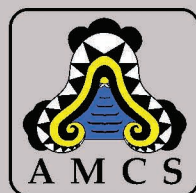


# HEART OF EARTH

## STUDIES IN MAYA RITUAL CAVE USE

Edited by  
James E. Brady



BULLETIN 23



# HEART OF EARTH

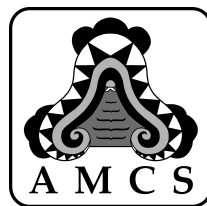


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ASSOCIATION FOR MEXICAN CAVE STUDIES  
BULLETIN 23  
2012

Cover photo: This structure at the back of Quen Santo Cave 3, Huehuetenango, Guatemala, was called the Temple Room by Eduard Seler in his report published in 1901. The room is still an important pilgrimage destination for the Maya. Photograph by Allan Cobb.

Association for Mexican Cave Studies  
PO Box 7672  
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## Preface

The idea for this volume of short articles grew out of a discussion with Dominique Rissolo in Merida that touched on a number of issues related to Maya cave archaeology. We expressed our satisfaction with the fact that the field was clearly active and growing. This was reflected in large sessions organized each year at the Annual Meeting of the Society for American Archaeology (SAA) where new advances in method and theory were being presented. We both expressed our concern, however, with the fact that publication of this work was lagging. The problem was that practitioners were increasingly operating on a shared understanding of a body of grey literature that was inaccessible to those outside of the small circle of cave specialists.

There are many reasons for the lack of publications, some of which are common to small, emerging sub-disciplines. Many of the presentations targeted issues that were considered too narrowly focused for submission to a general anthropology or archaeology journal. While a specialty journal like the *Journal of Cave and Karst Studies* was a possibility, their backlog for theme issues made them unattractive. Since Dominique and I had both worked with the *Association for Mexican Cave Studies*, we agreed that this would be the preferred venue. I was delighted when the editor, Bill Mixon, expressed his support for the project.

The articles submitted fall nicely into three categories. The first section, Historical Developments in Cave Archaeology, begins with Ann Scott's, "The Historical Context of the Founding of Maya Cave Archaeology," which was presented at the 2004 SAA meeting. The paper has been considerably revised since then and establishes a chronology that is generally followed today. The article is particularly important in illuminating the transition between the Post War Period ending in the 1970s and the Foundation Period beginning in the 1980s. Kieffer and Scott's important work, "The Mesoamerican Cave Paradigm," articulates what the authors feel are the core tenants of cave archaeology. These have never been explicitly set out, so it will be interesting to see if it generates discussion and debate. The article exemplifies all the problems of going through the peer review process. A positive reviewer wanted the detailed critique of habitation cut because (s)he felt that no one held this view any longer. A second reviewer, however, vehemently maintained that cave habitation was "obvious." The third reviewer got so bogged down in the term "paradigm" that (s)he never addressed the substance of the paper. I was pleased to grab it and present it here.

The second section, Archaeological Field Studies, includes contributions on Mexico, Guatemala and Belize. Domenici

and Pongetti provide an excellent overview of chronological changes in cave ritual in the Selva El Ocote area of Chiapas. Their GIS analysis of the Cueva del Sapo isolated changes in the utilization of the cave over time. Ishihara-Brito and Guerra's contribution is of great interest, in that we know almost nothing about cave use in the piedmont area of Guatemala. It further reinforces the importance of caves even in non-karstic areas. Finally, they provide ethnographic data on the continued use of these caves. While the cave association of monster mask façades on Chenes structures has long been recognized, my article on architectural caves draws attention to an additional type of structure whose form suggests that it was meant to represent a cave. Sabalam provides evidence that architectural caves existed from at least the transition between Middle to Late Preclassic. The contributions from Belize not only present case studies but attempt to expand the limits of our interpretive frameworks as well. At Je'reftheel, Helmke and Wrobel attempt to relate the osteological and artifactual assemblages to spatial distribution in order to get a sense of the number of "events" that occurred in the cave. They then scrutinize their ceramic assemblage to identify what they consider to be a "ceramic activity set." Morton et al. look at the temporal differences in the use of space at Actun Neko. Like Stemp et al., this contribution also provides a detailed analysis of an usual artifact, a shell disc. The last contribution in this section presents a valuable review of previous analyses of cave architecture. Moyes then attempts to interpret architecture at Las Cuevas in terms of its creating a cosmological landscape through which actors move.

The final section, Artifact Studies, focuses on several themes. Stemp et al. analyze a green obsidian eccentric from Actun Uayazba Kab. The artifact at this point is unique. The contributions by Mirro and me are closely related. Mirro describes the use of granite cobbles in Barton Creek Cave and stresses the fact that none of this material occurs naturally on the ledges. All of the stone, therefore, even in the most unpretentious feature, represented a deliberate act by some ancient visitor. The observation allows us to appreciate, furthermore, the labor expended in hauling the stone up to the ledges. "Leaving No Stone Unturned" discusses the recovery of unmodified stones that had been brought into caves. Ethnographic data are presented to illustrate the range of meanings that can be attached to these objects. Finally, Nation et al. report the results of attempts to use Inductively Coupled Plasma Mass Spectrometry to source speleothems from the Sibun Valley, Belize. The authors advance some tentative interpretations of this data set that differ significantly from assumptions previously made.—James E. Brady



## 1

## The Historical Context of the Founding of Maya Cave Archaeology

Ann M. Scott

History never looks like history when you are living through it.  
It always looks confusing and messy, and it always feels uncomfortable.—John W. Gardner

Writing intellectual history is like trying to nail jelly to the wall.—William Hesselntine

Cave exploration has a long history in Maya archaeology, but it is generally agreed that a formal body of methodology and theory concerning caves only developed in the last two decades of the twentieth century. Because of this, Maya cave archaeology has only recently achieved recognition as a legitimate area of investigation. It is also the case that the majority of its practitioners have entered the field so recently that they have little appreciation of the tumultuous events that shaped the founding of their subfield. There is a danger in leaving the early history of the field unrecorded because the details of this period are known to only the few individuals who actually participated in the events so these chapters can easily be lost. This article will explore the impact of a series of events during the 1970s that changed the course of Maya cave archaeology.<sup>1</sup> As an actor during cave archaeology's formative period, I was present while their impact was still being acutely felt.

The events described below have been largely ignored in the few historical pieces written about Maya cave archaeology for a number of reasons. The first historical treatment of cave research, formulated in the mid-1980s, does not mention these events perhaps because they had occurred too recently to be put in historical perspective (Brady 1989:10-31). As John W. Gardner aptly notes, "History never looks like history when you are living through it." In a later work, Brady and Prufer (2005) discuss the intellectual background of this period in their review of theoretical publications during the 1970s and early 1980s, but the focus on published works can often be misleading. These intellectual assessments often focus on the contribution of antecedents to later work and thus emphasize continuity. The lag between research and publication also has a tendency to create temporal gaps between events and later publications that were affected by those events. This gap may obscure the relationship between

events and publications. Both of these tendencies are evident in the previous discussions of the relationship of cave publications in the 1970s to those in the 1980s. An examination of actual historical events provides a very different view of what occurred during the 1970s and explains the trajectory that the field was forced to take during the 1980s and 1990s. In the course of analyzing these events and their implications I have questioned previously proposed chronologies for the emergence of Maya cave archaeology as a self-conscious subfield. I argue that the emergence does not occur until near the end of the 1990s. I have attempted to construct a balanced assessment of the period by consulting a number of senior scholars who generously agreed to share their insights and opinions with me.

#### Brief History of Maya Cave Investigations

Historically, cave investigations in the Maya area can be traced back to the work of Stephens and Catherwood in the 1840s (Stephens 1841, 1843). Over time, interest in caves grew and a number of significant cave studies were carried out in the last decade of the 19<sup>th</sup> century, including: Henry Mercer's *The Hill-Caves of Yucatan* (1896), Edward Thompson's *Cave of Loltun* (1897), George Gordon's *Caverns of Copan* (1898), and Eduard Seler's report on Quen Santo (1901). While these studies were laudable in terms of both field methodology and reporting, they failed to make an impact on the field at the time. Even the presence of fairly spectacular discoveries such as the ossuary in Cave 3 at Copan and the "Temple Room" in Cave 3 at Quen Santo failed to generate any discussion or debate about the nature of Maya cave use.

Instead, cave investigation all but disappeared from Maya archaeology during the period between the World Wars (Brady and Prufer 2005:1). Hammond (1982:20) includes these years in what he calls the Period of Institutional Domination. With the exception of the British Museum's excavations at Pusilha (Joyce 1929; Joyce et al. 1928; Gruning 1930), none of the major institutional projects allocated any appreciable resources to cave investigation. The impact was tremendous. Not only did cave investigations fail to participate in the remarkable advances occurring within

<sup>1</sup> A version of this paper was originally presented in the Biennial Gordon Willey Symposium on the History of Archaeology at the 69th Annual Meeting of the Society for American Archaeology in Montreal, Quebec, Canada in 2004. The author wishes to thank the organizers, Stephen E. Nash and James N. Snead, for the opportunity to participate.

Maya archaeology as a whole, but their exclusion from the large projects marginalized them as an area of inquiry. It is not surprising that cave investigation languished and that, in general, this period:

produced a number of short cave descriptions but, by and large, these were nothing more than visits that lasted only long enough to gather up the choicest artifacts. None of these reports approached the best work of the previous period either in methodology or completeness (Brady 1989:20).

Cave studies experienced a resurgence during the Post-War Period [1950 - 1980] (Brady 1997a). Nevertheless, the first synthetic statement on Maya cave use did not appear until almost 60 years after the late nineteenth century flurry of activity noted above. The first systematic attempt to analyze cave use was Sir J. Eric Thompson's *The Role of Caves in Maya Culture* published in an obscure German journal in 1959. It was not until Thompson revised and expanded his synthesis for the introduction to the reprint edition of Mercer's *The Hill-Caves of Yucatan* in 1975 that his contribution was widely circulated.

#### Historical Events of the 1970s

The resurgence of Maya cave studies culminated in the 1970s with a number of important publications, of which three are particularly noteworthy: the Balankanche report published in 1970 by E. Wyllys Andrews IV, Thompson's synthesis in 1975, and MacLeod and Puleston's article *Pathways into Darkness* that appeared in 1979.<sup>2</sup> While the intellectual contribution of these works is recognized, they have not been interpreted within the context of historical events occurring at the same time. These events brought a close to the Post-War Era and allowed a radically different theoretical approach to emerge in the 1980s and later become established in the 1990s.

In light of the important contributions made during the 1970s, it is not surprising that Brady's (1989) history of cave studies simply placed his own work as a continuation of the tradition that preceded him. This, however, obscures how the deaths of three prominent scholars during the 1970s significantly impacted the direction of Maya cave research. The premature death of E. Wyllys Andrews IV in 1971 at age 54 (Wauchope 1972), removed the foremost field archaeologist at the time with experience in caves. His publications on Gruta de Chac (1965) and Balankanche (1961, 1970, 1971) had been far more detailed than previous cave work, despite the fact that the investigations were carried out as

adjunct components to his surface project at Dzibilchultun. Most importantly, the spectacular finds at Balankanche were accepted by scholars as relating to a ritual use of the cave. Furthermore, Andrews held a prominent academic position at Tulane, which was the leading American university working in Yucatan, and could draw on the resources of the Middle American Research Institute.

The death of Sir J. Eric Thompson in 1975 at age 76 (Hammond 1977) also deprived cave studies of its most prominent advocate and the only Mayanist of the era who had done serious scholarship on caves. His 1959 synthesis provided the first theoretical discussion of Maya cave use from a ritual perspective. Because it was published by Hamburg's Museum für Völkerkunde, the article went largely unnoticed, although some scholars such as David Pendergast (e.g., 1970, 1971) recognized its importance and cited the work. Even Edwin Shook, Thompson's colleague at the Carnegie Institution of Washington, professed never to have seen the piece (Brady 2005a:f-5). While the revised version of this paper was widely distributed when published in 1975, historical events mitigated its impact. Thompson's death the same year prompted a flood of criticism of many of his positions so that for a time his work was not taken as authoritative (Brady 2005a:f-6). As a result, the second synthesis was essentially ignored and Thompson's premise that cave utilization was basically religious in nature was never widely accepted. Instead, habitation tended to remain the default explanation for the presence of cultural material in caves. Thompson's death also removed the dominant voice in Maya studies as a possible champion of cave archaeology.

Finally, the tragic death of Dennis Puleston in 1978 at age 38 deprived cave studies of an original thinker and an energetic investigator who had just begun to explore caves (Harrison and Messenger 1980; Willey 1982). It appeared that Puleston himself was set to influence the future of cave archaeology as he had just presented his first statement on Maya cave use only days before being struck by lightning on the top of the Castillo pyramid at Chichén Itzá (MacLeod and Puleston 1979). Certainly he was ideally situated to take such a leadership role with a position at the University of Minnesota and with an established reputation and strong ties to the most prominent Mayanists from his work on the Tikal Project in the 1960s. Later, Barbara MacLeod, who had been prominent in Belizean cave exploration during the 1970s (McNatt 1996:82), appeared to retire from active cave investigations and instead shifted to Maya iconographic and epigraphic studies.

The one archaeologist of note with cave experience whose career spans the 1970s and 1980s was David Pendergast. During the 1960s and early 1970s, Pendergast conducted investigations in Belize (1962, 1964, 1966, 1969, 1970, 1971, 1974) producing some of the best field reports of cave utilization to that point. The investigations, however, were predominately salvage operations and after the appearance of the final monographs, Pendergast's publications on caves cease.

2 Doris Heyden's (1973, 1975, 1981) publications interpreting the cave beneath the pyramid of the Sun at Teotihuacan are not included here because they did not deal with Maya archaeology and did not appear to have an impact on Mayanist thinking during the 1970s. They became extremely influential, however, during the Foundation Period.

### A Reformulation of Chronology

Previous discussions of the intellectual history of Maya cave research document shifts in the ways in which developments since World War II were being conceptualized (Brady 1989, 1997a; Brady and Prufer 2005). Brady's first historical assessment, appearing as a chapter of his dissertation (1989), utilized three chronological periods: an Early Period (1840-1914), a Middle Period (1914-1950), and a Recent Period (1950-present). Later, he divided the Recent Period in two, with a Post-War Period (1950-1980) and a Recent Period (1980-present), and argued that the subfield of Maya cave studies began with the redefined Recent Period (Brady 1997a).

In reviewing Brady's history after the passage of more than a decade, it is clear that certain aspects need to be reconsidered. In particular, I disagree with his proposal that a subfield of Maya cave archaeology emerged in the early 1980s. In 1991, when my own involvement with caves commenced, there were only a few isolated practitioners, but a recognizable, cohesive group of cave archaeologists did not exist. A body of literature dealing with Maya or Mesoamerican caves was scattered within the broader recesses of surface archaeology or art history. Finally, the overall field of Maya archaeology in no way recognized cave studies as a formal area of investigation. However, publications were appearing and cave investigations began being conducted as part of large, regional projects in the early 1990s in Belize and Guatemala. It was out of these projects that Maya cave studies coalesced.

Cave researchers formally met for the first time as a group at the 1997 Society for American Archaeology (SAA) meetings in Nashville in the session, "New Perspectives in Mesoamerican Cave Archaeology." In the process of organizing the session and disseminating information about it, an informal e-mail network was established that continues to link practitioners to this day. In anticipation of the meeting, a large bibliography of Mesoamerican cave sources was assembled that defined the field's literature (Brady 1996). The dozen papers drew nearly everyone working in cave studies at that time as either a participant or as a spectator. The success of the session served as the impetus for an almost unbroken string of SAA cave sessions since that time (Scott 2007). These factors taken together were instrumental in making cave archaeology a self-conscious entity. Because of the importance of the 1997 meeting, I have tentatively used this event to mark the commencement of the subfield of Maya cave archaeology and, therefore, the beginning of the "Recent Period."

#### Defining the Foundation Period 1980–1997

My redefinition of the chronology creates a nearly two-decade gap from 1980 to 1997 between the end of Brady's Post-War Period and the actual emergence of the subfield of cave archaeology. I propose calling this the "Foundation Period" because the underlying assumptions of the field were

defined, a methodology was established, and a theoretical position took shape during these years.

This article also differs with previous work on the nature of the transition between the 1970s and 1980s. The works (Brady 1989, 1997a) focusing on publications, give the impression of a smooth development of the "Recent Period" out of the trends of the 1970s. My examination of actual historical events within Maya archaeology suggests a more radical break. The significant publications in the 1970s were the final statements by three prominent scholars so that, by the end of the decade, there was virtually no one of note seriously investigating caves or cave use. Furthermore, with these deaths, all of the important Mayanists pushing for a ritual interpretation of cave use were removed. In their absence, Maya archaeology's thinking at that time was accurately summed up by Norman Hammond's (1981:177) statement, "Whether residence in caves was permanent, periodic or sporadic, regular or only for ritual and refuge, we do not yet know. . . ."

Cave related publications continued to appear in the 1980s, but it is noteworthy that the authors are totally different than those of the 1970s. Most were graduate students at least two intellectual generations removed from Thompson and Andrews. Lacking senior scholars charting the direction of investigation, it is not surprising that the tone of these new studies began to diverge significantly from earlier work. While not trying to minimize the contributions of individuals such as Juan Luis Bonor (1989) or art historian Andrea Stone (1995), it is clear that the Foundation Period was dominated by more than 40 cave specific publications authored or co-authored by James Brady. Brady's (1989) investigation of the large cave in Guatemala called Naj Tunich in 1981 and 1982 offered new approaches in methodology and theory in the cave context. It also differed from previous work in not being a salvage operation, but instead a problem-oriented investigation.

I am more interested, however, in exploring some of the political ramifications of the radical transition to the Foundation Period and how that determined the development of cave studies. A critical examination of this period in light of the deaths of Andrews, Thompson and Puleston, helps to explain the field's struggle for acceptance during the 1980s and 1990s. When Brady begins the investigation of Naj Tunich in the early 1980s, there were no senior scholars leading intellectual discussions of cave investigations and archaeology in general had no idea how caves were used or that they might be important. Thus, a new approach to a highly marginalized area of Maya studies was being led by a graduate student.

The deaths of Andrews and Thompson removed the two senior scholars most closely linked to cave studies. In this respect it is interesting to note that, had he lived, Andrews would have only been 64 at the time of the Naj Tunich Cave Project, and in a powerful position to influence the direction of that investigation and the acceptance of Maya cave investigations into mainstream archaeology. More

often than not, senior scholars play crucial roles in getting students and their ideas accepted in the field. The backing of a senior scholar signals colleagues that a student is to be treated with respect and their ideas taken seriously. For cave studies the lack of a senior champion was especially critical because Brady's position that caves were important sacred space was in direct conflict with the widely accepted notion of caves as habitation sites and the ecological-materialist bias that minimized the importance of religion.

Lacking champions, cave archaeology's acceptance within the general field of archaeology faced difficulties during this period. The publication process was frequently an ordeal because knowledgeable and sympathetic reviewers who recognized cave issues tended to be difficult to find (Brady, personal communication, 2005). The death of established practitioners also meant that the authors writing during the Foundation Period had no name recognition to aid in the dissemination of their ideas. The lack of acceptance was reflected in funding as well so cave research simply did not command the type of funding enjoyed by surface projects. In making these points, let me stress that I am not suggesting that cave archaeology was singled out nor was it treated with any particular malice. Rather, these are obstacles commonly faced by significantly new ideas or approaches that are not led by a prominent figure already established in the field.

The impact of a high profile promoter for cave investigations was best demonstrated by Arthur Demarest in the early 1990s. As director of the Petexbatun Regional Archaeological Project, Demarest extolled the importance of the cave sub-project, the Petexbatun Regional Cave Survey. As E. Wyllys Andrews V observed, "Certainly the cave project that has received the best press in recent years is the Petexbatun work. Arthur made caves one of the important branches of research, and that gave it a great deal of respectability. He also had the best person working on it, Jim [Brady]." Interest in caves noticeably increased at this time because of Brady's innovative investigations and Demarest's role as a facilitator. In fact, I became involved in cave research after hearing Demarest speak about the Petexbatun cave sub-project and this culminated in my working on the cave project during 1993 field season.

#### **Perceptions of Maya Cave Archaeology During the Foundation Period**

When the foundations of a specialized subfield of cave archaeology were being laid in the 1980s the topic already carried a good deal of intellectual baggage because cave investigations had been carried out since the nineteenth century (Brady 1989: 10-31). To better contextualize caves studies within the perceptions of the time, I consulted a number of archaeologists who were active during the 1970s and 1980s. During one interview, a prominent Mayanist told me, "They [caves] seemed to call for very large investments of effort, planning, etc. for relatively small scientific returns. ... It seems to me to be a rather limited field and one which produces information and interpretation, which are difficult to integrate with the mainstream data produced by site and

regional projects."

It is not difficult to see what this archaeologist is referring to. Throughout the 1970s, caves were treated as self-contained sites and little attempt was made to relate cave data to the larger social system of surface settlement. This in itself is interesting because cave investigations at the time were being carried out by surface archaeologists who had, for one reason or another, strayed into caves. Because these surface archaeologists generally worked on only one cave during their entire careers there was little effort to develop the method and theory that could relate caves to surface features. For all of his insights into the religious nature of caves, even Thompson was unable to offer much help in this area. Brady (2005a) noted that, "Thompson made no attempt to indicate how cave ritual articulated with the larger religious system or to assess the importance of caves within Maya society." It is only with the advent of cave specialists that models relating caves to larger social issues appear.

Another informant noted that he was never tempted to get involved with cave work and said, "I've always been attracted by much more prosaic, traditional mainstream kinds of archaeological questions." Thus, cave projects faced strongly entrenched attitudes that they offered little in terms of important data, were difficult to relate to traditional research questions, and were decidedly peripheral to mainstream interests.

Another interesting perception among the senior scholars emerged from a question concerning securing academic employment with a specialization in cave studies. While none of the prominent Mayanists I interviewed suggested that a prejudice against cave archaeology existed, one individual offered that, "being too specialized will hurt you" when it comes to finding a job. Another senior person suggested, "The general strategy for a Maya archaeologist that is interested in cave research probably would be to have at least one or two other specialties; e.g. ceramic analysis, or settlement patterns, or Classic Maya art with an emphasis on murals. Those could be emphasized and then the cave research could ride in those more career-friendly canoes. However, the other specializations would have to be genuine and vigorously pursued and not charades."

The comment implies that cave archaeology is "too specialized" and not appropriate as a primary specialization. This idea is linked to the perception that cave data cannot address surface concerns. The general view was that cave archaeology was confined to discussing one type of geological feature of marginal importance. Cave archaeologists, however, assert that caves represent the best context for investigating the archaeology of Maya religion (Prufer and Brady 2005:2, 9). Since religion is embedded in political and economic institutions as well, cave archaeology allows its practitioners to address a wide range of issues (Brady 1997b, 2005b; Brady and Colas 2005; Halperin 2005; Prufer and Kindon 2005).

The view of cave studies as a specialized, but also marginalized subfield, was certainly exacerbated by the theoretical approach that placed it at odds with the ecological-materialism

of Processual Archaeology (Prufer and Brady 2005). Equally specialized subfields, such as settlement pattern studies or household archaeology that worked within the Processualist paradigm appear to have been more readily accepted as research foci. This issue is evident in Gordon Willey's (1982:10) posthumous discussion of Dennis Puleston who he characterized as having "the qualities of the mystic" for his interests in iconography and religion and said that Puleston's discussion of the ideological basis for the Maya collapse "set a good materialist's teeth on edge" (ibid:12). While any figure practicing cave archaeology at that time might face such criticism, these do not seriously impact an established member of the academy, but are particularly damaging to those seeking a position or tenure.

### An Institutional Base for Cave Archaeology

With the death of Andrews and Puleston cave studies lost all of the archaeologists with cave experience who held academic positions. Despite extensive field experience and numerous publications, Brady found difficulty in securing an academic position after graduating in 1989 and this deprived cave archaeology of an institutional base during the entire Foundation Period.

The lack of an institutional base clearly impacts a new sub-discipline's ability to attract students. As noted earlier, the Foundation Period is separated from the appearance of the sub-discipline of cave archaeology because it was relegated during the earlier period to a handful of practitioners. Jaime Awe must be credited with recruiting the largest part of the second generation of cave archaeologists. His Western Belize Regional Cave Project, a component initiated in 1996 of his long running Belize Valley Archaeological Reconnaissance, became the proving ground for the majority of the cave archaeologists receiving Ph.D.s during the first decade of this millennium. The project's importance is reflected in the number of students presenting papers in the annual SAA cave sessions during the Recent Period.

Cave archaeology is only now recovering from the loss of an institutional base suffered in the 1970s. With the hiring of Brady, California State University, Los Angeles became an active center of cave research but it is not a Ph.D. granting institution. Lacking cave archaeologist at major institutions, students interested in Maya caves had to find graduate programs friendly to cave related dissertation topics. This has begun to change when Keith Prufer was hired at the University of New Mexico in 2007 and Holley Moyes was hired at the University of California, Merced in 2010.

### Conclusions

These reflections have grown out of my position as the first of a new generation of cave archaeologists. When I began working in caves in 1991, "the field" consisted of little more than Brady, Andrea Stone, and Juan Luis Bonor, and I vividly remember the very marginal place of caves in Maya archaeology. Cave studies developed rapidly through the 1990s so that when a self-conscious subfield emerged at the end of the decade, conditions had already substantially

changed. Cave archaeology was receiving increasing recognition, a far more ample corpus of interpretive works existed, and explicit research questions were being debated.

The changes in the field were quite apparent in the work produced. In writing the forward to the publication of the first cave-related dissertation since his own, Brady (2003:11) notes that, "The time separating this work from my own dissertation is also very noticeable in that Rissolo writes with a clarity of vision, a confidence of direction and a sophistication in theoretical approach that I would have envied."

In attempting to explain to newer students how much things have changed over the last 20 years, I note that it is in part due to Brady's emergence as a recognized figure in the larger discipline. Stephen Houston (2006:356) comments in his review of the edited volume, *Stone Houses and Earth Lords: Maya Religion in the Cave Context*, that, "[Brady] has managed to forge a new subfield of Maya archaeology . . . that can now rework prior Mayanist perception of the landscape and lead to publications in outlets once shy of such esoterica." Maya cave archaeology finally has the senior scholar that the field had been lacking since the late 1970s. One cannot help but wonder if cave studies would have been more smoothly integrated into mainstream archaeology had Dennis Puleston not been struck by lightning. That fluke event changed the trajectory of the field's direction and may have delayed the emergence of Maya cave archaeology as an accepted subfield by two decades.

### Acknowledgments

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## 2

## The Mesoamerican Cave Paradigm: Its Historical Development

C. L. Kieffer and Ann M. Scott

**Introduction**

Although there is a long history of cave investigation in Mesoamerica dating back to the 1840s, a dramatic revival of cave studies began in the 1980s leading to the emergence of a self-conscious sub-discipline of Mesoamerican cave archaeology in 1997 (Scott 2007). The approach developed by the new field has been influential especially in the advancement of a Southwestern cave archaeology that has borrowed heavily from Mesoamerican models. In the session, “Sipapus, Sinkholes, and Shrines: New Approaches to the Study of Ritual Cave Use in Southwestern Archaeology,” at the 72<sup>nd</sup> Annual Meeting of the Society for American Archaeology, the organizer, Scott Nicolay (2007), referred to the approach as the Mesoamerican Cave Paradigm. Nicolay coined the term from his experience working on Jaime Awe’s (1994; 2005) Western Belize Regional Cave Project to refer to the ideas he encountered there and incorporated into his own work in the Southwest. Mesoamericanists, for the most part, have not used this designation although Brady (2007) acknowledges it in his paper, “The Mesoamerican Paradigm in the Southwest,” given in Nicolay’s session. The use of the label by Southwesternists raises an interesting question, however, as to whether a cave paradigm, recognized or not, actually exists in Mesoamerica. This paper will examine whether a paradigm exists and, if it does, will attempt to define and critically evaluate it.

**What is a Paradigm?**

The uncertainty over whether a Mesoamerican Cave Paradigm exists is, to a great extent, due to the misuse of the term paradigm. Archaeologists have often used the terms paradigm, theory, and theoretical framework interchangeably. Some archaeologists classify processual, postprocessual, and other such “schools of thought” as paradigms. They are not. These are logical theoretical frameworks, which are “constructed by using an established, coherent explanation of certain phenomena and relationships” and act as structures that guide research (Eisenhart 1991: 205).

Kuhn (1962: 23) defines a paradigm as “an accepted model or pattern.” This definition, however, is too lacking in specificity to be useful. Kuhn (1996: 175) later revised his definition to include “an entire constellation of beliefs, values and techniques, and so on, shared by the members of a given community.” These beliefs become so instilled in a

group that the way they view the world is different than those who do not share the same paradigm. Burrell and Morgan (1979: 24) make this same point in stating that “be[ing] located in a particular paradigm is to view the world in a particular way.” Martin (1971: 5-6) holds that a new paradigmatic ideology significantly alters the discipline, desired goals, concept of culture, and methods utilized. “The new paradigm does not resolve any problems. Its value rests in the fact that it revolutionizes our methods of thinking and permits us to view our inquires in a different way and with greater scope” (Martin 1971: 6). It is based on these definitions and expectations that existence of a Mesoamerican Cave Paradigm will be judged.

**History of Mesoamerican Cave Archaeology**

As noted earlier, there is a long history of cave investigation in Mesoamerica. The study of these features, however, was not pursued with equal intensity in all parts of the culture area. Because the entire Maya lowlands is karstic in nature, the majority of the early reports are from this region and the Maya area has remained at the forefront of the theoretical developments in cave studies. To determine if a Mesoamerican Cave Paradigm exists, it is helpful to examine the historical development of cave scholarship. This allows periods of methodological change and theoretical innovation to be highlighted. A review of that literature clearly shows that the developments during the last two decades of the twentieth century marked a significant break from work that had gone before it.

The period from 1840 – 1914 has been designated the Early Period (Brady 1989; Brady and Prufer 2005a) and was initiated by the writings of John Lloyd Stephens (1841, 1843) and illustrations by Fredrick Catherwood of their explorations in the 1840s that popularized Maya archaeology. In their travels, visits to a number of caves are described, highlighted by Catherwood’s painting of the ladder in Bolonchen Cave. This period is noteworthy for the publication of four studies: Henry Mercer’s *The Hill-Caves of Yucatan* (1896), Edward Thompson’s *Cave of Loltun* (1897), George Gordon’s *Caverns of Copan* (1898), and Eduard Seler’s report on Quen Santo (1901) that rank among the best work carried out in the Maya area at this time. The period also stands out for its missed opportunities. Edward Thompson’s dredging of the Cenote of Sacrifice was widely known within the field but the cenote was not recognized as a cave feature. More

importantly, his manuscript on the High Priest's Grave was filed away unpublished for decades (Thompson 1938). If Seler had known that a major pyramid at Chichen Itza had been built over a cave it might have influenced his interpretation of the cave-architecture relationships that he noted at Quen Santo. Theoretically there was little challenge to the European view of caves as habitation sites. Henry Mercer (1895: 397) states the position explicitly,

Just as the Drift Hunter, the oldest proved inhabitant of Europe, was found to have left traces of his presence in caves, just as the prehistoric European epochs of human culture, bronze under iron, then polished and then chipped stone, were found to be represented in caves by the super-position of films of this rubbish resting one above the other, so here in America we may hope to find similar evidence, if it exists. If the Indian had a predecessor, we may expect to reveal proof of his presence in some cavern not difficult to discover.

Although a number of significant cave studies provided a foundation of data on cave use in the Maya area, no attempt was made to synthesize this material and there was no active discussion about the function of caves. It is clear, therefore, that nothing approaching a paradigm existed at this point.

The Middle Period (1914-1950), witnesses a near complete cessation in cave investigations (Brady and Prufer 2005b:1). In the Maya area most of this period falls into what Norman Hammond (1982:20) calls the "Period of Institutional Domination," [1924 – 1970] when large projects sponsored by institutions such as the Carnegie Institution of Washington, the Peabody Museum of Harvard University and the University Museum at the University of Pennsylvania drove advances in the field. The British Museum's Pusilha Project was the only major institutional investigation at this time that included substantial cave work (Joyce et al. 1928, Joyce 1929, Gruning 1930). The absence of cave investigations in the research agendas of institutional projects meant that caves disappear from the discussion of Mesoamerican archaeology so that there is nothing that could be called a paradigm at the end of this period.

During the Post-War Period (1950-1980), field studies of caves began to reemerge. The Carnegie Institution's last project at Mayapan produced a significant number of cave studies (Smith 1953, 1954; Strómsvik 1956). E. Wyllys Andrews IV documented the Gruta de Chac (Andrews 1965a) and the important cave of Balankanche (Andrews 1961, 1970, 1971), significant because the religious function of the site was well accepted by the field. David Pendergast (1962, 1964, 1966, 1969, 1970, 1971, 1974) contributed a model of first rate reporting in a series of monographs based on salvage operations. Doris Heyden's (1973, 1975, 1981) interpretation of the cave beneath the Pyramid of the Sun at Teotihuacan greatly influenced the views of the subsequent historical periods especially in terms of understanding and seeing constructed sacred landscapes.

The most important contribution of the period was the first synthesis and interpretation of the cave data in Sir J. Eric Thompson's *The Role of Caves in Maya Culture* (1959). A revised and expanded version appeared as the introduction to the reprint edition of Mercer's *The Hill-Caves of Yucatan* in 1975. Thompson's syntheses are significant in that he explicitly discounts habitation saying, "Most caves in Central America are too damp to be suitable for long residence" (Thompson 1959:129) and all of his principal uses of caves were for ritual. Unfortunately, the first article was published in an obscure German journal and so was not widely circulated and the second was published the year he died and so, once again, had little immediate impact on the field (Brady 2005a:f-6). Archaeology's view at the end of this period is neatly summed up in Norman Hammond's (1981:177) statement, "Whether residence in caves was permanent, periodic or sporadic, regular or only for ritual and refuge, we do not yet know..." Clearly, nothing approaching a cave paradigm had appeared at the end of the Post-War Period.

The Post-War Period ended with the deaths of a number of the prominent figures who had worked in caves (Scott 2004). A.H. Anderson died prior to publishing all of his cave findings in 1967 (McNatt 1996), E. Wyllys Andrews IV died of a heart attack in 1971 at age 54 (Wauchope 1972), and Sir J. Eric Thompson died in 1975 at age 76 (Hammond 1977). Dennis Puleston, who had only days before presented his first statement on Maya cave utilization (MacLeod and Puleston 1979), was struck by lightning on the top of the Castillo pyramid at Chichen Itza in 1978 and died at age 38 (Harrison and Messenger 1980). These deaths at the end of the Post War Period contributed to the introduction of a fundamentally different approach when a new generation of archaeologists entered the field with virtually no prominent, authorities active from the previous period.

Over the last two decades, the division of the historical periods has evolved as the passage of time has provided a changing perspective on the development of cave studies. In the first historical overview of Mesoamerican cave studies written in the 1980s, Brady (1989) referred to the period from 1950-1980 as the Recent Period. In 1997, he proposed dividing the Recent Period into a Post-War Period (1950-1980) and a Recent Period (1980-present) during which he saw a subfield of Maya cave archaeology emerging (Brady 1997a). Ten years later Ann Scott (2007) further refined the history by renaming the period from 1980-1997 the Foundation Period, with the amended Recent Period (1997-present) beginning with the 1997 Society for American Archaeology meeting in Nashville.

The Foundation Period (1980-1997) marked the appearance of the first specialized archaeology focused on caves. Scott (2007) states that this was "when the underlying assumptions of the field were defined, a methodology was established, and a theoretical position took shape." The new approach grew out of James Brady's 45 publications between 1985 and 1997, which established basic methodological and interpretative approaches that cave archaeology followed into the Recent Period (Scott 2004). Scott's characterization

of the Foundation Period makes this span the obvious place to look for a cave paradigm. Scott (2007) has also argued that the session, “New Perspectives in Mesoamerican Cave Archaeology,” at the Society for American Archaeology meeting in Nashville marked the end of the Foundation Period, the beginning of the Recent Period (1997-present), and the emergence of a “self conscious” sub-discipline of Mesoamerican cave archaeology.

### Is There a Mesoamerican Cave Paradigm?

In examining the history of Mesoamerican cave archaeology, we have concluded that a paradigm does in fact exist. Since the term was first formally used by Southwesternists, Mesoamerican cave archaeologists are largely unaware of the designation, so no attempt has been made by practitioners to define the paradigm or to discuss what elements make up its key constituents. Our task, therefore, is to define the Mesoamerican Cave Paradigm.

In attempting this definition, we have followed Clifford Geertz’s ideas about paradigm definitions when he says,

Let us, therefore, reduce our paradigm to a definition, for, although it is notorious that definitions establish nothing, in themselves they do, if they are carefully enough constructed, provide a useful orientation, or reorientation, of thought, such that an extended unpacking of them can be an effective way of developing and controlling a novel line of inquiry (Geertz 1973: 90).

Following Geertz, our review of the literature suggests that the Mesoamerican Cave Paradigm is constituted around four basic propositions:

- Caves were used primarily for ritual.
- Caves must be understood from an indigenous perspective.
- Caves played a significant role in Pre-Columbian society.
- Cave Archaeology can address wider theoretical issues.

#### Caves as Ritual Features

The first element in the paradigm is that Mesoamerican caves are features used primarily, if not exclusively, for ritual. This point is built on Thompson’s (1959, 1975) syntheses that outlined a number of functions of Maya caves and argued that all the major uses are religious. Habitation, even for temporary refuge in times of unrest, is dismissed by Thompson (1959: 129) who notes, “but one may doubt that this kind of occupation was sufficiently prolonged to have had much effect on their contents; most caves in Central America are too damp to be suitable for long residence.” His point is well taken. Thermohydrographs placed in Naj Tunich recorded a very stable environment with a relative humidity slightly over 90% at all times (James Brady, personal communication, August 2005) and two TipTemp Dataloggers placed in Midnight Terror Cave near the surface site of Tipan Chen Uitz, Belize recorded an average temperature of 22.5°C (72.5°F) and an average relative humidity of 99.62%

and 99.99% during 2008-2009 (Humberto Nation, personal communication, 2011). Similarly, Yok Balum Cave near the site of Uxbenka, Belize recorded an average temperature of 22.92°C (73°F) and an average relative humidity of 100% with an ONSET HOBO U23 Pro v2 Temperature/Relative Humidity Data Logger (Keith Pruffer, personal communication, 2011). This point has been too often overlooked by archaeologists who, prior to the Foundation Period, rarely spent more than a day or two in a cave. With the extended periods now spent investigating individual caves, most cave archaeologists have anecdotal stories of finding gloves or other equipment left in a cave that were covered with mold. While controlled experiments on preservation have not been conducted in caves, information is available for the subterranean environment of chultuns that have almost identical temperature and relative humidity as Midnight Terror Cave and Yok Balum Cave (Puleston 1971:329). Dennis Puleston’s attempt to store a variety of crops in chultuns showed that little of the food was edible at the end of his 11-week experiment. He concludes that chultunes “could not be used for the storage of maize, beans or squash. Even the root crops did not do very well” (Puleston 1971:330). It is important to recognize that one of the primary determinants of fungal growth in grain is moisture content, which is determined by relative humidity (Christensen and Kaufman 1969:25). We mention this because much of the Naj Tunich tunnel system is covered with a thick layer of dust that gives it the appearance of a “dry cave” so archaeologists need to exercise caution when characterizing a cave as dry.

Andrews (1965b:291), while accepting the possibility of cave habitation, states, “Inland, particularly on the flat northern plain, caves and cenotes, especially water caves, is a likely place to search for ancient man, but excavation and exploration of scores of caverns since the turn of the century have produced not a single indication of really early habitation.” If the Maya were not using caves for habitation early on, then it is unlikely that they were used for habitation during the Classic Period when we find the heaviest utilization.

Although Hammond’s statement quoted above indicates that the larger field of Maya archaeology had not accepted Thompson’s position, those actually working in caves during the Foundation Period had accepted and were utilizing Thompson’s (1975) second synthesis as the point of departure in their research (Brady 2005a:f-7). This is illustrated in an extended critique of Thompson in which the critique does not reject Thompson so much as demonstrates how his major points are being rethought and reprioritized in the emerging paradigm (Brady 1989:32-37). The religious function of caves was further strengthened by the first direct critique of the idea of cave habitation in the Maya area (Brady 1989:2-6). The application of the ritual model of cave use through the 1980s and 1990s largely defined who was working within the paradigm and separated them from those outside of it.

The difference in position between those working within the cave paradigm and those working outside of it is illustrated in Paul Healy’s review of two volumes of collected articles

on Mesoamerican cave archaeology (Brady and Prufer 2005a; Prufer and Brady 2005a). Healy not only notes that all of the authors are working within the same model but also explicitly sets himself outside of the paradigm in stating:

None of the authors in either volume discuss any alternative (nonritual) uses of caves in antiquity, despite the fact that these sites regularly contain evidence for habitation (e.g., grinding stones, food residues, utilitarian ceramics, signs of fires), and may have provided temporary, or emergency, shelter in times of inter-center warfare (Healy and Prikker 1989). The authors of these volumes have a strong adherence to the belief that the caves of Mesoamerica in late Pre-Columbian times were all ritualized, sacred (not mundane) sites. Others would be less sanguine (Healy 2007:271).

For those working within the paradigm, Healy's comments simply reflect all the problems encountered in the pre-paradigmatic approach in which archaeologists applied interpretive models developed at surface sites and in domestic contexts with little appreciation for the radically different nature of the cave context. Why, for instance, are signs of fire an indication of a habitational function? At the most obvious level, charcoal in caves is deposited by the use of torches regardless of the type of activity being carried out. More to the point, however, fire is an integral part of Maya ritual (Scott 2009). This is reflected in the fact that the K'iche' Maya refer to rituals as "burnings" (Cook 1986:139) and to the altar where rituals are performed as a "burning place" (*quemador*) (Bunzel 1952:431). Food offerings also play a prominent role in Maya ritual (Scott 2009) so the discovery of food residues is exactly what one would expect in ritual contexts (Morehart and Butler 2010). Recent work has also shown that faunal material is ritually deposited in caves as well (Brown 2004, 2005; Brown and Emery 2008; Halperin et al. 2003).

Manos and metates are commonly encountered in caves (Brady 1989:303-306) but those working within the paradigm see no reason to assume that these are associated exclusively with domestic activities. Andrea Stone (1995) proposes that they were used in the production of the ritual dough and breads known ethnohistorically (Durán 1971) and ethnographically (Gomez N. 1974; Love and Peraza Castillo 1984) to have been utilized in ritual. Nor is this the only possible ritual use. Polly Peterson (2006:85-86) extracted fossil pollen from manos and metates recovered from caves in the Sibun Valley which indicated that chili peppers and other items were being ground. Furthermore, Peterson found that metates were re-used as burning surfaces and materials for wall construction inside the dark zone of caves.

Finally, assertions of habitation based on the presence of "domestic" or "utilitarian" ceramics has been heavily criticized with good reason (Brady et al. 1992; Brady and Peterson 2008). These terms generally refer to nothing beyond the fact that the ceramic is unslipped or monochrome slipped so their actual function is not in fact known. It has been

shown that the unslipped and monochrome slipped ceramic at Naj Tunich frequently show signs of fire blackening on the vessel interior related to the burning of copal incense, most likely during rituals (Brady 1989:212-213).

The forgoing discussion focuses on specific issues because they were raised by Healy as evidence for habitation. On a higher level, however, the discussion illustrates Kuhn's point that competing paradigms are incommensurable or irreconcilable because they lack mutually accepted standards of verification. The older approach accepts the existence of utilitarian artifacts whose function is inherent in the object and the presence of such artifacts is then used to determine the function of a site or activity area. The cave paradigm rejects the notion of artifacts having inherent function. Hayden and Cannon (1984:96) note that in living societies "artifacts rarely function in the utilitarian, social, or ideological domain to the exclusion of the others" so function is contingent on context. Therefore, critiques that point to a particular type of artifact or deposit as being proof of habitation simply fall short of the complex argument required by the cave paradigm to demonstrate such a function. There is an epistemological difference at the most fundamental level that impacts not simply the meaning of a particular unit (artifacts) but also how that meaning can be employed in constructing acceptable explanations.

Since the issue of cave habitation has been raised, perhaps it needs to be considered. We would point out that no one asserting cave habitation has considered the larger theoretical implications of such a practice. Who were the people living in caves? Proponents of the habitation model have not discussed the social status of those living in caves. Were they landless peasants? Considering the large quantities of valuables (jade, pyrite, polychrome vessels, finely worked lanceolate blades and hachas of fine-grained stone) recovered from the caves at Dos Pilas (Brady 2005b), this seems unlikely. Could they have been elites? This appears equally unlikely given the large number of palaces at Dos Pilas.

Furthermore, all the archaeological cave surveys that have been conducted have located many more caves than could be studied. If, as the model proposes, every cave containing charcoal or grinding stones is considered habitational, then a sizeable class of cave dwellers would have existed. What were the social relationships between cave dwellers and surface dwellers? How did a habitational function articulate with a ritual function? One of the reasons that cave habitation remains a viable proposition among critics, in our opinion, is precisely because archaeologists have not seriously considered the implications of habitation.

#### Caves in Indigenous Ideology

A second distinctive element of the Mesoamerican Cave Paradigm is its extensive and unapologetic use of ethnographic and ethnohistoric analogy to create emic models of the meaning and, to a lesser extent, the function of caves (Brady and Prufer 2005c). At the lowest level, ethnographic analogy has been used to redefine the very scope of the field in adopting an emic definition of "cave." It appears that early

in the Foundation Period, the concept of “cave” was left largely undefined. Bonor Villarejo (1989b:19) simply calls them subterranean spaces while Brady and Veni (1992:149) point out the geological definition of caves as “Humanly accessible natural cavities in the earth.” An explicitly emic definition of caves is proposed in Brady’s (1989:1) dissertation but this element only appears to be adopted at the end of the Foundation Period when it appears in a more widely distributed work. For the field:

*Cave* is being used here in the sense of the Maya word *č’en* which means a hole or a cavity that penetrates the earth. As such it includes caves, grottoes, cenotes, sinkholes, many springs, places where rivers emerge from or disappear into the earth, crevices, and any number of other holes (Laughlin 1975:132). At times rockshelters will be treated as a *č’en* and be used ritually while other times not. While this definition is not nicely bounded, it reflects both the nature of human categories and the ambiguity often encountered in the field (Brady 1997b:603).

The use of an emic definition of caves appears to have been generally accepted in cave archaeology and has been explicitly acknowledged (Rissolo 2003:20-21; Ishihara 2007:27-28) and elaborated on (Scott and Maxwell 2008; Chavez and Landeros 2009) in subsequent work. The issue appears to have been settled by David Stuart’s decipherment of the “*ch’een*,” (cave) glyph in ancient Maya inscriptions (Vogt and Stuart 2005, see also Helmke 2009: 536-600).

On a higher level, the Mesoamerican Cave Paradigm has created a model of the meaning of caves in indigenous cosmology and how this meaning was related to cave’s function in the society. It is interesting that Thompson (1959, 1975) does not discuss the meaning of caves to either the ancient or modern Maya and does not address the social significance of caves in ancient society. Heyden (1973, 1975, 1981) attempts to do this in her analysis of the cave beneath the Pyramid of the Sun at Teotihuacan but her discussion is focused specifically on one particular cave so she does not produce a generally applicable regional or cultural model. Responding to the lack of a conceptual framework for interpreting Maya caves, Barbara MacLeod and Dennis Puleston (1979) proposed that caves were associated with the underworld, a view constructed from the *Popol Vuh* as well as from Lacandon ethnography. In the *Popol Vuh*, the underworld is portrayed as a place full of dangers and presided over by the malevolent underworld deities. The attribution received wide acceptance and was applied with little question for the next 20 years (Bassie-Sweet 1991; Brady and Stone 1986).

The first critique of the underworld model came at the 1997 SAA meetings in Nashville that marked the beginning of Recent Period (Brady 1997a). Reservations about the idea came from ethnographies where many of the properties, such as rain, attributed by MacLeod and Puleston to the underworld were associated with *Earth* in indigenous

thought. The modeling of actual cave use after a mythical event in a place that was not explicitly identified as a cave was also heavily criticized. Scott (2009) notes that during invocations, Kaqchikel *ajq’ijob* frequently use the paired couplet, “*ruk’u’x Kaj, ruk’u’x Ulew*” (“heart of sky, heart of earth”) while references to underworld are notable by their absence. The underworld model was replaced among cave archaeologists by the association of caves with the concept of a sacred, animate *Earth*, an idea more solidly grounded in ethnographic evidence in terms of the modern Maya beliefs (Brady and Prufer 2005c; Scott 2009; Vogt and Stuart 2005).

The association of caves with the sacred *Earth* has led to the development of additional connections that provide a multifaceted model of areas where caves might be expected to have been important. At the highest level, caves are associated with the actual creation of the universe since celestial bodies such as the sun and the moon emerged and rise from and set into caves (Brady and Prufer 2005c:371; Duby and Bloom 1969:292; Garza 2009:49; Villa Rojas 1945:156). Likewise, human creation is also associated with caves. Many Maya today still believe that their community’s founding couple (*Jich Mi* and *Jich Mam* in Jakalteko myth) originated in the cave or still live in one. This thereby establishes the cave as a symbol of group identity (Brady and Delgado 2009; Casaverde 1974; LaFarge 1947; Vogt and Stuart 2005:164). These myths and continued ancestor veneration at caves often forms the basis for a group’s claim to rights and access to land (Garza 2009:53). The idea of caves being a source of fertility is emphasized with the belief that clouds and rain are believed to originate from caves (Vogt 1969:387; Vogt and Stuart 2005:177). Both ethnographic and ethnohistoric accounts document the importance of rain rituals and agricultural rituals performed in caves. Recent ethnographic research has even shown that caves are seen as living and breathing entities (Garza 2003). While others have noted that caves are associated with the place of creation (Heyden 1987), the Mesoamerican Cave Paradigm has recognized this as a singularly important fact. Although the significance of the act of creation has been recognized in other fields dealing with religion (Eliade 1959:80-81), it has largely been unappreciated in Maya archaeology.

#### Caves Played a Significant Role in Pre-Columbian Society

J. Eric Thompson was well known for integrating ethnographic and ethnohistoric data into his discussion of the ancient Maya and Doris Heyden relied heavily on both as well. Therefore, it was not the lack of an indigenous view per se that was the critical element missing in the formulation of the social significance of caves. Instead, it appears that it was Thompson’s inability to grasp the social significance of caves and Heyden’s failure to generalize her findings beyond the one cave at Teotihuacan that prevented them from fully accepting the importance of caves in the indigenous view, a perspective eventually developed by Brady (1997b). Brady explicitly notes that the issue of social importance is at the

heart of the new paradigm:

At its very simplest, it [the Mesoamerican Cave Paradigm] maintains that caves and earth openings were so fundamental to the religious concerns of indigenous populations that their presence in the landscape structured human activity, including settlement, around them... While the implications of this statement could keep us here for hours, it is precisely this insight that has driven Maya cave archaeology for the last two decades (Brady 2007).

The pre-paradigmatic view of caves as unimportant has its historical roots in several sources. First, because of the view of caves as habitation sites, they could have been theoretically important only if they had yielded evidence of Pleistocene occupation. When Mercer and others failed to find deposits predating the Preclassic, interest waned. Cave habitation in this view could be little more than a minor component of the larger settlement system, probably housing the lowest strata of Mesoamerican society. At a time when excavation focused almost exclusively on elite centers, there was little interest in studying such commoners.

Second, while surface archaeology focused on the largest centers with their monumental pyramids and elite palaces, the caves that were explored tended to be modest both in size and artifact assemblages. This skewed the appreciation of the relative importance of the surface and subterranean contexts. Interestingly, three important caves, Loltun, the High Priest's Grave at Chichen Itza and Quen Santo Cave 3, were investigated during the Early Period and they play a prominent role in J. Eric Thompson's syntheses. It is interesting to speculate how Thompson's work might have been impacted if more great caves had been known. Along the same line, if Edward Thompson's (1938) report on the High Priest's Grave had been published promptly, it might have changed Selser's interpretation of Quen Santo (Selser 1901; Brady 2009).

Once the conviction that caves were not significant was established, it became self reinforcing. The Carnegie Institution of Washington visited a great cave in Alta Verapaz, Guatemala, Seamay Cave, which has a long stairway and retaining walls (Gurnee 1965; Gurney et al. 1968), but failed to publish any mention of it. As a result no great caves are reported until after World War II to challenge the view of caves as being unimportant. The discovery of Balankanche in 1959 did impact the field because the material was spectacular and the ceremonial function of the cave was never seriously questioned. Even more important was the discovery of the cave beneath the Pyramid of the Sun at Teotihuacan in part because Heyden's (1973, 1975, 1981) interpretation did argue for the high social significance of the cave.

The role of these great discoveries is best exemplified by Naj Tunich (Stuart 1981), which was reported at the beginning of the Foundation Period. To this day, the site contains the greatest amount of architectural modification, the first masonry tombs ever documented in a Maya cave and the

largest corpus of hieroglyphic inscriptions known from a cave (Brady and Stone 1986; Stone 1995). The first publication on Naj Tunich stressed the extraordinary nature of the site. Based on the labor and resources needed for construction and the belief that the inscriptions were painted by a scribal elite, Brady and Stone (1986) propose direct elite involvement with, and utilization of, the site. This was a novel idea at the time. Some archaeologists, while accepting the ritual use of caves, saw that utilization being restricted to peasants, much as it is today. That view marginalized caves as features outside of elite concerns and the "great tradition" in Maya history. It was the investigation of Naj Tunich that led directly to the formulation of caves being important and this element of the paradigm appears to have been the first to be adopted.

The other archaeological data that contributed to the realization that caves were features of central social importance in Mesoamerica was the appropriation of resources for construction of pyramids and temples over caves. This is interesting because it is precisely the material that both Thompson and Heyden had earlier discussed. J. Eric Thompson was aware of this because he had come upon Edward Thompson's manuscript on the "High Priest's Grave" at Chichen Itza and had edited it for publication (Thompson 1938). In his first synthesis of the cave data, J. Eric Thompson (1959: 128) says, "Mention should be made of caverns beneath buildings, notably the High Priest's Grave at Chichen Itza, but discussion of them would vastly extend our subject." Thompson appears to suggest that there were quite a number of examples but never interprets these and by the time of his second synthesis has concluded that they are not important (Brady 2005a:f11-12). In her first two articles on the cave beneath the Pyramid of the Sun at Teotihuacan, Heyden (1973, 1975) was unaware of Thompson's discovery at Chichen Itza. When she does learn of it, she clearly misses the point in stating, "This of course, presupposes a cave per structure, which is doubtful" (Heyden 1981: 14).

Brady combined the High Priest's Grave at Chichen Itza and the cave beneath the Pyramid of the Sun at Teotihuacan with additional examples from both Central Mexico and the Maya to propose that caves were regularly used to validate settlement space in Mesoamerica (Brady 1989:64-71). This idea was then tested in the field on the Petexbatun Regional Archaeological Project and documentation of a close relationship between caves and architecture was first presented at the International Congress of Americanists, a document widely circulated among cave archaeologists during the Foundation Period (Brady 1991). Elaborated discussions of these correlations were then published at the beginning of the Recent Period (Brady 1997b; Brady and Ashmore 1999; Brady et al. 1997).

#### Cave Archaeology Can Address Wider Theoretical Issues

For her paper on the development of cave archaeology from the end of the Post War Period, Scott (2004) interviewed a number of senior scholars, one of whom noted, "[Caves] seemed to call for very large investments of effort, planning,



etc. for relatively small scientific returns. It seems to me to be a rather limited field and one which produces information and interpretation which are difficult to integrate with the mainstream data produced by site and regional projects.” This quote touches on a central problem of pre-paradigmatic cave studies that is related to Hammond’s (1981:177) observation, quoted earlier, that archaeology at the end of the Post War Period did not know how caves had been used. At the heart of the issue were the lack of any theoretical approach and the dearth of even basic research questions (Brady 1989:6-9).

Brady attributes this to the absence of individuals specializing in caves, which seriously impacted cave scholarship. He notes that:

although a large corpus of published cave material exists, there is little dialog with these data. As a consequence, later works do not build on the foundation laid by earlier studies and so reports rarely rise above the level of elementary data presentation. . . . Lacking such fundamental building blocks, it is not surprising that archaeologists have struggled with larger questions of interpretation (Brady 1996:ii).

Cave archaeologists working during the Foundation Period responded to this need with the production of works that were clearly synthetic in nature and provided the building blocks for interpretation (Bonor 1989b; Brady 1989; Stone 1995).

The problem of relating cave data to surface archaeology was resolved to a great extent by the advent of cave surveys conducted in conjunction with large surface projects. Hammond (1982:177) had stated that “caves must clearly be considered part of the same settlement system as open residential and ceremonial sites that their users also frequented” but no attempt had been made to that point to systematically document them. The first systematic archaeological cave survey was Juan Luis Bonor’s under-funded study conducted in conjunction with the Oxkintok Project (Bonor 1987a, 1987b, 1988, 1989a). Bonor (1989a:303) documented 40 caves in the area, which clearly pointed to a richer, more varied, and more complex pattern of utilization than had been heretofore considered.

The cave survey in its current form can be traced back to the Petexbatun Regional Cave Project in the early 1990s (Brady 1997b; Brady et al. 1997). The project was also influential because it used an explicit landscape approach. The Petexbatun Project’s methodological approach was employed in later cave investigations. These included cave surveys associated with the Yalahau Project (Rissolo 2003), the Maya Mountains Archaeological Project (Prufer 2002), the Xibun Archaeological Research Project (Peterson 2006), and the Cancuen Project (Spenard 2006; Woodfill 2010). Even projects focused on single cave features (Moyes 2006; Ishihara 2007) utilized the landscape approach leading Smith and Schreiber (2006:19) to observe that:

For the Classic Maya, studies of sacred landscapes are dominated by research on caves. Caves were important cosmological features in all Mesoamerican societies, and the karst landforms of much of the Maya area are riddled with caves containing offerings, burials, and other material remains of ritual activity (Bassie-Sweet 1996; Brady 1997; Brady and Prufer 1999; Dixon et al. 1998; Stone 1995). In contrast to the empirically grounded cave research, other work on Classic Maya sacred landscapes is highly speculative in nature (e.g., Koontz et al. 2001; Stone 1992, 2002).

Another factor in cave archaeology’s drive to address larger issues has been the changing appreciation of the importance of religion in complex society. Prufer and Brady (2005b) have noted how religion was largely marginalized by early processual archaeology in which important religious functions in the political or economic spheres were simply treated as aspects of the political or economic systems (e.g. Price 1974). The landscape approach focused attention on the political appropriation of sacred landscape and, more specifically, of sacred landmarks (Brady 1997b, Brady et al. 1997; Ishihara 2007, Mirro 2007; Peterson 2006; Prufer 2002; Rissolo 2003). Moyes (2006) in her detailed study of Chechem Ha relates alternating periods of use and abandonment to political issues and sees the Terminal Classic use being related to drought (Moyes et al. 2009). A number of authors have also used cave data to address wider local and regional economic issues (Brady 2005b; Morehart and Butler 2010; Spenard 2006; Woodfill 2010).

Buttressing the idea that caves were fundamentally important, recent archaeological and epigraphic data suggest that caves were desecrated after military defeats (Brady and Colas 2005; Helmke and Brady 2009). Helmke (2009: 76-193) scoured the epigraphic corpus for references to caves and their usage to outline the emic importance of caves in the Classic period (A.D. 376-849). In so doing he found that the surprising majority of caves are involved in martial actions, whereas texts citing caves as places witnessed (as part of pilgrimages), or as the loci royal inhumations, calendrical rituals and accession rites are noticeably rare (Helmke 2009; Helmke and Brady 2009). At present we have to offer the caveat that the texts do not provide as comprehensive and unbiased a record as that afforded by the material culture recovered by archaeologist. Furthermore the texts may not record all of the different uses to which caves were put, but what the texts do demonstrate is that caves did play a significant role in antiquity and that these hosted a series of significant activities that might not have been reconstructible by archaeological methods alone.

### Discussion and Conclusions

Applying Kuhn’s (1962: 23; 1996:175) definitions, it appears that the Mesoamerican Cave Paradigm does fulfill the criteria for being considered a paradigm in the sense an “accepted model” or “constellation of beliefs, values and techniques shared by the members of a given community.”

Having accepted its existence, we have sought to define the paradigm around four propositions (1. caves were used primarily for ritual; 2. they must be understood from an indigenous perspective; 3. they played a significant role in Pre-Columbian society, and 4. caves allow archaeologists to address wider theoretical issues) to provide, in Geertz's (1973: 90) terms, "an effective way of developing and controlling a novel line of inquiry" about caves.

Our discussion of the four propositions shows that all four were established during the Foundation Period, with the first and the third growing out of Brady's investigations of Naj Tunich in 1981 and 1982 at the beginning of the era. Aspects of the second proposition were also in place during the Foundation Period, although the replacement of the underworld cave model with that of the animate earth model appears only at the beginning of the Recent Period. Finally, the fourth proposition is established during the Foundation Period with the completion of the Oxkintok and Dos Pilas cave surveys and the beginning of ones on the Yalahau and Maya Mountains Projects.

As noted at the beginning of the paper, the Mesoamerican Cave Paradigm was recognized by a Southwesternist, rather than by Mesoamericanists who actually developed and used it. In fact, there has not been, until this paper, a discussion in print of the paradigm or what constitutes it. Scott (2007) in analyzing the importance of the cave session at the 1997 SAA meetings in Nashville for the emergence of a self-conscious field notes that it engendered an almost unbroken string of annual SAA sessions. These sessions, and the social gatherings that followed them, served the important function of enculturating members into the evolving paradigm. It is hoped that this explicit formulation of the propositions constituting the paradigm will lead to further discussion and refinement of the concepts.

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## 3

## Cueva del Sapo: A GIS Spatial Analysis of Surface Remains in a Classic Ritual Cave of Western Chiapas, Mexico

Davide Domenici and Cristina Pongetti

### Introduction

Since 1997, the Río La Venta Archaeological Project has been studying the Pre-Hispanic occupation of the Selva El Ocote, in the heart of the Zoque-speaking region on the Western edge of the Chiapas Central Depression (Figure 1)<sup>1</sup>. The Project's research has focused on human colonization of the area, as witnessed by various surface sites ranging from rural hamlets to relatively large monumental sites, as well as upon the long tradition of ritual use of caves in the highly karstified landscape of El Ocote, crosscut by the 500 meter-deep and 84 kilometer-long canyon of the middle La Venta river.

The general results of our surveys, carried out in close collaboration with the speleologists of the Italian La Venta Exploring Team, have already been synthesized (Domenici 2006, 2008a, 2009; Domenici and Lee 2004, 2009). The Project discovered more than sixty caves with surface archaeological remains (Figure 2), three of which have been partially excavated (Cueva del Lazo, Cueva del Camino Infinito and Cueva El Castillo). The collected data allowed us to sketch some general traits of a long hypogean ritual tradition that started at least in Late Preclassic times – as

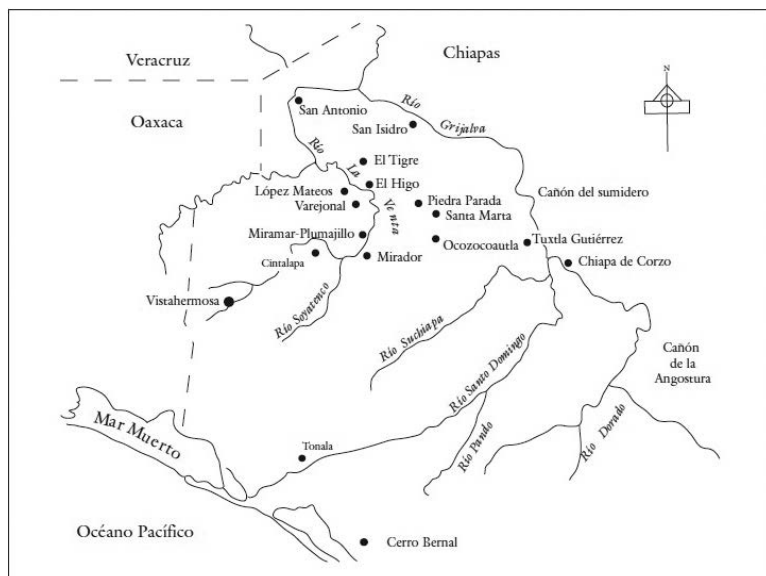
shown by the well-known context of the Cueva de la Media Luna (Lee 1969) – and which lasted until Late Postclassic and even Colonial and modern times (Domenici 2008b, 2010a, 2010b).

### Ritual Use of Caves in Selva El Ocote: Chronology and General Characteristics

To date, the Cueva de la Media Luna offering of 519 Late Preclassic (Guañoma phase, ca. 300-1 B.C.) stacked bowls is the oldest example of a ritual pattern that became widespread during the Early Classic, when massive offerings, mainly composed of large numbers of differentially fired black ware bowls, were deposited in caves of the El Ocote area, as well as in other regions of Western Chiapas such as the *meseta* of Ocuilapa, the San Fernando area (Merino and Náfate 2005) and the Ocozocoautla area (Acosta Ochoa and Méndez Torres 2007: 6)<sup>2</sup>. During the Late Preclassic and Early Classic periods, the El Ocote area was almost completely uninhabited, and, therefore, the offerings must have been deposited by people from the neighboring areas of the Ocozocoautla and Jiquipilas valleys, where important sites such as Mirador, Piedra Parada and Cerro Ombligo were flourishing (cfr. Agrinier 1970, 1975, 1990, 1992; Ekholm 1984, López Jimenez and Esponda Jimeno 1999).

Various examples of massive offerings in caves on the western margin of the La Venta canyon have been described and illustrated by Matthew Stirling (1945, 1947; Paillés 1989)

**Figure 1.** Map of Western Chiapas with main archaeological sites and modern towns (D. Domenici).



<sup>1</sup> The Río La Venta Archaeological project, directed by Thomas A. Lee and Davide Domenici from 1999 to 2010, was organized by the University of Bologna (Italy), the Universidad de Ciencias y Artes de Chiapas (Mexico), and the La Venta Exploring Team (Italy). Since 2002, the Project has been partly financed by the Italian Ministero degli Affari Esteri.

<sup>2</sup> Big stacks of pottery are also common in areas as Oaxaca (cfr. Fitzimmons 2005: 99).

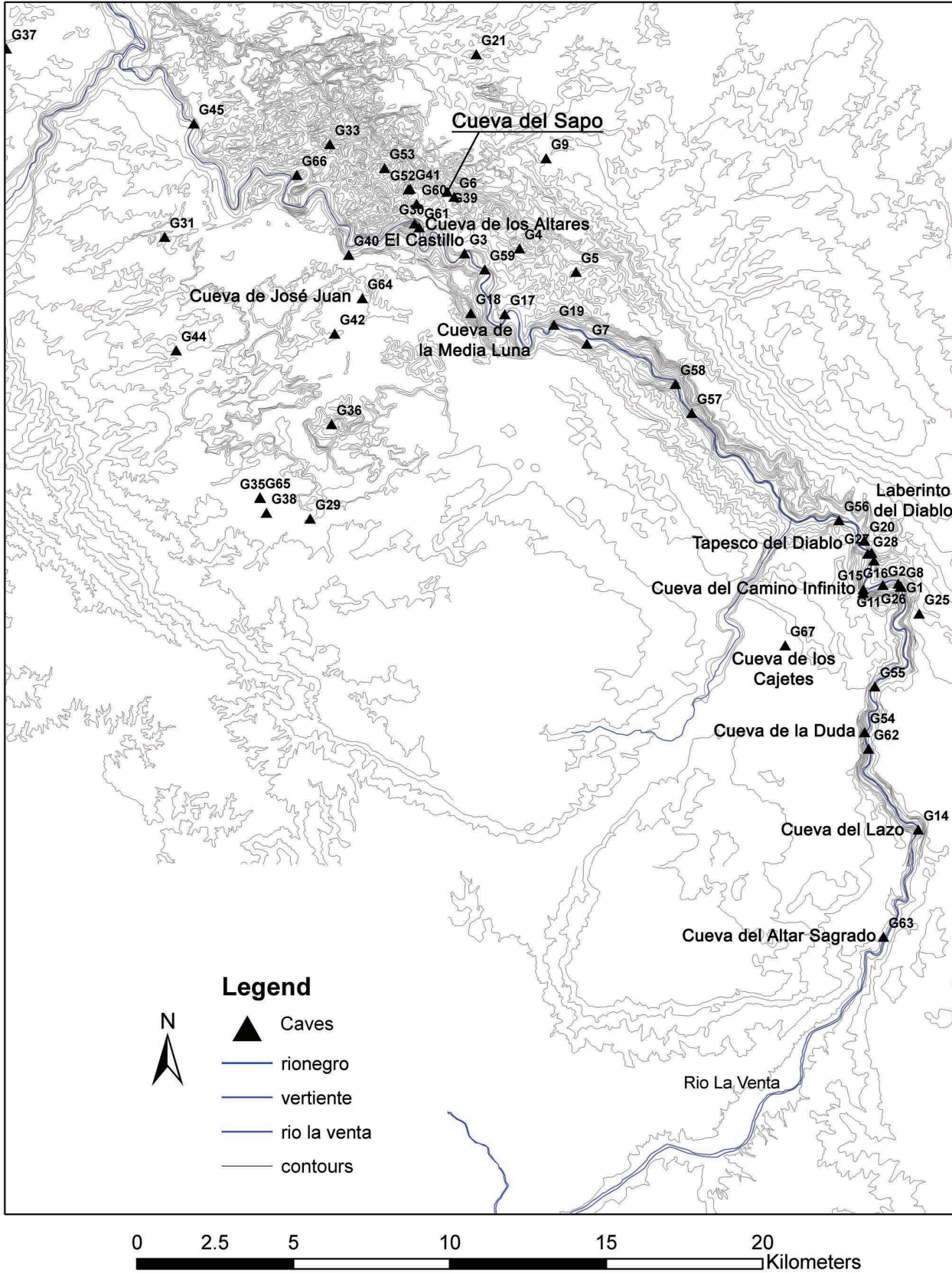


Figure 2. Map of the Rio La Venta region with location of archaeological caves. Full names of main archaeological caves mentioned in the text are given (N. Maestri).



and Frederick Peterson (1961a, 1961b), the Cueva de los Cajetes (Paillés 1989: 10-13; Peterson 1961a: 55-56) and the Cueva del Carrizal (Paillés 1989: 24-27) being the best-known examples. Numerous other massive Early Classic offerings have been discovered by our project in caves such as Cueva de José Juan, Laberinto del Diablo, Cueva de la Sorpresa, Cueva de los Trastes, and Cueva del Sapó, as we will see in detail. All of these contexts share some general characteristics: the caves, located atop the *meseta*-like area on the canyon's sides or at the bottom of the canyon cliffs, are often active, or "wet", and easily reachable by walking in the jungle or along the river bed. Groups of black or smudged bowls and dishes, varying from a few items to several hundreds<sup>3</sup>, are deposited near salient speleothems such as alcoves, stalagmites, columns, flowstones, or fallen blocks. A single cave can host one or more offering areas, usually containing pottery from various Early Classic phases, often with later (even modern) additions; masonry walls with doorways sometimes divide the underground space into various rooms<sup>4</sup>; bowls can be individually deposited on the ground but they are often grouped in stacks of similar or identical specimens. In addition to the common black or smudged bowls, massive offerings often contain smudged black tripods, censers and small hemispherical coarse-paste bowls usually containing traces of carbonized material, probably *copal*<sup>5</sup>. In some instances, bowls may have contained offerings of food, as shown by chemical analysis conducted by Guillermo Acosta Ochoa, who identified traces of *Dioscorea* pollen in bowls from caves of the Ocozocoautla region (Acosta Ochoa 2010). In other cases, empty bowls were placed directly under water drippings that have since enclosed them in a calcite matrix.

A few Early Classic caves stand apart from the general pattern discussed above. The previously mentioned Cueva de la Media Luna context, for example, is unique not only for the presence of a stepped, plastered, and painted platform, but also for including additional offerings such as lip-to-lip caches. It is still not clear if this difference should be attributed to chronological factors (Cueva de la Media Luna is the only Late Preclassic hypogean archaeological context known in the El Ocote area) or to a more specialized ritual function of the big rock shelter. Another unique case is Cueva del Altar Sagrado, which is also positioned at the base of the canyon cliff: the whole floor of the cave was stepped and finely plastered, while its front was enclosed by an *adobe* wall with a single access. On top of the front wall stood a complex triangular-like element, resembling in some way the Mesoamerican year sign. The cave was discovered, intact, by the local Topos Speleological Association; unfortunately, before our first planned visit, looters sacked the cave shattering its outstanding architectural features. A third unusual Early Classic archaeological context is Cueva de las Calaveras, where the floor of the deeper room is literally covered by the skeletal remains of at least twenty individuals, suggesting a use of the cave as an ossuary or collective funerary precinct<sup>6</sup>. A last Early Classic ritual context worth mentioning is the El Carpintero offering area. It consists

of a natural limestone outcrop at the summit of one of the highest mountain peaks of El Ocote, where a large number of broken offering vessels (both Early and Late Classic) were found. Apparently, the rocky outcrop served the same function as prominent speleothems in caves, thus confirming James Brady's statement that "cave and mountain can be united in a single symbol and [...] the most sacred locations are those that combine the fundamental elements of earth and water in a unified sacred expression of the power of the earth" (Brady 1997: 603); Selva El Ocote, with its maze of caves and mountains, must have appeared to the Zoque as just such a sacred place.

The transition from Early to Late Classic in El Ocote was marked by the first colonization of the area, as reflected by a florescence of stone-masonry architecture and the widespread diffusion of Fine Orange pottery that suddenly replaced the old Olmec-derived black ware tradition, suggesting that the Gulf Coast continued to represent the area of major cultural interaction for the Chiapas Zoquean population; after the abandonment of the area at the end of the Terminal Classic Period, a second colonization wave occurred in Postclassic times. Ritual use of caves continued throughout the whole sequence, apparently reaching its peak during the Late Classic and decreasing in later phases<sup>7</sup>. The occupation of the previously uninhabited area caused a radical change in the

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3 Among the richest massive offerings, we can mention the Cueva de las Ollas (San Fernando, Chiapas), containing between 900 and 1500 dishes (Merinos and Náfate 2005: 104), and the Cueva de los Cajetes where, according to F. Peterson, there were "thousands" of vessels, today reduced to a thick layer of sherds.

4 The most important evidence of underground masonry structures comes also from Cueva de los Cajetes, where they created three different rooms; many other smaller walls had been identified in El Ocote caves, often breaking off a gallery into different sections. See Brady, Scott, Cobb *et al.* 1997: 360 for references to architectural modifications of caves in the Maya area.

5 In El Ocote we never found any shoe-pot vessels, very common in caves of the Maya area during the Early Classic (Brady 1989: 238); their presence has, however, been reported by speleologists working in the Selva del Mercadito, relatively close by.

6 Another cave containing a similar assemblage of human bones has been recently reported by speleologists working in the same area. See Thompson 1975: xxxi-xxxii, and Scott and Brady 2005: 271-273 for data concerning caves used as ossuaries.

7 The reassessment of the local ceramic sequence resulting from our excavations in El Higo monumental site considerably changed our view of Postclassic typologies, showing a strong and unexpected continuity with Late Classic ones. Although our cave surveys had been mainly realized before the reassessment of the ceramic sequence (and thus being probably affected by some dating error), we still think that Late Classic (the phase with the densest human occupation of the area) was a major period of ritual cave use in El Ocote, followed by a much less widespread and still poorly understood use in Postclassic times.

preferential location of ritual caves. Since the Late Classic, in fact, Zoquean peoples of El Ocote began to use caves located on the canyon cliffs, only reachable by climbing or walking along the narrow ledges that run along the canyon's walls, as attested by a host of archaeological evidence such as low sidewalls and rock paintings. Apparently, this new preferential location of hypogean ritual precincts in far and difficult to reach places was aimed at maintaining the required spatial, functional and symbolical distance between residential areas and ritual spaces.

Late-Terminal Classic archaeological evidence shows a much more varied set of cave rituals when compared to Early Classic ones, making a broad depiction of Late Classic cave contexts much more difficult to sketch in the limited space of this article. Caves such as El Tapesco del Diablo (Linares Villanueva 1998; Silva Rhoads and Linares Villanueva 1993; Linares Villanueva and Silva Rhoads 2001), Camino Infinito, Cueva de los Altares, or Cueva del Lazo (Domenici 2010a) are good examples of the richness of Late Classic cave contexts in the area. In general terms, there was an apparent preference for dry caves, where pottery offerings, mainly represented by Fine Orange bowls and plates of the local Mechung phase (700-900 A.D.) and in most cases less massive than Early Classic ones<sup>8</sup>, continued to be deposited near salient speleothems. Overall, cave assemblages became much richer than before, often containing precious items such as *tecali* vessels, jades, and a vast array of artifacts including mirrors, weaving implements, and many perishable artifacts, whose preservation was favored by the dry climate of the caves. An element worth noting here is the presence of rock paintings, sometimes associated with caves and cliff ledges containing Late Classic archaeological evidences. Moreover, there was an obvious increase in burial contexts, probably better described as "special mortuary deposits", as showed by the extraordinary Cueva del Lazo assemblage where eleven infant burials were discovered together with a vast array of perishable materials such as textiles and foodstuffs that allowed the interpretation of the context as a possible sacrificial deposit, as discussed in detail elsewhere (Domenici n.d.).

For different reasons, it is quite difficult to comment on purely Postclassic ritual contexts. Some of the aforementioned Late-Terminal Classic contexts in El Ocote (Cueva El Castillo, Cueva del Lazo, Camino Infinito) seem to include a later facet that, despite strong cultural continuity with preceding materials, could well correspond to Postclassic times. Stylistic elements and the recurrent association with diagnostic pottery suggest that the array of stylized and schematic rock paintings on the canyon cliffs could date

to the Late Postclassic. We argue that a shift in prevailing ritual practices may have been differentially reflected in the archaeological record, with rock paintings becoming the dominant trait of pure Late Postclassic ritual contexts.

### Interpreting Ancient Hypogean Rituals

As Andrea Stone (2005a: 249) stated, "cave artifact assemblages are the end products of a sequence of human actions that encompasses caves and the larger landscape." These sequences of human actions, given their ritual character aimed at communication with the supernatural realm, can be seen as "discourses" (López Luján 1993: 52-55) whose elements have a specific semantic (i.e. symbolic) value and are articulated by a specific syntactical (i.e. structural) relationship. Obviously, not every ritual act leaves a recognizable trace in the archaeological record. Not only are words, prayers, chants, dances, etc., forever lost to us (with the significant exception of epigraphically recorded words), but acts utilizing perishables are generally invisible to the archaeologist's eye, often limited to seeing non-perishable traces (again, with the significant exception of dry caves such as Cueva del Lazo). This led Andrea Stone (2005b:135) to state that archaeological remains reflect non-specific patterns of ritual behavior so that we can only have "the vaguest notion of the specialized rituals."

In terms of non-specific ritual behaviors, it is evident that the *ritual form* most commonly reflected in the El Ocote underground archaeological contexts is the *oblation* or offering of various kinds of items, such as ceramics, food, speleothems, copal, tobacco, children, etc. Many of the items found in cave offering areas, in remarkable accord with Early Colonial descriptions of ceremonies related with Earth and Rain gods, seem to pertain to a relatively homogeneous water/fertility-related semantic sphere expressed by such concepts as "new", "green", "unripe", "fresh" or "cold".

From a syntactical perspective, Classic offering areas, often massive in scale, seem to be the product of the repeated deposition of objects in specific loci of ritual activity distributed along the underground landscape, often adding new items to previous, often centuries-old, offerings. The "paratactical" structure of offering events repeated along broad expanses of time suggests that they were probably following a cyclical, calendar-related, pattern, similar to the one reported both in colonial documents and ethnographic reports. The massive scale of the offerings as well as the existence of huge masonry structures that required corporate labor investments in caves such as Cueva de la Media Luna, Cueva de los Cajetes or Cueva del Altar Sagrado suggest that most Late Preclassic-Early Classic ceremonies may have been community-, lineage- or house-based activities, probably involving numerous people and possibly sponsored by important neighboring political entities<sup>9</sup>.

The usual distribution of various offering areas along cave galleries suggests the existence of ritual pathways (cfr. Moyes 2005) that reflect a linear and sequential structure clearly mirrored in some Colonial description of hypogean rituals (Aramoni Calderón 1992; Domenici 2008b). Inner walls, lintels and other artificial features sometimes appear

<sup>8</sup> The only instance of Late Classic massive offering was located in Cueva Colmena, where Lee identified "hundreds of coarse paste bowls" (Lee 1969).

<sup>9</sup> Cfr. Fitzimmons 2005: 112 for a similar interpretation of Blade Cave, Oaxaca, and Brady 2000a: 135 for a similar suggestion regarding Cueva de las Pinturas and for a general discussion of the political appropriation of the sacred landscape.

to break the cave galleries into sections divided by ritual thresholds<sup>10</sup>. Predictably, the main threshold is usually the cave entrance, marked by offering areas (Cueva de los Altares), hand prints and other rock paintings (Cueva de la Duda, Cueva del Lazo) or food preparation areas (Cueva de la Sorpresa). Again, the emphasis on this important threshold is reflected in Colonial accounts where the cave entrance is described as the meeting place with the *nahuales* (Domenici 2008b).

If the above-mentioned linear-sequential ordering of ritual activity areas is evident *inside* the caves, we can suppose that a similar pattern also guided the movements preceding the entrance to the underground space. In Late Preclassic-Early Classic times, El Ocote was a no man's land crossed by people coming from neighboring areas. These people would have covered many kilometers across the hard karstic terrain of the jungle or along the riverbed in the canyon, walking along routes that were probably part of wider, pilgrimage-like circuits, implied not only by the spatial arrangement of archaeological remains, but also by a wealth of ethnographic data from all over Mesoamerica (cfr. Adams and Brady 2005: 311-312; Brady 1991; Brady 2000b; McAnany, Berry and Thomas 2003: 78; Moyes 2005; Prufer 2005: 199; Sandstrom 2005; Stone 2005a: 255-256). These pilgrimage-like circuits could have ranged from ample, collective enterprises to more secluded activities carried out by small parties, or even single individuals during vision quest-like experiences. Considering what we know about Mesoamerican ritual behaviors as described in historical sources, these kinds of "liminal" activities could well have been accompanied by specific conducts such as sexual abstinence and fasting<sup>11</sup>.

Unfortunately we do not have any direct archaeological evidence of these epigean ritual paths during Early Classic times, when jungle tracks and the river bed were probably followed by large numbers of people as part of communal rituals; on the contrary, clear evidence of them is available from the Late Classic onwards, when the colonization of El Ocote shifted the choice of caves used for ritual purposes primarily to those located in barely reachable places on the canyon cliffs, as witnessed by sidewalls and various archaeological evidence such as rock carvings, rock paintings and ceramic offerings that again seem to reflect a lineal-sequential pattern. This pattern could suggest an increasingly restricted access to the ritual caves, a trend that seems to have reached its peak during the Late Postclassic, with the predominance of schematic, non-iconic rock paintings and small stone precincts on high cliff ledges; ritual specialists may have used the cliff ledges during ritual circuits or seclusion periods that could well have included initiations, *nahual*-meeting and other healing rituals or visionary experiences<sup>12</sup>. If our hypothesis is correct, the range of ritual activities carried out in El Ocote seems to have progressively shifted from more public/political ceremonies to more private/sociomedical ones (cfr. Prufer 2005).

In light of the themes so far discussed, it is clear that in order to understand the structural scheme of ancient rituals, an analysis of the spatial distribution and chronological

composition of the various offering areas in a cave is of primary importance. In our research area, logistical and scientific reasons induced us to strictly limit excavations in caves, focusing on recording surface remains; moreover, in many cases the archaeological materials are simply deposited on the rocky floor of the cave, thus impeding stratigraphic excavations and making that even a simple surface collection would have resulted in the complete dismantling of the archaeological context. To preserve both the archaeological context and its intimate relationship with the underground natural environment (luckily protected in the El Ocote Biosphere Reserve), we thus preferred to devise an adequate methodology in order to obtain a detailed recording of surface remains and then proceed to a hopefully insightful spatial analysis. Due to the characteristics of its archaeological assemblage, Cueva del Sapo is the place we selected for a first application of our research strategy.

### Cueva del Sapo: Location and Description

Cueva del Sapo is located in the El Ocote jungle, on the North side of the Middle La Venta river, approximately 1.2 km from the canyon's rim. The cave, easily reachable by a long walk through the forest from both the valleys of Ocozacoautla and Jiquipilas, was first discovered in 2003 thanks to the information given by a local friend, and briefly described in our annual report (Domenici and Lee 2004). In 2004, while excavating the site of El Higo, we carried out the detailed mapping, photomapping, and description of the archaeological evidences of the cave<sup>13</sup>.

Access to the cave is provided by two contiguous accesses on its western side. The main access is a low opening 2.5 m wide, reaching a maximum height of approximately 0.8 m, while the secondary one is approximately 3 m wide, with a maximum height of 0.6 m. The limited height of the accesses, requiring crawling to get in, and the vegetation growing in front of them reduced their visibility and probably limited modern entries in the cave, thus reducing looting activities. Nevertheless, we found some discarded Early Classic bowls (almost intact or broken in two parts) immediately outside the access<sup>14</sup>, indicating that some looting had occurred before and, therefore, the offerings areas described hereafter were

<sup>10</sup> Walls, lintels and similar artificial elements in cave contexts are also quite common in the Maya area: see, for example, Stone 1997a: 203.

<sup>11</sup> Thompson (1970: 173; 1975: xxix) reports various examples of cave ceremonies marked by continence and fasting. See also Adams and Brady 2005: 309.

<sup>12</sup> For some data concerning visionary rituals in caves see MacLeod and Puleston 1979: 75-76; Brady 1989: 420-423, Prufer 2005.

<sup>13</sup> The 2004 work resulted in Cristina Pongetti's graduation thesis (Pongetti 2005).

<sup>14</sup> These bowls were the only specimen we collected in the site and are today housed in the storerooms of the Regional Museum in Tuxtla Gutiérrez.

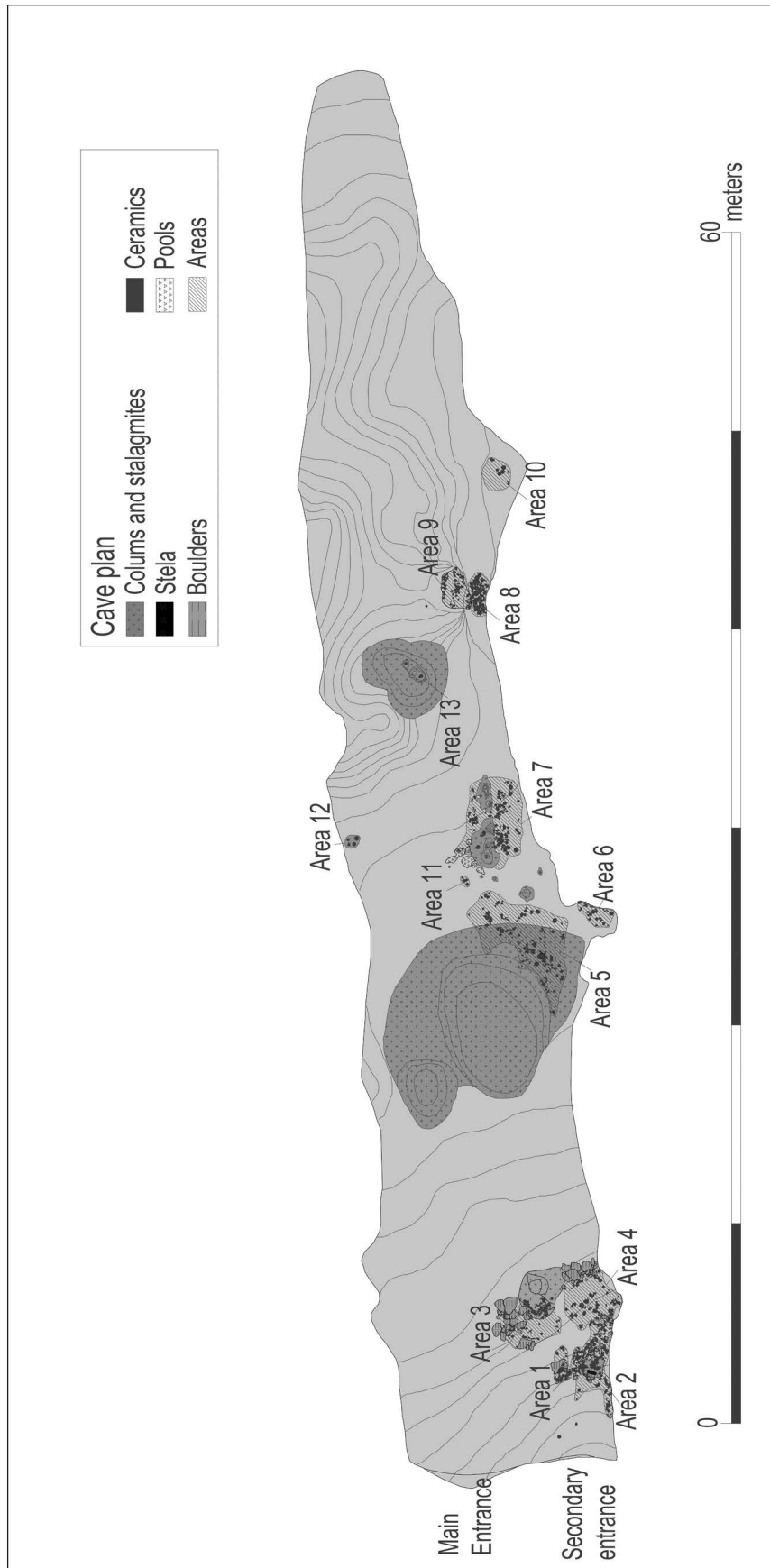


Figure 3. Map of Cueva del Sapo with numbered offering areas (C. Pongetti).



**Figure 4.** Offering Area 2 with plain limestone stela (D. Domenici).

Room 1. Four concentrations of pottery were defined in Room 1 and nine in Room 2; we provide here a brief description of each area.

*Area 1 (Room 1):* Concentration of fragments and three whole vessels around fallen rocky blocks, mainly on their western side. It is almost spatially connected with Area 2 and the two could also be considered as parts of a same area. Nevertheless, the association with the rocky blocks and a lower level of pottery breakage induced us to define it as a separate functional unit.

*Area 2 (Room 1):* Concentration of broken vessels around a roughly squared, plain limestone stela standing on a rocky step (Figure 4). The pottery fragments are scattered around the stela and along the nearby southern wall of the cave; a chunk of a broken speleothem, obviously

brought from a different part of the cave, is located amidst the ceramics.

*Area 3 (Room 1):* Concentration of small pottery fragments on the western side of the base of a small column and of a group of rocky blocks located on the northern side of the column.

*Area 4 (Room 1):* Concentration of pottery fragments located on the western side of a row of blocks that links the above-mentioned small column to the southern wall of the cave, thus “blocking” the passage between the two; nevertheless, the low height of the blocks makes the blockage easily passable by simple walking. Area 4 is spatially sequential with Area 2 and could be also considered as part of the same area; nevertheless, the chronological homogeneity of the materials in Area 4 (see below) led to its definition as a separate functional unit.

*Area 5 (Room 2):* Concentration of fragments and whole vessels on the eastern side of the base of the big column separating the two rooms (Figure 5).

*Area 6 (Room 2):* Small concentration of pottery fragments and whole vessels in a sort of niche in the southern wall of the cave; materials are mainly located at the base of a flowstone and some of them are completely encased in a calcite matrix.

*Area 7 (Room 2):* Concentration of whole vessels and fragments around two groups of aligned small stalagmites formed by a still active water dripping from a crack in the cave’s roof. Some whole vessels are completely encased in the calcite matrix formed by the dripping water (Figure 6) that also formed some small pools

not in pristine state when discovered.

The cave is a gallery over 70 m-long, oriented West-East (Figure 3). It reaches a maximum width of approximately 16 m, with the terminus narrowing to 4 m in width. The cave floor slopes from West to East with a total drop of approximately 4 m. The inner space of the cave is divided in two main rooms (Room 1 and Room 2) by a huge and imposing column with a diameter of approximately 7.5 m. The cave’s roof, almost one meter-high at entrance, rises to more than 5.5 meters in the area of the column, and then slopes downward again.

On the cave surface, pottery vessels and fragments of various periods are concentrated in specific areas (hereafter Area 1, 2, etc.), often concentrated near salient speleothems, flowstones, water drippings and a plain stela standing in



**Figure 5.** Offering Area 5 at the base of main column (D. Domenici).

**Figure 6.** Detail of offering Area 7 with bowl embedded in calcite matrix (D. Domenici).

of stagnant water.

**Area 8 (Room 2):** Group of whole and broken vessels on a small ledge along the southern wall of the cave (Figure 7). It is the major pottery concentration of the cave. Some of the pottery show traces of a red, post-firing pigment identified as hematite.

**Area 9 (Room 2):** Concentration of pottery fragments on the floor of a depression below the Area 8 ledge; the fragments are mainly located toward the walls of the crack and in its center, thus leaving two free “corridors” where one can walk without trampling on the pottery.

**Area 10 (Room 2):** Concentration of fragments and four whole vessels on a second ledge, four meters east from Area 8.

**Area 11 (Room 2):** Group of four whole vessels located between Areas 5 and 7.

**Area 12 (Room 2):** Group of four bowls located on a slim stalagmite in the eastern part of the cave (Figure 8).

**Area 13 (Room 2):** Group of four bowls located near the northern wall of the cave, north of Areas 7 and 11.

Two more vessels were isolated: a bowl in front of the secondary entrance and a small hemispherical bowl located inside a recess of the main column (Figure 9). It is worth noting that this last bowl is located in the very area of the column that, when hit with a hand, produces a low sound whose resonance in the cave is quite impressive.

### Methodology

The entire Cueva del Sapo – including its walls and roof – was mapped with a Total Station, while the concentrations of offerings were also orthophotomapped, that is, recorded by means of zenital photos corrected for optical deformation and united in a georeferentiated photomosaic (Figure 10). The subsequent digitalization of the photomosaic produced detailed vectorial maps of the archaeological evidences (Figure 11) despite the reduced time for fieldwork.

The topographic map and the photomaps were then uploaded in ARCGIS software that allowed several elaborations and the integration of the spatial data with those in

<sup>15</sup> Every fragment was described, when possible, according to the following fields: “ware”, “form”, “incised decoration”, “other decoration”, “type”, “variety”, “complex”, “period”, “description”, “diameter”, “state”. The first eight fields refer to the defining elements of the type-variety classification; “description” includes notes on the state of the object (divided in “intact”, “semi-intact”, and “fragment”); the “diameter” field was recorded in order to ascertain the degree of standardization of offered items; “state” included information on anthropogenic activities such as burning, or natural processes such as calcification. Drawings of selected diagnostic fragments and whole vessels were also made in the field; as previously stated, no items were collected from the cave, apart from the whole vessels found outside the entrance.



the database created to describe ceramic items in the field<sup>15</sup>. Distribution maps of selected elements were created by specific *queries*, which consist in attributes selections by alphanumeric data taken from the database. The ceramic

**Figure 7.** Offering Area 8, the main pottery concentration in the cave (D. Domenici).





**Figure 8.** Offering Area 12, with bowls on a stalagmite. Note the bowl in the upper part, as well as bowls at the stalagmite's base.

cave, by relating the depositional areas with the easiest paths on the flattest surfaces.

#### **The Formation of the Archaeological Context: Depositional and Post-depositional Factors**

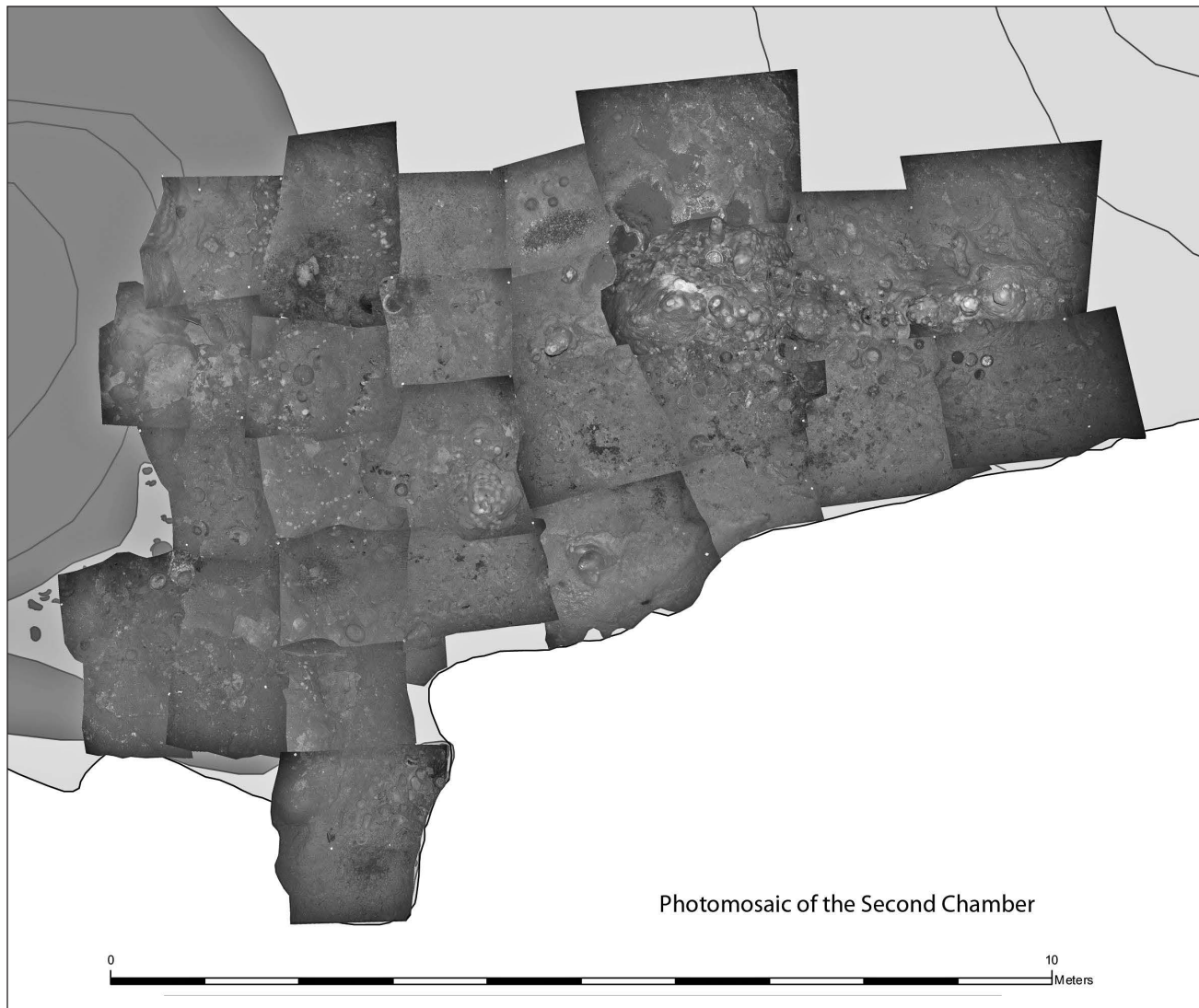
Due to the importance of spatial distribution of archaeological remains for interpreting ancient hypogean rituals, a first aim of our analysis was to ascertain if flows of rainwater coming from the outside during the wet season could have affected their distribution on the cave surface. The elaboration of the TIN allowed us to trace the *steepest paths* on the surface, that is, the most probable routes followed by flowing water. If most concentration areas in Room 2 were not directly affected by these paths, areas 1, 2, and 3 were obviously located along a possible flow route. This led to the observation that pottery sherds were probably washed from Areas 1 and 2 and accumulated at the base of

**Figure 9.** Isolated bowl located inside a recess of the main column (D. Domenici).

attributes by area were then visualized by means of *charts* and *histograms*. Density maps, realized by measuring the distances between the centroids of the digitalized elements, allowed the degree of reciprocal proximity of selected elements to be represented in order to define areas of major or minor concentration.

A 3D model of the cave was obtained using SURFER software; the creation of a Triangulated Irregular Network (TIN) of the cave surface provided a model of the slopes of the floor. The *slope* instrument indicates the inclination degrees of each “triangular” surface, in order to systematically detect the levellest areas and the steepest ones. In this way, the system draws some *steepest paths* – graphic linear elements automatically generated by the software from a starting point indicated by the operator – corresponding to the main water flows in the cave during the wet season. The taphonomic role of water flows in the disturbance of pottery concentrations was then evaluated by comparing the steepest paths starting from the two entrances of the cave and the density maps of ceramic fragments, also considering the degree of fragmentation in every area. This analysis was also useful to infer the main paths that organized human circulation in the





**Figure 10.** Photomosaic of the offering Areas 5, 6, 7, and 11 (C. Pongetti).

the nearby column and rocky blocks, thus forming Area 3. Most sherds in Area 3 were water-worn and covered with calcite. We cannot be sure if all the fragments in Area 3 were transported there by the action of water (the location near a column fits a common pattern of local offering disposal), but it is obvious that the process of formation of Area 3 was strongly affected by water flows.

Other taphonomic processes seem to have affected various offering areas. In Room 1 90% of pottery items are fragments, while in Room 2 this percentage drops to 49%, meaning that more than half of the recorded items are whole vessels. Our interpretation of this pattern is twofold: Room 1, still in the twilight zone, probably suffered more breakage and looting of whole vessels by modern visitors as well as a higher amount of rainwater flows. However, a different chronological composition of offerings in the two rooms (see below) suggests that the different breakage pattern could have been caused by ancient visitors and probably by

differences in the prevailing ritual practices. We will return to this issue in our concluding remarks.

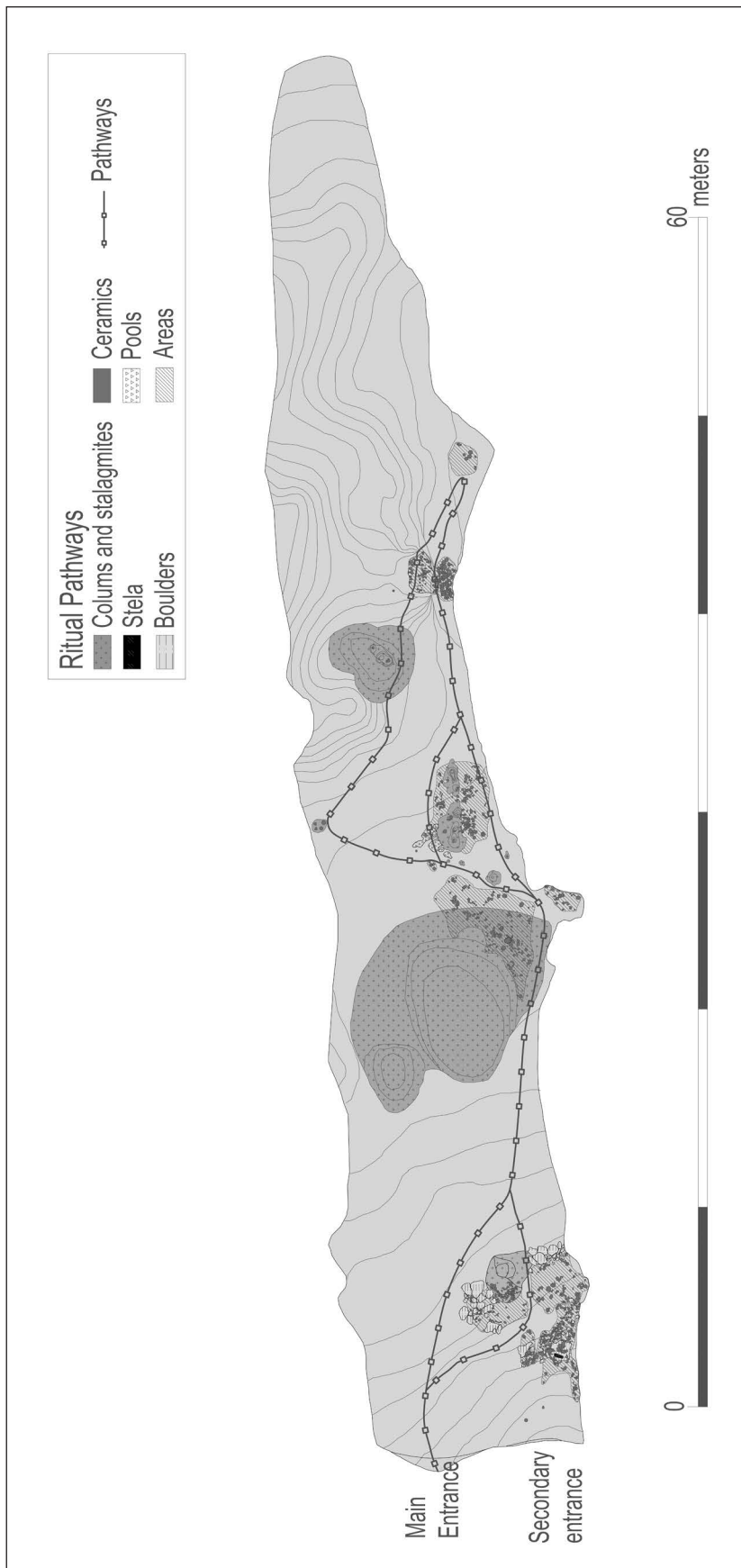
The physical characteristics of the underground landscape obviously played a role in the selection of the places where to deposit the offerings. We already noted the common association with speleothems such as columns or stalagmites, as well as with dripping water. Moreover, it is clear that in most cases flat surfaces (cave floor, ledges, or rocks) were selected, obviously providing stability for the offerings. The underground landscape was also modified in ancient times: the stela was erected in Room 1 and two rows of stone blocks were aligned on the sides of the first column, thus creating a “closed space” that, together with the southern wall of the cave and the rock at the base of the stela in Area 2, encircles most of Areas 1-4.

The partially built underground landscape of Cueva del Sapo should have affected the movements of ancient ritual actors: in light of our above-mentioned interest in identifying





Figure 11. Digitalized map of offering Areas 1, 2, 3, and 4 (C. Pongetti).



**Figure 12.** Suggested circulation pathways linking the offering Areas in Cueva del Sapo (C. Pongetti).

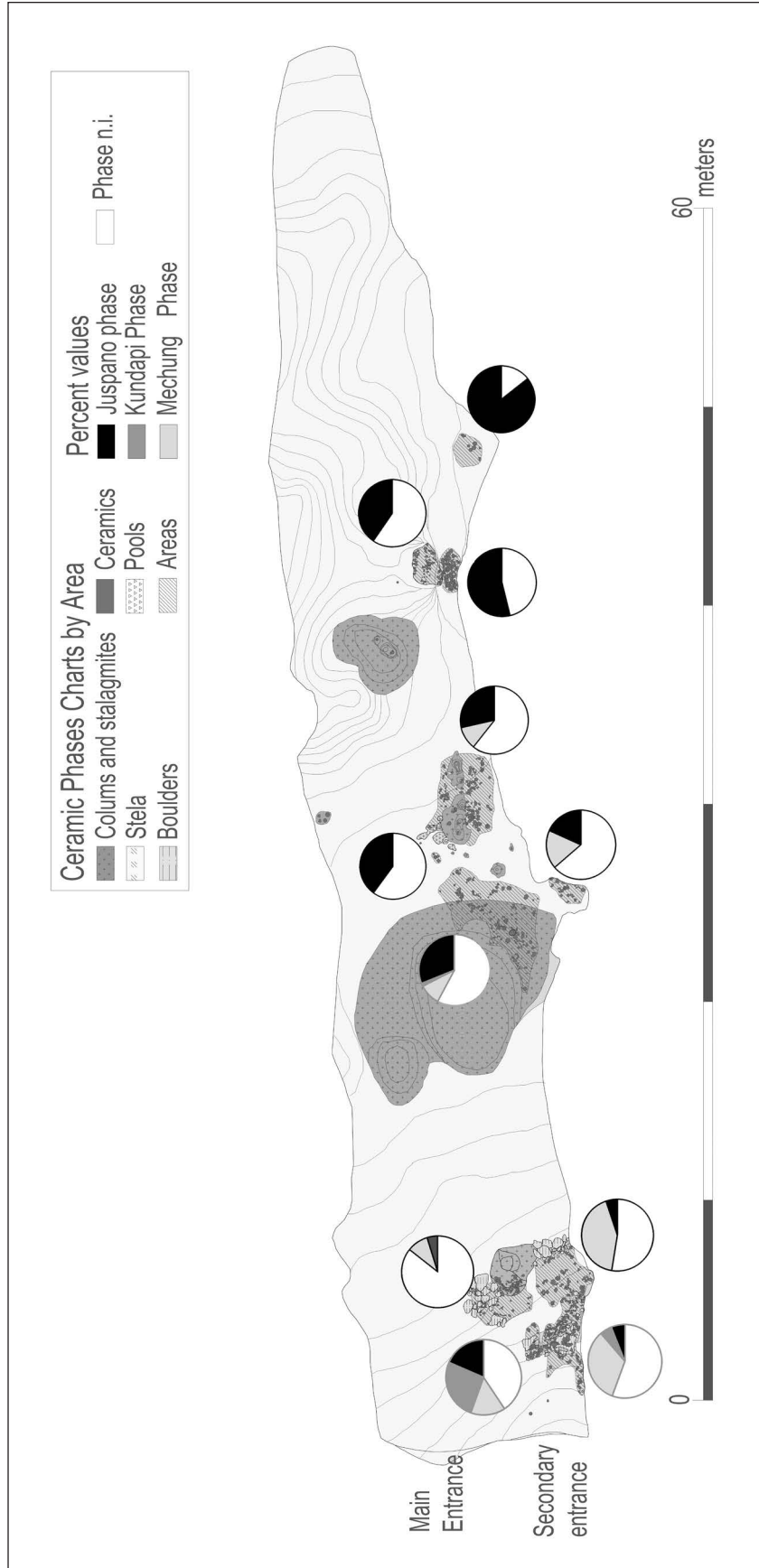


Figure 13. Phase components of offering Areas in Cueva del Sapo (C. Pongetti).

ritual pathways both outside and inside the caves, we tried to sketch the most probable circulation routes in the underground space considering factors such as the location of the offering areas, floor slopes, obstacles, etc. The result (Figure 12) is an overtly hypothetical one that, anyway, seems quite viable in light of our own physical experience of the cave.

The evaluation of elements so far discussed such as breakage patterns or circulation routes, as well as a general interpretation of the dynamics of ancient ritual practices, cannot be carried out without a detailed understanding of the chronological dimension of the archaeological context, one of the main purposes of our analysis. The chronological attribution of the ceramics was made on the basis of the type-variety sequence of Western Chiapas Zoque pottery as established by Peterson (1963), Agrinier (1969, 1970, 1975), and Thomas A. Lee (1974a, 1974b) on the basis of their works at Mirador and in various locations of the Middle Grijalva area.

The identifiable pottery specimens found in Cueva del Sapo pertain to three different phases of the Classic Zoque sequence: Juspano (Early Classic I, ca. A.D. 200-400; types Venta Smudged, Paniagua Recessed and Sanjuanojmo Crude), Kundapi (Early Classic II, ca. A.D. 400-600; types Venta Smudged and Santome Tan), and Mechung (Late-Terminal Classic, ca. A.D. 600-1000; types Zuleapa White, Yomono Fine Incised, Tonapac Coarse)<sup>16</sup>. Many fragments of coarse ware, when not clearly pertaining to a known form, have been described as chronologically “not identified” (n.i.)<sup>17</sup>. The n.i. group also includes all the fragments covered by calcite deposits or that, due to their physical location under other items, cannot be properly observed without dismantling the offering contexts.

Figure 13 represents the relative frequency of materials of the three phases in Cueva del Sapo’s areas, clearly showing a meaningful distribution. In Room 1, while Area 1 shows a quite even percentage of all the phases, Areas 2, 3, and 4 show a clear predominance of Late-Terminal Classic Mechung pottery, being the Fine Orange Zuleapa White the most represented type. In Room 2, on the contrary, Early Classic I Juspano ceramics, mainly of the Venta Smudged and Paniagua Recessed types, predominate in all areas and represent the only component in Areas 8, 9, 10, 11, the easternmost and innermost offering areas of the cave; a Late Classic Mechung component is present in the three southwestern areas (5, 6, and 7; that is the nearest to Room 1), while an extremely reduced Early Classic II Kundapi component (actually, two fragments of one single tripod vessel) is present

<sup>16</sup> Absolute dates are simply indicative, since a discussion of the absolute chronology of the local ceramic sequence is well beyond the aim of the present paper. We do not use here the obsolete “Middle Classic” definition for the Kundapi phase, characterized by a strong Teotihuacan influence in ceramic forms.

<sup>17</sup> In our database the coarse ware has been subdivided in the following subgroups: *Orange*, *Reddish Orange*, *Buff*, *Yahama Roughware* e *Canoa Coarse*.

only in Area 5. It is important to mention here that the vast majority of n.i. items in the Juspano-dominated areas corresponds to fragments of coarse hemispheric bowls usually filled with carbonized material and probably used as lamps or copal burners, strongly suggesting a Juspano phase dating for these materials too, even if they strongly resemble the Pitutal Smoothed, Pitutal Variety, Yahama Roughware attributed by T. A. Lee to the Protoclassic Ipsan phase in San Isidro (1974b: 48-49). Due to their relatively scarcity in the areas where Mechung materials predominate, but where Juspano materials are anyway present, a Late-Terminal Classic continuity of this form seems highly improbable. No hypothesis has been formed regarding their use during the poorly represented Kundapi phase.

In general terms, the chronological composition of the different areas shows that the ritual use of the cave began during the Juspano phase, also corresponding to the phase of major use both in terms of quantity of deposited materials and in terms of spatial distribution. Juspano people apparently left offerings in Rooms 1 and 2, thus creating all the offering areas utilized in the cave. The presence of Juspano pottery in Areas 1, 2, and 4 suggests that the plain stela was also erected during this phase, a hypothesis that seems to be confirmed by the presence of plain stelae in various Early Classic sites in the Jiquipilas valley (López Jiménez and Esponda Jimeno 2009) and in the neighboring Mercadito jungle area. The contemporary use of all 13 areas suggests that the proposed main pathways linking the different offering areas were also established at this time. Nevertheless, the various areas show a clearly different pattern of formation: if Areas 11, 12, and 13 could have been the product of a single offering act, areas such as 1, 2, 5, 6, 7, 8, and 9 were clearly formed through repeated depositions.

A strong diminution of ritual activities in Cueva del Sapo occurred during the Early Classic II Kundapi phase, when a small quantity of vessels was deposited in areas 1, 2, and 5, that is, simply following the pattern established during the previous Juspano phase, but not venturing into the deepest part of the cave. Actually, the only Kundapi item in Room 2 was a single cylindrical, nubbin feet tripod.

During the following Late-Terminal Classic Mechung phase, despite a clear increase in ritual activity, offerings were only left in Room 1 and on the southeastern part of the main column in Room 2, exactly as during the preceding Kundapi phase. Most importantly, the clear predominance

**Figure 15** (facing page). Selected examples of Juspano ceramics. a) Composite tripod, Polished Black, Venta Smudged type; b) Rounded wall bowl, Smudged Black, Paniagua Recessed type, with incised scroll within framing lines on basal line; c) Out curving wall bowl, Smudged Black, Paniagua Recessed type, with incised hachured triangles and dentate basal ridge; d) Slightly out curving wall bowl, Orange Brown, Paniagua Recessed type, with incised striped scalonated motif and basal ridge with incised waves; e) Tripod, reddish orange, Venta Smudged type, with gadrooned base and rim; f) Hemispherical censer, Smudged Black, Paniagua Recessed type, with incised flowers and circles within two framing rows of hachured triangles (C. Pongetti).

## Juspano Ceramic Forms by Area

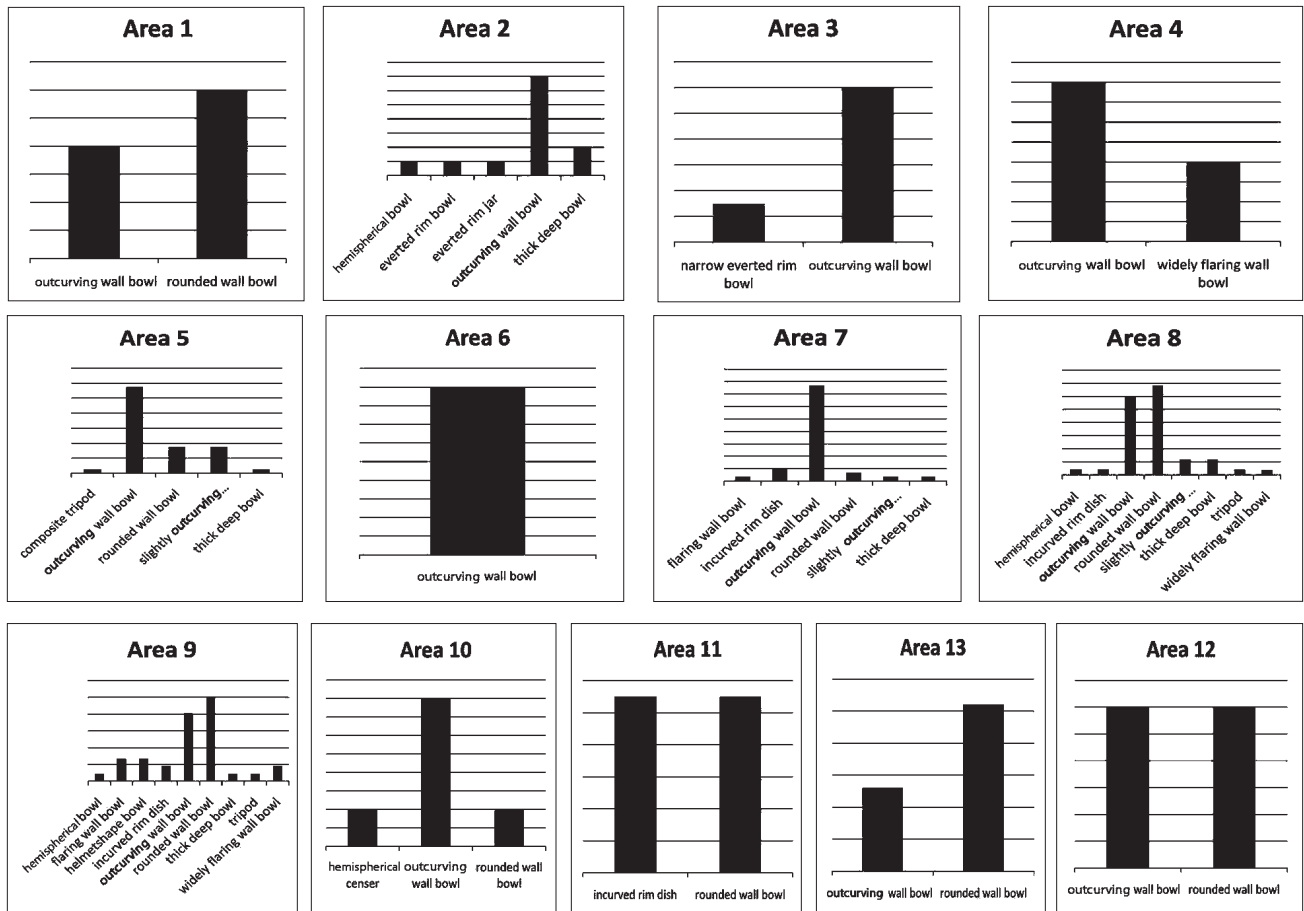
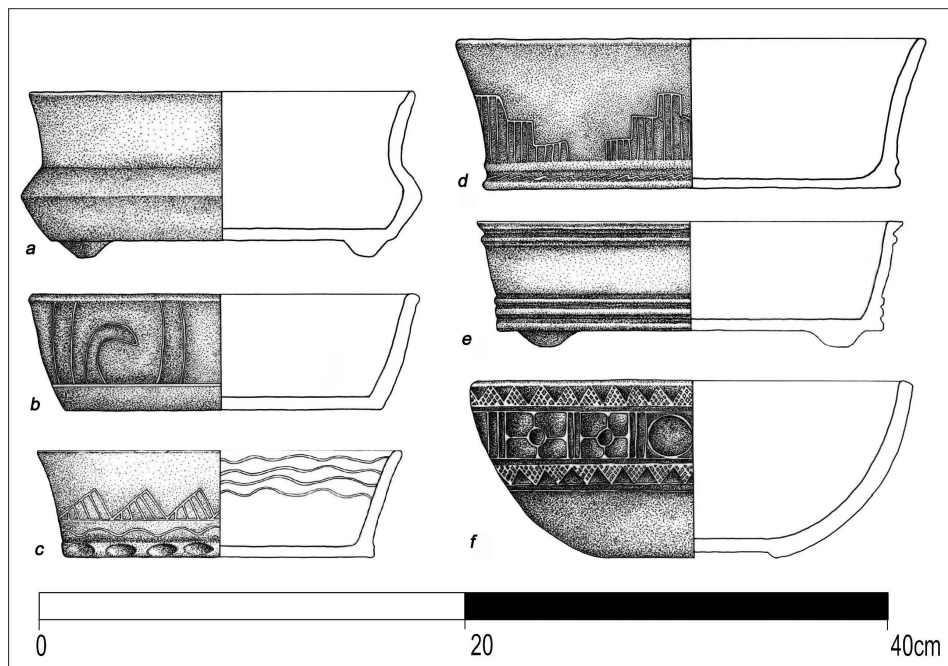
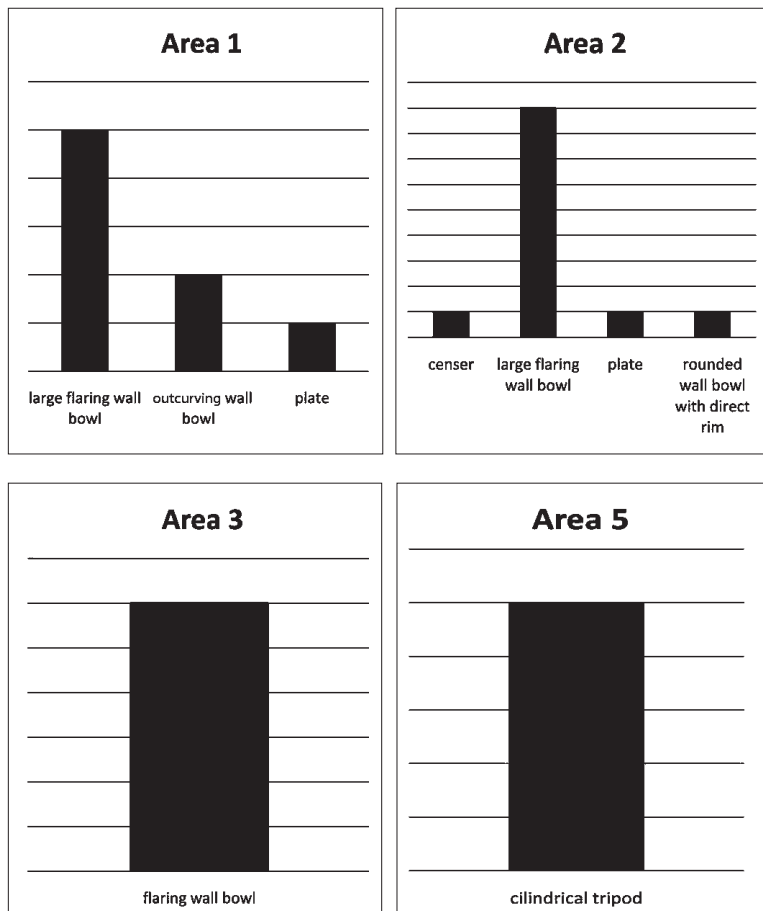


Figure 14. Distribution of Juspano phase ceramic forms by offering Area (C. Pongetti).

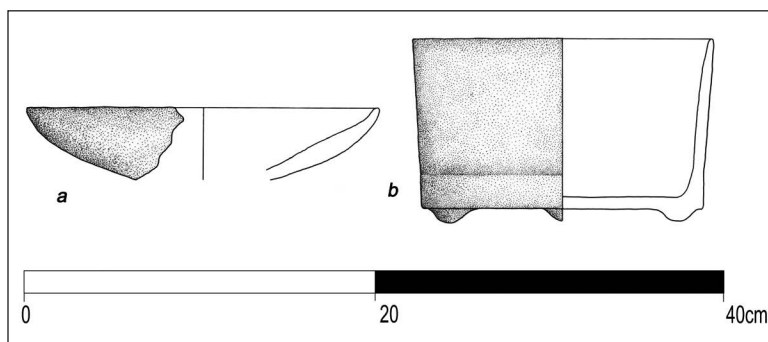


## Kundapi Ceramic Forms by Area



**Figure 16.** Distribution of Kundapi phase ceramic forms by offering Area (C. Pongetti).

**Figure 17.** Selected examples of Kundapi ceramics. a) Plate, Reddish Orange, Tonapac coarse type; b) Teotihuacan cylindrical tripod, Smudged Black, Venta Smudged type (C. Pongetti).



of Mechung pottery in areas 3 and 4 suggests that the “blockages” on the sides of the first column were established during this phase, when the twilight zone of Room 1 clearly became the main focus of ritual activities. We cannot be sure if the southern “blockage” was anyway surpassed to reach the area southeast of the main column in Room 2 or if this area was now reached walking around the northern side of the column. In general terms, Mechung offerings were usually deposited on top or on the margins of the already established Juspano offering areas.

To further proceed in the understanding of the emerging ritual patterns of the various phases, it is now useful to look at the main ceramic forms represented in the various components of the offering areas. As shown in Figure 14, Juspano offerings consist almost completely of bowls and dishes of different forms. The vast majority of them are black wares (Venta Smudged and Paniagua Recessed; Figure 15), often with waving incised lines and hachured triangles and with post-firing hematite painting. A small quantity of censers and tripods (again, incised black ware) has been identified. We must remember that a significant quantity of coarse hemispherical bowls classified as n.i. is present in all the Juspano-dominated areas, suggesting a Juspano phase attribution also for these forms. The higher variety of bowls forms in Areas 2, 5, 7, 8, and 9 seems to be simply an effect of the higher quantity of pottery fragments in these areas, probably formed during a longer period of repeated use.

A similar pattern seems to characterize the Kundapi components (Figures 16-17) that, albeit minimal in quantitative terms, contain mainly bowls, tripods and a censer. The Mechung component of the offering areas (Figures 18-19) is, on the contrary, much more varied, since the “usual” bowls and plates (now mostly of the Zuleapa White Fine Orange ware) are joined by a higher quantity of censers (including ladle censers with modeled handles) and, above all, by an important quantity of jars, a form almost completely absent in earlier phases.

### Concluding Remarks

The methodology applied in recording and analyzing the surface materials in Cueva del Sapo, even if of limited value for quantitative analysis (e.g. due to the impossibility of joining fragments from a single broken vessel) and obviously affected by sampling errors due to differential visibility of the archaeological items, allowed a rather detailed interpretation

## Mechung Ceramic Forms by Area

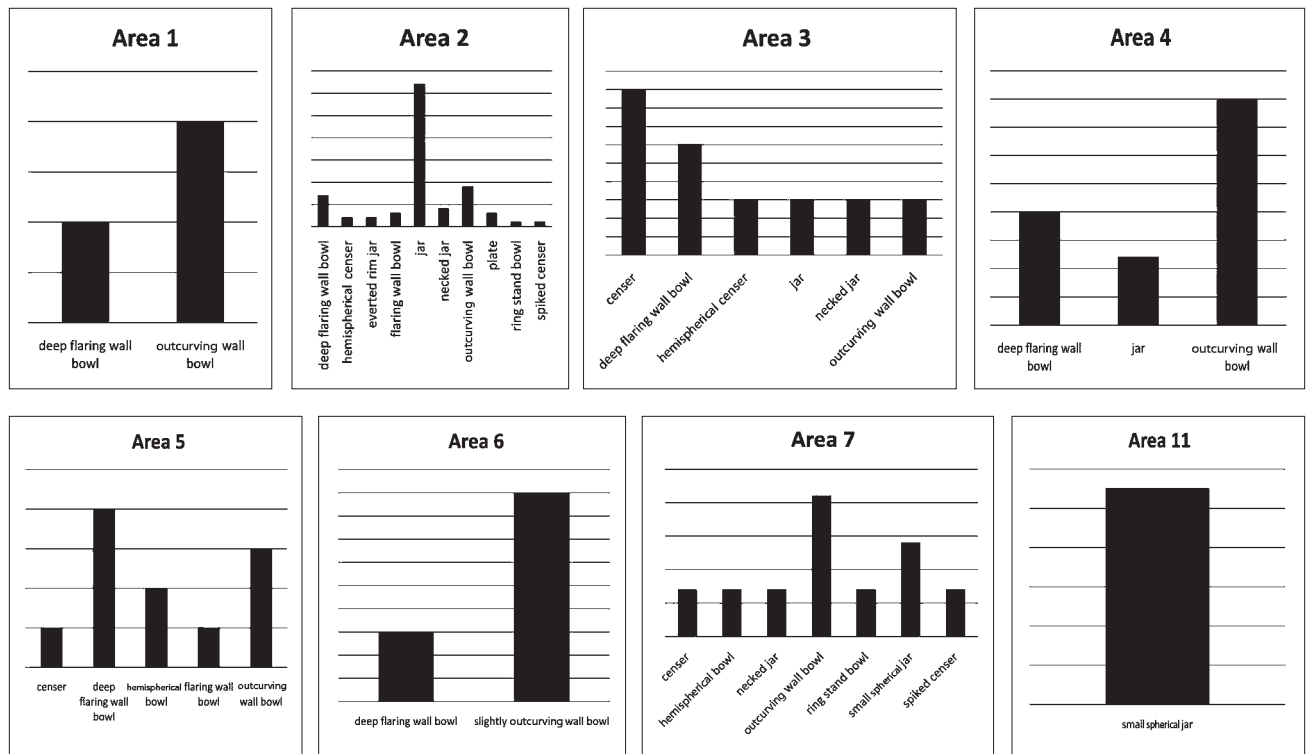
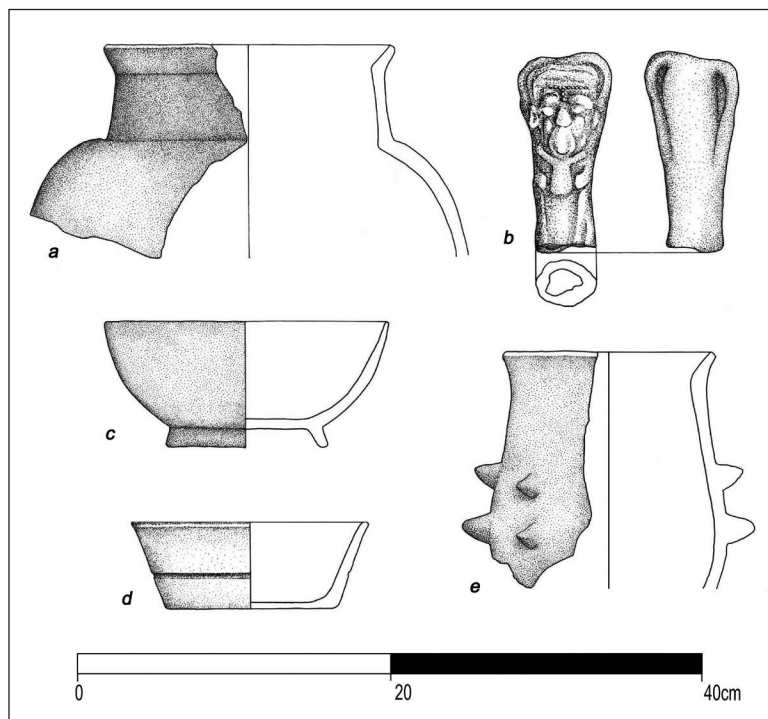


Figure 18. Distribution of Mechung phase ceramic forms by offering Area (C. Pongetti).



of the ancient ritual practices without affecting its archaeological contexts, preserved almost untouched in the cave.

Our analysis showed that Cueva del Sapo was used by the Zoque people living in the region as a ritual precinct all throughout the Classic Period. Over this period of almost a millennium, we have detected dynamics of continuity and change fitting, and at the same time enriching, the general picture previously sketched for the local hypogean ritual tradition.

The major period of ritual use corresponds to the Early Classic I Juspano phase, when offerings, mainly composed of black ware bowls and coarse hemispherical bowls, were left in

Figure 19. Selected examples of Mechung ceramics. a) Necked jar, Canoa Coarse; b) Anthropomorphic censer handle, Orange Brown ware; c) Ring stand bowl, Fine Cream, Zulepa White type; d) Out curving wall bowl, Tuma Orange, Yomono Fine incised type, with red-coloured incised basal line; e) Spiked censer, Canoa Coarse, Tonapac Coarse type (C. Pongetti).

various places where salient speleothems such as columns and flowstones obviously constituted the foci of ritual activity, probably due to their conceptual relation with underground waters. As an indigenous informant explicitly declared to James Brady and colleagues, “they themselves are water” (Brady, Cobb et al. 2005: 218)<sup>18</sup>. In Cueva del Sapo, various plates and bowls are located on top or *inside* of them, as in the case of the mentioned bowl located inside a sound-producing area of the main column. The placement of the bowl in that very place suggests that the musical effect of the column was known to the ancient Zoque, as it has previously been suggested for the Maya area (MacLeod and Puleston 1979: 75; Brady, Cobb et al. 2005: 221)<sup>19</sup>. Of particular interest is the erection of a plain stela in Room 1, the only such case so far known in the area<sup>20</sup>. The stela stands as the focus of an offering area, in this specific case apparently fulfilling the same function usually performed by speleothems; it also seems to reflect a common pattern of plain stelae erection in Early Classic open-air sites of the region.

The water-focused character of hypogean rituals is also attested by the location of bowls under the dripping water in Area 7, obviously aimed at collecting “pure” underground water, itself an important ritual item known as *zuhuy ha* among Yucatec Maya (Thompson 1975: xv-xxii; Brady 1989: 35-37; Bonor Villarejo 1989: 37-38, 41-43, 67-68). The same general symbolic reference seems to be embodied in the offerings themselves: the black ware bowls, probably sometimes used as food containers, often bear incised decorations in the form of waving lines on the interior of the rim, and hatched triangles and step-frets on the outer walls, motifs that Gareth Lowe (1999: 131-135) interpreted as representations of bodies of water and mountains, respectively<sup>21</sup>. This same black ware bowls are often found in huge stacks of identical items in other Early Classic caves of the area, suggesting that, in some instances groups of newly produced bowls were offered together. This hypothesis, based on the strict semantic association that links the concepts “new,” “unripe,” “green” or “fresh” with the ontological essence of the Earth’s watery interior and its supernatural (cfr. Yucatec Maya word *zuhuy*, “brand new”), could well fit with Diego Duran’s description of the ceramic containers of Aztec food offerings brought to Mount Tláloc during the *Huey Tozoztli* celebrations: “all the crockery they used to serve him was new, and the little baskets and cups containing cacao had never been used” (Durán 1995: II, 93). Eric Thompson mentioned the use of brand new (*zuhuy*) utensils in contemporary Yucatec Maya rituals, and Barbara Tedlock noted a similar pattern in modern K’iche’ rituals, where any type of pottery vessels can be used so long as it has not been previously used (Tedlock 1992: 65). The different pattern of breakage in the two rooms, and above all the huge amount of whole vessels in the deepest Room 2, suggest that the breakage of pottery vessels was not part of ancient Juspáno rituals and that it should be attributed to later accesses to the cave. As previously discussed, a “watery” semantic sphere could be also attributed to the broken speleothems used as offering items, as in the case of Cueva del Sapo offering area A, where

a big chunk of a broken stalagmite was placed amidst the black ware bowls. Broken speleothems used as offering items have been recorded also in Cueva de los Altares, where they form a circular space associated with Early and Late Classic pottery offerings, and in Cueva Cuatro Hacha, where Thomas A. Lee described a group of broken stalactites arranged near a table-like limestone slab (Lee 1969)<sup>22</sup>.

The recurrent association between black ware bowls and the little coarse hemispherical bowls (showing a perfect one-to-one correspondence in the smallest concentrations) suggests that the deposition of an offering was usually associated with incense burning. If the minor concentrations could have been formed during a single ritual performance, the major areas seem to be the result of repeated, “paratactical” acts of obliteration, probably carried out during cyclical, calendar related ceremonies. The spatial distribution of offering areas seems to reflect the existence of circuit-like pathways that guided the movement of people in the underground landscape during the ritual performance. A different pattern of breakage in the different areas poses questions about the state of the ceramics at the moment of the offering. If Area 8 contains the highest percentage of intact vessels, the nearby Area 9 contains the highest percentage of pottery fragments; since

<sup>18</sup> For comparative data on this aspect, cfr. Brady, Scott, Neff et al. 1997; Brady, Cobb et al. 2005; Fitzimmons 2005; Heyden 2005: 30-31; Peterson et al. 2005. Cfr. also the Nahuatl word *atet* “water-stone” (Knab 1991) and the Yucatec *xix ha tunich* “drip-water stone” (Moyes 2005: 287), both indicating calcite formations. In cases such as the big column at the centre of Cueva del Sapo main room, the trunk-like appearance of the column could suggest a symbolism linked to the tree-*axis mundi* concept, a hypothesis often proposed in relation to hypogean columns and based on ethnohistorical and ethnographic evidence, but obviously quite difficult to evaluate on the basis of pure archaeological data.

<sup>19</sup> The local Zoque folklore often mentions music (played by violins, flutes, horns, etc.) as a typical trait of mountain-dwelling extra-human beings (Wonderly 1947: 152, 155). See Brady and Rodas 1995: 29, 32; Hapka and Rouvinez 1996: 67-68; Ishihara 2008: 178-181 for data regarding the association between music and caves.

<sup>20</sup> See Awe, Griffith and Gibbs 2005 for a discussion of stone stelae in caves of Belize and in the general Maya area. In contrast with the pattern observed in the Maya area, the Cueva del Sapo stela is located in the first and more accessible offering area of the cave, still in the twilight zone, suggesting that in this case the stela cannot be related to restricted, high-status ceremonies, as proposed by Awe, Griffith and Gibbs. Stone stelae had been found also in Cueva de Agua Canoa, Cerro Rabón, Oaxaca (Hapka and Rouvinez 1996: 61-63).

<sup>21</sup> See Fitzimmons (2005: 101) for similarly incised pottery in Oaxacan caves.

<sup>22</sup> For the use of broken speleothems in Maya and Oaxaca caves see Brady, Veni, Stone and Cobb 1992: 78; Brady, Cobb et al. 1997; Moyes 2000; Fitzimmons 2005: 95, 104.



Area 9 is located in the inner part of the cave, where slope conditions and the absence of calcification exclude the action of water flows and where human walking should have been limited, we should ask if some ceramics were intentionally broken during the hypogeal ritual.

The scanty evidence of Early Classic II Kundapi phase materials does not allow any firm interpretation, apart from observing an almost complete limitation of ritual activities in Room 1 and the recurrent deposition of offerings in the very same spot where older Juspano offerings were located, probably reflecting both a strong similarity in the prevailing ritual patterns as well as an emically perceived relation of continuity with the acts performed by ancestors.

A similar continuity in terms of offering areas characterizes Late-Terminal Classic Mechung activities. This is quite interesting because of the strong changes that affected Zoque culture of Western Chiapas at the beginning of Late Classic period. Older sites, usually occupied all through the Early Classic (often since Preclassic times), were abandoned and new sites with dressed stone architecture were established. As previously mentioned, the El Ocote area was first colonized by permanent settlers who, after centuries of widespread use of black ware ceramics of Olmec origin, produced new ceramic complexes dominated by the diagnostic Fine Orange ware. In the context of such deep cultural changes, the use of the very same offering areas in the caves could indicate that a sense of cultural continuity was still perceived. A clear expression of this idea, as well as of the palimpsest-like character of the described offering areas, is in Area 2 where a Late Classic ladle censer is located on top of a Kundapi bowl, in its turn resting on a Juspano bowl<sup>23</sup>.

As we commented at the beginning of the article, Late Classic ritual practices in El Ocote show a good degree of innovation. In Cueva del Sapo this is reflected by the restriction of main ritual activities to Room 1 and to the area southeast of the main column in Room 2, that is, to the twilight zone and around the main spelothem, with no entrances in the deepest part of the cave. To this phase we also attributed the building of the “blockages” on the sides of the first column, probably an attempt to circumscribe the main ritual area of the cave whose spatial focus was again the Juspano plain stela. A similar “blockage”, constituted by a semicircular low wall of stone blocks, was identified in the entrance area of Cueva de la Duda along the La Venta river, where it divided the twilight zone from the dark gallery at the back. The ceramics on the surface of the entrance area are Late Classic, thus suggesting a similar date for the wall. Data are admittedly scanty, but the similarity between the two cases could suggest a common Late Classic pattern of underground space modification aimed at enclosing and emphasizing the twilight area of the caves. Anyway, both the spatial distribution of the ceramics and the stone blockages

suggest that most of underground circulation in the cave was limited to its first part in Late-Terminal Classic times, a fact that could be related to the major emphasis given to open-air ritual pathways attested in the general El Ocote area.

Late-Terminal Classic ceramics show that bowls (food?) offering and “pure water” collection continued to be the main ritual activity carried out in the cave, with a clear increase of incense burning; the abundance of previously uncommon jars could reflect a stronger emphasis on food offerings, an activity also witnessed in dry caves such as Cueva del Lazo, where huge quantities of macrobotanical samples were identified (Piacenza 2000). However, not having carried any chemical identification of residues in jars, the association between this form and food offerings remains purely speculative. Almost all the Late-Terminal Classic vessels were found broken. Obviously their physical location in the most accessible part of the cave favored their modern breakage and looting of whole specimens. Since some fragments (e.g. in Area 2), however, are located in places that the slope analysis shows not to be easily reachable by flowing water or human walking, we cannot rule out the possibility that pottery-smashing was part of Late-Terminal Classic hypogeal ritual performances, not an uncommon practice in the Maya area. The theme of possible intentional breaking of ceramics during hypogeal rituals in different chronological periods surely deserves further investigation.

Taphonomic processes affecting the archaeological contexts of Cueva del Sapo have been identified in the form of rainwater flows and a limited looting activity. Despite these factors, the Cueva del Sapo archaeological context arrived almost intact to us, showing a marvelous integration between archaeological evidences and natural underground environment. Our actions in the cave were aimed both at studying and preserving it for the future.

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## 4

## Windows of the Earth: An Ethnoarchaeological Study on Cave Use in Suchitepéquez and Sololá, Guatemala

Reiko Ishihara-Brito and Jenny Guerra

Ethnoarchaeological studies have aided in providing more nuanced interpretations of past behaviors including religious ritual practices of prehispanic Maya peoples. In the piedmont area of southern Guatemala, contemporary ritual practices performed at caves and other cave-related sites offer insight into ancient cave utilization. A brief ethnoarchaeological reconnaissance was conducted in the modern community of Chocó and the surrounding area of northern Suchitepéquez and southern Sololá in order to explore the potential for future investigation. The objectives of the project were threefold: to document known caves and cave-related topographic features in the area; to examine their use today with a particular focus on cultural materials, spatial use, and associated beliefs; and to assess the extent of prehispanic cave use in the area. Three of the seven caves documented in the current study are intensively visited today as places to communicate with the ancestors and other supernaturals, and they provide case studies through which some patterning of use began to emerge. Some of the implications of the study for archaeologists who investigate cave sites concern differential spatial use within caves and outside cave entrances as well as the close association of caves with water.

The piedmont area, known as *bocacosta*<sup>1</sup>, of Guatemala constituted a geographical and cultural bridge between settlements along the Pacific coastal plains and those in the Highlands throughout Maya history, underscoring the importance of archaeological investigations in this area (Robinson et al. 1999). Yet archaeological research in the piedmont has been sparse (e.g., Shook 1965) compared to other parts of the Maya region such as the adjacent Highlands and the Lowlands, and documentation of prehispanic cave sites is even more scant in this area. The recent proliferation of rock art studies at subterranean sites in southern Guatemala shows that caves and rockshelters abound in the volcanic Highlands and were important topographic places in the landscape (Carpio Rezzio and Román Morales 1999, 2002; Pérez et al. 1999; Robinson et al. 2002; Rowe

and Steelman 2004; Stone and Ericastilla Godoy 1999). At many major sites in the Highlands, tunnels were excavated into the igneous bedrock to modify cavities and create artificial caves (Brady and Veni 1992). Caves and cave-related locales throughout the Highlands are frequently visited in modern times to perform a variety of ritual practices (e.g., Brady and Veni 1992; Termer 1957[1930]; Villacorta and Villacorta 1930). Two recent ethnoarchaeological investigations (Brown 2002; Scott 2009) in the central Highlands have highlighted not only the richness of the cultural practices, behaviors, beliefs, and associated material remains but also the utility of examining modern rituals and ritual remains in understanding prehispanic cave utilization. It was in this context that prompted us to initiate an ethnoarchaeological study to examine cave use in the Guatemalan piedmont area and to learn about modern practices that may inform archaeological research on cave rituals.

As part of the Chocó Archaeological Project co-directed by Jonathan Kaplan and René Ugarte Rivera, a reconnaissance was conducted in August 2005 on the contemporary uses of caves in the modern community of Chocó (which overlies the archaeological site by the same name) and the surrounding area that encompasses the departments of northern Suchitepéquez and southern Sololá (Guerra and Ishihara 2006, 2007). Project members had known of the existence of caves in the area (Valdés and Vidal 2005:43), but the current study stands as the first survey focusing on cave sites. The objectives of the project were threefold: to document known caves and cave-related topographic features in the area; to examine their use today with a particular focus on cultural materials, spatial use, and associated beliefs; and to assess the extent of prehispanic cave use in the area. The reconnaissance benefited from the generous assistance of two of the community leaders who guided us to nearby caves and set up interviews with community members who shared with us their beliefs concerning caves. A GPS point was recorded for each cave so that they could be incorporated into the Chocó site map. The caves were then mapped using a Brunton compass and a Leica DISTO laser distance-meter, and observations concerning the material culture and spatial uses were noted. All caves were assigned a consecutive number (starting with PACHC01); the names of caves we mention in this paper are those used by the local people.

<sup>1</sup> The Guatemalan piedmont encompasses the foothills of the volcanoes, ranging from about 100 m to 1500 m above sea level, and is characterized by alluvial fans from the rivers that drain from the Highlands (Chinchilla Mazariegos 1996:54-55; West and Augelli 1989:388).



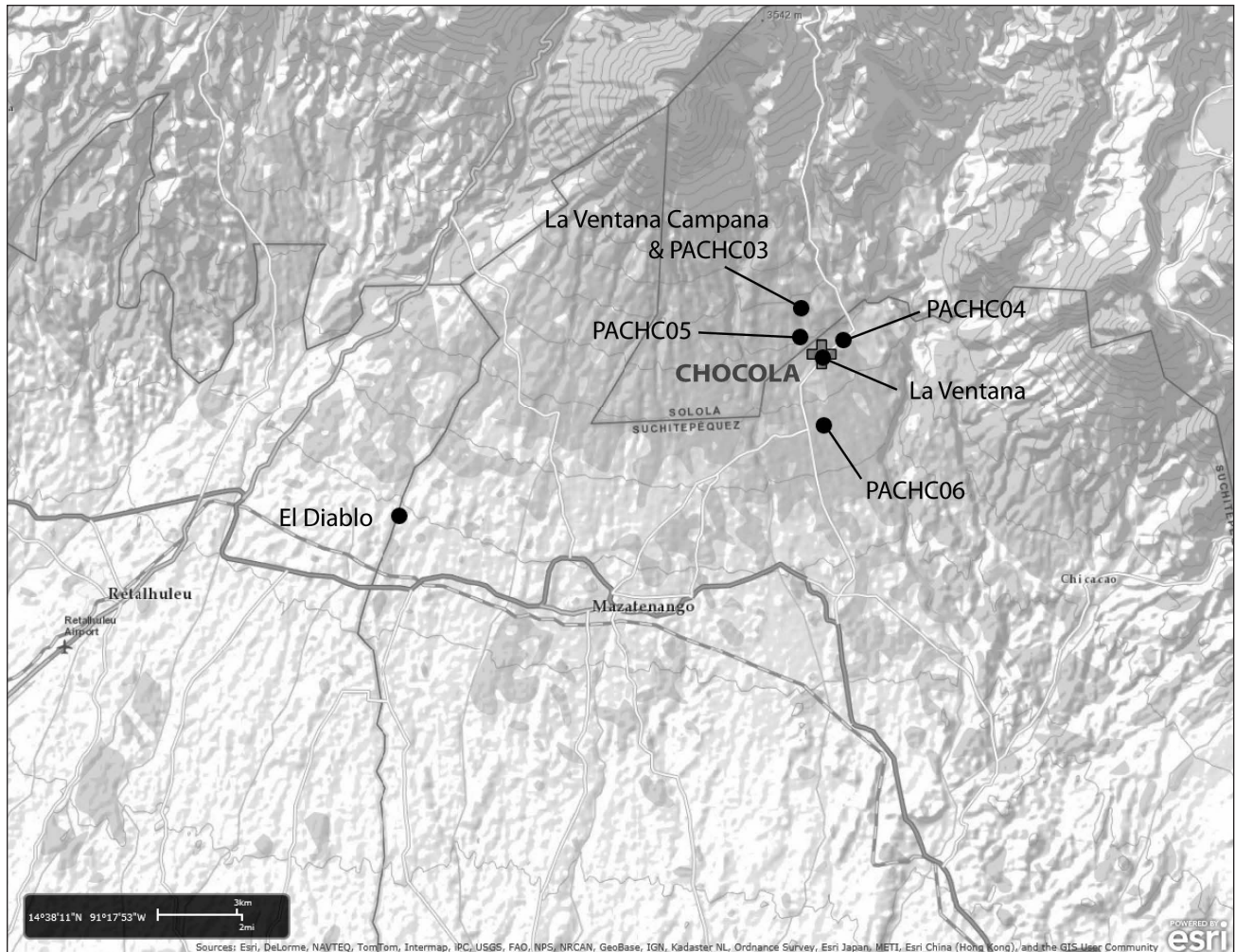
**Figure 1.** Map showing location of Chocolá, Suchitepéquez, Guatemala. (Map by Reiko Ishihara-Brito based on ESRI ArcGIS Explorer Online.)

Chocolá is located at the northern edge of the *bocacosta* in the department of Suchitepéquez (Figure 1). Occupation of the archaeological site has been dated to the Middle Preclassic through the Early Classic periods, ca. 800 B.C. to A.D. 400, based on ceramic and radiocarbon analyses (Kaplan 2008:403). Chocolá shares cultural developments with nearby major centers such as Tak'alik Ab'aj, 35 km to the west, particularly in its hydraulic system consisting of stone-lined canals or drains, and Kaminaljuyu, with Chocolá Monument 1 stylistically and thematically mirroring Kaminaljuyu Stela 10 (Kaplan and Valdés 2004:80).

In contrast to the karstic landscape of the Lowlands to the north, which is pitted with solutional caverns and sinkholes, the subterranean features in this volcanic area consist of rockshelters and narrow tunnels. All types of openings in the earth including rockshelters, spaces under overhangs, small chambers, and tunnels were documented in the survey as “caves.” The people from Chocolá use the word *ventana* (Spanish word meaning window), *wenta'n* (likely a derivative from *ventana*), and *ch'en* (K'iche word which is the

same in Tzotzil and other Maya languages meaning “hole in the earth” [Vogt 1981:120]) to refer to these features. The use of the word *ventana* suggests the function of the subterranean features as a portal into the earth where spirits and ancestors reside, a focal point allowing direct communication with them. In Cuyotenango, about 50 km southwest of Chocolá, caves are referred to as *encantos* (spells, charms) (Byron Lemus, personal communication, 2005), indicative of the powers inherent in these places. Rituals for curing illnesses and petitioning, locally referred to as *trabajos*, are conducted in these transitional spaces between the earth and the supernatural.

Our survey recorded a total of seven caves (Figure 2), of which three are intensively visited today as places to communicate with the ancestors and other supernaturals. We did not find any archaeological evidence of use on the surfaces, but this is likely due to the prevalence of modern usage concealing earlier deposits. Our preliminary study confirms the active role of caves in the daily lives and worldview of the local people, which is also evident in at



**Figure 2.** Map showing locations of surveyed caves. (Map by Reiko Ishihara-Brito based on ESRI ArcGIS Explorer Online.)

least one folktale involving caves. In this paper, we present our principal findings and briefly discuss their implications to Mesoamerican cave archaeology.

### Principal Ventanas

#### La Ventana

La Ventana (PACHC01) is located on the slope of a small hill, facing Río Chocó. A single-chambered cave measuring 6 m wide, 13 m long, and 2 m high from floor to ceiling (Figure 3), it is the most important cave in the community of Chocó for its proximity to the community and the spring that it contains. The spring that originates out of La Ventana supplies water to part of the community; a modern pipe channels the spring water, which is covered by three removable concrete slabs, from the cave to the narrow river at the foot of the hill. The spring is said to have medicinal properties. The cave's prominence was made apparent when we learned that non-local visitors frequented the cave to perform rituals, including a ritual practitioner along with her client and

the client's family who allowed us to observe the last in a series of curing rituals.

La Ventana had been modified extensively, specifically by the installation of a concrete floor that covers more than half of the cave floor; the exposed portion of the floor lies in the northeastern and eastern parts of the cave. Of the three altars that were identified based on the recently placed offerings including flowers and candles, the main altar (Altar 1), located at the deepest (or farthest) part of the cave, is a raised area that is covered in concrete. The other two altars are small ledges (Altars 2 and 3). Remains of burned offerings—in the form of soot-blackened ceiling and walls throughout the cave, blackened floor surface from burning of offerings, and melted wax from candles—were observed on the floor throughout the cave. Other material remains found on the cave surface included newspaper fragments, empty (often burned) aluminum cans of jalapeño peppers, empty glass bottles of water and sodas, lids of liquor bottles, flowers, sugar, plastic bags, incense, and glass shards.

Another important modification to the cave consists of a

low platform constructed immediately outside the entrance along the southwestern cliff face (Figure 4). A couple of palm tree trunks are placed along the southern edge of the slightly raised earthen platform, functioning as a retaining wall. Offerings are regularly burned here, as we observed firsthand and as there were two other circular residues of burning. As a place where *quemados* (burnings of offerings) take place to provide offerings to the summoned supernaturals, this platform can be referred to as a *mesa* (Brown 2004:37). On the other side of the cave entrance, there is a row of stones. During our visit when the ritual took place, the stones were used as seats by family members who had accompanied the ritual practitioner and petitioner.

La Ventana Campana

La Ventana Campana (PACHC02) is located about a half-hour walk from Chocolá in the neighboring town of Chuajij, Sololá. This cave consists of a narrow tunnel that connects to a small chamber (Chamber 1) and ends in a larger chamber (Chamber 2) where one can stand (Figure 5). Above the relatively small entrance, measuring 2 m wide and 1.5 m high, is a carving in the form of its namesake, a bell. The entrance including the surface of this carving is covered in thick, black soot as are the interior walls throughout the cave, indicative of frequent use of fire. Unlike the other caves documented in this survey, pine needles were strewn across the floor, though they were more numerous in the two chambers located in the dark zone where no sunlight reaches and where water drips from the ceiling. Chamber 1 contained a niche whose wall and ceiling were heavily covered in soot, with a few scattered, small burned rocks and a glass candleholder. The dominant locus of activities, however, occurred in the farthest area of the cave, Chamber 2. Its central area was occupied by a low mound of dark soil—likely burned—and covered with a layer of pine needles. The mound was wet from water drippage. Most of the medium-sized rocks covered in soot were found along the edges of this chamber; several of the rocks had one or two candles atop them. Two types of objects were unique to this cave: plantain leaves and firecrackers found with matches. The latter was found in Chamber 1; igniting firecrackers in a small space would have enhanced the loud sound and smoke.

Similar to La Ventana, an earthen platform, which was bordered by a one- to two-course-high retaining wall comprised of medium-sized rocks, had been constructed outside along the western

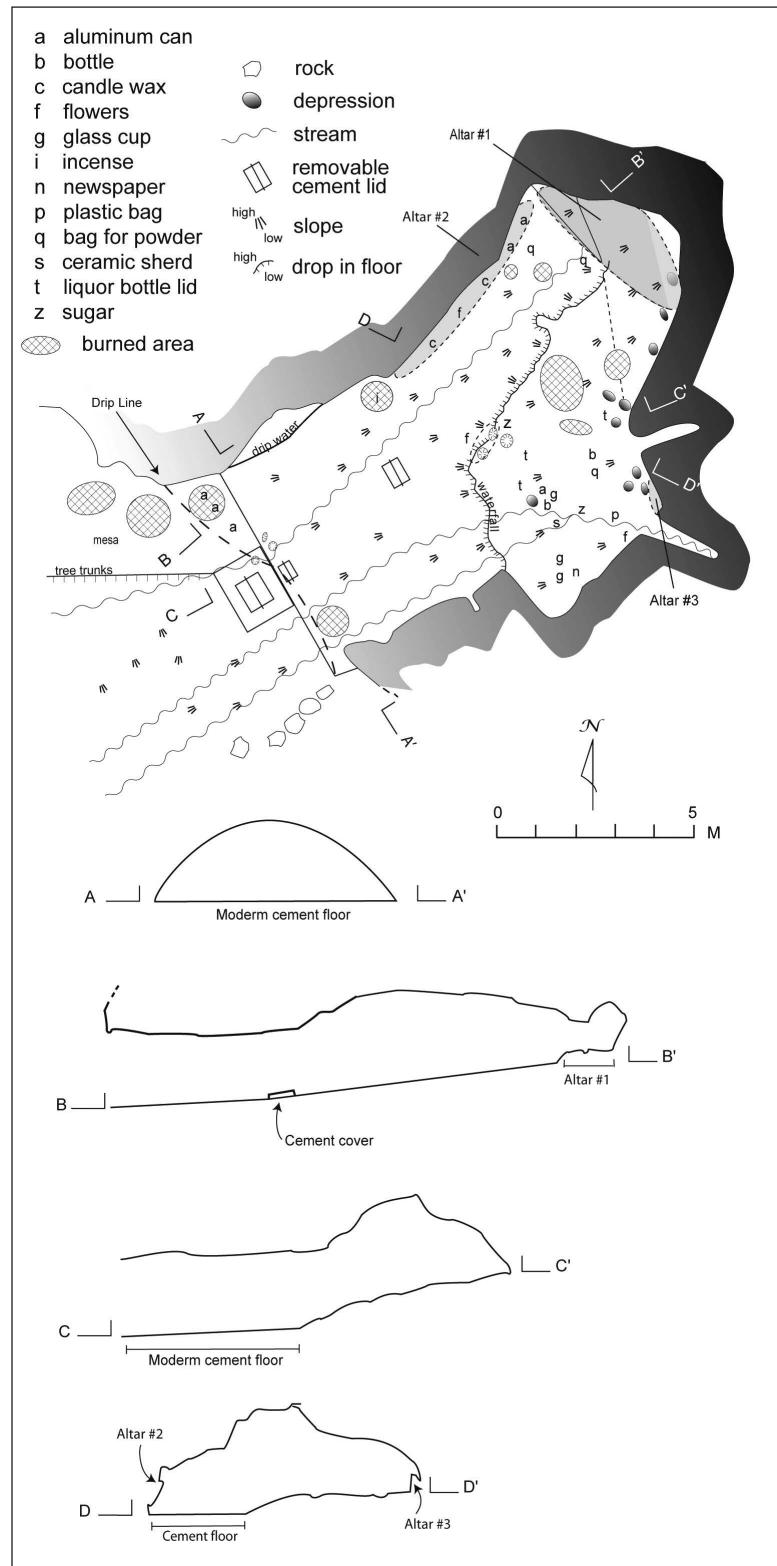


Figure 3. Map of La Ventana. (Map by Jenny Guerra and Reiko Ishihara.)





**Figure 4.** Photograph of platform feature outside the cave entrance of La Ventana. (Photograph by Reiko Ishihara.)

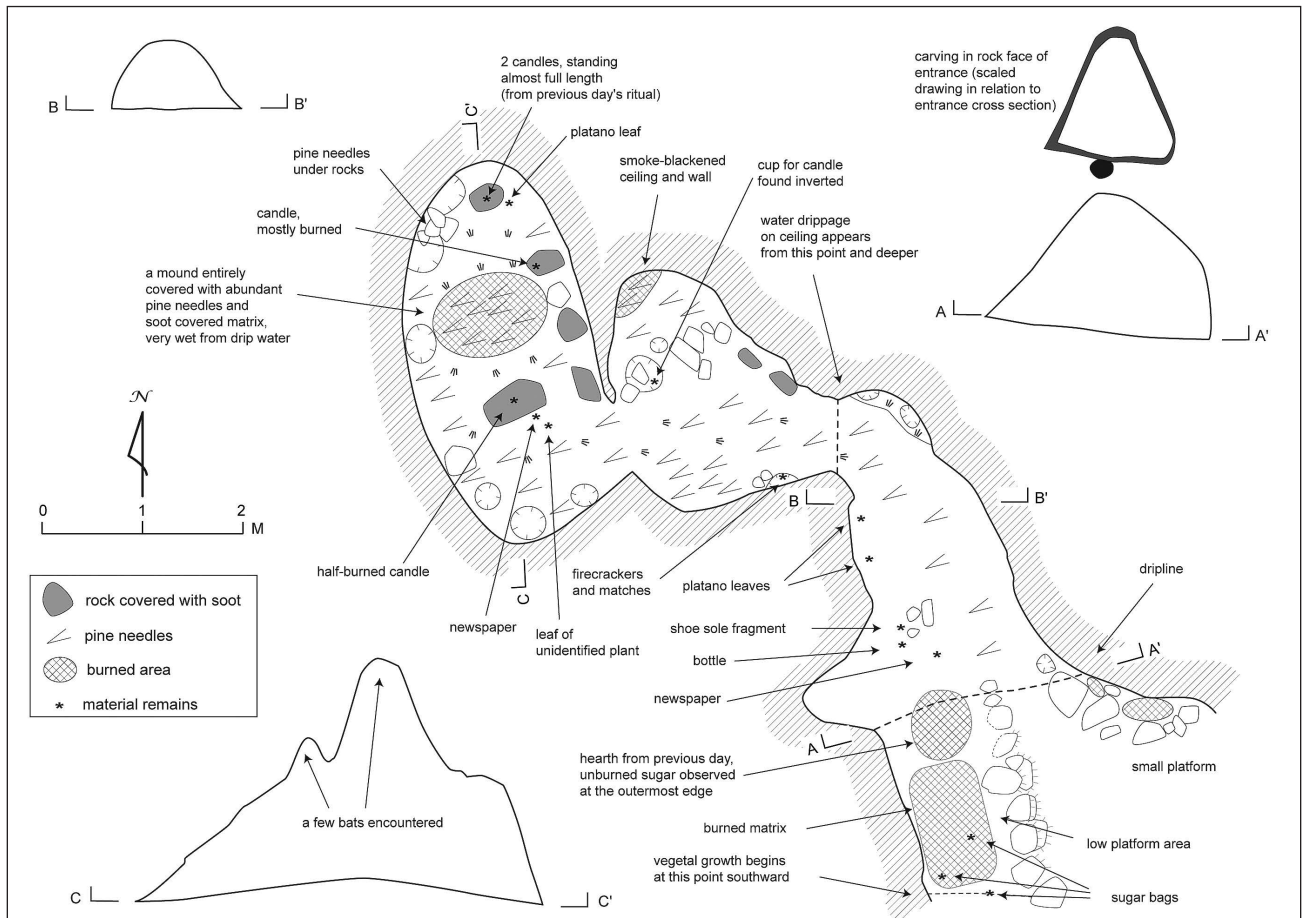
wall of the cave entrance. The southern edge of the platform, hence the limit of the cave's activity area, was clearly demarcated by the abrupt line of vegetation. The entire surface showed evidence of burning along with some material remains including a couple of sugar bags. On the opposite side of the entrance, there was a smaller mesa formed by rocks placed in a crescent-shaped alignment, where two distinct areas of burnings were evident.

A much smaller cave feature (PACHC03) was located 17 m to the east of La Ventana Campana along the same hillside, adjacent to an active spring. The feature was a niche that consisted of a triangular-shaped entrance, measuring about 1 m wide and 1.2 m high, with a depth of no more than 1 m. Although no cultural remains were observed on the floor, the roof of the niche interior showed evidence of smoke blackening as did some of the rocks on the niche floor. At the back of the niche was a small pool of water.

PACHC04

PACHC04 is a single-chambered rockshelter,

**Figure 5.** Map of La Ventana Campana. (Map by Jenny Guerra and Reiko Ishihara.)



measuring 6.5 m wide, 2.0 m high, and 2.8 m deep, with an active spring in the southeast corner at the back, which flows into the nearby stream. With the landowner's permission, photos were taken and the rockshelter was mapped. The rockshelter is fenced off and PVC pipes direct the spring water to the owner's home and a series of three swimming pools, which are open to the public. No evidence of ritual uses of the rockshelter was observed including smoke blackening, and the landowner indicated that no such modern uses had been associated with this cave.

#### PACHC05

PACHC05 is a small niche, measuring approximately 1.8 m wide, 1.0 m high, and 1.5 m deep. Our guide had informed us that the spring that flows out of this niche supplies water to a section of Chocóla. The niche had been sealed within the past year in order to avoid contamination of the water supply; its floor surface is completely covered by cement. As is the case with La Ventana, there is an accessible cement block in the entrance along with several others, which follow the stream that flows southwest of the niche. The only evidence of use was a small area of the niche ceiling that showed possible blackening due to smoke. Our informant described that, before the cave had been sealed off, it was a place where rituals had been conducted.

#### PACHC06

PACHC06, located in an area previously known as "La Colección" due to the variety of coffee plants on the plantation, is a collapsed cave whose entrance is mostly covered today. According to our guide, the cave had at one time been large enough to enter—the entrance perhaps measuring 2.5 m high, 5 m wide, and 3 m deep. The wide depression in front of the small cavity visible today was likely the cave entrance. We were told the cave had a seasonal spring, but the drainage pipe that had been placed to direct the water had caused the surrounding matrix to become unstable and collapse.

#### Cueva del Diablo

The last cave is located on a rubber tree plantation about 18 km southwest of Chocóla. Locally referred to as Cueva del Diablo, the rockshelter is on the southern bank of the fast-flowing Río del Sis. The rockshelter measures 6 m high, 6.4 m wide, and 3.5 m deep. The entire rockshelter was wet from water drippage, and the streams of water falling from the edge of the rockshelter demarcated a clear dripline, coinciding with the row of stones placed at the entrance to the rockshelter. Remnants of ritual activities were observed on the flat surfaces of three waist-high ledges—two larger ones with a smaller one on top—that jut out. These ledges served as *mesas*, as they were covered in a carbonized layer of loose sediment along with other material remains including newspaper fragments, various bottles, candles, burned cans, animal bones, egg shells, a cigarette box, and an aluminum casing for incense. The ceiling and the back of the rockshelter contained soot. Although our guide indicated

that the rockshelter is not used often, he reported that a group of people had visited the rockshelter the previous week to conduct a ritual.

#### Local Folktales

In our interviews with local community members, one particular folktale—albeit with variations—was recounted to us repeatedly, in which a *gallo* (rooster) appears near caves. Two of the caves we visited (La Ventana, PACHC06) and another near Chocóla that we were unable to visit were identified as such places. According to our informants, a rooster of pure gold or a white rooster appears in front of the cave entrance and crows. We were told these *gallos* are *encantados* (bewitched) because they have the power to make people follow them and not return. In the case of La Ventana, once a man followed such a *gallo* into the depths of the cave and never came out. This incident was recounted to us as part of the reason why the cave was sealed off. We were also informed that the cave was closed off to prevent contamination of the water. The significance of the *gallo* is unknown.

#### Some Implications to Cave Archaeology

The brief study near Chocóla provides some ethnographic examples of spatial uses of caves. In the three caves that presented evidence of modern ritual uses, the main altar where material remains were concentrated is located at the deepest part of the cave or rockshelter. Altars were identified by having candle wax and remnants of flowers, and soot was found on the adjacent cave wall and ceiling. In the case of La Ventana and Cueva del Diablo, the main altar—an elevated flat surface—abuts the back wall of the cave, allowing the visitor to face toward the supernaturals who reside deeper in the earth. At La Ventana Campana, no such altar was found, but the deepest chamber contained a central mound of burned offerings, suggesting its function as a principal area of activity. Other locales where offerings were placed are smaller than the principal altar and include ledges and niches found along the cave walls, either elevated in the wall or on the floor. Rocks with flat surfaces were also used to hold candles. The altars usually contained only the most recent set of offerings, as any old remains are cleared off to the side or thrown outside the cave. The majority of these altars are found in the dark zone where sunlight does not reach—toward the deeper end of the cave—perhaps suggesting proximity to the supernaturals residing in the earth.

Aside from the altars, another significant activity area is the platform constructed immediately outside the cave entrance on one or both sides. They are low, earthen platforms, placed parallel with the cave wall and bordered along the outer edge with a one- to two-course-high rock alignment or tree trunks that function as retaining walls. As we witnessed at La Ventana, they are used for *quemados*, or burnings of offerings as sustenance for the supernaturals, and may be called *mesas*. At La Ventana, we documented three circular areas with burnt matrix and the cliff face above the platform contained soot, indicating that the platform is regularly used

for such burnings. La Ventana Campana presented a similar case with the entire platform surface being covered in burnt matrix and the cave wall above the platform blackened from thick soot. The use of the space outside the cave entrance as a prominent locus of ritual activity has important implications for archaeologists studying cave sites, because archaeological investigations (including the mapping process) tend to focus on the interior of caves without giving much consideration to the immediate exterior spaces (cf. Ishihara-Brito et al. 2011).

Furthermore, in the case at La Ventana, three middens were located outside the cave: a large one consisting of candleholders, beverage bottles, plastic bags, and empty food cans, located along the slope in front of the cave that leads to the stream; a smaller one consisting of old flowers, used candleholders, and empty beverage bottles adjacent to the platform; and an even smaller one surrounding the row of stones used as seats, containing trash from foods and drinks that were consumed by the accompanying family members. At Cueva del Diablo, no middens were found but it is likely any such remains are washed away by the fast-flowing river adjacent to the cave. The limit of the cave as defined by the combination of the cave proper and the exterior area associated with ritual activities is demarcated by the line of vegetal growth that begins abruptly due to maintenance and use of the platform by clearing and burning.

In addition to the *mesa* outside the cave, at La Ventana, offerings were also burned inside the cave on the floor, not necessarily demarcated by architectural features or other physical delineations. Two circular burnt marks were found by the cave walls: one by the entrance and another midway into the cave. Two small burnt remains with partially carbonized cigar fragments and candle wax were observed in front of two of the larger altars at the back of the cave, and there were a few additional ones in the elevated earthen area (not the main altar) in the northeastern part of the cave.

A striking characteristic of most of the caves visited during the study is the close association between water and caves. In six of the seven caves we documented, a spring emerges from the depths of the cave (La Ventana, PACHC04), a stream or river runs adjacent to the cave (La Ventana Campana, PACHC03, PACHC05, Cueva del Diablo), or water drips inside the cave (La Ventana Campana, Cueva del Diablo). With regard to the seventh cave that had collapsed and could not be entered now, we were told it had a seasonal spring that ran only in the rainy season. At La Ventana, despite the fact that the majority of the cave is covered by a cement floor, water streamed from at least two points in the earthen, northeastern part of the cave, leaving the cave floor completely wet. At Cueva del Diablo located on the banks of a fast-flowing river, the highly active water drippage during the rainy season would create a “curtain of water” at the entrance of the rockshelter, which surely augmented the significance of the place. In addition, a pool of water that formed between the large boulders in front of the cave may also have been an important component of the ritual space at the rockshelter.

Apparently, the mere presence of water was not sufficient to make a cave ritually significant, as not every cave with water was a place to perform rituals—at least not today. Only certain waters and caves had special significance. For example, the spring at La Ventana is valued for its medicinal properties in curing illnesses. One informant mentioned that he has bathed in it because the water at La Ventana is “pura medicina.” Only the water from this particular cave has these qualities because, we were told, La Ventana was “different” from the other caves in the area. A similar case is reported from Esquipulas, where water collected from Río Milagro in front of the cave has curative properties (Brady and Veni 1992:155; Smith 1979:27). The practice of collecting materials of medicinal value from cave contexts is not limited to water but also clays found within caves (Brady and Rissolo 2006).

In prehispanic subterranean contexts, watery areas are often where concentrations of cultural remains may be found. Underground pools of water are frequently areas that received special attention. The most famous example is the water-filled Sacred Cenote at Chichen Itza where a large quantity of offerings was recovered (Coggins 1992; see also Tozzer 1941). Bodies of water in Naj Tunich were associated with ceramic offerings and architectural features including altar-like structures and an earthen platform (Brady 1989:415-416). At Actun Tunichil Muknal, Cayo District, Belize, a cave system through which a river runs, rimstone dams where water pooled were particularly favored spots to deposit ritual remains including ceramic jars and human bodies (Moyes 2001:106-107). At Stela Cave in the Cayo district of Belize, a semi-circular arrangement of stones was found atop a now desiccated travertine (rimstone) dam formation in one corner of the chamber. This area with the stone arrangement was enclosed in part by a cave wall with evidence of speleothem breakage and possible charring (Ishihara and Griffith 2004). In Quintana Roo, parallel patterns were observed in sinkholes and caves, where pools of water were foci of activities (Andrews 1970; Rissolo 2005:346, 361-363). As the inner parts of the mountain-earth from which clouds, rain, lightning, thunder, and the first maize originate (Burkitt 1920; Gossen 1974:21; Groark 1997:25), the cave is analogous to the womb, and thus, watery spaces within caves may have been particularly charged places. In addition to standing bodies of water, areas with water drippage from the cave ceiling are also spaces where ritual deposits are found. In the Main Chasm at Aguatemala, concentrations of ritual remains were documented in areas wet from water drippage, and was likely a factor that added value to the importance of the place (Ishihara 2009:20, 67-68, 71, 223, 224). Water drippage may have been perceived as the cave sweating—a sign that the cave, and hence, the earth was alive (Brady et al. 2005:218).

The geological nature of the caves in the Maya Lowlands accounts for the frequent association of caves and water, as the karstic caves of the lowlands including cenotes are created by dissolution of the soft limestone bedrock by water. We provide empirical evidence that, in the piedmont, caves are

also physically related to water in the form of springs and drip water. At Cueva Julimax<sup>2</sup> in Patzicia, Chimaltenango, associated with Preclassic sculptures and occupation through the Early Classic period, the Julimax Stream emerges from the cave (Robinson 2005; Robinson et al. 2008). Of the numerous caves and rockshelters containing rock art in the Guatemalan piedmont and Highlands surveyed by Stone and Ericastilla Godoy (1999), Siete Manos in Jutiapa, La Piedra de Ayarza in Santa Rosa, and El Manantial in Quetzaltenango were reported to be found in close proximity to bodies of water such as springs and a lake. In one of two artificial tunnels at Llano Largo on the outskirts of Guatemala City, water drips from the ceiling and runs off into an artificially created shallow pool at the cave entrance (Brady 2004:5). This observation in the piedmont and highlands indicates that the cave-water relationship is not restricted to the lowlands, and is a pan-Maya area phenomenon, valued by the visitors of these areas as particularly meaningful locales. Although the significance and nature of the rituals enacted at watery spaces in caves must be examined and considered within each specific context, conceptual links between caves and water have been suggested based on ethnographic research. These associations include caves as sources of pure water (Thompson 1975), caves as origins of rain clouds (Gossen 1974:21; Groark 1997:25; Guiteras-Holmes 1961:287; see Ishihara 2008:176-177), and rain-related deities residing in caves and cenotes (Guiteras-Holmes 1961:287; Holland 1963:93; Thompson 1970:267-270). The ceremony we observed in La Ventana did not use any of the water from the springs in the cave in their ritual activities, and thus we have inconclusive evidence of physical use of the water in their rituals. This observation, albeit needing further empirical data, brings a cautionary note in uncritically using J. Eric Thompson's suggestion that caves were places where *zuhuy ha* ("pure water") was collected for use in rituals (Thompson 1975:xiv).

### Concluding Remarks

As the first survey that focused on documenting caves in the area, almost one cave was recorded per day of reconnaissance in the field. This finding indicates that subterranean features are prevalent in the geography of the piedmont, contrary to a commonly held view that naturally formed caves are only found in the karstic Maya Lowlands. An understanding of the local concept of *wenta'n*, or *ventana*, as windows of the earth was essential to the reconnaissance, as we were made cognizant of the types of subterranean openings that were considered *wenta'n*: usually rockshelters and narrow tunnels, not necessarily grandiose chambers. The ritually charged modern practices at the *wenta'n* sites suggest that these places play an important role in the lives and worldview of the ritual practitioners and other visitors as locales to communicate with the supernaturals. The

<sup>2</sup> Robinson (2005) notes that while *hulim* means cave or hole and *hulima* signifies pond, local people suggest that Hulimax means sorcerer's cave.

close physical association found between many of the subterranean features and water is noteworthy because, unlike the solutional caves in limestone, the caves in the piedmont are not created by water dissolving the bedrock. Of particular importance is the medicinal value attached to water associated with at least one cave—part of a pan-Maya phenomenon. These windows of the earth—some more than others—stand as key features in the local landscape, with which community members interact for various reasons including curing of illnesses. The study has shown that the area is ripe for extended research, particularly in the field of ethnoarchaeological cave studies, for both the abundance of cave features that are frequently visited today and the general openness of many ritual practitioners in allowing us to learn about their practices.

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## 5

## The Architectural Cave as an Early Form of Artificial Cave in the Maya Lowlands

James E. Brady

Almost a half century ago, Evon Vogt (1964) pointed out the intimate relationship between Maya architecture and the natural environment when he suggested that pyramids represented sacred mountains. David Stuart's (1987) reading of the *kawak* glyph as *witz*, "hill," has now confirmed this. As more scholarship has turned to the issue, Maya archaeology has come to appreciate the deeper significance of this association as Stuart and Houston (1994: 86) note that ". . . the Maya name for human construction appears to be a metaphor for hill." Thus, human architecture was clearly identified with and modeled after these natural features. Several years ago, I proposed that caves and mountains were two components of a single complex that represented *Earth* (Brady 1997). Just as pyramids are artificial mountains, I have documented dozens of examples of artificial caves (Aguilar et al. 2005; Brady 2004; Brady and Veni 1992). The cave beneath the Pyramid of the Sun at Teotihuacan now stands as the preeminent example of the artificial cave (Manzanilla et al. 1994). If, however, there is a close link between caves and mountains, then why isn't "cave" also used as a metaphor for human construction?

I believe that in fact considerable evidence exists to demonstrate that caves were features after which much of Maya and Mesoamerican architecture was modeled. J. Eric Thompson notes that 16<sup>th</sup> century Yukatek Maya speakers used the term *aktun* to refer to both caves and stone buildings and says that this supports "Las Casas's inference that caves and temples were partially interchangeable as scenes for religious rites . . ." (Thompson 1959:124). Furthermore, this lends support to the idea that there was a close identification of temples with caves. Diego Duran (1971:183), for instance, describes the Aztec temple of Yopico as containing "an underground place or vault," which held the skins of flayed individuals. Sahagun (1981:5) says explicitly, "They cast them into a cave in the pyramid which they called Yopico."

Sahagun's account is particularly interesting because it suggests that, in addition to what might have been a general association between cave and temple or stone building, ancient peoples also constructed buildings with specific features that identified them as caves. While I am quite certain that my distinction in no way models indigenous thinking, I am treating architectural caves for analytical purposes as a type distinct from artificial caves. Because artificial caves model

natural caves closely by being excavated into the ground, they have been generally accepted by archaeology as models of and replacements for natural caves. Architecture, however, is an established category in Western thinking so archaeologists have been more reluctant to associate structures with caves even though a number of scholars have at least suggested a relationship.

Daniel Schávelzon (1978, 1980) identified the zoomorphic façades on structures across Mesoamerica as representing caves. Building on David Grove's (1973) analysis of Olmec altars, the façades are recognized as employing the same motif as surrounds the niche on La Venta Altar 4. Without going into all of the associations, Schávelzon sees this as a cultural "invariant" related to a primal myth and materialized architectonically in monster maw iconography that identifies the structure as a cave. Paul Gendrop (1980:141), while not identifying "zoomorphic portals" as caves, does identify the façades with earthly deities. He also provides characteristics of the depictions across northern Yucatan and beyond. Elizabeth Benson provides a broader pan-Mesoamerican view of architecture that she feels are metaphorical representations of caves. She notes, "Schematized caves are often related to, or interchangeable with, architecture" (Benson 1985:184). In the Codex Borgia, the two are merged with the entrance to a temple depicted as the open maw of an earth monster. The open serpent's mouth surrounding the entrance to the "Eagle House" at Malinalco also led to its being identified as a symbolic cave (Mendoza 1977). Richard Townsend (1982, 1992) has argued that the structure was utilized by the Aztecs for the investiture of provincial governors.

In the literature discussed above, architectural structures were identified as representing caves by the presence of iconographic elements that are well established motifs associated with earth openings. A second category of architectural caves consists of structures whose internal configuration suggests that they were intended to model caves even in the absence of iconographic elements identifying them as such.

John Lloyd Stephens was the first modern investigator to document one of these architectural caves during his second trip to Yucatan. Interestingly, the discovery was accidental in that he had intended to explore an actual cave as he describes:

La Cueva de Maxcanú, or the Cave of Maxcanú, has in that region a marvelous and mystical reputation. It is called by the Indians “Satun Sat,” which means in Spanish *El Laberinto* or *El Perdedero*, the Labyrinth, or place in which one may be lost. Notwithstanding its wonderful reputation and a name which alone, in any other country, would induce a thorough exploration, it is a singular fact, and exhibits more strikingly than anything I can mention the indifference of the people of all classes to the antiquities of the country, that up to the time of my arrival at the door, this *laberinto* had never been examined. My friend Don Lorenzo Peón would give me every facility for exploring it except joining me himself. Several persons had penetrated to some distance with a string held outside, but had turned back, and the universal belief was that it contained passages without number and without end (Stephens 1962:139).

Stephens immediately recognized that the walls of the Satunsat at Oxkintok were masonry and by the end of his exploration concludes:

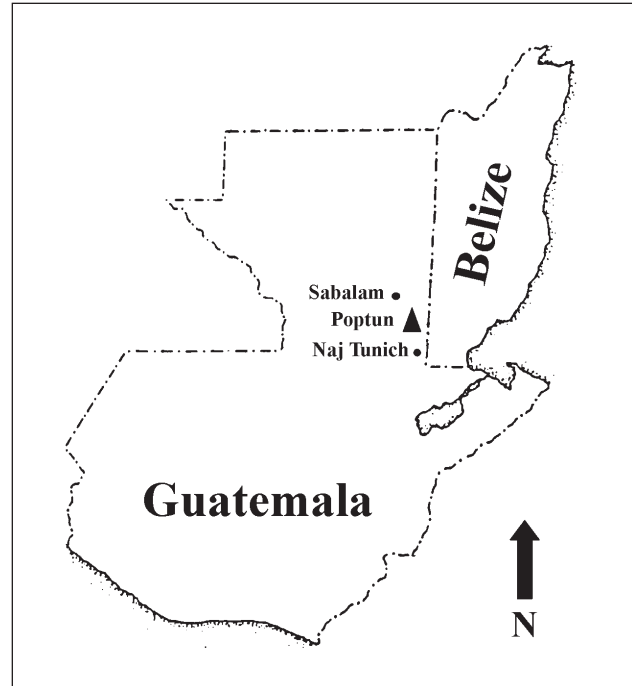
Having heard the place spoken of as a subterraneous construction, and seeing, when I reached the ground, a half-buried door with a mass of overgrown earth above it, it had not occurred to me to think otherwise; but on examining outside, I found that what I had taken for an irregular natural formation, like a hill-side, was a pyramid mound of the same general character with all the rest we had seen in the country. . . . The door of El Laberinto, instead of opening into a hillside, opened into this mound, and . . . instead of being subterraneous, or rather, under the surface of the earth, was in the body of this mound (Stephens 1962:143).

Interestingly, Mercer (1896) took a sample of ceramic from the Satunsat during his visit. Brainerd (1958:15) reports that most of the material consisted of “figurine incensario fragments dating from shortly before the Conquest, another evidence of Maya religious pilgrimage to ancient sites.” It seems clear then that the indigenous view of the Satunsat as a cave was established before the arrival of the Spanish.

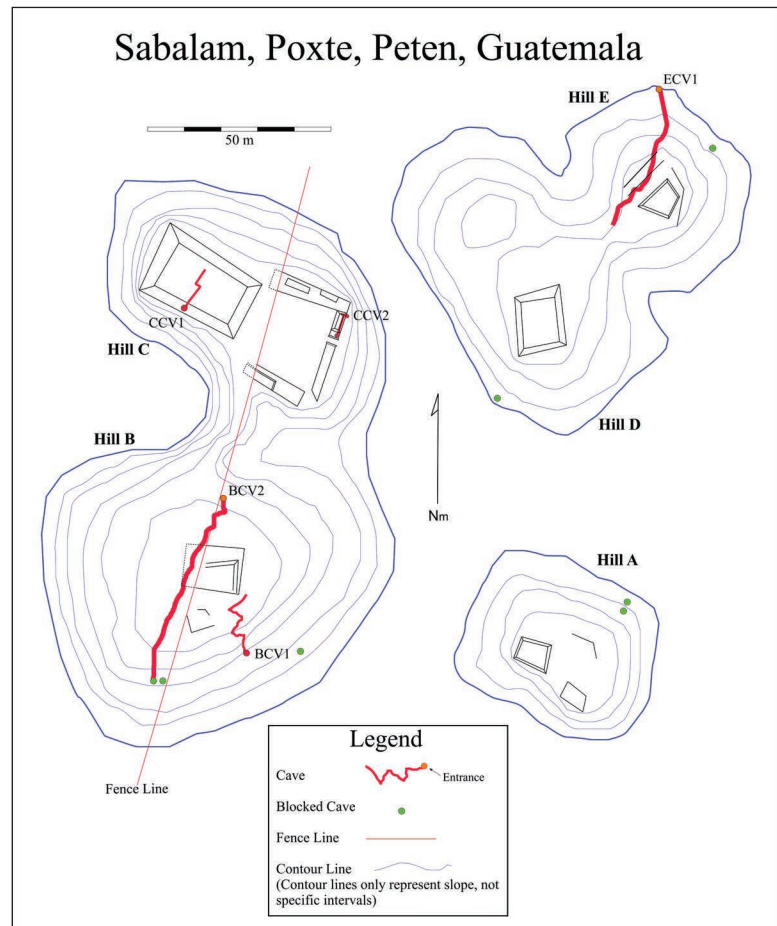
### Sabalam

Sabalam is a rural settlement located some 15 km northwest of the modern town of Poptun in southeastern Peten, Guatemala (Figure 1).

**Figure 2.** Plan view map of the site of Sabalam showing the locations of structures and caves (map by Allan Cobb).



**Figure 1.** Map of Guatemala showing the location of Sabalam in relation to the modern town of Poptun and the cave of Naj Tunich.





The site consists of four small, closely-spaced hills set in a quadrilateral pattern (Figure 2). All the hills, except Hill C, have natural caves running through them. Two architectural caves were discovered during the summer of 2004 located on Hill C as part of the most elaborate architectural construction at the site. Both caves were constructed in the fill that was brought in to level the top of the hill and both were placed directly under surface architecture. The walls were made of unshaped stoned fitted together with a flat surface facing outward. The ceiling was made from crude *lajas* laid between the two walls and the floors were paved with flat stone.

Cave 1 was built into the fill that leveled the western side of Hill C and formed the large platform that dominates that side of the hill. The entrance is 125 cm high and 59 cm wide but almost immediately widens to nearly a meter. There is a small drop in the floor of about 10 cm located 1.6 m from the entrance and a more abrupt drop of 54 cm at 2.6

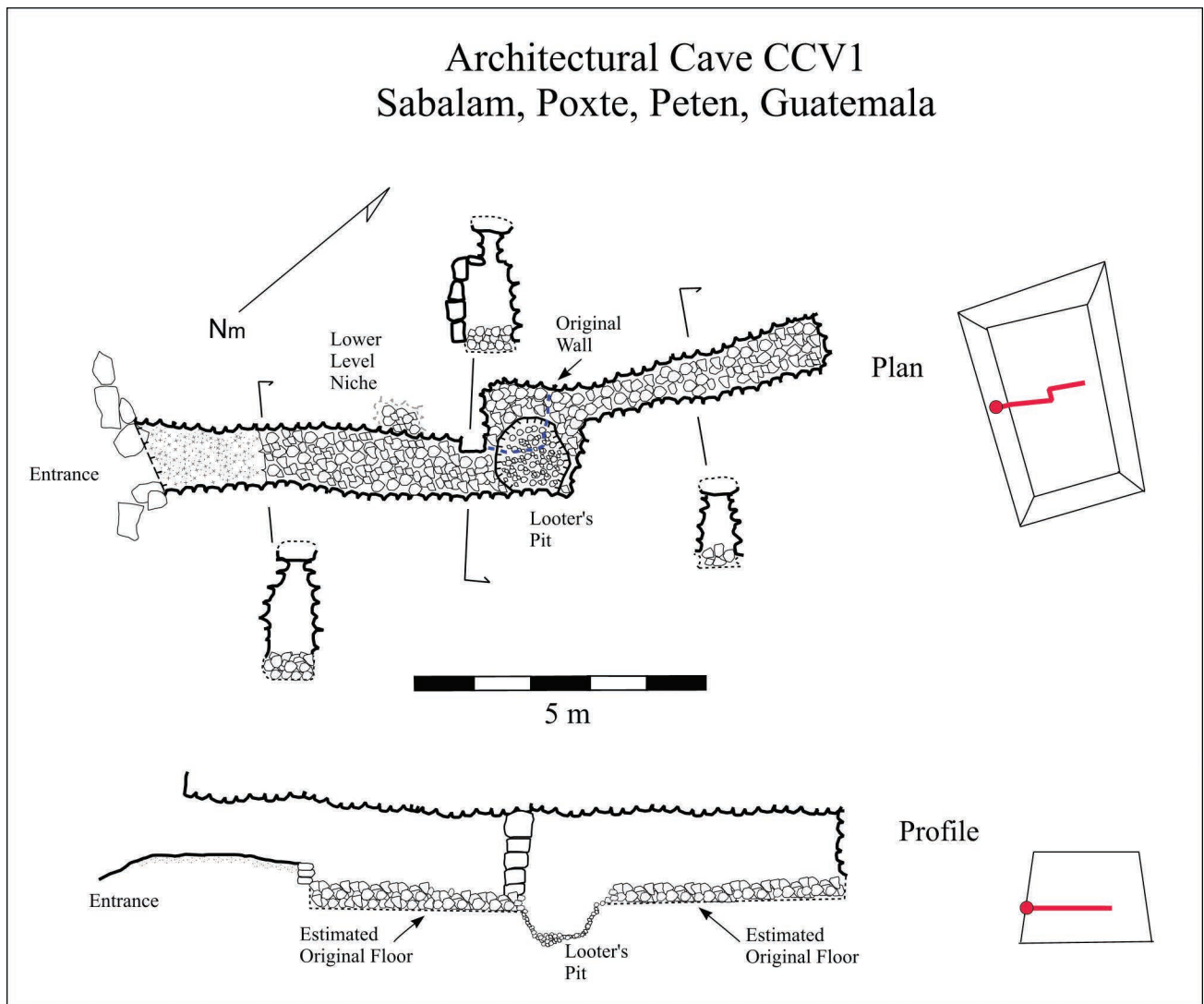
m from the entrance. At this point it is possible to stand as the ceiling reaches a height of 177 cm.

The cave is laid out in a backward **Z** form (Figure 3). The entry passage extends for 6.15 m to a point where a line of rocks juts out 30 cm from the northern wall (Figure 4). This may have been a light baffle that blocked light from entering the second passage. The passage then jogs to the north before continuing to the east another 5.6 meters (Figure 5). Because of the line of stones and the off-set between the two passages, the inner passage is in the dark zone.

At the time of our mapping, the floors of both passages were covered with stone that had been pulled from a large looter's pit a meter and a half deep in the small chamber between the two passages. Because the floor was obscured in most places it was not possible to check for the presence of artifacts. The two sherds that were found were both Pre-classic in surface finish.

Cave 2 is located on the eastern edge of the hill. Originally,

Figure 3. Plan and profile views of Architectural Cave 1 (map by Allan Cobb).





**Figure 4.** Photo of the entry passage of cave 1 showing details of construction. Note the portion of the wall extending in passage (left, rear) that may have acted as a light baffle (photograph by Alezandra Brady).

**Figure 5.** Photo of the inner passage with a person for scale. Note the floor is covered in rubble from recent looting (photograph by Allan Cobb).



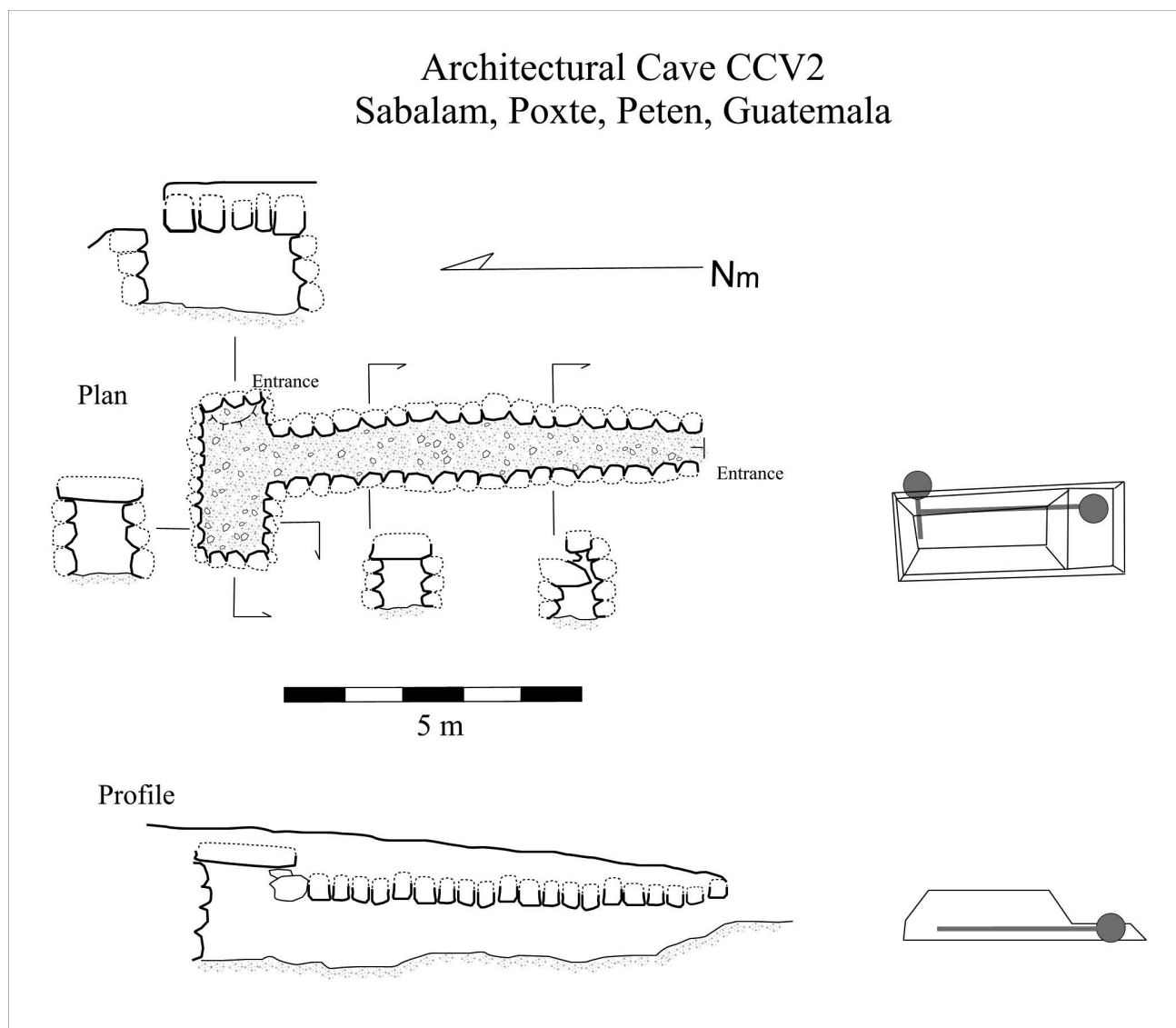
a long low passage starting at the southern end of the platform gave access to a rectangular chamber. That passage is now filled with enough silt that it is no longer humanly passable. The passageway is 7.64 meters long, 1.03 m high and 0.86 m wide (Figure 6). It appears always to have been open which would preclude it from having been a tomb. At the time of our investigation the passage was partially filled with soil so that its entire length was not passable. We entered the main chamber through an opening created when several stones were pulled from the side of the structure during recent looting activity. The chamber is 2.39 m long by 0.8 m wide and 1.54 m high. A small looter's pit indicates that the floor was paved with flat stones but this is now buried beneath 15 cm of soil. A single Preclassic waxy-ware sherd was found in the looter's backdirt.

The ceramic, although not abundant, is equivalent to the Preclassic material recovered from the nearby site of Balam Na (Brady et al. 2003) and the burials in Cave 4 at that site are thought to be from settlement in the immediate area such as Sabalam. Since the appearance of the publication on Cave 4 (Garza et al. 2001) a radiocarbon sample (AAR-9641) from a tooth yielded a two sigma range for the burial of 420 – 200 B.C. with the highest probability suggesting that it falls between 410 – 350 B.C. Sabalam is considered to be contemporaneous with Balam Na.

### Discussion

Considerable evidence exists that an array of structures across Mesoamerica were understood by indigenous societies, either because of their form or iconographic decoration, to represent caves. Pyramids and platforms represented mountains while enclosed spaces represented caves, especially if that space was in any way sacred. Together these were the embodiment of the animate, sentient *Earth*. Why has this not been better recognized or accepted? The fault appears to lie in several intellectual traditions in Mesoamerican studies. During the first half of the 20<sup>th</sup> century, the classificatory bent of archaeology trained practitioners to set up typologies as a way of organizing, understanding and explaining material. Thompson, for instance, notes that caves were one of three major focuses of Maya ritual (Thompson 1970:183), with mountains and temples being the other two. Setting up this typology appears to have erected mental barriers between the categories and prevented him from seeing the relationship between the parts. Mountains and caves are two parts of the same symbol representing *Earth*, while temple pyramids are the architectural expression of that symbol.

Later, as processual archaeology marginalized the study of religion and cosmology (Prufer and Brady 2005), these areas became the province of iconography. Here the influence of structuralism also obscured basic interrelationships between the different elements. Dichotomies generated by Western analysts were imposed on Mesoamerican data with little critical thought about the salience of those categories to the original society. Mountains and caves became opposed to architecture as reflecting the dichotomy between natural versus cultural. Caves became structural opposites



**Figure 6.** Plan and profile views of Architectural Cave 2 (map by Allan Cobb).

to mountains primarily because of secondary, very Western, meanings that generated and drove the entire analysis. This is exemplified in the statement, “The womblike cave has a structural opposition – in all senses – to the pyramid, which may be built over the cave as a glorifying, sky-pointing cover. ... The pyramid is, of course, an architectural mountain with secondary meanings of highness, heaven” (Benson 1983:184). As already noted, cave and mountain, rather than being opposed to one another, are two potent symbols of *Earth* that are then replicated in architecture. The natural versus cultural dichotomy that is so important in Western thought, does not appear to have a great deal of salience in Mesoamerican thinking. This is nowhere better illustrated than in Sahagún where *tepetate* quarries are mentioned as a type of cave. Even though they were created by humans for the extraction of building material, this did not stop them from being, in indigenous thought, “a place of magic, a supernatural place,

a lurking place, a hiding place, a crouching place, a spying place” (Sahagún 1963:276).

The two architectural caves at Sabalam are interesting in calling attention to the early date of this architectural form. The find is not unique, however, in that other Preclassic examples have been reported. In Central Mexico, Bodo Spranz (1967) found passages leading to a chamber containing a large basin carved from a monolithic chunk of basalt inside a major pyramid at Totimehuacan, Puebla. This architectural cave was dated to at least 200 B.C. These discoveries suggest that architectural caves had become an established and widely distributed architectural form by the close of the Middle Preclassic. There may be even earlier precedents if one considers La Venta Monument 7, the buried structure constructed from basaltic columns, as representing a cave (Figure 7).

While the Sabalam architectural caves and all the



**Figure 7.** Monument 7 at La Venta, originally a buried structure constructed from basaltic columns, may have represented a cave (photograph by the author).

the significance of the word *na* (house and by extension, building). The use of terms for cave in many Maya languages translates as “stone house” suggesting that a close conceptual association between caves and stone structures may have existed across the Maya region (Stone 1995:35-36). The question of intent is not, however, one that needs to be addressed through inference. The Maya and other Mesoamerican people frequently told us exactly what their buildings were supposed to mean. The zoomorphic façades discussed earlier provide a very explicit statement: as one passes through the doorway of this structure, one enters a cave.

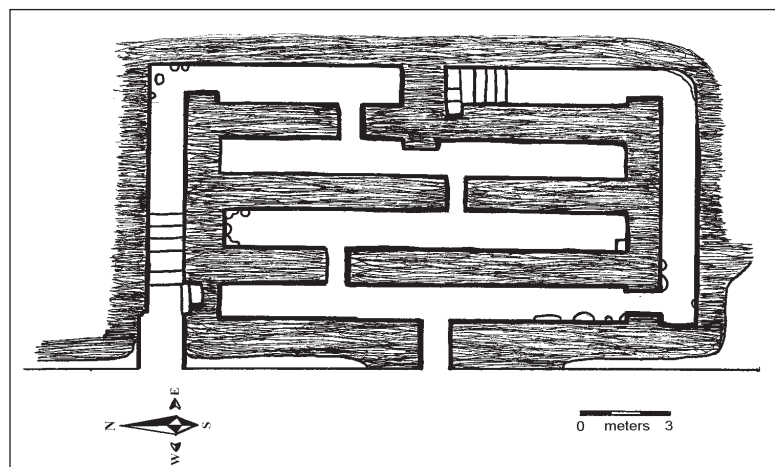
Preclassic architectural caves mentioned above are small and simple in form, they become much more elaborated during the Classic Period. Returning to the example discovered by Stephens, the Spanish Proyecto Oxkintok cleared and restored the Satunsat in the 1980s. Miguel Rivera (1987, Rivera Dorado and Amador Naranjo 1993), who directed the work, explicitly identifies the lowest level as representing a cave (Figure 8). He pointed out the similarity of the Satunsat to Structure 19 at Yaxchilan and the Palace of the Underworld at Tonina. Structure 19 at Yaxchilan, also referred as the Labyrinth, features “dark, bat filled” passages and “pitch-black stairways” passing through three levels, two of which are at least partially subterranean (Tate 1992:182-183).

These examples of architectural caves are widely separated geographically so they do not appear to be the product of a single regional architectural style and all appear to date to Late Classic. While the form of the Sabalam caves differs markedly from those at Tonina, Yaxchilan and Oxkintok, this may simply reflect the fact that Sabalam predates those Late Classic examples by a millennium. At the very least, the Preclassic date for Sabalam allows us to appreciate the fact that structures like the Satunsat are the products of a long tradition that culminated in temples like Yopico and Malinalco at the time of the conquest.

The documentation of structures whose form or decoration was designed to represent caves brings us back to the question raised at the beginning of this discussion. Did caves serve as a basic model for some forms of Maya architecture in the same way that hills were the prototype for pyramids? The use of the word *aktun* in 16<sup>th</sup> century Yucatan to refer to both caves and stone buildings is certainly suggestive in light of Stuart’s (1998) discussion of

The evidence, therefore, strongly suggests that caves were a basic model for Maya construction.

This discussion of architectural caves complements earlier work by Vogt, Stuart and Houston that underscored the close conceptual relationship between hills and architecture. The fact that the structures I have presented were metaphorical caves often sitting on platforms or pyramids that were metaphorical hills offers tangible evidence that cave and hill, and by extension temple and pyramid, functioned as a unified expression of the close identification with *Earth*. The fact that most of the examples of architectural caves have been carried out in public and elite architecture is not surprising. In his discussion of zoomorphic façades, Schávelzon draws explicit parallels with Grove’s analysis of Olmec thrones where the cave is a central legitimizing motif of rulership. The rural, Middle Preclassic Sabalam examples hardly fit this pattern, however. Instead, the Sabalam caves may have been identified with other aspects of the cave cult. Among modern Maya the association with rain and vegetal fertility is a pivotal concern that their ancestors would have shared. The cave is also the place of creation or origin and so is linked with the people’s claim to the land (Garza 2009:52),



**Figure 8.** Floor plan of the lowest level of the Satunsat or Labyrinth at Oxkintok (drawing by Nicholas Y. Harp after Miguel Rivera (1987) and Ferrándiz Martín (1990)).

another vital concern of agriculturalists. The fact that caves carried multiple important meanings that resonated with different segments of society explains why architectural caves remained a relevant form that continued to be constructed over several millennia of Mesoamerican history.

### Acknowledgements

This study was carried out as part of the Atlas Arqueológico de Guatemala. The author wishes to thank the director, the late Juan Pedro Laporte for his help and support. The project was funded in part by Danish explorer Christian Christensen. The success of this project was in a great part due to Allan Cobb's participation. Thanks is also rendered to Melanie Saldaña for her comments on an earlier draft of this paper.

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6

Je'reftheel, Roaring Creek Works, Belize

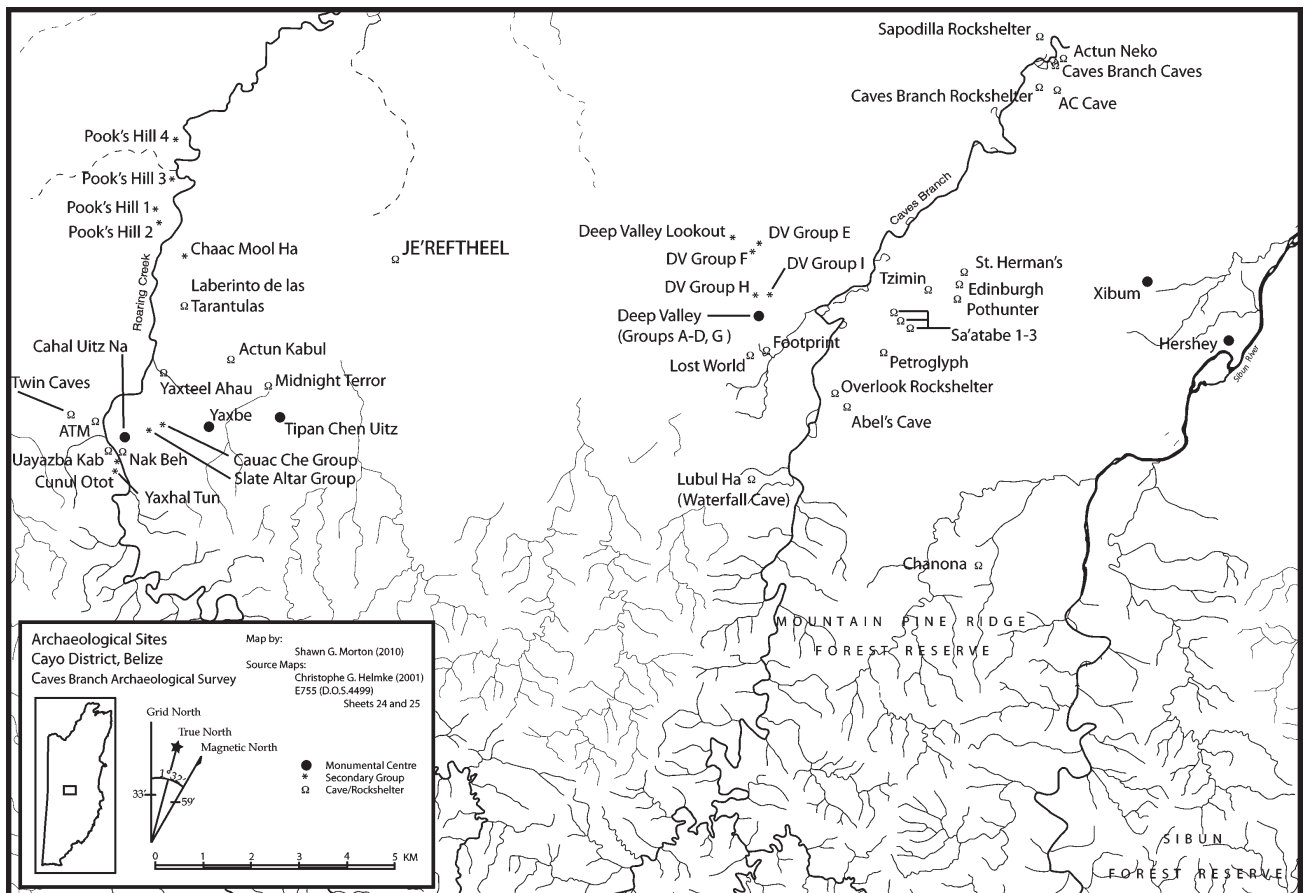
Christophe G. B. Helmke and Gabriel D. Wrobel

The small dry cave of Je'reftheel (Plautdietsch for 'Skel-ton Cave,' a.k.a. Franz Harder Cave after the cave's discoverer) is located on the outskirts of the modern Mennonite village known as Springfield in the eastern karstic hills of the Roaring Creek Valley (Figure 1). The area is generally known as the southern Roaring Creek Works and refers to a series of limestone hills defined by the course of the Roaring Creek to the west and the Caves Branch River to the east. Recent settlement has resulted in the nearly complete dismantling and leveling of all ancient housemounds in the direct vicinity of the site (Franz Harder, personal communication, 2003), and thus we cannot speak to the relationship of Je'reftheel

to a specific community in antiquity. However, it should be noted that during recent investigations, members of the Caves Branch Archaeological Survey (CBAS) project have observed the presence of housemounds in several locations in the surrounding area, and have documented the existence of several new large urban cores (Andres et al. 2011). These data suggest the presence of relatively dense settlement and a social hierarchy established in the area during the Late Classic period.

Access to the cave is gained via a small diagonal fissure (measuring at most 4.5 m wide and 0.6 m high) in a limestone outcrop. This fissure opens up into a narrow vertical

**Figure 1.** Map of the Caves Branch and Roaring Creek Valleys, showing the location of Je'reftheel and neighboring archaeological sites. Map by Shawn Morton.



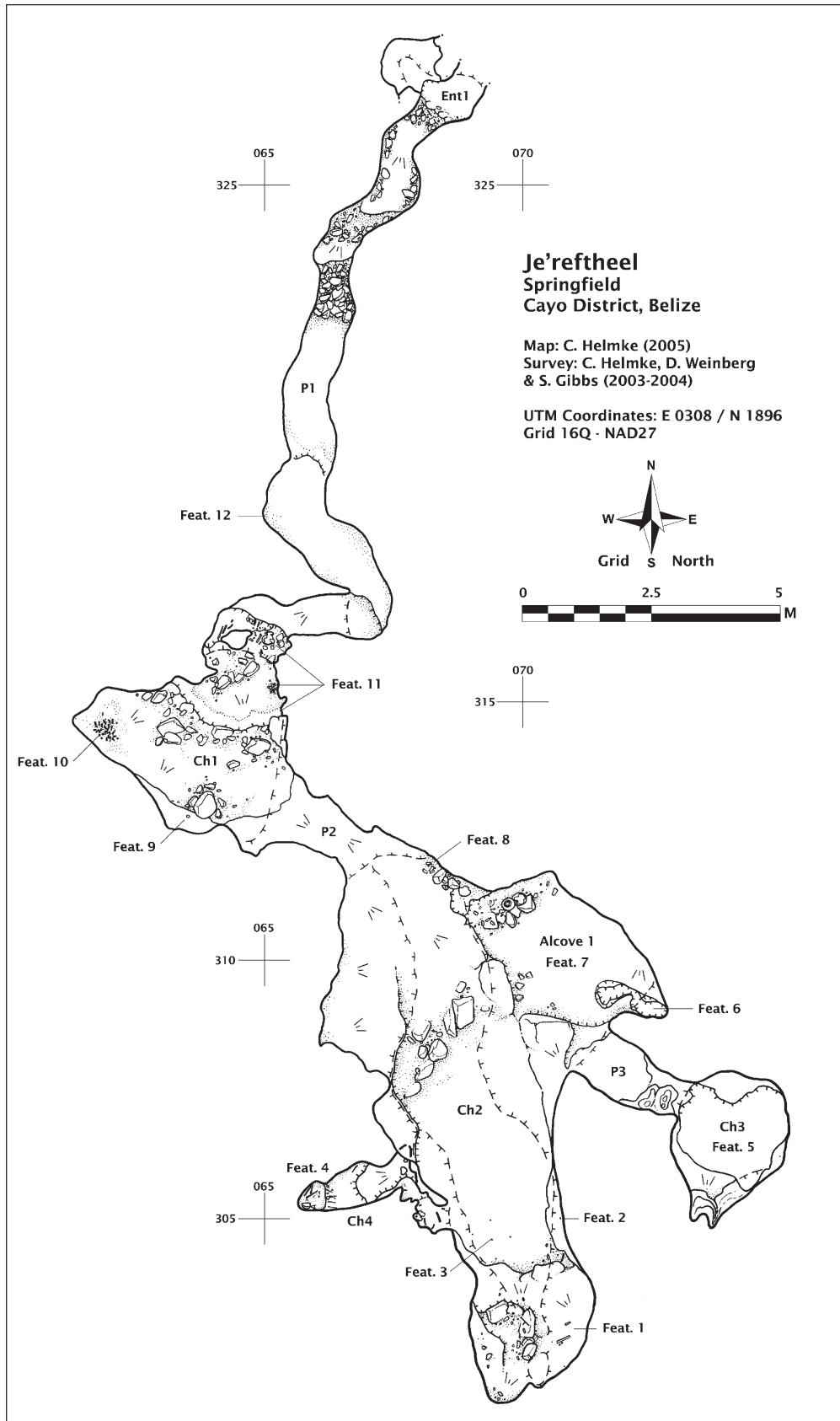


Figure 2. Plan of Je'reftheel indicating the location of archaeological features.



chimney that is just barely big enough for an adult to squeeze into, forming the entrance. The c. 5 m high shaft connects to the narrow (c. 0.7 m wide) and high (over 5 m) Passage 1 (Figure 2). In all, Passage 1 measures at least 14 m in length (north-south). The northern end of Passage 1 is filled by a steep breakdown talus that drops sharply from the entrance. Climbing down the breakdown from the entrance, leads to the mid-point of Passage 1, where the breakdown gives way to a mostly level floor, composed of wet and very sticky clay. Passage 1 continues to the south and ends at a small ledge overlooking Chamber 1. Directly below the ledge is a deep and vertical solution funnel that punctures the flooring of Chamber 1, greatly complicating entry into Chamber 1. Even with sturdy ladders, experienced cavers have taken at least half an hour to make it from the entrance to Chamber 1 (despite the short 17 m circuit separating the two).

Although Chamber 1 measures only 3.8 by 4.4 m, its ceiling is far higher than that of Passage 1. The floor of Chamber 1 is composed mostly of colluvium formed by repeated seepage and minor collapse of the cave's ceiling. Leading off from the southeast is the narrow Passage 2 that connects to the cave's largest chamber (Chamber 2). Although unconfirmed, it seems possible that Passage 2 was widened in antiquity, based on the roughly quadrangular shape of the aperture and what appears to be a spoil heap at the western threshold in Chamber 1. Chamber 2 measures as much as 10.6 m long (north-south) and 5.5 m wide (east-west), although the ceiling is only sufficiently high to permit standing over a third of the chamber's total surface area. The northern end of Chamber 2 is characterized by limestone bedrock, while the southernmost extremity is partly engulfed by a small breakdown, covered in active drip-water formations. A sharp drop in the ceiling at the eastern side of the chamber forms Alcove 1 that is separate in terms of ambient space from the remainder of the larger chamber. At the southeastern corner of Alcove 1 is a small solution funnel that extends vertically downwards for 2 to 3 m. From the southern end of Alcove 1 is the narrow and low Passage 3 that exhibits active drip-water formations (maximum width and length are c. 1 m and 2.2 m respectively). Passage 3 connects to the small Chamber 3 that measures 2.4 m in diameter, on average, and has a maximum ceiling height of c. 1.2 m. The entire west wall of Chamber 2 is coated in drip-water and flowstone formations. A small opening (c. 0.5 x 0.7 m) in this curtain of formations leads down into Chamber 4, the cave's smallest chamber. The entirety of Chamber 4 is coated in flowstone and drip water formations. The only portions of the cave that are sufficiently big to accommodate groups of

up to five people are Chambers 1 and 2, while all others at most can only accommodate one person at a time.

### Account of Investigations

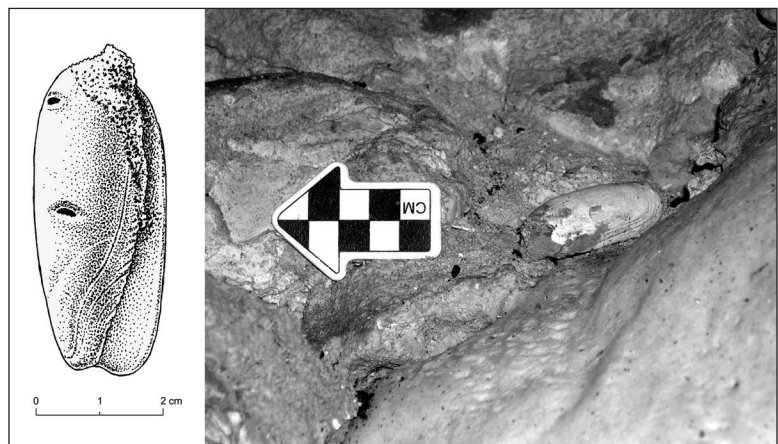
Following the initial report of Je'reftheel in 2003 to the Belize Institute of Archaeology by a group of three Springfield Mennonites, a small team led by Christophe Helmke and Jaime Awe reconnoitered the site in an effort to confirm its location and unlooted status. Later, the team began a short and intensive effort to map the entirety of the cave, produce detailed plans of archaeological features, record all artifact remains, and collect several representative soil and carbon samples. Sherry Gibbs also conducted preliminary *in situ* analyses of the human remains, indicating a preliminary MNI estimate of 18. Small teams followed up these efforts on brief visits to the cave in 2005 and 2006. In 2007, the two authors returned to carry out the specific task of documenting, exhuming and recovering the scattered surface deposits of human remains in Alcove 1 of Chamber 2 for detailed laboratory analyses. Upon discovering that many of the bones were still articulated within the underlying clay matrix, the collection activities were halted. A later team from the CBAS project led by Wrobel revisited the site in 2009 and 2010 to carefully excavate and document the position of all human remains in an attempt to discern interment practices and to interpret the nature of subsequent movement of bone. Laboratory analyses of the human remains are ongoing.

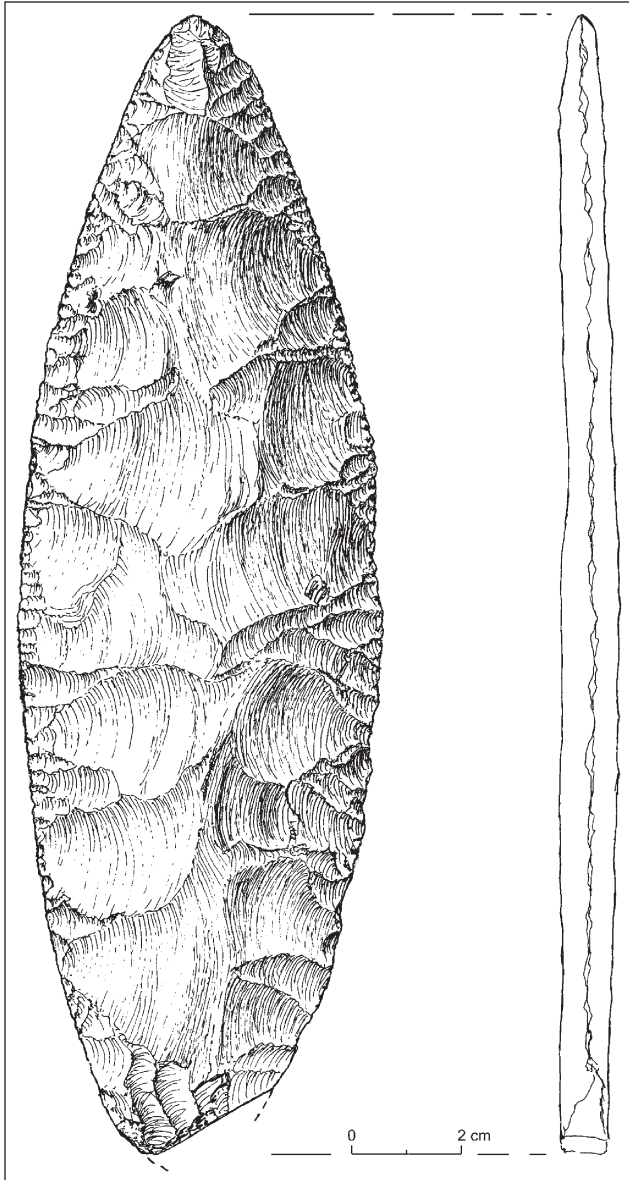
### Artifacts and Features

All artifacts and features found in association with Je'reftheel were found within the cave and the eleven identified concentrations were designated from the southernmost recesses of Chamber 2 outwards to Passage 1. Feature 1 is a small scatter of a few disarticulated human remains that is commingled with minor collapse on the breakdown slope, at the southern end of Chamber 2. The bones have been leached due to the drip-water activity in this area and are therefore quite brittle. These were likely relocated in antiquity on the basis of differential preservation.

Feature 2 refers to a perforated Olive shell (*Oliva* sp.) tinkler that had been placed on a small limestone shelf in the

**Figure 3.** The olive shell tinkler that forms Feature 2. Left: Drawing of the shell tinkler. Drawing by Gustavo Valenzuela. Right: Photo of the tinkler, calcified *in situ* onto a brecciated limestone shelf. Photograph by Christophe Helmke.





**Figure 4.** Chert lanceolate biface, from Chamber 4. Drawing by Gustavo Valenzuela.

southeastern portion of Chamber 2 (Figure 3). The tinkler had been deposited there in antiquity with flowstone subsequently bonding the artifact to the shelf. The presence of more tinklers in Feature 5 (discussed below) may indicate secondary movement of primary deposits within the cave, although it seems probable that the olive shell tinkler was purposefully placed at its find spot and constitutes its own discrete feature.

Feature 3 is a dense cluster of highly commingled human remains, composed mostly of long bones (MNI = 3). The feature is situated in Chamber 2, at the southern mouth of the entrance to the small Chamber 4. The feature has the appearance of a ‘bundle burial’ (see Reese-Taylor et al. 2006). Since no textile remains were found with the feature, the bundling of these bones remains open to question, although these were clearly gathered into a discrete cluster secondarily, subsequent to ossification.

Feature 4 comprises all the human remains that have been found within Chamber 4 and the narrow passage connecting it to Chamber 2. At the western extremity of Chamber 4 the human remains are represented mostly by long bones and a fragmentary mandible, while the smaller passage contains two skulls and smaller bones. Included within Feature 4 was a complete, finely knapped, chert lanceolate biface (Figure 4).

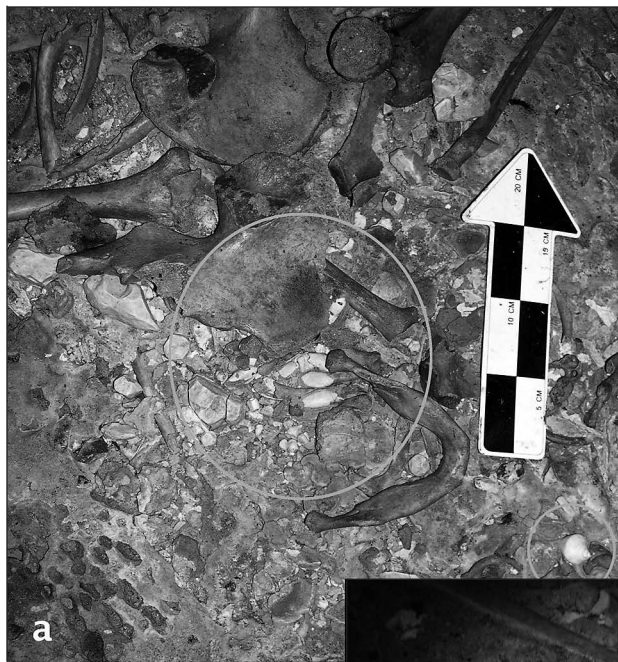
Features 3 and 4 lie directly beneath a shaft in the cave ceiling in which numerous bats roost. A comparison of pictures of Feature 3 taken in 2003 and 2009 shows the rapid deterioration and displacement resulting from the accumulations of guano, as well as the death and putrefaction of dead bats in the area during this interval (Figure 5). The area around Feature 3 slopes slightly down to the very small passage containing Feature 4. Features 3 and 4 may therefore represent part of the same deposit, since there is no distinct

**Figure 5.** Pictures of Feature 3 taken in 2003 (left) and covered by guano in 2009 (right).





**Figure 6.** Panoramic view of Feature 5 within Chamber 3 (looking south-east from Passage 3). Composite photo-mosaic by Christophe Helmke.

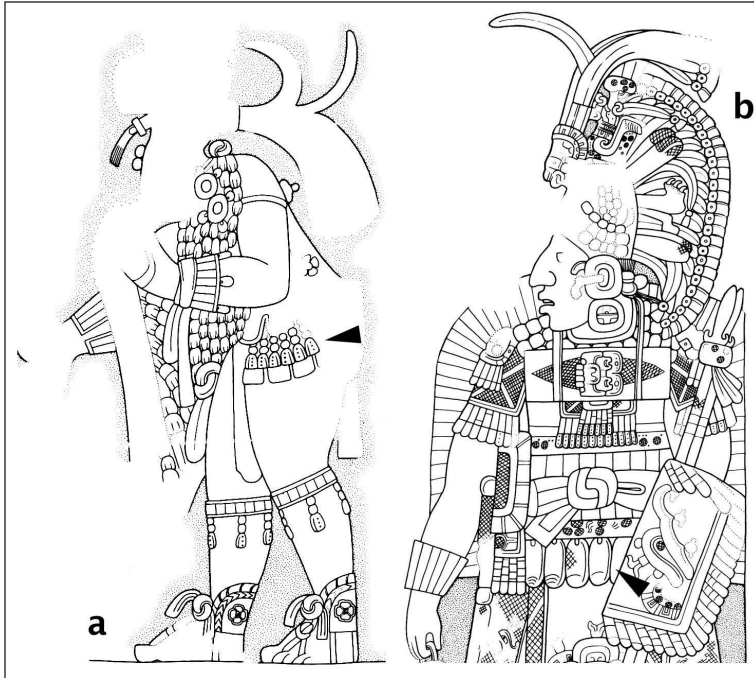


**Figure 7.** The concentrations of perforated shell tinklers, Feature 5, Chamber 3. **a)** A concentration of shells associated with pelvic bones (encircled). **b)** Close-up view of the shell tinklers *in situ*. Photos by Christophe Helmke.



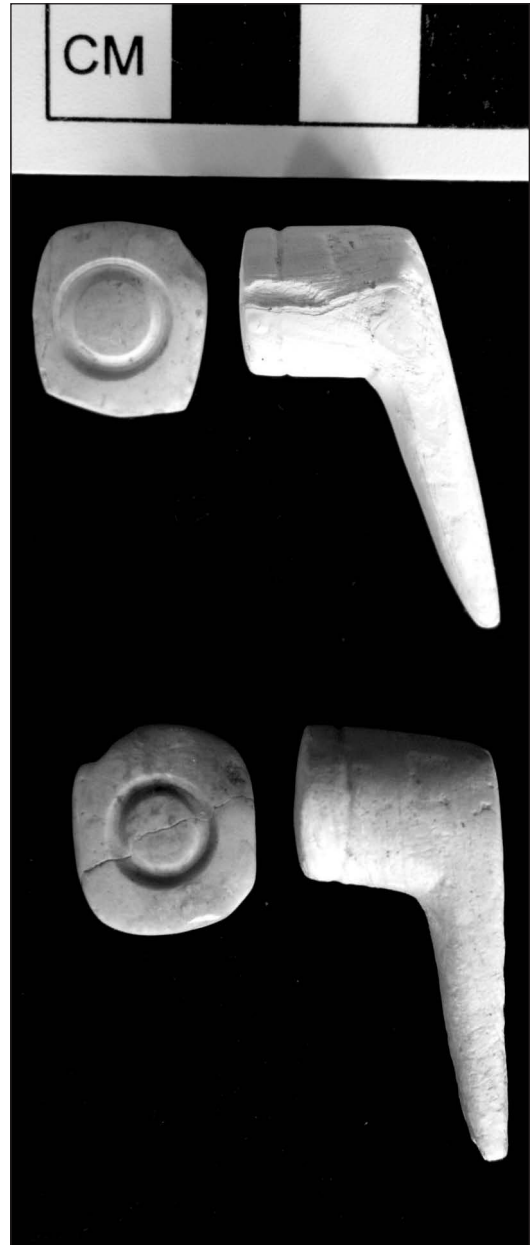
break within the bone scatter. Gibbs's *in situ* analysis in 2003 (prior to the putrefaction of bats) identified an MNI of 3 for Feature 3 and 4 for Feature 4.

Feature 5 represents all the well-preserved and highly commingled human remains of Chamber 3, as well as associated artifacts (Figure 6). Artifacts included a small ceramic jar (Vessel 1), numerous perforated Dwarf Olive (*Olivella* sp.) shell tinklers and other marine gastropod shells, L-shaped adornments made of carved shell with greenstone appliqués, several carved shell *adornos*, and a stemmed chert biface. One cluster of tinklers found in association with pelvic bones (Figures 7a and 7b) originally must have formed part of a belt assemblage, in keeping with iconographic representations (Figure 8). Another cluster was found encircling an articulated wrist, and it likely formed a bracelet (Figure 9). In the Roaring Creek Valley, similar shell tinklers have been found in the main burial chamber of Actun Kabul, at Actun Tunichil Mucnal in the westernmost extent of the Eastern Chambers, and in special deposits at Pook's Hill. Otherwise comparable examples have been found in several other caves in the Lowlands, including Actun Balam (Pendergast 1969: 55, Fig. 10g), Eduardo Quiroz Cave (Pendergast 1971: 71, Fig. 17b-h), Actun Polbilche (Pendergast 1974: 55, 56, 59), Naj Tunich (Brady 1989: 286, Fig. 6.11a), Petroglyph Cave (Reents-Budet and MacLeod 1997: 42-43, 70-72, Fig. 49e and f), Actun Yaxteel Ahau (Owen and Gibbs 1999: 190-191, Fig. 2a), Actun Hub (Peterson 2006:



**Figure 8.** Belts of shell tinklers in Late Classic Maya iconography, associated with military regalia. **a**) The ruler *Itzamnaaj B'ahlam III* (AD 681-742) in battle, grasping the hair of a vanquished foe (Lintel 46, Yaxchilan). **b**) The ruler *K'ahk' Tiliw Chan Chaahk* (AD 693-728) in military regalia, possibly dressed as a *Yajaw K'ahk'* or 'Vassal of Fire', a priestly military order (Stela 2, Naranjo). Black triangles point to the belts of shell tinklers. Drawings by Ian Graham.

**Figure 9.** An olive shell bracelet around an articulated wrist from Feature 5, Chamber 3. Photo by Gabriel Wrobel.



**Figure 10** (above). L-shaped ear adornments from Feature 5, Chamber 3.



**Figure 11.** Stemmed biface from Feature 5, Chamber 3.

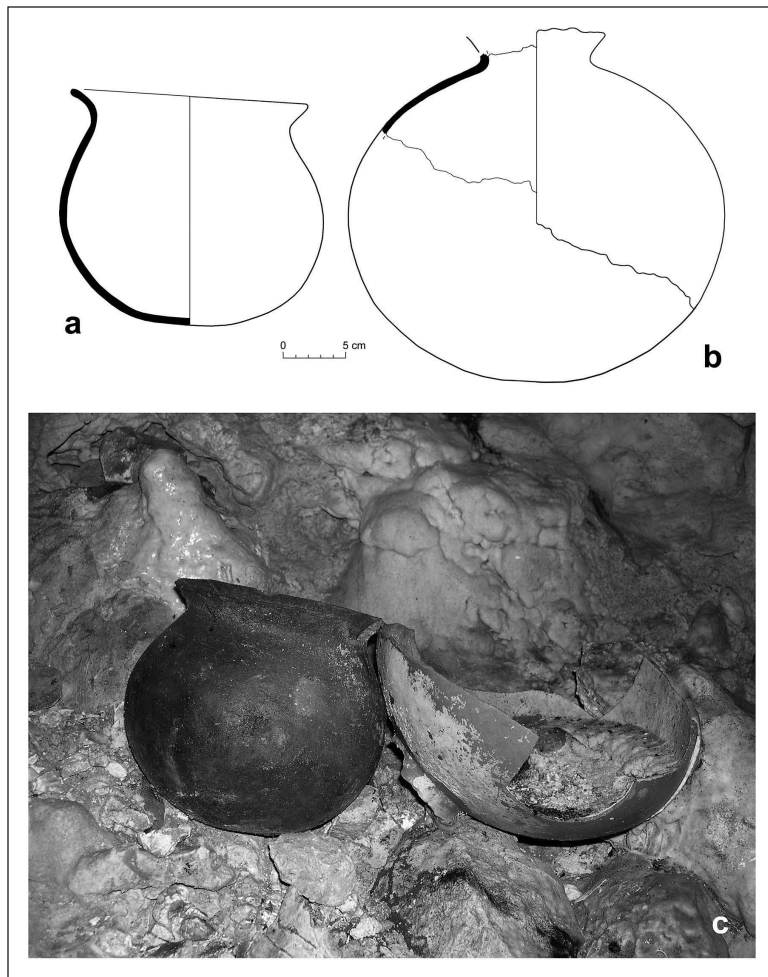
46), Midnight Terror Cave (Brady 2009: 88), and Cuychen (Helmke et al. 2011). L-shaped artifacts have elsewhere been referred to as “boot-shaped adornments” (Coe 1959: 58) and “pins” (Pendegast 1990: 188, Figs. 91, 92b-c) and have been provisionally identified as ear adornments (Pendegast 1990: 188) or labrets (Helmke 2009: 400-402). Nevertheless, as far as we are aware, the function of these adornments has not been adequately resolved to date. Significantly, the examples from Je’reftheel (Figure 10) were found as a pair in close association with articulated shoulder elements and cervical vertebrae, on either side of the skull of this individual. The context, as well as the fact that these specimens occurred as a paired set strongly suggests that these were used as ear adornments. Comparable specimens have been found at nearby surface sites, including three complete and two fragmentary ones at the Pook’s Hill *plazuela*, where these appear to have been made of dense, homogeneous and polished limestone (Helmke 2009: 402). These are very similar to examples found at other Lowland Maya sites including Deep Valley (Andres and Shelton 2010: Fig. 2.13), Altun Ha (Pendegast 1990: Fig. 92b-c, f, g-i), and further afield, at Piedras Negras (Coe 1959: 58, Fig. 55q-t). In terms of cave contexts similar examples have been noted from Petroglyph Cave (Reents and MacLeod 1997: 43, 66, 67, 93, 106, Fig. 49d), Actun Tunichil Mucnal (Helmke 2009: 400-402), Actun Yaxteel Ahau (Brady 2010: 48), and from deposits at the nearby Sapodilla Rockshelter. The biface was discovered beneath a small flat stone near the entrance to Chamber 3 (Figure 11). No use-wear was evident, suggesting it may have been manufactured specifically for deposition within the cave. In the Belize Valley, Willey et al. (1965: 412) identified examples with the same general form as “tapered stem, long blade” bifaces (see specifically Fig. 261d, p. 413) and date them to the Late Classic period (Tiger Run and Spanish Lookout phases).

Investigations by the CBAS during the 2010 fieldseason focused on creating a detailed map of all bones and artifacts

found within the small Chamber 3. This involved the removal of surface deposits and excavation within the underlying shallow sticky clay matrix. Overall, the bones were in an excellent state of preservation, perhaps because of the limited foot traffic in this area resulting from the very narrow entrance passage. However, drip water in some areas has cemented bones in place, and guano by roosting bats has also resulted in degradation in other areas. Many of the bones in Feature 5 were still in articulation, indicating that the deceased individuals were deposited before the onslaught of decay, conforming to what can be termed primary interments. Nevertheless many individual elements were seemingly scattered within the chamber, suggesting subsequent movement following decomposition. As will be discussed below, in Feature 7 it appears that later interments were

**Figure 12.** The archaeological materials that together form Feature 6, within the solution funnel at the south-eastern corner of Alcove 1, Chamber 2. Composite photo-mosaic by Christophe Helmke, based on photographs by Gabriel Wrobel.





**Figure 13.** The pair of jars that form the westernmost extent of Feature 7, Alcove 1, Chamber 2. **a)** Vessel 3 (Cayo Unslipped). **b)** Vessel 4 (Tinaja Red). Drawings by Elmer and Juan Ramirez. **c)** Vessels 3 and 4 as found *in situ*. Note how the rim of Vessel 3 has been terminated by chipping at the rim and how the fragmented Vessel 4 has a small stalagmitic formation growing inside. Photograph by Christophe Helmke.

pertain to inclusion within any specific type of social group in which sex and age were clearly defined.

Feature 6 comprises all the highly fragmentary human remains and small ceramic sherds found within the solution funnel, at the southeastern portion of Alcove 1 (Figure 12). Due to the drip-activity associated with Passage 3, it seems most likely that the materials found within the solution tunnel have been secondarily displaced from the archaeological remains found in Alcove 1. A fragmentary unslipped jar was also discovered within this solution tunnel as c. 27 sherds (Vessel 2).

Feature 7 encompasses the fragmentary human remains and ceramic sherds that are widely scattered and partly imbedded into the silty floor of Alcove 1. Two jars—one red-slipped and fragmentary (Vessel 4), the other complete (Vessel 3), except for a partially chipped lip—were set side-by-side, forming a discrete entity and the westernmost extent of this feature. A small stalagmite was found

at least in part responsible for disrupting articulations of earlier ones. While this may also be the case in Feature 5, no bodies were completely articulated, suggesting that some other mechanism was at work as well. Our investigations in part sought to determine whether this movement of bones within the cave resulted from intentional manipulation as part of an extended mortuary ritual, intentional or unintentional displacement of bones in conjunction with the placement of later interments, and/or taphonomic forces such as water movement. Comparison of the plan view photos from 2004 and 2009 show that all six of the intact crania have shifted positions, as have some of the long bones. The mechanism(s) responsible is not clear, though certainly either occasional inundation of water or curious local visitors could be responsible. No elements present in the 2004 photo appeared to be missing during the 2010 season.

Because of the excellent preservation and nearly complete collection of the Feature 5 assemblage, our preliminary inventory confidently identified nine individuals by cranial and/or dental remains. Ongoing lab analysis seeks to match and assign postcranial elements to the skulls. An analysis of all cranial material from Feature 5 shows the presence of both sexes and of both adults and sub-adults. Thus, clearly, the rules governing interment within Je'reftheel did not

growing in the middle of the fragmentary jar, and the complete jar contained a small deposit of colluvium and a human phalange (Figure 13).

Following initial surface collection of bones from Features 6 and 7 by the authors in 2007, intensive investigations by the CBAS project in 2009 focused on exposing and documenting the position, and specifically the presence of articulations, of bones from Feature 7. The entire feature was covered in a layer of dense, light gray clay (Level 1), which appears to have washed in over time and was similar to that found in Feature 5. Removal of Level 1, which was no more than 3 cm deep, revealed a single layer of bone lying on a surface of very dark clay (Level 2). The Level 2 surface was not completely horizontal, and sloped downward slightly towards the south towards Feature 6. As a result, Level 1 had filled in the depression and was deepest in this area. Because many of the bones were still articulated, it can be assumed that Level 2 was the original ground surface on which bodies were deposited. While the dark color may be the result of the heavy organic residue left by the decomposing bodies, no such layer was found in Feature 5. No bones or artifacts were found within Level 2. Beneath Level 2, which was approximately 6 cm thick, there was a distinct and sudden transition to a layer of white clay (Level 3). On this surface

in the northernmost corner of the area lay the remains of a partial and poorly preserved globular narrow-mouthed jar (Figure 14). The vessel was missing its base, and the top half, including the rim, were crushed flat. The ceramic was heavily burned, though no ash was evident in the vicinity, and the fragments were soft due to permeation of water. Attempts to remove the vessel failed, since the sherds were too brittle, and consequently these were left *in situ*. Level 3 was directly on the underlying flowstone. The clays of Levels 2 and 3 were distinctly different in color and texture, and thus it is entirely possible that this surface was prepared for its use as a platform for the placement and disposal of the dead.

The bones from Feature 7 were in varying states of preservation as a result of erosion caused by drip water in some areas. After the rains began in late June of 2009, we noticed that drip activity increased dramatically, eroding a series of tiny vertical holes through the exposed clay. This action could easily account for the discrepancies noted in the preservation of bone in adjacent areas. During the excavation of Feature 7, five partially articulated skeletons were identified, and several other possible articulations were noted as clusters of anatomically related elements, though poor preservation prevented a definite determination of whether they represented *in situ* individuals. In addition, though, it seems quite likely that many of the bones were washed or swept into the sinkhole to become part of Feature 6. Given the estimated placement and orientations of the individuals based on the articulated *in situ* bones, they are not consistently aligned with one another and many would have overlapped if they were interred simultaneously. Instead, the bones form a single layer, and there is no evidence of any stacked articulated elements, suggesting that bones of earlier interments were moved to make way for newer ones. This specific mortuary behavior, while not previously noted in caves, is commonly reported in tomb contexts (Awe et al. 2005b: 41; Chase 1994; Healy et al. 1998; Weiss-Krejci 2004).

Feature 8 is represented by a scatter of 9 ceramic sherds,

**Figure 14.** Fragments of top half of a poorly preserved globular vessel beneath Level 2, in Feature 7.



most of which conjoin with the red-slipped jar of Feature 7 (Vessel 4). Feature 8 was deposited just 1.7 m northwest of the jars from which the sherds stem, at the foot of the Chamber 2 wall.

Feature 9 refers to a naturally-formed, cylindrical cavity that measures 6.8 cm in diameter and as much as 10 cm deep. This cavity punctures a small shelf of breccia conglomerate limestone on the southern end of Chamber 1. A cluster of wood charcoal was documented at the bottom of this small cavity, suggesting that it may have served as an expedient torch holster, a practice documented elsewhere in the caves of Chechem Ha (Moyes 2004: 5) and Xba'qel Cho'qow (Morehart et al. 2005: Fig. 6, 262).

Feature 10 is a small cluster of soda straw formations that have been deposited in the westernmost extremity of Chamber 1. The origin of these formations is unclear at present, but since the most active area of drip water formations documented in the cave is Alcove 1 and the west wall of Chamber 2, it is presumed that these may have their origin there and subsequent to breakage were cached as Feature 10 in Chamber 1.

Feature 11 is a widely scattered cluster of human remains and the fragmented remains of two jars. The human remains are scattered all along the northeastern wall of Chamber 1 and some appear to have washed down the slope, into the solution tunnel, by hydraulic activity. The remains of the two jars (Vessels 5 and 6) were found as three discrete clusters along the base of the northeastern wall of Chamber 1. The northernmost cluster consists of 19 large and intermingled sherds of the two jars, placed as though stacked, and thereby greatly resembling Feature 8. The central cluster represents the largest portions of the two jars, in which the unslipped jar was nestled into the red-slipped jar, associated with an additional 10 sherds. The southernmost cluster is represented solely by 17 small-to-medium sherds of the red-slipped jar (Vessel 5), as though this was the location where this jar had been initially smashed. We collected the scattered human remains, which seem to have been pushed or washed down from the main chamber area, from the solution tunnel. All appeared to have been recently displaced, and a preliminary visual inspection of the remains shows an MNI of at least 2 adult individuals based on cranial fragments. The general size and robusticity of the cranial features suggest that both individuals are adult males.

Feature 12 is a cluster of medium-to-large speleothems that were stacked at the foot of the western wall of Passage 1. Placement of the feature, at the widest point of Passage 1 in a small recess, suggests that these speleothems were originally scattered throughout the passage and were stacked out of the way to clear access.

### Spatial Distribution

The features containing artifacts and human bones encountered in Je'reftheel were all readily visible on the surface and minor test excavations conducted throughout the cave, for the extraction of matrix samples (for the recovery of charred macrofloral remains via floatation), revealed that

the few areas exhibiting accumulations of matrices were quite shallow (c. 10-15 cm). Consequently, the features visible on the surface amount to the bulk of the assemblage for the entire cave. Nevertheless, some artifacts and human skeletal elements are undoubtedly still concealed in these shallow matrices, as has been confirmed by the excavations of Features 5 and 7; these, however, are deemed to be negligible constituents. With the exception of Jereftheel's termini (Chambers 3 and 4, as well as Alcove 1 and the solution funnel that stems from it), one section of the cave leads to another in an extremely linear fashion. It thus stands to reason that the majority of the cave was solely used for ingress to, and egress from, the deeper areas. In fact, the only evidence of human activities encountered in the areas proximate to the entrance is Feature 12, a stack of splintered speleothems that appear to have been moved out of the path solely to facilitate access. The remaining cultural features of Jereftheel are otherwise distributed nearly equally in three principal areas: Chamber 1, Chamber 2 and collectively the termini of the cave. Chamber 1 and Chamber 2 are the only two areas of the cave that provide room for standing and the gathering of small groups of people. The presence of larger groupings of artifactual features in these areas thus appears to be a direct consequence of this fact. The termini in contrast, are all low-lying areas, which require crawling to be accessed, and few can fit more than one adult at any given time. The features present at these termini thus appear to have been deposited by solitary individuals. Despite these differences, if the number of features is taken as an indication of the intensiveness or extensiveness of ancient usage, then Chambers 1 and 2 as well as all the termini appear to have witnessed the same amount of usage and no true focal point of activities can be discerned.

#### Temporal Distribution of Ceramics

The ceramic remains found within Jereftheel were few and comprise a small sample. Compared to those from nearby caves, the ceramic assemblage of Jereftheel is relatively small in terms of frequency, types represented, and temporal breadth, and thus can be characterized as being highly homogeneous throughout. The few vessels found within the cave are all jars and only two specific sub-forms were documented: Cayo Unslipped: Variety Unspecified (Brown) vessels, which are all stout, wide-mouthed, jars that exhibit extensive black fire-clouding or charring along their bases, and Tinaja Red: Tinaja Variety vessels, which are all larger, red-slipped, highly oxidized, narrow-mouthed jars. Unlike other caves where the ceramic assemblage tends to be dominated by jars, that of Jereftheel is comprised exclusively of such jars. No other forms were documented amongst the ceramic remains.

Because the site was unlooted at the time of its first exploration, we are also in the advantageous position of discussing the complete ceramic assemblage, rather than a sub-set thereof. All ceramics deposited in the cave belong exclusively to the Late Classic (AD 550-950) Spanish Lookout Complex; however, no clear evidence has been

found to indicate if these specimens belong to the early facet (LC2) or late facet (LC3) of the Spanish Lookout Complex, because the types represented occur during the entirety of the complex. While these types tend to be slightly more commonplace in the late facet Spanish Lookout (AD 830-950, Terminal Classic), the forms and sizes of the vessels are more in keeping with those of the early facet (AD 550-830), and thus we are unable to refine the dating of the specimens to any particular facet of the Spanish Lookout. An AMS date derived from a carbon sample demonstrates a 2-sigma range of AD 680-890, which spans both facets and thereby does not conclusively help to resolve to which facet the deposits belong. The form modes and the sizes of the vessels are consistent throughout the small assemblage and thus, irrespective of the facet to which these should be assigned, these are clearly and squarely contemporaneous and must date to a specific segment of the Late Classic, as demonstrated by the AMS date. As such, we can see the cave being utilized for a short period of time in the Late Classic, probably somewhere within the same century or century and a half, at which point presumably all archaeological features were formed.

#### Form Distribution

One interesting peculiarity is the fragmentation of jars and the subsequent dispersal of sherds into discrete clusters (although these could be conclusively refitted to nearby partial jars during analyses). Vessel 4 (Tinaja Red) was found as a partial jar, as part of Feature 7, while the sherds of its fragmented side cluster 1.7 m away as Feature 8. The partial Vessels 5 (Tinaja) and 6 (Cayo) were found nestled into one another as the central portion of Feature 11, while a scatter of sherds of Vessel 5 were found 1 m to the south, and the remaining commingling sherds of Vessels 5 and 6 were found as another cluster, set in a small niche at ground level, less than a meter to the north. The smashing of jars and the deliberate dispersal of sherds into neat clusters or stacks is a practice that has also been observed at Actun Tunichil Mucnal (Helmke 2009: 390-392, 456-458) and Eduardo Quiroz Cave (Pendergast 1971: 9). This practice appears to be part and parcel of a particular type of termination ritual that formally closed the activities conducted in the caves that introduced the ceramic implements in the first place. An alternate form of termination appears to have been to chip away at the rim of a jar, and this practice is seen on Vessel 3 (Cayo) that forms part of Feature 7 (Figure 15). Similar chipping has also been observed on otherwise complete jars found within the unlooted section of the Laberinto de las Tarántulas, where a comparable termination function has been invoked (Helmke 2009: 60, 247). The complete smashing of a jar is represented by Vessel 2 (Cayo) that appears to have been cast down the solution funnel of Alcove 1. This leaves Vessel 1 of Feature 5 as the sole complete vessel in the cave's assemblage. This vessel is also the smallest of the cave's assemblage, but otherwise all the other vessels found within Jereftheel have witnessed some sort of termination.

The other noteworthy feature of the spatial form



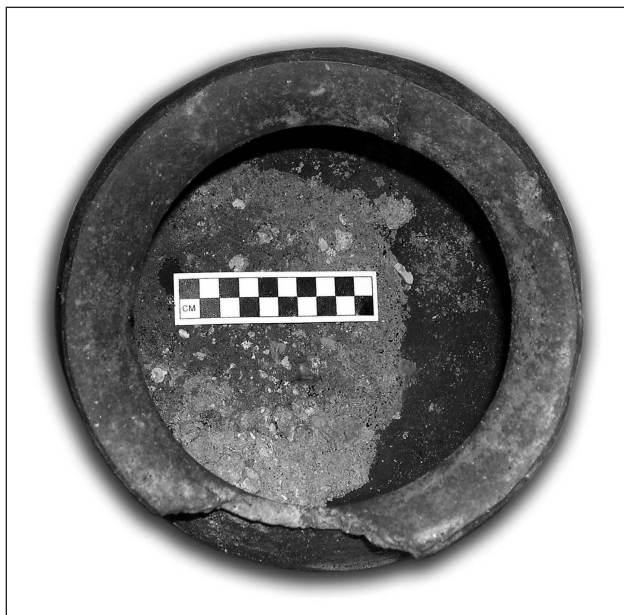
distributions is the occurrence of jars in pairs. This is clearly seen by the paired Tinaja and Cayo jars of Feature 7 (Figure 13) and the similarly paired Tinaja and Cayo jars of Feature 11. This then leaves Vessels 1 and 2. Vessel 1 was found complete and apparently *in situ* as part of Feature 5 in Chamber 3. We therefore suspect that Vessel 1 (Tinaja) was left in the position where it has originally been deposited. This also leads us to suspect that Vessel 2 (Cayo) was originally paired to Vessel 1 and was only divorced from its original pairing when it was cast down the solution funnel as part of a termination event. With this reconstruction the salient pattern that emerges is that there were three discrete pairings of jars, one in Chamber 1 (Feature 11), one in Chamber 2 (Feature 7) and the other in Chamber 3 (Feature 5).

The other important aspect is that these pairings are each composed of a wide-mouthed jar (that presumably contained semi-liquid food or stews) and a narrow-mouthed jar (that probably contained liquids, such as a type of beverage). Together these two forms of jars, clearly define the activity set for Je'reftheel. This activity set is remarkably similar to that reconstructed for the unlooted Upper Passages of the Laberinto de las Tarántulas where jars (one wide-, one narrow-mouthed), dishes and bowls occurred according to a predominant ratio of 2:1:1 (Helmke 2009). At the Laberinto de las Tarántulas and Actun Tunichil Mucnal, bowls and dishes also co-occur in nearly equal frequencies. The one major omission in the case of Je'reftheel, therefore are the bowls and dishes that appear to have been used as secondary containers, into which the contents of wide- and narrow-mouthed jars would have been poured. If these were indeed utilized in Je'reftheel, then it stands to reason that

perishable bowls were used (presumably made of gourds), or that these were carried back out of the cave. However, the presence of paired jars at both Je'reftheel and the Laberinto de las Tarántulas is a significant continuity and the relative proximity of the two sites may be the underlying factor.

As is the case at the Laberinto de las Tarántulas, the individual activity sets identified at Je'reftheel may well pertain to discrete events that took place at the site. Since three homogeneous activity sets could be identified for Je'reftheel, it would thus seem that these are the remains of three discrete events. If this is the case, then it is possible that the deposition of human remains may also follow this pattern and data from the excavation of human remains shed further light on the timing of mortuary activities within Je'reftheel. As discussed above, the distribution of bones within the features demonstrates the presence both of primary interments and of secondary manipulation and movement of elements. It is likely that the majority (if not all) of the individuals were originally interred as whole bodies. Features 5 and 7 clearly show that some of the movements of bone were related to disturbance by later intrusive interments, and thus we can rule out the notion that each chamber represented a single, discrete deposition event. The secondary burials of Features 3 and 11 demonstrate bundling and/or stacking practices. At present, we cannot be sure if the primary interments of these individuals occurred within Je'reftheel or if the individuals were relocated there as secondary burials from other sites, though further lab analysis may help to resolve this issue. For instance, a cranium found within Feature 4 (Chamber 4) matched a mandible and 2 maxillary incisors found within Feature 5 (Chamber 3), suggesting secondary movement of elements following natural decomposition. In general, the presence of secondary burials, along with the partial commingling found in Features 5 and 7, suggest a pattern of periodic revisitation and manipulation of previous interments. Thus, the variations in the observed patterns of deposition between ceramics and human remains may imply that they represent different, though undoubtedly related, rituals.

**Figure 15.** Plan photograph of Vessel 3, Feature 7. Note the human phalange in the jar, and the chipped rim, presumably a form of termination. Photograph by Christophe Helmke.



#### Distribution of Human Remains

All areas that exhibit artifactual features also contain human remains, and this congruity suggests that the distribution of human remains should also be considered in spatial terms. In addition, the spatial incidence of artifacts with human remains suggests that the former were integrated into the activities that resulted in the deposition of the latter. When considering the distribution of individuals identified throughout the cave, we find that none are located near the entrance, relatively few are located in Chambers 1 and 2, and the vast majority are found in the four termini of the cave. This notable increase in human skeletal materials as one proceeds deeper and deeper within the cave is significant. First, it suggests that the focal point of the cave's usage may have been the termini and that the primary activity was the one resulting in the deposition of human remains. Second, it implies that the termini were viewed as locations that differed in type from all other portions of the cave, and

that these termini were more amenable, or suitable, to the activities that resulted in the deposition of human remains. Consequently, three different types of activity areas can be isolated for Je'reftheel: 1) entrance areas for ingress and egress, 2) chambers for gatherings and the deposition of the bulk of artifactual materials, and 3) termini that were the preferred areas for the deposition of human skeletal remains. The distinction between entrance(s), gathering chambers and termini has also been documented for the other sites in the area (e.g. Stone 2000; Helmke 2009), although with some differences in the constituent archaeological features.

On account of the contemporaneity of all ceramic materials within the cave, the gradual ingress into the cave is not observed, as is otherwise the case with the other caves examined. This attribute is probably also brought about by the relatively small size of the cavern and the little distance that separates each of the areas within the cave. One interesting peculiarity, however, is the fact that all materials in Je'reftheel date to the Late Classic, which is precisely the span to which the majority of materials from almost all other caves in the surrounding area date (Pendegast 1969, 1970, 1971, 1974; McNatt 1996; Helmke 2009; Moyes et al. 2009). In this case we appear to be looking at a site that had not witnessed utilization until the peak of cave usage in the Late Classic. Thus, it is not only caves that had already been used in earlier periods that saw continued and more intensive usage in the Late Classic, but new and previously unused caves that were also drawn into the roster to serve as the loci of activities. In much the same way as previously unused areas of caves were utilized for the first time in the Late to Terminal Classic, Je'reftheel as a cave of more technical access, also only witnessed usage at that time period.

### Conclusion

Je'reftheel provided us with the rare opportunity to investigate an unlooted cave site. Our documentation and excavation efforts have also revealed that the site was intensively utilized during the Late Classic, demonstrated on the basis of ceramic types and corroborated by an AMS date. Whereas at present we are unable to conclusively narrow down the dates of the cave's utilization, it seems to be restricted to a relatively short period of time. Furthermore, no evidence exists to suggest that the cave saw usage before or after the Late Classic period and thus emerges as a cave site that was used intermittently for a series of ritual events during the course of perhaps no more than just a few generations. The large quantity of skeletal material found within the site indicates that the cave served as an important repository for human remains. On-going osteological analyses are already beginning to suggest that the cave served as the locus of a particular type of funerary ritual, rather than the setting of human sacrifice (Wrobel et al. 2011). The artifact assemblage was found to be relatively small, and aside from the lanceolate points and items of personal adornment, is dominated by ceramic jars. These were found to be entirely homogeneous in terms of dating, with varying forms being

taken as indicative of original function. The spatial patterning and absence of looting allowed the identification of a functionally simple, but complete, ceramic activity set, formed by a pair of wide- and narrow-mouthed jars. Each of the activity sets was found in discrete areas of the caves in close association with important deposits of human remains and it seems likely that these were closely related in terms of the events that led to the deposition of these archaeological features. The continuities and discontinuities of the Je'reftheel assemblage with the assemblages from other caves were scrutinized with an eye to identifying the different types of activities responsible for the formation of these respective deposits. These indicate that Je'reftheel forms part of a coherent regional tradition of cave utilization, although the minor differences noted suggest that it likely is associated specifically with its own distinct community, which unfortunately remains unidentified to date.

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## 7

## Investigations at Actun Neko, Caves Branch River Valley, Belize

Shawn G. Morton, Christophe Helmke and Jaime J. Awe

As the name suggests, the flanking karst of the narrow Caves Branch River Valley, Central Belize (Figure 1), provides a landscape rife with caves, sinkholes and rockshelters that were intensively used by the ancient Maya. Fieldwork at Actun Neko was conducted in 2007 under the auspices of the Belize Valley Archaeological Reconnaissance (BVAR) project, directed by Jaime Awe, and has been incorporated into the continuing work of the Caves Branch Archaeological Survey (CBAS) project, a sister project of BVAR, co-directed by Gabriel Wrobel and Christopher Andres. The underlying goal is the same: to produce a broad regional reconstruction of pre-Hispanic cultural patterns in and around the Caves Branch River Valley with specific reference to a wide range of sites of different types and sizes. Such a regional approach holds true that one cannot adequately understand any one portion of the archaeological record without attempting to contextualize it among its broader integrated parts. With this overarching objective in mind, Actun Neko serves as a keystone site in the dissertation research of the senior author and may best be tentatively contextualized in this light. In this paper we describe the morphology and material culture of Actun Neko and explore its position within a regional socio-political and ritual context, paying particular mind to an elaborately incised and inlaid shell disc found within.

Work in the Caves Branch region is only now beginning in earnest. It appears that the valley may have filled a strategic frontier niche as a likely resource acquisition zone and transportation corridor between the resource rich Maya Mountains and the major civic-ceremonial center of Caracol to the southwest (increasingly important during the Late Classic period, see Graham 1987; Lentz et al. 2005; Helmke and Awe 2008) and coastal trade routes to the east. While sporadic research at a number of large and easily accessible cave and surface sites within the valley has been conducted (Davis 1980; Gibbs 1998; Graham et al. 1980; Griffith 1998), the Caves Branch and its peripheral uplands are only now emerging as a regionally significant center of ancient Maya civilization in its own right. Recently, more comprehensive reconnaissance has revealed both numerous additional caves (e.g. Brady 2009; Morton 2008; Wrobel 2008; Wrobel et al. 2009), as well as sizeable civic-ceremonial centers, including Cahal Uitz Na in the neighboring Roaring Creek Valley (Conlon and Ehret 1999; Helmke 2009; Helmke and Awe 1998), Deep Valley in the Caves Branch River Valley (Jordan 2008), and Tipan Chen Uitz and Yaxbe in the Roaring

Creek Works (the dissected upland watershed separating the Caves Branch from the Roaring Creek; Andres et al. 2010). This region was unusually well integrated via a series of *sacbeob* connecting the aforementioned centers. Based on recent assays, it appears that these centers, while likely long-established, fluoresced and collapsed in relatively short order amidst the generalized ‘collapse’ of the Late/Terminal Classic (A.D. 700-900). Further research into the Valley’s archaeology with particular attention paid to processes of regional development and interaction during this period can greatly aid us in understanding the complex relationships between this and neighboring regions during a pivotal time in the history of one of the world’s great ancient civilizations. Given the well-documented incorporation of subterranean sites in rites of political accession, aggrandizement, legitimization, and social incorporation (Bassie-Sweet 1996; Prufer and Brady 2005; Vogt and Stuart 2005), they serve as proxy contexts for the investigation of these systems and changes occurring therein. And while still in its early stages, continuing research in the subterranean sites of the Caves Branch river valley and the Roaring Creek Works bolsters parallel work conducted by others in the neighboring Roaring Creek and Sibun Valleys (e.g. Helmke 2009; Peterson 2006).

#### Site Description: Geomorphology and General Archaeology of Actun Neko

Suffice to say, the majority of subterranean sites used by the ancient Maya were neither large, nor spectacular in terms of their geomorphology or speleological formations. Subterranean sites in the Caves Branch region fall within a wide range of spatial contexts based on the size and form of their interior spaces as well as their location in the wider landscape and relative associations with other sites. Whereas larger caves have traditionally attracted the attention of archaeologists, more modest contexts, such as Actun Neko (Figure 2), were also heavily utilized in antiquity.

#### Entrance 1 and Chamber 1

Entrance 1 is horizontal, partially blocked with colluviums including rockfall, eroded sediment, and active speleothems. This entrance measures 8.54 m wide by approximately 1.5 m high. All portions of Entrance 1 lie within the light zone of the cave. The entrance faces northeast into a partially enclosed area defined by a large overhanging ridge to the south and a tall limestone outcrop to the west and north. The

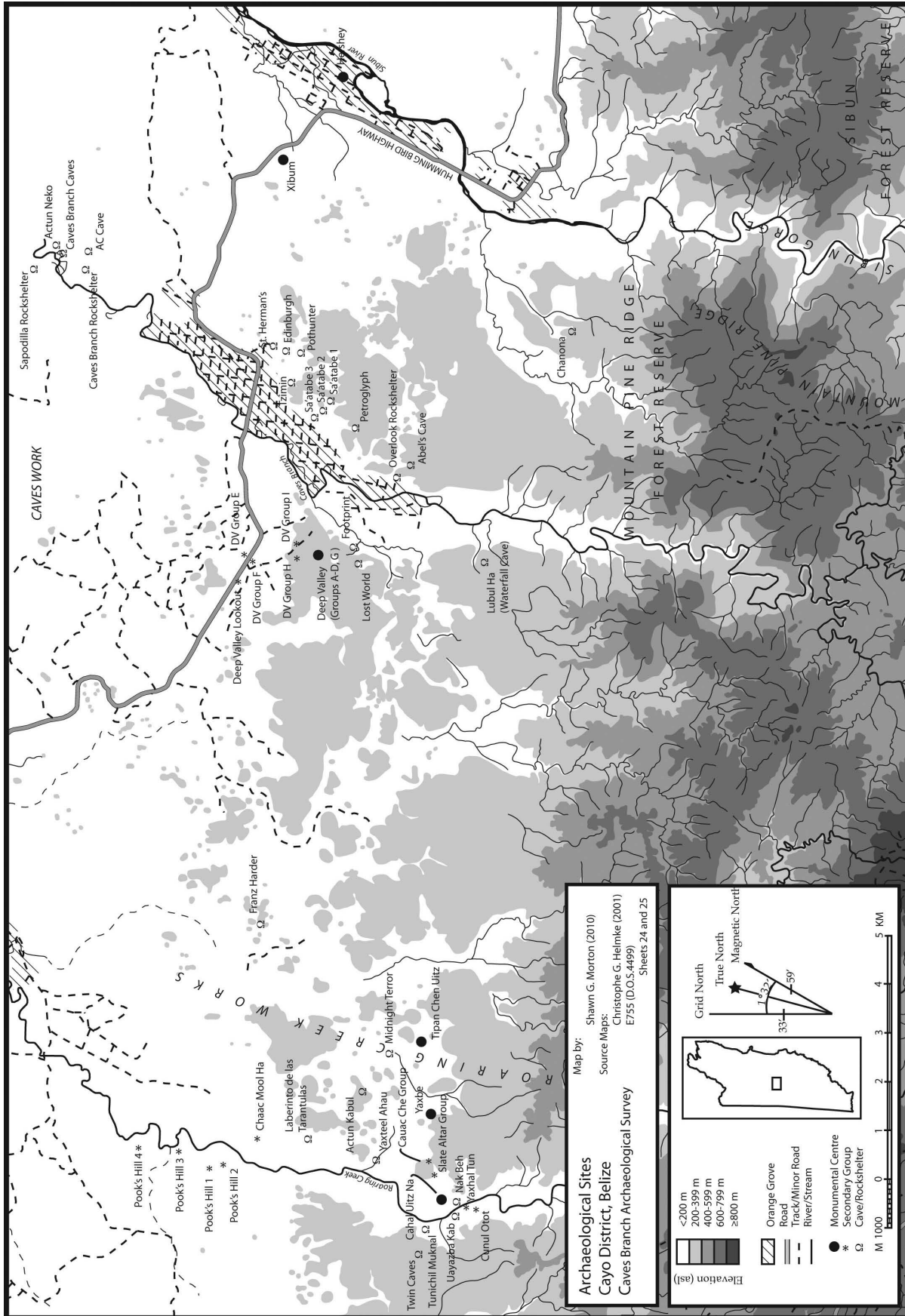


Figure 1. Map of Caves Branch Area (map by Morton, courtesy Christopher Andres and Gabriel Wrobel, Directors, Caves Branch Archaeological Survey).

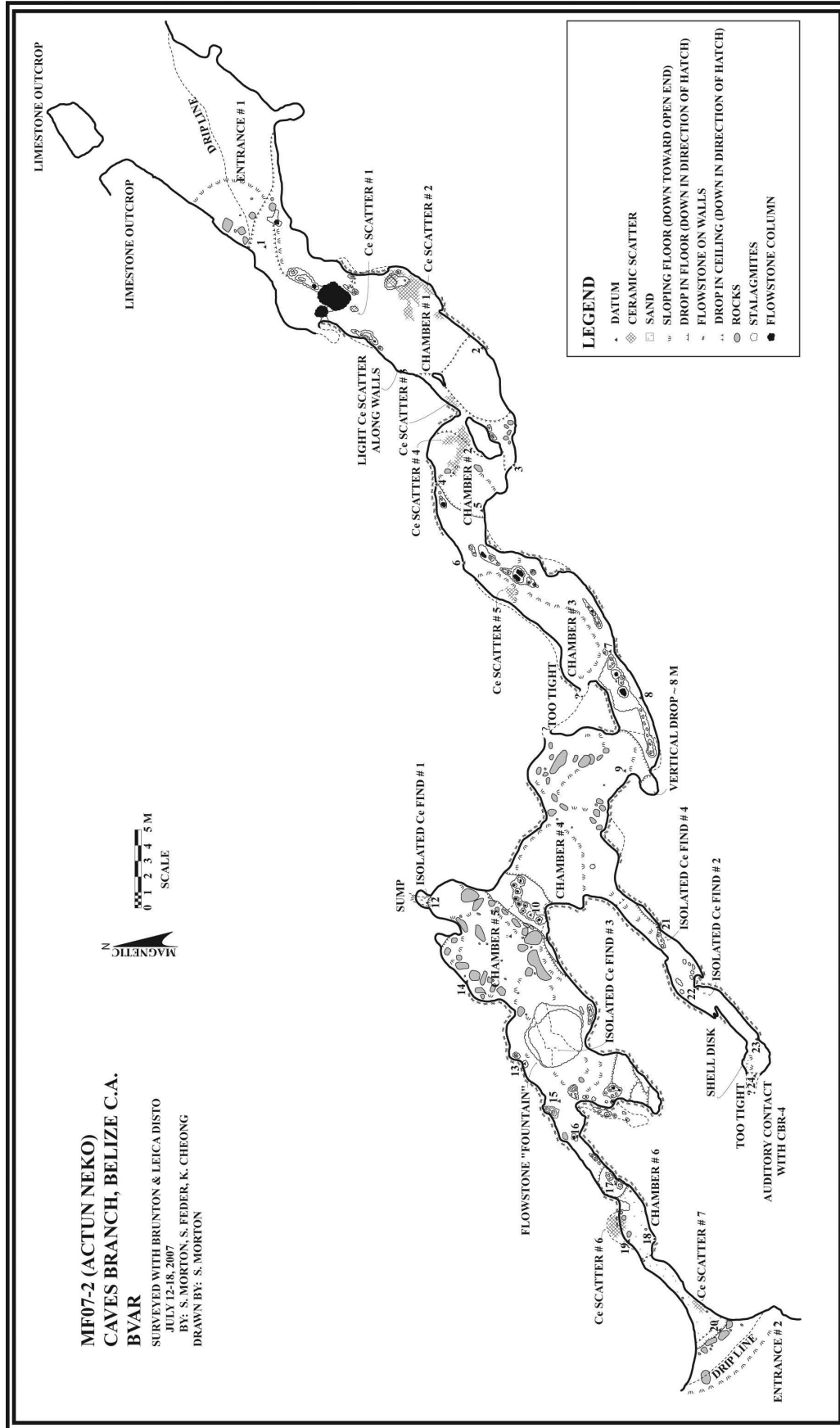


Figure 2. Plan View of Actun Neko (plan by Morton).

area provides a natural shelter and while it does not exhibit definitive signs of ancient cultural modification, there are a number of positive handprints painted on the wall inside the drip line; as these were not noted upon initial investigation, it is possible that these marks were left by still-more-recent visitors.

Five meters into the cave, the passage narrows to approximately 90 cm between a large flowstone column and the cave wall. Past this point, Chamber 1 opens as a space oriented SW-NE, approximately 16 m long by 5.5 m at its widest point. The ceiling height rises to around 4 m. The floor of the chamber consists of a hard, densely packed and nearly level surface of sedimentary deposits. Flowstone is evident on the walls of the chamber and at various places on the floor in the form of small stalagmites. Small burrows in the floor surface evidence rodent activity and the remains of an armadillo were found near the center of the chamber. While natural light entering this chamber is limited by the low, deeply overhanging entrance and restricted access, it is possible to navigate through this chamber without aid of additional illumination during the morning hours. The chamber ends in another small choke.

A number of discrete artifact scatters were found in Chamber 1. Two Spanish Lookout complex rim fragments (Cayo Unslipped, Late Classic Period, ca. A.D. 680 – 880; Gifford 1976:276, 282), from two different vessels, were found sitting on a rock just inside Chamber 1 (Ceramic Scatter 1, east end of chamber). The guides from the Caves Branch Lodge occasionally take visitors to the cave; based on their unusual placement these fragments likely represent modern secondary deposition, though neither sherd appears temporally inconsistent with the rest of the chamber. Two additional scatters of firmly identifiable Spanish Lookout complex sherds were documented (Ceramic Scatters 2 and 3, consisting mostly of individual sherds from dissimilar vessels in varieties of Cayo Unslipped, Alexanders Unslipped, and Rubber Camp Brown types; Gifford 1976:233, 282, 283). Both scatters likely represent Pre-Columbian secondary deposition along the cave walls and the ceramics that define them are heavily fragmented. Test probes in the area of the scatters revealed a dense floor surface with no cultural depth.

#### Chamber 2

Access to Chamber 2 is via two small openings, approximately 80 cm wide and 70 cm tall, at the southwest end of Chamber 1. A sharp drop in the floor (nearly 1 m) and a corresponding rise in the ceiling height to approximately 4 m define entrance to this chamber. The chamber measures approximately 5 m by 5 m. The walls are awash in flowstone and the floor is muddy and wet. The floor rises again and the passage (2 m wide at this point) continues to the west. This is the first “dark zone” of the cave (i.e. it is not possible to navigate this space without the aid of artificial light).

Ceramic Scatter 4 consists of a thin surface scatter of ceramic remains measuring approximately 2 m (N-S) by 3 m (E-W). Most of the scatter is located on top of a small ledge just inside the northern entrance to Chamber 2 though some

has apparently slid to the bottom. Consistent with Chamber 1, diagnostic sherds appear to date entirely to the Spanish Lookout complex. Again, the deposit is characterized by a clustering of dissimilar sherds.

#### Chamber 3

From Chamber 2 to Entrance 2 (and with the exception of Chamber 5), the character of the cave in general is that of a phreatic passage. For the purposes of facilitating descriptions of archaeological ‘areas’, this passage is here broken up into various ad-hoc ‘chambers,’ usually based on changes in passage bearing or grade.

In Chamber 3, approximately 6 m from Chamber 2, the floor again dips approximately 1.5 m at the lowest point and after heavy rains the lowest area is partially filled with water. The ceiling reaches approximately 5.5 m high and the largely flowstone covered floor is again muddy. Both walls (maximally 4.16 m apart) exhibit some flowstone; active formations dominate the southeastern side of the chamber. Chamber 3 is approximately 9 m long, and terminates as the floor again rises accompanied by a concentration of speleothems.

Ceramic Scatter 5 was located in a floor depression at the northern end of Chamber 3. Three diagnostic sherds were collected from a scatter less than 1 m by 1 m. While the sherds were not cemented in place an accumulation of calcium carbonate on their surfaces, likely from the nearby active formations suggests that they have been resting in place for some time. Two of these sherds, consistent with the now-expected Cayo Unslipped: Cayo Variety (Gifford 1976:276), were recovered. One sherd, tentatively identified as part of the Early Classic Hermitage complex (ca. A.D. 280 – 590; Gifford 1976:186) was also recovered.

#### Chamber 4, Breakdown 1 and the Southwest Passage

A sharp drop in the floor of approximately 1 m marks the southeast entrance into Chamber 4. The chamber, approximately 11 m long by 6 m wide, is separated into two distinct, low bowl-like depressions. The ceiling reaches a maximum height of approximately 6 m. The floor consists of soft, damp, sediments and eroded limestone; the walls are largely covered in active flowstone. Immediately upon entering the chamber from the east is a vertical drop of approximately 8 m adjacent to the southwest wall. While the reconnaissance team did not investigate this drop, a number of Caves Branch guides indicated that it ends in a sump just out of sight from the top. The sump is non-navigable, simply a slow-draining pooling point for water after heavy rains. Breakdown 1 dominates the northeast corner of the chamber; thick depositions of sediment on these stones suggest that the collapse event is not recent.

At the western end of Chamber 4, the passage splits. A wall of speleothems restricts access to Chamber 5 to the northwest. A narrow (1 m wide) passage extends to the southwest at an initially steep positive inclination of 16 degrees before leveling. The ceiling is rarely more than 1 m high. This passage extends approximately 14 m, finally



choking off in a tightly restricted phreatic passage too tight for human navigation. The floor in the passage is similar to that of Chamber 4, namely damp, soft sediment. However, at the limit of the explored passage the floor turns dry and loose; a disturbance in the sediment at this end evidences recent rodent activity. From this location auditory contact was made with the nearby Caves Branch Rockshelter 4 (CBR4). The shell disc, mentioned in the introduction, was found in the disturbed sediment at the southwest end of this passage. Isolated Ceramic Find 4 (a single sherd identified as Balanza Black: Variety Unspecified, Hermitage complex; Gifford 1976:161) was one of three additional artifacts (the other two being non-diagnostic ceramic body sherds) discovered in this section of the cave, making the isolated placement of the disc in this small area all the more significant.

#### Chamber 5 and Breakdown 2

Chamber 5 is large at 21.39 m long with a maximum width of 6.5 m, oriented northeast southwest. From Chamber 4, the floor (which consists of wet sedimentary material and guano) drops sharply (1.5 m), and is negatively graded to the west at 15 degrees. The maximum ceiling height in the chamber is approximately 4.5 m. The north half of the chamber is littered with large breakdown (Breakdown 2). A tight opening in the north wall descends a short distance to a seasonal, slow-draining, floor sump. A large flowstone 'fountain formation,' consisting of one large rimstone dam above another, dominates the center of the chamber and was active during the time of the survey. This formation restricts passage through the chamber and effectively isolates the northern half from the southern half. The southern half, most easily accessed by passing directly under the fountain is completely encrusted in active flowstone. A tight passage, less than 1 m wide extends to the southwest from the southern half of Chamber 5. Only two isolated sherds were found in this area; neither was identifiable.

#### Chamber 6 and Entrance 2

From Chamber 5, a narrow passage approximately 1 m wide with a 2.5 m high ceiling extends 5 m to the southwest into a small sandy chamber (Chamber 6). Chamber 6 is maximally 1.8 m wide by 4.7 m long, with a ceiling height of approximately 2 m. A low (40 cm high) alcove extends a further meter to the north. Initial inspection of the chamber suggested considerable depth to the ceramic scatter (Ceramic Scatter 6) concentrated on the chamber's western end and within the alcove. A very limited amount of natural light is admitted to the chamber from the southwest through the long and restricted passage from Entrance 2.

The dry matrix of eroded limestone and sandy sediment as well as the chamber's proximity to Entrance 2 made excavation conditions favorable. It was therefore decided to place a 3 x 3 m excavation within Chamber 6 (a size that ensured total coverage of the loose sediment in the western portion of the chamber). The goal of this excavation was to test deposition depth and to recover a larger sample of ceramic materials. Excavated material was placed in bags

and screened through 1/4-inch mesh outside Entrance 2. All-in-all 32 cm of matrix were excavated, recovering some 913 ceramic sherds. While these sherds await detailed analysis by the senior author, surface materials from Chamber 6 date without exception to the Hermitage complex, including varieties of both Socotz Striated (Gifford 1976:187, 189) and Minanha Red (Gifford 1976:157).

A very low opening, approximately 25 cm high by 50 cm wide divides Chamber 6 from the long (6 m) passage of Entrance 2. From the exterior, Entrance 2 extends horizontally toward the northeast into the base of the same ridgeline as Entrance 1, and only a dozen or so meters west of CBR4. The passage rapidly constricts from 6.4 m wide at the drip line to 2.5 m by 1 m high; the associated passage narrows in places to less than a meter.

Ceramic Scatter 7 was found along the southern wall of the passage between Chamber 6 and the opening of Entrance 2. The sherds were heavily fragmented, though obvious refits suggest possible damage due to travel through the passage. The scatter measured approximately 1 m east to west by 50 cm north to south and again consisted entirely of Early Classic, Hermitage complex, ceramics.

#### Archaeological Summary

While work on the materials recovered from Actun Neko continues, a number of interesting patterns have emerged that shed light on the particular ways that the ancient Maya used this cave. First, there appears to be a strong temporal division in this cave, suggesting a shift in focus over time from the Early Classic at Entrance 2 (Hermitage complex) to the Late Classic at Entrance 1 (Spanish Lookout complex). With scant material evidence for use-area overlap in the intervening chambers it appears that Actun Neko may have functioned, not as one cave, but as two distinct loci. This observation stands as a yet poorly understood quirk of the cave, particularly as both entrances lie within close proximity to Caves Branch Rockshelter 4, a site that was the focus of ritual activity from the Proto- to the Terminal Classic (Hardy 2009:111).

Second, it appears that the particular ways in which spaces were used differed, particularly between Entrance 2/Chamber 6 and Entrance 1/Chamber 1. While at both ends of the cave, the artifact assemblage is highly fragmented, vessels found at Entrance 2/Chamber 6 are far more complete. It appears that whole, or nearly whole vessels were shattered in the relatively restricted Chamber 6, resulting in a much denser, thickly layered build-up of cultural material. The highly fragmented nature of the deposit in this case may simply be a secondary consequence of the use of these particularly restricted spaces, much as Digby (1958; cited in Thompson 1975:xviii) notes of a small cave near Las Cuevas, Belize (See Moyes this volume). In contrast, the deposits from Entrance 1/Chamber 1 are more in line with a broader pattern of cave use that we are documenting throughout the valley and beyond (Helmke et al. n.d.; Wrobel et al. 2010); that is, the incorporation of multiple loci, at least some subterranean, into a single extended ritual act

or circuit. In this formulation, deposits are created that are characterized by the deposition of single sherds (or several), but never whole vessels, resulting in a highly fragmented and diverse assemblage such as that noted in Chamber 1. Further, while Entrance 2 and Chamber 6 were spatially restricted (potentially limiting the ability of ritual practitioners to perform *in situ*), Entrance 1 and Chamber 1 are expansive. As such, it may not be surprising to find evidence in the form of wall-side scatters of the “ritual cleansing” of spent cultural materials (see Brady et al. 2009:55-56; Brown 2004:36; MacLeod and Puleston 1979:72; Vogt 1976:102; Helmke et al. n.d.). Rather than functioning as a simple dumping ground, Entrance 1 and Chamber 1 served as the locus for structured, repetitive, ritual acts. With this in mind we turn to a discussion of the shell disc, arguably the most significant artifact found within Actun Neko.

### The Shell Disc

By far, the most spectacular find from Actun Neko is the inlaid shell disc (Figure 3) found at the terminus of the southwest passage. The disc was exposed by rodent burrowing, which might account, in part, for some of the missing inlays. However, considering that artifacts deposited in caves are frequently terminated, it also seems probable that some of the inlays were purposefully removed by the ancient Maya, as a means of ritual breakage, prior to deposition. Below we provide a description of the shell disc, comments on the iconography, as well as a preliminary assessment of its date of manufacture.

#### Description

The disc is made of unidentified, white marine shell, and measures on average 5.7 cm in diameter. Its decorated surface has been flattened and polished by grinding. The obverse is convex and exhibits two drilled holes for suspension or fastening. One perforation has penetrated from the obverse to the frontal (decorated) surface. Decorations are twofold, including fine incising as well as deeper gouging and graving, to create sockets for inlays that were in turn incised with additional details. Only two inlays were recovered with the shell disc, one of greenstone (presumably jadeite), the other of red shell (*Spondylus* sp.). Anywhere between 12 (simply counting large sockets) and 23 (attempting to estimate coloration and form) of the original inlays are clearly missing considering the many sockets visible on the decorated surface of the disc. Although the matrices around the find spot were sieved for additional inlays, none were recovered, suggesting that these were removed from the disc prior to deposition. Owing to its circular design the decorations presented on the shell disc conform to this shape and are accentuated by an incised circular frame. Since all incised details run straight up to the edge of the frame it is clear that the frame was executed first. It also seems likely that the iconography was first executed by incising the shell disc, and it was only subsequently that certain areas were selected to receive inlays. Minor chipping is evident along the left circular edge of the disc, which is suggestive of use wear. Otherwise the



**Figure 3.** Photograph of Inlaid Shell Disc (photo by Helmke).

disc was recovered in a very good state of preservation and was clearly executed by a skilled craftsman.

#### Iconography

**Main Figure.** The iconography represents an anthropomorphic figure (presumably a human male) seated cross-legged, and facing to the viewer’s left (Figure 4). The toes of the right foot are visible below the left thigh. The kilt of this figure was originally rendered by a series of inlays, as was his necklace and tubular pectoral. Only the greenstone bracelet of the left arm remains, which was apparently fashioned by three strands of beads as suggested by the two parallel and vertical incisions of the inlay. With the exception of the tip of the nose, the lips and the extremities of the headdress, the entirety of the head and headdress of the human figure were also executed by a series of inlays. Differing outlines and depth of inlay sockets give the impression of a somewhat corpulent figure with a heavy jaw and bulbous cheeks. Extending from the tip of the nose is an ovoid shape with a small notch at the end, which undoubtedly signals two nose beads. The left hand is rendered as a quadrangular form, with fingers marked by as a series of three parallel lines and fingernails indicated by a transversal incision. The nose beads and the execution of the hand are temporally diagnostic and these will be accounted for in the dating section, below. The little that remains of the headdress suggests that it was made of cloth, or some other pliable material, with a pointed edge over the face. A big knot, indicated by the large circular inlay socket at the back of the head, from which extends a fringed sash-like element, apparently fastened the headdress. This type of headdress is seen in the iconography of several sites in the central Lowlands, but particularly close examples are found at Uaxactun and Río Azul (Stuart 2005: Fig. 109a).



**Figure 4.** Illustration of Inlaid Shell Disc (drawing by Helmke).

The same headdress is also found in the writing system of the ancient Maya where it is worn by an avian figure (nicknamed the ‘Banded Bird’) that serves as a logogram referring a particular title and office (see Stuart 2005:132-135). Yuriy Polyukhovich (personal communication July, 2008) and Helmke (May, 2008) have independently suggested the tentative reading **NA’AT**, lit. ‘thinker, knower, wiseman’ for the ‘Banded Bird’ logogram based on phonetic complementation **-ta** and **-ti** and eastern Ch’olan sources (Morán 1695: 164; Wisdom 1950: 539). As a result it would seem that the individual depicted on the shell disc from Actun Neko is an individual that held the office and title associated with this particular type of headdress.

**Masquette.** Another key element of the iconography is the diminutive figure attached to the back of belt assemblage of the seated figure. Undoubtedly this represents a small masquette, worn at the small of the back, as is seen in other Classic Maya examples. Below such masquettes is a band of plaited cloth—or a mirror sign—and a group of three hanging celts; a standard of belt assemblages. Here the band of plaited cloth, or mirror element, below the masquette is rendered as a rectangular form with three diagonal incisions. Below is a socket that would have held a greenstone inlay representing the three celts that are normally rendered in this position (see Stuart 2004a for the incised and inlaid shell from Dzibanche where this inlay is preserved). Much like the principal figure, the masquette also appears to be adorned with a nose bead, a feature that is seen on other masquettes as well. The earflare of the masquette is composed of three elements: the central element is the earflare proper; the upper element, rendered with incising, is a scroll of cloth (which served to fasten the earflare assemblage); the lower element is now missing and is indicated by a circular inlay

socket. Typically this lower earflare element represents a type of bead, serving as a counterweight, sometimes rendered floridly, other times more abstractedly as a glyphic element (i.e. T534; see Thompson 1962: 149-152, 452).

The identity of the figure that the masquette depicted is now lost, since it was rendered on a missing inlay. Frequently such masquettes—and headdresses in general—depict either supernatural entities or serve to spell out the name of a deified ancestor (Schele and Miller 1986: 71; Grube and Martin 2000: II-30, 34, 37; Martin and Grube 2000: 34, 77; Stuart and Stuart 2008: 111). The masquette is shown wearing a particular type of headdress, here composed of a small and simplified *ajaw* glyph as its central element surrounded by three leafy projections. The leafy elements of the headdress indicate that it is a so-called ‘Jester God’ or ‘Hunal’ type headdress (see Schele and Miller 1986: 53, 68; Freidel and Schele 1988: 552-555), the mark of a regal headband or diadem (Taube 2006). In the Classic period, this type of headdress appears to have been referred to as an *ux-yop-hu’n*, lit. ‘three-leaf-headdress’, as indicated by complete spellings in the text of Palenque (see Stuart 2004a: 135; Stuart and Stuart 2008: 216). In the texts of Copan and Pusilha there are references to mythico-historical individuals whose names are rendered glyphically by the same combination of ‘Jester God’ headdress and *ajaw* sign. Very little is known about these individuals, who have been nicknamed ‘Foliated Ajaw’, or ‘Three Leaves Ajaw’, except for a period-ending celebration that is credited to the earlier figure in A.D. 159 (8.6.0.0.0), and another such commemoration connected to the latter, dated to A.D. 376 (8.17.0.0.0) (Schele and Looper 1996: 94-95; Martin and Grube 2000: 193; Grube and Martin 2001: II-9-11; Stuart 2004a: 136-137, Fig. 7; 2004b: 223). There is too little information at present to determine whether the headdress of the masquette referred to such a ‘Foliated Ajaw’. Nonetheless, it has been suggested that the so-called ‘chi-Bent Kawak’ toponym that is associated with ‘Foliated Ajaw’, is a locality in the Central Lowlands (Stuart 2004a: 136, Fig. 7; 2004b: 221), making an apt (if tentative) connection to the Actun Neko shell disc. Alternatively, it is also plausible, that the combination of ‘Jester God’ and *ajaw* sign are here used to indicate that the figure that was originally depicted was that of an ancestral king. The use of a similar headdress as a marker of royalty, can be found in several other examples, including the shell earflare insets from Holmul, the carved jade boulder from Tomb B-4/7 at Altun Ha (Pendergast 1982: Fig. 33, 57-59), and the so-called Po Panel from the Bonampak area (see Stuart 2004a: Fig. 6). Based on present evidence, the second author takes the example from Actun Neko to duplicate these patterns and to represent a regal crown to an ancestral figure.

**Offering.** Held in the extended left hand of the seated figure is another figurative element. Much like the foregoing masquette it was rendered predominantly with a series of inlays and therefore remains indistinct. Nonetheless, based on the outline of the various inlays and the overall shape it appears to have represented a head of some sort. Analogous examples suggest that this was the head of a supernatural

entity, since in one example the head of God K (*k'awiil*) and in the other the head of 'Jaguar God of the Underworld' (*chuwaaj?*) are held in outstretched hands (K6031b; Fine Arts Museum of San Francisco, Cat. no. 2002.84.1.20). The nose of the head also appears to be embellished by nose beads, as in all the other instances on the disc. A pair of pointed elements, possibly stylized flames, which frame a series of three wedged-shaped items, the central one of which is represented by a red *Spondylus* sp. inlay, adorns the top of the head. Similar stylized flame frames a diminutive shrine that together serve as a headdress to a feline head on Stela 31 at Tikal. Below the head on the Actun Neko disc is a knot that resembles the logogram **HUN** for *hu'n* 'paper, headdress' (T60, see Thompson 1962: 46, 446). The circular inlay socket below the knotted sign presumably rendered a bead. Three parallel lines extend out from the circular socket and connect to the scene's frame. In addition to the comparisons made with the other shell discs, the iconography of the Actun Neko shell disc is also strongly reminiscent in form and composition to that rendered on the magnificently preserved Altar 4 of El Cayo. This monument depicts *Ajchak Wayaab' K'utiim*, the *sajal* of El Cayo (see Zender 2002), holding a pouch and scattering pellets of incense onto an altar that supports an unlit censer (see Martin and Grube 2000: 150). The face of a skeletal supernatural entity is modeled onto the censer with a spotted feline ear. Since similar censers—of the Pedregal Modeled type-variety—frequently depict the Jaguar God of the Underworld (see Sabloff 1975: 114-116; Rice 1999), the composition is quite comparable to that rendered in Figure 3. These points of analogy lead us to speculate that the Jaguar God of the Underworld was also depicted on the disc from Actun Neko.

#### Dating

A preliminary dating for the Actun Neko shell disc is based on the presence of certain temporally diagnostic iconographic elements, as well as the stylistic execution of other features. We will not rely on the dating of ceramic materials, since the shell disc was not found in a sealed context and was not directly associated with any ceramic remains, which could otherwise make such an exercise a useful application. Furthermore, the full chronological spectrum covered by the ceramics found within Actun Neko remains to be determined, since the analyses are still on going. Most salient among the temporally diagnostic iconographic elements are the nose beads that adorn the central seated figure, the masquette and the head that is held in outstretched hands. Such nose beads are a characteristic feature of Early Classic art, where these occurs in high frequencies, and are typically absent in the Late Classic (Kettunen 2005: 59, 179, 192-193, 197-201). Based on the presence of this iconographic feature alone, it is clear that the shell disc can be dated to the Early Classic. This conclusion is further supported by the execution of the hand of the principal figure, which is rendered with squared outlines. The rendition of hands with squared features in both iconography and glyphs is another typical feature of the Early Classic, since Late Classic examples represent

fingers with more rounded tips and ovoid fingernails. Without conducting an extensive paleographic analysis of the hand signs involved it is unclear at present to which portion of the Early Classic this feature belongs. The scalloped, or trilobate, outline of the *ajaw* sign in the headdress to the masquette has, however, already succumbed to paleographic analyses by Alfonso Lacadena García-Gallo (1995). As part of his work, he has found that this type of *ajaw* sign predominates between c. 8.18.0.0.0 and 9.11.0.0.0, which is to say between A.D. 396 and 652 (Lacadena García-Gallo 1995: 297). As a result of these parameters it seems safe to assign the shell disc to an interval between A.D. 400 and 650, which also accords well with a similar specimen found at Blue Creek, dated to a comparable time period on the basis of associated ceramics (Thomas Guderjan, personal communication July, 2007). This dating also finds support from the carved and inlaid shell from Dzibanche. On the basis of stylistic attributes the similar shell from Dzibanche has been dated to c. A.D. 450-550 (Stuart 2004a: 140). Finally, two fragmentary specimens that are very similar in size, style and execution to the Actun Neko disc have been found in general excavations and in Problematic Deposit 275 at Tikal (Moholy-Nagy & Coe 2008: 30, Fig. 181f-h). These are dated to between the Early Classic (A.D. 250-554) and Late Early Classic (A.D. 554-692) (Moholy-Nagy and Coe 2008: see Table 3.46-3.50). For the Tikal examples the inlay sockets appear to have been misidentified as a means of termination described as 'obliterations by shallow drilled depressions' (*ibid.*). In sum, on the basis of available data, the shell disc of Actun Neko can be dated to between 5<sup>th</sup> and 7<sup>th</sup> centuries, and proves to be an important addition to the corpus of Maya iconography.

#### Discussion

Data from cave contexts suggests that the Caves Branch River Valley was occupied at least as early as the Archaic period, however, consistent use of the caves and rock shelters in the region is not demonstrable until after the Middle/Late Formative periods (ca. 300 B.C.). Use of these contexts continued until the end of the Classic period (ca. A.D. 900) with a brief hiatus or period of decreased use in the early part of the Late Classic. The scant evidence for habitation (i.e. surface sites) prior to the Late Classic period prompted McAnany to suggest that this region of central Belize was a long-distance pilgrimage destination (McAnany et al. 2004:296-297). While evidence for early settlement is still negligible, the use of caves/rock shelters does not accord with what would normally be expected for a long-distance pilgrimage site: That is, evidence for the ritual use of caves in the region prior to the Late/Terminal Classic period is nearly ubiquitous (rather than focused on several prominent sites as might otherwise be expected), includes locales of various sizes (suggesting ritual at a variety of scales; Morton 2008; Wrobel et al. 2010) and provides few examples of the architectural elaboration seen at other long-distance pilgrimage sites (e.g. Hammond and Bobo 1994). While the black gloss ware types associated with the Southwest

Passage, Chamber 6 and Entrance 2 (Gifford 1976:191) and distinctive iconography of the shell disc speak to long-ranging ritual and economic ties with the Petén, following Hammond and Bobo (1994:19), it is more likely that these cave sites were incorporated into short-distance pilgrimage ritual by an as-of-yet undefined local population that was nonetheless tied to a broader web of socio-economic interaction (see also Peterson 2006).

At present, it appears that the region was inhabited by a dispersed population, minimally focused around the small Formative centers of Cahal Uitz Na in the Roaring Creek Valley (Ferguson 1999), Tipan Chen Uitz (Morton and Andres 2011), and the Hershey site in the neighboring Sibun Valley (Peterson 2006:111). The probability that earlier occupations similarly predate the Late/Terminal period Deep Valley and Yaxbe sites should be acknowledged though this question awaits further excavation. Nonetheless, it appears that strongly nucleated populations did not flourish in the region until the Late Classic Period (ca. A.D. 700-800) (Andres et al. 2010; Peterson 2006; Wrobel et al. 2010).

The establishment and/or the expansion of complex socio-political centers in the Caves Branch/Roaring Creek micro-region was apparently rapid. Examples from the Early/Middle Formative (ca. 1100 B.C.) Belize Valley and the Late/Terminal Classic north Vaca Plateau serve as instructive illustrations of this process. During the Kanocha Phase (1100-900 B.C.) at Blackman Eddy (Garber et al. 2004:29-31) and the contemporary Cunil Phase at Cahal Pech (Awe 1992), nucleation of domestic centers on the periphery of Formative complex societies in the western southern lowlands and northern lowlands was accompanied by the presence of non-local exotics and a well-developed ceramic tradition. The presence of these materials speaks to economic contact with complex socio-political institutions from regions as far away as southeastern Honduras. The relatively rapid construction of centralized (though small) civic-ceremonial architecture in the following phase (900-700 B.C.) has been used to suggest that the consistent and significant contacts with these more complex peoples as well as the possible movement of secondary elites from neighboring regions (Garber et al. 2004:28) fostered the transplantation of familiar complex institutions into the Belize Valley.

A similar process is described by Iannone (2005:29-33) in reference to the Late Classic fluorescence of Minanha. Located between the major Classic period centers of Caracol and Naranjo, Minanha appears to have existed throughout the majority of the Classic period as a minor center in this internal frontier zone (Kopytoff 1987, 1999). The familiarity of Minanha's secondary elite with paramount elite institutions allowed them to take advantage of the declining fortunes of these surrounding polities during the Late Classic and implement a spectacular century-long building program in the site core as well as the establishment of a number of peripheral minor centers (Iannone 2005:29). The result was a brief period of micro-regional dominance before it, like many other centers in the southern lowlands lapsed into a terminal decline (A.D. 810-900).

Much the same picture can be painted for the Caves Branch and Roaring Creek valleys. Based on artifact assemblages from Actun Neko and other cave contexts (Reents-Budet 1980), it appears that this region had long been an active consumer of goods associated with the more centralized centers of the neighboring Belize Valley and Maya Mountains. As at Minanha, on present evidence the fluorescence of Tipan Chen Uitz, Cahal Uitz Na and Deep Valley, as well as the establishment of the myriad minor centers in the valleys, coincides with a general period of balkanization in the Southern and Central Maya Lowlands. It seems likely that such processes encouraged the movement of secondary elites, or 'cadet lineages,' from core Maya regions (likely the Belize River Valley or Vaca Plateau) and/or the opportune assertion of authority from lesser elite already inhabiting the region. In either scenario, the rapidity of center expansion illustrates a pre-existing familiarity with the institutions and symbols of paramount elite authority.

### Summary and Conclusions

In this paper we have presented preliminary findings at the small but well-utilized Actun Neko. In the process, we have attempted to incorporate the cave and those who used it into an emerging picture of the Caves Branch during the Classic Period. The cave saw two distinct periods of use with Early Classic ceramics deposited *en masse* in an entrance chamber located a scant 20 m from an actively used rockshelter. In addition, it appears that these Early Classic explorers penetrated the furthest depths of this cave (such as they are) to deposit an astonishing shell disc. Both the shell disc and ceramic evidence speak to the broad regional socio-economic incorporation of the Caves Branch at this time. During a period for which we have no evidence of complex nucleated settlement in the valley, this disc may furthermore provide the first solid evidence for the socio-political incorporation of this region into the 'high culture' of its neighbors. Further, it is worth noting that the disc was found at a point of auditory, if not physically navigable, contact with a nearby rockshelter. To our knowledge, the implications of soundscape on Maya cave use have not been well explored.

Later, after an appreciable gap, the focus of activity in Actun Neko shifted to the larger chambers near Entrance 1, where ritual acts paralleled established patterns elsewhere in the region. These consist of repetitive *in situ* acts punctuated by ritual cleaning and either the deposition of a fragmentary ceramic assemblage, or else the subsequent removal of large quantities of ceramic materials, resulting in a highly fragmented ceramic assemblage drawn from a wide sample of vessels and marked by few refits. Ceramic evidence suggests a material shift in ritual fodder (Cayo Unslipped and Alexanders Unslipped both being produced much more locally, though still related to examples from the central Petén; Gifford 1976:288). If this interpretation holds, then Actun Neko should be understood, not as an isolated ritual locus, but as one point on a web of interrelated loci and supports the emerging picture of the Caves Branch/Roaring Creek

Works as a late-blooming frontier region that was able to take advantage of the swiftly crumbling institutions and traditional power structures of the neighboring Belize Valley.

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## 8

## Constructing the Underworld: The Built Environment in Ancient Mesoamerican Caves

Holley Moyes

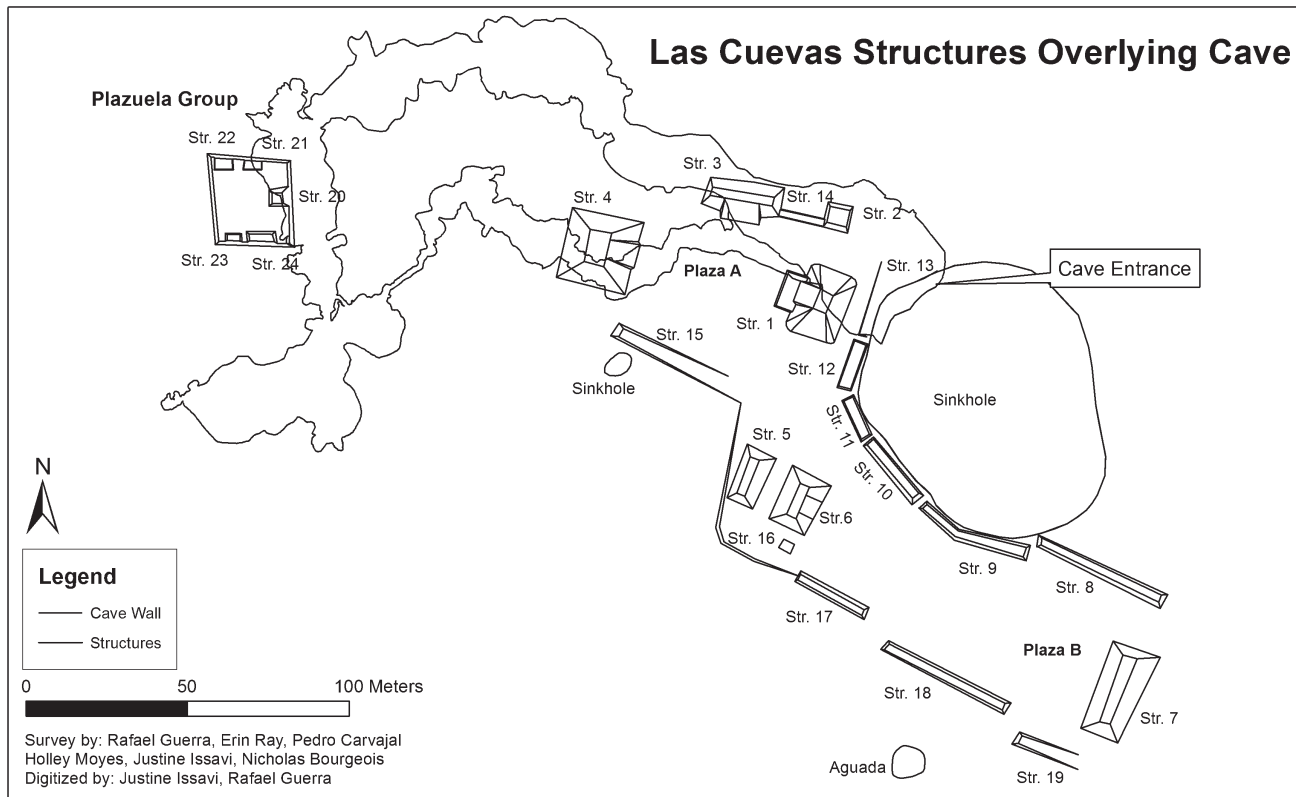
Architectural analysis is a major line of inquiry in Mesoamerican archaeology that has given rise to a number of publications regarding the cosmological meanings, analyses of performance space, and socio/political functions of the built environment (e.g. see Houston 1998; Inomata and Houston 2001a, 2001b; Kowalski 1999). Despite the importance of these studies to understanding ancient cultures there have been no contributions to this dialogue based on cave research, and no systematic study of architectural modifications in the cave environment. Although we have been aware of the presence of such features for at least 100 years (Mercer 1975), architecture is one of the most poorly understood areas of cave inquiry. Stone (1995:16-18), for instance, equates caves with the Maya concept of *K'aaax* (wilderness), which appears to ignore the presence of architectural modifications completely. This notion of caves as wilderness has not been widely accepted by archaeologists working in caves who encounter architectural features that “create ritual order and cultural space” (Peterson 2006:125). James Brady and his colleagues (1997:359-60) suggest that modifications are substantial enough to consider that caves are “built environments” but they do not provide extensive substantial data to support the assertion.

Architecture is described in many cave reports but is seldom included as a unit of analysis (for exception see Brady 1989; Rissolo 2005). What is striking about this omission is the large number of architectural modifications reported in caves. In a 2005 survey of 53 cave sites throughout Belize, the Belize Speleothem Project noted that over half the caves visited contained some form of architecture (Moyes et al. 2006). Of the caves surveyed during the Minanha Ha Project in western Belize, seven of the 12 caves visited contained architecture (Moyes and Awe 2010). The largest site, Actun Isabella was extensively modified with terraces, walls, platforms and blockages. In his survey of the Ek Xux valley caves in southern Belize, Keith Prufer (2002) noted that eight of 25 caves contained some form of formal architecture and in the Muklebal Tzul valley, there were constructions in 10 of the 24 cave sites. Dominique Rissolo (2001: 365) observed that formal ceremonial architecture was not uncommon in Maya caves in Yucatan. He discovered a pyramidal structure within Actun Toh, and also noted that formal architecture was often associated with intermittent

pools or other water sources.

Because caves were and are established ritual venues, investigation of architecture found within cave sites represents one of the most fruitful avenues of study for those who seek to understand ritual performance in the Mesoamerican archaeological record. Architectural features appear to function in a variety of ways. For example some features structure ritual performance by separating the performers from the observers or enhance sight lines. Others channel movement, create focal points (Kenward 2005:256), force changes in body posture, or occlude views. Borrowing a metaphor from de Certeau (1984), as one moves through the cave modifications appear to create a “spatial story” that forms a narrative of time and space. This narrative between architecture and performance has been studied in surface architecture that lends itself to ritual drama. For instance, based on building layouts and architectural details, David Freidel and Charles Suhler (1999) argued that two structures at Yaxuná were built for specific performances involving the actor’s descent into the underworld. David Webster (1998:27) argued that ancient Maya building reconstruction was done partly to improve them as stages for public dramas. He noted that the three modifications made to the Temple of the Inscriptions at Palenque reflected changes in actual performances at the site. In his recent article on the archaeology of performance, Takeshi Inomata (2006:807-811) stressed the role of ritual and festivals in the establishment of kingship and argued that these large-scale performances were inherently political. He believes that they were likely to be held in large plazas but specifically *not* in caves, stating that “. . . elaborate head-dresses and backracks and heavy jade ornaments shown on stelae, however, appear extremely cumbersome for entering caves, which often requires climbing down cliffs and crawling through narrow, muddy passages.” Clearly Inomata was not aware of caves with massive entrances that contained monumental architecture suitable for public spectacle.

For example the entrance to Naj Tunich Cave in Guatemala reported by James Brady in his 1989 dissertation, is a vast space that is architecturally modified. At the entrance is a large pile of breakdown (collapsed boulders from the ceiling) fitted with walls and terraces. The top of the breakdown is a leveled platform that is the most intensely utilized area of the cave, which looks out onto the entrance hall (Brady and



**Figure 1.** Map of the site of Las Cuevas illustrating the cave that runs beneath buildings in the site core. The cave entrance sits below the eastern structure of Plaza A, and is accessed via a dry sinkhole (Map courtesy of the LCAR).

Stone 1986; Stone 1995:101). The sheer size of the entrance and its accompanying modifications lead Brady to be the first to discuss caves in terms of public and private spaces.

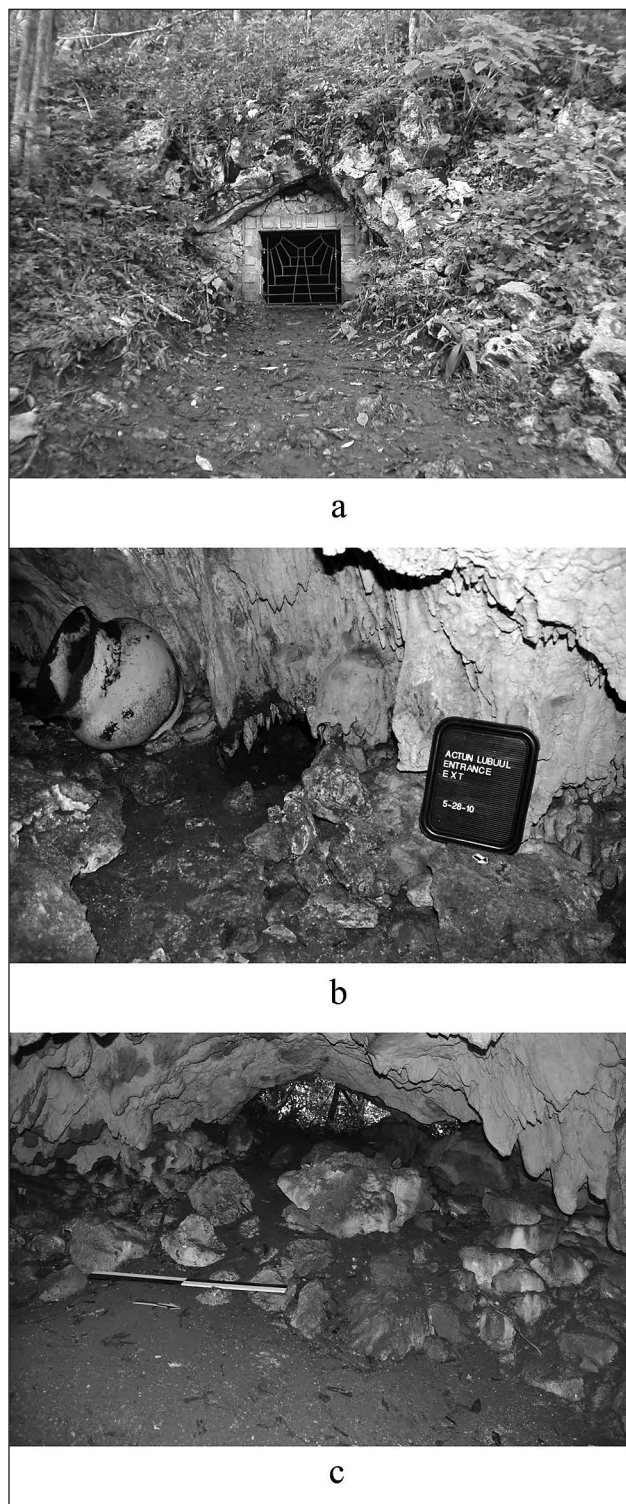
Naj Tunich is not anomalous in this regard. Another cave containing a large performance space is Actun Chapat located in the Macal Valley in western Belize. Entrance II of the cave is a cathedral-like space located at the base of a sinkhole (Ferguson 2000). It forms a large flat area surrounded by 15 constructions including walls, at least 11 rising terraces, and stairways. It is difficult to imagine that these constructions were designed for anything other than performances with large numbers of participants.

Perhaps the best example of public performance space in caves is found at the site of Las Cuevas in western Belize. This medium-sized center was originally reported by Adrian Digby in 1958 and is currently being investigated by the Las Cuevas Archaeological Reconnaissance (LCAR) under my direction. Here, a large cave system runs beneath the surface site core. The massive cave Entrance Chamber is almost completely constructed or modified with platforms, stairs, and terraces, creating a performance space equivalent or larger in size to many outdoor plazas (Moyes et al. 2012a; Figure 1). The area of the chamber dwarfs Plaza A of the surface site that sits above it. Plaza A measures only 45 m x 45 m whereas the cave Entrance Chamber measures 106 m x 41 m. The area of Plaza B is comparable to the cave entrance measuring 45 m x 101 m. Compare this with the

plaza in front of the massive structure of Caana at Caracol, which measures approximately 50 m. x 50 m. Additionally, the cave is accessed via a collapsed sinkhole that forms an amphitheatre-like space in front of the entrance measuring 73 m x 90 m, greatly increasing the area that may have been used as public space. The south side of the sinkhole is lined with linear structures described by Adrian Digby (1958: 274) as “viewing stands,” and terraces descend toward the cave mouth.

Actun Isabella located near the site of Minanha in western Belize is topographically similar. It sits at the base of a hill and the entrance is surrounded by natural ridges that form a plaza-like area in front of the cave (Moyes and Awe 2010:145-146). The cave mouth measures 50 m in width and three large terraces span the east side of the entrance descending to the cave floor. These data suggest that cave entrances as well as the areas in front of caves provide access for large numbers of ritual participants. As performance spaces, they are inherently sacred contexts with ideological associations to cosmological models whose symbolic meanings serve to sanctify the rites and ceremonies occurring within those precincts.

While large public spaces located at cave entrances are typically architecturally modified, cave interiors are also fitted with constructions. Taking a functional viewpoint, one could argue that cave architecture such as walls and partitions served to constrain or restrict space. James Brady



**Figure 2.** (a) Constricted entrance to Chechem Ha Cave was closed with limestone boulders and reopened by the landowners who placed the gate, (b) Actun Luubul entrance was blocked with loose rock after its last usage until it was reopened by locals, (c) Moth Cave viewed from interior. Entrance was blocked from the inside (Photos by author).

(1989:402-406) suggested that partitioning of space in caves may have served to create dark zone spaces or to differentiate public from private ritual. This public/private interpretation mirrors studies of palace architecture, which demonstrates that over time, an ever increasing number of walls, doors, and passages created progressively restricted access specifically designed to separate elites from commoners (Awe 1992; Awe, Campbell, and Conlon 1991; Houston 1998:522-523; Pendergast 1992:62-63).

Accessibility also has implications concerning the opening and closing of cave entrances. Excavations at Chechem Ha Cave demonstrated that limestone boulders were used to constrict the cave mouth, and that the entrance was closed off and reopened on several occasions (Moyes 2006; Figure 2a). This was of interest because the opening and closing of the cave was correlated with regional social unrest and environmental stressors. Blocking of cave entrances is in fact quite common. Most caves that have entrances small enough to be easily blocked off, are. For instance, Actun Luubul located within the Minanha site core is entered via a 10 m descent to the base of a sinkhole. The entrance to Chamber 1 was blocked by dry laid boulders and had a small opening measuring 0.55 m in width with a height of 0.5 m. The entrance was closed with loose rock after its last usage until locals recently broke into the cave (Figure 2b). The entrance to Moth Cave, also located in this area, was similarly blocked with a pile of medium to large boulders, and had been opened by looters (Figure 2c). The restricted opening measured 1.7 m in width with a ceiling height of 0.5 m. It is unclear as to whether a formal opening was constructed.

Constructions that are somewhat more formal at cave entrances are also instructive. The site of Numyaj Naj (House of Pain), located in western Belize near the site of Minanha (Moyes and Awe 2010:152-153) is accessed via a very tight natural squeeze. Marking the entrance on the interior side of the squeeze is a roughly constructed wall of dry-laid boulders. Side walls clearly delineate the 0.50 m constructed entryway in the wall, which was blocked after its last usage and later reopened by looters (Figure 3a). At Blue Creek in northern Belize, Alvin's Cave is entered via an 8 m drop into a sinkhole, similar to Actun Luubul (Figure 3b). A well-constructed wall of dry laid boulders extends over the 10 m wide and 2 m high entrance, but falls 0.75 m short of the ceiling. A small constructed entryway is found on the eastern side of the cave beneath an overhang forming an alcove. The 0.5 m x 0.5 m entry construction forces one to crawl into the cave. One of the best examples of wall construction is at Cormorant Cave located in western Belize equidistant between the sites of Guacamayo and Pacbitun. Like Actun Luubul and Alvin's Cave, it is entered via a sinkhole that drops 5 m into in entrance chamber. A beautifully constructed wall held together with mud mortar completely fills the 2.6 m x 2 m entrance to the tunnel system. At 1.25 m above the floor a crawl space 1 m in width and 0.75 m in height forms a constructed entrance. Stone steps descend into the cave on the interior of the wall (Figure 3c). After its last use, the entrance was closed off with loose limestone boulders, which

looters pulled out of the entryway and discarded in front of the wall. All of these blocked entrances occlude some but not all light from the cave's interior regions. However, their primary function appears to be to restrict entrances so that only one person may enter at a time, forcing the person to enter the cave on their hands and knees. What is the cultural logic underpinning this practice?

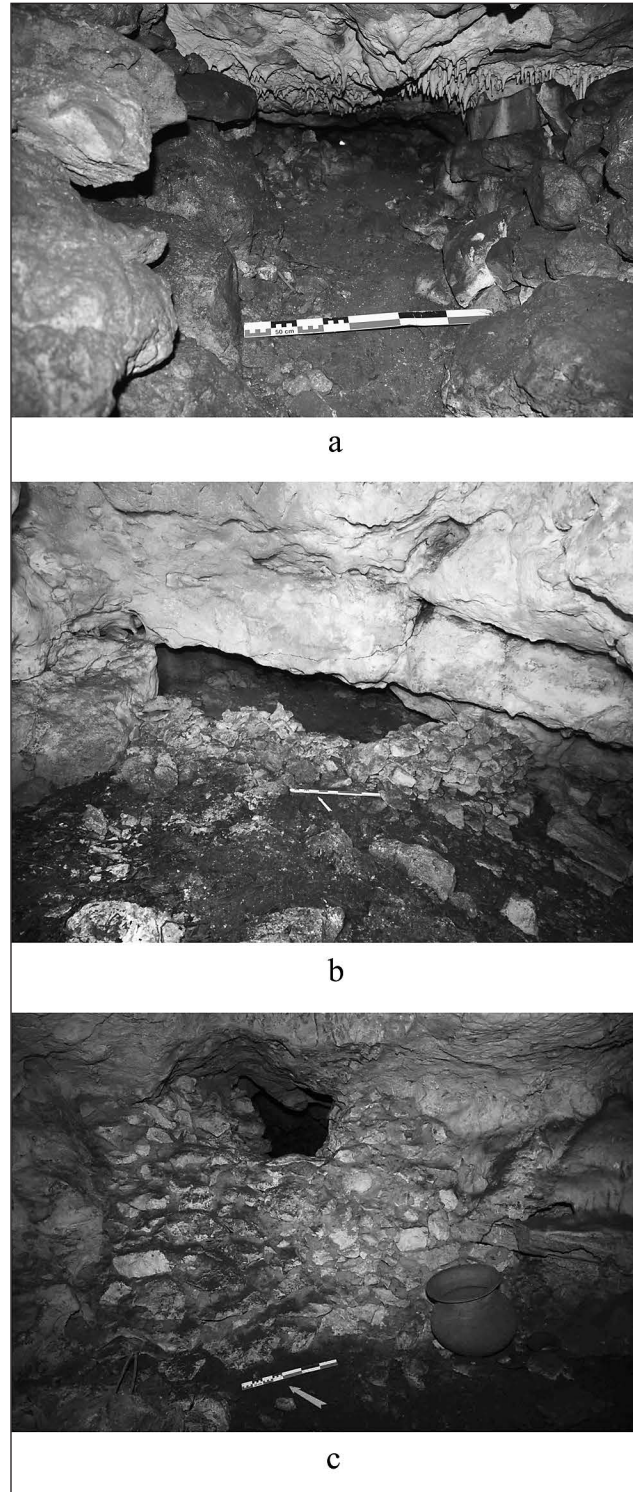
To address this question I suggest that we think of cave modifications not solely in terms of function, but that we consider their role in structuring cave space as predicated on understandings of mythological constructs and cosmological ideals as has been proposed in analyses of surface architecture. Wendy Ashmore (1991) has long argued that the twin pyramid complexes at Tikal reference the quincuncial model of the universe, creating spatial order, and encoding directional meanings. Architecture and its accompanying sculptural elements may also form the backdrop for royal rites that place kings at the center of the cosmos, a construct exemplified at Temple 22 of Copan (Freidel et. al. 1993:149; von Schwerin 2011) with its flowery mountain, emerging maize deities, and bird deities that reference the world at the dawn of creation as related in the *Popol Vuh*.

In this paper I examine how cave architecture is used to structure cave space by considering Maya conceptualizations of mythic space, and argue that these concepts would have constituted a phenomenological reality for the ancient users. I also contend, following Henri LeFebvre (Zieleniec 2007:61), that space is not neutral but is socially produced by ideological, economic, and political forces that seek to regulate and control it. This perspective allows us begin to understand caves as “spaces of representation,” constituted by the interplay of social relations, activities, and movement (LeFebvre 1991:39). Therefore, I argue that in ancient Maya caves human use is predicated on cosmological associations at the heart of the social production of space.

In order to understand how architecture is used within a cultural context, I discuss cosmological models conceptualized by Maya people as reported in ethnohistoric and ethnographic studies. These models help us to create expectations of how cave space may be constructed to mirror these ideals. Using the example of the spatial structure of the cave at Las Cuevas, my analysis then moves beyond the “public” vs. “private” heuristic to demonstrate that cave architecture materializes cosmology (see Demarrais 1996) and creates narratives predicated on mythological concepts. These narratives create a framework that guides participants in their journeys through the Maya underworld.

### Caves as Underworld Entrances

Both the Maya and the Aztecs envisioned the vertical axis of the cosmos as consisting of the sky, the middle world or earth, and the underworld. Research on ancient Mesoamerican sacred landscapes has highlighted the importance of the sacred earth in Prehispanic religions (Brady and Ashmore 1999; Brady and Prufer 2005; Moyes and Brady 2005; Stuart 1997; Vogt and Stuart 2005). Years ago, Barbara MacLeod and Dennis Puleston (1978) were the first

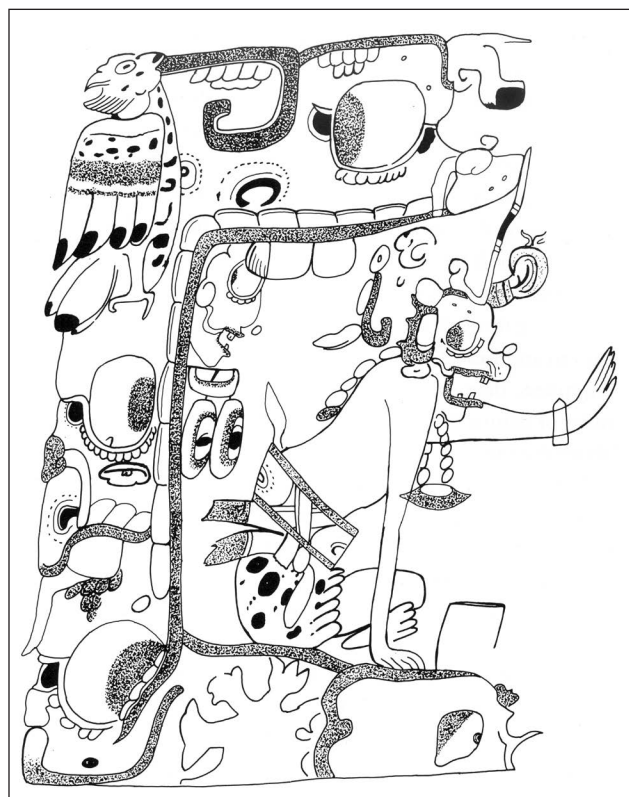


**Figure 3.** (a) Constructed “doorway” in wall blocking entrance at Numyaj Naj (House of Pain), (b) Entrance blockage at Alvin’s Cave, (c) Well-constructed mortared wall at Cormorant Cave forces one to crawl through the “doorway” (Photos by author).

to argue that caves were entrances to the underworld based on ethnographic accounts reported by J. Eric Thomson and the ethnohistoric *Popol Vuh* story, a concept that deserves to be examined and readdressed. Following MacLeod and Puleston, I argue that as literal geographic entrances into the earth, caves are one of the most salient features of the sacred landscape because they reify the cosmology of this three-tiered universe representing a conduit between the middle world of humans and the underworld.

In the following discussion I grapple with the question, are caves considered part of the earthly or underworld domain or both in Maya cultural logic? In Maya cosmologies, the earth itself, its mountains, trees, and stones are considered sacred and animate. While earth is represented in many landscape features, one of the most powerful symbols is the mountain with a cave. Ethnographically caves are considered to be the domain of supernaturals commonly referred to as “Earth Lords,” that oversee rainmaking and agricultural fertility (Gossen 1974:21; Holland 1962:126-129; Vogt 1976:16; Scott 2009; also see for discussion Brady and Prufer 2005:366-367; Moyes and Brady 2005:332-33). Earth Lords may also be found in sources of water and on high mountains (see Holland 1962:127). Among the Q’eqchi’ of Alta Verapaz the in-dwelling Earth spirits or *Tzuultaq’as* (meaning literally “mountain valley”) are propitiated deep within caves, which are thought to be the house of the deity

**Figure 4.** Illustration from a painted Late Classic vase depicting Chac, the rain god sitting in his cave/house (After Stone 1995: fig. 3-1, adapted from Coe 1978:78, no.11).



(Wilson 1990:69, 98).

Many of these Earth Lords are responsible for producing rain. For example, at Zinacantan in Chiapas, the Earth Lord is associated with specific openings into the earth such as caves, sinkholes, or waterholes (Vogt 1976:16-17). This being lives underground and is conceptualized as a fat ladino that possesses great wealth. He controls lightening and clouds that emerge from caves to produce rain for crops. These ethnographic examples help explain why Chac, the Maya rain deity, is depicted as sitting in a cave entrance in Late Classic period iconography (Figure 4). Such constructs based on modern Maya thought have led James Brady and Keith Prufer (2005:5) as well as Ann Scott 2009 to separate the “earth” from the “underworld” and to attribute cave use to the earthly realm. But, as Scott (2009: 190) acknowledges, these observations are based on ethnographic survivals of a rural Maya peasant religious tradition and there is apt to be considerable disjunction, as I have argued elsewhere (Moyes 2006:45-84), particularly in the elite ritual use of caves of the Classic period.

Despite the emphasis on earth-based deities in modern Maya ritual, underworld associations are still prevalent in modern cosmological models. It is likely that ancient Maya cave use was more strongly associated with the underworld due to links between the ancient creation myth and ritual that are not likely to be played out in exactly the same way modern Maya contexts. Many survivals of the ancient myth exist today, but they are often fragments of the story or alternative forms (See for example Sexton 1999:65-84). Also, according to David Stuart (See Vogt and Stuart 2005: 157-159), Classic period glyphic associations for ancient Maya caves contain elements such as the skull, bone, mandible or detached eye within a half darkened field, suggest death and underworld affiliations. Stuart adds that these motifs are also associated with bat wings in Maya iconography, further establishing a cave/death/underworld ideological nexus.

The traditional underworld was considered a fearsome and dreaded place named *Mictlan* by the Aztec, and *Xibalba* or “place of fright” by the K’iche’ Maya (Miller and Taube 1997:177). It was a place through which all souls, save those killed violently (for example victims of warfare), must journey after death. According to the *Popol Vuh*, it was inhabited by the Lords of the Underworld, denizens of death, disease, and violence that preyed on human frailty. In the myth, the Hero Twins traveled deep into the underworld to encounter the evil lords, navigating the rivers and trails that lead to the lowest levels.

Also of note is that the evil lords were not the only underworld inhabitants. In both the *Popol Vuh* story and in modern ethnography (Gossen 1974:21), we find that the underworld is populated with human-like inhabitants, mirroring the middle world or earth. Aside from these denizens, the beneficent Maize deity also abides in the nether regions of the underworld. According to the *Popol Vuh*, Hun Hunahpu, the father of the Hero Twins was transformed into the Maize God, and was left in the underworld to dwell and receive offerings, cyclically emerging into the middle

world as the maize plant each growing season (Christenson 2003:190-191).

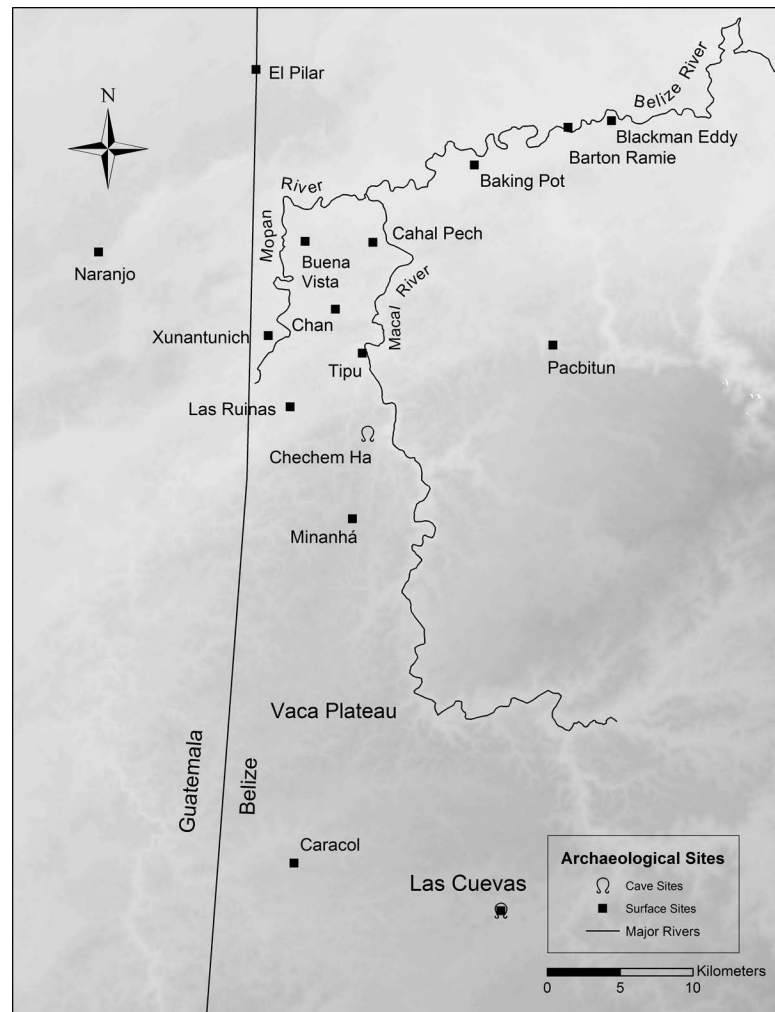
In Pre-Columbian examples, Aztec models of how the underworld was conceptualized are the most explicit. According to Miller and Taube (1993:177), at the time of the conquest, most Central Mexican people conceived of the sky as having 13 levels, and the underworld consisting of nine. The most detailed pictographic description of the underworld is in the Codex Vaticanus A in which the first layer is part of the inhabitable earth. One then descends into the passage of waters, followed by the entrance to mountains, hill of obsidian knives, place of frozen winds, place where the flags tremble, place where people are flayed, place where the hearts of people are devoured, and finally to the ninth layer, referred to as *Mictlan Opochcalocan*, where the dead lie in eternal darkness (Aguilar-Moreno 2007:139; See also Berdan 2005:130). As Miller and Taube note (1993:177), these layers are reminiscent of the torture “houses” that the Hero Twins must endure in the Maya *Popol Vuh* story.

Maya ethnographic data also suggest that both the sky and underworld are made up of layers, though the number of levels varies. J. Eric Thompson (1970:195) reports that the sky is conceptualized as have 13 layers consisting of six ascending from the eastern horizon with the seventh as the zenith of the sky, with another six descending to the western horizon. The underworld is composed of four steps descending down the western horizon to the nadir of the fifth level, and another four steps ascend to the eastern horizon. William Holland (1962:94-96), working among the Tzotzil of Larrainzar, also reports that cosmological models illustrate the sky as having 13 levels and the underworld as having nine. Humans live in the bottom two levels of the sky and earth deities are located within the sky’s lowest level. The ninth level of the underworld constitutes *Olontik* or the “Land of the Dead.” There is a deity associated with each level, and the underworld gods are considered to be malevolent, bringing evil and death to humans. These deities roam the earth at night and reenter the underworld through caves at daybreak where they are thought to make their homes. Earth deities are more easily controlled than Sky or Underworld denizens, but underworld beings must be constantly solicited for protection against the evil forces they control (Ibid. 126-133).

This differs from Gary Gossen’s (1974:21) account of the Tzotzil of Chamula who envision the sky as having three concentric layers and the underworld as a single layer supported by Miguel, the Earth Bearer. In Gossen’s model, caves are considered part of the earth, though

they are associated with water, dampness, darkness, and lowness, suggesting that they are in fact transitional zones between the middle world and the underworld. William Hanks (1990:304) reports that his Yukatek informant envisioned the vertical cosmos as a “bubble in which the earth is a horizontal plane located midway between the zenith and the nadir.” In this model, the earth sits atop a body of water that contains underground rivers. Below this is a layer of fire constituting the underworld or *Metnal* “hell.” The sky is envisioned as having seven cloud layers, but people inhabit an area “inside above Earth,” which includes the surface of the earth and the area below the cloud layers. Jaguars and other Earth Guardians live here as well. Although Hanks never explicitly mentions caves, following his informant’s cultural logic, anything beneath the earth’s surface would be *below* “inside above Earth,” particularly if it contained water or an underground river, placing it in a liminal area. Perhaps also telling is John Sosa’s (1985:424) account of the Yukatek Maya of Yalcoabá. He comments that “the subterranean level of the cosmos is not really completely distinct from the earth, but is conceived to be within it.”

Other ethnographic accounts relate caves more specifically to the underworld. In his work in Momostenango in highland



**Figure 5.** Map showing location of Las Cuevas site (Courtesy of LCAR).

Guatemala, Garret Cook (2000:164) reports that caves represent the entrance to the underworld and are inhabited by the human dead and liminal beings from other world orders or past creations. Working in the same area, Barbara Tedlock found that the underworld is “an evil location that is entered by human beings at death, through a cave, or the standing waters of a lake or ocean” (1992:173). Allen Christenson (2008:108) also working in highland Guatemala argues that caves are conceptualized as portals to the “other world,” which is the domain of ancestors, saints and deities.

Admittedly, there is a great deal of variation among modern Maya cosmological models, but a few conclusions drawn from this discussion help us to understand how space may have been used and conceptualized by the ancient Maya. First, the vertical cosmos is consistently conceptualized as having levels, so it is likely that there is some separation between the earth and the underworld, though this is not defined well in modern models or in the *Popol Vuh*. The number of levels appears to have considerable variation in modern thought, but in Pre-Columbian texts and in some ethnographic instances there are 13 levels of the sky and nine levels of the underworld. The lowest parts of the earth level appear to be transitional areas. The lowest level of earth may also be thought of as the first level of the underworld.

As noted in Larraínzar, both earth and underworld deities live in caves. Earth deities appear to be associated with the more superficial areas, whereas underworld denizens would be expected to reside primarily in lower levels. The Q’eqchi’ *Tzuultaq’as* that is propitiated deep within caves is an exception to this. In examples from highland Guatemala, caves appear to be considered conduits to the underworld or what Christenson refers to as the “other” world.

In terms of the archaeological record, what expectations might we derive? How might these conceptions be materialized in terms of the experience of the ancient Maya cave users? We might expect that cosmological levels were demarcated, but is there evidence for this? The cave site at Las Cuevas is instructive in understanding how underworld space was constructed.

### The Cave at Las Cuevas

Arguably, the most heavily modified cave site in all of the Maya area is the site of Las Cuevas in the Chiquibul Forest Reserve in western Belize (Figure 5). The cave lies beneath a medium-sized minor administrative/ceremonial center whose nearest neighbor is the mammoth site of Caracol located approximately 14 km to the east as the crow flies. The Las Cuevas surface site consists of 24 buildings including temples, range structures, a ballcourt, and linear structures surrounding the edge of a dry sinkhole measuring 73 m on its east/west axis and 90 m on its north/south axis, with a maximum depth of 15m (See Figure 1). The southeast-facing cave mouth is accessed via the sinkhole and lies directly below the eastern structure (Str. 1) in Plaza A, and the tunnel system extends beneath the site. While it is not unusual for Maya sites to be associated with caves, we rarely see such a direct connection or such an extensive tunnel system beneath

a site core (Moyes and Brady 2012).

The massive entrance, measuring 28 m width, opens into a cathedral-like chamber measuring 108 m in length, 40 m in width, and 17 m in height. The Entrance Chamber is heavily modified with monumental architectural constructions including terraces, retaining walls, stairs and platforms that are topped with layers of thick plaster (Moyes et al. 2012a). A cenote containing a natural spring lies at the center of chamber. The cenote is lined with cut stone block retaining walls, and five stairways descend to the spring at its base. The LCAR noted a total of 58 separate platforms connected by stairways in the Entrance Chamber, suggesting that the cave was used for large and well-organized ceremonies and that could be viewed by many observers and supported a large number of participants.

Cave excavations conducted in the 2011 field season suggest that, based on ceramic cross-dating, the cave architecture was erected in the late part of the Late Classic period between A.D. 700- 900. The ceramic types found at the site are typical of the Petén, Belize Valley and points south, suggesting they are being imported from afar (Kosakowsky and Moyes 2012). This, coupled with the extensive modifications to the cave, suggests that the site served as a ritual pilgrimage center. This conclusion is also supported by initial settlement surveys that located few residential structures in close proximity to the site (Moyes et al. 2012b).

The cave’s Entrance Chamber is the most heavily modified area, likely constructed to accommodate large public spectacle (Figure 6). It is divided into an east and west area separated by an archway, which from some angles resembles the representations of the maw of the Earth Monster in Maya iconography. As one proceeds west the light zone fades to twilight, which fades further into darkness at the westernmost wall of the chamber. The platforms and stairs on the east side surrounding the cenote ascend to the cave walls creating an amphitheatre-like space. More platforms and stairways in the rear of the entrance abut terraces leading up to the entrance to the tunnel system.

The tunnel system entrance lies at the back of the chamber on the westernmost wall, which forms a natural constriction. A wall (Wall 1) constructed from small to medium-sized limestone boulders spans the 6.2 m wide constriction blocking it totally (Figure 7). A formal entrance or “doorway” measuring 0.75 m in width and 1.1 m in height, forces one to bow or duck when entering Chamber 1. Loose limestone boulders strewn on the exterior of the wall suggest that the entrance was blocked off completely at some point in the past.

The main tunnel system, measuring 335 m in overall length, is comprised of rooms and passages that circle around on themselves and terminate in a window 8 m above the floor on the west wall of the Entrance Chamber (Figure 8). The window looks out onto the eastern end of the Entrance Chamber with a view to the cave mouth and cenote, as well as the platforms and terraces on the north side of the cave (Figure 9). The acoustics are quite impressive from the window and even a soft voice may be heard all the way to the north wall of the chamber. On the floor of the window there is a great

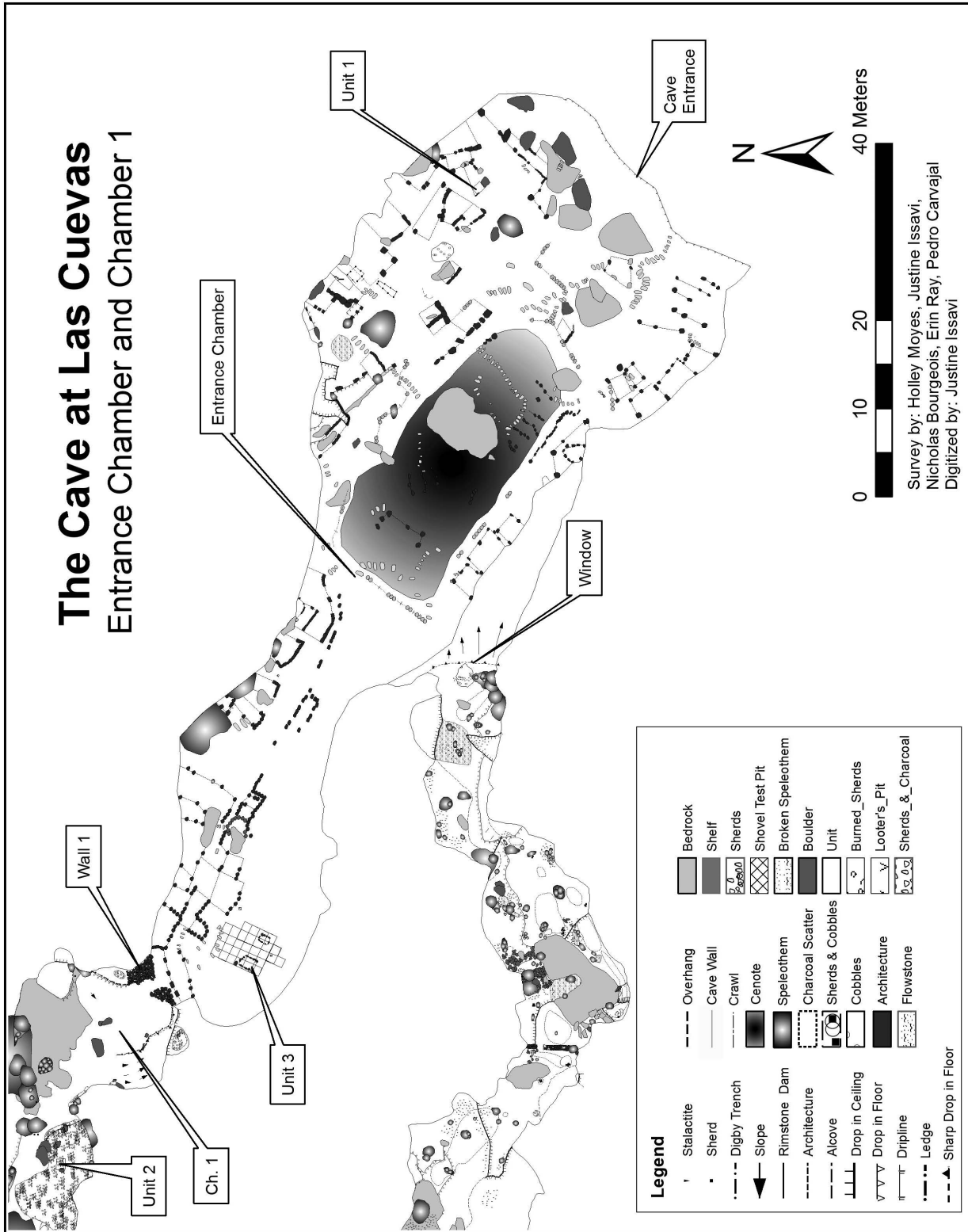


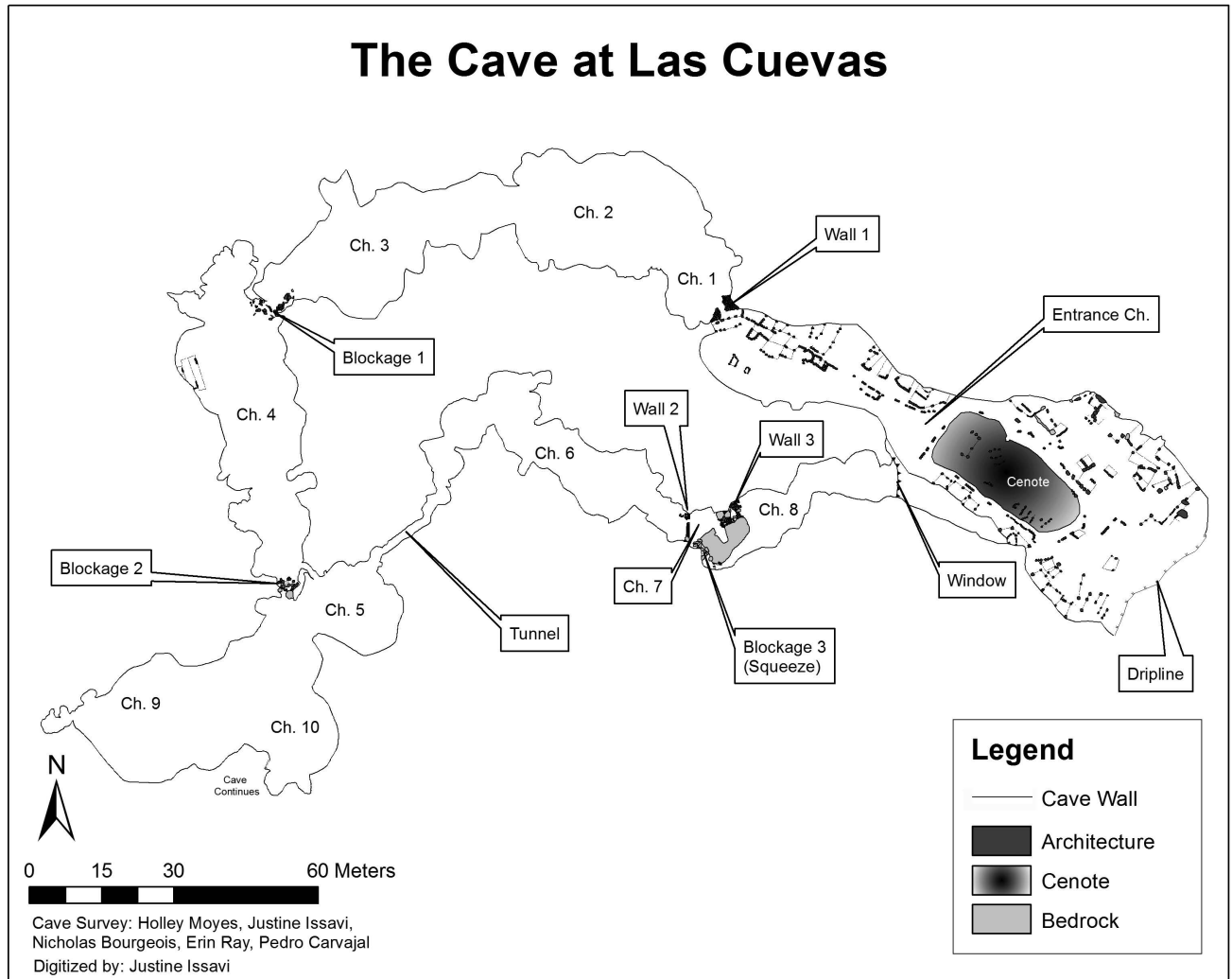
Figure 6. Map of the Las Cuevas Entrance Chamber (Courtesy of LCAR).





**Figure 7.** Wall 1 blocks the entrance to the tunnel system. A constructed doorway restricts access (Photo by author).

**Figure 8 (below).** Map of Las Cuevas tunnel system showing locations of constructions (Courtesy of LCAR).





**Figure 9.** View from the window at the termination of the tunnel system looking down onto the Las Cuevas Entrance Chamber (photo courtesy of LCAR).

deal of charcoal but only a handful of potsherds, suggesting that performative activities occurred there as opposed to the deposition of offerings. One can imagine a grand oration being presented from this high vantage point.

Pertinent to this study is the architectural elaboration of the tunnel system. Aside the wall blocking the tunnel's entrance, as one moves through system one encounters three blockages, two additional walls, and a natural morphological restriction. The first blockage is between Chambers 3 and 4. Blockage 1 is constructed with small to medium-sized limestone boulders and speleothems. It further restricts a small 3.3 m wide opening with a 0.7 m ceiling height forcing one to crawl through a squeeze into Chamber 4 (Figure 10a). Upright flat stones and a fallen stalactite form an entryway on the northwest side of the entrance. The blockage was completely closed at one time as evidenced by loose boulders and speleothems lying on the floor next to the interior of the wall suggesting that they were pushed outward. Another crude blockage, Blockage 2, occurs as one exits Chamber 4 and enters Chamber 5. Here, there is a 2.5 m wide natural constriction with a ceiling height of 1 m, plugged by piled up limestone boulders to further restrict the entrance (Figure 10b). Rock has been pulled out of the blockage and lies on the floor in front of the entrance.

A natural constriction occurs as one exits Chamber 5

(See Figure 8). A long narrow tunnel measuring 23 m in length and 1-2.3 m in width must be traversed in order to enter Chamber 6. The ceiling height is high enough to allow one to walk through the tunnel. The space is entered via a window 2 m above floor. Small boulders were placed on the floor below the window to assist with access at some point in the past, so this may be a modern feature. Though it is possible that the boulders once sat in the window, there is no real evidence for it.

The next construction as one moves through the system is between Chambers 6 and 7. Wall 2 was constructed in the 5 m wide natural constriction and reaches from floor to ceiling, measuring 1.5 m at its highest point (Figure 10c). It is 0.5-0.6 m thick, and on the north side there is a constructed doorway measuring 0.5 m in width and 0.8 m in height. The wall is constructed of small to medium limestone boulders and speleothems. It is nicely laid and held in place by mud mortar. The mud contains large amounts of charcoal suggesting that it was collected from the cave floor.

**Figure 10** (facing page). (a) Blockage 1 separates Chambers 3 and 4, (b) Blockage 2 entrance, (c) Exterior of Wall 2 with constructed "doorway," (d) Wall 3 blocks off the larger natural entrance to Chamber 8, (e) Blockage 3 forces one to crawl into Chamber 8. Justine Issavi pictured. (Photos courtesy of LCAR).



a



b



c



d



e

It is loosely packed, so that it is possible to see through the cracks in the rock.

Chamber 7 contains two constructions. At the back of the chamber there is a natural 4.4 m opening into Chamber 8 along the west wall. This was completely blocked off from floor to ceiling at one time by Wall 3 (Figure 10d). The wall is constructed of well-laid small to medium-sized limestone boulders and is 2.5 m in thickness. Looters have collapsed the rock to allow entry to Chamber 8 and loose rock lies on the floor on either side of the blockage. I suspect that this entrance was blocked to force ritual participants to enter Chamber 8 via a small constructed crawl space, Blockage 3, beneath a drop in the ceiling on the north side of Chamber 7 (Figure 10e). This constriction is 1.1 m in width, with a very low ceiling height of 0.7 m. The 2.5 m crawl has a both constructed entryway and exit fashioned with upright flat stones that constrict the entrance to 0.5 m in width.

Chamber 8 terminates with a sheer drop off from the window looking onto the Entrance Chamber. The window measures 5.5 m across and has a ceiling height of 3.15 m. Although the cave has been heavily looted, judging from the number of potsherds observed throughout the tunnel system, there is a decrease in activity or at least the number of offerings as one moves through the tunnel. The floors of Chambers 2 and 3 were covered by carpets of sherds easily numbering in the tens of thousands, whereas there are few artifacts in Chamber 4. Chamber 5 contained some partial vessels, a few sherd scatters, two obsidian blades, some fragments of a child's skull and animal bone, but little else. Chamber 6 contained a few single jute shells strewn in the pathways, very few potsherds, and a great deal of charcoal. Beyond Wall 2 there are but a hand full of sherds and large scatters of charcoal, particularly at the end of the tunnel adjacent to the window. The pattern of artifact deposition and

**Figure 11.** (a) James Brady stands in front of wall that does not extend to ceiling in twilight area of Las Pinturas cave near Flores in Guatemala (Photo by author), (b) Holley Moyes stands in front of wall that does not extend to ceiling in twilight area at Bird Tower Cave located near Las Cuevas (Photo courtesy of LCAR), (c) Christophe Helmke stands in front of wall that does not extend to ceiling in twilight area of Actun Chapat (Photo by Author), (d) Wall at entrance to Skull Cave (Actun Tsek') in the Macal Valley, Belize near the site of Minanha.



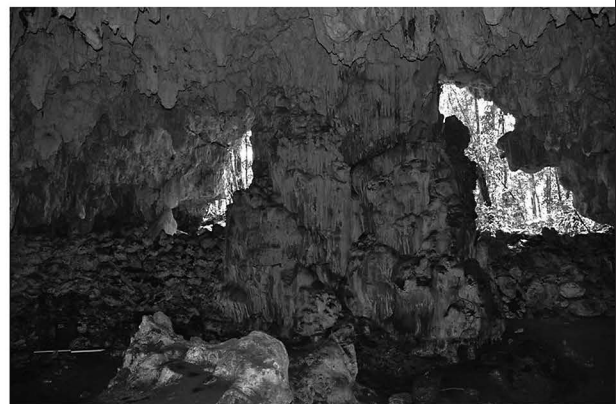
a



b



c



d

low density of artifacts suggests that relatively few people were advancing into the tunnel system as it wound its way through the cave.

### Discussion

When we examine the tunnel constructions at Las Cuevas holistically, they help us to understand the principles and cultural logic underlying the structure of the space. By considering the placement of the blockages, it becomes apparent that their function and meaning go beyond the public/private dichotomy. Having said this, it is clear that the cave entrance serves as a performance space while the tunnel system appears to be reserved for the few who have the spiritual power to encounter the dangers within, and the pure heart so that they may offer a sacrifice. Similar to constructions blocking entrances at other cave sites, the walls and blockages at Las Cuevas restrict access and force changes in body posture. I would argue that it is unlikely that walls in caves serve to either create dark zones or block visual access. Most walls in caves in general are constructed of dry laid boulders, and even when mud mortar is applied, the porous structure allows light to penetrate so that one can simply peek through the rock into the adjacent area or chamber. Additionally many cave walls, even those of considerable thickness located in twilight areas near cave entrances do not extend to the cave's ceiling (Figure 11), so it is unlikely that their purpose was to create dark zones.

Rather, based on cosmological ideals, I propose that restrictions commonly present at the entrance to tunnel systems or those that separate the entrance of the cave from deeper areas, are marking the separation of earth from underworld. In the case of Las Cuevas, Wall 1 would serve this function. At Las Cuevas, the interior blockages delineate underworld levels as one moved deeper into the cave. The tunnel at Las Cuevas delineates a journey through the underworld that eventually emerges back into the twilight area of the cave's entrance. This spatial organization is reminiscent of the underworld descent and reemergence of Hun Hunahpu of the *Popol Vuh* story, who is sacrificed and resurrected as the Maize God, returning to the earth as the maize plant as pictured on Classic period vases (See Christenson 2007: 190-191). This is replicated by his son Hunahpu, who is sacrificed and resurrected as the Sun deity. The element of sacrifice is suggested at Las Cuevas by obsidian blades found in the tunnels and body parts of at least one child, suggesting that blood sacrifice may have been part of that journey.

The mythological themes of the journey, sacrifice and reemergence are at the heart of Maya religious tradition, so it is hardly surprising that they are played out in caves—the most sacred precincts. They are enacted today in the initiation rites of daykeepers. Duncan Earle (2008:85-88) equates these rites of passage to a re-birthing of the initiate who is re-born from a cave as a new spiritual being with a new role in society. The journey, which is both physical and spiritual, starts at the home of the initiate and moves to the cave beneath the ruins of Uatlan, considered to be the “center” or midpoint of the journey, and finishes by

giving offerings at the cave of the Dawning Place high on a mountain “at the edge of the spiritual universe.” Here, the cave referred to as the “Window of the World,” is entered via small chamber that leads to a small squeeze described by Earle as “not unlike a ritual birthing canal,” which opens into a small room. The room contains a deep fissure into the earth that produces wind. This is where offering are made before the initiate emerges from the cave and waits on the mountain top for the sun to rise. One can hardly imagine a better analogy to describe the journey through the tunnels at Las Cuevas where one enters the dark tunnels through a narrow constriction, moves through the underworld and squeezes into deep passages giving offerings and making sacrifices along the way, finally emerging back into the light high above the cenote at the cave's entrance.

### Conclusion

Architecture in caves has received little attention from Mayanists, so it is not well-known that they were constructed environments nor that many contain monumental architecture. Some, such as the cave at Las Cuevas, were likely to have functioned, at least partially, as public performance spaces similar to plazas in surface contexts, but with the added ideological salience of their associations with the natural landscape. Cave tunnel systems provided more restricted access and it is likely that these spaces were reserved for those with special agency such as the elite, the spiritually powerful (such as priests or shamans), or their initiates.

Using Las Cuevas as an example, I have suggested here that constructions within caves accomplished more than the partitioning space or separating public from private domains. Cave constructions recreated cosmic space, reified cosmological principles, and enhanced the embodied experience for the ancient users. Architectural constructions in the tunnel system of Las Cuevas structured a narrative for participants as they moved through the space. These elaborations not only separated the earth from the underworld, but also defined levels of descent as participants moved deeper into the cave. By taking human experience and embodiment into account, architecture is envisioned not as static piles of rock that partition space, but as dynamic constructions that created, directed, and structured the ancient journey through the underworld.

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## 9

## A Green Obsidian Eccentric from Actun Uayazba Kab, Belize

W. James Stemp, Christophe G. B. Helmke, Jaime J. Awe, Tristan Carter, and Sarah Grant

**Introduction**

Green obsidian artifacts, although comparatively unusual in the Maya lowlands, are not rare finds, for the most part. Based on their distinctive “translucent bottle green to green-black to a chatoyant shimmering golden-green” color (Ponomarenko 2004: 79), these artifacts are usually assigned to the Pachuca source in Central Mexico and have been primarily sourced visually (Santley 1983; Spence 1996; Moholy-Nagy 1999, 2003; Moholy-Nagy and Nelson 1990: 71). The Pachuca source has been variously known as Sierra de Pachuca, Sierra de las Navajas, Cerro de las Navajas, Cruz del Milagro, Huasca, Cerro de Minillas, El Ocote, and Rancho Guajalote (Cobean et al. 1991: 74) and the flow zone is now recognized as being composed of numerous sub-source areas (see Tenorio et al. 1998; Argote-Espino et al. 2012). Moreover, green obsidian may also originate from Tulancingo (El Pizzarin) or, less likely, Rancho Tenango, although this material is distinguished by a coarser texture and generally opaque black or grey coloring with a green tinge (Cobean et al. 1991: 74-75; Spence 1996: 22).

Green obsidian artifacts recovered throughout Mesoamerica, most commonly in Central Mexico, are typically thin lanceolate bifaces, thin stemmed bifaces, prismatic blades, and small eccentrics (Santley 1983; Spence 1996; Tolstoy 1971; see Clark 1986: 64). Throughout the Maya lowlands, they have been found at a number of sites, both large and small, in almost all regions (Figure 1), including southern Mexico and the Yucatan Peninsula – Becan (Rovner 1975; Rovner and Lewenstein 1997: 30, 39), Tonina (Sheets 1977: 147), Edzna (Nelson et al. 1983), Dzibilchaltun (Rovner and Lewenstein 1997: 40), Chichen Itza (Rovner 1975: 107-108; Braswell and Glascock 2002), Isla Cerritos (Andrews et al. 1989: 361, Table 4; Braswell and Glascock 2002), and Mayapan (Proskouriakoff 1962: 369ff); throughout Guatemala – Tikal (Coe 2008: 34; Moholy-Nagy 1975; Moholy-Nagy and Nelson 1990; Moholy-Nagy et al. 1984), Uaxactun (Kidder 1947: 10-11, 15, 24; Smith 1950: 104), Piedras Negras (Hruby 2006), El Mirador (Nelson and Howard 1986), Cancuen (Kovacevich et al. 2007: 1242), Kaminaljuyu (Kidder et al. 1946: 31, 138, Fig. 157a, c, f), Balberta (Bove 1990; Carpio R. 1993), La Sufricaya (Estrada-Belli 2003: 13), and Dos Pilas (Palka 1997); in Belize – Chaac Mool Ha (Braswell 2007: 104, 106), Nohmul

(Hammond 1985; Hammond et al. 1987), Pacbitun (Healy 1990: 259-260, 1992), Altun Ha (Pendergast 1971, 1979, 1990: Figs. 120-122), Caracol (Chase and Chase 2011: 10, Figs. 4-5, 12), Marco Gonzalez (Graham and Pendergast 1989), Wild Cane Cay (McKillop 1989: 45-46), and Putilha (Braswell et al. 2008: 58, Fig. 5); and into Honduras at Copan (Aoyama 1999, 2001a; Webster 1999), to name but a few. At these sites, green obsidian artifacts have most frequently been dated to either the Early Classic (AD 250 – 550) or the Terminal Classic to Early Postclassic transition (AD 900 – 1200); however, some examples are known from other time periods as well. The Early Classic specimens are attributed to the interaction of the lowland Maya with the central Mexican site of Teotihuacan, whereas those dated to the later periods are primarily the result of socio-economic and socio-political relationships with the so-called Toltec populations via the Yucatan Peninsula (Andrews et al. 1989; Pendergast 1990, 2003; Spence 1996; Cobean 2002: 41; Braswell 2003; Pastrana and Domínguez 2009).

Most of the artifacts from the Maya lowlands and Pacific piedmont are prismatic blades and stemmed bifaces of various types excavated from ritual deposits such as burials and caches (Spence 1996). Nevertheless, at Tikal and Balberta, green obsidian blades have been recovered from domestic contexts, in addition to caches and graves (Demarest and Foais 1993: 164) and, at Copan, the majority of the green obsidian is found in domestic middens and construction cores. Most of these blades were used for basic utilitarian tasks based on microwear analysis (Aoyama 1999: 107). However, green obsidian eccentrics are much rarer, having only been found at Tikal and Altun Ha, and green obsidian artifacts of any kind recovered from cave contexts are almost unheard of. Exceptional cases include the proximal end of a green obsidian blade that was recovered from Glenwood Cave in the Sibun Valley of Belize (Peterson 2006: 72), and the two green obsidian bifaces or points recovered from Tiger Cave in the Sibun Valley (Peterson 2006: 72-73, Fig. 4.2) and Midnight Terror Cave in the Roaring Creek Works of Western Belize (Brady 2009).

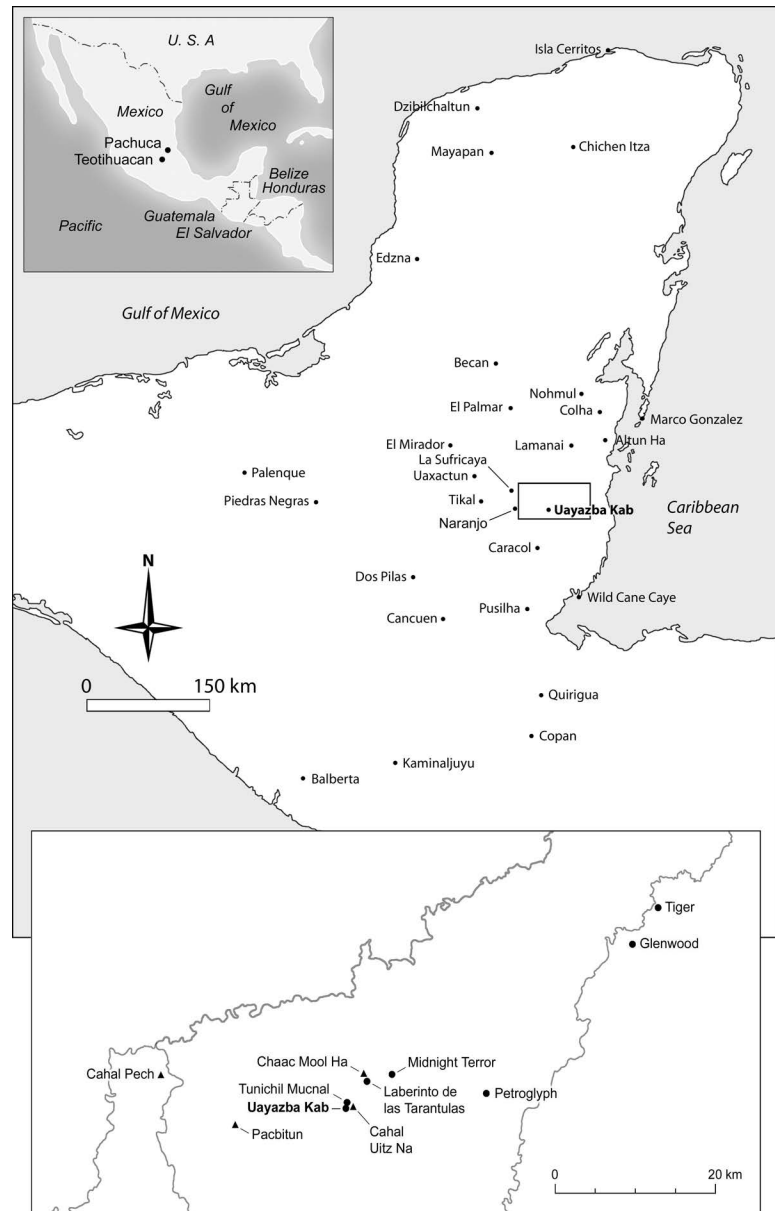
Typically, eccentrics of both chert and obsidian are recovered in association with stelae, altars or temples in dedicatory caches, although they may also, but rarely, be found as grave goods (Hruby 2007: 76; Iannone 1992: 252-253; Iannone and Conlon 1993: 81; Meadows 2001:

73, Table 3.1, 83, Table 3.2, 90, Table 3.3; see Pendergast 1971, 1979, 1990). At Colha, some chert eccentrics were found in workshop middens and in some domestic contexts, but most of these are fragmentary and may have been discarded pieces (Meadows 2001: 83). Eccentrics in caves are essentially unheard of, with the exception of the chert eccentric found at Naj Tunich (Brady 1989: 310, 311, Fig. 6.16a). Consequently, the discovery of a small eccentric made from Central Mexican green obsidian at Actun Uayazba Kab, a limestone cave in the Roaring Creek Valley of the Cayo District of west-central Belize, is highly remarkable.

### Description of Actun Uayazba Kab

The site of Actun Uayazba Kab was discovered as part of the investigations of the Western Belize Regional Cave Project in the upper Roaring Creek Valley, under the direction of Jaime Awe, in 1996. Actun Uayazba Kab has the distinction of being the cave that exhibits that greatest degree of variation in rock art, discovered to date, in a single site in Belize. Included in the site's corpus are negative handprints, pictographs rendered in charcoal, crude sculptures executed on speleothems, a row of petroglyphic footprints carved into flowstone, as well as a panel of geometric petroglyphs and a series of simple petroglyphic faces that accentuate the orbits and buccal areas (see Helmke and Awe 1998, 2001; Helmke et al. 2003). Actun Uayazba Kab, is located just over 500 m south of the by now well-known Actun Tunichil Mucnal, and approximately 400 meters west of Cahal Uitz Na. The latter is a large surface site containing several slate and limestone monuments (Awe and Helmke 1998; Conlon and Ehret 1999; Helmke 2009: 261-282). The entrance to Actun Uayazba Kab consists of two interconnected "chambers" that are sub-divided by a large stalagmitic column (Figure 2). One of these open chambers lies to the north and the other to the south of the column; they were designated as Entrance 1 and 2 respectively. Both entrances face east. Since Entrances 1 and 2 penetrate less than 10 m into the cliff and since their ceilings are over 12 m high, most of the entrance area is illuminated by daylight, save for a few recessed alcoves and tunnels that are penumbral. Given the small surface area of the entrances, the cave broadly resembles a rock-shelter more so than a cavern. The only area of the cave that is devoid of all light is the interior of the cave proper that extends west of the stalagmitic column that divides the two entrances.

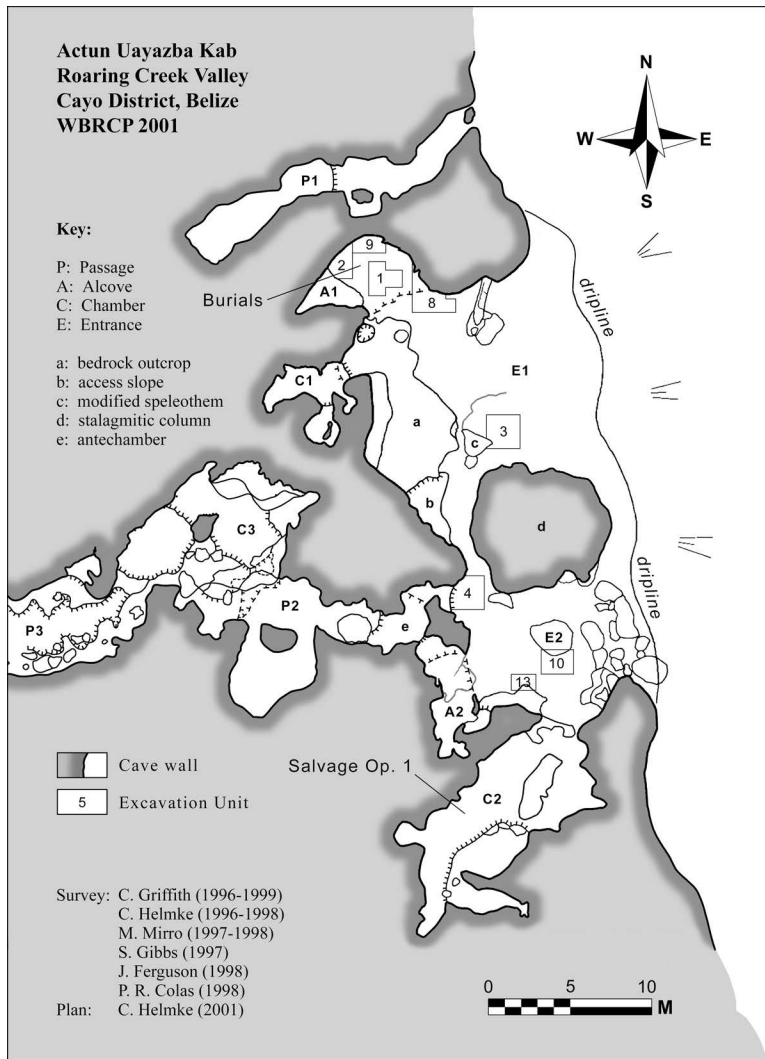
Both entrances, particularly the northern entrance, were decorated with a variety of petroglyphs, sculpted faces, and



**Figure 1.** Map of Maya sites mentioned in the article, with Teotihuacan and the Pachuca source in the Sierra de las Navajas shown. In the inset map circles represent caves and triangles surface sites (map by Christophe Helmke).

architectural modifications. In contrast, the walls of the small and dark chambers within the cave proper contain several pictographs that include schematic drawings, four negative hand prints, and torch "tampings" (see Helmke et al. 2003: 115, 117).

The concentration of cultural remains at the entrances to the cave suggests that these areas of the site were the focus of most prehistoric activity. Apart from the pictographs and torch tampings and a cluster of faunal remains, few artifacts were discovered within the interior dark zone of the cave. The absence of artifacts in this area may be the result of the intensive looting in the years preceding our investigations, but



**Figure 2.** Plan of Actun Uayazba Kab showing the distribution of excavation units (plan by Christophe Helmke).

may also reflect genuine differences in prehistoric utilization. The faunal remains may also represent natural deposition rather than cultural features, thereby reinforcing the impression that prehistoric cultural activities were concentrated at the entrance to the cave. In keeping with the patterning noted, the eccentric was found as part of excavations of the northern Entrance 1.

### Context of Discovery

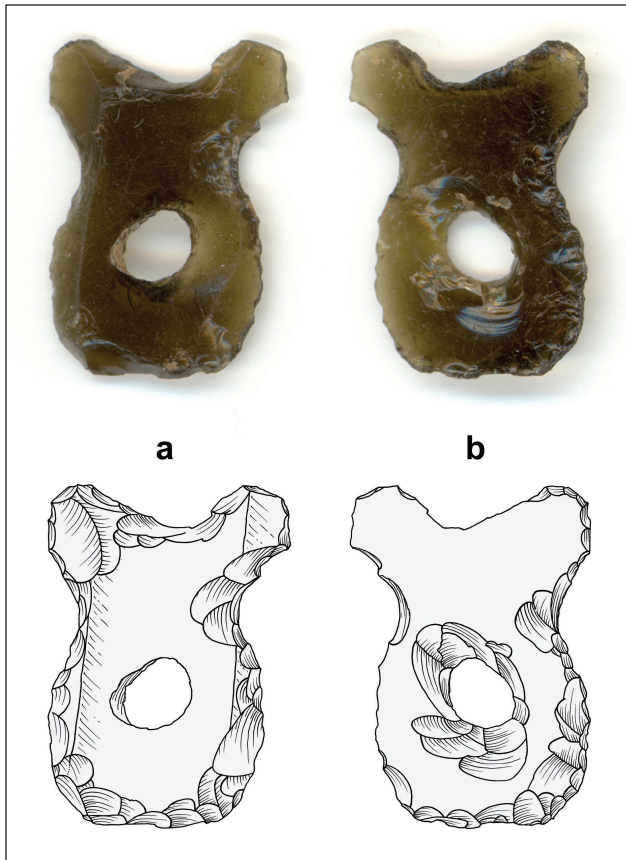
The eccentric was in the northwestern alcove of the northern of the two entrances to the site within the penumbral area of the cave. This is a transitional space between the light and dark zones of the cave. The area was a focus of excavation efforts since initial reconnaissance of the site in 1996 identified a series of shallow looters' pits, wherein fragmentary human remains were clearly visible in the associated spoil heaps. Thereafter, during formal investigations at the site between 1997 and 1998 a series of 4 contiguous

excavation units (Units 1, 2, 8 and 9) were established in this alcove, which led to the discovery of 7 burials, that can be described as inhumations, although these may represent the remains of sacrificial victims (Gibbs 1998, 2000; Griffith 1998: 38-39; Ferguson and Gibbs 1999). As part of the excavations it was found that the northern entrance of Actun Uayazba Kab had been plastered over by two floors, thereby architecturally accommodating the natural setting of the cave. Specifically, the eccentric obsidian was peripherally associated with Burial 98-2 and was found in Level 4 (below the level of both floors), within the eastern extension of Excavation Unit 8 (see Ferguson and Gibbs 1999: 119). Analysis of the skeletal remains found that Burial 98-2 was a primary interment of an adult woman, approximately 20 years of age. The body was laid in a prone, semi-fetal position (flexed at the knees), with hands crossed at the pelvis, and head facing northeast (Ferguson and Gibbs 1999: 119). Although the archaeological features of the alcove were not directly associated with any rock art, it is noteworthy that a simple pecked face, designated as Petroglyph 21, was found directly overlooking the area in question (see Helmke and Awe 1998: 158-159, Fig. 8; Helmke et al. 2003: 119).

### The Eccentric

The eccentric is made on a medial prismatic blade segment of translucent green obsidian (Figure 3). The segment is trapezoidal in section. Based on the ripples of force associated with conchoidal fracture when the blade was originally punched from a polyhedral core, the 'prongs' of the eccentric are on the proximal end of the artifact, whereas the rounded, circular portion represents the distal end. In terms of its dimensions, the eccentric is 16.1 mm long; the maximum width of the distal end or 'head' is 9.9 mm, the maximum width for the proximal end or 'tail' is 11.0 mm. The maximum thickness of the distal end or 'head' is 1.5 mm; whereas the maximum thickness for the proximal end or 'tail' is 1.3 mm. The segment was produced from a blade before it was perforated or any edge retouch was undertaken.

Edge retouch is bifacial, for the most part. The blade segment was pressure flaked on both the dorsal and ventral surfaces to transform it into its current form. The notching is bifacial for the sides, but unifacial for the proximal end with the pressure flaking on the dorsal surface. The hole in the middle of the blade segment body was not ground or drilled. Instead, the perforation was most likely initially created using a punch, despite the risk of snapping the blade segment into two or more fragments, and then flaked most likely using a pressure, or possibly indirect percussion,



**Figure 3.** The eccentric found in Actun Uayazba Kab. **a)** dorsal side; **b)** ventral side (scans by W. James Stemp, drawings by Christophe Helmke).

technique applied to the dorsal surface. The flaking was unidirectional around the circumference of the hole based on the fact that all of the flake scarring is on the ventral surface around the perforation. None of this flake scarring is present on the dorsal surface. It is possible that the dorsal surface of the blade segment was partially ground or was abraded or scored first to thin the obsidian, and then it was perforated prior to being flaked. Based on the mechanics of pressure or indirect percussion flaking, the perforation must have been created such that some exposed edges were produced in order to start pressure flaking.

This technique is likely similar to that described by Kidder et al. (1946: 138) for the 61 ‘flake sequins’ from the medial segments of green obsidian blades at Kaminaljuyu (Sheets 1977: 142).

The technical skill involved in obsidian production, including the manufacture of eccentrics, is argued to be quite high (Hruby 2007: 74-76; see also Meadows 2001: 133) and

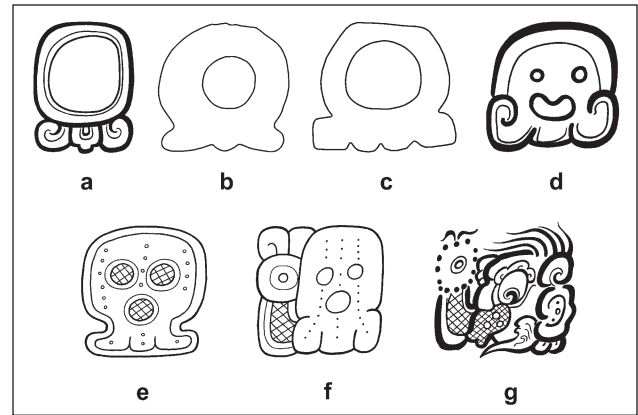
**Figure 4.** Examples of so-called “knuckle-duster” eccentrics. **a)** Three individuals wielding trident eccentrics (highlighted), detail of Lintel 2, Temple 3 (Str. 5D-3-1<sup>st</sup>), Tikal (drawing by William Coe). **b)** Chert eccentric from Altun Ha, Belize (drawing by Amy B. Henderson, published in Whittaker 1994: 48, Fig. 3.20).



is well demonstrated by the work of Gene Titmus (Titmus and Woods 2003); however, the eccentric from Actun Uayazba Kab would not have been an extremely difficult object to make for a reasonably good knapper assuming s/he was not responsible for initial core preparation and maintenance or platform preparation of the core from which the blade used to make the eccentric was struck (see Hruby 2007: 74; Crabtree 1968). The only difficult part would have been the creation of the hole in the center of the eccentric. This eccentric is clearly not as elaborate as some of the intricately flaked specimens, for example those from Quirigua and Copan (Morley 1956: 421, Pl. 102e; Agurcia Fasquelle and Fash 1991) or some of the large chert specimens from Altun Ha, Colha, and Lamanai (Meadows 2001). In fact, most eccentrics produced on obsidian tend to be relatively small artifacts and are not as complex in their design or difficult in their execution compared to others (e.g., Coe 1959, 2008; Hruby 2007; Iannone 1992; Coe 2008). Excellent examples of this on green obsidian are the so-called ‘little green men’ from Altun Ha (Pendegast 1971, 2003: 238-240, Fig. 9.1). Despite this observation, the esoteric knowledge and possibly ritualized nature of obsidian eccentric production was likely passed down from craft-person to craft-person and may have been closely guarded within particular workshops from the rest of the population, perhaps in association with status differentiation (Hruby 2006; 2007: 71-74; see Clark 1989: 305 for Lakantun Maya arrowhead production). As stated by Meadows (2001: 133): “The iconography embodied in these forms illustrates that [...] crafters possessed an intimate knowledge of the linkages between their own surroundings, important historical events, and the cosmological underpinnings of the Maya universe.”

In relation to better-known eccentrics found at other lowland Maya sites, the one from Actun Uayazba Kab can be superficially compared to so-called “knuckle-duster” eccentrics, which entail a perforated circle that is topped by a series of pointed prongs or triangular serrations (see Meadows 2001: 160, Ill. 5.1, 161) (Figure 4). At Tikal, this type of eccentric has been labeled as Type 4A (see Moholy-Nagy 2008: Figs. 1-26; also see Coe 1959: 21, Fig. 18d for Piedras Negras; Morley 1956: 421, Pl. 102a for El Palmar) and examples are known of this type of eccentric in Classic Maya iconography (Follet 1932: Figs. 31, 32; Morley 1937-1938: 226-234, 1956: 394, Pl. 91; Ricketson and Ricketson 1937: Fig. 118h; Satterthwaite 1954: Fig. 11). Somewhat similar forms from Northern Belize are also classed as ‘barbed and serrated rings’ (Meadows 2001: 165-166). If this comparison is viable, this would imply that the example from Actun Uayazba Kab is essentially a miniature form, or effigy, of the larger “knuckle-duster” eccentrics.

Nevertheless, the possibility remains that the Actun Uayazba Kab eccentric may be better related to another artifact class entirely. In particular, the eccentric can be aptly compared to a particular set of small shell *adornos* that essentially seem to represent the frames of Day Sign cartouches of the Tzolkin calendar (Figure 5a). Artifactual examples have been found at several Maya sites, including



**Figure 5.** Possible epigraphic and artifactual counterparts to the eccentric from Actun Uayazba Kab. **a**) The frame of Day Sign cartouche of the Tzolkin calendar, Temple 19, Palenque; **b**) shell *adorno* from the Laberinto de las Tarántulas; **c**) matching artifact from Petroglyph cave; **d**) logogram T628, Temple 19, Palenque; **e**) logogram T543, Naranjo Stela 21; **f**) **cha-CH'AB?** ‘wax, hive’, Temple of the Cross, Palenque; **g**) the name of a quasi-supernatural entity nicknamed Casper, possibly spelled **cha-CH'AB?**, Temple 21, Palenque (drawings by Christophe Helmke).

San José (Thompson 1939: 177, Fig. 94k, 181) and Altun Ha (David Pendegast, personal communication, 1999). Possibly due to the fragility of these shell *adornos*, well-preserved examples are from several caves sites, including the Laberinto de las Tarántulas and Petroglyph Cave (Helmke 2009: 230, Fig. 4.17a-d) (Figure 5b-c).

Previous analyses of eccentrics of both chert and obsidian have led to suggestions that these artifacts are ceremonial items that served multiple functions in Maya ideological and religious systems (Iannone 1992; Meadows 2001; Hruby 2007). Iannone (1992: 249-251; Iannone and Conlon 1993: 82; see Schele and Miller 1986: 49, 73) has argued that these artifacts are symbolic depictions of ancestors and gods and, as such, were used to represent a ruler’s bloodline and were connected to ancestor worship in significant places like temples or near stelae. Similarly, Helmke (1996), Meadows (2001: 239-241), and Hruby (2006, 2007: 68) have suggested that they are effigies of deities or ancestral figures. However, based on his analysis of the large chert eccentrics from Northern Belize, Meadows (2001: 241) posits a number of additional possible uses for eccentrics based on their forms, including depictions of historical figures, personifications of particular events, abstract representations of Maya cultural aesthetics, and ritual weaponry.

#### Use-Wear Analysis

Using a Unitron MS-2BD metallographic microscope, we conducted an examination of the eccentric for traces of use-related wear and residues to potentially shed some light on how this artifact may have been specifically used in cave ritual activity. In his work, Meadows (2001: 259-260), using SEM and electron-dispersive spectrometry, found evidence of textile fragments and mineral residues on a small number

**Table 1.** Elemental composition (ppm) of UK98-OB-058 and the MAX Lab standard RGM-2.

Sample	Ti	Mn	Fe	Ni	Cu	Zn	Ga	Rb	Sr	Y	Zr	Nb	Ba	Pb	Th
UK98-OB-058	1181	957	18525	0	3	262	32	214	7	108	1019	96	-26	37	27
RGM-2	1458	324	13928	4	8	39	15	146	106	26	233	9	823	24	11

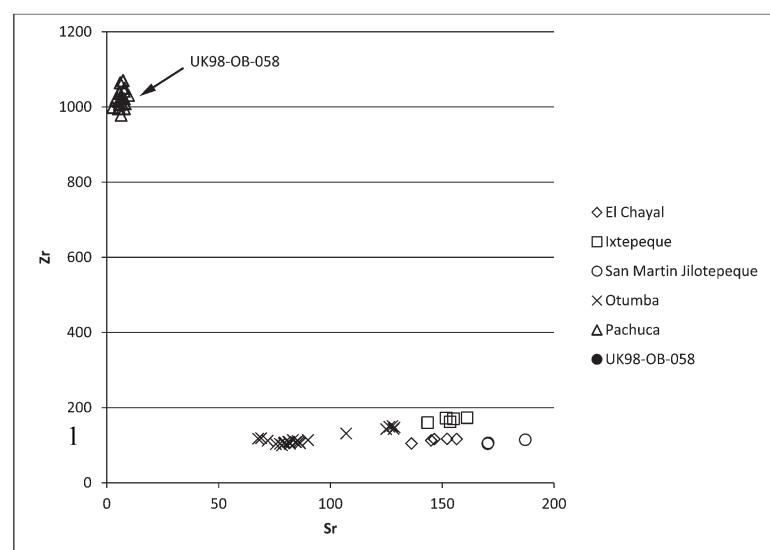
of chert eccentrics, which led him to conclude that at least some eccentrics were wrapped or bundled in fabric prior to deposition and that some were decorated (colored or painted) and therefore contained much more detail than observed on the examples in their current states (see also Agurcia Fasquelle and Fash 1991). As such, all surfaces of the green obsidian eccentric were examined under both low (40x) and high-power (200x) magnification to visually determine the possible presence of similar organic or inorganic residues. Both the dorsal and ventral surfaces of the eccentric possess large quantities of variably-sized, multi-directional sleeks and striations. Long, short, deep, shallow, wide, narrow striations all cross-cut one another in various directions that had no clear directional patterns emerge. Coupled with the presence of fairly severe pitting and edge attrition randomly distributed across both surfaces, it appears the wear on this artifact is the result of the post-depositional environment, most likely due to contact with the cave sediment and pedestrian traffic, stepping on the object as it lay in the ground (Stemp 2001: 122, 241-242, 244; Tringham et al. 1974: 182, Fig. 6, 192; Vaughan 1985: 25; see Lévi-Sala 1986, 1993). Some of this sediment is trapped in the microcracks of the flake scars on the eccentric. Whether some of this sediment contains or masks the presence of other residues or pigments is not known at this time. There are some very small patches of polished/rounded surface on the eccentric, which might indicate contact with a slightly softer material, perhaps hide, but the severity of the post-depositional scratching and surface abrasion makes this wear difficult to interpret. This evidence raises the possibility that the eccentric was carried in a bag or affixed to clothing or a leather thong, but this cannot be unequivocally substantiated.

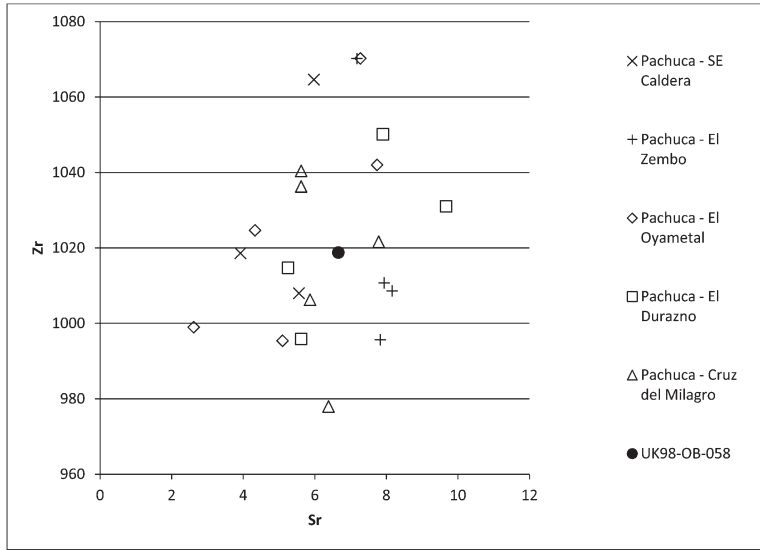
### Visual Sourcing and Elemental Characterization

Although most green obsidian artifacts from the Maya area are visually sourced based on the physical characteristics of the stone from which they are made, there is more than one source of green obsidian in central Mexico and recently there have been attempts by archaeologists to determine intrasource variation among those from different sub-sources or flows. The green obsidian for the eccentric from Actun Uayazba Kab is believed to be from the Pachuca source based on visual identification of the peralkaline raw material (Argote-Espino et al. 2012; Ponomarenko 2004); however, to be certain

elemental characterization of the artifact was conducted at the McMaster Archaeological XRF Lab [MAX Lab] as part of a larger study of obsidian assemblages from Maya sites in Belize. The analysis was undertaken using energy dispersive x-ray fluorescence spectroscopy [EDXRF], a non-destructive technique that is rapid, relatively cheap, and capable of determining elemental concentrations at the ppm level, with reproducible high-quality data. Specifically, the eccentric was analyzed by a Thermo *Quant'X* EDXRF spectrometer, having first been cleaned in an ultrasonic tank with distilled water for ten minutes. The analytical protocols and methods follow those devised by Shackley (2005, appendix; Poupeau et al. 2010).

The eccentric's elemental profile was compared to those of several geological samples from obsidian sources that were used by ancient Maya populations in Belize. These included the three major highland Guatemalan sources of El Chayal, Ixtepeque, and San Martín Jilotepeque (Río Pixcaya), as well as the central Mexican sources of Otumba and Pachuca. The distinctive high zirconium levels (1019 ppm) and low strontium (7 ppm) indicative of peralkaline obsidian (Table 1) allows the artifact's raw material to be confidently assigned to the Mexican source of Pachuca using a simple bivariate contents plot (Figure 6). The Pachuca source is now understood to comprise a number of spatially and geologically distinct flows, some of whose products were recently discriminated elementally by ICP-MS analyses

**Figure 6.** Bivariate Sr vs. Zr contents plot of the green eccentric (UK98-OB-058) and geological samples from major Mesoamerican obsidian sources.



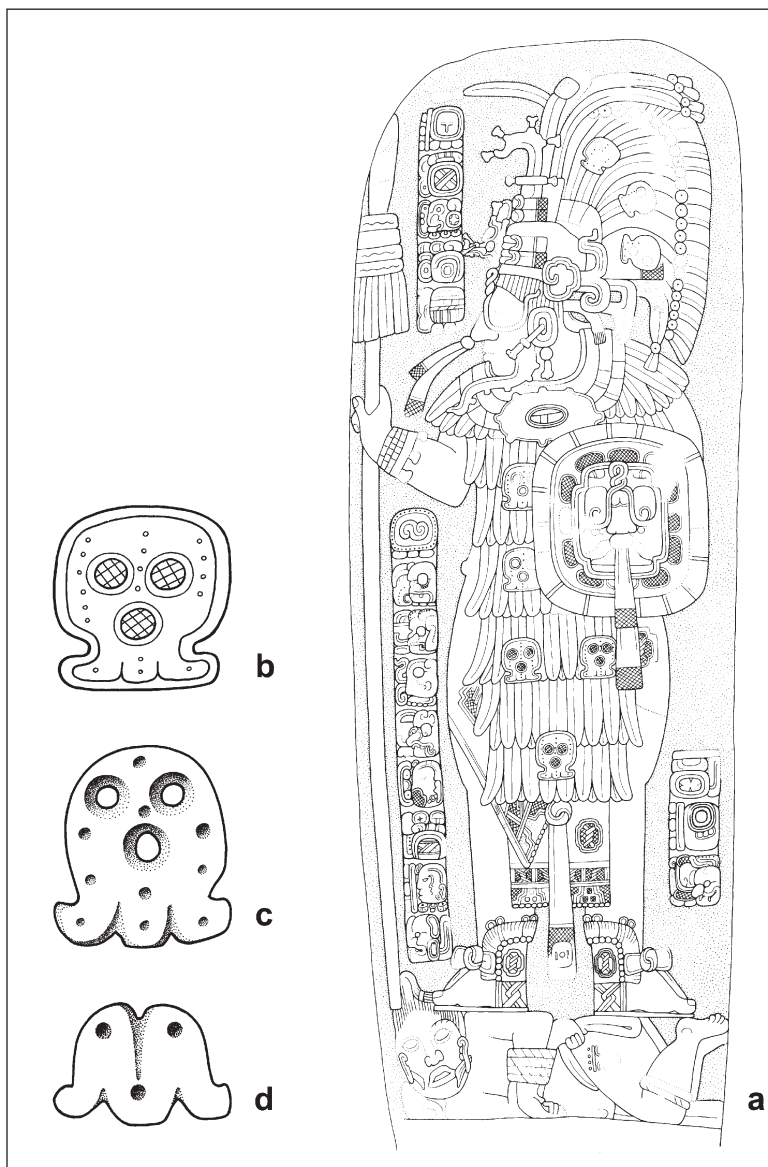
**Figure 7.** Bivariate Sr vs. Zr contents plot of the green eccentric (UK98-OB-058) and geological samples from the various sub-sources of the Sierra de Pachuca.

and multivariate statistics (Argote-Espino et al. 2012). Unfortunately, in keeping with the recent statement by Argote-Espino et al. (2012: 49), it is not currently possible to achieve a successful separation of these sub-source materials through the use of XRF techniques (Figure 7).

Although our EDXRF analyses failed to achieve chemical discrimination of the Pachuca sub-source materials there is an alternative approach with which we can attempt to at least remove some of the outcrops from consideration. Drawing on the analyses of Ponomarenko (2004), Argote-Espino et al. (2012) were able to determine that the distinctive green and gold obsidian from the Pachuca sub-sources El Zembo, Oyamental, El Durazno and Cruz del Milagro were associated with the Las Minas flow complex. In turn, the brownish and grey obsidian from the south-east side of the caldera derives from the Ixatla and El Horcón flows. Thus using these visual distinctions, the eccentric’s distinctive green color allows us to eliminate the area of the south-east caldera and by extent the Ixatla and El Horcón flows. On the basis of chemistry and visual appearance we thus believe the artifact’s raw material to have derived from one of the sub-sources associated with the Las Minas flow complex in the Western area of the Pachuca source (i.e., either El Durazno, Cruz de Milagro, Oyamental or El Zembo).

**Discussion**

Based on control over production and usage, eccentrics were often used by elites as justifications and re-affirmations of both their divine status as rulers and in the Maya socio-political hierarchy (Iannone 1992: 253-254; Iannone and Conlon 1993: 82). They may have been involved in elaborate rituals whose main purpose was to recreate certain historical or mythical events that may have emphasized connections to the gods (see Meadows 2001). As noted by Hruby (2007: 72), “This process has the recursive effect of reaffirming social



**Figure 8.** Shell *adornos* in Classic Maya imagery and associated artifactual examples. **a)** Stela 1 at Naranjo; **b)** item regalia of Stela 21, Naranjo; **c)** shell *adorno*, Uaxactun; **d)** shell *adorno*, Actun Uayazba Kab (a: drawing by Ian Graham; b-d: drawings by Christophe Helmke).

roles in the community and clarifying personhood and social identity” (see also Clark and Houston 1998; Joyce 2001). However, the eccentric from Actun Uayazba Kab seems to deviate from these explanations to some degree. For one, this eccentric does not appear to be a god effigy nor is it a zoomorphic or anthropomorphic object; instead, it may depict a glyphic form.

In fact, like the shell *adornos* to which the eccentric has been compared, a similar *adorno* is featured as a regalia item of Stela 21 at Naranjo (Graham and Von Euw 1975: 53) (Figure 8a-b; see also Figure 5e). The particular *adorno* featured on Stela 21 also shares the same form as the Day Sign cartouches (Figure 5a), as well as the glyphs designated as T543 and T628 (Figure 5d-f) (Thompson 1962: 155, 452). In addition to the depiction at Naranjo, artifactual examples of precisely the same type of shell *adorno* have also been found at Uaxactun (Kidder 1947: Fig. 53d1; Weiss-Krejci, personal communication, 2011) and at Actun Uayazba Kab itself (Figure 8c-d). Considering the contexts in which glyphs T543 and T628 occur in Maya writing, it is clear that these should be segregated and treated as separate signs, with T628 serving as the logogram **K’IK’** ‘blood’ (Figure 5d) (Stuart 2002). Recently, Ukrainian epigrapher Yuri Polyukhovich (personal communication, 2011) has suggested that the T543 glyph represented in these *adornos* may represent a stylized beehive, read *ch’ab* ‘wax, hive’. Part of the evidence rests on the spelling of the name of a mythical or quasi-supernatural entity cited in the texts of Palenque, which takes as its initial phonetic complement the syllabogram **ch’a** (Figure 5f). Intriguingly, the name of this figure alternates between a geometric form employing the T543 glyph, and a head variant form depicting an entity with elongated lips (Figure 5g). According to Polyukhovich, this figure may depict a bee, hence the cone-shaped and elongated lips, or aptly enough, proboscis. But unlike Polyukhovich, we see the geometric form of T543 as a *pars pro toto* element representing the diagnostic buccal element of this mythic entity from Palenque, rather than a beehive per se. Whereas both the *ch’ab* (T543) and *k’ik’* (T628) readings each have their own merit, it remains unclear which of these glyphs more likely corresponds to the form of the eccentric. For our purposes here, it suffices to remark that the eccentric conveyed in its very form a glyph, which to the initiated reader conveyed a message that was intrinsic to its use and likely reinforced connotations that were intimately tied to its original owner.

Clearly, the material from which this eccentric was made is also significant. Not only is it a long distance material from Central Mexico, but it is an important color for the Maya. The color of green obsidian likely held important sociopolitical and ceremonial meaning to the Maya, perhaps due to its connection to Teotihuacan and other symbols of its power, such as Teotihuacan-style ceramic vessels (see Sharer 1983: 255). Green is also associated with the center of the world in the codices of the Yucatek Maya (Miller and Taube 1993: 65) and, in the case of jade objects, has symbolic connections to fertility, agriculture and maize, as

well as the world tree which connects the three levels of the Maya universe (Taube 2005: 25).

### Conclusion

How the green peralkaline eccentric made its way into Actun Uayazba Kab and what its specific function may have been are difficult to reconstruct with absolute certainty. However, our multi-method approach to analyzing this single important artifact has provided a substantial number of clues that render suppositions about its use by the ancient Maya more than wild speculation. If we consider its context of recovery, the technology of its manufacture, damage to its surface, its symbolic and ideological meaning, and the material from which it was made there is much that we do know about this object. Caves were places of extreme importance to the Maya, symbolizing both life and death, as well as being intimately connected with fertility, agriculture, and the emergence of maize. They were entrances to the underworld and places of creation, and where ritual practitioners and other religious specialists went to commune with ancestors and the supernatural realm (Bassie-Sweet 1991:79; Brady and Prufer 2005; MacLeod and Puleston 1978: 73; Moyes 2007; Moyes et al. 2009; Prufer and Brady 2005; Prufer and Kindon 2005: 26-28; Tedlock 1996; Thompson 1970:268; Vogt 1969: 387). Artifacts recovered from caves are typically seen as ritually significant forms of material culture that were viewed and used in ways that were somehow different from similar objects found at surface sites.

Eccentrics are prestige goods typically associated with royal or elite use and are almost always found in cache deposits or other ceremonially meaningful locations/contexts for the veneration of ancestors (Helmke 1996; Hruby 2007: 68; Iannone 1992; Iannone and Colon 1993; Meadows 2001; see Hodder 1982). The connection between status and elite utilization of the cave is reinforced by the glyphic form of the eccentric in question, regardless of its specific reading. However, the reading of the glyph provides yet another level of interpretation, particularly one that reinforces the ritual nature of its function. If, in fact, it is meant to be a representation of the glyph for blood (**K’IK’**), this would fit well with reconstructions of symbolic value. The ancient Maya used lancets made from obsidian to pierce various body parts in acts of auto-sacrifice to provide blood to the gods. This was undertaken during religious rituals, often in caves, as attested to by multiple sources of evidence (Aoyama 2001b; Awe et al. 2005; Colas et al. 2000; Pendergast 1974; Stemp and Awe n.d.).

Traces of use-wear on the artifact offer the possibility that it may have been carried in a pouch or tied to a leather thong possibly as an ornament worn by a shaman or other religious practitioner during rituals. Whether this may have been for display or other symbolic or supernatural reasons cannot be known for sure.

That the eccentric is made from green obsidian may also suggest that status differentiations were involved in the cave rituals ultimately resulting in the inhumation of the woman in Burial 98-2. The acquisition of green obsidian, as a long



distance trade good from Central Mexico, was undoubtedly more difficult than the gray and black obsidians of the Guatemalan highlands (Spence 1996), providing both economic and social value. Based on ethnographic evidence both political status and ritual/religious status may be connected through strict hierarchical ordering and ascribed status (Villa Rojas 1985: 420-421). As such, for very important rituals, involving requests of rain from the gods or ancestors, high status men seem likely candidates as religious practitioners of sacrificial rituals in caves (see also Bartolomé 1978: 78). Moreover the color of the eccentric likely connects it to ideas about fertility, water, maize, and life as elements in an intricate web of ideological and symbolic meaning. When considering all the information generated through multi-method analysis of this artifact, it is clear that the green obsidian eccentric from Actun Uayazba Kab was a powerfully charged object in the lives of the ancient Maya.

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## 10 Manuports in Caves

Michael Mirro

### Introduction

One of the hallmarks of recent Maya cave archaeology has been the appearance of cave specialists whose experience in the cave environment and greater familiarity with karst geomorphology has allowed them to detect an array of cultural modifications that previous archaeologists had never noted. The documentation of these features has increased our appreciation of the extent of modification of subterranean spaces so that these often become, to some degree “built environments.”

The large-scale importation of lithic manuports has rarely been considered in the course of cave investigations. This may be due, at least in part, to archaeologists’ inability to recognize the types of stone one would and would not expect to encounter in caves. The investigation of Barton Creek Cave by the Western Belize Regional Cave Project (WBRCP) supervised by Mike Mirro and Vanessa Owen under the direction of Jaime J. Awe provided some striking geological contrasts between the cave and surface environments that facilitated the identification of stone not naturally occurring in the cave.

Barton Creek Cave first became a site of interest to the WBRCP in 1998 when David Simpson, a local Cayo tour guide took Sherry Gibbs, Michael Mirro, and Vanessa Owen to the cave. On this trip, Simpson introduced the project to Ledge 9 and its assemblage of human remains (Gibbs and Mirro 1999). The following year, Mirro and Owen conducted a brief inventory of the cave concluding that extensive and relatively intact archaeological remains were present on nine ledges near the cave entrance (Mirro et al. 2000). Formal investigations were undertaken in 2000 by Mirro and Owen (Mirro and Owen 2001) resulting in a more complete inventory of the contents of the cave and an extensive map of the known areas utilized by the Maya. Further, the data on skeletal remains formed the basis of Owen’s thesis (Owen 2002). Concurrently, David and Eleanor Larson along with members of the National Speleological Society (NSS) began surveying and mapping the cave in 1999.

The investigations of the cave revealed that the Maya utilized ten ledges between the entrance

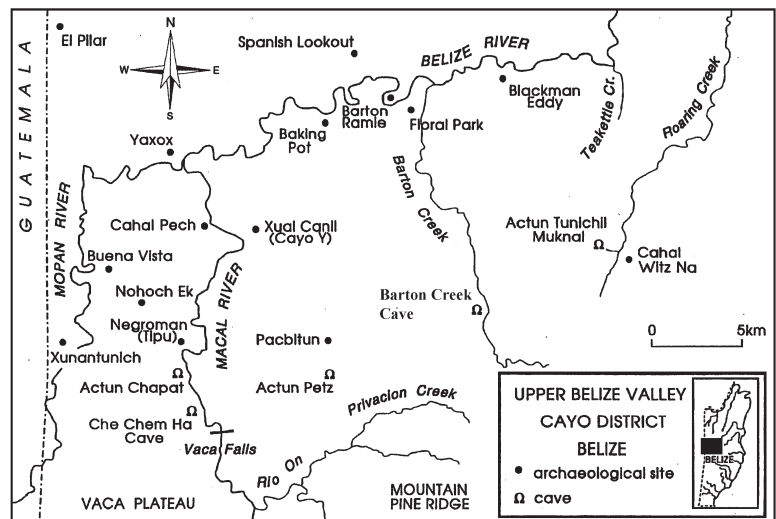
and 500 m into the cave. Based on ceramic analysis, the most intense time of use was from the Early Classic Period (A.D. 250 to 600) to the Late or Terminal Classic period (A.D. 600 to 900) (Mirro and Owen 2000). A variety of artifacts were transported into cave including diverse and abundant ceramics, stone tools, beads and other adornments, and a spindle whorl. Owen (2002) reports the interred remains of over 31 human individuals, some of which are believed to have been sacrificed. Further, ecofacts such as jute snail shells and cobbles were widely distributed on all ledges. These archaeological materials were found arranged into clusters and associated with hearths, arrangements of stones, or minor modifications to the cave.

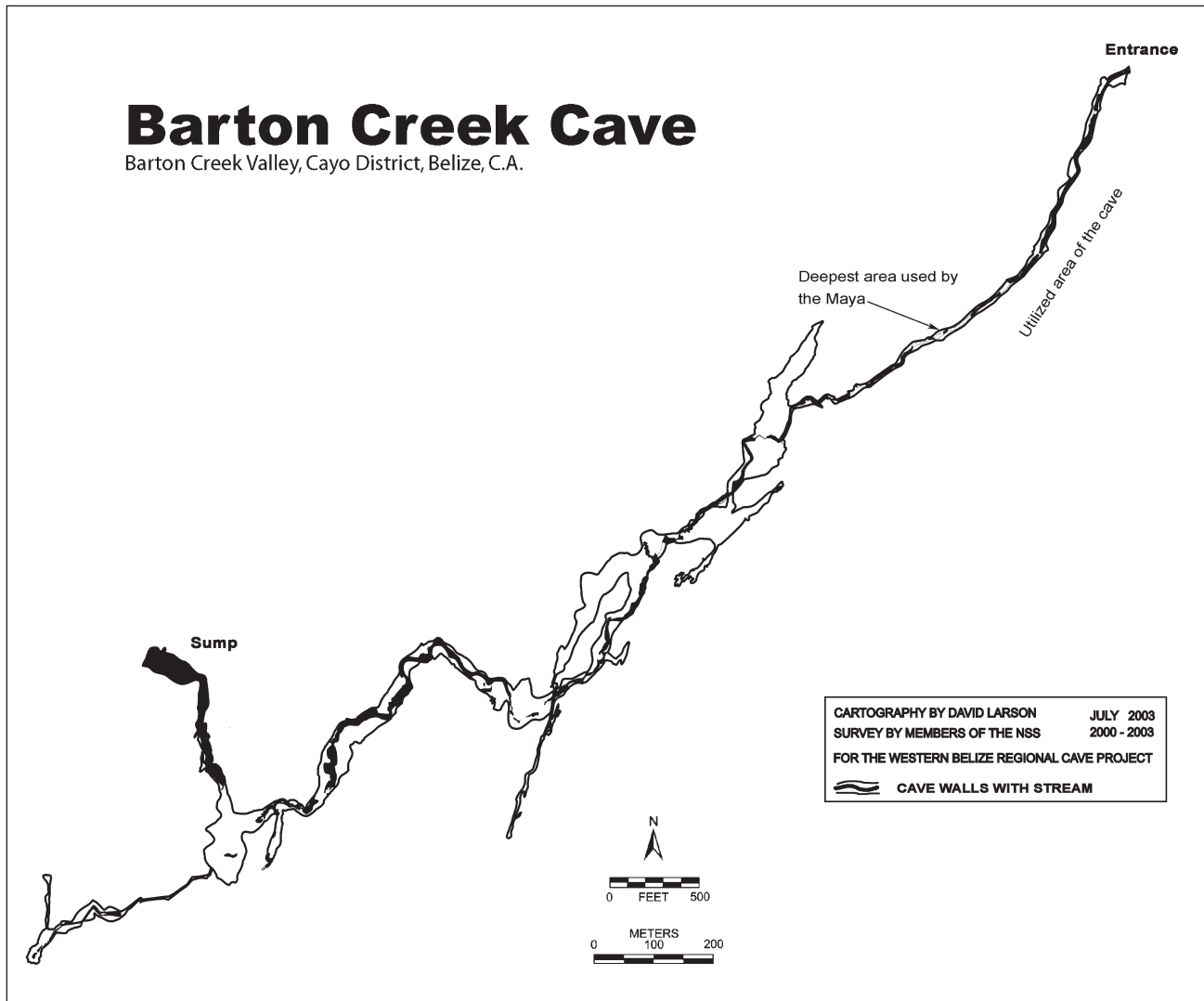
### Barton Creek Cave

The entrance to Barton Creek Cave is located on Barton Creek, a tributary of the Belize River, near the northern end of the Mountain Pine Ridge (Figure 1). The Pine Ridge is a large granite massif, which forms the upper drainage basin for Barton Creek. The streambed and alluvial sediments of the Barton Creek Valley are, therefore, rich in granite and slate, which have been transported via the creek from the Pine Ridge.

These granite and slate cobbles, as well as limestone

**Figure 1.** Map of the Upper Belize Valley (Awe 1998) showing the location of Barton Creek Cave.





**Figure 2.** Map of Barton Creek Cave showing the area utilized by the Maya.

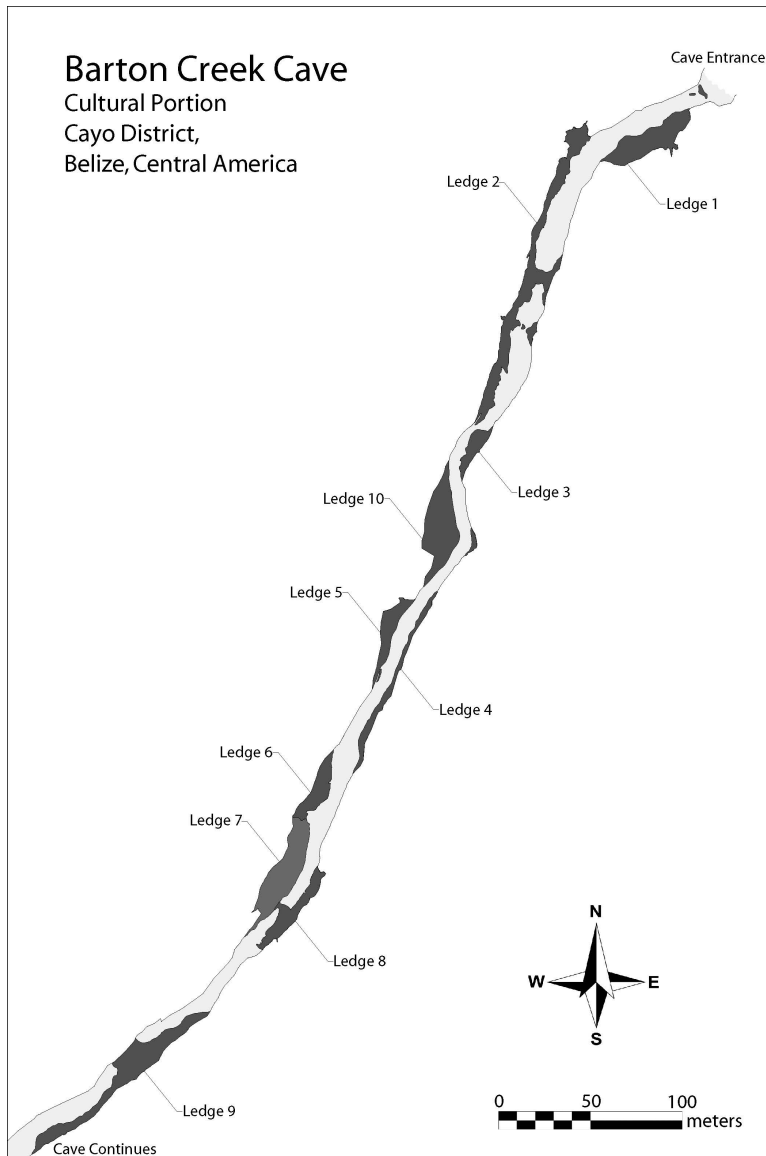
form the stone resource base for the Barton Creek Valley. Examination of a small cluster of mounds located on a terrace outside of the cave shows that the Maya utilized stone from the creek as construction material. Platform and mound fill consists of rounded granite and slate cobbles as well as limestone fragments (Mirro and Owen 2000). The abundance of these materials in surface construction should alert the archaeologist to the fact that the deposition of these items away from Barton Creek may be an indication of ancient cultural activity.

The geological make-up of the cobbles within Barton Creek Cave contrasts sharply with the situation found in the creek. Caves generally form in limestone by dissolution of the rock by water charged with carbonic acid derived from decomposing organic materials in the soil. Water, seeping into the bedrock, dissolves passageways and chambers in the limestone. Given these geological processes, the materials found in caves are almost exclusively limestone and limestone derivatives, such as speleothems.

Barton Creek Cave consists, for the most part, of a single passage ranging from 30-60 m in height and over six thousand meters in length (Figure 2). A significant volume of water flows through the cave. The local hydrology has produced a large trunk conduit cave with a perennial stream. Trunk conduit caves as a type in Belize are formed in the boundary fault region and transport water and sediments from the Mountain Pine Ridge through the karst (Miller 1996).

A series of ledges have formed on the walls of the passage during the dissolutional, or early stages of cave development. Later, down cutting lowered the stream level to a point where water no longer reached the level of the utilized ledges. This is demonstrated by the lack of erosion, scalloping, fluvial sediments or displacement of Classic Period artifacts due to water flow. Therefore, these ledges provided a stable environment suitable for cultural utilization. Generally, sediments on the upper ledge are fine silty clays and clays resulting from the decomposition of limestone and guano. In contrast, coarse alluvial sediments can be observed on





**Figure 3.** Ledges utilized by the Maya in Barton Creek Cave.

cobbles were present in the stream nor was granite observed in sediments on the ledges. This rules out the possibility that the cobbles were deposited in the cave by natural forces. We can infer, therefore, that human agency was involved in the deposition of these stones in the cave.

Ten ledges with cultural materials were discovered in the first 500 meters of Barton Creek Cave (Figure 3). On eight of the ledges, granite and slate cobbles were observed. A total of 109 granite cobbles and seven slate cobbles were recorded. They ranged in size from 9 x 6 x 5 cm to 27 x 27 x 27 cm averaging 14 cm on a side in size. All cobbles tended to be rounded, although several were fractured by heat and impact. The cobbles showed no signs of further modification.

While slate and granite cobbles were found throughout the cultural portion of the cave, the heaviest concentration were observed in Areas A, B, and C of Ledge 2, which is located between 30 and 150 meters from the entrance to the cave (Figure 4). A total of 59 granite cobbles were documented on this ledge. Access to this and other ledges was no simple task. Ledge 2 is reached only after a five-meter vertical climb. Twenty-five granite and four slate cobbles were observed on Ledge 6, located approximately 300 m from the entrance. This ledge also requires a five-meter vertical climb from the cave stream followed by a second 5 m climb to reach an upper area. Deeper into the cave, 11 cobbles were found on Ledge 8, some 360 m from the entrance. The ledge has two tiers five and nine meters above the cave stream. To reach this ledge

it is necessary to either use a ladder and climb up from the stream or rappel ten meters down from Ledge 7. Access to the upper tier requires additional climbing. Nine of the 11 cobbles were observed on the upper tier.

It should be noted that other materials are also associated with the granite and slate cobbles. At least 129 limestone rocks and 18 speleothem fragments are incorporated into the features with the granite and slate. The cobbles found in the cave in most cases have been incorporated into cultural features. Twenty-one cobbles were found in a circular pit associated with a hearth feature on Ledge 6 (Figure 5). Most of these cobbles evidenced heat-alteration. Cobbles formed part of two triangular arrangements on the upper tier of Ledge 8 in Lots 137 and 138 (Figure 6). On Ledge 2, a small two coarse wall was constructed across the drainage of the depression in the floor (Figure 7). Other cobble features appear to be more random arrangements as in Lot 164 (Figure 8), where the cobbles are associated with a burned

lower ledges that are periodically flooded. Furthermore, large areas of these ledges are covered with flowstone marking the latest stage in cave development and postdating the period of stream deposition. The presence of cobbles on top of the flowstone, therefore, indicates that these stones must be of fairly recent origin and were transported there by other forces than nature.

The bedrock in the culturally utilized section of the cave is very stable, as no breakdown or collapse is present. The lack of naturally occurring lithic material would, therefore, necessitate the importation of stone from outside the cave. Our investigation revealed the presence of an unexpectedly large number of unmodified granite cobbles. Cobbles tend to be located on ledges as far as 500 meters from the entrance and are associated with hearth features, sherd clusters, rock alignments and human remains. Since granite, an igneous rock, does not occur naturally in limestone solution caves, an examination of the cave stream was made. No granite

**Figure 4.** Map of Ledge 2 showing the location of Areas A, B, and C.

piece of wood, a piece of jade, a core, and a pile of sherds. In other cases single cobbles were commingled with ceramic materials in no obvious pattern.

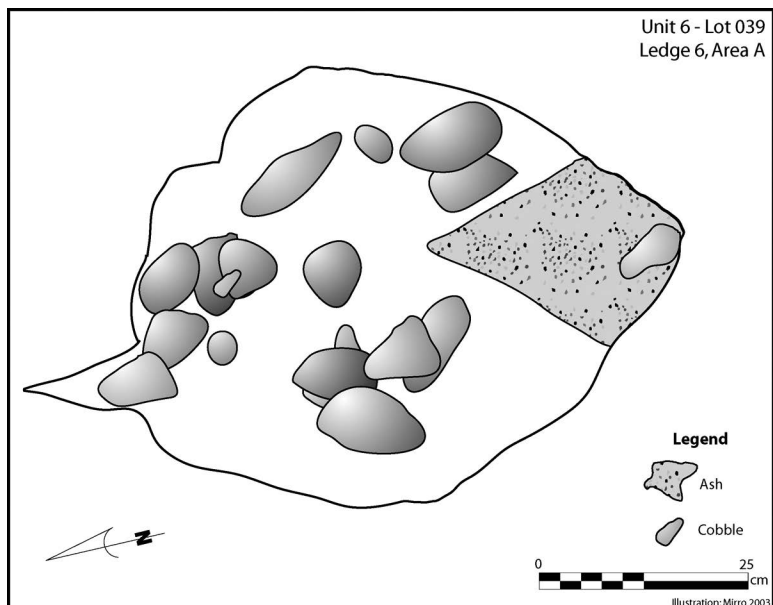
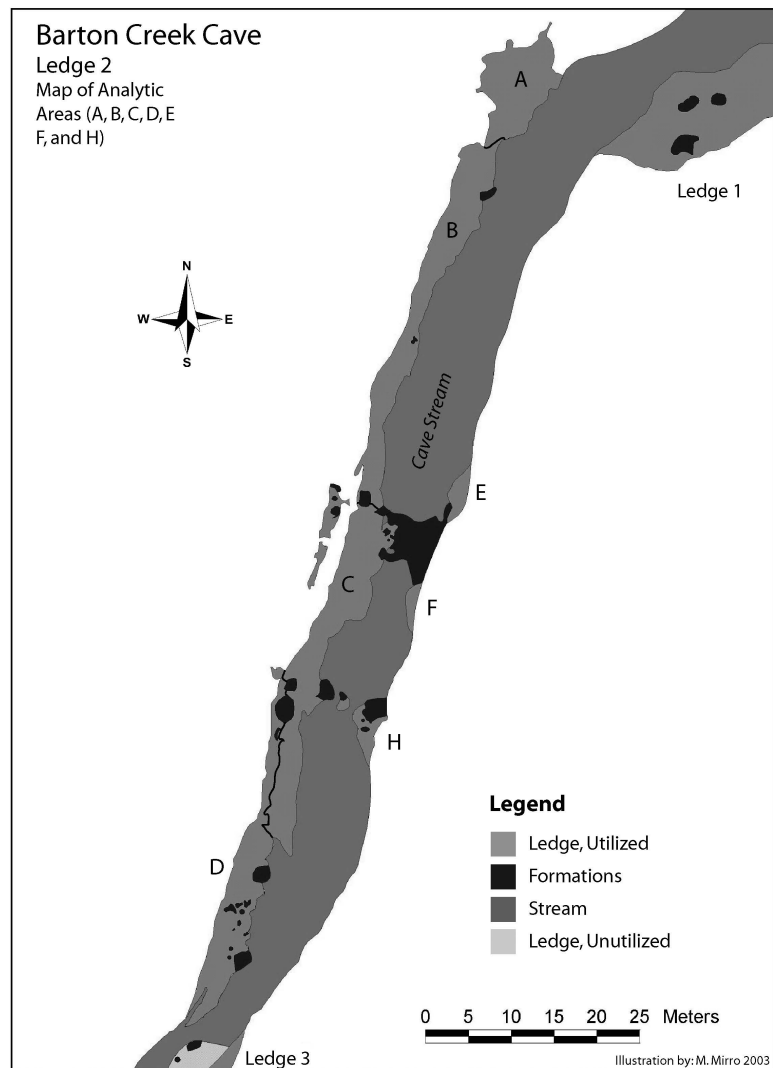
Another type of activity noted at Barton Creek Cave is the deposition of human remains. The Maya interred over 31 human individuals on six separate ledges (Owen 2002). Cobbles are associated with most of the human remains. For example, cobble clusters are positioned near ceramic vessels and adjacent to a pit with an interred individual in Lots 158 and 162 (Figure 9).

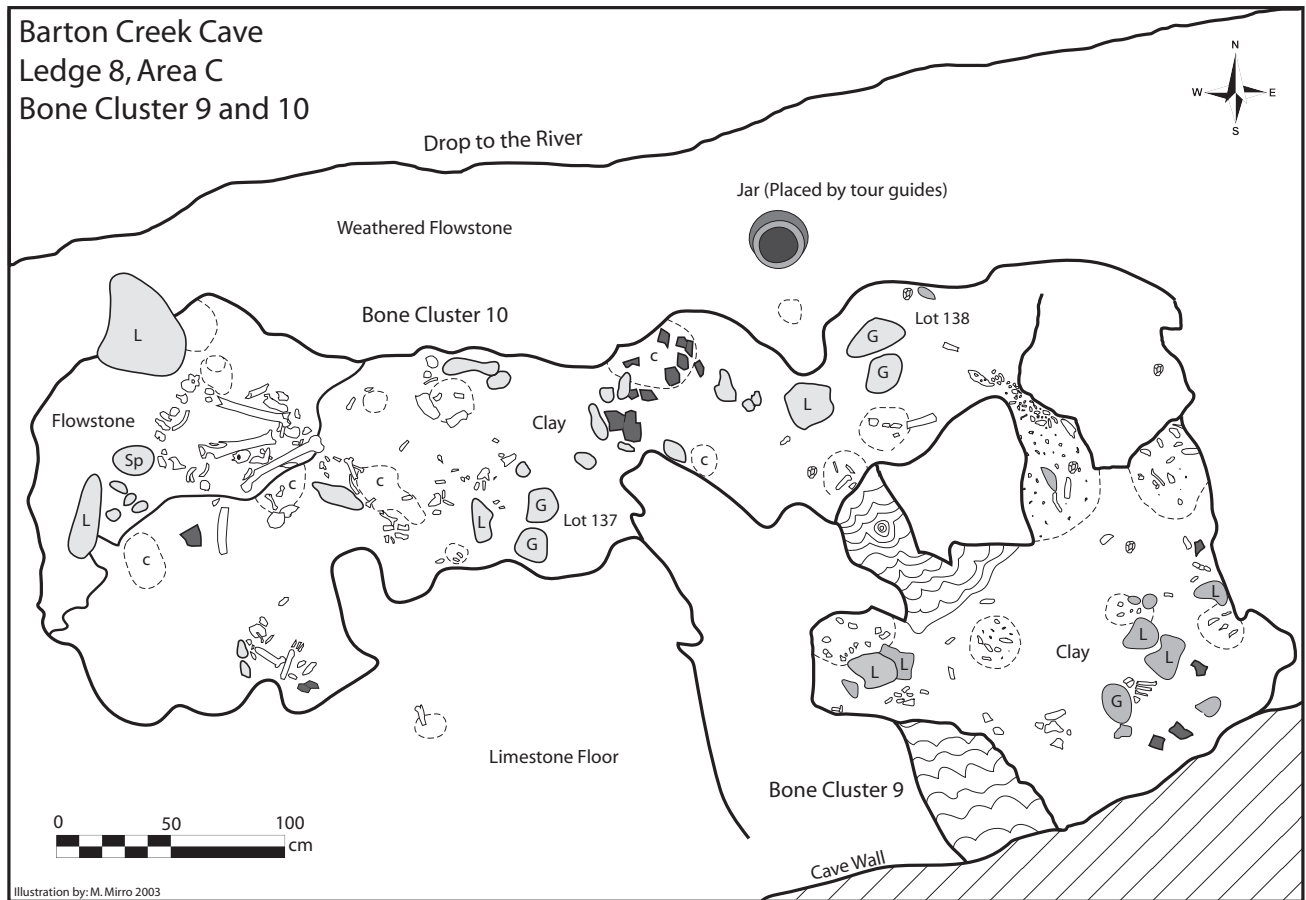
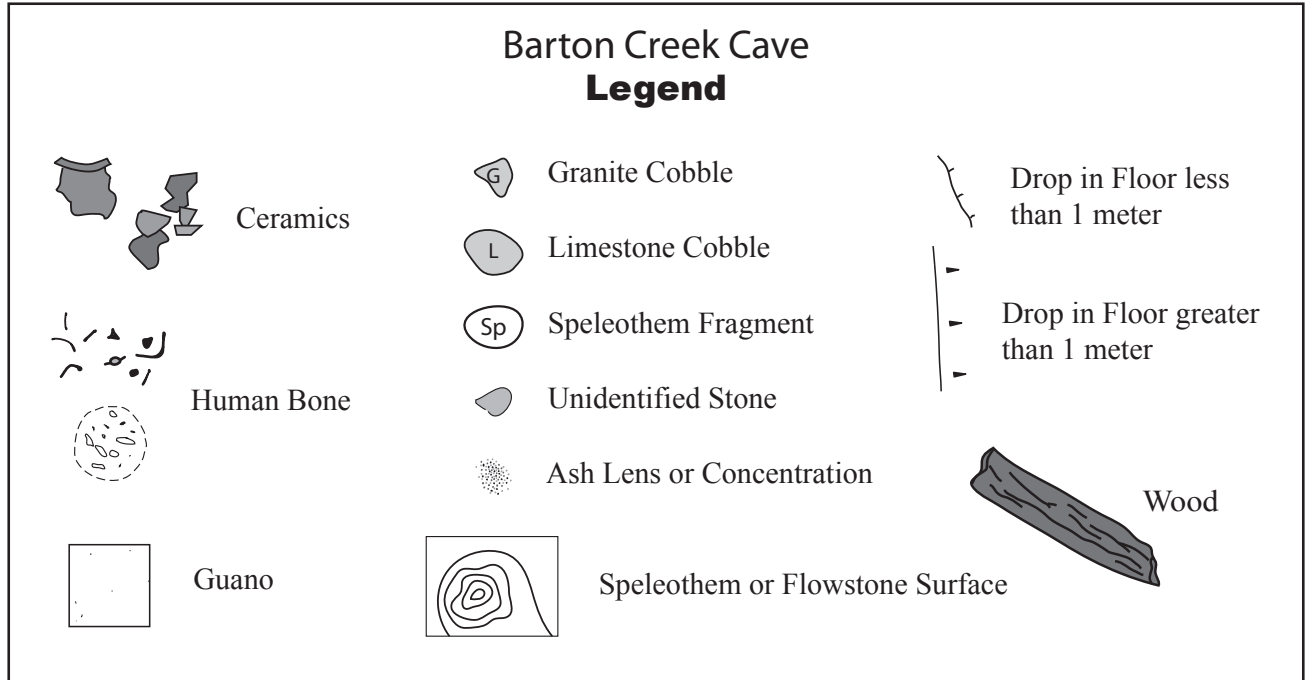
The apparent random use of limestone, granite and slate, often in the same construction, suggests that stone type may have been less important than gathering enough material to construct the features. For our purposes the importance of granite and slate is that they are easily recognizable as manuports while the source of limestone is more problematic. In Eduardo Quiroz Cave (Pendergast 1971), for instance, walls were constructed from limestone but it was not possible to determine if the material had been taken from collapse or from talus outside the cave.

### Discussion

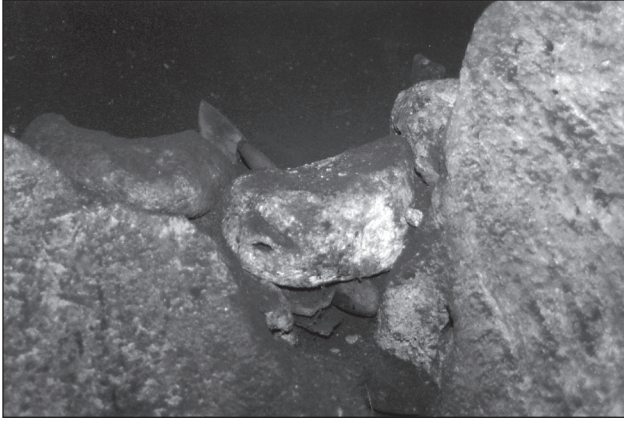
While the investigations at Barton Creek Cave are the first to document the large scale importation of stone manuports in a cave, data from several other caves suggest that the practice may be widespread. In the Roaring Creek Valley, which runs parallel to the Barton Creek valley, and similarly drains the Mountain Pine Ridge, a ledge near the entrance to Aktun Yaxteel Ahau has two granite, five slate and three unidentified river cobbles incorporated into rock concentrations and clusters (Mirro and Awe 1999). Other granite and slate cobbles are present on ledges elsewhere in the cave. Graham et al. (1980) noted eight features on a ledge in Footprint Cave consisting of river cobbles or limestone and associated with charcoal and ceramics. Reents-Budet and MacLeod (1986) mention the presence of river cobbles associated with cultural features in Petroglyph cave. On a larger scale it has been documented with the importation of slate monuments at Laberinto de las Tarantulas (Helmke et al. 1999) and Actun Tunichil Muknal (Awe et al. 2005).

**Figure 5.** Plan map showing the distribution of cobbles excavated from a natural pit used as a hearth.





**Figure 6.** Plan view of Lots 137 and 138; triangular rock features associated with human remains on Ledge 8.

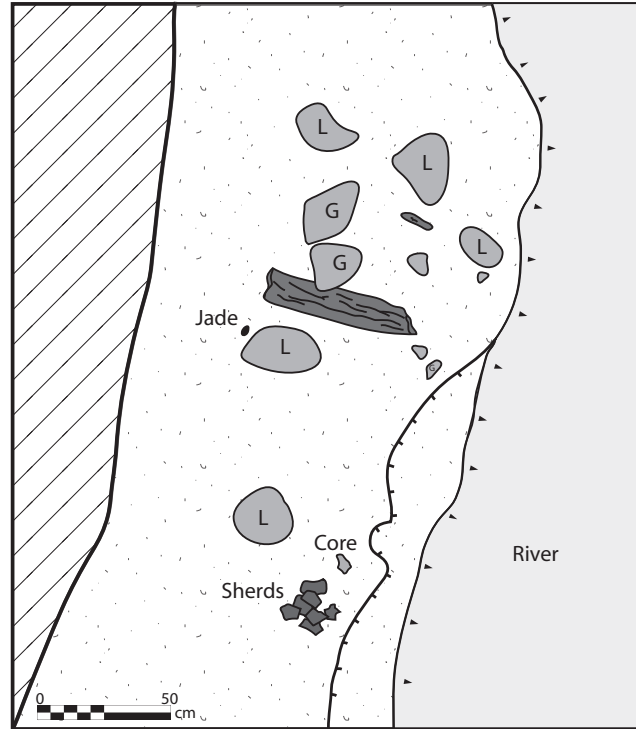


**Figure 7.** Lot 176 - Stone feature constructed across a gap in a rimstone dam.

**Figure 8 (right).** Lot 164 - Cluster of stones near a piece of burned wood, jade adorno, core, and a small pile of sherds.

The recognition of stone manuports in caves should immediately alert the archaeologist to the fact that these materials were somehow required in the rituals that were taking place. The size of the stones, the distance from the entrance, and the height of the climb to access the ledges indicate a large investment of energy to import such materials to the activity areas. In Barton Creek Cave, rituals took place on ledges 5 - 15 meters above the cave stream that required difficult climbs. The transportation of stone to ledges made preparation for a ritual a far more difficult and elaborate task than previously appreciated. The identification of manuports from outside the cave also allows the archaeologist to recognize that clusters of stone must have been constructions even if the form or intent of that construction is not particularly apparent. Additionally, the knowledge that the stone was imported adds to our appreciation of the effort involved in such simple forms as hearths, vessel supports or torch holders.

Our findings have further implications. There clearly appear to be a range of uses for unmodified stone in Maya ritual. The importation of cobbles appears to be associated with all types of activities documented in the larger pattern of ritual utilization of Barton Creek Cave. If the construction material were not present locally the Maya went to considerable effort in transporting it to the cave. The use of stones that do not naturally occur in the cave is interesting only because it permits us to easily and convincingly document this behavior. There is every reason to believe that these same behaviors are occurring in caves where only limestone is being utilized and thus the movement is more difficult to detect. More attention needs to be paid to the presence of rock concentrations in caves in order not to miss evidence of transportation of unmodified raw materials. Our findings are part of a growing appreciation of the tremendous extent of cave modification that has gone unnoticed by previous investigators.



Finally, this investigation underscores the importance of considering geology with the archaeology of a cave site. A poor understanding of the geology of the cave and karst environment significantly increases the possibility that observations of important cave modifications will be lost to the investigator.

#### Acknowledgements

My sincere thanks go to Dr. Jaime Awe and the Institute of Archaeology in Belmopan, Belize and for giving me so many valuable research opportunities over the years. I would like to extend gratitude to Dr. James Brady for all of his guidance and support. I would also like to thank the staff and students of the Western Belize Regional Cave Project for all of their assistance. In particular I would like to thank Cameron Griffith, Chris Morehart, Christophe Helmke, Sherry Gibbs, Brent Woodfill, Caitlin O'Grady and Jon Spinard for all of their hard work and valuable advice. Finally, thanks to my loving wife, for all of her support, Vanessa Owen.

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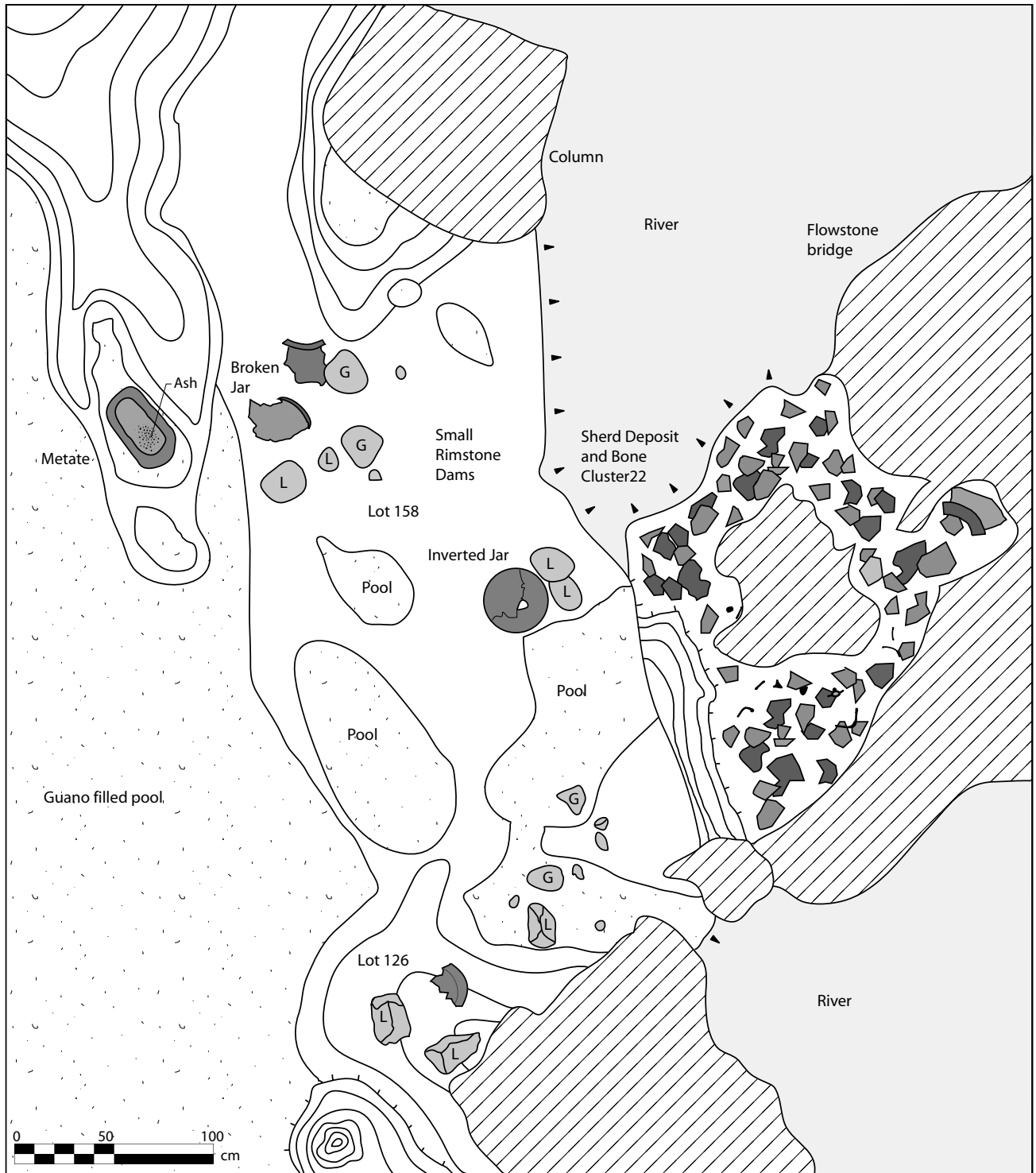


Figure 9. Ledge 2, Area C, Lots 126 and 158 - Imported stone associated with ceramics, stone artifacts, and human remains.

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## 11

## Leaving No Stone Unturned: The Identification and Interpretation of Unmodified or Minimally Modified Stone Manuports in Caves

James E. Brady

Over the past two decades, caves have, for a number of significant reasons, shown themselves to be an ideal context for the archaeological study of ancient Maya religion. First, the fundamental importance of caves in Pre-Columbian religion has been amply demonstrated. Second, the “dark zone” location of many deposits, deep within cave tunnels, all but eliminates the possibility of utilitarian functions, and establishes the ceremonial nature of these deposits. This allows archaeologists to concentrate on constructing ritual interpretations of the artifacts found there. Third, caves have yielded enormous quantities of artifacts that provide our fullest view of ancient ritual assemblages. Finally, because caves tend to be tightly bounded physically, they provide the archaeologist with an unparalleled opportunity to recognize unmodified or minimally modified natural objects that may have been brought from outside the cave to rituals within the cave.

This paper calls attention to the presence of small, unmodified stones recovered in cave contexts that were clearly brought from outside of the cave. Although not exhaustive, a search of the archaeological literature collected enough examples of similar objects recorded by surface archaeologists in burials and caches to demonstrate that the cave finds are in no way unique. These examples illustrate that such stones played some type of role, or perhaps more correctly, played various roles in ancient ritual. A broad range of uses of stones is noted in modern indigenous rituals that suggests possible functions and meanings of these stones in ancient contexts.

### Cave Stones

Because of the very prosaic nature of the data, I will cover the material rapidly. At Naj Tunich, my first experience in working in a cave, two spherical stones were recovered from excavations just below Structure 1 (Brady 1989:318). Spherical stones have been found at a number of surface sites so that these stones fall into a recognized category of manuports (Willey 1972:140).

At Dos Pilas, 17 unmodified, dark green to black, smooth, fine-grained stones were recovered from five different caves (Figure 1). Three were recovered from excavations in a deep midden created by dropping offerings down a ceiling entrance into the Cueva de los Quetzales so the stones were not naturally occurring. The same type of stone was found

in a special deposit at Arroyo de Piedra by Héctor Escobedo showing that this type of stone was recovered from other types of ritual deposits as well.

A stone with a natural collar of white quartz encircling one end and with a spot of quartz in the center of the collar was recovered from the Cueva de Sangre at Dos Pilas (Figure 2). The stone may have been collected because of its phallic appearance (Brady 1994:636-637).

### Archaeological Distribution of Unmodified Stones

Unworked stones appear to be under-represented in the archaeological literature because they are not, by definition, artifacts or at least not clearly so. They have been recovered in several caches at Chalchuapa, El Salvador. In Cache 1, “two small, unworked volcanic stones” were found under an inverted, Terminal Preclassic ceramic bowl (Sharer 1978: 181). In Cache 5, “three small volcanic rocks” overlay an inverted Late Preclassic ceramic vessel (Sharer 1978: 183). Finally, in Cache 12 “33 closely packed, round to oval, smooth, white stones” were found as the only offerings in a

**Figure 1.** Seventeen of these smooth, fine-grained black stones were recovered from caves at the site of Dos Pilas.



“round pocket of loose earth” (Sharer 1978: 183). This last cache was similar to 16 round “pigeon’s egg” stones found in Tomb II of Mound E-III-3 at Kaminaljuyu (Shook and Kidder 1952:113). In Tomb 1 of the same mound Shook (1949:219-220) recovered mica sheets, quartz crystals and water-worn pebbles.

A “small piece of orthoclase feldspar” had been placed within a shaman’s bundle recovered from the Cueva de Media Luna in La Venta Canyon, Chiapas (King 1955: 73).

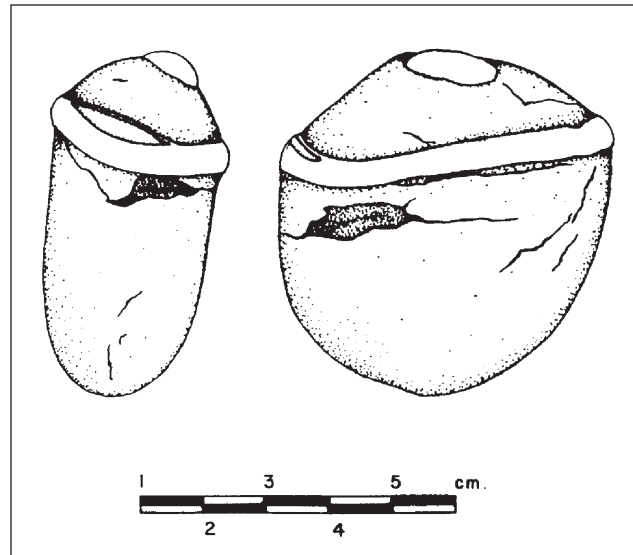
### Ethnographic Uses and Meaning of Stones

Any number of meanings can be attached to an object like a stone. At the birth of a baby in Colotenango, Chiapas, the father places a stone in the family waterhole. The waterhole is a sacred feature and the focus of familial ritual because a supernatural *Dueño*, or owner, dwells within it. In placing the stone, the father addresses the *Dueño* and says that he is “planting” (*sembrando*) the child and asks the *Dueño*’s protection from illness. At marriage, a man is required to sponsor two ceremonies. During the second ceremony, a *chimán* removes a stone from the wife’s waterhole and it is placed in the waterhole of the husband, symbolic of her taking up residence with his kin group (Valladares 1957: 203-206). In one case where a man had failed to undertake the required marriage ceremonies, the stones of his children were planted in the waterhole of his wife’s family. Thus, the stone represents the individual and its placement is a statement of group membership. Having stones represent individuals may be a more common type of symbolism than previously suspected. In the Mixteca Alta, stones or cave formations representing the bride and groom are set up next to the newly weds’ house (Ravicz and Romney 1969:394).

During a religious movement among the Mayo Indians in 1972, a series of God ceremonies (*liohpaskom*) were held in honor of the *ili tetam* (little rocks) which were thought to have fallen from heaven (Crumrine 1975: 132). Some of the rocks bore images of the saints or writing. By 1973 the cult had spread so that there were several dozen families sponsoring ceremonies to boxes of small stones. The stones were sent from god to castigate the people for not praying and respecting the deity, a situation that, if not remedied, would lead to immanent destruction of the world (Crumrine 1975: 137). Although the stones were not seen as deities themselves, they were, nevertheless, the focus of ritual activity and kept on an altar.

The Chorti travel to a sacred spring to collect five stones that are to be placed on the altar for the New Year ritual. They are selected from this place because it is where the rain gods drink. Ideally, the stones should be spherical or at least ovoid and a bit smaller than the size of a fist. A cosmogram is formed by placing four stones of very similar size in each of the cosmic directions, while the fifth, and largest, stone occupies the center (Girard 1962:23).

Robert Bruce (1975:80) states that the “god pot” is the most sacred ritual object for the Lacandon. Davis (1978:73) notes, however, that the most important aspect is not the pot itself but rather a stone that is placed in the bowl. The



**Figure 2.** This stone with a collar of white quartz was recovered from the Cueva de Sangre at Dos Pilas and may have been collected because of its phallic appearance.

stone is called *tunchi? nah*, “stone from the house” because it is taken from a shrine, often a cave, sacred to the god in question. The act of placing the stone in the pot activates the incense burner so that the god is present from that moment (Boremans 1993: 328). The stones are also called *u k’anche’k’uh*, “the seat of the god” because the god may sit upon the stone in the middle of the burning incense (Bruce 1975:80). Boremans (1993: 333) states that the Lacandon communicate with the deities through stones and that no communication would be possible without them. The practice of placing stones in incensarios may have ancient roots. Palacios (1977:7) mentions finding four stones in a vase at the cave site of Hokeb Ha and observes that:

The four stone pieces and charcoal lumps were found in bowl No. 26, which was either an incensario or incensario component. Three of them are sandstone and one is limestone. They do not have distinct tool characteristics and it is difficult to attribute any function to them. Parts of the former are blackened by fire and may have been used in the process of incense burning.

In addition to the stones in god pots, the Lacandon also keep small stones that are considered sacred on the altars near the pots. These are called “stones of the forest” (*tunin<sup>s</sup> muur*) and incense is burned to them as an offering to the forest (Soustelle 1961:59). It should also be noted that the Lacandon believe that stones in general, “have spirits, the *Xtabai*, which are neither feared nor worshipped but simply exist” (Duby and Blom 1969:293).

In Zinacantan, stones or sherds are made as an offering in a particular cave. It is believed that if three stones are not thrown into the cave as “tribute,” a person will die. Once a year, a group of men gather and sweep out the stones thrown



in during the previous year which threaten to block the flow of water from the cave (Bricker 1973:114). A similar use of stones has been noted in connection with pilgrimages to the Basilica of the Black Christ at Esquipulas. Along the way, pilgrims make an offering of a single rock which they haul up the side of the hill of San Sebastián and thousands have been deposited there (Smith 1979:31).

Stones of various types are thought to be power objects. Villa Rojas (1987:290) reports that in Quintana Roo pieces of flint and obsidian found near archaeological sites are collected by curers who consider them to be magical objects. Flint at one time was used in making fire (Redfield and Villa Rojas 1960:37). Perhaps because of that, it is associated with rain-making deities who are thought to strike lightning from it. For that reason the stone is sacred and unworked chunks are placed on altars by the Chorti (Wisdom 1940:382). Obsidian, called *tso'k'anal* (star feces) by the Tzotzil, is one of the stones thought to have been part of shooting stars (Laughlin 1975:93). Certain black and colored stones found in the forest or near the entrance to a cave are thought to be shooting stars that have fallen to earth (Vogt 1997:113).

Curers and diviners in the Mixteca Alta also carry stones. In addition, there is also a rain cult in the Mixteca Alta focused on sacred stones that represent rain and are thought to have the power to bring rain and insure a good harvest. The stones and ritual prerogatives that go with them pass from one generation to another through family lines (Ravicz and Romney 1969:394).

### Discussion and Conclusions

In recent years, increasing attention has been paid to all types of stones in caves. Several years ago, a number of colleagues and I noted the widespread breakage and movement of speleothems (Brady et al. 1997) and more recently we have attempted to quantify the amount of breakage actually occurring (Brady et al. 2005). Peterson et al. (2005) have shown that the largest proportion of this material was removed from caves and incorporated into surface site architecture. Mike Mirro (2001; also see this volume), on the other hand, has tracked the presence to granite cobbles in Barton Creek Cave to show that stone material was also entering the cave. Holley Moyes (2002) used GIS to plot the distribution of stone and artifacts to show that stones appear to be a focus of ritual activity in Actun Tunichil Muknal. In a study more related to the present theme, Keith Prufer and I discussed one category of unmodified stones (crystals) that were important ritual objects used in caves and have suggested that there may have been considerable interchange of these objects between surface and cave (Brady and Prufer 1999).

This paper has attempted to show that unmodified stones or pebbles form another category of manuports that have been largely overlooked by archaeologists. Cave archaeologists frequently employ ethnographic analogy to suggest specific functions of objects within the cave context. In this case, however, the data warn against there being a specific or even a narrow range of possible meanings or functions attached to these manuports. Ethnography provides an impressive array

of symbolic meanings that can be attached to such stones and the objects can be used in any number of different ways. This suggests that in many, or even most cases, it may not be possible to reconstruct the belief system surrounding such manuports. It is hoped, nevertheless, that context and artifactual associations will provide clues to interpretation. The first problem, however, remains one of recognition but because caves are tightly bounded physically, the presence of material originating from outside of the cave is more easily recognized and documented.

Cave archaeologists, therefore, are in a particularly good position to collect evidence of this type of ritual object. Given the ritual function of caves, archaeologists should strongly suspect that the objects were functioning in the symbolic realm. I have attempted to call attention to the presence of these stones in caves and have provide a broad interpretive framework in the hopes that this will lead to more frequent recovery of such items.

### Acknowledgements

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## 12

## Using Inductively Coupled Plasma Mass Spectrometry to Source Speleothems from Archaeological Contexts in the Sibun Valley Region of Belize, Central America

Humberto Nation, Polly A. Peterson, James E. Brady, Hector Neff, and Patricia A. McAnany

### Introduction

The breakage and transport of speleothems during ancient Maya cave visitation has become an increasingly well-documented phenomenon since the practice was first noted over a decade ago (Brady et al. 1997). Two recent studies have substantially increased our understanding of the scale of breakage and redeposition of detached material in surface sites. Brady et al. (2005) conducted a speleothem inventory in Cave 1 at Balam Na in Guatemala and documented that nearly 60% of the stalactites had been broken. The 1,660 broken stalactites indicate that an impressive amount of material had been removed from this small (40 m long) cave since few stalactites littered the floor of the cave. Peterson et al. (2005) recorded that thousands of speleothems had been incorporated into public and residential architecture at settlements investigated by the Xibun Archaeological Research Project (XARP) in central Belize (see McAnany et al. 2004; McAnany and Thomas 2003; McAnany 2002, 1998). This practice of incorporating speleothems into the built environment of Maya settlements probably accounts for a large percentage of the speleothems removed from caves.

The study by Peterson et al. (2005) is significant in providing actual physical evidence for the close relationship between caves and settlements. The recovery of physical evidence is important because it offers an opportunity to map very specific settlement/cave relationships—particularly if speleothems can be sourced to their cave of origin. In a seminal article on speleothem utilization, Brady et al. (1997:741–744) provide evidence that Instrumental Neutron Activation Analysis (INAA) of speleothems from caves in the region of Copan, Honduras, can produce chemical signatures that are discrete to individual caves. It was uncertain, however, whether the method would be applicable to caves in the southern Maya lowlands where the geology was thought to be far more homogeneous than in highland Honduras. Until now, no subsequent research in the Maya lowlands was attempted to test the implications of the first study.

The current effort is a preliminary attempt to source speleothems recovered from cultural contexts—in both caves and settlements—adjacent to the Sibun River of central Belize (Figure 1). Speleothem samples were collected in the

course of mapping and excavation. Additional samples were taken from specific caves to ensure an adequate sampling of intra-cave variability in chemical signatures. Permission to export the samples was provided by the Belize Institute of Archaeology. Two data sets using Inductively Coupled Plasma Mass Spectrometry (ICP-MS) have been generated employing different instrumentation. One set of analyses using speleothems from both settlements and caves was conducted by Peterson in the ICP-Emission Spectrometry Laboratory of the Department of Earth Sciences at Boston University. A second suite of samples from both contexts was run by Nation in the ICP-MS laboratory of the Institute for Integrative Research in Materials, Environments, and Society at California State University, Long Beach (CSULB).

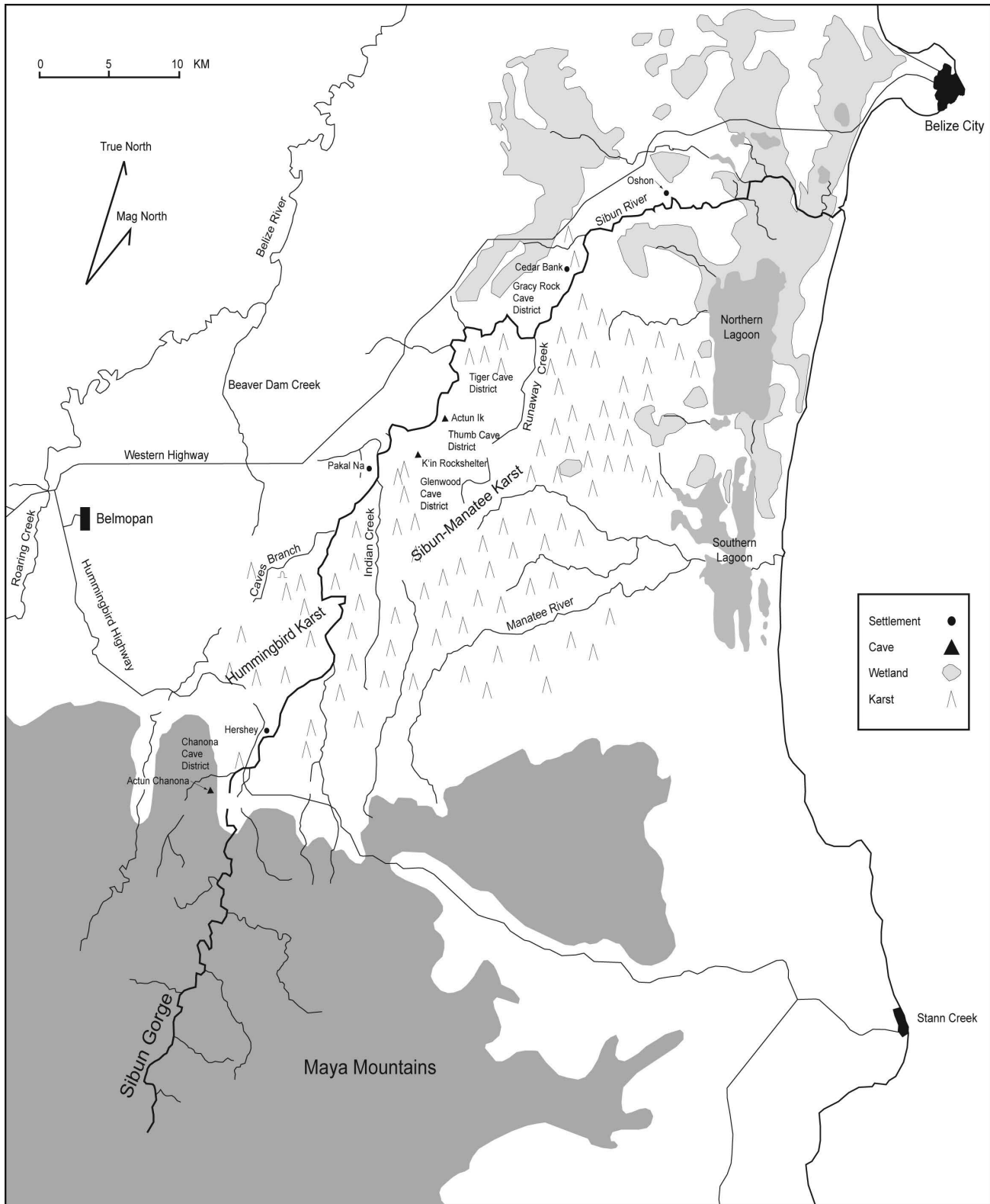
### Methodology:

#### Inductively Coupled Plasma Mass Spectrometry

ICP-MS is one of the most powerful spectroscopic elemental methods because of its ability to detect minute amounts of most elements. This level of accuracy allows for qualitative and, more importantly, quantitative characterization of *trace* (parts per million to parts per billion) and *ultra-trace* (parts per trillion to parts per quadrillion) elements.

Most samples analyzed by ICP-MS are introduced as liquids. Solid samples are usually “digested” or dissolved using acids and heat treatment. The speleothem samples prepared by Peterson were digested in hydrofluoric acid prior to analysis. The processed liquid samples were then analyzed in a VG Plasma Quad Excell ICP-MS, equipped with an ICP-quadrupole mass spectrometer at Boston University.

For liquid samples the most common introduction method used in ICP-MS consists of a nebulizer and spray chamber. Samples are introduced via a peristaltic pump into a line with argon gas as a carrier and transported into a nebulizer. In the nebulizer, the liquid samples are transformed into a fine aerosol with a stream of argon gas. These droplets are carried through the spray chamber and injected into a plasma torch. At the torch, a plasma is formed and ignited by a radio frequency emission “spark” from a tesla coil. The ignition of the plasma causes and propagates collisions between electrons and argon atoms resulting in the creation of more argon ions and electrons and so the process becomes self-



**Figure 1.** Location of XARP settlements and caves sampled and mentioned in the text. Notice the southwest to northeast trend on the Sibun River Valley; the distinct geological formations of the Maya Mountains, the Hummingbird and Manatee karst; and the location of the sites with respect to each other and its lithology

sustaining. The plasma ionizes the argon and other element atoms in the sample. The temperatures within this plasma range between 9500 and 11000 K. The nebulized sample is introduced into this plasma at which point its elemental components are ionized. The resulting ions are then passed into a high vacuum mass spectrometer through an interface ion lens where they are focused. The focused ion stream is then passed through the quadrupole which separates the ions by their mass-to-charge ratio ( $m/z$ ) before reaching the detector. The detector measures the spectral intensity of the ion's signal; where the intensity of a specific peak in the mass spectrum is proportional to the concentration of that isotope (element) in the original sample. Finally, a graphic and tabular report of the results is generated.

#### Laser Ablation ICP-MS

Alternatively, some solid matrices can be analyzed using laser ablation to vaporize the sample. In this case, the gas sample is introduced directly into the instrument for measurement. The speleothem analyses by Nation at CSULB utilized a GBC Optimass time-of-flight (TOF) ICP-MS attached to a New Wave UP-213 laser ablation system. The advantage of TOF-ICP-MS lies in the ability for transient signals from any solid material to be analyzed. Moreover, analysis of solid samples by laser ablation TOF-ICP-MS requires little preparation, and the introduction of a dry sample into the plasma results in a lack of polyatomic interference produced by the interaction of water and acid species with the argon plasma.

However, because laser ablation samples an extremely small area, there was a concern that its use might produce wildly variable results if the speleothem composition was heterogeneous. We were especially concerned that element concentrations might vary over the growth history of speleothems, which could present serious problems in determining a chemical signature for a cave. These possibilities were explored using a stalactite from the Poptun area of Guatemala. The stalactite was cut horizontally to expose a fresh surface and eight runs were taken from each of three different points for a total of 24 samples. The eight runs on each spot were used to determine the amount of variation that could occur in a relatively small area. The three different areas were selected in order to isolate changes in concentrations during the growth of the speleothem. The results from the eight runs were averaged to provide a single set of values for each point. Aberrant results did occasionally occur, but these outliers were excluded from the average. The results from the three points cluster for all elements, indicating that, at least in this sample, composition does not vary significantly over time. While the results suggest that speleothem sourcing using laser ablation TOF-ICP-MS is possible, clearly more work needs to be done.

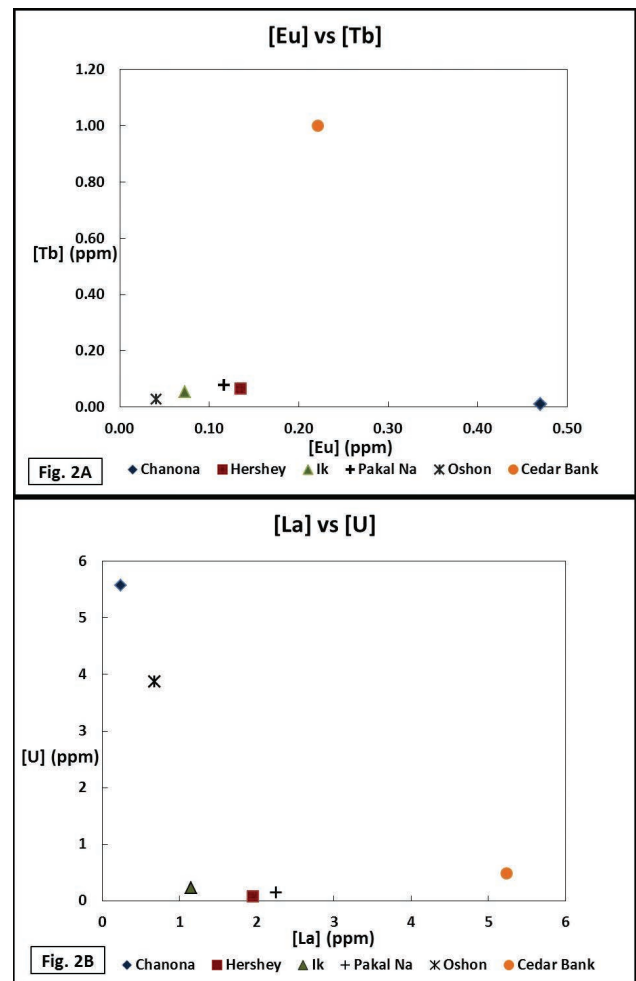
It should be noted that values obtained for speleothems collected from Actun Chanona in the Boston University and CSULB analyses differ. There are a number of possible explanations for the discrepancies: the samples were not the same, different methods of preparation were employed, and

concentrations were measured using different instrumentation and different approaches to standardization. Furthermore, Actun Chanona is approximately 279 meters long, so it is possible that chemical variation exists within the cave itself. Our solution is to treat the results as two discrete data sets and to confine interpretation to a single set at a time.

### Results

Analyses conducted at Boston University provided the first test of general assumptions about links between caves and surface sites. From archaeological evidence, we had assumed that a large upriver settlement situated at the base of the Sibun Gorge—namely, the Hershey site—controlled access to Actun Chanona. The settlement and the cave are physically proximate (about 5.8 km apart); both contain contemporaneous deposits dating to the Late-Terminal Classic period (AD 600–900; Peterson 2006:30), and each displays

**Figure 2.** Elemental concentrations of Eu vs. Tb (a) and La vs. U (b) showing the compositional variability between the various surface and cave speleothem samples analyzed in this study. In both graphs, the compositional variability between those samples representative of Actun Chanona (rhomboid) and the rest of the sites is evident, reflecting a geological determinant.



the most elaborate monumental architecture found in the Sibun Valley. The Hershey site contains two pyramid plazas and the only ballcourt documented in the valley (Thomas 2005:160). Actun Chanona, likewise, contains a large artificial platform—measuring 30 m long by 15 m wide and rising 10 m above the cave floor. The structure was built in the interior dark zone of the cave, over 170 meters from the main entrance (Peterson 2006:27–31). It was hypothesized that speleothems found at the Hershey site likely would have been transported from Actun Chanona.

Of the eleven samples analyzed at Boston University, three had been collected from Actun Chanona and three from the Hershey site. The remaining five samples were retrieved from sites located downriver, including Actun Ik, a cave in the Thumb Cave District, and from the settlements of Pakal Na, Oshon, and Cedar Bank. All results were calibrated with respect to the Actun Chanona values since it was expected that the Actun Chanona and Hershey results would cluster while the other five samples might display divergent patterns. The actual results turned out to be quite different (Figures 2a and 2b). The elemental concentrations found in the Actun Chanona samples differ from all other samples. Results clearly indicate that the speleothems recovered from the Hershey site originated in the Sibun-Manatee karst and not in the nearby Hummingbird karst where Actun Chanona is located. The elemental concentrations suggest that the speleothems found at the Hershey site came from a cave located somewhere between the settlement of Pakal Na and the cave site of Actun Ik.

Laser ablation TOF-ICP-MS was conducted at CSULB on nine additional XARP samples. Once again the samples from the Hershey site were compositionally different than those from Actun Chanona. Five samples were analyzed from Actun Chanona and one of these provided an unanticipated insight into ancient Maya speleothem breakage and relocation patterns. Because Actun Chanona is one of the largest caverns in the region, there was concern that compositional variation might occur over the length of the cave. For that

reason, samples were systematically collected from different parts of the cave. In order not to unnecessarily damage cave formations, already broken pieces were collected from the floor. In retrospect, although we expected all the samples collected inside Actun Chanona to come from that cave, we could not be certain that they had come from the particular areas of the cave where they were sampled or from Actun Chanona at all. Laser ablation TOF-ICP-MS showed that one of the samples was clearly distinct from the other four, (Figure 3) matching the composition of a sample from K'in Rock Shelter (located approximately 28 km away in the Glenwood Cave District) so closely that it appears that both samples came from the same place.

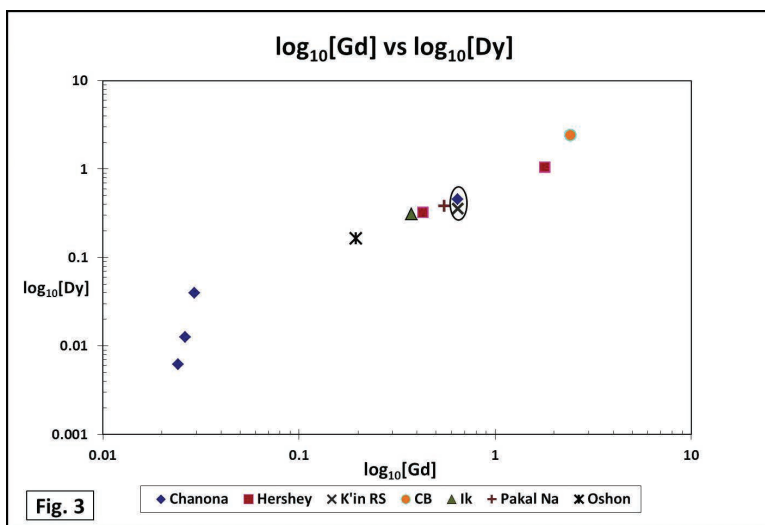
### Conclusions

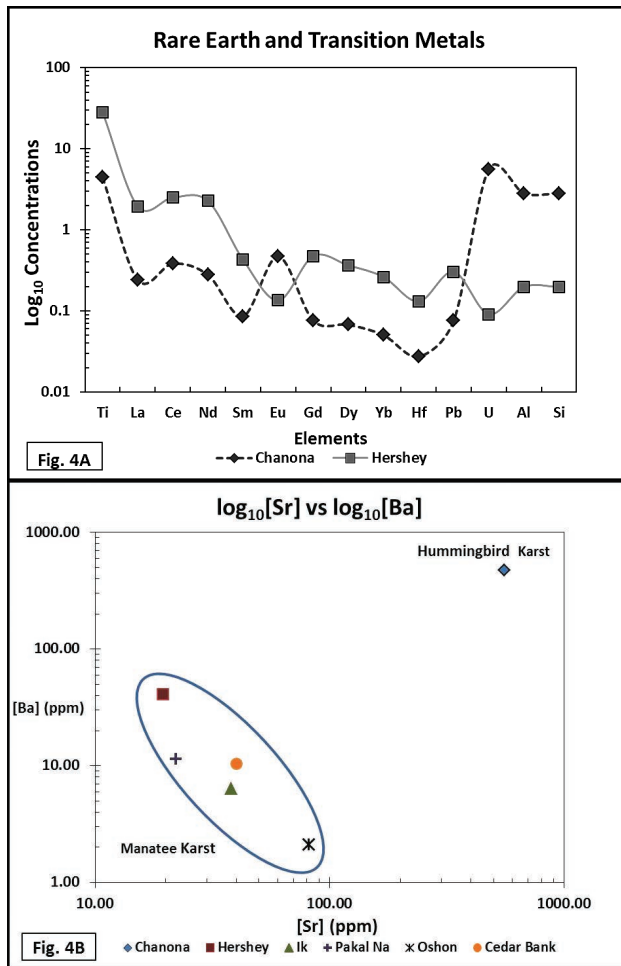
This paper has presented the first results of a preliminary investigation of ancient Maya speleothem breakage and movement utilizing ICP-MS as an analytical sourcing method of speleothem formations. The results clearly indicate that this method can isolate compositional differences in speleothems from different caves and lithographies (Figures 4a and 4b), if the differences are great enough to allow for the recognition of discrete chemical signatures. Tests on a single stalactite found no significant variation in the concentration of elements over the growth of the formation.

Although the sample is small, the results are significantly at odds with existing models of speleothem transport. In this case, it had been assumed that the speleothems recovered from the Hershey site would come from Actun Chanona based on the proximity of the cave to the settlement and the similar scale of architectural elaboration. This model is based on the assumption that speleothems found within ritual architecture at a settlement were collected within a ritual landscape “catchment” and served to link settlements with one or more caves of great significance to the community. Cave formations, under this model, were brought to settlements as a means of imbuing the built environment with supernatural power. Data presented here, however, suggest that the Hershey speleothems originated in an unidentified cave at some distance downriver.

If our original model of speleothem use is at least partially correct, results suggest that a currently unknown cave, possibly one which residents perceived had an ancestral link, was the cave of greatest ritual importance to those who built the Hershey site. The chemical signature points to a cave located in the Glenwood Cave District. A second possibility

**Figure 3.** Elemental concentrations of Gd vs. Dy showing both the range of compositional variability of Actun Chanona samples against those from other sites, and near similarity in composition of one Actun Chanona collected sample to one from the K'in Rock Shelter (oval). The compositional similitude suggests a possible origin (and transport) of this sample from the Glenwood Cave District into Actun Chanona proper.





**Figure 4.** Graph (4a) comparing the logarithmic concentrations of Rare Earth and transition metals for samples obtained in Actun Chanona and the Hershey settlement. Despite the proximity, there are elemental variations between both locales. The logarithmic concentrations of Sr and Ba shown in (4b) clearly differentiate between the Manatee Karst (circled), and the Hummingbird Karst where Actun Chanona is located.

is that the Hershey site did not control or use Actun Chanona. This scenario appears unlikely. The frequency with which residents of Hershey visited Actun Chanona could be determined by future chemical sourcing of ceramics from both the settlement and the cave to see if the pottery follows the same pattern as the speleothems. If ceramic data do not mirror patterns in the speleothem data, then it is likely that the two data sets refer to different kinds of ritual practices. Ceramic data are likely to be highly informative regarding who controlled use of the cave.

If we discard the original assumption about proximity and ritual catchment, some alternative possibilities emerge. Brady and Colas (2005) suggest that speleothem breakage was a desecratory act associated with warfare. Speleothems from a vanquished foe's cave could have been collected and displayed as war trophies by the victor or used as architectural armatures on the facades of buildings. The latter occurred

at the circular shrines located in the lower part of the Sibun Valley (McAnany 2012). This practice could account for the fact that the chemical signature of the speleothems indicates a source distant from the Hershey site. The frequent incorporation of formations in ceremonial structures at settlements suggests that speleothems were perceived as potent receptacles of supernatural power. This logic is consistent with contemporary Maya beliefs and practices that include the placement of speleothems on altars (Deal 1988:74). In the past, desecration of a sacred community cave site could have signified termination in the same manner as did torching a pyramid, despoiling ancestral tombs, or depositing the smashed spoils of war from plundered palatial residences. All three acts of "termination" are attested archaeologically; notably, the main plaza of the Hershey site contains two corridors filled with what arguably are desecratory termination deposits (Harrison-Buck et al. 2007; Murata et al. 2008). Military defeat translated into the transfer of supernatural power from the vanquished to the victor.

Finally, the general assumption that speleothem fragments found on cave floors were broken from nearby formations is questioned by results of this study. Our sampling "miscue" at Actun Chanona inadvertently uncovered evidence of speleothem transport between caves - a practice that had never been previously suggested. Results indicate that fragments of speleothems were removed from one cave and deposited in another. We know from ethnographic sources that modern Maya ritual practice includes walking a circuit during which a number of sacred sites (including caves) are visited (Adams and Brady 2005; Smith 1979). If such circuits existed in pre-contact times they would have provided an ideal opportunity to move speleothems from one cave to another. Speleothem sourcing offers the possibility of reconstructing such circuits.

In conclusion, this preliminary study underscores how little is known about speleothem transport, utilization, and social significance. This small data set challenges a number of basic assumptions and illustrates the need for a large scale, fine-grained investigation of speleothem utilization in several karstic zones of the Maya region.

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