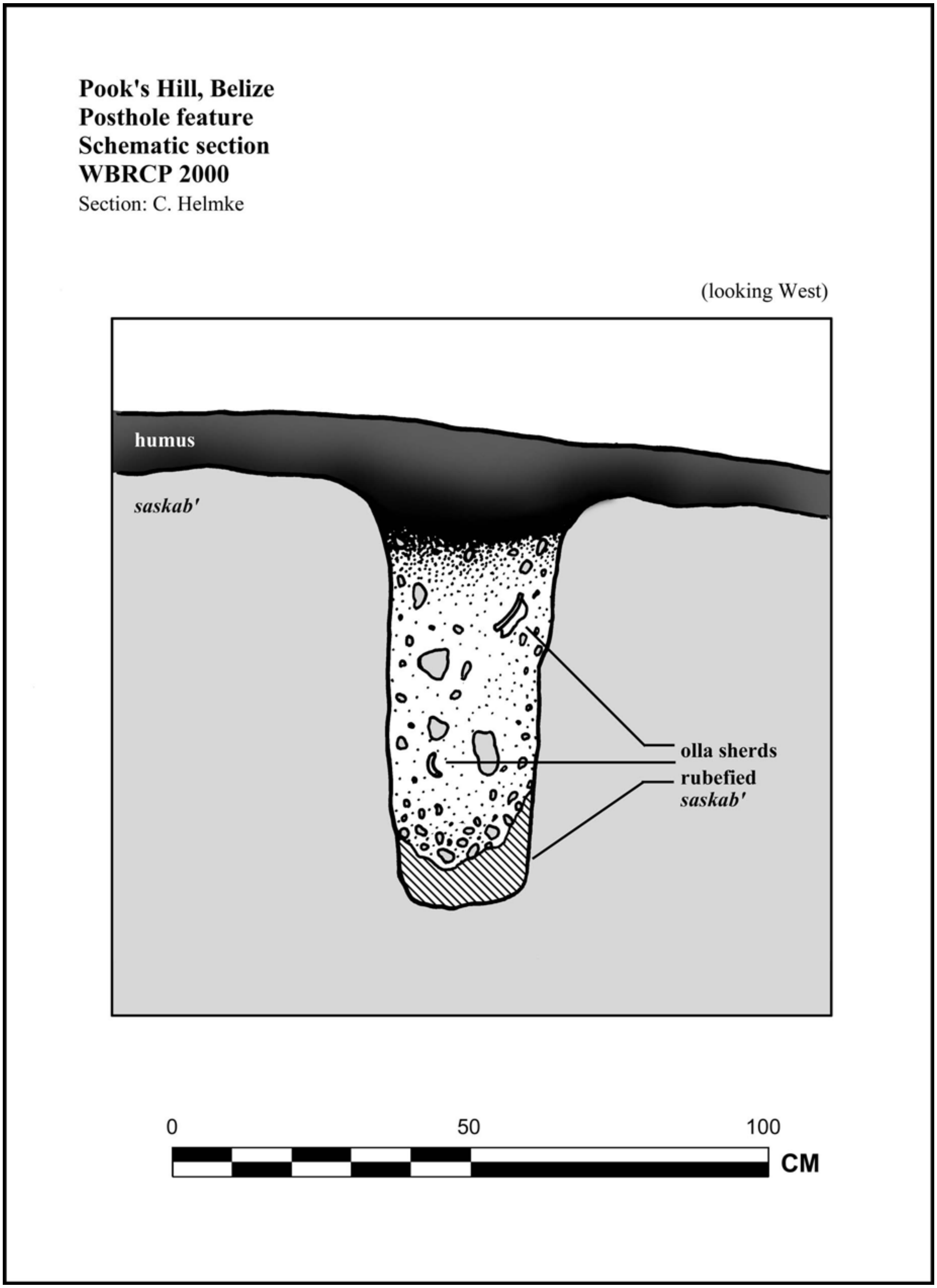

Figure 5: Schematic section of the posthole feature discovered in the vicinity of the Pook's Hill 1 *plazuela*.

with these features (data derived from profiles included in Haviland et al. 1985). The metric dimensions of the Tikal and Pook's Hill feature are presented in Figure 6.

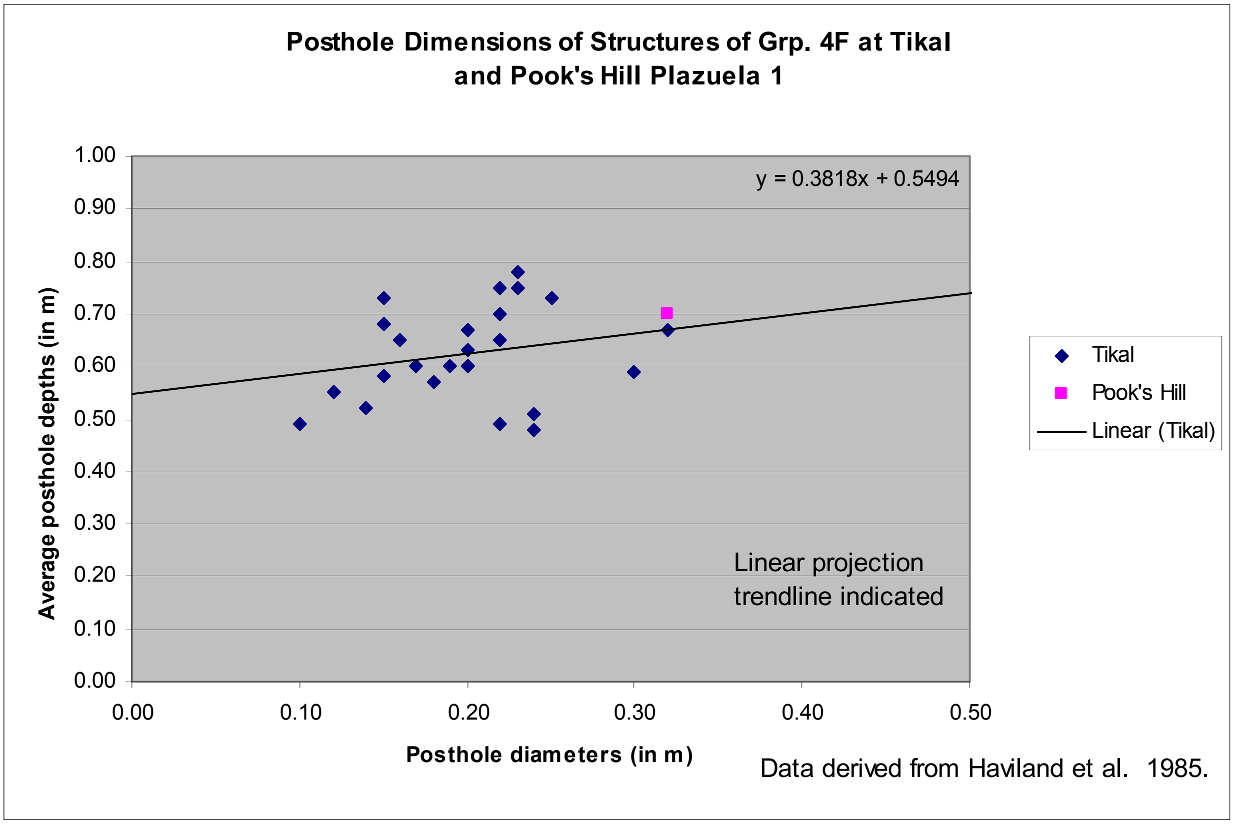

Figure 6: Comparison between posthole depth and diameters of a sample of structures at Tikal and the Pook's Hill feature.

The discovery of alignments between postholes is generally used to interpret the structural function of these components. As this is the only such feature discovered thus far at Pook's Hill it is difficult to suggest the function of this posthole. Speculatively it is suggested that this post may have served as a mainpost for an architecturally invisible structure (see definition of "hidden mounds" in Ashmore 1981) possibly serving residential, storage, or other purposes. It seems also possible that this post was part of a palisade, fence, or terrace faced by wooden planks, although these suggestions remain speculation at present.

It should be taken into consideration that the graphic representation of the posthole data from Tikal (Figure 6) indicates that the Pook's Hill posthole feature is in the upper range and was thus designed to bear considerable weight. In order to address this question more concretely, it is hoped that future investigations may locate additional postholes. The posthole was not excavated in 1999 due to lack of time but its provenience was fixed with theodolite instrumentation.

Possible Agricultural Terraces

To the southwest of the *plazuela* linear features extend on the surface of the terrain that may represent the remains of ancient agricultural terraces. In relation to modern features, these extend below the road down to the creek near an octagonal gazebo cage that holds iguanas. Although no true architectural features appear on the surface, it seems most likely that these were produced by artificial terracing as these features are regularly spaced and parallel the contour of the hill. The location of the Pook's Hill 1 *plazuela* on the western slopes of the Roaring Creek Valley coupled with the presence of these possible terraces suggests that maize (possibly *Zea mays*) may have been planted in abundance near the *plazuela*. Indeed, the research conducted by Willey *et alii* (1965; Bullard 1965: 20) in the upper Belize valley suggests that maize was planted on limestone slopes, leaving the alluvial plains as places for settlement and minor cultivation of tuber crops and beans. The location and setting of PKH1 may thus have been selected on the basis of higher maize yield obtainable and the presence of a small creek useful in irrigation.

Isolated Platform Architecture

There are several archaeological sites located on the property owned by the Snaddons. During the 1999 season, the Snaddons were kind enough to guide us through their property and lead us to some of the ancient residential sites that have been relocated. Most of these are identified on the basis of the mounded architectural remains of ancient masonry platforms. All additional mounds seen on the property in 1999 can be classed as Type 1 in the typology developed for Copan (Freter 1994; Abrams 1994: 14; see also Willey and Leventhal 1979). In addition to the *plazuela* investigated in 1999, three other *plazuela* groups have been identified (provisionally designated PKH2 through PKH4) and visited in 1999. Raymond Snaddon suggests that there are additional *plazuela* groups located on the property, but these were not located in 1999 (pers. comm., 1997). The three *plazuelas* visited in 1999 are considerably smaller in architectural volume, average structure height, and surface area of the patio when compared to the PKH1 *plazuela* located at the Lodge. Two of these *plazuela* groups appear to have been constructed on supporting platforms, measuring on average 0.50 m high, an architectural feature also shared by the PKH1 *plazuela*.

Although the density of isolated or non-grouped house mounds occurring between *plazuelas* cannot be estimated at the present time, several such structures were noted. Reconnaissance explorations conducted between 1996 and 1999, within a 1.5 km radius of Cahal Uitz Na, suggest that the density of mounded architectural features on the Snaddon property is comparable to that of Cahal Uitz Na's immediate periphery. Two mounds were also seen abutting or incorporating low agricultural terraces, an architectural type seen in the periphery of Caracol (see Walsh 1985: 49, 53-54; Healy et al. 1983: 403), Cahal Uitz Na (see Helmke et al. 1999a), as well as in the vicinity of Actun Chapat at the site of Oxmulcab (Poe, this volume).

Limestone Quarry Site

A possible quarry site, presumably used for the extraction of limestone blocks was pointed out by Raymond Snaddon in the vicinity of the PKH3 *plazuela*. Interestingly, in publications outlining the preliminary archaeological reconnaissance of the Big Laugh site, located 5.5 km NW of PKH1, Lawrence Lisch also reports the presence of quarry sites (1969, 1974, 1983). Determining the time period during which these quarries were used as well as the volume of material retrieved from these quarry sites may be insightful with regards to the construction history and intensification of architectural construction in the Roaring Creek Valley. Such a study would draw on the methodologies designed for the investigations of the Calakmul (Gallegos 1994) and Nakbe (Woods and Titmus n.d.) quarries.

Chaac Mool Ha *Plazuela*

Located to the east of the Snaddon property in the alluvial valley bottom is a large *plazuela* group named Chaac Mool Ha (Awe et al. 1998). This *plazuela* group can be classed as Type 3 in the Copan typology (Freter 1994; Abrams 1994: 14; see also Willey and Leventhal 1979) and was briefly examined during the 1997 season (Awe et al. 1998). Ancient Maya settlement of the Roaring Creek Valley has not been the subject of a detailed study, but based on observations made between 1996 and 1999 it seems that the Chaac Mool Ha group may be the *plazuela* of largest volume in the upper reaches of Roaring Creek Valley (Awe et al. 1998). It is also of interest that the Chaac Mool Ha *plazuela* is extremely similar in configuration and patio size to the Nohol Nab *plazuela* of the minor center of Xualcanil (Iannone 1998: 11-13; Stemp et al. 1996; Seibert 1998: Fig. 1), which may be indicative of the site's function and the status of its ancient inhabitants.

OPERATION 1 – SITE SURVEY AND SURFACE COLLECTIONS

Site Survey

The architectural layout and configuration of the seven structures forming the Pook's Hill *plazuela* group was secured with the aid a theodolite as part of Operation 1A. The instrument used is a portable Ushikata digital read-out Teo-100 graciously donated to the WBRCP by its manufacturers in Japan. The survey of the *plazuela* was conducted between the 23rd and 24th of July, resumed on the 14th and completed by the 17th of August 1999. Just in excess of 250 points were shot with the instrument to survey the architectural remains of the *plazuela* group. All points were plotted at a scale of 1:50, for publication at 1:100 or smaller. The map was plotted using polar tie-ins and distance measurements were obtained with the stadia method (see Kavanagh 1997: 178-189). Non-architectural cultural features were measured with a combination of steel tape and theodolite-derived measurements.

In setting up the initial magnetic north baseline of the survey (designated as IoS), the first datum was arbitrarily assigned an elevation of 100 m above mean sea level. Placing the location of the *plazuela* on a 1:50 000 government map, with GPS data obtained subsequent to completion of the survey, indicates that the PKH1 *plazuela* is actually closer to 80 m in elevation than the arbitrary 100 m. Consequently, all elevations presented herein will have to be adjusted in the future. For the sake of consistency and simplicity, elevations obtained in the field with the theodolite and the assumed 100 m are presented in this report, as these are the data obtained during the 1999 season. Corrections of the elevations will await acquisition of absolute elevations of the initial datums and baseline. Magnetic declination has been taken into account and all plans produced have been adjusted through realignments to True North.

Plans requiring a greater level of detail such as the 1:20, 1:30 and 1:50 plans and profiles of the salvage excavation units and LP1 were produced by measuring rectangular (90^{o}) off-sets from fixed baselines (see Kavanagh 1997: 4, 5). Azimuths (horizontal orientation in relation to magnetic north) of the baselines were measured with the aid of a Brunton "Pocket Transit." This compass has a built-in line level and circular spirit level, which enables the leveling of the instrument while taking measurements. Occasionally the tripod support for the Brunton was employed to assure increased dampening and thus greater precision in the measurements. Use of these devices enables a partial reduction of the pull of magnetic inclination operating on all magnetic devices (see Renton 1994: 26-27 for further explanations). All baselines were set up level to one another so that the vertical elevation profile data could be tied-in to the elevations obtained with the theodolite.

Surface Collections

Archaeological materials exposed on the surface during the clearing and construction of the Pook's Hill Lodge between 1992 and 1998 were collected by the Snaddons. These artifacts were stored as two separate lots. The first lot included all decorated ceramic sherds, lithic materials, and special finds (designated as Stratigraphic Unit 1, referred to hereafter as SU) while the second was comprised exclusively of monochrome and unslipped sherds (designated as SU 2). All sherds recovered during the clearing of the *plazuela* and the up-keep of the lawns between 1993 and 1998 were lumped into the second lot. Together these lots form the first documented surface collection conducted at Pook's Hill. The bulk of diagnostic ceramics from these lots represent a time span stretching from the Early Classic to the Terminal Classic (ca. AD 400-900). In addition, at least one Late Preclassic (ca. 600-300 BC) and two Early Postclassic (ca. AD 900-1150) sherds were identified.

As part of Operation 1 other surface collections were initiated. Surface Collection 2 contains materials that had been exposed by an animal (possibly an armadillo, *Dasypodidae* sp.) which had excavated a den into the southern flank of Str. 2B (Figure 7). This burrow appears to have been excavated between August 1998 and May 1999. All these materials were contained in the architectural collapse debris and were exposed in the backdirt of the animal burrow. The materials collected dated exclusively to the Late Classic II phase (AD 700-800) and were designated as SU 3. This allows for a tentative dating of Str. 2B's terminal phase architecture to the 8th century AD.

Surface Collection 3 is composed of four artifacts encountered on the surface during the theodolite survey of the *plazuela* (Figure 7). The provenience (although secondary) of each artifact was secured by angular polar tie-ins and distance measurements obtained by the stadia method. These artifacts were selected on a random basis and grouped together as SU

4. Artifacts collected include a fragmentary turtle-back granite *metate* (PKH1-4/1) found on the surface of the northeastern flank of Str. 2A; a fragmentary granite *mano* (PKH1-4/2) found near the southeastern corner of Str. 2A in the plaza; a near complete *mano*-shaped slate artifact (PKH1-4/3) found near the summit of Str. 3A; and the fragmentary base of a Terminal Classic/Early Postclassic Belize molded-carved vase (PKH1-4/4) (see Helmke 1999, and this volume) found in the plaza near the western base of Str. 4B.

In addition to the materials collected, artifact scatters were also documented on the surface but not collected. Scatters of sherds and other artifactual material were documented along the base of Strs. 1 and 2A (Clusters 1 and 2). Both Clusters 1 and 2 were found to concentrate along the bases and near the primary axis of the mounded platforms and extended partially onto the plaza. These artifactual materials may represent either the terminal phase refuse of the group or materials that were contained in the architectural core exposed through erosion and bioturbation. Materials from these scatters were not collected. A similar scatter was present near the western base of Str. 4A (Cluster 3) and appears to have been covered by the core retrieved by looters from LP1 (see below). This scatter may have extended northward onto the plaza along the western base of Str. 4B as suggested by the presence of sherds near the PKH1-4/4 specimen (see above). Materials from the tentatively identified Cluster 3 will be discussed below (see Lots 9, 10, 11, 12 and 14).

During the survey of the base of Str. 4A three items of note were documented amongst the collapse debris of the rear or eastern face of Str. 4A. This loose grouping comprises a fragment of volcanic pumice, a fragment of a granite *mano*, and a block of granite. In addition a fragment of a granite *metate* was also discovered on the summit of Str. 4B. At this point it should also be mentioned that another partially abraded block of stone (tentatively identified as pumice) was located along the base of Str. 3A. The locations of all these items were secured with the theodolite but were not collected. Several sherds were also noted along the eastern bases of Strs. 4A and 4B although these do not form the concentrations noted along the bases of Strs. 1 and 2A.

OPERATION 2 – CLEARING LOOTER BACKDIRT

Prior to the WBRCP investigations, Structure 4A had been partly excavated by looters. The trench representing these efforts measured 2 m wide and 6 m long (on average), and its volume has been calculated at nearly 15 m^3. It is presumed that this trench (designated LP1) may have originally been 1.50 m wide, with erosion and collapse widening LP1 over the years, since 1 to 1.5 m wide trenches are the standard within the eastern Peten (Black and Potter 1984: 40). For reasons unknown, the trench was initiated offset 2 m north of the primary axis. In so doing, the looters bypassed the entire outset stair but destroyed most of the facings of the north stair side. As excavations proceeded, the looters decided to deflect the second half of the LP1 trench towards the center of the structure.

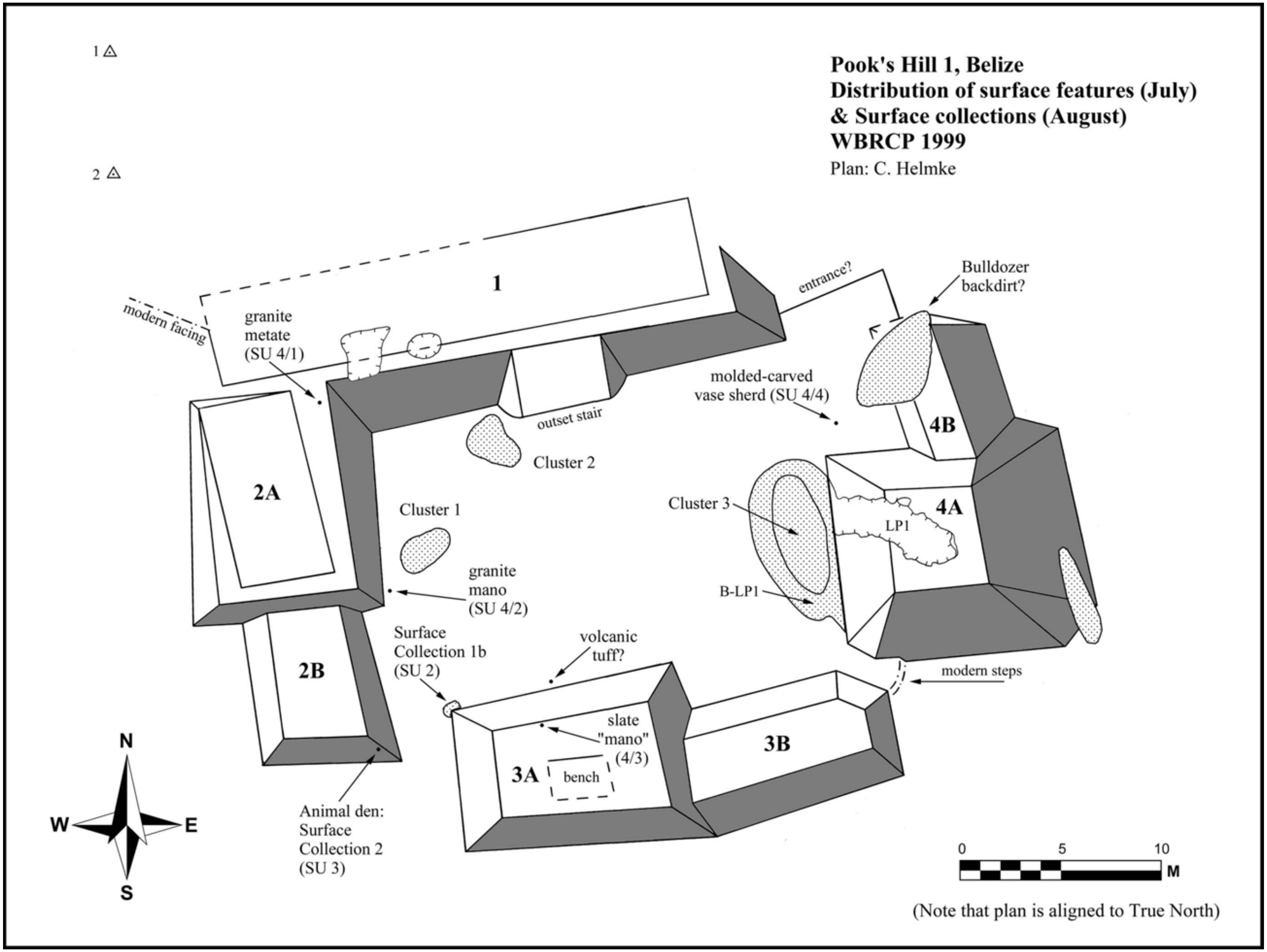

Figure 7: Plan of the Pook's Hill 1 *plazuela* showing the distribution of surface features recorded during the site survey and the location of discrete specimens or artifact clusters recovered during surface collections.

As excavations proceeded the looters deposited all humus, collapse debris and core that they recovered from the LP1 trench into a large spoil heap or "backdirt" pile along the western and frontal base of Structure 4A. Before this mound of backdirt (designated as B-LP1) was dismantled as part of the salvage excavations, it measured ca. 8.15 m N-S, 4.20 m E-W, and 0.82 m at its highest point, forming an approximate total of 13 m^3 of humus, collapse debris and core material.

Based on the size and diameter (i.e. 0.35 m) of the Bullhoof tree (*Drypetes brownii*) growing on top of the backdirt pile it has been estimated that the looting probably took place in the late 1970s or early 1980s. As the growth of trees in the tropics is continuous, growth rings (i.e. vascular cambium layers) if present are not necessarily indicative of yearly growth cycles or age (Constantine and Hobbs 1987: 5, 14). Consequently, the age of the Bullhoof tree growing atop the looter's backdirt could not be satisfactorily determined by counting the growth rings present in cross-section. Vascular cambium layers were present, although these were difficult to distinguish and tended to blend into one another. Nonetheless, sixteen concentric circles were counted. As these growth rings may represent contrasts between times of reduced growth brought about by dry seasons and times of ample growth brought about by rainy seasons, it is tentatively assumed that the tree was approximately sixteen years of age. Substantiating the possibility of the looting having taken place relatively recently, are the remains of the looter's encampment recovered from underneath the backdirt pile. Evidence of the encampment included tin cans, bits of plastic bags, plastic maize chip wrappers and the broken handle of a shovel.

In hopes of recovering a sample of artifactual remains extracted by looters from the core of the structure (minus any artifacts that they may have removed), the B-LP1 pile was excavated in a series of five excavation units, designated as Excavation Units 1, 2a, 2b, 3, and 4 (hereafter abbreviated as EU) (Figure 8). The excavation units were set up as a control, should the materials be distinctly stratified as to architectural phases or episodes of looting. All units were aligned to magnetic north and were set up in such a fashion as to split up the pile into four quadrants, at its highest point. On account of its large size, the SE quadrant was divided into two; the larger northern EU was designated as 2a and the smaller southern one as 2b. Excavation Unit 1 defined the NW quadrant, EU 2a and 2b the SE quadrant, EU 3 the SW quadrant, and EU 4 the NE quadrant. Statistics concerning unit size and volume of material recovered are reported in Table 2, while layout and configuration are presented in the plan of Figure 8.

Excavations proceeded in the sequence of EU numbers, and consisted of: 1) stripping the archaeologically sterile humic layer that had formed/deposited atop the backdirt pile since cessation of looting activities (Level 1a); 2) dismantling the large limestone blocks of core and collapse debris that had become entangled by the growth of roots (Level 0); 3) trowel excavation of the soil component of architectural core and collapse debris that had re-deposited to the bottom of the backdirt pile (Level 0); 4) trowel / shovel clearing of all backdirt material until the underlying humic MGS was encountered throughout all excavation units (Level 0-1a transition); and 5) screening of all matrices through a 1/8" screen (Figure 9).

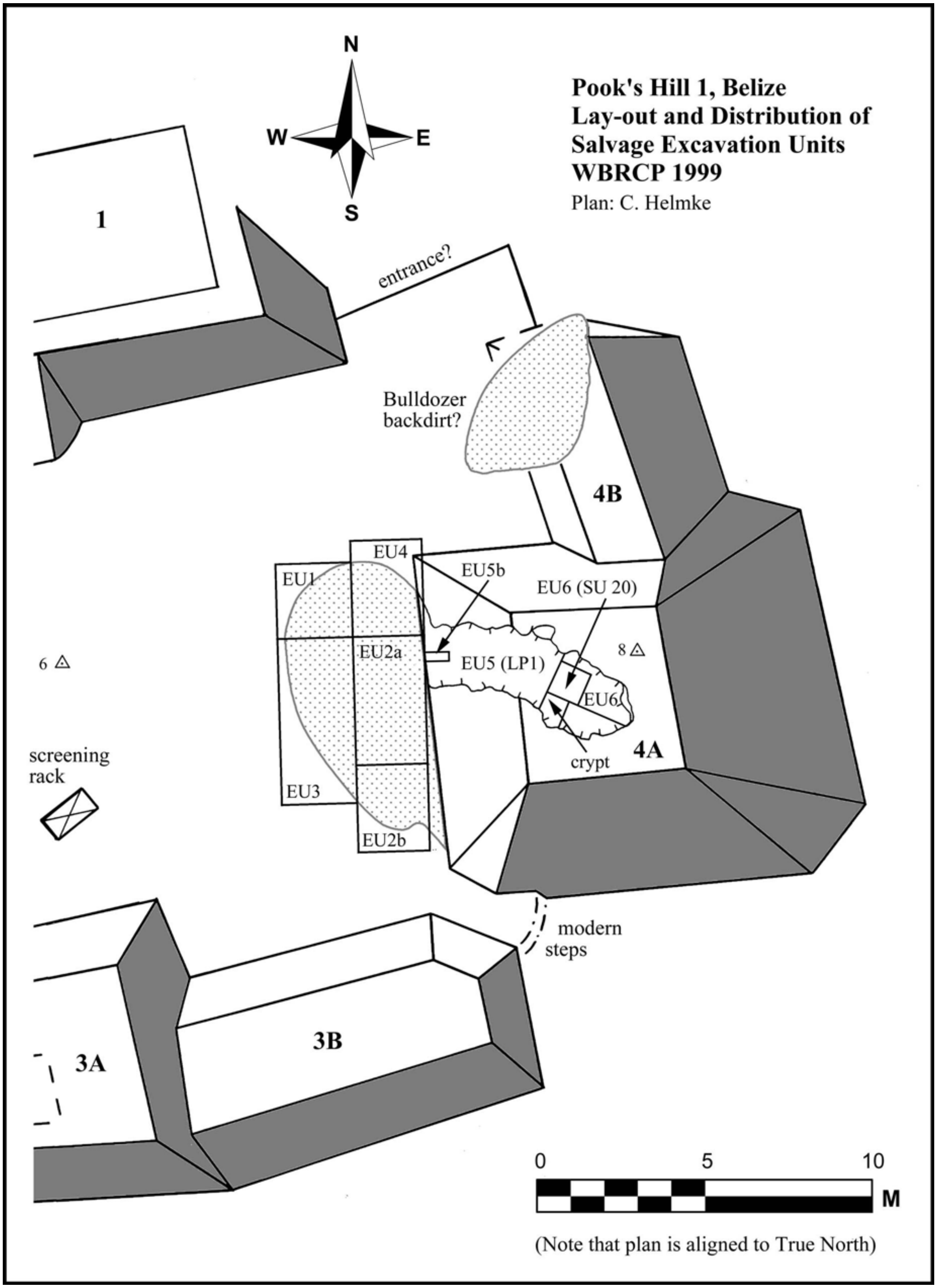

Figure 8: Plan showing the layout and configuration of the salvage excavation units in relation to the looter trench and its associated spoil heap.

	EU 1	EU 2a	EU 2b	EU 3	EU 4	EU 5 (LP1)	EU 5b	EU 5 Crypt	EU 6 (L4a?)	EU 6 (L4b?)	TOTAL
DIMENSIONS											
Width / length N-S	2.25	3.80	2.65	5.00	2.80	2.00	0.30	1.23	1.30	1.00	---
Width / length E-W	2.25	2.10	2.10	2.25	2.10	6.00	0.75	0.55	2.60	1.00	---
SURFACE AREA											
Unexcavated plaza MGS	1.52	0.00	0.88	4.58	1.00	---	---	---	---	---	7.98
B-LP1 surface area	3.54	7.98	4.69	6.67	3.90	---	---	---	---	---	26.78
Total surface area	5.06	7.98	5.57	11.25	4.90	12.00	0.23	0.68	3.38	1.00	52.05
MATRIX COMPOSITION											
humus	0.18	0.62	0.20	0.47	0.21	---	---	---	---	---	1.67
core and ballast (rocks)	0.92	2.71	1.01	2.63	0.39	---	0.02	0.01	---	---	7.69
alluvial fill	0.32	1.60	0.35	0.65	0.79	---	0.05	0.06	---	---	3.82
Total volume	1.42	4.92	1.56	3.75	1.39	14.69	0.07	0.07	1.39	0.89	30.15
CERAMIC CONTENT											
Ceramics B-LP1 (L0)	255	1568	402	289	70	---	---	---	---	---	---
Ceramics MGS (L0-1a)	n.a.	1595	54	355	254	---	---	---	---	---	---
Ceramics Other	---	---	---	---	---	352	39	75	305	117	---
Total ceramics	255	3163	456	644	324	352	39	75	305	117	5730
Ceramics per cu. meter	179.58	642.89	292.31	171.73	233.09	n.a.	557.14	1071.43	219.42	131.46	---

Table 2: Complete tabulation of the physical characteristics of salvage excavation units.

As excavations proceeded, it became apparent that the southern portion of EU 2a and the entirety of EU 2b contained the collapsed remains of the outset staircase. Remains of this architectural feature were concealed by the deposition of the looter's backdirt, and thus were not noted during initial survey. The core of the outset stair could not be effectively distinguished from the loose core material deposited atop thereof by the looters (B-LP1) (excavated as SU 13 and 14, with parts of SU 6 and 9). As a result, some inadvertent mixing has occurred (SU 6 and 9). The portion of the outset stair penetrated by the excavations revealed that it was constructed of dry-laid, roughly hewn, blocks of limestone without any binder or soil constituent. Extensive bioturbation over the course of a millennium, reduced most of the outset to a mass of stacked limestone core. Facings of the stair risers had also been displaced, which ultimately made identification of this architectural component a problematical task that was not satisfactorily achieved by the end of the 1999 season.

The salvage excavations recovered 7 fragments of plaster and 95 fragments of plaster flooring. The latter were all coated by a thin (ca. 0.05 cm) layer of hematite pigment. Were these fragments to be fitted back together so as to form a single patch of flooring, it would only measure approximately 30 cm^2. Despite the minuscule surface area that the plaster fragments represent, they clearly indicate that at least one construction phase of Str. 4A was coated in red oxidized hematite. Two plaster fragments represent at least one re-flooring episode (probably of the summit) as two hematite floor surfaces were found superimposed in the cross-section of these fragments. A thorough search of the architecture represented in the baulks of LP1 did not enable the association of any of these fragments with a particular construction phase. The hematite coated plaster fragments recovered at Pook's Hill contrast noticeably with the plaster flooring discovered at Str. ATM-M1, where the pigment employed is glistening specular hematite (Song and Zubrzycki, this volume). This difference can not be adequately explained at present but may be due to the sources of hematite, or techniques employed in creating the pigment. Nonetheless, it is in evidence that the lowland Maya tradition of brightly coloring buildings in red was also adhered to in the Roaring Creek Valley.

Materials recovered from B-LP1 (SUs 5, 6, 7, 8, and 18) included 2151 ceramic sherds and 546 non-ceramic artifacts. These largely comprised archaeological items that were once included in the core of Structure 4A. Arguing in favor of this interpretation are the 13 m^3 of backdirt comprising B-LP1, which represent 88% of the total 14.7 m^3 volume of LP1. Strongly supporting this interpretation, however, is the fact that the linear correlation coefficient between the temporal curve formed by the accretive assemblage of ceramics recovered from B-LP1 (SU 5, 6, 7, 8, and 18), and the curve formed by the ceramics recovered during the clearing of LP1 (SU 15 and 17) are identical to within 2% (Figure 10a).

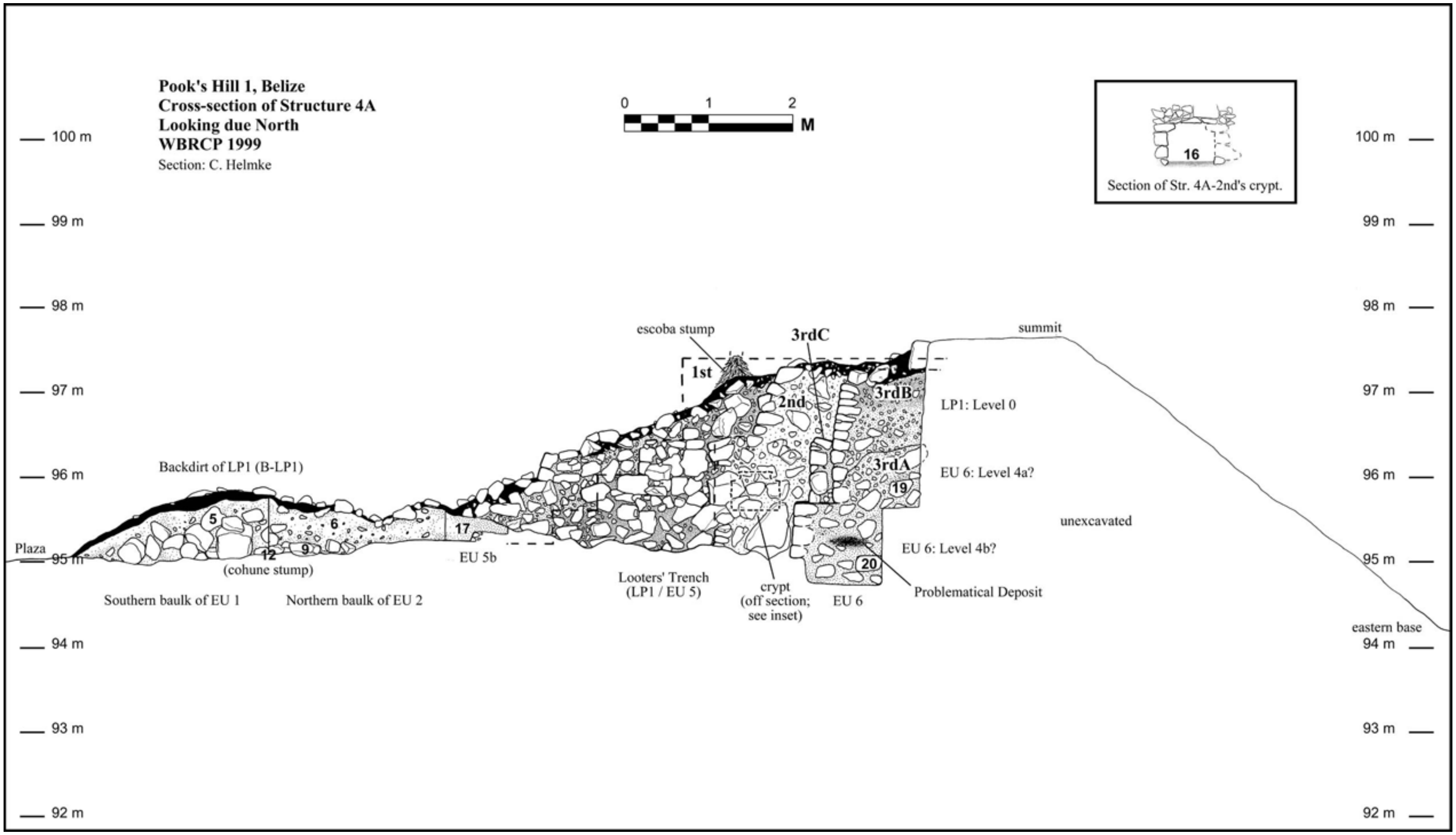

Figure 9: Section through the spoil heap of LP1 and elevation of the northern baulk of LP1 revealing the relationship between the various construction phases of Structure 4A, the test and salvage excavations.

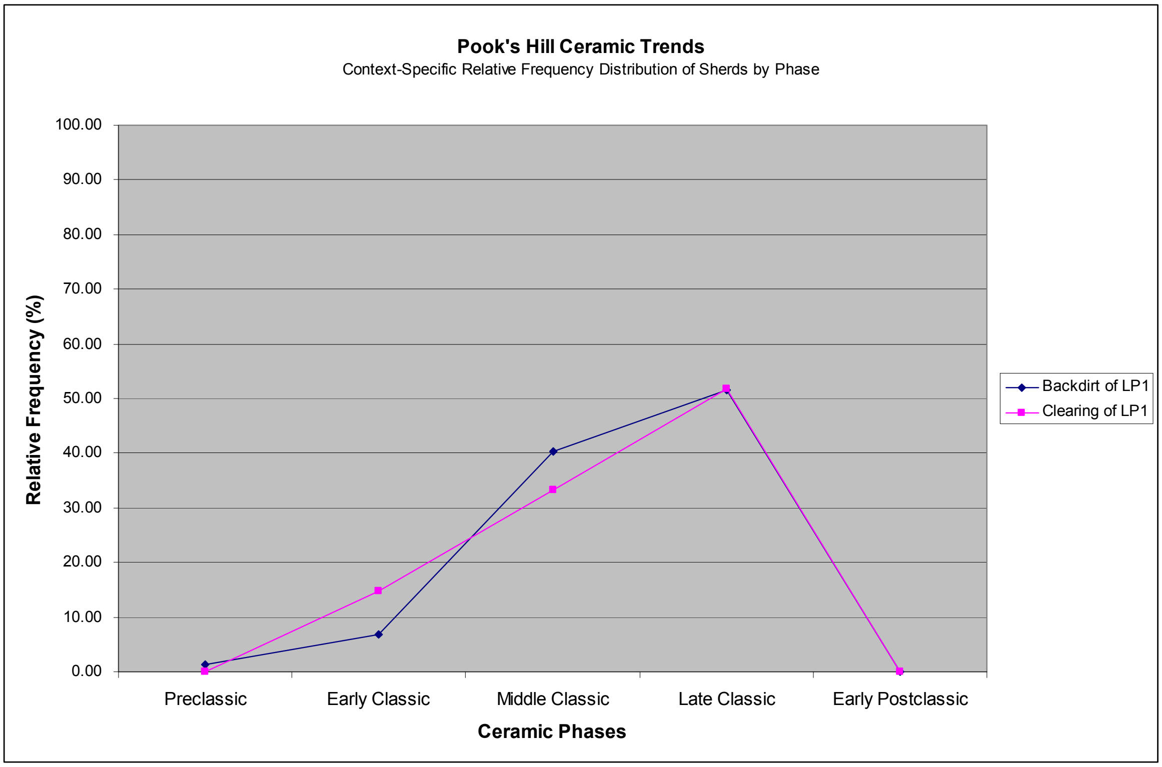

Figure 10a: Temporal curves formed by the sherds recovered during the clearing of LP1 and the accretive assemblage of sherds recovered from B-LP1 (i.e. Level 0).

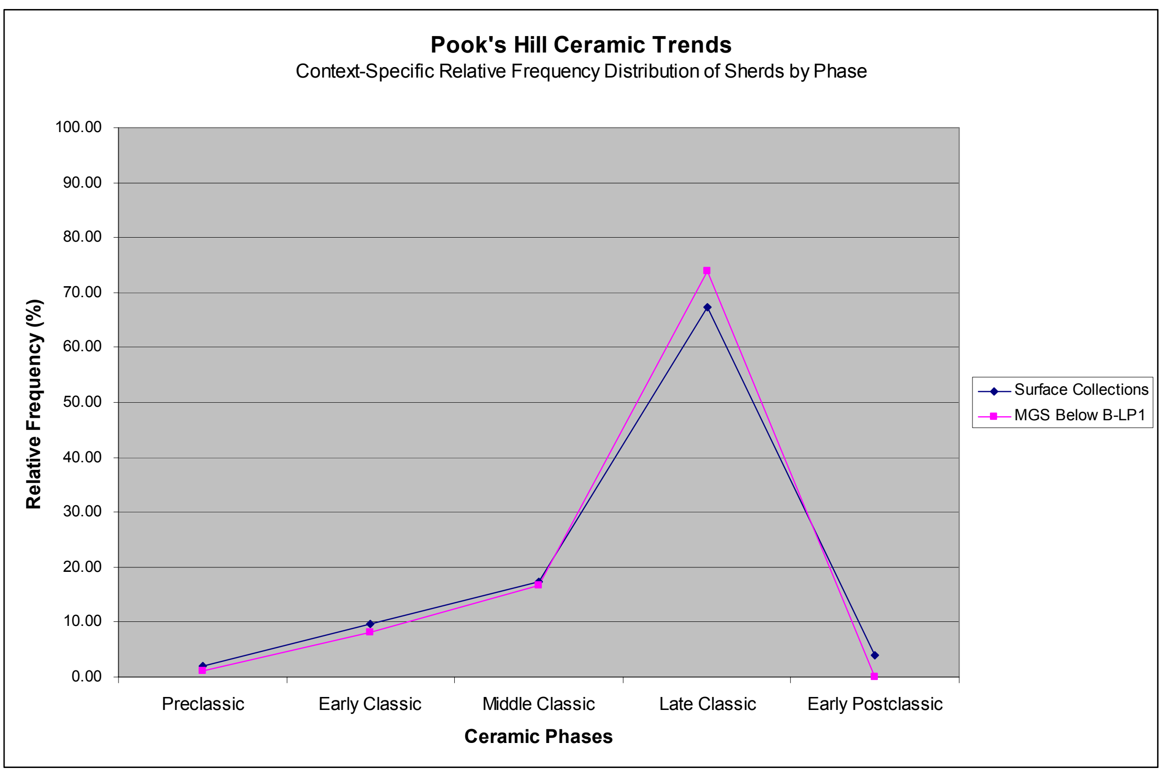

Figure 10b: Temporal Curves formed by the sherds of the surface collections and those recovered from Level 0-1a transition, underlying the B-LP1 material.

As the looters backdirt was deposited directly onto the humic MGS of the plaza, distinguishing between the mixture of brown alluvial fill in B-LP1 ('Level 0') and the black humus of the plaza's MGS (Level 1a) came with relative ease. During the clearing of the stratigraphic interface between these two levels (Levels 0-1a) it was noted that a high concentration of ceramic sherds littered the plaza's humic layer. Ceramics recovered from this transitional level (SUs 9, 10, 11, 12, 14) date predominantly to the Late Classic II and III phases (ca. AD 700-950) although some Early Classic (AD 300-500) materials are also present. The temporal curve formed by the ceramics from the transitional level (SU 9, 10, 11, 12), duplicate the curve formed by the ceramics recovered from surface collections carried out throughout the *plazuela* (SUs 1 through 4) (Figure 10b). The two curves formed are over 95 % identical, using linear correlation coefficients (Figure 10b). Considering this extreme positive correlation as well as the contexts of both assemblages, it seems clear that the materials recovered from underneath the B-LP1, were present on the MGS of the plaza, prior to the looting events taking place. Therefore, these ceramics likely represent abandonment period material as well as artifacts that have been displaced from within the core of structures through bioturbational and other erosive processes. Together the sub-assemblage thus defined is referred to as surface Cluster 3, which was briefly referred to above.

It was assumed in the field (during the salvage excavation of B-LP1) that clusters of materials representing secondarily re-deposited special deposits (which have been contained in the core of Str. 4A) would be distinguishable on the basis of quantitative attributes. These attributes were presumed to be artifact concentration and a high frequency of materials per surface area in relation to volume. Plotting the distribution of artifacts by cubic meter contained within B-LP1 in plan view, we find that the there is a close relationship between volume of matrix and artifact yield. Thus the volume of backdirt contained in an excavation unit has directly affected, the number of artifacts recovered. Through post-processing, we therefore find that frequency of artifacts within clusters could not be used to gauge those that represent the remains of originally discrete primary deposits within Str. 4A. Consequently, all identifications of such clusters had to rely on qualitative characteristics, including an evaluation of artifact types represented. In addition, conjoining ceramic artifacts and human remains were found in several excavations units, which provided clues as to the spread of materials from their primary contexts to their secondary B-LP1 setting.

Despite the above remarks, three clusters of artifacts recovered from B-LP1 (especially SU 6/1, SU 16a and b, and SU 18a and b) may have formed part of special deposits such as interments and caches. It is presumed that looters may have removed the contents of special deposits simultaneously. Therefore it is plausible (but admittedly tenuous) to suggest that these three clusters of artifacts encountered in B-LP1 represent the remains of three once discrete deposits that occurred within the core of Str. 4A. Despite all uncertainties, these three clusters encountered during the excavation of B-LP1 stand out significantly (Figure 12).

The first is SU 18a that is composed exclusivity of over 230 fragments of human bone, representing an MNI of 2 (Bassendale, this volume). The second is SU 18b which partly covered SU 18a and included 30 sherds, 4 conjoining to form a reconstructible Tinaja Red (Sabloff 1975: 158-160; Adams 1971: 23; Smith 1955) *olla* rim and 7 of which form part of a fragmentary Mountain Pine Red (Gifford 1976: 193-195) dish. In addition, SU 18a included what appears to be a partly-ground-slate-cobble preform of an elongated celt (for similar specimens see Willey et al. 1965: 472-476; note Cat. no. 1909). Three additional examples of these celt-like preforms were found during the clearing of LP1 (SUs 15 and 17). One of these (SU 17) was found 0.90 m to the SE of the second cluster. The third cluster of note (SU 6/1) was comprised of 43 Mountain Pine Red sherds representing at least one dish, occurring in a nucleated area measuring less than 35 cm in diameter. The fact that the third cluster is located 0.45 m SSW of the second cluster, and the presence of Mountain Pine Red sherds in both is probably no coincidence. Looking at the distribution of these clusters (Figure 11), it is clear that all three occur within 1 m^2. This square meter is therefore understood as representing the locus where looters discarded materials recovered from discrete special deposits encountered during the excavation of LP1 (see also Bassendale, this volume). Similar trends having been reported for other sites (Chase and Chase 1987: 37; Sharer 1995: 15). In addition, only two temporal phases are represented among the three clusters (i.e. Late Classic I and Late Classic II) and the Mountain Pine Red type predominates and crosscuts two of the clusters. It should therefore come as no surprise that the remains of a crypt were discovered within Str. 4A in association with an architectural phase apparently dating to a time transition between Late Classic I and II (AD 650-750) (cf. Appendix B). Thus although the provenience of all artifacts recovered from the B-LP1 salvage excavations have lost their primary provenience, it is possible to provisionally reconstruct the original provenience of at least three clusters to one particular special deposit.

OPERATION 3A – ARCHITECTURAL RECORDING

Structure 4A was the locus of continuous architectural refurbishment since its first phase of construction. The sequence currently documented, appears to represent a relatively narrow window of time, which may be extended at either end of the span once material from primary contexts has been recovered from additional structures. The architecture visible in the baulks of LP1 suggests that three distinct phases of architectural construction are represented at the Str. 4A locus (Figure 9). The LP1 looters trench was partly cleared of collapse debris and vegetation (SUs 15 through 17) prior to the drafting of architectural profiles as exposed in the trenches' baulks. Three minor architectural modifications are associated with the earliest phase (provisionally designated as Str. 4A-3rd). Here the different architectural phases are designated using the system employed in the Tikal Project excavations, where ordinals (-1st, -2nd, etc.) refer to major modifications, while letters affixed to the ordinals refer to small-scale alterations (see Coe and Haviland 1982; Coe 1990; Haviland 1981: 91; Haviland et al. 1985). Again in keeping with the Tikal Project conventions, construction phases are enumerated from the terminal (-1st), to the penultimate (-2nd), to the initial phase architecture (-nth).

The core of Str. 4A-3rd A was tested by an excavation unit measuring between 1.10 and 1.30 m wide by 2.50 m long (EU 6), which began at a maximum elevation of 96.40 m HAE and proceeded to an elevation of 95.70 m HAE (Figure 9). This excavation was not aligned to magnetic North, but to architectural remains instead, in order to follow as much of the cross-section of LP1 as possible. The first excavation level (Level 4a?; SU 19) was arbitrarily halted to coincide with the maximum height of Str. 4A-3rd's Terrace 1. It was presumed that this terrace may represent a discrete component or architectural unit of an earlier phase of construction. No traces of plaster flooring, however, were encountered at this horizontal level

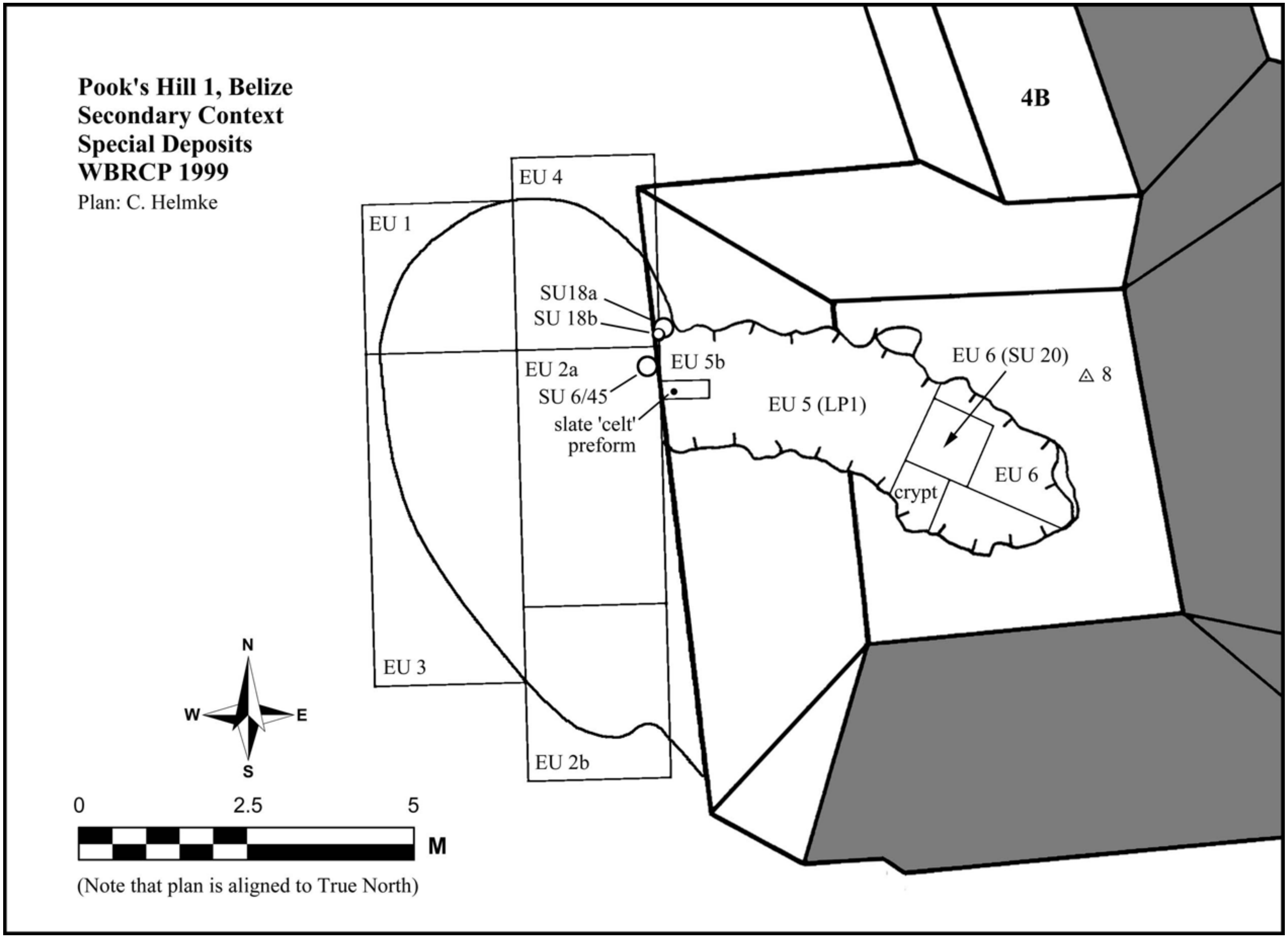

Figure 11: Distribution of secondary context artifact clusters, possibly derived originally from discrete primary context special deposits.

and the consistency of the core persisted throughout. Consequently, it was determined that Terrace 1 formed an integral part of the Str.4A-3rd A construction activity at this locus, and thus did not represent part of an earlier phase of building activity. Upon adjournment of SU 19, EU 6 was downsized to a 1 x 1 m test excavation, due to time limitations and concerns of possible collapse of the baulks of the looters trench. The excavation was aimed to reach the bedrock underlying the structure. Based on an examination of the contours of the terrain to the north and west of Str. 4A, it was anticipated that bedrock could be reached within the next meter at an approximate elevation of 94.70 m. Unfortunately, owing to time constraints and concerns for the structure's integrity, the excavations of the arbitrary level (Level 4b?; SU 20) were halted at an elevation of 94.72 m, without bedrock being reached (Figure 9).

Excavating Unit 6 consisted of hauling out large dry-laid blocks of limestone interspersed with minor quantities of alluvial binder that together formed the core. This architectural core is consistent with that encountered at numerous sites in the Cayo district, including the sites of Pacbitun (Juan Antonio Puc and Jaime Awe pers. comm. 1999; Healy 1990), Cahal Uitz Na (Awe and Helmke 1998), Las Ruinas de Arenal (Taschek and Ball 1999), Yaxhal Tun (Awe et al. 1998), and Structure ATM-M1 in the vicinity of Actun Tunichil Muknal (Zubrzycki and Song, this volume). Level 4a (SU 19 of EU 6) had numerous pockets of loose matrix and core that suggested that the looters' disturbance of LP1 had penetrated that far. Conversely, the underlying Level 4b (SU 20) was found to be devoid of looters disturbances and thus all artifacts retrieved from that level represent one of the few samples of material from a primary context at Pook's Hill 1.

Based on the concentration of ceramic sherds recovered from the primary context core of Str. 4A-3rd A (SUs 19 and 20), an estimate of original sherds per cubic meter, prior to the looting, could be established (Table 2). Applying this estimate to the volume calculated for the LP1 looter's trench (ca. 14.7 m^3), one obtains an estimated range of ceramic sherds that could have been contained within the core of Str. 4A and which subsequently would have been re-deposited onto the plaza as B-LP1. The estimate of ceramic concentration thus obtained ranges between 2000 and 3200 sherds. That the total number of sherds from B-LP1 (SUs 5, 6, 7, 8, and 18) should fall within that range is not surprising in itself, however, what comes as more of a surprise is the fact that the total from B-LP1 corresponds relatively closely to the mean of the range (i.e. 2151 vs. 2600 sherds) (cf. Table 2). Thus the remainder of ceramic materials that are interpreted as representing surface Cluster 3 that was present prior to the looting (i.e. SUs 9, 11, and 12) forms a mutually exclusive category. This conclusion is supported by two observations: 1) the total of ceramic sherds from Level 0 and Level 0-1a transition, would by far exceed (i.e. by 150%) the maximum within the estimated range obtained from primary context concentrations, and 2) the total of ceramics recovered from B-LP1 forms a satisfactory match with the mean of the estimate.

CONTEXT AND OBJECTIVES OF THE RESEARCH

Several caves located in the upper Roaring Creek Valley became the setting of intensive archaeological investigations conducted by the WBRCP under the direction of Jaime Awe of the University of New Hampshire. That project has functioned in concert with the Belize Valley Archaeological Reconnaissance Project that has been investigating sites in the greater Belize River Valley since the 1980s. The research conducted in these caves revealed a large body of artifacts that were brought into these sanctuaries in antiquity. The WBRCP has had as one of its initial objectives the identification of links connecting subterranean sites and nearby surface sites between Late Preclassic and Early Postclassic (300 BC-AD 1200) (Awe 1998b). Although the data recovered to date leaves no doubt that the ancient Maya periodically entered caves, only sporadic attention has been paid to the loci where these same Maya spent the rest of their lives. In an effort to remedy this lacuna, the WBRCP has launched a program of excavations that focuses on the settlement sites of the Roaring Creek Valley.

As it is impossible to predict which social segments used which caves, and when, only a small portion of the sample of residential sites that is planned for excavation may overlap with the sample of cave sites investigated. Systematic and large-scale excavations could overcome this obstacle encountered in the sampling strategy, but remain unfeasible. Consequently, we have to rely on a certain element of chance.

Pook's Hill was selected as a site for investigations for numerous reasons. Chief among these was the fact that the effects of looting and mechanical plowing had only minimally affected the site, when compared to the house mounds located along the meandering course of the Roaring Creek. The investigations at the Pook's Hill *plazuela* were launched and operated concurrently with the analysis of ceramic remains recovered and/or documented by the WBRCP in the caves of the Roaring Creek Valley. From the standpoint of ceramic analyses, the archaeological material from caves lends itself to the formation of typologies since the vast majority of ceramic remains are better preserved and more complete than those recovered from surface sites. The complicated taphonomic conditions that characterize cave environments coupled with intensive looting and limited deposition of stratified matrices, however, disable the construction of secure chronological seriations. Stylistic seriations have been constructed on the basis of material from sealed contexts at surface sites, but even these have sometimes met with difficult applications (e.g. Gifford 1976 vs. Lincoln 1985). As a result, specific chronological elements of cultural deposits need be addressed with certainty. Without such data, stylistically-discrete typologies cannot be associated with the temporal dimension they once occupied in Maya history.

One of the principal objectives, in short, is the retrieval of material from sealed deposits. The Pook's Hill material is thus used as an important comparative assemblage. A detailed comparative analysis of the cultural remains present at surface sites such as Pook's Hill will be used to contrast and to discern what artifact assemblages are representative of the activities conducted in caves in antiquity (Helmke 2000b). In addition, similarities and differences in ceramic types will suggest temporal differences, while form and modal differences may be useful in determining inferred functional differences. Although limited, surface treatment and decoration may be used to determine iconographic differences between surface and sub-surface assemblages. Additionally, since the bulk of artifacts from cave sites are found outside of clearly stratified deposits, the Pook's Hill material is used to assign diagnostic horizon markers of sealed deposits. Consequently, the excavations of Pook's Hill are aimed at the formulation of provisional chronological phases. The artifactual material recovered thus forms one of the most concrete databases on regional cave usage, since it will be directly related to assemblages recovered from the surface site of Pook's Hill. Another point of reference is the material recovered from the Ponces *plazuela* that also lies in the Roaring Creek valley (DOA files). This group was the focus of salvage excavations by the Department of Archaeology in 1982 (Awe et al. 1998). It is hoped that comparative analyses between Ponces and Pook's Hill will prompt preparation of the Ponces report, which may ultimately be tied into the greater Roaring Creek Valley assemblage.

OPERATING BIAS

The focus of the 1999 Pook's Hill investigations was on the eastern Structure 4A. Although the investigations functioned as a series of salvage operations (since the structure had been heavily looted), the investigations did take place within a set of operating research biases that guided the excavations. The framework is presented here so as to divulge the ideas guiding the investigations as well as the interpretations. The operating bias is that Structure 4A had served non-residential special function(s) in antiquity, and rests upon four premises:

- In a *plazuela* group composed of six range structures the presence of a pyramidal structure obviously sets it apart from all other --presumably residential-- structures (see Ashmore 1981: 50).

- The small surface area of the summit and the pyramidal form of Str. 4A could not have supported a perishable building large enough for habitational purposes (cf. MRU in Ashmore 1981: 47-48).

- The pyramidal form and square base of Str. 4A are reminiscent of ritual temple structures that have been excavated elsewhere in the greater central Maya lowlands (cf. Satterthwaite 1944).

- Based on decades of archaeological excavations in the central Maya lowlands, the eastern structures within *plazuela* / patio group configurations are expected to contain human interments and thus may have served as lineage shrines (Becker 1971, 1986, 1999; Bullard 1960: 357; D. Chase 1994: 129; D. Chase and A. Chase 1999; Haviland 1981; Welsh 1988; Willey et al. 1965).

Archaeological materials recovered from the salvage excavation of Str. 4A, confirm the non-residential special function(s) bias and the PP2 configuration hypothesis that were formulated at the onset. Materials supporting this conclusion include: 550 fragments of human bone that may represent as many as three separate interments; fragmentary ceramic vessels that were contained within the structure's core as cache or burial furnishings; and documentation of architectural configuration that indicate the earliest versions of this structure could not have supported any superstructure, perishable or otherwise.

RESEARCH OBJECTIVES: PRELIMINARY FINDINGS

Although the 1999 season excavations at Pook's Hill only took place over the course of 17 days, many data have been generated in the field and through subsequent out-of-field processing of the former. Indeed, a complete plan of the *plazuela* was produced, surface collections were undertaken, reconnaissance of the surrounding area took place, and the eastern shrine was the focus of salvage operations. In addition, the trench gutting the shrine was backfilled so as to reduce collapse that is brought about by continued exposure to the elements. All ceramic and osteological materials recovered were also the subject of preliminary identifications and analyses (cf. Bassendale, this volume). Moreover, all architectural data gathered has been recorded and computer-assisted analyses allowed for the drafting of reconstruction drawings. It is evident that additional analyses will have to take place for complete coverage of the materials recovered in 1999. Nonetheless, the analyses that have taken place already allow for a good understanding of the sum of the proverbial parts. The reports of the 1999 season of investigations have therefore set the stage for more investigations, which (pending approval) would focus on the primary contexts represented by the unlooted structures of the Pook's Hill group.

Multiple lines of evidence have been utilized in the interpretations of the data recovered from Str. 4A during the 1999 season. These have led to the conclusion that the Pook's Hill *plazuela* conforms squarely to the Plaza Plan 2 configuration identified at Tikal (Becker 1999). In keeping with the model that the eastern structures of PP2 *plazuelas* served as lineage shrines (Becker 1999; D. Chase 1994; Welsh 1988) are the hundreds of fragments of human bone recovered during the salvage operations (Bassendale, this volume). This osteological assemblage is understood as representing as many as three separate interments originally contained within Str. 4A (Bassendale, this volume). Functionally, Str. 4A therefore contrasts distinctly from the non-eastern structures of the group, since these are presumed to have served residential functions (cf. Becker 1999: 138; Blanton 1994).

Identifying Str. 4A as the shrine of the *plazuela*, would thereby associate the artifacts recovered from that context with 'ritual' activities. This provides an exceptional starting point for the analysis of the ceramic materials recovered from caves, as these are also understood as being the product of 'ritual' events. Consequently, the materials recovered from Pook's Hill Str. 4A are exceedingly useful to the research objectives within which this research is set.

Since ceramic artifacts are (among other things) the product of distinct functional needs, these therefore figure as prominent representatives of past activities, or categories thereof (Helmke 2000b). Based on this stipulation, it should therefore be expected to find distinctive quantitative and qualitative features, distinguishing utilitarian/domestic from ritual/funerary ceramic assemblages. The ceramic materials can thus be contrasted and compared to the assemblages recovered from caves. Are the same ceramic type:varieties associated with the shrine and the caves? Or are these the product of the contemporaneity of both types of sites? Examining the preliminary ceramic tabulations one finds for example that approximately 70% of the ceramic types identified at Pook's Hill 1 are also present in the caves of the Roaring Creek Valley. It has already been noted by Jaime Awe that the number of types represented in caves is particularly consistent and considerably reduced when compared to the multitude present at surface sites (pers. comm., 1999). This observation suggests that the ceramic remains present in caves form a discrete sub-set, which is the product of conscious decisions pertaining directly to the activities that were conducted in subterranean contexts.

Definite connections between the PKH1 *plazuela* and caves in the Roaring Creek (in particular with Actun Tunichil Muknal) are represented by two distinctive kinds of ceramic containers. The first is a Vaca Falls Red olla sherd that displays an applique and incised 'monkey' figure, which thus far has only been identified at Barton Ramie (Gifford 1976: Fig. 145e), Actun Chechem Ha, Actun Tunichil Muknal and Pook's Hill. The second connection is the presence of sherds of Belize Molded-carved vessels, which are explored in detail in another report (Helmke 1999, and this volume). The third link is the presence of 3 rock fragments recovered from B-LP1 that may be of cavernous origin (cf. Brady et al. 1997). These pieces of evidence are sufficient indication to relate the inhabitants of Pook's Hill with the social segment that did use caves, and pending confirmation by geological inspection of the rock specimens in question, the evidence may suggest that the residents of Pook's Hill themselves followed in the tradition of ritual cave use. These elements provide a strong case for the one-to-one statistical correlation of the artifactual assemblage present at Pook's Hill with that of caves sites in the Roaring Creek. Were fragments of speleothems to be discovered in primary context association with the eastern shrine structure, it would have to be assumed that some connection transcended both types of ritual loci. To reach this conclusion would be to suggest the existence of at least two dynamic and overlapping spheres of ritual activity. As these would affect each other considerably, it would be possible to account for the variability in surface vs. sub-surface assemblages as represented artifactually, in terms of traits restricted to either type of site, and those shared by both.

Since the beginning of the WBRCP investigations in 1996, the search for ceramic types that are exclusively found in caves, has been unsuccessful. At first it was presumed that Daylight Orange: Darknight Variety (Gifford 1976: 301-303) may prove to be a good candidate (Jaime Awe pers. comm., 1997), but the type has also been found at the surface sites of Cahal Uitz Na (Erhet and Conlon 1999), as well as at the Cauac Che *plazuela* (Mirro et al. 1999) and the Pook's Hill 1 *plazuela* (Figure 12a). It is possible that this type was used primarily in ritual contexts, but this assumption still requires further testing. In the process of seeking cave-specific ceramic types, a few surface-specific types or varieties have been identified. The best examples are the sherds of unslipped spiked censers which have been found at Str. XN-1 near the Eastern mouth of Actun Tunichil Muknal (Helmke, this volume; Zubrzycki and Song, this volume) as well as at Pook's Hill 1 (Figure 12b). Censers can be considered one of the best indicators of ceremonial activities as these used for the burning of *copal* incense, which is ubiquitous in all Maya ceremonies. Consequently, no satisfactory explanation can be offered at present to account for their frequent absence from western Belizean cave assemblages.

On the other hand, form (and relative frequency distributions thereof) may provide a clearer segregation between surface and cave assemblages (Helmke 2000b). Shoe-shaped vessels for example have been found with some frequency in caves (Brady 1989, 1992;

Figure 12a: Rim sherd of a Daylight Orange: Darknight Variety dish. Specimen recovered from Cluster 3 (EU 2, Level 0-1a, SU 9).

Figure 12b: Sherds of unslipped, spiked applique censers. Sherd recovered from the core of Str. 4A-3rdA (EU 6, Level 4a?, SU 19).

Brady and Dixon 1988; Jaime Awe pers. comm., 1997), and although no decisive statistical information is available at present, it would seem that these occur more frequently in caves. Supporting this observation is the fact that no single sherd diagnostic of shoe-shaped pots has thus far been recovered from Pook's Hill. Conversely, these are present at Actun Tunichil Muknal and Actun Yaxteel Ahau. Thus based on the few observations presented above, it would seem that the relative frequency distribution of vessel types as well as vessel forms need to be considered, as both yield differing distribution sets.

It should be noted that few ceramicists have ever attempted to discern primary from secondary functions of vessels, in a strict and methodic fashion. Indeed, how could it be argued that *ollas* constitute the prime example of ceremonial vessels? Nonetheless, at present *ollas* do constitute the largest component of cave assemblages, not only in terms of the number of types represented, but also in terms of relative and absolute frequency (see Helmke et al. 1999b). On the other hand, the presence of *ollas* at a surface site can be taken as an indication of domestic activity. Alternatively, are all house mounds loci of extensive ritual activities? There remains an implicit distinction in archaeological interpretations that relies heavily on context-specific inductive thought processes, be they unconscious or not. A secondary function of *ollas* in ritual contexts is well attested by their presence in termination or dedication rituals of temple structures. Although determining the ancient function of vessels is a complicated undertaking, it remains an imperative task as it may account for the presence of certain vessels and the absence of others, in specific contexts. Thus the inductive bias identified above needs to be exploited and made explicit, while at the same time severing it from the context-specific manner in which it manifests itself (Helmke 2000b).

Based on the above observations, which are based on four years of preliminary but continuous ceramic analyses by the WBRCP, it seems clear that the identification of idiosyncrasies of cave assemblages should not rely purely on an analysis of and in itself, but may be defined with regards to the broader ceramic spectrum present in the Roaring Creek Valley. Sampling of residential structures may thus provide insight into which ceramic types were used predominantly for domestic activities, and which types (as yet undocumented) occur in the Roaring Creek Valley outside of cave contexts. These data would also help to address why close to 70% of the ceramic types identified at Pook's Hill in association with the shrine also occur in cave settings. Do these particular types cluster in contexts that are related to ritual activities? If so, what are the similarities and differences between the material manifestations of subterranean and surface rituals? These are some of the key questions that the WBRCP hopes to explore, in its continued investigations of the PKH1 *plazuela*.

Appendix A:

Pook's Hill 1, Operations 1A-3A, Index of Stratigraphic Units (1999 Field Season)

SU	Op.	Str.	EU	Lvl.	Description
1	n.a.	PKH1	SC1a	Surf.	Surface collection conducted during clearing of PKH1 *plazuela* between 1992-1999. Includes decorated sherds and all special finds.
2	n.a.	PKH1	SC1b	Surf.	Surface collection. Same as above. Includes monochrome, unslipped sherds and chert pieces.
3	1A	2B	SC2	Surf.	Surface collection of materials in spoil heap of animal burrow penetrating into the S flank of the collapse debris mound of Str. 2B.
4	1A	PKH1	SC3	Surf.	Surface collection of materials encountered during the site survey.
5	2	B-LP1	1	0	Looters' spoil from LP1 deposited directly upon humic MGS.
6	2	B-LP1	2a	0	Looters' spoil from LP1 deposited directly upon humic MGS.
7	2	B-LP1	3	0	Looters' spoil from LP1 deposited directly upon humic MGS.
8	2	B-LP1	4	0	Looters' spoil from LP1 deposited directly upon humic MGS.
9	2	4A / Plaza	2a	0-1a	Transition between the looters' spoil heap and the humic MGS.
10	2	4A / Plaza	3	0-1a	Transition between the looters' spoil heap and the humic MGS.
11	2	4A / Plaza	4	0-1a	Transition between the looters' spoil heap and the humic MGS.
12	2	4A / Plaza	1, 2a, and 3	0-1a	Materials from within the hole of a decayed cohune tree stump, underlying the looters' spoil heap.
13	2	4A / Plaza	2b	1a-2	Mixture of humus, looters' spoil from LP1 and core of the outset stair of Structure 4A.
14	2	Plaza	2b	2	Core of the outset stair of structure 4A.
15	3	4A (LP1)	5a	2-4?	Materials recovered during the clearing and baulk straightening of LP1. Materials from a wide variety of contexts.
16	3	4A (Crypt)	5a	3?	Materials recovered during the clearing of the crypt component.
17	3	4A / Plaza	5b	0-1b	Materials recovered in test pit designed to search for the foot of T1 of Str. 4A-1st as well as its articulation with the terminal floor.
18a	2	4A / Plaza	4	0	Human remains deposited by the looters at the mouth of LP1 at the SE corner of EU 4. Materials may originally derive from the crypt.
18b	2	4A / Plaza	4	0	Artifactual materials. Same as above. This SU is partly draped over SU 18a.
19	3	4A	6	4a?	Dry-laid boulder core of the earliest phase of architecture exposed in LP1. Possibly Str. 4A-3rd. SU halted at elevation of verge of T1 of this structure.
20	3	4A	6	4b?	Same as above. Top of SU defined by the verge of T1. Bottom arbitrarily halted

Appendix B:

Description of the Crypt Component of Str. 4A-2nd

The crypt can be described as a Type 6 interment, in the classification scheme established by Richard Adams for the site of Rio Azul (Adams 1999: 49-64). Sufficient architectural elements remain to reconstruct the original size of the crypt as follows: 2.00 m long (N-S), 0.55 m wide (E-W), and 0.46 m high. Upon clearing of LP1 in 1999, only part of the western and southern faces remained, as well as the SW and SE corners of the crypt. No evidence exists to suggest that the crypt is an intrusive architectural feature and it thus seems to represent an integral part of the construction effort. During the salvage efforts, the crypt was cleared separately (SU 16) in hopes of recovering osteological remains that might conjoin with materials from B-LP1. It was also hoped that a sub-floor cache may be encountered in the southern extremity of the crypt chamber, as these are known to occur in the tombs of Caracol (D. Chase 1988), Altun Ha (Pendergast 1971, 1982), and Río Azul (Hall 1984). While no formal cache was encountered, ceramic sherds of vessels originally present within the interment were found (SU 16a) as well as ceramic material included within the remains of flooring underlying the crypt (SU 16b). These ceramic sherds allowed for the determination of the date after which (SU 16b) and the date at which (SU 16a) the crypt was sealed. Only nine sherds were recovered from the crypt (SU 16). Four date to the Early Classic (AD 300-600) and three date to the Late Classic I (AD 600-700). The crypt is thus tentatively dated to a time transitional between the Early and Late Classic (ca. AD 550-650). The possibility that SU 18 and Vessel 6/45 represent the original content of the crypt that was left behind by the looters is suggested above (see also Bassendale, this volume).

The faces of the crypt are built of four partial courses of well-dressed block facing stones. The widths of these stones as exposed in the walls are nearly triple their depth and height. Despite the preponderance for large core stones in this phase of construction the facing stones of the crypt retain backing masonry of smaller fist-sized limestone blocks and light brown alluvial soil. The ceiling of the crypt was capped by slabs of limestone that are too short to span the width of the crypt. These slabs were bonded together to form a masonry cap by a concentration of apparently wet-laid aggregate and plaster. The floor of the crypt appears to have been defined by a series of nearly level rock slabs that may have received a thin layer of burnt lime. The western face of the crypt and the western face of Str. 4A-2nd were built nearly back-to-back thereby forming a type of wall measuring less than 0.45 m thick. The ceiling of the crypt and the flooring of Terrace 1 also appear to have been constructed back-to-back as the ceiling of the crypt lies only 0.36 m below the terrace's flooring surface.

The crypt is oriented along a 340^{o} azimuth in relation to true north (i.e.: 342^{o} azimuth in relation to magnetic north). Due to this orientation, at good portion of the crypt must have extended underneath the stair of the structure. At the present time, no features of the crypt are represented in the northern baulk of LP1. This suggests that the crypt was shorter than the width of the looters trench (LP1) at that point. As the looters trench (LP1) is 2.25 wide (north-south) at that point, the crypt must have measured 2.00 m long or less on account of the northern face of the crypt which can be estimated to have been at least 0.25 m thick. The crypt was designed to house the remains of an ancient Maya presumably laid to rest in an extended position. The measurements re-constructed for the crypt are in keeping with the average stature determined for ancient Maya adults. Using the data presented in Haviland (1967; 1992: 56-57), Adams (1986), and Coe (1959), the average stature of elite males during the Early Classic (AD 250 - 600) is determined at 1.70 m and at 1.64 m in the Late Classic (AD 600 - 900). These measurements suggest that the crypt was likely a little below 2.00 m long so as to accommodate the individual occupying the crypt. In keeping with this assumed length of the crypt, are the lengths of the burials encountered in the ancestor shrine (Str. A1) of the Zubin group, located South of Cahal Pech. The majority of burials at Zubin were found to measure between 1.75 and 1.90 m long (Schwake 1996), measurements that are in the same range as that surmised for the Pook's Hill crypt. As the crypt is oriented nearly north-south the individual therein was likely oriented with head to the south as was customary in the Belize Valley during the Classic period (AD 250 - 900) (see Welsh 1988; Song 1995; Bassendale, this volume).

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PRELIMINARY COMMENTS ON THE HUMAN SKELETAL REMAINS FROM STRUCTURE 4A, POOK'S HILL 1, CAYO, BELIZE

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INTRODUCTION

The following paper presents preliminary comments on the human remains recovered from Str. 4A of Pook's Hill 1 (PKH1) during the salvage excavations of the looters backdirt during the 1999 field season (see Helmke, this volume). Excavations at this time have been limited to Str. 4A, the eastern structure of the *plazuela* group (for a more extensive analysis of the structure see Helmke, this volume).

Due to the secondary provenience coupled with the fragmentary nature of the skeletal material as well as the restricted time for analysis, a limited amount of information has been gathered from these remains. There are many fragments that have yet to be identified and only a rudimentary in-field analysis was undertaken. Thus, this paper is simply a preliminary tabulation and identification of the frequency of the materials retrieved from the looters backdirt. It does not serve as the final analysis of the data. A more detailed analysis will be undertaken when the excavations have been completed, as there are a number of techniques that will augment the information presented herein.

STRUCTURE 4A

Structure 4A is the eastern structure of *Plazuela* Group 1 at Pook's Hill (Figure 1). Although this structure has been disturbed by looting, much valuable information on the activities occurring at this locus have been salvaged. Due to the positioning of the looters trench (i.e. LP1), it seems that all architectural phases were bisected. These were recorded in two partial 6 m long architectural profiles exposed in the baulks of LP1. These reveal a total of four groupings of architectural components, representing two or three discrete phases of construction, apparently associated with superimposed but separate structures as discerned in the baulks of the looters trench (Helmke, this volume). Preliminary analysis of the ceramics indicates that the first phase of construction may date to the latter third of the Early Classic (ca. AD 550-650?) while the last phase of architecture was likely completed by the end of the third phase of the Late Classic (AD 830-950). Initially, in its late Early Classic guise (phase A), the eastern structure stood as a small and unimposing building too small to support a superstructure on its summit. Two minor additions were subsequently made, adding height (phase B) and accentuating the terraced architecture of its western face (phase C). In its final stage as Str 4A-1st the building had become a medium-sized terraced pyramidal structure possibly supporting a wattle and daub superstructure (Figure 2).

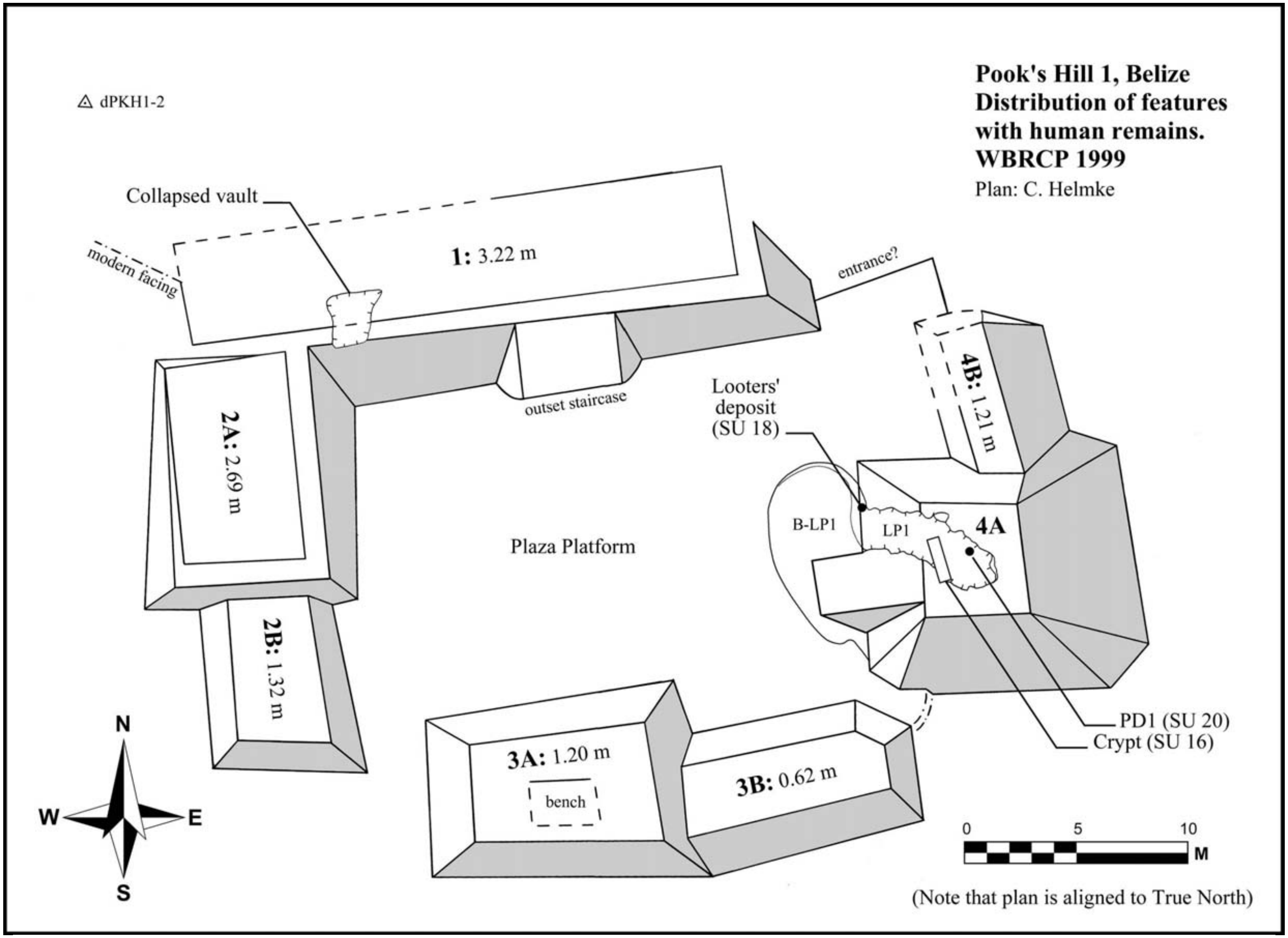

Figure 1: Plan of the Pook's Hill *plazuela*, showing distribution of human skeletal remains.

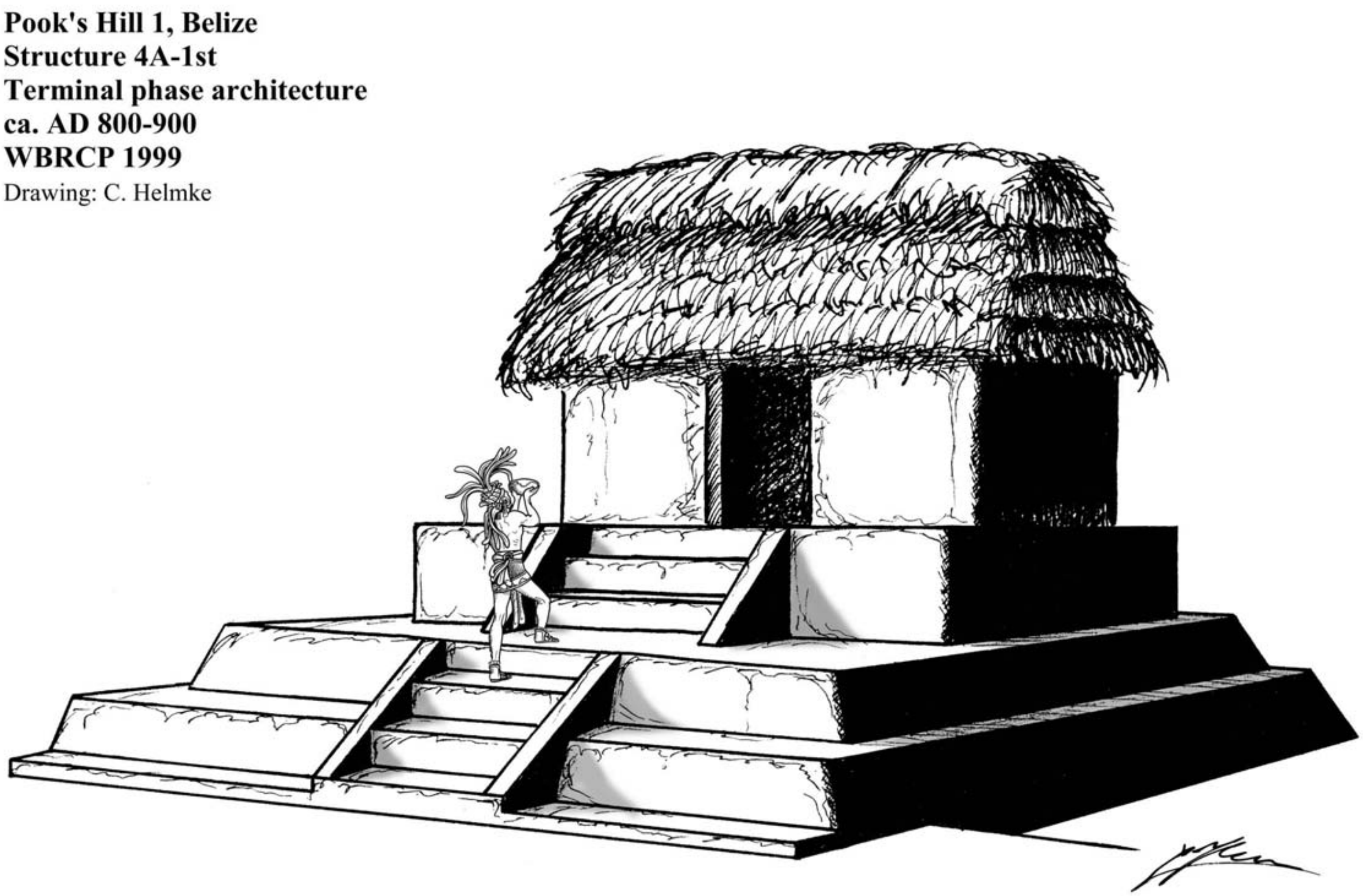

Figure 2: Artistic reconstruction of the terminal phase architecture of the eastern ancestor shrine based on architectural data recorded in 1999.

At the time of excavation, the vast majority of human remains were recovered from secondary context. These materials, however, appear to have formed part of discrete deposits within Structure 4A. Discovery of a crypt in Structure 4A-2nd (Figure 3) for example, likely contained the remains of adult individual. The crypt represents a separate architectural component that was apparently incorporated into a temporally coeval phase of construction, although this requires validation through future excavations. Helmke (this volume) has posited that the crypt contained the remains of one of the individual represented in the MNI of Stratigraphic Unit 18a (SU 18a), indicating that an additional burial locus had been uncovered by the looters. No evidence of a second architectural feature associated with a burial was uncovered during the salvage. Through a reconstruction of the looting events that cross-date materials from the looters backdirt and the various construction sequences, it may in fact be possible to discern the original contexts from which the human remains were recovered. A third grouping of human remains (PD 4A-1) was uncovered in primary context (Unit 6, Level 4b?, Lot 20), in the core of the earliest structure and may represent a ceremonial cache or yet another burial dedicating the construction phase.

METHODOLOGY

The analysis of the human remains from Str. 4A is extremely preliminary owing to time restrictions and the absence of adequate reference materials. Metrics and pathologies were not obtained and the analysis relied heavily on identification of diagnostic elements and the determination of an MNI, as well as an estimate of age based on the teeth and mandible. The osteological material was examined according to context numbers and all fragments were counted and recorded, with special note being given to the diagnostic fragments. Many observations were performed in the field, but more in-depth examinations were carried out at WBRCP facilities in San Ignacio.

Due to the fragmentary state of the bones there is a limited amount of data that could be generated from initial observations. Indeed it should be noted that several fragments of long bones displayed deep cut marks brought about by the careless use of shovels and/or machetes by the looters (cf. Helmke et al. 1999, for similar observations). Complete osteometric analysis was not performed as the equipment was not available and the preservation of many of the bones, particularly the cranium, appeared inadequate to permit such studies. The fragmentary, eroded or incomplete condition of diagnostic elements (i.e.: the pelvis and cranium) (Saul and Saul 1997) rendered the sexing of these remains an extremely difficult task and was consequently not attempted at this point.

The osteological material has been separated into three sub-assemblages:

1) The materials of secondary provenience from the looters backdirt (B-LP1; SUs 5, 6, 7, 8 and 13) as well from the transitional level underlying the backdirt pile (SUs 9, 10 and 12).
2) The materials of secondary provenience recovered from the looters' deposit (Excavation Unit 4; Level 0; SU 18a). These likely represent materials retrieved by the looters from the crypt as is suggested below (cf. Helmke, this volume).

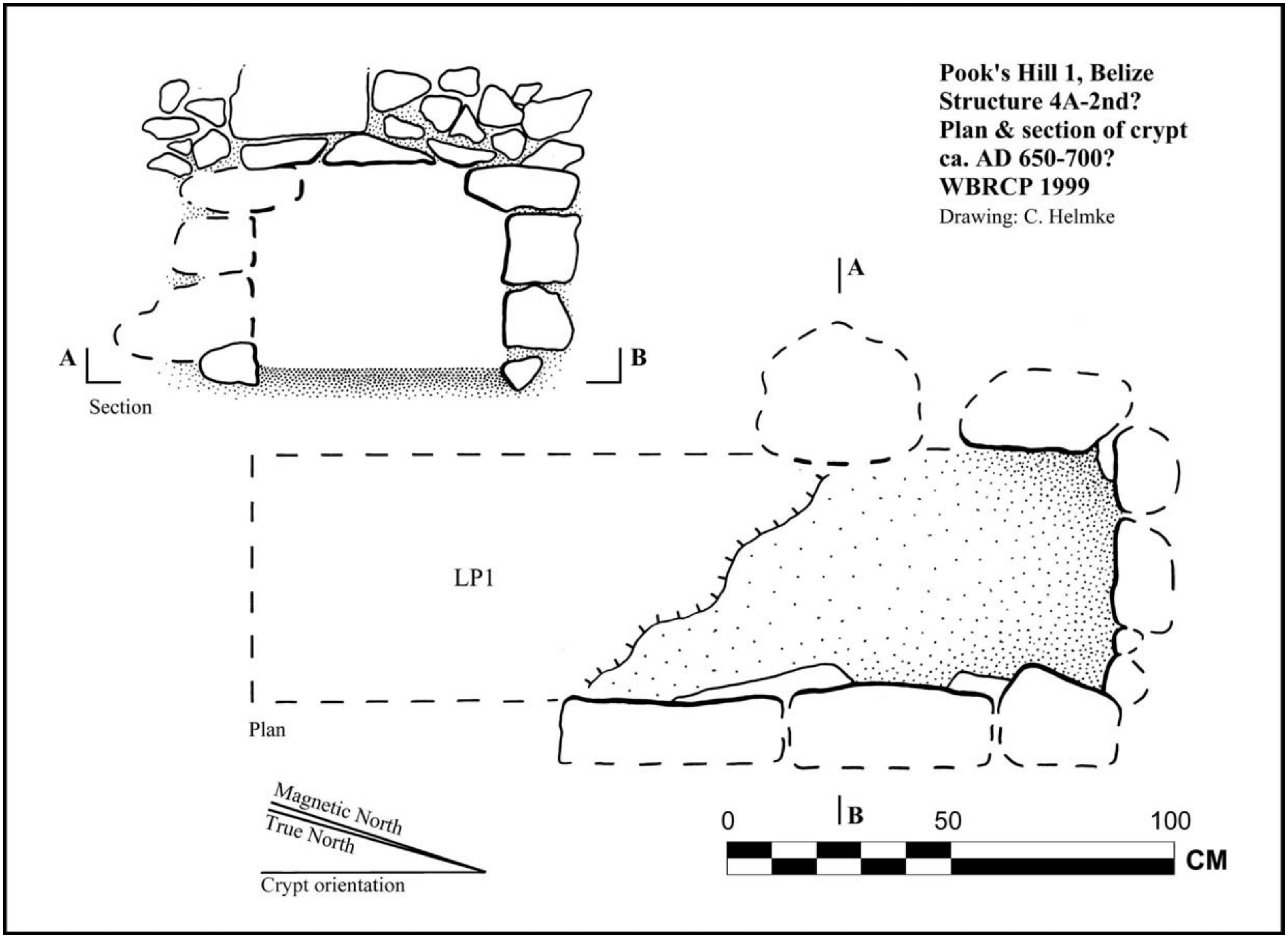

Figure 3: Plan and section of the crypt tentatively assigned to Structure 4A-2nd.

3) The materials of primary provenience retrieved from the test-pit excavation (i.e. PD 4A-1; EU 6; Level 4b?; SU 20) penetrating into the core of the initial construction phase.

DISCUSSION

Based on the presence of two fragmentary mandibles, an MNI of 2 has been established for the Str. 4A assemblage. This is based on the size differences of the two mandibular fragments clearly indicating that they are from different individuals. One of these individuals appears to be a young adult based on the limited amount of wear on the majority of the teeth as well as the absence of hypercementosis (Joanne Curtin, pers. comm., 1999). The age of the second individual remains undetermined at present.

Of further interest regarding the human remains recovered from Str. 4A are the two artificially modified upper central incisors (Figure 4). These teeth were symmetrically modified to a B-4 type (Romero 1970: Fig. 1, pp. 51), otherwise known as a II-4 type (Buikstra et al. 1994: Fig. 30a, pp. 59). As such, the occlusal one-third of the mesial and distal portions of the crown have been filed away resulting in a central occlusal projection that is right-angled and approximately one-third the width of the tooth. As discussed previously, these teeth appear to belong to a young adult of which the sex remains undetermined. Of the 15 teeth recovered from the interments of Structure 4A (Figure 5) only two have been identified as being culturally modified.

To place the Pook's Hill 1 data in context, it should be pointed out that the most common type of dental modification among the osteological population of Caracol, is also of the B-4 type which is also applied to central incisors (D. Chase 1994). In addition it was found that individuals with this *particular* type of dental modification were often encountered within eastern shrine structures of Tikal's (Becker 1999: xvii) and Caracol's (D. Chase 1994; A. Chase 1992) Plaza Plan 2 *plazuela* groups (see Becker 1999), thereby paralleling the data recovered from Pook's Hill, exactly. As dental modification does not seem to have served as a status differentiator among the Classic Maya (Havill et al. 1997; A. Chase 1992), no satisfactory explanation of the purpose of this practice, beyond aesthetics, has been offered. It has also been suggested however, that modifications may have signaled lineage or ethnic affiliations, although these models require intensive testing. In addition, upon examining the representations of deities in Maya art, one cannot help but notice how many are depicted with filed teeth (Miller & Taube 1993: 77). Of particular interest are depictions of solar deities (i.e. God G a.k.a. *K'inich Ajaw*), maize-related deities (i.e. God E a.k.a. *Junyenal*), deities of partition (i.e. *tsuk*), and deities of sanctification (i.e. God C a.k.a. *k'uh*) (see Schele & Miller 1986), all of which have central upper incisors which bear B-4 or B-5 modifications (e.g. Figure 4). These examples suggest that these specific types of modifications signal an intricate statement that is intimately tied to the attitudes of deities and gods. Although this message has not been deciphered at present, Maya iconography may provide us with the best clues to its unraveling.

Of direct relevance to the comparison between the artifactual assemblages from the cave sites of the Roaring Creek and Pook's Hill's assemblage are the distribution of dental

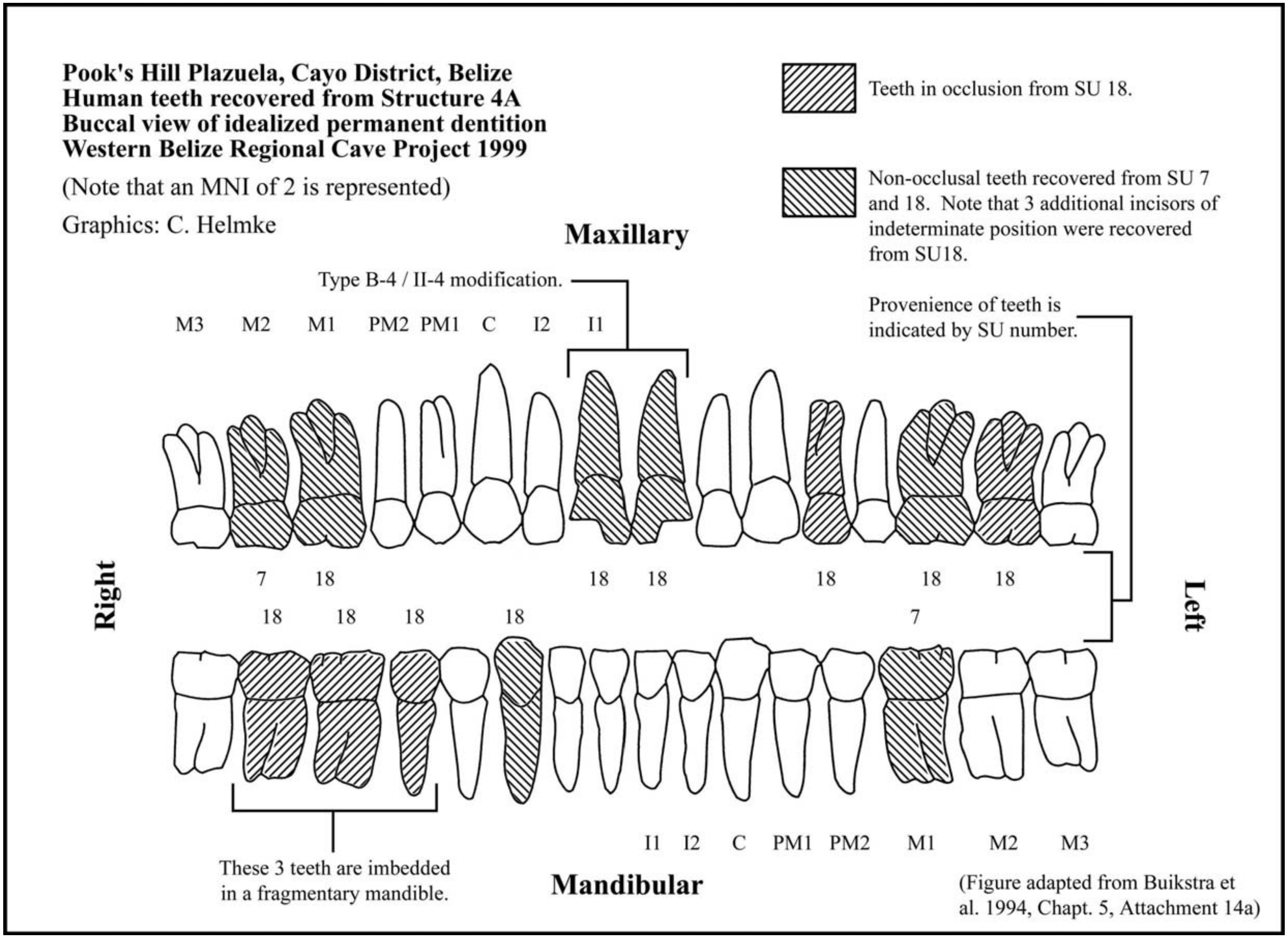

Figure 4: Teeth represented in the Pook's Hill assemblage.

Figure 5a:
Central upper incisors recovered from SU PKH1-18. These modified teeth are probably those of the individual entombed into the crypt of Structure 4A. The lateral incisors with A-4 modifications are conjectural.

(Drawing by Christophe Helmke from a photo by Megan Bassendale)

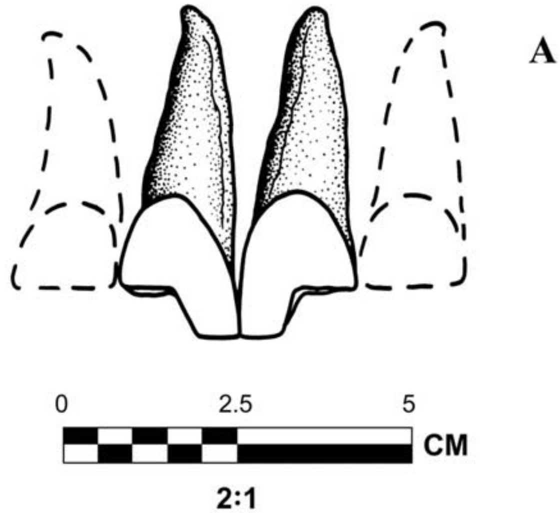

Figure 5b:
Unprovenanced sculptural fragment. The sculpture represents a Late Classic (AD 600-900) rendition of the solar deity known as *K'inich Ajaw.* Note the prominent and modified central incisors, forming a T-shaped *ik'* sign. The *ik'* sign is understood as symbolizing the notions of "wind" and "breath."

(Drawing by Christophe Helmke, adapted from a photo by Justin Kerr. Original photograph published in Sotheby's 1998 with permission from the David Stuart Galleries).

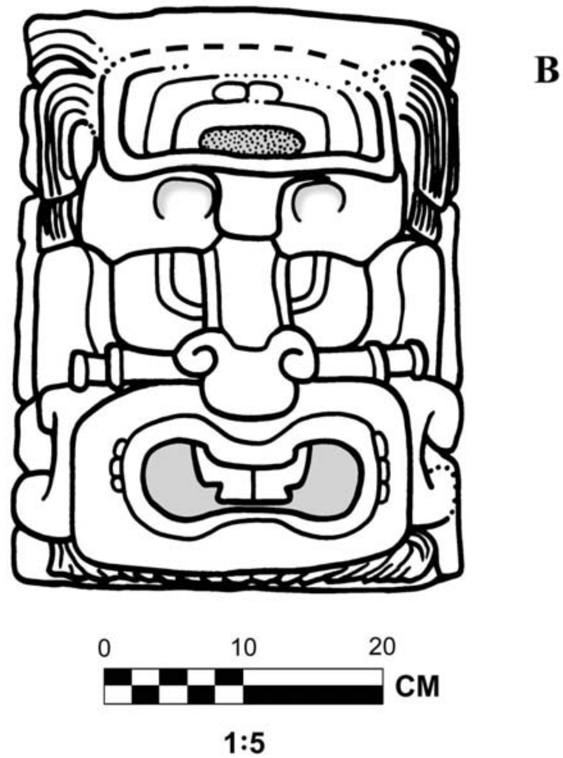

Figure 5: Culturally modified teeth from Structure 4A at Pook's Hill 1 and a depiction of the same type of dental modification in contemporaneous Maya art.

modification types throughout the valley, and through time. The table below outlines the distribution of dental modifications in the Roaring Creek Valley (see Gibbs 1997) and suggests the possibility of temporal variation to account for the different types of modification encountered at Actun Tunichil Muknal. Nonetheless, this important cave site is located 4.7 km south of Pook's Hill, again suggesting the possibility of different lineages using each site.

Site	Individual	Type	Dating
Pook's Hill *Plazuela*	Crypt?	B-4	EC III - LC I (ca. AD 550-650)
Actun Tunichil Muknal	Skeleton 1	A-2	Late Classic II - III (AD 700-900)
	Skeleton 3	A-2	Late Classic II - III (AD 700-900)

Table 1: Distribution of dental modification in the Roaring Creek Valley.

Based on the presence of human remains in association with the eastern structure (Str. 4A), it can be inferred that the Maya living in this residential group were indeed placing at least some of their dead within the eastern structure. Based on comparative analysis of information from other *plazuela* residential groups, accounting for the labor expenditure required in the construction of these distinguished resting places, leaves little doubt that the individuals interred therein were held in great esteem by their lineage (Becker 1999; Welsh 1988). This emphasis is greatly accentuated through the recognition that the initial Pook's Hill structure could not have served any domestic or residential functions. Adding to this view is the apparently commemorative aspect of some phases of construction. Indeed, based on examinations of the architectural profiles revealed in the baulks of LP1, it seems likely that structure 4A-2nd was constructed specifically to house the crypt. Drawing on interpretations by Welsh (1988) and Becker (1999) in conjunction with the evidence represented at Pook's Hill, one can assume that Structure 4A did in fact serve as an ancestor shrine within which influential members of the Pook's Hill lineage were buried.

CONCLUSION

Prior to the looting of the Str. 4A it thus appears that there were 3 individuals buried in separate internments, which were likely constructed during different phases of architecture. It can be argued that the bones which were recovered from the looters' deposit (SU 18) were originally contained in the crypt of Str. 4A, due to their good state of preservation as well as the sherds found in association with the bones (SU 18b) that are apparently contemporaneous with that construction phase. As the crypt of Str. 4A measured only 0.55 m wide and 0.48 m high, it seems unlikely that that chamber contained the remains of more than one individual, particularly if buried in the flesh. This interpretation is reinforced by the absence of any evidence suggesting re-entry and the deposition of additional remains at a later date (for example see Healy et al. 1998). Additionally, the presence of the mandible of the young adult in SU 18, leads to the conclusion that the second individual, for whom age has not been determined, was probably interred within an additional burial locus, at present remaining unidentified. As the human remains recovered from the core of the initial construction phase (PD 4A-1, Unit 6, Level 4b?, SU 20) were found in a context that was unaffected by the looting activities, these represent a third burial locus. Nonetheless these remains may have been buried in a fragmentary state as very little of that individual remains and no architectural elements indicative of a burial were encountered.

Although at the present time the observations on the remains recovered from Structure 4A are preliminary and the vast majority of remains were retrieved from secondary context, several conclusions can be reached. The remains from this sample are extremely fragmented, however, the manner of burial is consistent with other burials throughout the Maya area. The crypt for example, is oriented along a north-south axis (see Figure 3), which is a typical trend in the greater Belize Valley from the Middle Formative onwards (Song 1995; Welsh 1988). The sex of both individuals is undetermined at this time. It is likely that the individual interred within the crypt was a young adult. At the present time, it is not possible to say anything regarding the diet or status of these people, but based on the location of these burials in the eastern ancestor shrine, one can infer that both individuals were important members of the lineage group residing at Pook's Hill.

Future analysis of these bones is highly recommended, as there is a great deal of additional information that could be retrieved from these remains. Likely, the age of both individuals could be established as well as the sex of the second individual. Osteometrics are also suggested as is a more detailed examination of the teeth. Examination of the bones for pathologies was not undertaken and would also be recommended as it may give some insight into the health and environmental factors or occupational stresses affecting these individuals.

		PKH1-5	PKH1-6	PKH1-7	PKH1-9	PKH1-10	PKH1-12	PKH1-13	PKH1-18	PKH1-20	Σ
CRANIAL	Frontal										
	Parietal frag.					2.0					**2.0**
	Occipital										
	Temporal frag.								3.0		**3.0**
	TMJ										
	EAM frag.								1.0		**1.0**
	Sphenoid										
	Zygomatic								1.0		**1.0**
	Maxilla								2.0		**2.0**
	Palatine										
	Mandible frag.				1.0	1.0			3.0		**5.0**
	Left Mand. frag.								1.0		**1.0**
	Right Mand. frag.								0.9		**0.9**
	Unid. cranial frag.						2.0		32.0		**34.0**
TEETH	**Maxillary**										
	L-I1								1.0		**1.0**
	L-I2										
	L-C										
	L-PM1								1.0		**1.0**
	L-PM2										
	L-M1								1.0		**1.0**
	L-M2								1.0		**1.0**
	L-M3										
	R-I1										
	R-I2										
	R-C										
	R-PM1										
	R-PM2										
	R-M1								1.0		**1.0**
	R-M2										
	R-M3										
	Mandibular										
	L-I1								1.0		**1.0**
	L-I2										
	L-C										
	L-PM1										
	L-PM2										
	L-M1			1.0							**1.0**
	L-M2										
	L-M3										
	R-I1										
	R-I2										
	R-C								1.0		**1.0**
	R-PM1										
	R-PM2								1.0		**1.0**
	R-M1								1.0		**1.0**
	R-M2			1.0					1.0		**2.0**
	R-M3										
	Unid. incisors								3.0		**3.0**

Table 2: Tabulation of the osteological materials recovered from Str. 4A.

		PKH1-5	PKH1-6	PKH1-7	PKH1-9	PKH1-10	PKH1-12	PKH1-13	PKH1-18	PKH1-20	Σ
POST-CRANIAL	Clavicle										
	Scapula										
	Patella										
	Sacrum										
	Os Coxa										
VERTEBRAE	Unid. frags.	3.0		6.0		1.0			9.0		**19.0**
RIBS	Unid. frags.	1.0		2.0		1.0				1	**5.0**
LONG BONES	L-Humerus								0.4		**0.4**
	R-Humerus								0.5		**0.5**
	L-Radius								0.5	0	**0.9**
	R-Radius										
	L-Ulna								0.7		**0.7**
	R-Ulna										
	L-Femur								0.9		**0.9**
	R-Femur										
	L-Tibia										
	R-Tibia										
	Fibula								1.0		**1.0**
	Unid. frags.				2.0				25.0	9	**36.0**
HAND	Carpals			1.0		1.0				6	**8.0**
	Metacarpals			1.0					3.0		**4.0**
	Phalanges - prox.	1.0							3.0	2	**6.0**
	Phalanges - med.			1.0					1.0		**2.0**
	Phalanges - dist.			3.0							**3.0**
	Hand / Foot ?			2.0					1.0		**3.0**
FOOT	Tarsals	1.0									**1.0**
	Metatarsals										
	Phalanges										
UNIDENTIFIED DIAGNOSTIC FRAGS.				4.0	2.0	2.0			11.0	26	**45.0**
UNIDENTIFIED UNDIAGOSTIC FRAGS.		33.0	4.0	168.0	16.0	18.0	2.0	4.0	104.0		**349.0**
TOTAL		**39.0**	**4.0**	**190.0**	**21.0**	**26.0**	**4.0**	**4.0**	**217.7**	**44**	**550.1**

Table 2: Continued.

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