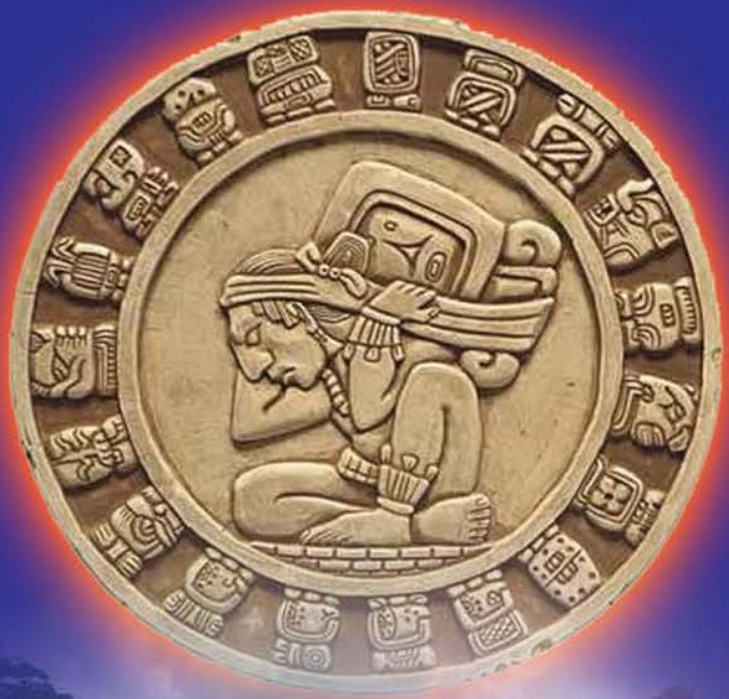
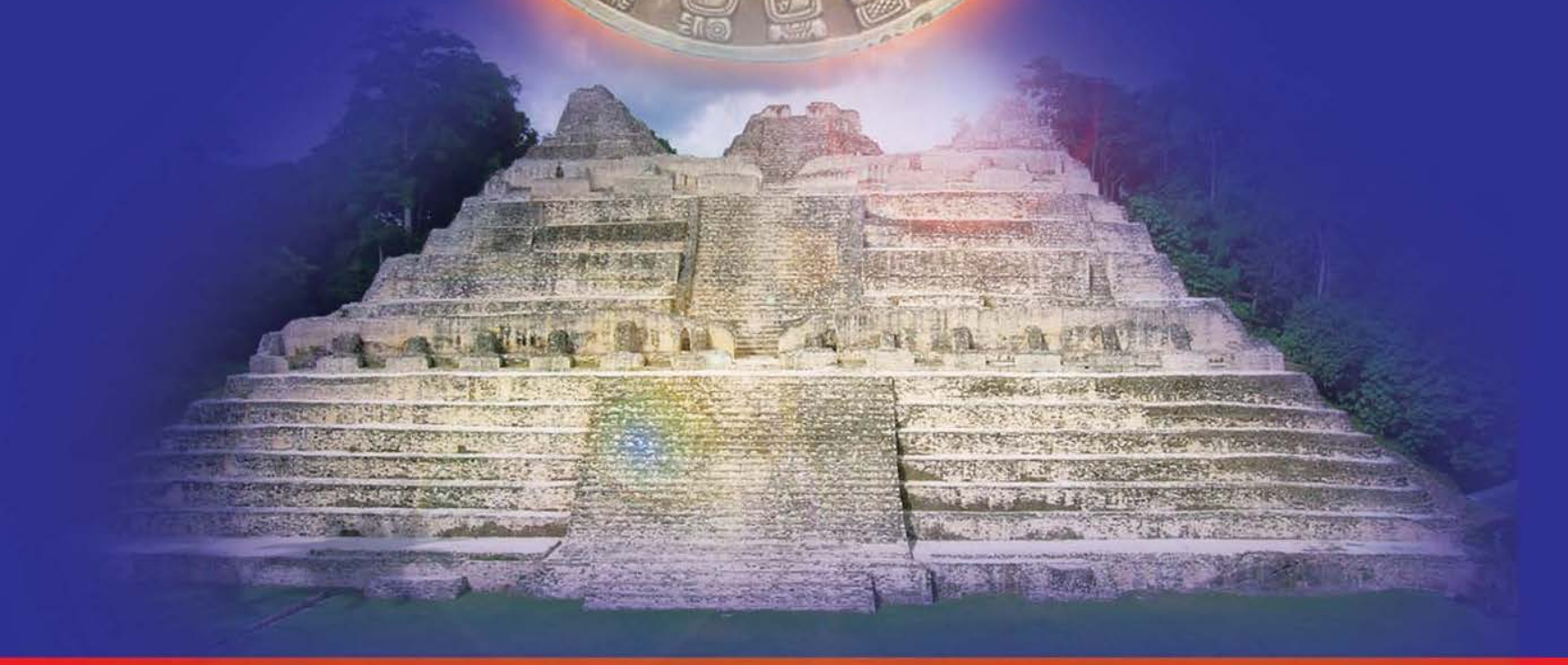
Research Reports in Belizean Archaeology

Papers of the 2012 Belize Archaeology Symposium

Time and the Maya





Edited by
John Morris, Jaime Awe,
Melissa Badillo and George Thompson

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Archaeological Investigations in the Eastern Maya Lowlands: Papers of the 2012 Belize Archaeology Symposium

Edited by John Morris, Jaime Awe, George Thompson and Melissa Badillo

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SECTION TWO: GENERAL RESEARCH REPORTS

1 ALTERNATIVE APPROACHES TO SOCIO-ECOLOGICAL CRISIS: PERSPECTIVES FROM BELIZE'S NORTH VACA PLATEAU

Gyles Iannone and Sonja Schwake

In recent years, scholars and the general public alike have become increasingly concerned with issues such as climate change, overpopulation, declining resources, economic recession, and political upheaval. For some, pessimism regarding the future has spawned a kind of paralysis, culminating in the nihilistic doomsday prophecies associated with December 21st, 2012. An alternative approach – one which is far more proactive – emphasizes the need to develop a much more nuanced understanding of the complex nature of socio-ecological relationships. The ultimate goal of such research is to better model the possible future ramifications of our present actions, or inactions, with respect to contemporary environmental, economic, social, political, or religious issues. The latter perspective is grounded in the idea that, in order to effectively model these potential future outcomes – and develop solutions for these varied problems – it is necessary to generate detailed, integrated socio-ecological histories for past communities, and broader societies. For the past 14 field seasons the Social Archaeological Research Program, and its collaborating research projects, have been building a detailed, integrated history for Belize's North Vaca Plateau. This chapter summarizes the key components, and significant findings, of this long-term, transdisciplinary research program, and critically assesses the alternative, "supernatural" approach to understanding socio-ecological cycles.

Introduction

In recent years, few topics have captured the imagination of the general public more than the idea of December 21st, 2012. The 2012 end-of-the-world "industry" has spawned numerous books, websites, Hollywood movies, tourism campaigns, and even a BAS symposium. The question remains, however, what does this date actually signify? To be honest, it doesn't really seem that anyone truly knows. The epigraphic references to this date are limited, and not entirely clear in terms of their intent, meaning that we really have no concrete idea as to what December 21st, 2012 meant, as a specific point in time, to the ancient Maya – other than that it apparently references the time of creation, and the end of the 13th Baktun (Van Stone 2010). This is why it is so odd that the fringe and popular culture interpretations surrounding the significance of 2012 are so detailed, and offered with such certainty.

One of the things we might say for sure about 2012 is that our perceptions of it are clearly influenced by current environmental, economic, social, political, and religious issues, like every other end-of-the-world prophecy that has preceded it. Doomsday prophecies connected to auspicious dates have likely existed as long as we have watched the celestial bodies move across the sky, and especially since we developed some form of calendar cycle. The apocalyptic hysteria leading up to the anticipated end of the world in the year 1000 is well documented (Boserup 1978; Landes 2000), as is the evangelical and fundamentalist fervor surrounding the end-of-times prophecies connected with the recent Y2K phenomenon (McMinn 2001; Schaeffer 2004). Ultimately, however, every prediction of the end of the world has, so far, failed to materialize. Considered in this light, one could argue that, even if the Maya epigraphic record was replete with references to December 21, 2012, and that each of these references clearly stated that the world would end on that day, it doesn't, in the words of an illustrious star ship captain, "make it so."

There is, however, something incredibly significant, and age-old, in our fascination with 2012. On one hand, it is clearly a recent manifestation of our species' long-term preoccupation with trying to bring greater predictability to our lives by building a better understanding of how the world works, and in some cases, fostering the belief that we have at least some control over its operation. On the other hand, it also reflects an enduring, and one might add tried-and-true, means through which leaders have built and enhanced their political legitimacy. The acquisition and perpetuation of power has long been achieved by demonstrating a special knowledge of, and control over, how the natural world works, particularly in relation to its various cycles. The latter has invariably been achieved through "ideology," in the pure Marxist sense of the term, wherein politically

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charged rituals and beliefs are utilized to liaise social and ecological cycles into a unified whole that can be manipulated by an elite, or self-appointed spokesperson, in order to shape people's perceptions, even in direct opposition to reality.

Normally, ideas concerning socio-cultural and ecological cycles do reflect how the world actually operates, an idea that is captured by the broader theme of "death and the regeneration of life" (Bloch and Parry 1982). Plants, people, and kingdoms all emerge, grow, peak, and die, only to be replaced by new ones. The problem is that, at least from a scientific perspective, social and ecological cycles never map onto each other perfectly, as demonstrated by the two millennium doomsday cults mentioned previously. But perfect articulation is exactly what is being posited, once again, by the 2012 prophecies. It seems a little audacious to think that any culture, past or present, could develop a calendar cycle that incorporated, so accurately, every major celestial event that might occur. Nevertheless, the belief that past societies were closer, spatially and temporally, to the supernatural powers and the time of creation, and hence had special access to, and insights about, how the universe operated, is a persistent theme in the philosophies of many cultures throughout the world. This Doctrine of Degeneration is opposed to the Doctrine of Progress which has prevailed in Western thought since the enlightenment, and has been particularly dominant in the past century. Ironically, the idea of continual progress, and the special role that is given to scientific inquiry in this endeavour, actually pushes contemporary researchers to develop the same level of understanding of the universe that Degenerists assign to the ancients. In the end, however, our predictive abilities, whether they are grounded in a temple complex or a lab facility, have been, and always will be, limited, and as a result our social-cultural cycles will never articulate perfectly with those of the natural world we inhabit. The true nature of the relationship between social and ecological systems was succinctly summarized by V. Gordon Childe (1949, 1956), arguably the most important archaeologist of the 20th century, when he stated that cultures do not adapt to the natural world as it actually is, but rather as it is perceived to be. However, as pointed out by Bruce Trigger (1991:555), our perceptions of the natural world do have to reflect, to a significant degree, its actual material qualities otherwise our ability to survive as a species would be drastically undermined. In our view, these perspectives capture the complex character of the integrated social and ecological systems that scientists focus their attention on.

Interestingly, current scientific concentration on the analysis of integrated socio-ecological systems has been influenced by the same factors as the 2012 prophecies: climate change, declining resources, soil exhaustion, food security, growing inequalities, wars, terrorism, natural disasters, and the roller-coaster ride the global economy has been on over the past few years. The difference is, rather than waiting for the inevitable "end of the world," scientist are attempting to develop a better understanding of how we might mitigate the impacts of the various issues associated with a rapidly expanding, increasingly unequal, over-consuming, and incredibly wasteful, and destructive global population (e.g., Costanza, Graumlich, and Steffen 2007; Costanza, Graumlich, Steffen, Crumley et al. 2007). Until recently, archaeologists have only dabbled in such research, but a growing number of scholars find themselves actively involved in investigations that incorporates an understanding of human resilience in case studies from all over the globe, including the Maya sub-area (Alexander 2010; McAnany and Gallareta Negrón 2010; Lucero et al. 2011; Scarborough 2000, 2008, 2009a, 2009b; Scarborough and Burnside 2010; Scarborough and Lucero 2010). The pairing of resilience frameworks and archaeology is a natural one because of archaeology's unique ability to generate and critically assess long-term, parallel or integrated histories for specific coupled socio-ecological systems, and especially since such data greatly enhances our ability to project the possible future outcomes of contemporary socio-ecological relationships, which is the underlying goal of this type of research (Costanza, Graumlich, and Steffen 2007:4-5; Kohler and van der Leeuw, eds. 2007). Under the banner of the *Integrated History and Future of People on*

Earth Project (IHOPE; see Costanza, Graumlich, and Steffen; Costanza, Graumlich, Steffen, Crumley et al. 2007), a number of researchers are currently attempting to build just such a detailed, multi-scalar, integrated socio-ecological history for various parts of the world, including the Maya sub-area. Our ongoing research in Belize's north Vaca Plateau is aimed at making a small, but significant contribution to this endeavour.

Towards an Integrated Socio-Environmental History for the North Vaca Plateau

The Vaca Plateau consists of a rugged, karstic landscape with elevations ranging from 300 to 560 meters above sea level, with an average elevation between 400 and 440 meters (Figure 1). In the past, much of the settlement in the Vaca Plateau was tethered to areas with permanent water sources, such as springs, and terrain that had slope and soil characteristics that were suitable for constructing agricultural terraces (Iannone 2005). The specific sub-region that is the focus of the current study is the North Vaca Plateau, which is bounded by the Belize Valley to the north, the Macal River to the east, the Belize/Guatemalan border to the west, and the ancient Maya center of Ixchel to the south. The research we have conducted in the North Vaca Plateau over the past fourteeen field seasons lends itself particularly well to generating a detailed, integrated history for this portion of the Maya sub-area.

Phase I

Our Phase I investigations focused on extensive excavations within the epicenter of the small city-state capital of Minanha (1999-2005). This center is situated roughly equidistant (25 km) between two of the major antagonists in Classic period (A.D. 250-900) warfare, Caracol and Naranjo. It appears that Minanha was once the seat of power for a series of "little kings" who were likely semi-autonomous (Iannone 2005, 2009, 2010b), but undoubtedly enmeshed in broader geo-political relationships with the "great kings" who ruled hegemonic city-states like Caracol and Naranjo.

The seven year Phase I study (1999-2005) indicated that Minanha emerged as a small city-state sometime in the 8th century AD. A key

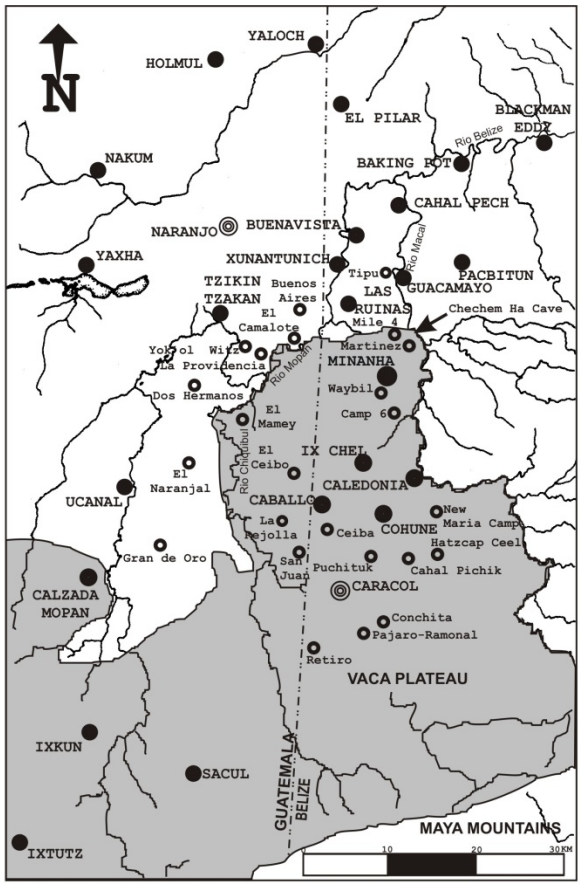

Figure 1. Map of Belize's north Vaca Plateau showing the location of Minanha, and other centers mentioned in the text.

contributing factor to this development was likely the existence of a swampy area that could be modified into a large reservoir – a key resource in a region where surface water is scarce – and a landscape with the correct slope and soil characteristics for intensive, terrace agriculture. After roughly a century of prosperity, Minanha's royal residential courtyard was buried by five meters of rubble, its stucco friezes and many of its stelae monuments were destroyed, and elite building projects were halted in mid-construction (Iannone 2005, 2010a). Although a lesser status population continued to inhabitant the epicenter into the 9th century, the aforementioned events signify the end of royal rule at Minanha. In summary, our Phase I findings provide us with a view of the rise and fall of the Minanha city-state from the perspective of the upper level of the micro-regional settlement continuum – the members of its royal court – a segment of the population that

does not appear to have been very resilient when faced with the dramatic cultural and environmental changes that occurred during the Late Classic to Terminal Classic transition.

Phase II

Our Phase II investigations were specifically designed to both complement and expand on the Phase I findings by examining the rise and fall of the Minanha city-state from the standpoint of its lower-level settlement component, or in other words, its support population. We achieved this goal by conducting settlement survey and detailed excavation of a stratified sample of settlement units in two 1 km^2 study zones, one surrounding the epicenter (Zone 1; Longstaffe and Iannone 2011), the other encompassing a dense pocket of settlement and agricultural terracing in the Contreras Valley, situated ca. 1.5 km southeast of the epicenter (Zone 2; McCane et al. 2010). Our sample of settlement units was stratified based on the Xunantunich classification system, which divides settlement units into seven types based on the number of structures, the degree of formal arrangement, and maximum structure height (e.g., Ashmore et al. 1994; Ehret et al. 1995). All of the settlement units examined in Phase II fell within the range of the smallest and least complex types: Types I through VI. These investigations were complimented by a small Electromagnetic Induction survey that attempted to locate hidden structures (Sweely and Trainor 2004), detailed mapping and test excavation of the associated terraced field system (Macrae and Iannone 2011), and a Carbon-Isotope analysis of humic substances from soils in the terrace beds to determine if, and to what extent, maize was cultivated in the past (Webb et al. 2007).

This multifaceted research program, which was carried out over the period of four field seasons (2006-2009), demonstrates that a pioneer population of smallholders established themselves in the area seven centuries or more before the emergence of the royal court. These groups settled near perennial water sources, and were instrumental in constructing a highly productive terrace agricultural system. The descendents of these pioneers were eventually incorporated, in various ways, into the Minanha city-state, at the same time that the surrounding population grew to its greatest size ever. Importantly, the longstanding groups who were descended from the initial settlers were also the principal groups that persisted, with some success, after the demise of the royal court (two of the larger and more complex Type VI residential courtyards). The "principal of first occupancy" (McAnany 1995), control over improved land, and access to water, made these groups highly resilient, and allowed them to weather the tumultuous Maya "collapse." In the end, the Phase II study generated a multifaceted history of the commoners who inhabited the settlement zones immediately adjacent to Minanha's epicentral court complex, some of whom do not seem to have been affected in a negative manner as a result of the collapse of the city-state (Iannone et al. 2008; Longstaffe and Iannone 2011; Macrae and Iannone 2011; McCane et al. 2010).

Phase III

Our Phase III research was initiated in 2010. At this time we expanded our research focus from the Minanha micro-region to the north Vaca Plateau sub-region, and set out, as a true transdisciplinary team, to enhance, in a significant manner, our understanding of long-term socio-ecological dynamics in this part of the Maya world. Our research foci currently include: 1) Gyles Iannone's efforts to refine our understanding of the Minanha chronology through additional excavations; 2) The test excavations Iannone has been carrying out to assess the chronology for the small city-state of Ixchel, located ca. 10 km southwest of Minanha; 3) The excavations and mapping Iannone and Sonja Schwake have been carrying out at the minor centers of Martinez and Waybil; 4) Holley Moyes and Jaime Awe's cave archaeology program, which is attempting to ascertain the degree to which changing ritual practices reflect shifts in climate, particularly droughts; 5) George Brook, Jason Polk, Philip Reeder, and James Webster's analysis of speleothems and sediments from multiple caves in order to refine our understanding of climate change, and shifting land-use patterns; 6) James Conolly and Chris Carleton's application of Bayesian statistical analysis to our large radiocarbon database, the results of which will allow us to

more effectively articulate the cultural and environmental sequences for the sub-region; 7) James Conolly, Chris Carelton, and Andrew Bevan's GIS modeling, which is being employed to predict site locations, and assess the factors contributing to the growth of the sub-region's intensive terrace agricultural system (Carleton et l. 2012); 8) Jocelyn Williams and Fred Longstaffe's stable isotope analysis of human bone and teeth, which is examining diet and mobility patterns; 9) James Stemp's ongoing analysis of the Minanha lithic assemblage; 10) The EDXRF study that Sarah Grant, James Stemp, Tristran Carter, and Iannone are conducting to evaluate changing patterns of obsidian trade; and, 11) Sean Downey's ethnographic research amongst contemporary Maya communities, which is exploring how the decedents of the ancient Maya have dealt with, and continue to deal with, periods of drought and deluge.

Productivity

In combination, our Phase I through Phase III research program has already resulted in five Doctoral projects, twenty-seven Master's studies, and four undergraduate Honor's theses. The topics covered by these intensive studies range from assessments of various artifactual (Chartrand 2005; Dell 2009; Grant 2012; Hills 2012; Lamoureux St-Hilaire 2011; Menzies 2003; Turuk 2007), faunal (Stanchley, in progress; Solis 2011), and mortuary (Schwake 2008; Snetsinger 2012) assemblages, osteological and isotope analyses of human bone and teeth (Herbert 2004; Stronge 2012; Sutinen, in progress), examinations of the center's administrative (Seibert 2006), domestic (Gonzalez 2006; Slim 2005), ceremonial (Moodie, in progress), and specialized (Paauw 2007) architectural features, as well as evaluations of settlement (Barry, in progress; DeMarte, in progress; Longstaffe 2011; McCane, in progress; Peuramaki-Brown 2003; Zehrt, in progress), terraced field systems (Macrae 2009, in progress; Pollock 2007), and water management features (Primrose 2003; Simone Philpot 2012), to the broader syntheses of the sub-region (Jones 2009; Kirschner 2012; McParland 2003; Mosher 2005), and the exploration of contemporary issues, such as the evaluation of field school opportunities (McRae 2007), and the development of archaeological parks (Stewart 2005).

CONCLUSIONS

In summary, the ultimate goal of our ongoing research in the North Vaca Plateau is to generate a detailed understanding of the development of coupled socio-ecological systems in this part of the Maya sub-area. The type of fine-grained articulation we hope to achieve using our various cultural and environmental datasets will hopefully allow us to make a small, but significant contribution to IHOPE-Maya's mission, which is aimed at crafting an integrated history for the ancient Maya world as a whole. Our hope is to learn as much as we can from this history, and in doing so enhance our future-looking model building activities.

In closing, we wish to return briefly to the issue of 2012. Maybe there is something we can say about this topic with some certainty: it has been, more than anything, a highly successful marketing campaign. Unfortunately, some have used it to play on the many fears people have about both the present, and the future. Few people can say that they are not touched in some way by the spectres of growing debt, higher commodity costs, job uncertainty, loss of savings, and unemployment, never mind the larger issues of increasing socio-economic inequalities, climate change, declining resources, wars, and a global economy that is sputtering, and potentially about to stall. In our view, we can adopt the position that fate has already dealt the cards, and sit and wait for the end. Or, we can strive, to the best of our abilities, to proactively mitigate the various issues we are currently facing. We believe that the latter is an admirable goal for archaeology.

For us, December 21st, 2012 is significant because it references an incredibly auspicious date in the Maya calendar, the time of creation. In other words, it is an anniversary that should be celebrated. At the same time, we also hope that it is a time that ushers in a period of intense introspection, and eventually action, aimed at changing the way that we, as a global population, treat each other, and our planet. So, to borrow an image from the Hollywood movie,

let's ride a 2012 wave of meaningful, thoughtful change, towards a better future for everyone, with one eye on the past, and the other on the future.

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2 TEMPORAL CYCLES IN THE ARCHAEOLOGY OF MAYA RESIDENTIAL GROUPS FROM CARACOL, BELIZE

Arlen F. Chase and Diane Z. Chase

Considerations of ancient Maya cycles of time often focus on dated events obtained from texts on carved stone monuments or on Maya prophecies recorded in ethnohistoric documents. However, temporal cycles are also in evidence in the archaeological records of Maya households. Archaeologically recognizable cycles can be seen in the contextual data of Caracol's residential groups, specifically in terms of timed ritual acts carried out in these locations that are often associated either with cache practices or with human burials. For the Caracol Maya, the dates and sequencing of residential deposits suggests that acts of veneration were linked to overarching temporal cycles rather than to individual history and events relating to household or family – or even to the death of a family member. Taken collectively, these data suggest that the ancient Maya worldview was both focused on and constrained by specific concepts related to time. Commemorating the completion of temporal cycles was important for all levels of Maya society.

Introduction

It has long been known that the ancient Maya commemorated various cycles of time. Stone monuments were often erected in cyclical fashion, repeatedly celebrating 20-year temporal intervals. The attention that the ancient Maya paid to time is noted in ethnohistorical accounts and is also evident in the attention given to lunar and venus cycles within the codices. Ancient Maya time also became relevant to contemporary society in celebrations of the 13th Baktun in December 2012, however misguided this might have been. Yet, there remains debate about the degree to which specific Maya events, activities, monuments, and/or constructions reflect historical, as opposed to cyclical, commemorations. We continue to suggest that cyclical time was far more important to the ancient Maya than has been previously argued and that its significance is reflected in the archaeological record of many, if not most, sites.

Maya rulers are often portrayed carrying out ceremonies at the change of a given katun, or 20-year period of time; in fact, many carved stone monuments are katun markers that were erected in sequence by each ruler (e.g., Beetz and Satterthwaite 1981; Proskouriakoff 1950; Satterthwaite and Jones 1982). Individuals not only kept counts of their katuns of rule – in many cases counting down these 20-year periods of time in their texts – but they also often categorized their lives in terms of katun periods and further noted their participation in first-fire events that were often associated with New Years' ceremonies carried out in 52 year intervals at times of calendar round shifts. Given the public placement of the carved stone monuments that emphasized katun endings and portrayed Maya rulers carrying out scattering ceremonies in association with these cycles, the broader populations of Maya cities were undoubtedly aware of the royal temporal commemorations. Archaeological evidence also suggests that these temporal cycles were commemorated by the population at large.

For more than three decades we have attempted to understand how the Maya used time through analyzing their archaeological records (A. Chase 1991; D. Chase 1985a, 1985b). We have found that certain ancient ritual remains can be articulated with celebrations of time (D. Chase and A. Chase 2008, 2009). We have further suggested that interments were often placed in association with specific temporal cycles rather than with the death of specific individuals (D. Chase and A. Chase 2004, 2011). At Santa Rita Corozal, it was possible to demonstrate that the paired incense burners found in many ritual buildings correlated with katun changes during the Postclassic Period. Paired incense burners found associated with the latest temples of Caracol suggests that katun changes were similarly marked at the end of the Classic Period (D. Chase and A. Chase 1998, 2000). The remnants of one ceremony can be dated to the 10th baktun on the summit of Caana; two incensarios accompanied the placement of a dateable giant ahau altar at the base of Structure B19 on the summit of Caana (A. Chase and D. Chase 2004).

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The even earlier onset of the 8th baktun was marked by both construction efforts and the deposition of an elaborate series of caches associated with Caracol's Structure A6, the Temple of the Wooden Lintel (A. Chase and D. Chase 2006). The various temporal divisions of the 9th baktun – its 20-year katuns – were marked by the placement of Giant Ahau altars in the site epicenter (Satterthwaite 1954) and presumably by widespread deposits in the archaeological record of Caracol.

The archaeological data collected over the last three decades also appear to demonstrate that temporal celebrations integrated Caracol's residential households during the entire 9th Cycle. These ceremonies are more easily discernable in the archaeological record of Caracol because of the large number of ritual deposits associated with residential shrines at the site. Minimally 60% of Caracol's residential groups exhibit eastern shrine structures associated with caches and burials (A. Chase and D. Chase 1994; D. Chase and A. Chase 1998). In an earlier paper, we argued that Caracol's residential burials correlated with double-katun cycles of 40 years or, alternatively, calendar round cycles of 52 years (D. Chase and A. Chase 2004). Here we expound on this concept and also suggest that the face caches found in these same residential groups served as katun markers.

Temporal Cycles in Caracol's Residential Groups

The ritual deposits found within Caracol's residential groups were not accidentally placed. They commemorated deceased ancestors and bound social groups together. Most Maya residential groups do not house the graves of all of their past inhabitants. Instead, it appears that only selected individuals were interred within a given residential group. These decedents make up no more than 5-10% of the total residential group population. This is not only true at Caracol, but has also been noted for residential groups that have been archaeologically excavated at Tikal, Guatemala (D. Chase 1997). At Caracol, a relatively fine-grained ceramic sequence has been developed using funerary ceramics from hieroglyphically dated chambers, radiocarbon dating, and stratigraphic associations (A. Chase 1994). Because of the sample size and excellent contextual information, it is possible to date funerary ceramics to within relatively small blocks of time during the peak of Caracol's occupation during the Late Classic Period (A.D. 550-800). When ceramics are combined with stratigraphy across the various contexts, additional burials and caches can be dated through seriation. What emerges from these data is that fact that residential burials at Caracol placed in ritual contexts – i.e., on the axis to various structures – appear to have been interred with a temporal element that mimicked a 40-year or double-katun cycle. Absolute dating for the burial cycle can be established by examining dated tombs in Structure B20 in which the first was utilized by an individual who died in 9.5.3.1.3 (A.D. 537) and the second was occupied by an individual who died in 9.7.3.12.15 (A.D. 577), setting up a 40-year parameter between the stratigraphically-related individuals. The death dates in the tombs, however, do not account for double-funerals, secondary interments, or other post-processing of the dead that commonly occurred among the Maya, so some latitude may exist within this temporal cycle. As has been previously documented (D. Chase and A. Chase 2004) and as in the example included here, similar cycles of interment are found across various residential groups at Caracol.

While we were able to demonstrate that both face and finger caches are associated with burials at Caracol (A. Chase and D. Chase 1994), the isolated nature of these cache deposits, often placed in plazas in front of buildings, made it difficult to articulate exactly how caches fit into the broader picture of ancient Maya ritual. We were able to show that face caches appeared in the archaeological record of Caracol toward the beginning of the 9th Cycle but could neither satisfactorily explain their stylistic differences nor their temporal position and longevity. However, excavations undertaken within Caracol's residential groups within the last few years have yielded archaeological contexts containing caches that could be stratigraphically related to each other and to dateable burials. These data now permit us to suggest that face caches were deposited as part of both mortuary and katun ceremonies in

20 year intervals. The style of faces on the pottery vessels can be temporally seriated.

To demonstrate how the cache and burial cycles articulate, we will first look at the stylistic changes found within the face caches over time. Next, we will examine some of the archaeological excavations that were undertaken from 2007 through 2011 at Caracol. The first example shows the deliberate placement of a face cache immediately above the capstones of a crypt containing Late Classic vessels. The second example illustrates the stratigraphic relationships between burials and multiple face caches placed into a single building. And, the third example outlines the archaeological history of a residential compound consisting of adjoining plazas and structures in which the ritual deposits (both burials and caches) were sequent between the eastern buildings associated with the two plazas.

Caracol's Face Caches: Stylistic Development and Contents

By comparing various deposits across the residential groups excavated at Caracol over three decades, it is now possible to see a stylistic sequence for the site's face caches. The earliest known face cache is a large lidded urn that is characterized by "jeweled" censer-like flanges found in the front core of Structure B34 (D. Chase and A. Chase 1998: figure 7); it was stratigraphically followed by the only other face cache associated with this structure – a similar, smaller urn that exhibits both jeweled flanges and, importantly, barbles and that was capped with a lid modeled to resemble flowering maize. As in Structure B34, barbles are also associated with one of the two urns recovered from in front of Structure A37; the other urn from Structure A37 has a hood but no barbles (A. Chase 1994: figure 13.7). The caches recovered from both Structure I5 (Figure 1a) and Structure F33, discussed below, reflect similar sequencing. Lightly hooded cache vessels, often without earflares, continue later in the sequences of both buildings. These jeweled hoods are similar to costuming found around the faces of several of Caracol's early rulers as portrayed on Stela 14 dating to A.D. 554 (9.6.0.0.0) and Stela 5 dating to A.D. 613 (9.9.0.4.0); it is likely that the caches are contemporary with these portraits.

Figure 1. Different styles of Caracol face caches: a. face with barbles and projecting/ flanged hood; b. bird continence; c. simple face with earflares; d. hooded or beaded face with earflares.

These jeweled hoods (Figure 1d) do not appear to continue into the late Late Classic and there is a disjunction in the sequence that is marked by face caches that portray birds (Figure 1b). The bird face caches are fairly widely distributed at Caracol, occurring in at least a half dozen excavated residential groups. Human-like faces with earflares (Figure 1c) continued for a short while after the bird, but subsequently faces caches are marked with more simple representations of faces, often on smaller containers. The final caches vessels that were utilized in Caracol's residential groups often contained no portraits.

Many face caches contain no preserved contents, probably indicative of organic matter. However, a number of Caracol's caches are associated with obsidian eccentrics (D. Chase and A. Chase 1998: figure 15). The use of obsidian eccentrics with face caches continued through the Late Classic Period at the site and is reminiscent of the use of obsidian eccentrics in caches associated with Tikal's stelae (often erected to commemorate katun cycles). Earlier face caches at Caracol contain other materials, ranging from beds of malachite to shells to

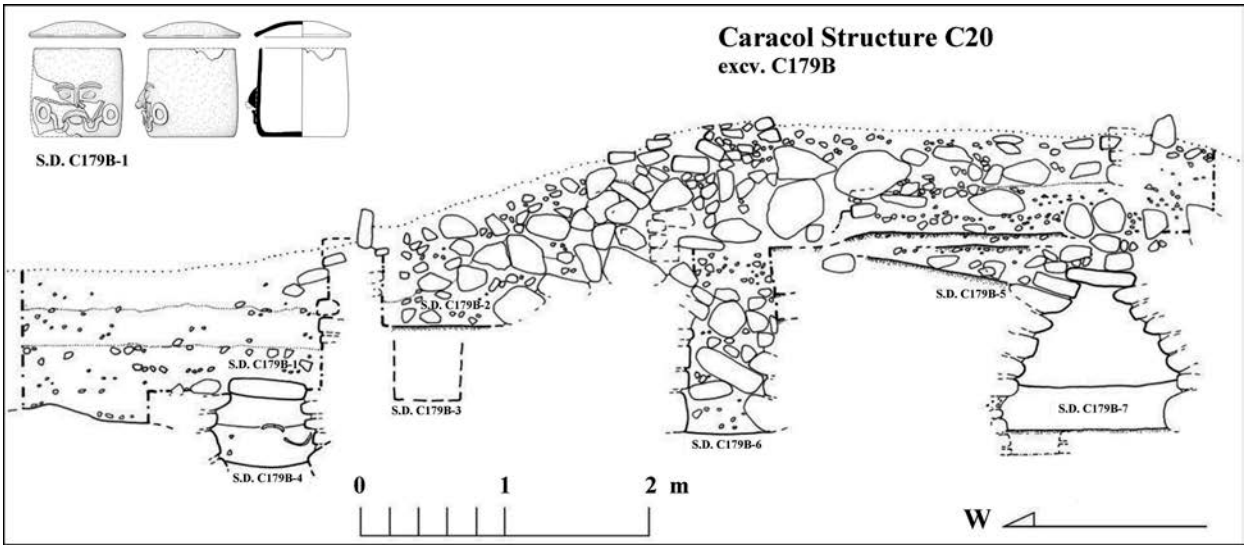

Figure 2. Section of Caracol Structure C20; the face cache was recovered immediately above the capstones for the frontal crypt.

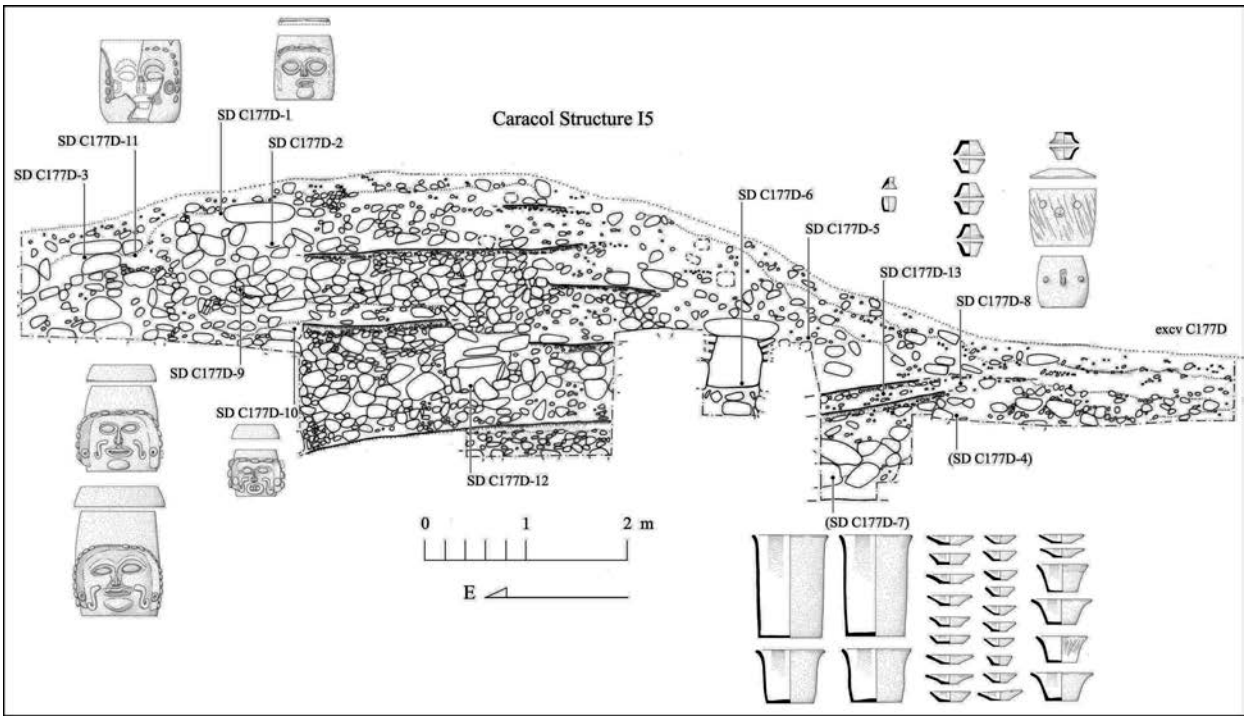

Figure 3. Section of Structure I5 and its caches.

jadeite beads. Inclusion of items in these caches, however, was rare by the onset of the Late Classic Period.

Culebras: Structure C20

The Culebras Group was excavated during the 2008 and 2009 field seasons. The eastern building in this group proved to be a typical one for the Maya of Caracol in that it yielded 4 burials and 2 caches (Figure 2). The burials are all associated with ceramic vessels, permitting these deposits to be sequenced into a series of episodic events separated by approximately 40 years and extending throughout the Late Classic

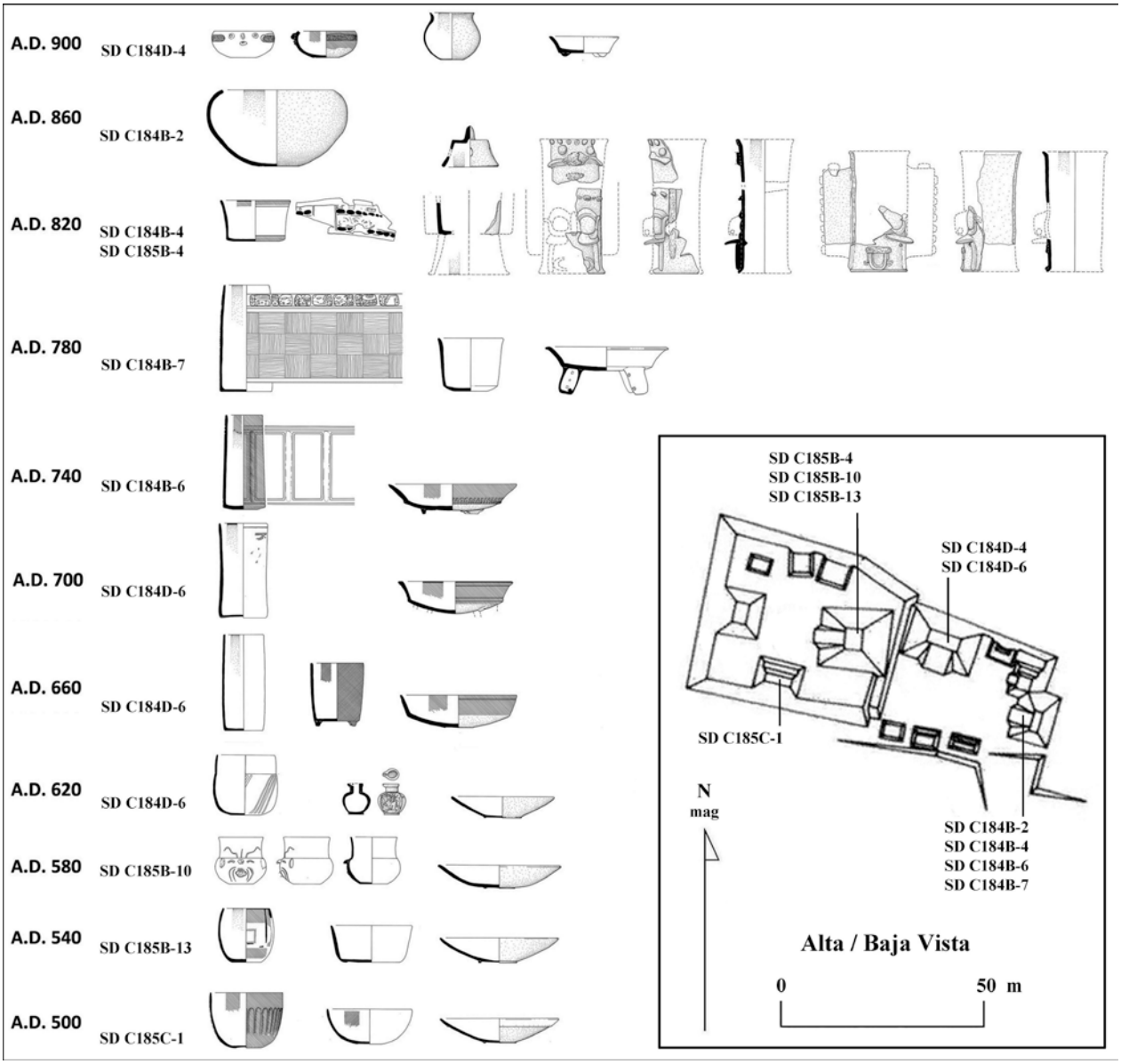

Figure 4. Seriation of burials recovered from Alta/Baja Vista following a double-katun pattern of interment that is consistent with the ceramic contents.

Period. One burial is of primary interest here. Located in front of the step of the building, it consisted of a single crypt with an extended individual with head to the north and the bones of an additional individual placed near the feet. The two vessels that accompanied this interment are clearly Late Classic in date, consisting of a footed plate and a polychrome figure cylinder. Above the capstones that sealed this deposit was a cache consisting of a finger bowl and a non-hooded face cache, thus positioning this face cache as contemporary to the Late Classic burial vessels and providing a stylistic reference point for caches found in other residential groups.

GRB Group: Structures I1-I8

In 2007, a residential group immediately northwest of Caana was investigated in order to look at variability in residential remains. Four buildings were excavated within this group and two produced burials and caches. The north building, Structure I2, produced two burials within the building fill and a single face cache at the base of its stair. The eastern building,

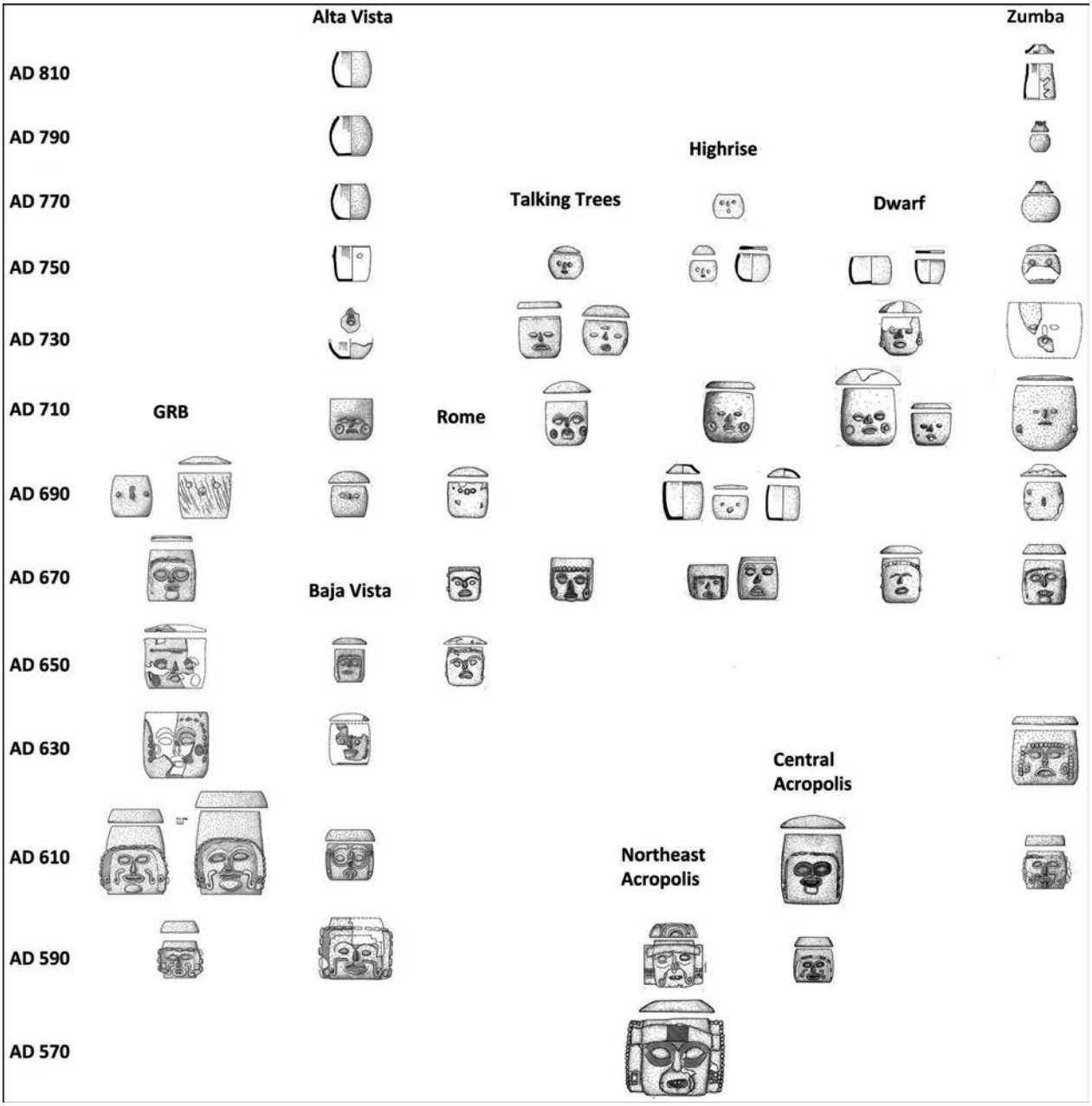

Figure 5. Seriation of caches from Alta/Baja Vista and other residential groups, showing the stylistic and temporal sequence of these containers.

Structure I5, produced minimally 8 caching events and 4 burials (Figure 3). Six of the caching events involved face caches and two burials contained vessels. One of the face caches clearly was placed sequent to one of the burials and this same burial is placed directly above two of the earlier face caches, thus permitting the whole sequence to be better articulated. While the burials in Structure I2 and I5 can be sequenced throughout the Late Classic Period, the face caches appear to span the earlier part of the Late Classic Period. The earliest examples in the sequence exhibit barbles and flanged jeweled hoods (Figure 1a). This is followed by examples with lightly marked hoods with and without earflares and then finally by a set of bird caches, one of which contained a carved limestone portrait of kinich ahau set atop

a series of obsidian blade eccentrics. Additionally, a sealed set of three finger bowls underlies the eastern building at its western extent and a massive caching event was placed into the front of the building during the late Late Classic Period.

Vista Group: Structures F30-F42

Over the course of the 2010 and 2011 seasons, seven structures were investigated within a conjoined residential compound referred to as Alta/Baja Vista. These investigations recovered a broad series of burials and and caches that can be temporally ordered and that suggests the veracity of the proposed ritual cycles relative to caches and burials (Figures 4 and 5). The Vista Group was ceremonially utilized throughout the course of the Late Classic Period. The initial ritual focus was in its western plaza area; the ritual focus shifted to the eastern plaza area in the late Late Classic Period.

The eastern building in the west plaza, Structure F33, contained two large urn caches dating to the early and late Early Classic Period; both urns contained Charlie Chaplins and other ritual items and are reminiscent of caches placed in public architecture in the Caracol epicenter. A change in the ritual focus of the Vista Group was marked at the end of the Early Classic Period by the placement of a burial within the summit remodeling of the southern Structure F34. Some 40 to 52 years later, the ritual focus shifted back to the eastern building with the placement of a small tomb in a stair balk at the base of the structure in association with a large lip-to-lip cache. The construction of this tomb disturbed a pre-existing lip-to-lip cache at the base of the structure, but represents a shift to traditional Late Classic Caracol caching patterns. One other burial, four face caches, and a number of finger caches followed. The face caches can be sequenced and generally follow the same stylistic sequence seen in Structure I5. However, burials are next deposited in the eastern plaza in association with the northern Structure B35, which also included a tomb. Following the use of this tomb, face caches are next found in the eastern building of the eastern plaza, Structure F38. The Structure F38 locus yielded 3 individual burials and 1 ritual deposit that included human bone, all dating to the late Late Classic Period. The earliest burial at this locus contained two vessels and was placed beneath a small basal shrine room that fronted the structure. A second burial was placed to the front of this shrine room, as was a bird face cache. A renovation of Structure F38 elevated the summit of Structure F38 and infilled the shrine room. Contained within this shrine room were whole and partial cache vessels, partial incensarios, partial speleothems, and most of a human body. A new shrine was constructed above this locus and was associated with a small broken stone sculpture. A burial dating to the Terminal Classic Period was placed into the summit of the building and both it and the shrine were engulfed in a final renovation of the building. A final Terminal Classic burial of a child was placed into the north building.

For the Vista Group, the recovered burials can be positioned into a 40-year or double-katun cycle (Figure 4) and the recovered cache vessels are appropriate for positioning on each katun (Figure 5). The mix of cache vessels in the shrine room suggests that it was designed to Structure F38 possibly correlates with the placement of a burial into the summit of Structure F33 that was covered with the same broken incensarios. It is believed that both incensario deposits were associated with ceremonies carried out for the 10th baktun.

Summary

Because of the long-term commitment to understanding Caracol's archaeological past, it is now possible to make some sense out of what once appeared to be disparate ritual deposits found throughout Caracol's residential units. While initially interesting because of their widespread distribution at the site and because of their social implications (A. Chase and D. Chase 2009), Caracol's face caches can now be associated with calendric ritual and assigned to specific blocks of time – 20-year katuns; thus, they also are exceedingly useful for dating the ritual use of a given residential unit. The face caches appear to interdigitate with residential burials that are also cyclical in nature, but that operate on an expanded double-katun timeline hase 2003, 2011]). Permutations in ritual remains among Caracol's residential groups still

remain to be explained. Some groups have multiple internments, but only limited caching activity; other groups have few burials, but numerous cached vessels. How and why these combinations occurred is something that should be answerable through future research at the site.

Temporal Cycles in Tikal's Residential Groups

Residential households that have been archaeologically excavated at Tikal, Guatemala were also examined to see if there were any correspondences to the Caracol patterns. While Tikal follows somewhat variant ritual patterns, there does appear to be a focus on calendric ritual. Specially prepared ceramic cache containers are not known from Tikal residential groups and Tikal does not exhibit the face caches and finger caches found at Caracol. However, we know that Tikal emphasized rituals associated with the 20-year katun. This can be seen both in caches at the bases of Tikal's stone monuments, consisting of chert and obsidian eccentrics (Moholy-Nagy 2008), as well as in its emphasis on large architectural groups referred to as "twin-pyramid" complexes, which were erected to celebrate new years' ceremonies associated with the transitions of the Late Classic katuns at the site (Jones 1969). Still extant twin-pyramid complexes can be identified at Tikal for the katuns ranging from 9.13.0.0.0 (A.D. 692) to 9.18.0.0.0 (A.D. 726) and three earlier examples are also known (Jones 1991). The earlier examples date to before A.D. 562, when Tikal suffered a devastating star-war at the hands of Caracol.

Archaeological data from Tikal has already been used to suggest that most household inhabitants were not buried within the residential groups at the site (D. Chase 1997; Haviland 1988). However, an examination of Tikal's archaeological record suggests that the burials found in the eastern shrines of its residential groups did not follow the Caracol pattern of 40 to 52-year deposition. Rather it appears that the Tikal interments may have been oriented to actual katun ceremonies; this is strongly supported by the late Late Classic date of most residential burials that have been recovered (see Becker et al. 1999; Haviland et al. 1995). The repetition and stylistic similarities of the vessels found in Tikal's residential burials strongly suggest a katun patterning for these stratigraphically separated deposits, but only in the late Late Classic time frame. If one examines the special deposits that were recovered during excavations made into residential groups at Tikal, it does not appear that the site celebrated much residential ritual between A.D. 562 and A.D. 692, or precisely the time of Caracol's apogee. Most of the recovered deposits at Tikal date to the late Late Classic (or Imix ceramic complex; see Culbert 1993) and many of its residential groups contain Manik burials that are not directly followed by Ik period burials in the early part of the Late Classic Period (based on data in Becker et al. 1999 and Haviland et al. 1985). Thus, Caracol and Tikal exhibit somewhat different ritual patterning in their archaeological records, something that is not surprising given their history of interaction (A. Chase 1991). However, cyclical interment patterns are present at both sites.

Conclusion

Western perception of time is, for the most part, linear as well as historical. The historical aspects of Western time have come to be superimposed upon the interpretations that we make of the Maya archaeological record. Thus, archaeologists tend to focus on individuals and agency rather than on repetitive commemorative activities and offerings for the propitiation of cyclical time. Maya ritual events, specifically as relating to burials and caches, are often interpreted archaeologically in terms of individuals, families, and lifespans rather than being interpreted within a broader cosmological frame that commemorates temporal cycles. Ritual timing may differ from lifespan timing. Thus, a burial may commemorate a larger event or cycle and not the simple death of an individual.

How the ancient Maya viewed and used time has a complex history of interpretaion. While the modern world has appropriated Maya time, as was seen in the public preoccupation with and celebration of the end of the 13th baktun (and the supposed end of the world) in December 2012, professional scholars of the past also had difficulty understanding how the

Maya used time. In the mid-twentieth century, both academic and public views of the ancient Maya had their communities ruled by priests who did little more than manipulate considerations of time, calendars, planetary cycles, solar and lunar revolutions, and other ritual counts. A more realistic picture of the Maya – one that included warfare and conflict – supplanted a utopian belief in the peaceful Maya once the hieroglyphs were understood. Epigraphic breakthroughs in the 1960s proved that the hieroglyphs found on carved stone monuments once thought to deal solely with the purview of time actually dealt with the dynastic histories of elite rulers. Scholars have subsequently chosen to emphasize the familial histories contained within the texts. Still, as noted above, the epigraphically-recorded history of these rulers is carefully placed within cyclical time and imbued with religious metaphor through the erection of stone monuments associated with the completion of baktun, katun, and hotun cycles.

An examination of the ritual deposits recovered in Caracol's residential groups strongly suggests that they were placed in accord with certain temporal principles. In combination with stratigraphic sequences gained through the excavation of Caracol's residential groups, the stylistic differences that are evident in both the face caches and the burials permit these deposits to be both securely dated and seriated. An analysis of these deposits demonstrates that Caracol burials were placed within residential groups as ritual offerings on a 40-year or double-katun cycle. Face caches appear to have been deposited in accord with a 20-year katun cycle and the onset of their deposition in residential groups appears to correlate with Caracol's war of independence from Tikal in 9.6.4.8.2. (A.D. 562). The multitude of these deposits that occur in Caracol's residential complexes signifies the importance of these ritual temporal cycles to the ancient Maya.

Marshall Becker (1992), who perhaps excavated more residential groups at Tikal than any other archaeologist, suggested that ancient Maya burials and caches would be better labeled as "earth offerings" – in recognition that something was amiss in our interpretation of these deposits. Even though he presciently recognized that human bodies could be interred as ritual offerings, he could not articulate a broader framework to contextualize the placement of these deposits. The archaeological research at Caracol has succeeded in demonstrating that, for the most part, these earth offerings correlated with the ancient Maya celebration of cyclical time. The celebration of temporal cycles permeated all levels of Maya society at Caracol and was central to their identity.

Because of the disjunctions between the archaeological records and the present day Maya, we have tended to interpret their past remains with Western eyes – in which caches were purposefully secreted and burials were interred only when someone died. But, the ancient Maya were distinctly non-Western. They also were exceedingly religious. Maya hieroglyphic texts show that ancient Maya religious beliefs were interwoven with the celebration of time. While scholars have recognized the importance of time to the Maya elite for more than a century and a half, it has taken the archaeological record to demonstrate that the commemoration of the completion of temporal cycles was important for all levels of ancient Maya society.

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3 CERAMICS OF LAS CUEVAS AND THE CHIQUIBUL: AT WORLD'S END

Laura J. Kosakowsky, Holley Moyes, Mark Robinson and Barbara Voorhies

The identification of site specific ceramic complexes utilizing standard types, varieties, and modes has the advantage of informing on the temporal placement of the occupation at Las Cuevas in the Chiquibul. However, the choices made to name the ceramic types that comprise these complexes are not without implied meanings about broader regional and inter-regional connections. While Las Cuevas is only 14km from the large polity of Caracol, the nature and extent of Caracol's influence over a site such as Las Cuevas, and other smaller communities in the region, remain to be determined. The purpose of this paper is to ascertain if the ceramics from Las Cuevas are more similar to Caracol and the Petén region to the west, than to the Belize Valley and Vaca Plateau to the north, or to sites farther south in the Toledo District, the Xibun, and east along the Belize coast. Ceramic spheres are not static constructions and their spatio-temporal boundaries, which change through time, serve to highlight these connections, particularly during the Late Classic Period. What can we say about the ways in which these ceramic spheres overlap that might inform on interactions between Las Cuevas and these other sites and regions? An analysis of more than 16,000 sherds after two seasons is suggestive of a more complex story than might be expected. If ceramic spheres are a reflection of these interactions, then Las Cuevas may in fact be at world's end in more ways than one.(243 words)

Introduction

The Las Cuevas Archaeological Reconnaissance Project conducted preliminary work at the Las Cuevas site in 2011 (Moyes et. al. 2012), and returned in 2012 for a longer season. This is the first major project at the site since it was investigated in 1957 by British archaeologist Adrian Digby and A. H. Anderson, who at that time was Commissioner of the Belize Department of Archaeology (Digby 1958a; 1958b). The site, also known as "Awe Caves," is a medium sized center**,** located in the Chiquibul Reserve, in the Mountain Pine Ridge area of Belize, approximately 14km east of Caracol (Figure 1).

In 1938, mahogany cutters employed by Emilio Awe stumbled upon the archaeological site and cave below. A.H. Anderson did a brief reconnaissance of the site but other than chicleros passing through, no formal work was conducted until 1957, when Adrian Digby joined Anderson for a British Museum funded expedition. They planned a three month dry season excavation, however, delayed by rain, the rising Macal River, and poor logging roads, the season lasted only seven weeks. Anderson was tasked with excavating a small mound above the cave, while Digby conducted excavations on one of the platforms in the cave, as well as producing a map of the site. Digby also reported the presence of "broken urns and bowls for burial or for storage" in the cave as well as lids that he

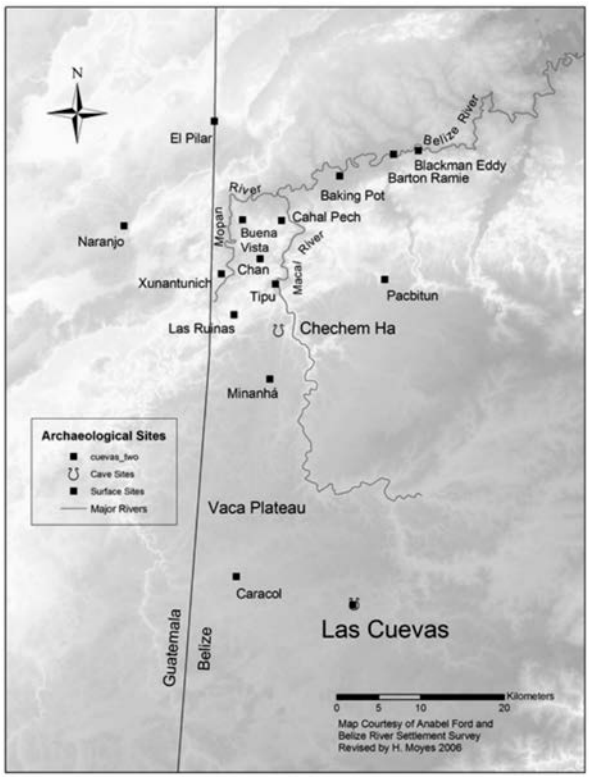

Figure 1. Regional map of southern Belize showing the location of the site of Las Cuevas (Courtesy of the LCAR).

described as covers for three-pronged incense burners (Digby 1958a: 274-5).

The site (Figure 2) consists of two large temples sitting on the eastern (Str. 1) and western (Str. 4) sides of a central plaza, a southern ball court (Strs. 5 and 6), and a second plaza bounded by a large temple (Str. 7), as well as a series of

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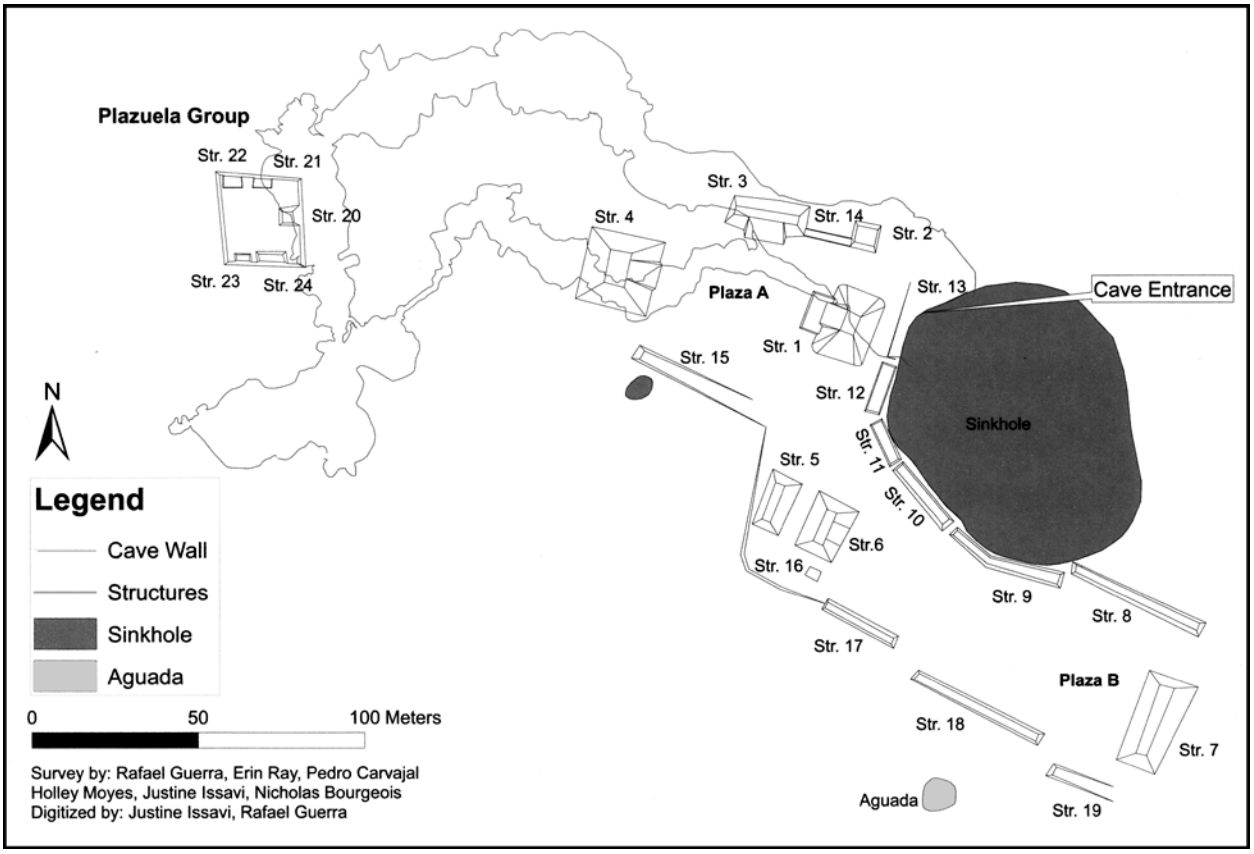

Figure 2. The site of Las Cuevas showing the location of all structures, including Str. 1 and the Ball Court (Strs. 5 & 6) overlying the cave (Courtesy of the LCAR).

low platforms that ring a sinkhole. The cave entrance is located on the west wall of the sinkhole, directly beneath the eastern temple. Investigations in 2011 focused on mapping the surface site and the cave, as well as test excavations at the surface site, largely in the ball court, and excavation in the cave, that produced an extremely small sample size of only 1728 sherds (Moyes et al. 2012). In 2012 we continued the program of both above ground and cave excavations. Surface excavations focused further work on the ball court as well as on the eastern temple (Str. 1) in the main plaza (See Figure 2) in an attempt to define better the chronological sequence of the site. Cave excavations continued as well and the 2012 season produced a much larger sample of 14,989 sherds. Thus, what follows are some preliminary thoughts on prior ceramic research in the Chiquibul, and the Las Cuevas ceramic typology. Throughout we will be attempting to use the concept of the ceramic sphere as a framework to help elucidate inter-site and inter-regional connections between Las Cuevas and other sites and regions.

Prior Ceramic Research in the Chiquibul

There has been little published ceramics-focused research on smaller sites in the Chiquibul region of Belize despite the long history of ceramic research elsewhere, especially in the Belize Valley. However, the largest site in the region, Caracol, has a well documented epigraphic, archaeological and ceramic record, with many articles and season reports by Arlen Chase and Diane Chase and their colleagues that are too numerous to cite here in their entirety (see for example Chase and Chase 1987).

North of Las Cuevas on the Vaca Plateau, decades-long research at the site of Minanha by Gyles Iannone (2005) has reported extensively on the architecture and site history. Research at the site of Mountain Cow and the nearby region by John Morris (2004) provides some

comparative ceramic information. Jaime Awe (1985) conducted the most extensive ceramic research in the area at the site of Caledonia providing excellent vessel form illustrations and preliminary type designations for comparative purposes. Additionally, in the 1960s and early 1970s, David Pendergast, under the auspices of the Royal Ontario Museum, conducted research in Actun Balam and Eduardo Quiroz caves, and documented Anderson's work in Rio Frio Cave (Pendergast 1969; 1970; 1971). Pendergast's monographs provide superb ceramic illustrations for comparative purposes, although he did not utilize the standard type: variety mode descriptions that would make inter-site comparisons easier.

Elsewhere in Belize, Patricia McAnany's regional project in the Xibun has produced a number of reports that include ceramic data useful for comparative purposes, principally Ellie Harrison-Buck's thesis (2007) on the Terminal Classic, as has Elizabeth Graham's work (1994) in the Stann Creek District. South of the Chiquibul early work in the Toledo District at the site of Lubaantun by Hammond (1975) produced an excellent site ceramic typology for the Late Classic, and Heather McKillop's extensive research on salt production and trade along Belize's southern coast and cayes, has documented ceramic typologies that also demonstrate regional similarities with Las Cuevas and the sites of the Chiquibul (McKillop 2002, 2007).

Methods

Most ceramic research in the southern Maya Lowlands has attempted to work within the frameworks and typologies created for three regions, due to the fact that their publication came early in the history of Maya archaeology and the extensive descriptions they provided. These include the ceramics from Uaxactún in the Petén (Smith 1955), and typed by Smith and Gifford (1966); the ceramics from the Pasión region at Altar de Sacrificios (Adams 1971) and Seibal (Sabloff 1975); and the ceramics of Barton Ramie in the Belize Valley (Gifford 1976). The identification of site specific ceramic complexes utilizing standard type: variety mode designations for Maya pottery, has the advantage of informing on the temporal placement of the occupation and construction history of a site, as well as allowing one to place the site in a regional and inter-regional context. However, the choices made to name the ceramic types that comprise these complexes are not without implied meanings about broader regional and inter-regional connections. Additionally type: variety designations foreground the importance of surface characteristics, and they become less useful as a tool when analyzing eroded material. In the absence of well-preserved surfaces, modal characteristics such as rim and lip shape, vessel form and visual paste and temper characteristics are also extremely useful in pottery identification, and are too often ignored.

For the purposes of this paper we will focus on one of the more useful comparative concepts in Maya ceramic research: that of the ceramic sphere (Willey, Culbert and Adams 1967: 306). The definition of the ceramic sphere concentrates on typological similarities and dissimilarities between ceramic complexes and "exists when two or more complexes share a majority of their most common types" and "makes possible the recognition of two degrees of content similarity: high…and little or none" (Willey, Culbert and Adams 1967: 306). Diagnostic types are abundant and widely shared among the ceramic complexes that constitute a sphere and are therefore quantitatively rather than qualitatively defined by their abundant, shared presence in numerous complexes. As elucidated by Ball in his summary of the pottery of Barton Ramie (in Gifford 1976: 323-30), definite full sphere membership means that about 60% or greater content similarity is present between two complexes. Peripheral sphere membership or exclusion occurs when there is roughly 40-50 percent content similarity, and definite exclusion from a sphere occurs if there is 40% or less content similarity. Therefore ceramic spheres can map inter-site and interregional connections, based on content similarity of pottery, and are dynamic rather than static in time and space. Unfortunately any examination of ceramic continuity or change carries a number of serious limitations as numerous studies (see Rice and Forsyth 2004 for examples) have shown that ceramic change is not always mirrored by socio-political or economic change or vice versa. In this preliminary study

we will attempt to describe the Late Classic ceramic sphere or spheres in which the inhabitants of the site of Las Cuevas participated, as it is the only time period for which we have a sufficiently large sample size.

Las Cuevas Ceramic Complexes

The complete sample of ceramics totaling 16, 717 sherds from two seasons was analyzed using standard type: variety mode designations where possible. The excavations produced only minimal in situ Late Preclassic ceramics, and smaller quantities of Early Classic and early Late Classic Tepeu I (Tiger Run in the Belize Valley) pottery redeposited in fill. The vast majority of the pottery and construction at Las Cuevas dates to the late Late Classic Tepeu 2/ Spanish Lookout 1 time period, though a small quantity of Tepeu 3/ Spanish Lookout 2 ceramics have been identified in the surface and collapse of both Str. 1 and the ball court, as well as in the cave.

Thus the late Late Classic is the first time period at Las Cuevas with a large enough sample size to begin any meaningful discussion of the ceramic sequence at the site. The late Late Classic ceramics from Las Cuevas present something of a puzzle. One of the most striking aspects is the complete absence of unslipped striated jars, which are usually a large part of Classic period ceramic assemblages, though why they are absent from Las Cuevas is unknown. The largest component of the assemblage, some 30%, is comprised of Belize Valley Pine Ridge Carbonate Ware monochrome red bowls (Figure 3), that not only in paste composition, but also in form and surface finish are more similar to the Belize Valley types of the Vaca Falls and Garbutt Creek Red Groups, than to those of the Tinaja Red Group identified at Petén and Pasión River sites. The Las Cuevas assemblage also includes examples of the Belize Red Group, approximately 11% of the assemblage (see Figure 3); its soft, sandy volcanic ash paste is a particularly useful diagnostic, whose origins likely lie in the Belize Valley near the site of Baking Pot based upon the high frequencies within the ceramic assemblage of the site (Reents-Budet et. al. 2005). Despite the overlap in some formal characteristics between the Belize Valley types and the Tinaja Group, few if any of the Las Cuevas bowls exhibit the circumferential impressed or incised decoration or fillet on the exterior shoulders of incurving bowls, characteristic of the Tinaja Group found at Petén sites. In the late Late Classic period many of the ceramics of the Pine Ridge Carbonate Ware and the British Honduras Volcanic Ash Ware that were made and used at Belize River Valley sites were distinctly different from coeval ceramics from sites in the Petén not just in paste composition but also in surface finish.

The Las Cuevas assemblage is comprised of only small quantities of Petén Gloss Wares, approximately 13% of the assemblage, including the Tinaja Red, Achote Black, and Tialipa Brown Groups (see Figure 3). It seems clear that in the Belize Valley, beginning in the late Late Classic, the ceramics of the Spanish Lookout Complex are a local manifestation marking increased regionalization. While the Tepeu Sphere ceramics maintained their importance at Petén sites, the Spanish Lookout Complex appears slightly peripheral to it in terms of the major content of its ceramic types. This is certainly the case at Las Cuevas where Belize Valley Pine Ridge Carbonate Ware ceramics out number Petén Gloss Wares by almost 3 to 1.

The Uaxactún Ware unslipped jars at Las Cuevas are within the range of those from either the Cayo Unslipped Group in the Belize Valley or Cambio Unslipped in the Petén and Pasión, and therefore are less useful in identifying ceramic sphere membership. At Las Cuevas they comprise 27% of the entire assemblage (see Figure 3), though as mentioned previously there are no striated jars. Additionally there are a significant number of scored incised incensario fragments and censer prongs, comprising 9% of the entire assemblage. Similar material has been found at other sites in the Chiquibul. Awe (1985) describes this material as “Chiquibul Scored-Incised” at Caledonia. There are no examples of Pedregal Modeled incensarios, and only three partial Miseria Appliqué censers in the final collapse of the eastern temple, Str. 1.

Of particular interest to any discussion of Las Cuevas’ role in regional ceramic spheres is the presence of relatively large quantities of unit stamped and comb stamped ceramics, comprising 10% of the late Late Classic

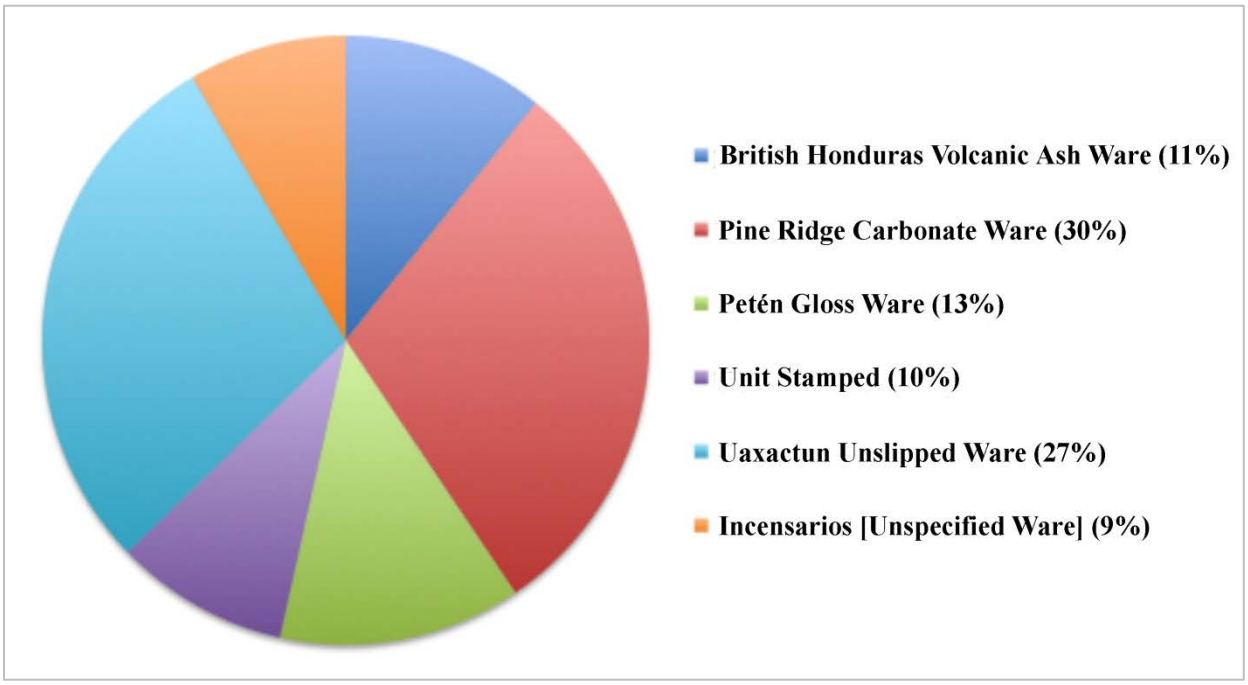

Figure 3. Relative Frequencies of Ceramic Wares during the late Late Classic at Las Cuevas.

assemblage (see Figure 3). Unit stamped types were originally included in Petén Gloss Ware (Hammond 1975; Sabloff 1975), however the Las Cuevas examples are markedly not glossy and visual macroscopic paste examination suggests that they do not fit well within the gloss ware tradition, though future technological studies may address better this question. For the purposes of this analysis all unit stamped ceramics have not been included in either Pine Ridge Carbonate or Petén Gloss Wares.

Unit stamped pottery was first identified as the Pantano Impressed: Stamped Variety in the Tinaja Group at Altar de Sacrificios (Adams 1971). Sabloff (1975) also found it at the site of Seibal in the Pasión River drainage, along with the Chaquiste Impressed: Stamped Variety in the Subin Group. Pantano Impressed is mentioned as occurring at Tikal in minor quantities and Culbert (1993) suggests that they are trade pieces. It is present at the site of Caracol as well (Chase and Chase 2001: Fig. 16bb), where examples appear similar to those found at sites in the Petén and Pasión regions. Hammond (1975: 301-5) reports that unit and comb stamping in the Remate Red Group at Lubaantun is an important part of the assemblage, and there are significant quantities in southern Belize along the coast, where McKillop (2002; 2007) calls it Warrie Red. Unit stamping also is reported at Barton Ramie in the Belize Valley with vessel forms similar to those of Kaway Impressed (Willey et. al. 1965: Fig. 233b). Kidder (1954) reported similar unit stamped pottery at Mountain Cow, and David Pendergast (1969; 1970; 1971) notes its presence in the cave excavations at Rio Frio, Eduardo Quiroz, and Actun Balam.

At Las Cuevas unit stamping occurs mostly on incurving monochrome red bowls although there are some examples of jars with both unit and comb stamping (Figure 4). The stamped decoration on the Las Cuevas pottery shares motifs more in common with those found in the Toledo District and along the southern coast than with Pantano Impressed in the Tinaja Red Group at Petén and Pasión River sites. Unit stamped vessels of the Pantano Impressed type on the ceramics from the Pasión sites of Altar de Sacrificios and Seibal are quadripartite and abstract in design, and the "S' pattern prevalent at Las Cuevas and in southern Belize is absent. However, the more elaborate stamped designs of monkeys and birds, and complex dots present on those from Lubaantun and the southern coast are

absent at Las Cuevas. Comb stamping also appears on vessels from both Lubaantun and Las Cuevas, while both unit stamping and comb stamping appear to be minor decorative features of pottery in the Petén. Hammond (1975: 305) has suggested that the origins of unit stamped pottery may lie in the south in the region of the site of Lubaantun, or perhaps even farther south along the coast.

Even the dating of unit-stamped pottery evokes disagreement among ceramicists. Adams (1971) dates unit stamping to the late facet of the Boca Complex (or Terminal Classic/ Tepeu 3) at Altar de Sacrificios, as do Chase and Chase (2001) at Caracol and Pendergast (1969; 1970; 1971) for the caves in the Chiquibul, although Hammond (1975: 305) suggests that it appears earlier at Lubaantun, starting in the late Late Classic (or Spanish Lookout 1/ Tepeu 2) rather than the Terminal Classic. Unit stamping co-occurs at least with Spanish Lookout 1/ Tepeu 2 material at Las Cuevas, and would seem to confirm the Lubaantun data of an earlier date, based on our small sample.

Conclusions

In the Late Preclassic and Early Classic, pan lowland Maya pottery spheres characterize most sites and regions. However, beginning in the Late Classic the Belize Valley became peripheral to the Petén, where new polychromes were still manufactured (Willey, Culbert and Adams 1971: 301). During the Late Classic the flow of pottery influences from the west, eastward into the Belize Valley seems to have abated, with the exception of small quantities of Petén Gloss Wares. So, while in the Late Classic period Belize Valley sites appear to be peripheral to the Tepeu Sphere centered on the Petén, what about a site like Las Cuevas and others in the Chiquibul region?

Caracol, the largest site in the Chiquibul region, is a major center with large quantities of Petén Gloss Ware pottery, as well as smaller amounts of Belize Valley types, most notably Belize Red (Chase and Chase 2012). Although Las Cuevas is only 14km east of Caracol, the Late Classic ceramic picture at Las Cuevas is much less clear. During the beginning of the Late Classic, the Tepeu Sphere dominated the north-central Petén, but like the Belize Valley,

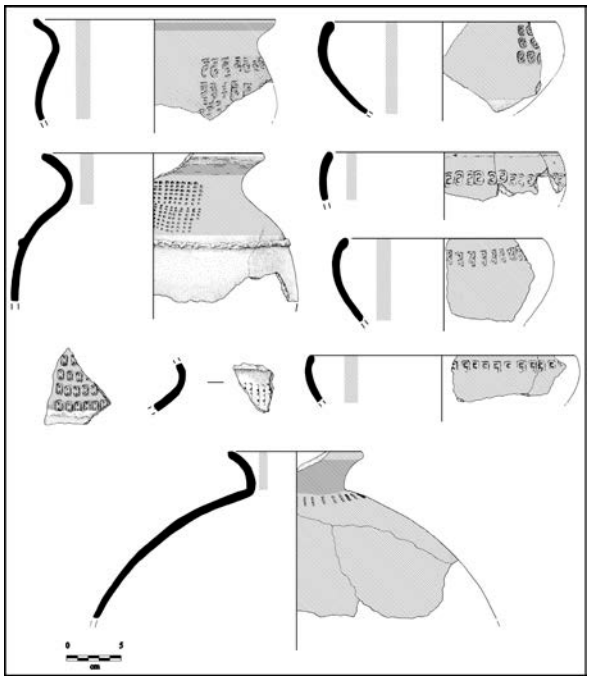

Figure 4. Examples of Unit and Comb Stamped Ceramics from Las Cuevas (Illustrated by M.B. Schumacher; Courtesy of the LCAR).

Las Cuevas may have been only peripherally affiliated.

But what do ceramic spheres, and sphere affiliation actually mean in terms of cultural affinities, economic and social ties, and geopolitical networks? Do ceramic spheres tell us something real about prehistoric Maya behavior? As Rice and Forsyth (2004: 53) have suggested, the participants in a ceramic sphere must have shared ideas about what was appropriate or customary, copying vessel shapes, surface colors, or decoration, within a region through trade, exchange, and travel. However, while “elite wares” may change relatively rapidly through gift giving or exchange, basic utilitarian serving, cooking, and storage vessels are likely less sensitive to change.

At Las Cuevas, located geographically peripheral to the Belize Valley and to the Petén region, we found that the content of the late Late Classic ceramic assemblage contains a greater quantity of Belize Valley types (a total of 41%, including 30% Pine Ridge Carbonate Ware and 11% British Honduras Volcanic Ash Ware) than Petén types (13% Petén Gloss Ware). However based on the definition of full ceramic sphere membership (greater than 60% content

similarity) or ceramic sphere exclusion (less than 40% content similarity), Las Cuevas does not belong to the Petén sphere and is barely peripheral to the Belize Valley. Throughout the Late Classic the ceramics of Las Cuevas are a mix of Belize Valley Pine Ridge Carbonate Wares, Petén Gloss Wares, and unit stamped ceramics marking the site as peripheral to the Petén, to the Belize Valley, and to sites in southern Belize as well. However, we must be careful in interpreting what this may mean because prior studies (see Rice and Forsyth 2004) have demonstrated that patterns of ceramic styles do not necessarily correspond to patterns of sociopolitical or economic organization. Las Cuevas may have been a relatively minor center, albeit with a ball court, that sits above a large and likely important cave, and thus served as a locus for ritual activities and pilgrimages during the Late Classic. However, whether at any time any polity dominated Las Cuevas remains questionable as evidenced by its multi-regional ceramic connections. Las Cuevas may sit at the crossroads, or intersection of many overlapping regional networks or spheres, or it may have been at world's end in more ways than one.

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4 JOURNEY ON THE CAHAL PECH TIME MACHINE: AN ARCHAEOLOGICAL RECONSTRUCTION OF THE DYNASTIC SEQUENCE AT A BELIZE VALLEY MAYA POLITY

Jaime J. Awe

In contrast to sites such as Tikal, Calakmul, Palenque, Caracol and Copan, determining the sequence of rulers at Maya polities that lack inscribed monuments is a particularly challenging task for the archaeologist. In spite of the inherent difficulties, however, it is possible to identify rulers at these sites through a systematic examination of the context and contents of elite burials and their associated symbolism. Applying this approach, this paper aims to demonstrate that we can identify a sequence of rulers, spanning from Preclassic to Terminal Classic times, at Cahal Pech.

Introduction

Subsequent to the "breaking" of the Maya code, and the veritable "revolution" in the decipherment of Maya hieroglyphs in the 1990's, epigraphers have identified and traced the elite dynasties of several large polities across the Maya lowlands. Nowhere is this more evident than at Tikal, Calakmul, Palenque, Caracol and Copan where large numbers of inscribed monuments provide historic records of elite rulers spanning several centuries (Martin and Grube 2000). But what about those sites without inscriptions; is it possible to identify their elite rulers over time? Practically in response to this very question, Arlen Chase (1992:37) noted that, "The uppermost elite are fairly easy to identify" and although it is often difficult to match elite burials with "textual information contained in carved stone monuments;" elite remains "tend to be distinctive because of both location and contents." Chase also contends that, "Rulers can be identified primarily by the markers associated with their interments in conjunction with the special locations of such interments." He further posits that the diagnostic markers that identify the burials of rulers include "…codex remains, cinnabar, mirrors, stone vessels, jadeite jewelry, jadeite ear flares, jadeite masks, jadeite pendants, jadeite or stone tinklers, ceremonial bars, certain rare shells, textual materials, and perhaps stingray spines" (A. Chase 1992:37, also A. Chase and Z. Chase 2011).

Outside of the Maya area, several researchers have applied similar criteria for identifying upper class elite individuals in their burial records. In their attempt to identify "rulers" in the Preclassic burials at Chalcatzingo, for example, Grove and Gillespie (1992:198) proposed that, "Location of the burial in elite/public contexts is taken as a first criterion of elite status." They (Grove and Gillespie 1992: 195) further note that the occurrence of stone statues in burials is a "significant correlate" that can be used for identifying graves as elite. They add that, "Monumental art is clearly associated with high-ranked individuals, who had the power and means to command its creation. Much of that art is portraiture of certain specific elite individuals, in most instances probably the site's chief." At Chalcatzingo (Grove and Gillespie 1992: 195), like in other parts of Mesoamerica, "Formative period monuments were frequently mutilated by decapitation, and such acts probably took place at the death of a center's chief."

For central Mexico, Grove and Gillespie (1992:192-202) identified four major archaeological indicators of high ranking elites in the Preclassic period. These include: grave type (elaborate vs. simple graves), grave context (public elite architecture), presence/absence of exotic grave goods, and "artifacts with particular ideological burden" (e.g. effigy vessels). They further contend that the archaeological indicators of high ranking elites in the Middle Preclassic Gulf Coast region differs little from that of central Mexico. For the Gulf Coast, the criterion used to identify ruling elite includes grave type (elaborate vs. simple graves), grave context (public elite architecture), presence/absence of exotic grave goods, and the use of increasingly complex symbol systems (e.g. symbols that associated the elite with supernatural powers).

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Most archaeologists (see Fitzsimmons 2009) would agree that the aforementioned indicators for upper class elite status listed by Chase, and by Grove and Gillespie, can be applied to cultures across the Mesoamerican landscape. If we accept this premise, it can be argued that the archaeological indicators for high ranking elite status in the Belize River Valley should include all of the following, or a combination of most of the following criteria:

1. Grave type (placement within a tomb and crypt versus a simple grave)
2. Grave context (interment in public elite architecture)
3. Presence/absence of exotic grave goods (particularly jade, polychrome pottery, iron ore mirrors, spondylus shells)
4. Presence/absence of objects with inscriptions (ceramic vessels with PSS, and/or inscribed bone, jade, shell, portable and non-portable stone objects)
5. Graves and artifacts with particular ideological burdens (e.g. corn god imagery, stingray spines, etc.).

By applying these criteria to the analysis of burials at sites without inscribed monuments, it should, therefore, be possible to determine which graves contained the remains of potential ruling elite. In an effort to test the validity of this hypothesis, and to determine a tentative sequence of rulers at Cahal Pech, we decided to examine the present burial data for the site against the five criteria listed above.

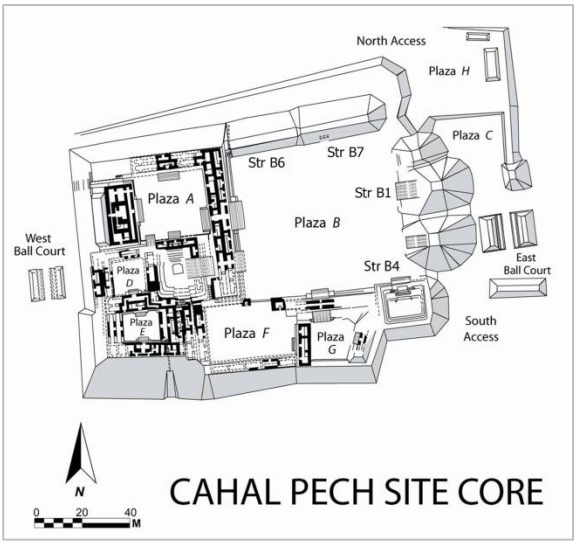

Figure 1. Plan of the Cahal Pech Site Core.

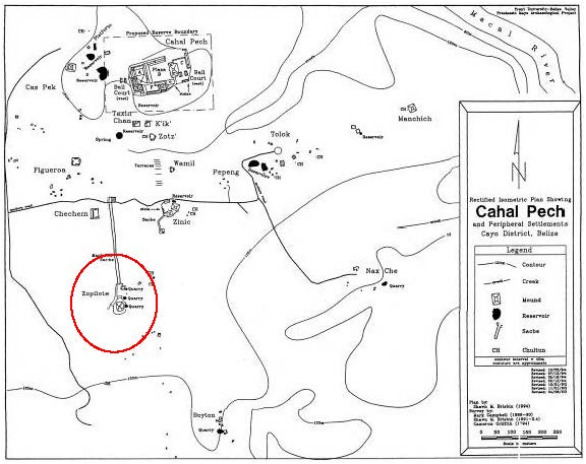

Figure 2. Map of Cahal Pech southern periphery showing location of Zopilote Group.

The Cahal Pech Burial Data

Presently, we have a total of 69 burials containing about 85 individuals from Cahal Pech (Fig. 1). These interments range in date from the Middle Preclassic to the Terminal Classic periods (800 B.C. – A.D.900). Some human remains have been recovered in Cunil phase (1200-900 B.C.) contexts but these consistently are comprised of small fragments of bone discovered in construction fill (Awe 1992). The earliest "formal" burial placed within a grave is the Plaza B burial described below. This apparent change in the disposal of the dead may indicate that burial patterns at the site changed at the end of Cunil times (900 B.C.), and that changes in the treatment of the dead may be associated with changes in the socio-political complexity of Middle Preclassic communities. Alternatively, it may simply reflect the fact that Cunil phase burials have yet to be discovered at the site. Regardless, once burial in graves became the norm, this tradition remained consistent from Middle Preclassic to Terminal Classic times. Burial orientation is another tradition that remains relatively constant during the almost two thousand years of occupation at Cahal Pech. The standard orientation of burials at the site, and actually for most of the upper Belize Valley, is prone, head to the south and often facing east (Friewald 2011).

At least 11 of the 69 burials found at Cahal Pech exhibit all, if not most, of the

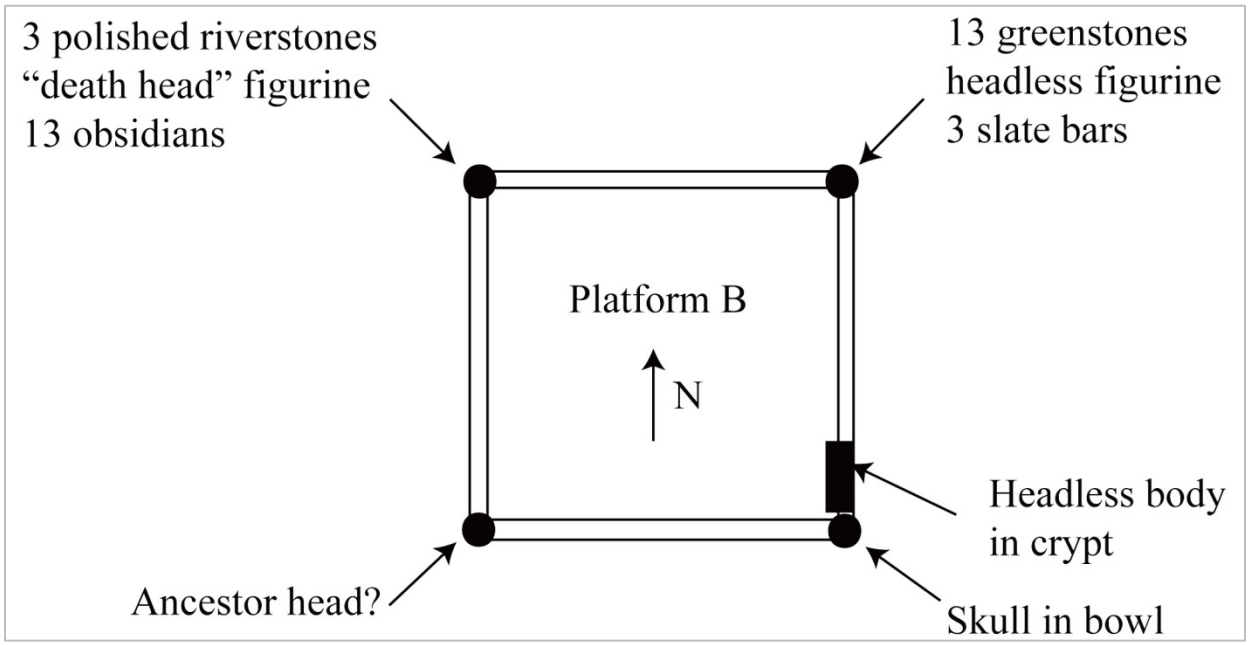

Figure 3. Plan of Plaza B Burial 1.

indicators of upper class elite graves. Several other burials, particularly those within tombs in eastern shrines in peripheral settlements, also display a number of the characteristic features of elite burials. This is not unusual in the Belize Valley and is actually quite common at the site of Caledonia in the upper Macal River (Awe 1985), and at Caracol (Chase 1992:37-38). In spite of these contexts, it is quite unlikely that any of the individuals buried in tombs at these peripheral settlement clusters were elite rulers of the site. The only exception to this rule at Cahal Pech may be two burials that were discovered in a large pyramid at the terminus of a causeway that connects the pyramid to the site core (Fig. 2). These, and other potential ruler graves, are described below. Because this is an attempt to identify a tentative dynastic sequence for the site, the burials are also presented in chronological order.

Plaza B Burial 1

Plaza B Burial 1 (henceforth Plaza B-Bu 1) was associated with a Middle Preclassic platform (Platform B) located more than a meter below the last, Classic period, Plaza B surface (Garber and Awe 2008:185-190). The burial was one of four ritual deposits that had been placed on the southeast, northeast, southwest and northwest corners respectively of the Middle Preclassic platform. Plaza B-Bu 1 represents the deposit placed on the southeast corner of the building. The grave consisted of two shallow crypts capped by large slabs of limestone. The southernmost and smallest of the two crypts contained a Middle Preclassic, Sampopero Red: Variety Unspecified, bowl. Within the vessel were a fragmented, but complete, human skull and six greenstone beads (Fig. 3). Immediately to the north, in a separate, but larger, crypt, was an articulated headless skeleton. We believe that the head and body are of the same individual and that the decapitation was post-mortem and part of a reverential act. In ancient Maya iconography, the concept of life, death, and renewal is a re-occurring theme (Mock 1998). Garber and Awe (2008:187) further note that:

> In the Maya creation story, after the Hero Twins have defeated the Lords of the Death, they retrieve the severed head of their father. The head is then taken to the Three Stone Place of creation where it is then resurrected as the Maize God. The Maize God then creates the world by raising the world tree, separating earth and sky. He then partitions the world and creates the first four humans.

The deposit recovered in the northeast corner of Platform B contained what Garber and Awe (2008: 187) referred to as a layered "cosmogram" cache. At the base of the cache were three slate bars overlain by a Middle Preclassic, headless, ceramic figurine, followed by a cluster of 13 polished greenstones above the figurine. Garber and Awe (2008:187) previously argued that:

> This deposit represents the created universe which took place at the Three Stone Place of creation as defined in Classic Period hieroglyphic texts and indicated here by the presence of the three slate bars. The 13 greenstones represent the 13 layers of the Upperworld and the firmament. The figurine represents the resurrected headless individual within the crypt of the southeast corner. According to the Classic Period texts, this occurs at the Three Stone Place of creation and the state of the created universe, in particular the north house, is called the "Raised-up-Sky-Place" (Freidel et al. 1993:71).

The ritual deposit in the northwest corner of the platform included another layered "cosmogram". This deposit, however, appears to be the "reciprocal opposite" of the northeastern deposit. It contained three river-rolled pebbles above a black ceramic figurine head which, in turn, overlay thirteen obsidian chips. The deposit at the southwestern corner of Platform B contained a single, large, Jenny Creek Phase, ceramic figurine head. All together, the ritual deposits were interpreted by Garber and Awe (2008:189) as "the remains of a ritual circuit associated with the death of an important individual. The purpose of this ritual was to symbolically resurrect that individual and place him in the sky – the place of revered ancestors." This complex ritual system "has strong parallels to a variety of elements in the iconographic and hieroglyphic systems of the Classic Period and demonstrates that the kings of the Classic Period were utilizing a system whose basic components had been developed several centuries earlier" (Garber and Awe 2008:189). Equally important is the fact that the Cahal Pech deposits on Platform B represent one of the "earliest expressions of this system in the Maya lowlands."

When compared to Classic period elite burials, it is readily apparent that Plaza B-Bu 1 lacks several of the indicators for high-ranking elite Maya burials. When compared to coeval Preclassic burials, however, the opposite is true. For example, the burial is associated with one of the largest Middle Preclassic platforms at the site (Garber et al. 2006). The symbolism reflected by the four caches is also more complex than any other Middle Preclassic cache discovered at Cahal Pech, or at any other site in the Belize Valley. The obvious symbolic association of the burial with the resurrection of the maize god is also a theme that is particularly associated with subsequent Late Preclassic and Classic period rulers. For all these reasons, we (see Garber and Awe 2008:189) previously argued that the ritual deposits must have been associated with the "death of an important individual" and why it is very likely that the individual interred in Plaza B-Bu 1 likely represents one of the first rulers at the site.

Zopilote Group Burial 2 (The Stela Chamber)

The Zopilote Group is located approximately 600 meters south of the Cahal Pech Site Core and is physically connected to the center by a 4.0 m to 6.5 m wide sacbe (causeway). The group has five structures. The most impressive building is Str. 1, an 11.5 m high pyramid that faces north toward the site core and which is located at the southern terminus of the causeway. Investigations of Str. 1 in 1992 and 1993 revealed that the pyramid underwent several construction episodes. The first construction phase was erected in the Middle Preclassic and the final in the Late Classic period. Our investigations at Zopilote uncovered two very impressive tombs. The first, Burial 1, was located at the summit of the temple. The second (Burial 2 or The Stela Chamber) was discovered beneath the north-facing central stairway of the temple. I propose here that both burials represent the graves of possible rulers or high-ranking elite. The ruler in Burial 2 is represented by the image of an early Late Preclassic individual carved on a buried monument while Burial 1 contained the remains of a Late Classic leader.

As I indicate above, Burial 2 at Zopilote was discovered directly beneath the stairway of the final construction phase of Str. 1 (Awe et al. 2009). The grave, a vaulted chamber measuring 1.7 m high, 1.0 m north-south and 0.75 m east-west, was completely packed with dirt. Filling the tomb with dirt was likely done to ensure the stability of the stairway and to contain what is still the most interesting deposits yet discovered in any burial chamber at the site. Just below the tomb's capstones, in an area we originally referred to as the upper burial (Fig. 4), were the remains of at least two, possibly four, infants aged between one and two years (Cheetham et al. 1993, 1994a). In association with the infant remains were 19 "halved or smashed" Spanish Lookout phase, Late Classic period vessels, three ceramic pendants, five "obsidian blade fragments, 1 intact obsidian blade, 1 small fragment of honey-coloured chert and 1 large *Pomacea flagellata* shell" (Cheetham et al 1994a:172).

Below the children remains, and placed in upright position in the center of the chamber, were two large fragments of a carved stela. Encircling the stela were approximately 200 (139 complete and several fragmented) small "finger bowls". Many of the unslipped finger bowls were placed lip to lip and contained adult human phalanges (Cheetham et al. 1994b). The presence of fragments of human remains around other bowls suggests that they originally all contained finger bones. "If all the phalanges recovered in the tomb are combined" (i.e. within and outside the finger bowls) "they total 206 medial and distal phalanges" (Cheetham et al. 1994:181). David Glassman, who analyzed the human remains from the tomb, suggests that the phalanges of the fourth, and perhaps the third, finger(s) were used (see Cheetham et al. 1994:181). If this is the case, and if phalanges from both hands were cut off, then approximately 25 to 27 adult individuals would have contributed to the cache of fingers in the tomb. Alternatively, if fingers from only one hand of an individual were cut off, the number of contributors would double.

At the northern base of the stela, and on the floor of the chamber (in what we referred to as the "Lower Burial"), we recovered 36 permanent mandibular incisors. Next to the

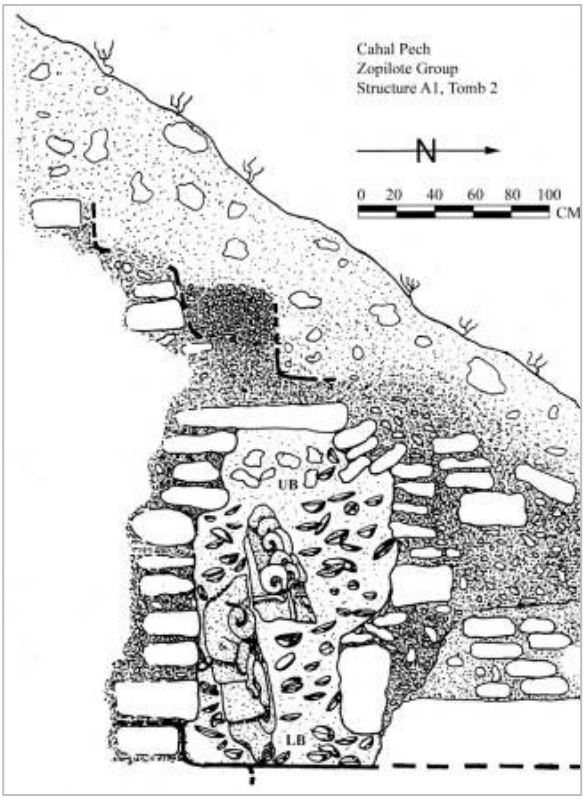

Figure 4. Plan of Zopilote Burial 2.

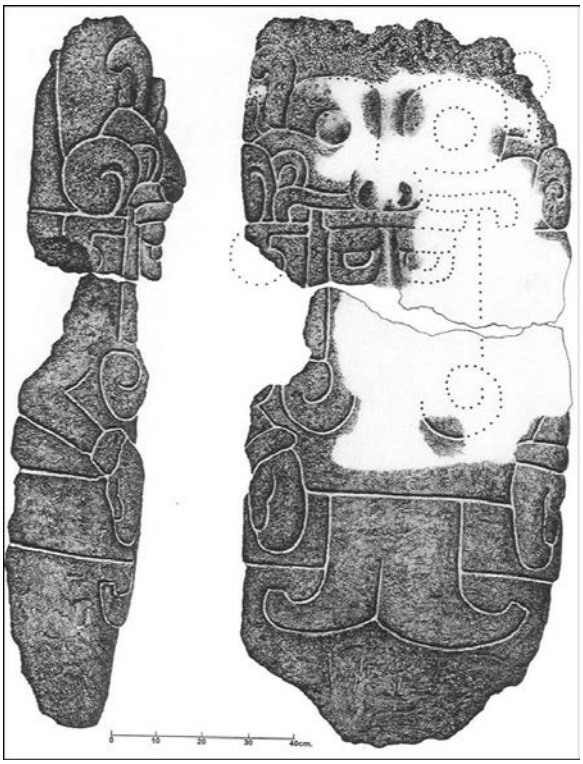

Figure 5. Preclassic Stela 9, Zopilote Group, Cahal Pech.

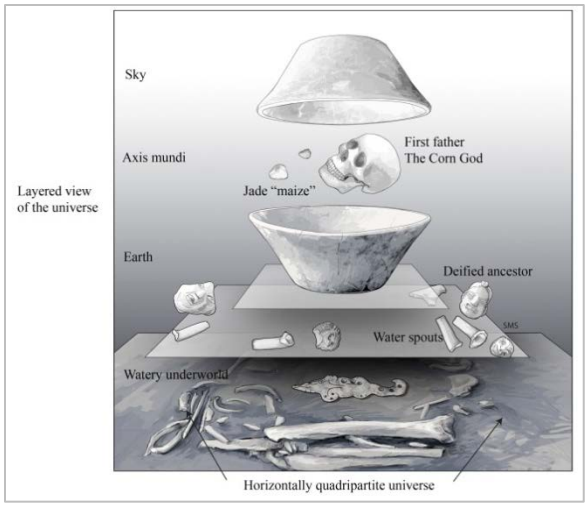

Figure 6. Reconstruction of Burial B4-3.

teeth were four obsidian blade fragments, a fragmented, but complete, obsidian blade and three shells. "Four fragmentary roots (most likely from mandibular incisors) were also recovered from this area (Cheetham et al. 1994:183). If the fragmentary roots were from separate mandibular incisors, it would bring the total number of incisors to 40. Poor preservation of the incisors inhibited us from determining the exact number of individuals whose teeth were extracted for this offering. The analysis of the remains, nevertheless, suggests that the minimum number of individuals was at least nine.

Awe et al. (2009: 179-190) previously reported that the stela (Fig. 5) buried in Zopilote Tomb 2 was very eroded, "defaced and broken into two large pieces. Despite its condition, the monument was positioned as vertically as possible within Tomb 2 in an apparent effort to facilitate the placement of the ritual deposits (finger bowls)" around the entire length of the monument. The stela depicts a central human figure within the wide open maw of a composite jaguar serpent creature. This iconography, the wrap around style of carving, similarities with early monuments from the Pacific coast of Guatemala, and the eroded condition of the monument all suggest that the stela dates to at least the early half of the Late Preclassic period. Its location at the center of the tomb, and the placement of artifacts and offerings on top, around and below the monument, also suggest that the primary purpose of the grave was to entomb the stela. But why bury a monument in a tomb within a large temple? I propose that the reason for this special termination rite is because the human depicted on the monument was likely one of the Late Preclassic lineage heads of the Cahal Pech community. It is for this reason that such special attention was accorded to the monument. Interestingly, this special treatment of monuments that depict early rulers is not unique to Cahal Pech. During excavations of the southwestern stairway on Str. A6 at Caracol, we found the upper section of Stela 20 which depicts one of the Early Classic rulers at the site. At Pacbitun, a carved fragment of Altar 3, depicting a ruler with a ceremonial bar, was also discovered in Str. 1 (Healy 1990, Helmke and Awe 2013). It is apparent, therefore, that the interment of monuments depicting rulers may likely be a western Belize tradition.

Burial B4-3

The next Late Preclassic, high ranking elite burial is Burial B4-3 (Fig. 6). This burial was axially located below the floor of the summit platform of Late Preclassic Str. B4 (Floor 3). The grave was dug into the fill of the Preclassic temple and the burial was deposited in cache-like form rather than like other standard burials at the site. Notwithstanding this fact, Burial B4-3 is certainly one of the most ideologically charged interments discovered at Cahal Pech. The burial contained two large, lip to lip, Sierra Red ceramic vessels. On the four sides of the vessels were several long bones that encased or framed the vessels in a quadripartite pattern. Alongside the bones, on each of the four sides of the vessels, a Middle Preclassic ceramic figurine head and the spout of a ceramic chocolate pot were placed. Within the vessels were large fragments of a human skull and two jade beads. Below the bottom vessel, and at the center of the bone square, was a carved conch shell figure in the form of a crocodile. Analysis of the human remains indicates that the skeleton was incomplete and missing almost all the teeth and most of the small bony remains. According to our BVAR osteologist (Dr. Ashley McKeown of the University of Montana), the absence of teeth and small bony remains is a pattern that is consistent with burials that have been exhumed

from their original place of interment and reburied in a new context.

I (Awe 2012) previously argued that the pattern of deposition evident in Burial B4-3 provides an excellent example of a Maya cosmogram as well as for the early establishment of the myth of the hero twins and the resurrection of the maize god. In regard to the cosmogram, the burial reflects both the vertical and horizontal partitioning of the universe. The square pattern of the bones is consistent with the quadripartite Maya view of universe. The four figurines alongside the bones likely represent the original four humans that were formed at the time of creation (Christenson 2007:184; Recinos, Goetz and Morley 1950:167-169; Tedlock 1985:164-165). In reference to these four humans, the Popol Vuh mentions that, "They were simply made and modeled, it is said; they had no mother and no father" (Tedlock 1985:165). In Allen Christenson's (2007:187) translation of the Popol Vuh, and in reference to these original four humans, he notes that "Their knowledge of everything that they saw was complete—the four corners and the four sides, that which is within the sky and that which is within the earth". Interestingly, this association with deified ancestors concurs with the function of figurines proposed by Grove and Gillespie (1984:32) and Joyce Marcus (1993) who suggest that figurines represented ruler portraits or were used in divination rituals and in early cults of the ancestor.

An alternative explanation for the presence of the figurines is that they could represent Pawatuns. Fash (1991:163) notes that these "Maya mythological earth-bearers of the four cardinal points" are common in Classic period Maya iconography. At Copan, for example, they are depicted on carved benches in Str. 9N-82 C 1st of the Sepulturas Group, as well as in Str. 66C (Fash 1991:161). Yet another example can be found at the entrance to Temple 22 at the same site (Fash 1991:163). Taube (1998:429-432) and others (cf. Coe and Kerr 1997 :187) have also argued that Pawatuns are quadripartite, they represent "four aged beings supporting the corners of the universe" or "cosmic house". If this is the case, then the skull inside the two vessels could symbolically represent the *axis mundi* from which the four cardinal directions radiate.

In regards to the vertical divisions of the universe, the skull placed within the lip to lip vessels is akin to being within a cave in the sacred mountain. This sacred mountain in turn rests on the back of the crocodile which floats in the primordial sea. This accords with Houston and Taube (2011:29) suggestion that:

> In Mesoamerican thought, the sea is commonly identified with a primordial crocodilian being that symbolizes the earth. Known as Cipactli or Tlaltecuhtli among the Aztec and Itzam Ka Ain for the contact period Yukatek, this is a creature of chaos and destruction that must be slain for the ordered world to be created…It is likely that through the mythic act of slaying the cosmic crocodile, the world tree and sky were created out of the primordial sea. According to the Colonial Yukatek Chilam Balam books of Mani and Tizimin, the directional world trees were fashioned to raise the heavens after slaying of Itzam Cab Ain.

The connection between the burial and the resurrection of the maize god as described in the Popol Vuh is also very apparent. In all translations of the Popol Vuh (as well as in Schele and Mathews 1998:211), it is noted that following their defeat and sacrifice of the underworld gods, the Hero Twins go to the ballcourt in Xibalba to dig up the remains of their father and uncle and then resurrect them. On the so called "Resurection" plate the hero twins are shown pouring water through a crack of the earth turtle. The water is directed to the skull of their father the maize god. This action results with the sprouting of maize or the rebirth of the maize god (Miller and Martin 2004:56-57).

The two jade triangulates that were placed with the skull inside the lip to lip vessels almost certainly represent kernels of corn that were associated with fertility and preciousness. The association of jade with corn is a long established concept in Maya archaeology. Indeed, more than 50 years ago, Adrian Digby (1964:25–26, pl. xivb) identified a "plaque pendant of unidentified provenience as a depiction of the maize god and based the

assertion on a comparison with a stone sculpture of the maize deity from Str. 22 at Copan currently in the British Museum." During the early Historic Period in the Yucatan, it was common practice to place a jade bead in the mouth of the deceased. According to Miller and Martin (2004:57), this practice served to symbolically plant "the germ of the Maize God" in the deceased "in preparation for rebirth". Additionally, the jades may have been placed in the vessels along with the skull as part of what Stross (1998) calls animation rituals. According to Stross (1998:31) this would ensure that the skull could be "animated or imbued with life"

In the case of the four chocolate pot spouts, I have argued that they are symbolically associated with the pouring of precious fluids, in this case water. In their analysis of spouted pots, Powis et al. (2002:96) noted that "…spouted vessels or pichingas, as they are called by modern Maya groups living in highland Guatemala, are used as water bottles…" In the town of Merida, Yucatan spouted jars also occur, but the modern Maya use them as water containers or coolers. The spouts on the sides of Burial B4-3 at Cahal Pech may therefore reflect the concept of *pars pro toto*, where one part of the pot represents the whole ceramic vessel. In sum, the spouts in the B4-3 burial represent whole vessels that, symbolically, would have been used to pour water on the skull inside the lip to lip bowls. It is through this action that the skull inside the pots would be revived.

To summarize, Burial B4-3 contained skeletal elements of a male individual whose remains were exhumed from its original location. The skeletal remains were subsequently reburied in Str. B4, one of the most important Preclassic temples at the site. The grave was ordered in a pattern that confirms to both the vertical and horizontal partitioning of the Maya universe while the associated artifacts were imbued with symbolism associated with the Maya creation story and the myth of the hero twins. This special arrangement serves to support my contention that the person interred in Burial B4-3 likely represents one of the Preclassic rulers at the site and that those who buried him expected that, like the maize god, he would resurrect and become a deified ruler like his ancestors before him.

Burials B1-10 and B1-8

For the Terminal Preclassic (A.D. 50-250) we presently have two high ranking elite graves at Cahal Pech; Burial B1-10 and Burial B1-8 (Fig. 7). The earliest, Burial B1-10, was discovered in a small tomb 7 meters below the summit of Str. B1, the eastern pyramidal shrine at Cahal Pech (Santasilia 2013). The tomb contained the remains of a male individual between 30 and 50 years of age (McKeown 2013). The body lay on top of four ceramic vessels (Fig. 8). Two other vessels, a large Sierra Red basin and a tetrapod mammiform bowl were located in a niche slightly above the individual. Beneath the pelvic area, there were flecks of green and red pigment, possibly the remains of painted parchment. Spread over the entire skeleton was also a layer of dark organic material suggesting that the individual may have been wrapped in fabric. Other non-ceramic remains included a jade effigy pendant and a tubular jade bead. Except for the Sierra Red basin, the other ceramic vessels, particularly those with tetrapodal supports, belong to the Augacate ceramic group of the Floral Park Complex at Barton Ramie.

Burial B1-8 was located just above B1-10, deep below the summit of the site's eastern shrine. Unlike B1-10, however, the grave that contained B1-8 had not preserved well because it caved in when the capstones of B1-10 collapsed (Santasilia 2013). This collapse shattered most of the human remains and damaged one of the ceramic vessels. In spite of this, we were able to determine that the interment was that of a male individual somewhere in his 30's. The associated grave goods (Fig. 9) included four ceramic vessels, two complete and two fragmented tubular jade beads, a tubular shell bead and a fragment of a figurine. The ceramic vessels in the tomb consist of a dish and bowl with tetrapodal supports and two pot stands. One of the pot stands is polychrome while the other, typed as a Late Preclassic Polvero Black vessel, has three knobs for supporting the vessel that may have originally sat on it. It can be argued that these three knobs ideologically represent the three hearth stone place in the Maya creation story. In regards to the date of the burial, its stratigraphic position slightly above B1-10 clearly places the

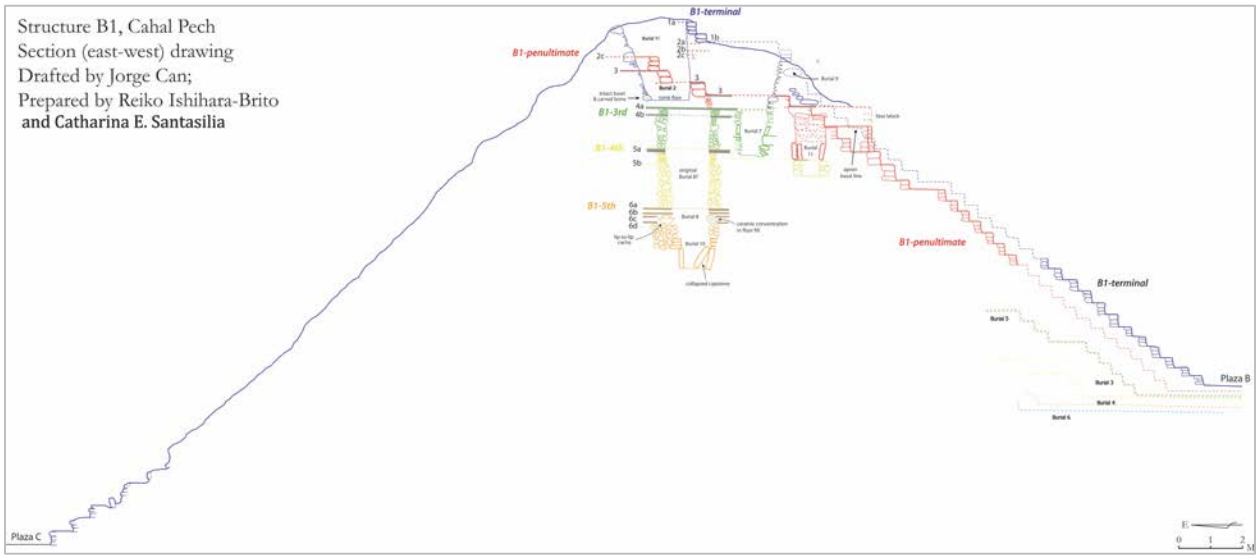

Figure 7. Section Plan of Str. B1, Cahal Pech.

date of interment sometime just before that of the latter burial. The fact that the ceramic vessels in both burials are relatively similar and can all be placed in the Floral Park Complex, however, suggest that not much time had elapsed between the two events.

Burial A1-1, Burial B1-11 and Burial B1-7

Two elite burials, Burial A1-1 and Burial B1-11, at Cahal Pech date to the Early Classic period and one, Burial B1-7, dates to the end of the Early Classic and start of the Late Classic (A.D. 550-650). Unfortunately, we know precious little of A1-1 because it was looted in the late 1970's. We also only found out about this burial from the confession of one of the looters who was apprehended and subsequently charged for vandalizing the mound. In his possession, the looter had a black-slipped, Teotihuacan style, Balanza Black, slab-footed cylinder vase. He claimed that this vessel, along with other objects, had been found in Str. A1. Except for the Early Classic vessel, the other objects had been disposed of but the looter refused to offer any further information on the burial or its contents.

Burial B1-11 was discovered within a stair block high up on the west face of Str. B1 2nd. The tomb contained the articulated remains of an older (40+ years) male (McKeown 2013) and several grave goods. The latter (Fig. 10)

Figure 8. Grave Goods from Burial B1-10.

Figure 9. Grave Goods from Burial B1-8.

Figure 10. Grave Goods from Burial B1-11.

Figure 11. Ceramic Vessels and shell artifacts from Burial B1-7.

included a Balanza Black basal-flanged bowl, a stingray spine, four large and one small tubular jade bead, a spherical jade bead, several small fragments of painted stucco, one unmodified spondylus shell and two perforated shell disks that either served as part of an *adorno* or could have been worn as ear flares (Ishihara-Brito et al. 2013).

Burial B1-7 was discovered in a large tomb about 3 meters below the summit of Str.

Figure 12. Jade Artifacts from Burial B1-7.

Figure 13. Bone Rings, pins and Stylus from Burial B1-7.

B1 (Santasilia 2012). The tomb contained the skeletal remains of at least three adult individuals. Although the remains were in a very poor state of preservation, their stratigraphic position allows us to reconstruct the sequence of interments in the tomb. The earliest and lowermost burial was represented by the articulated feet of an adult individual. These remains were discovered at the north end of the chamber, indicating a head to the south orientation. The rest of the skeleton was not found in situ but the discovery of skeletal fragments inside some of the pottery vessels, and throughout the fill in the tomb, suggests that the remains of this individual (Individual 3) was likely disturbed during interment of Individual 2 and then re-deposited throughout the tomb.

The remains of the second individual (Individual 2), "an adult male, was interred slightly above and to the east of the deposit of

foot bones" (Novotny 2012). Individual 2 was "laid in an extended, supine position with head oriented to the north". Like Individual 3, some of the remains of Individual 2 were not in their anatomical position. This suggests that the tomb was reopened yet again for the interment of Individual 1. According to Novotny (2012:10), this likely occurred when the body of Individual 2 "was mostly, but not completely, decomposed." Individual 1, an adult female, was deposited directly above Individual 2 in a supine, extended position with head to the north.

In terms of grave goods, Burial B1-7 is one of the two richest tombs yet discovered at Cahal Pech. The burial contained 8 ceramic vessels (Fig. 11). Two of these were Early Classic, basal-flanged, Dos Arroyos Orange polychrome bowls, a stuccoed vase, a bichrome bowl, a Late Classic, Silk Grass, fluted vase, and three monochrome red dishes. Polished stone objects (Fig. 12) included 12 jade beads, three jade celts or belt plaques, two jade bar pendants, a jade effigy pendant depicting the corn god, and three jade ear flares. Shell and bone objects (Fig. 13) were represented by three, deer antler, rings, one complete and 7 fragmented styluses, three pins, four shell *adornos* with obsidian and *spondylus* shell inlays, a shell inkpot with red, black, yellow and blue pigment, and bone spatula carved with a hand design, a necklace made from dog teeth, and numerous other small objects. One of the bone pins and two of the deer antler rings were carved and inscribed. Mark Zender (personal communication) deciphered the glyphs on the bone pin to read: (u-)ba-ki *(u)baak*, which translates to "his/her bone." The glyphs on the rings were translated by Zender as yo-?-bi K'AWIIL-la-CHAN-na K'IN-ni-chi K'AN-na-?-wa-BAHLAM or the ring(?) of K'awiil Chan K'inich, K'an ? Bahlam. These rings represent the first ever discovered in the Maya area with inscriptions and the latter may actually refer to the royal title of the rulers of the site (Santasilia 2012).

In addition to containing several unique objects, such as the rings and ink pot, Burial B1-7 had several very interesting features. For example, B1-7 represents the only multiple burial within a tomb at Cahal Pech. Equally intriguing is the fact that Individuals 1 and 2 represent the only burials with individuals lying in a supine position with a head to the north orientation. Both practices depart from the Belize Valley burial pattern of prone (face down) and head to the south orientation (see Freiwald 2011). There are three possible explanations for this divergence. First, it is possible that a mistake was made by those who deposited the burials in the tomb. This, however, seems an unlikely scenario for the grave attendants would have had to make the same mistake twice. The second possibility is that Individuals 1 and 2 were not local thus were interred in a manner that reflects orientation typical of their place of origin. At this point in time we cannot confirm this possibility but, hopefully, planned strontium isotope analyses will help to determine the origin of these individuals. The third possibility is that the divergent burial pattern evident in B1-7 reflects influences associated with changes in the socio-political landscape of the time. At the end of the Early Classic, following the defeat of Tikal by Calakmul and its allies, Caracol began to exert considerably more influence in the Belize Valley. At Caracol, multiple interments in tombs are the norm (Chase 1992, Z. Chase and A. Chase 2011), and about 50% of all burials at the site have a head to the north orientation (A. Chase, personal communication). If we assume that Tikal's influence in the Belize Valley was replaced by Caracol at the start of the Late Classic period, then it is possible that the Cahal Pech elite may have chosen to adopt or emulate burial practices that were typical of Caracol. The likelihood of this would be even greater if one of the individuals interred in B1-7 originated at Caracol. Here again is a situation that future strontium isotope analysis will be able to shed light on.

Burial B1-2

Burial B1-2 was discovered by Peter Schmidt in 1969 but he never published a report of these investigations. Schmidt's notes, and illustration of the grave (Fig. 14), indicate that the burial was placed in a large tomb located approximately 1 meter east of Burial B1- 8 at the summit of Str. B1. The tomb contained the remains of a single adult male individual. Schmidt's illustration of the burial indicates that the individual was lying in an extended position

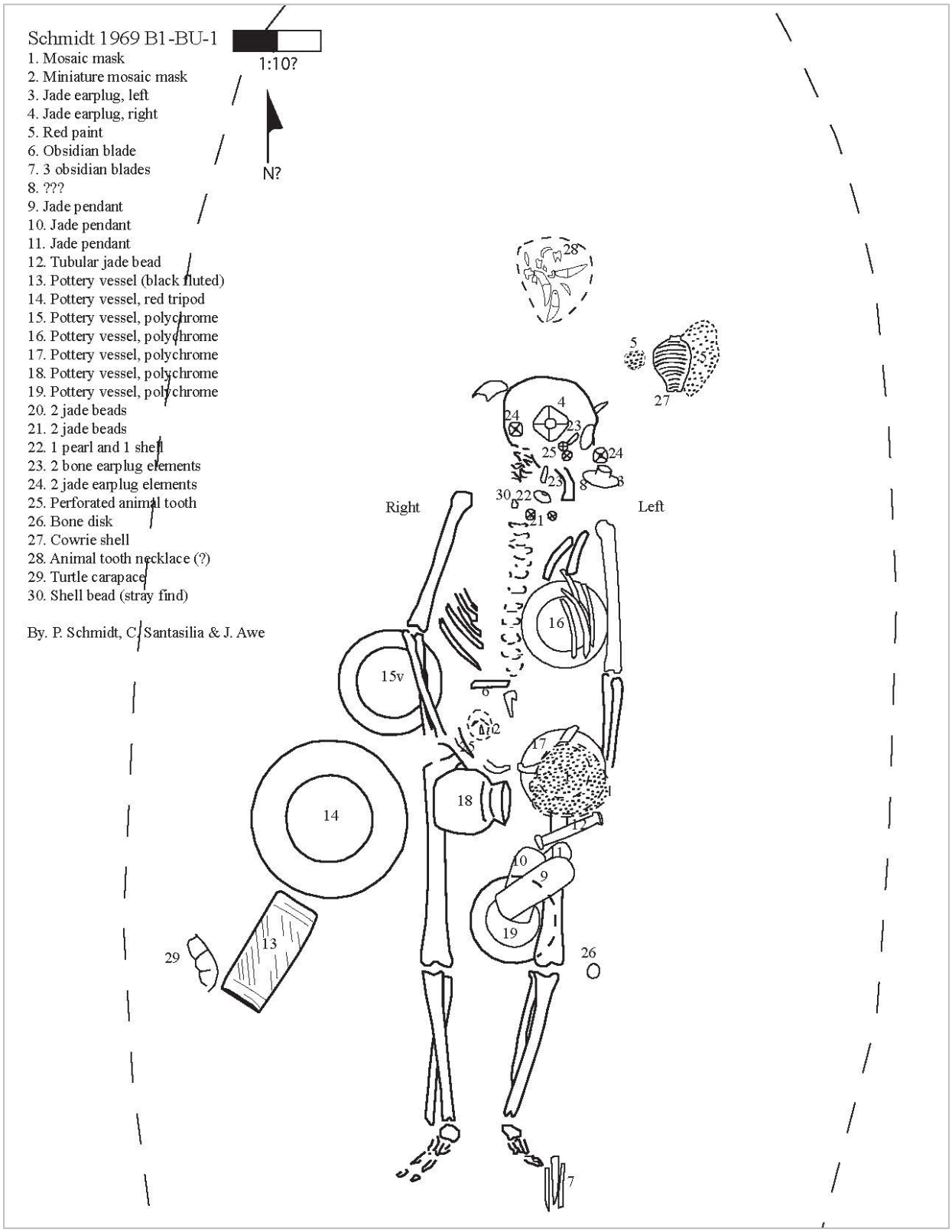

Figure 14. Plan View of Burial B1-2.

but the lack of a north arrow makes it impossible to determine the skeleton's orientation.

Burial B1-2 was accompanied by sumptuous grave goods. Above the pelvis was a beautiful jade and shell mosaic mask (Fig. 15). Other polished stone objects included six jade beads, six jade ear flares, a perforated jade tube, and three jade celts. The tube and celts are similar to those found in Burial B1-B7. Two additional mosaic masks, made predominantly from shell with a couple pieces of jade, were located just below the skull and several obsidian blades were placed near the feet of the individual. Ceramic artifacts (Fig. 16) included eight pottery vessels. Six of the vessels were polychrome and two were monochrome. One of the vessels, a Saxche Ceramic Group cream polychrome, is chaliced-shaped and depicts an individual in the act of blood-letting from his penis. Another vessel, a basal flanged bowl, is a Dos Arroyos Orange polychrome. There is also a fluted vase that is similar in form and stylistic treatment to the fluted vase from Burial B1-7. These, and other, similarities between B1-2 and B1-7 suggest an almost coeval date for the two burials with, perhaps, B1-7 predating B1-2 by a few years at most.

Zopilote Burial 1.

Burial 1 from the Zopilote Group was associated with the penultimate construction phase of Str. 1, the 11 meter tall pyramid at the terminus of the causeway. The tomb contained the remains of two individuals (Cheetham et al. 1993:152-172). Individual 1 was in an extended prone position with head to the south. The remains were those of an adult male individual. Several of his incisors were decorated with jade inlays. Individual 2 was represented by a skull that was deposited inside a dish. The skull was that of a young male individual. No other skeletal remains of Individual 2 were discovered in the tomb suggesting that the skull may have been that of a decapitated victim rather than that of a venerated ancestor.

Zopilote Burial 1 contained numerous high status grave goods. Non-ceramic artefacts included a large fragment of wood, a human effigy jade pendant and two jade beads, two shell (*spondylus*) ear flares, a shell disc, a stingray spine, a large *pomacea* shell, two small

Figure 15. Assorted Grave Goods from Burial B1-2.

Figure 16. Ceramic Vessels from Burial B1-2.

stone spheres, a stone bead, and a large number of elaborately decorated stucco fragments. The latter may have originally formed part of the decoration on the sides of a Balanza Black ceramic vase. A total of nine pottery vessels were found in the tomb (Fig. 17). Two of these, Vessels 1 and 2, are beautifully decorated with polychrome scenes depicting a deer hunt and a band of marching warriors (Fig. 18). Vessel 1 is likely a Saturday Creek Polychrome and Vessel 2 is a Saxche Orange Polychrome, both dating to the early Late Classic Tiger Run Complex in the Belize Valley. The other vessels include three bowls, another dish, a chalice and a small brown cream pitcher. The Balanza Black vessel and the cream pitcher share similarities with late Early Classic vessels from the Peten. It is this combination of both Early and Late Classic ceramic types that leads me to suggest that Zopilote Burial 1 dates to the early part of the

Figure 17. Ceramic Vessels from Zopilote Burial 1.

Figure 18. Illustrations of Vessels 1-2, Zopilote Burial 1.

Late Classic period. Furthermore, the grave type, its location, and sumptuous grave goods all indicate that the burial was that of a high ranking elite, male, individual. The placement of elite tombs in causeway termini groups, and the deposition of finger caches like those found in Burial 2 at Zopilote, are traditions typical at Caracol (Chase 1992: 39). It is therefore possible that both practices may reflect early Late Classic influences from that site.

Burial H1-1

We have recovered at least eight burials that date to the Terminal Classic period (A.D. 850-950) at Cahal Pech. Of these, Burial H1-1 is the only interment that is undoubtedly that of a high ranking elite. The only other burial that might fall into this category is an intrusive burial that was discovered by Schmidt in 1969 just below the summit of Str. B1. Because information on the latter is limited, I have decided not to include it in this paper.

Burial H1-1 was discovered just below the floor of Str. H1b, on the eastern side of Plaza H. The large tomb was constructed of cut stones that had been scavenged or looted from a Late Classic building that was subsequently covered over by Str. H1a. Inside the tomb were the articulated remains of a young adult male (Wrobel 2008). The skeleton was in an extended position with head to the south.

Associated with the burial were a variety of grave goods (Figs. 19 and 20) including 11 ceramic vessels, approximately 24 both complete and fragmented, perforated deer bone tubes, a dog teeth necklace that used teeth of at least 52 dogs, five obsidian blades, a carve jade pendant, two jade ear flares, two jade beads one modified conch shell and one shell bead. At the northern end of the chamber the remains of a small feline, possibly ocelot was found.

One of the ceramic vessels from the tomb, a cream polychrome, may be a Terminal Classic Belize Valley attempt to copy the finer Cabrito Cream Polychromes of the Peten. The other vessels include a bichrome cylinder vase, two effigy censers, a fluted bowl, a cream-slipped pedestal vase, three monochrome bowls, one unslipped bowl and fragments of an unslipped jar. The carved jade pendant is an effigy of the corn god. Similar effigy pendants have been found in the tombs of high status elites across the Maya area and range in date from Early to Terminal Classic times. Because Burial H1-1 dates to the Terminal Classic period, it represents the last ruler in Cahal Pech's incredibly long history of occupation.

Figure 19. Ceramic Vessels from Burial H1-1.

Figure 20. Assorted Grave Goods from Burial H1-1.

Discussion and Conclusion

As Arlen Chase, David Grove, Susan Gillespie, and now our research at Cahal Pech indicate, the highest ranking individuals, presumably the chiefs and rulers of sites, can be readily identified by the co-occurrence of several elite markers in their graves. In addition to inscriptions, these markers can include all of the following criteria, or a combination of these. In no particular order, these markers are: a) burial in monumental civic, or public architecture, b) interment within lavish crypts or tombs, c) the inclusion of exotic items of perceived high value (jade, mirrors, spondylus shells, etc., d) imported and/or locally made high quality pottery, and e) accompanying symbolism that serve to associate the individual with particular deities (e.g. corn god).

By applying the aforementioned criteria to the burials at Cahal Pech, we have identified at least 11 potential rulers at the site. The earliest of these high ranking elite was interred in Platform B in Plaza B during the Middle Preclassic. For the Late Preclassic we identified two possible rulers. For one of these we have no skeletal remains but believe he is represented by the carved depiction of the human on Stela 9. This monument was discovered in a tomb (Burial 2) within the large pyramid at the terminus of the causeway at the Zopilote Group. The second Late Preclassic ruler is represented by Burial B4-3. Although not deposited within a tomb, the ideologically laden arrangement of this burial, and its placement within the Late Preclassic B4 shrine, clearly reflects the elevated status of the individual.

During the Terminal Preclassic (a.k.a. Protoclassic) period, two possible rulers were buried at the site, Burial B1-10 and Burial B1-8. Presently, the graves of these individuals represent the earliest tombs discovered at the site. For the Early Classic we have at least two potential ruler graves. Because Burial A1-1 was looted in the 1970's, we have practically no

information on the burials context and contents. The second Early Classic burial is represented by Burial B1-11 which was deposited in the stair block of Str. B1-2nd. For the period between the end of the Early Classic and start of the Late Classic, we identified the graves of two potential rulers. In chronological order, from earliest to latest, these include Burial B1-7 and Burial B1-2. After these we have only one Late Classic and one Terminal Classic burials. The former is represented by Burial 1 at the Zopilote Group, and the latter by the large tomb in Str. H1b.

It is readily apparent that the 11 burials discussed in this paper can in no way represent all the high ranking elite individuals who likely ruled and died during the two thousand years of occupation at Cahal Pech. In spite of this, our analysis of the burial data has allowed us to identify potential rulers for all the major periods of development at the site. Hopefully, future research will discover the graves of additional high ranking elite and that this will allow us to continue building on the tentative sequence of rulers at this medium size Belize Valley polity.

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5 TIME, DISTANCE AND THE ANCIENT MAYA OF LA MILPA

Fred Valdez, Jr. and Vernon Scarborough

The ancient Maya site of La Milpa and its surrounding settlements are utilized as an example of occupations and developments in northwest Belize. The La Milpa "realm" is also an example of ancient Maya concepts concerning origins, cyclical time, and perhaps regeneration. This paper presents some pre-Maya data as related to Maya origins, the adaptive responses by the ancient Maya that made them a highly successful civilization, and the utilization of transport and festivities to maintain a sometimes fragile system. While some aspects remain speculation, excavation and survey data from northwest Belize are utilized to emphasize certain interpretations.

Introduction

The PFBAB has completed 21 seasons of research, 1992-2012 in the Rio Bravo area of NW Belize. The initial efforts were extensive survey and mapping, with the site of La Milpa recently added as an excavation location. In the process of survey efforts we have located several other large centers including Dos Hombres, Max Na, and Grand Cacao. Several middle-sized sites have been documented including Say Ka, Warrie Camp, Dos Barbaras, and Las Abejas among others (Figure 1). Additionally numerous much smaller settlements, more than 40 to date, that form a part of the Rio Bravo landscape.

A new or novel research approach, established in consultation with the Institute of Archaeology (then known as the Department of Archaeology), was the brining together of multiple scholars from various institutions as a collaborative research effort. Our organization for field and camp requires at least one staff member for every four participants in addition to Directors and Specialists. In the 2012 season, as in many recent seasons, we have had as many as 10 PhDs including soil scientists and botanists, in addition to the archaeologists and more than 15 graduate students at work on theses and dissertations.

Our findings over this 21-year endeavor include extensive settlements and significant landscape modifications such as pozas, terraces, chultuns, wells, and more. Many of the small sites along with various features have been the focus of graduate student and undergraduate student training.

Chronology as a Regional Interest

Our effort at a regional chronology is spear-headed by the ceramic studies of Dr. Lauren Sullivan, PfBAP Ceramist. We have data indicating an initial Maya settlement of the area during the Middle Preclassic and extending through to the Post Classic. The significant periods of occupation are the Late Preclassic as a core or base at most sites; we have a dispersed settlement at the Early Classic; and a return to intensive "city" or center settlement during the Late to Terminal Classic. Post Classic occupation is sparse in the Rio Bravo region except locations close to a dependable water source, such as the spring-fed Booth's River.

An interesting observation (and fact) is occupation and/or utilization of the nearby regions during the Paleoindian and Archaic periods. Evidence, particularly in the form of stone tools, has been observed and documented in recent years. How the Archaic population relates to Maya settlements, etc. remains uncertain due to a chronology that has not yet been refined.

Settlements Comments

PfBAP has continued to have a significant research effort at small site identification and documentation. The smaller settlements are not carbon copies of each other, but rather have specific layouts that likely reflect particular functions.

Small communities were often thought of as being independent, perhaps self-reliant, and primarily effective at reproducing themselves perhaps generationally (Southhall 1988). We now know, or certainly believe from our research, that many of these communities operate within a system of socioeconomic interdependencies. These entities and their interactions are part of a complicated/complex regional production and exchange system. The

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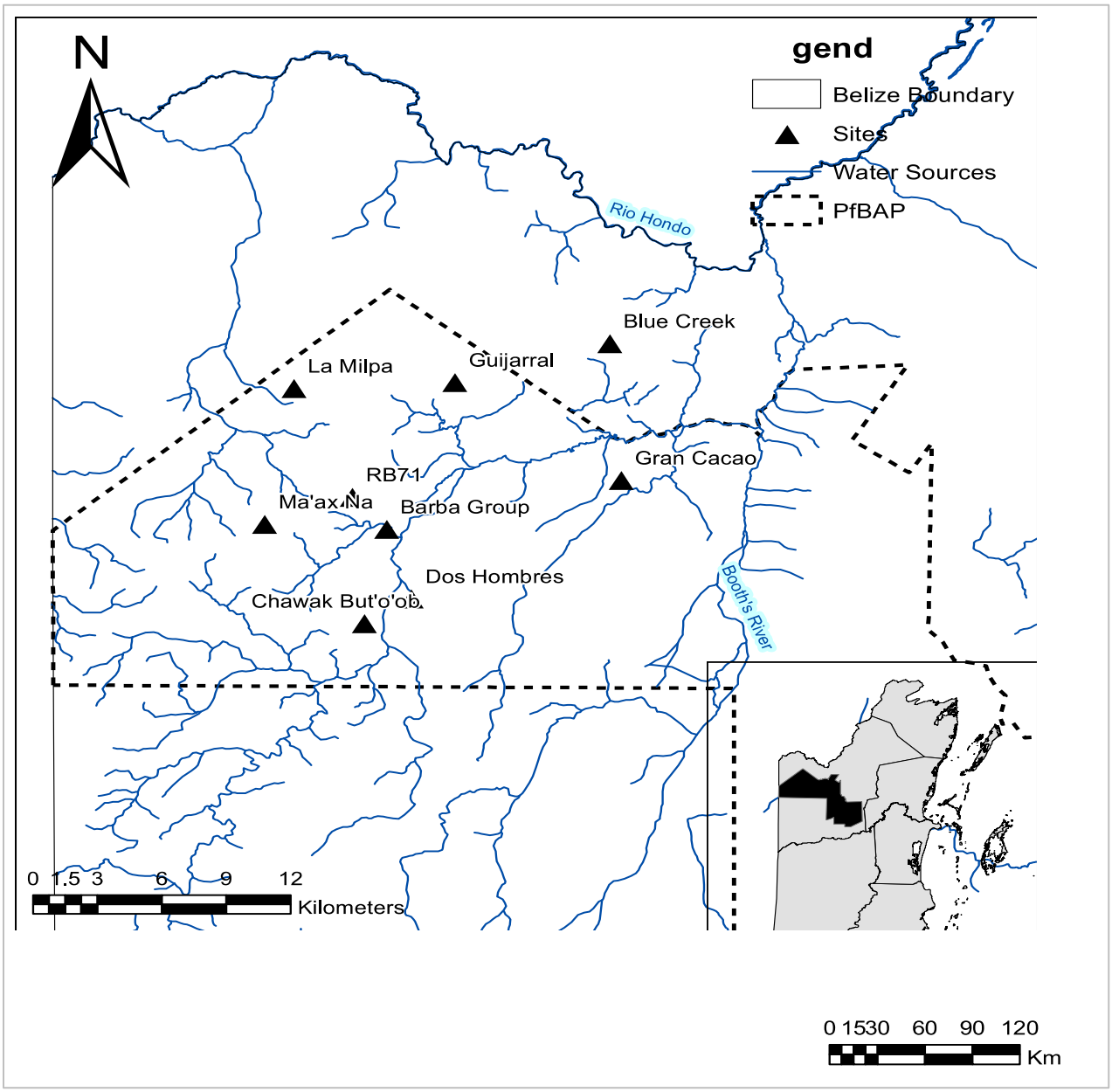

Figure 1. Map of Northwest Belize, PfBAP Project Area.

individual communities exploit resources in their particular area (of occupation?) in either a raw format or perhaps as refined products. While local resources, both as raw and/or refined products may be exchanged as required, special events/festivities/etc. are also indicated at various sites such as Chawak But'o'Ob (Figure 2; Walling 2011) and Quincunx (Zaro and Lohse 2005). These special events also serve as a venue for broader ritual activities that create greater intercommunity solidarity and exchange (Scarborough and Valdez 2003, 2009).

Larger centers were not immune to the various community interactions and requirements of their "support" populations. These centers had critical roles in infrastructure transport and scheduling while equally dependent upon the hinterland producers. The "rural elite" that Bullard (1960) noted five decades ago and has been since reported at numerous small communities throughout the Maya Lowlands,

likely coordinated production strategies for a community or a group of communities (Scarborough, Valdez, and Dunning 2003). Likely occurring at many sites, and in proportion to the host site, were marketplace activities and special events. It was only long-distance trade items or artifacts of highest quality and skill that drove the economic system (Inomata 2001). When we look at the ancient Maya and compare them to other archaic states, it is not a less complex system that we see, rather a civilization adapted to a different environment with different adaptation requirements. Maya civilization was a great success adapting and thriving in a semi-tropical environment and their story has clear implications for similar and present-day ecologies (Scarborough and Burnside 2010).

Stelea at La Milpa

Clearly historical documentation was attempted at La Milpa as is represented by surviving stelae. Stelae reflect upon La Milpa as part of general Maya practices and beliefs. Unfortunately, most of the La Milpa stelae are too eroded to read and their original data has been long ago erased. The data and beliefs recorded on the stelae, however, may have included references to origins in addition to other historical events. In the latter case, we are quick to note the so-called "Maya concern" with 2012 that has been quite popular in recent years (or our interpretation of it), but what then of the Terminal Classic? Shouldn't the AD 800-900 period have been recorded "in stelae" or elsewhere as a period of interest or concern, as a period of change and transformation?

General Maya Origins and Connections to the Archaic Period

Maya origins refer to a data of ca. 3400 BC. It is interesting and perhaps coincidental that there are also significant origins of horticultural activities, deforestation, etc. at 3400 BC. We have direct evidence of some of these activities, for example, from Cobweb Swamp in northern Belize. As from other areas of the New World, knowledge acquired by Archaic populations would have been passed down through the generations to the earliest permanent settlements. In north and northwest Belize, we argue the same or similar transfer of knowledge

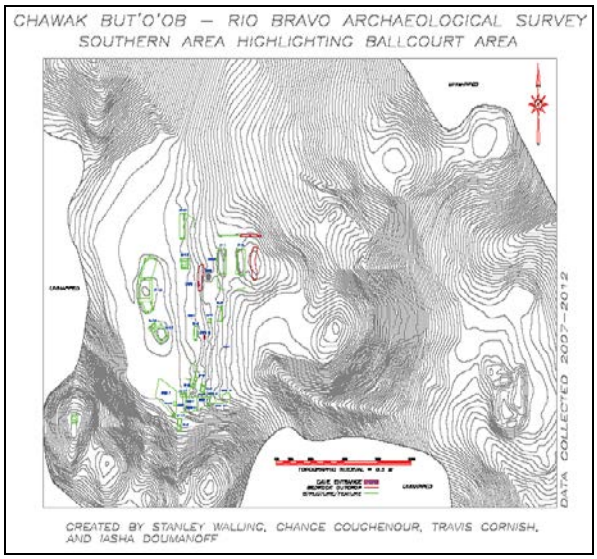

Figure 2. Map and Ballcourt at Chawak But'o'Ob (from Walling).

occurred with the earliest Maya. The Maya would certainly have inherited specific knowledge from their Archaic ancestors (about wild plants, the protection and/or cultivation of certain plants, annual cycles, etc.).

There are numerous artifacts that have been reported from the Archaic period in northern Belize (Valdez and Aylesworth 2005). Many of these artifacts are specifically utilized in plant/food processing, including some chipped stone tools (Figure 3) and most groundstone implements. Evidence for early deforestation has been found at locations such as Cobweb Swamp along with early cultigens. Thus, incipient horticulture was part of the Archaic subsistence activities and knowledge of these techniques was then likely adopted by the early Maya.

Regenerations as a Concept of Maya Adaptations

There are several disruptions in Maya chronology, for example in the Late Preclassic (when El Mirador, Cerros, and the like are abandoned), the Middle Classic *hiatus*, the Terminal Classic transformation and in many cases, site abandonments (Buttles and Valdez, n.d.). There are also cycle-ending concerns for the Maya as for example at each 52-year round. The likely modifications of/to Maya society occur after a change or challenge. These modifications may be labeled regenerations, an opportunity to begin anew. While developments

are accretional, the change or modifying of Maya society may also be viewed as an adaptation. So, this adaptation is part of the accretional developments or accretional knowledge and perhaps should be viewed as regeneration as well. The regeneration may represent a new start or new opportunity for the ancient Maya.

Another concept that has surfaced is what Hyde & Valdez (2010) have called "conscience archaism". Particularly during the Late-to-Terminal Classic certain red pottery is produced that replicates Late Preclassic pottery in surface treatment and form. This effort at replication can be viewed as nostaligic and perhaps as romanticizing the past, trying to recapture a perceived greater period of the past.

As mentioned above, there are Archaic period connections to the earliest Maya. An early origin date and the cyclical nature of time, or of a cyclical time concept including monthly, seasonal, yearly, 52 years, etc. All of these involve a combination of practice, modification, adaptation, and reinforcement. All represent opportunities of regeneration even if nostalgic or romanticizing in nature.

Maya systems, to makes these adaptations affective, include the development "over time" of transport method, including water and overland, as well as festivities to reinforce beliefs, myths, etc. Systems, however, are always somewhat fragile or on edge. A significant effort at maintenance is always at work. Rituals, oral histories, and written works are examples of means utilized to reinforce beliefs, practices, and for socio-political stabilization.

Summary

As mentioned earlier, small site function and differences between the settlements and structures of these sites indicate varying practices among the ancient Maya. We must consistently revisit our interpretations of available data, etc. Do we have "**an** answer"? **YES**. Do we have "**the** answer"? **NO**. For example, in northwest Belize several large centers are within proximity of each other and have medium nodes or settlements between the larger sites. This settlement pattern is a very elaborate system and had mechanisms for social, political, and economic control "generally speaking" that had to be in place and maintained. All of this, the

Figure 3. Archaic Chipped Stone Point.

Figure 4. Aerial View of Forest Area in NW Belize.

systems, etc. is very complex, representing questions of organization, and what were concerns among the controlling populace to maintain the *staus quo* that have been worked on for many years and perhaps several generations (at least).

We place a significant "emphasis on highly flexible road networks and schedules for the distribution of goods and services" that "assumes a production oriented-economy based on a dispersed, but populace landscape having adapted to the rhythms and tempos of a tropical rainforest setting (Figure 4). By incrementally modifying the environment the Maya not only produced a user-friendly set of resources, they transformed their socioeconomic system by way of a complex infrastructure mimicking aspects of a neotropical environment and adhering to its constraints and possibilities. By learning the ecological tolerances over many generations, those social and environmental adjustments made the Maya who they became—and always in the

"becoming" mode" (Scarborough and Valdez n.d.) implications for similar and present-day ecologies (Scarborough and Burnside 2010).

From our perspective, it will now fall upon our younger colleagues to press forward. We appreciate the various perspective/opinions/etc. that are often expressed such as those at the BAS (or contained in the current volume), and the conversations run both ways. We want and need new ideas, but these must be combined with previous experience and knowledge as we move the field forward. As the title of this paper reads, time, distance and the ancient Maya of La Milpa, it really reflects on all of us on the time, distance, and study of the ancient Maya.

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6 MISSING PERSONS: THE ROLE OF ANCESTORS IN THE RISE OF COMPLEXITY

M. Kathryn Brown

Ancestor veneration played an important role in the rise of complexity in the Maya lowlands. The Mopan Valley Preclassic Project has been investigating the development of ceremonial architecture and ritual at the site of Xunantunich for the past five years and has uncovered evidence of ancestor veneration beginning in the Preclassic. Recent excavations uncovered a Preclassic burial chamber placed in the summit of the eastern pyramid at Group E. This tomb-like feature was a formally prepared chamber with a large incised capstone. The body had been removed in antiquity and only a few bone fragments remained. The timing of the removal is unclear, but appears to date to the abandonment of Group E late in the Preclassic. The disinterment and manipulation of ancestor's bones is well documented and appears to be associated with ancestor veneration. The new evidence from Xunantunich shows the importance of ancestor veneration in the Preclassic and the role of the physical remains of the ancestors in the strategies of their living descendents.

Introduction

Ancestor veneration played an important role in the rise of complexity in the Maya lowlands and was an important component of the institution of kingship (Schele and Miller 1986). The king's power and authority was oftentimes legitimized through links to important ancestors and is clearly seen in the built environment of the ancient Maya. In the Classic period, monumental architectural constructions were built to honor the memory of important ancestors and/or house their bones. The built environment includes encoded messages related to important ancestors, whose bones may be present within the layers of important buildings. Although the built environment may trigger important messages and memories, it is through activities like commemorative events, that those memories become collective and social (Brown 2011). As McAnany states (1998, pg 273) "from the very start, the maintenance of links with the deceased via physical proximity within a built environment is a prominent characteristic of Maya society." The ritual activities performed at sacred locations transformed these places into powerful locations that became part of both the physical and ideological landscape of the community. Burial rituals associated with monumental architecture were oftentimes quite elaborate. Although primary internments were common, elaborate burial rituals were also centered around the re-depositing of bones, presumably of important ancestors. "Through their inclusion, ancestors facilitated a social definition of residence and augmented the political centrality of selected locales" (McAnanay 1998, pg. 271). Although it was a common practice to place ancestors in important buildings, such as pyramids, in the Classic period, fewer examples of this type of ritual practice have been documented during the Preclassic. This chapter will present new data from Xunantunich of a Late Preclassic burial chamber placed in an eastern pyramid. The bones of the individual placed in the chamber were later removed possibly to be re-deposited in another location. The new evidence from

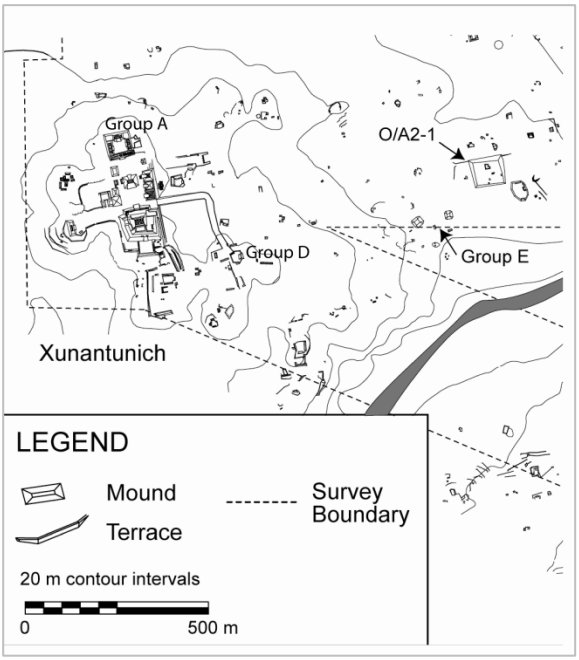

Figure 1. Map of Xunantunich (Courtesy of Keller and Yaeger).

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Xunantunich shows the importance of ancestor veneration in the Preclassic and the role of the physical remains of the ancestors in the strategies of their living descendents.

Xunantunich Group E

The Mopan Valley Preclassic Project has been investigating the development of ceremonial architecture and ritual at the site of Xunantunich since 2008. Most of our work has centered on the investigation of a small Preclassic ceremonial site, designated Group E (Figures 1 and 2). The formal architecture of Group E dates to the Middle and Late Preclassic and, therefore, predates the monumental structures in the site core of Xunantunich. In fact, Group E may have been the original site core of Xunantunich founded during the Middle Preclassic. Group E is dominated by two Preclassic pyramids, Structures E-1 and E-2, framing the western and eastern sides of what appears to be a sloping plaza (see Brown et al. this volume for more details). These structures are associated with a monumental rectangular platform located to the northeast. Although the Xunantunich's platform is much larger in size, this platform is similar in its location within the site plan to Middle Preclassic platforms documented at the nearby site of Blackman Eddy (Brown and Garber 2005; Garber et al. 2004).

Excavations on the eastern structure, Structure E-2, revealed that it had at least three construction phases and one sub-phase, the earliest two phases dating to the Middle Preclassic. The earliest of the phases, Structure E-2-3rd has been only partially investigated to date. It appears to be a low, broad, rectangular platform. The construction phase above this, Structure E-2-2nd, completely encased this platform. Our excavations have documented that this phase was a two-tiered pyramid set on top of a low platform with extended wings to the north and south. This form resembles the eastern arrangement of an E-Group, an architectural form first documented at the Maya site of Uaxactun and thought to have solar astronomical associations. Paired with the western pyramid (Structure E-1), this suggests Xunantunich's Group E was actually an E-Group (Figure 3), one of the earliest found to date in Belize.

E-Groups have their origin in the Middle Preclassic in the Maya lowlands and have been suggested to be associated with "large plazas where public rituals were likely performed" (Estrada-belli 2011, pg. 74). It is interesting to note that we encountered a series of post holes in the plaza directly on centerline in front of the steps of the eastern pyramid. It appears that a small perishable feature was erected in this location and rebuilt several times. An AMS date (UCIAMS 112169) from this feature places the structure at 2435 +/- 20 BP, calibrated at the 2-sigma range to 746-407 BC. This date corresponds nicely to an AMS date from a deposit of carbon and a partial Middle Preclassic vessel that was found smashed on the plaza surface at the base of Structure E-2-2nd. This sample (UCIAMS 12168) yielded the very same date of 2435 +/- 20 BP. I have interpreted the posthole feature as a wooden altar. The presence of a wooden altar in the plaza directly in front of Structure E-2-2nd is suggestive of public ritual activities. The fact that this altar was rebuilt several times supports the notion of cycles of rituals, quite possibly related to annual solar events like equinoxes and solstices.

Ritual offerings and caches are often found in plazas of E-Groups beginning as early as the Middle Preclassic and continuing through the Classic period. An elaborate Middle Preclassic cache was found at the site of Cival and illustrates the importance of cosmological themes at this early date. The cache at Cival contained five Middle Preclassic water jars placed in a quatrefoil pattern with four jade celts placed around the central vessel. Beneath the central vessel were114 jade pebbles and a single jade celt (Estrada-belli 2011). Francisco Estrada-Belli (2011, pg. 82) argues that the cache represents a ritual dedicated to the ordering of the cosmos. Although Middle Preclassic caches of this sort have not been found to date at Group E, further excavations may indeed reveal similar ritual patterns. The wooden altar feature, does suggest that this location was utilized as ritual space during the Middle Preclassic. We have documented a series of ritual deposits in this location dating to later time periods indicating that this sacred

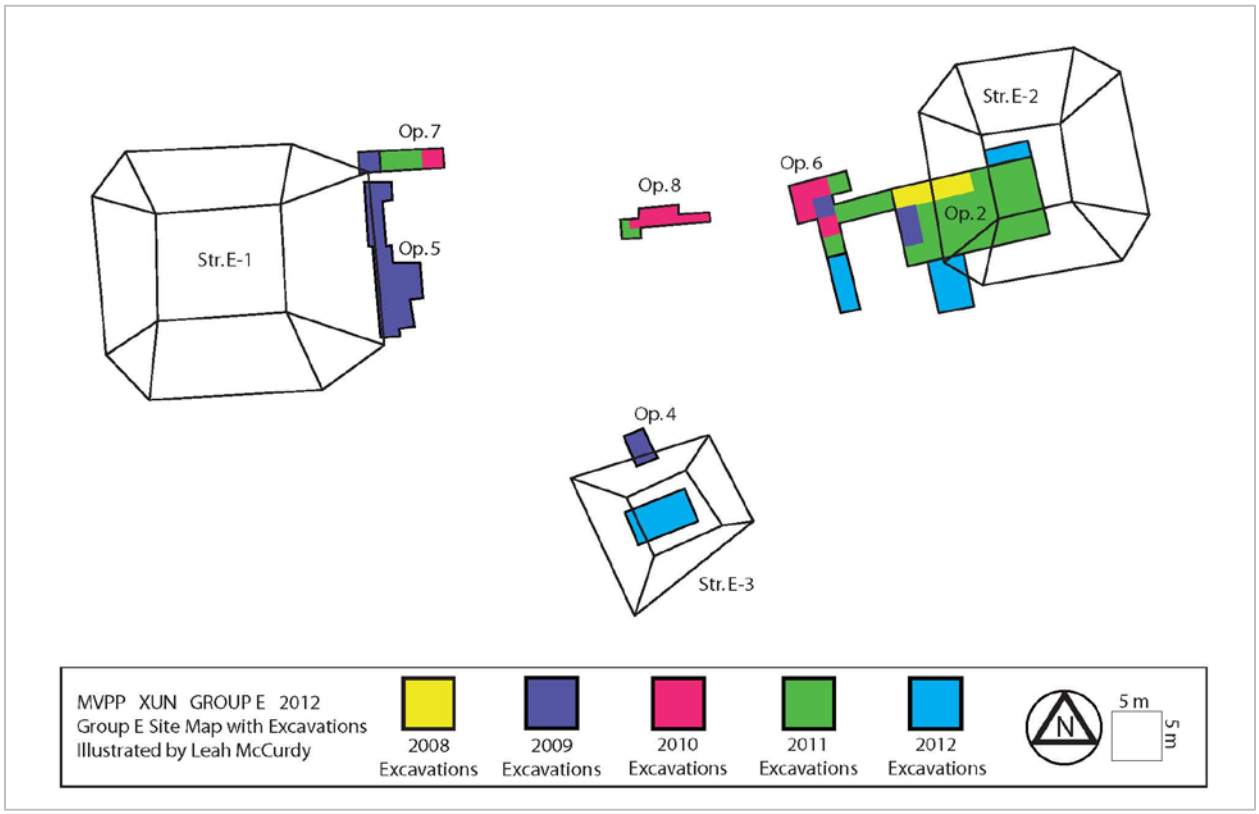

Figure 2. Map of Group E Showing Excavation Units.

locality continued to be utilized for public rituals (Brown 2011, 2012).

In addition to ritual offerings and caches associated with E-Groups in general, burials are often found associated with Preclassic and Classic period E-Groups. At Uaxactun, lip to lip caches containing human skulls and bones were found within the eastern structures of the E-Group (Ricketson and Ricketson 1937). Burials placed within the central staircase or beneath the summit of E-Group structures have been documented at a number of sites dating to the Late Preclassic including the nearby site of Chan (Robin et al. 2012). One of the objectives for the 2011 field season was to look for offerings and/or burials placed beneath the summit of the final construction phase of the eastern building. Although we anticipated finding an offering or cache, we were quite surprised by what we did encounter. In the final Late Preclassic construction phase of Structure E-2 (Structure E-2-1st-a) we encountered a masonry burial chamber placed in the summit directly on centerline of the building (Figures 4 and 5). The

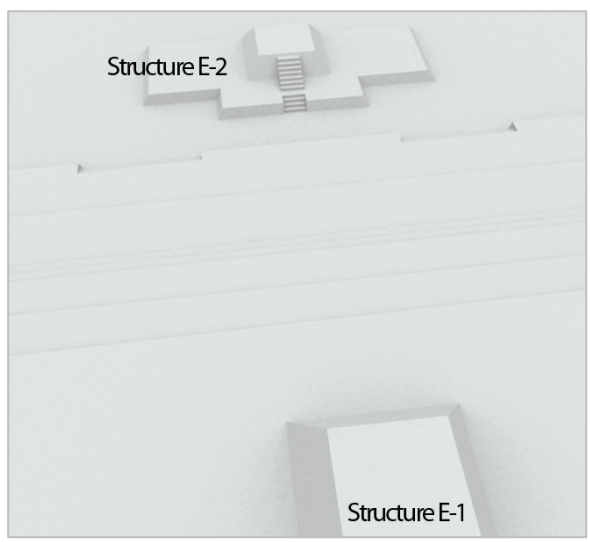

Figure 3. Isometric Drawing of Group E.

rectangular masonry chamber was constructed of four walls, measuring approximately 1 meter by 2 meters. The tomb-like (proto-tomb) feature was unexpected due to the Late Preclassic date of the building and may represent one of the earliest formal burial chambers of this sort found

Figure 4. Photograph of Burial Chamber in Structure E-2-1st.

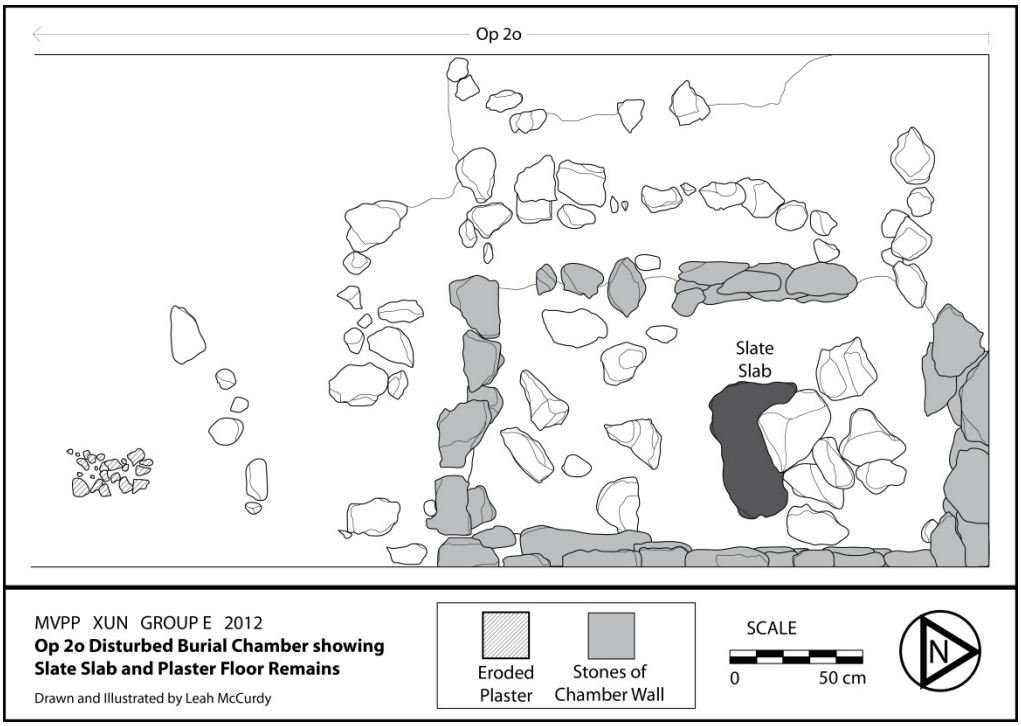

Figure 5. Plan Map of Burial Chamber in Structure E-2-1st.

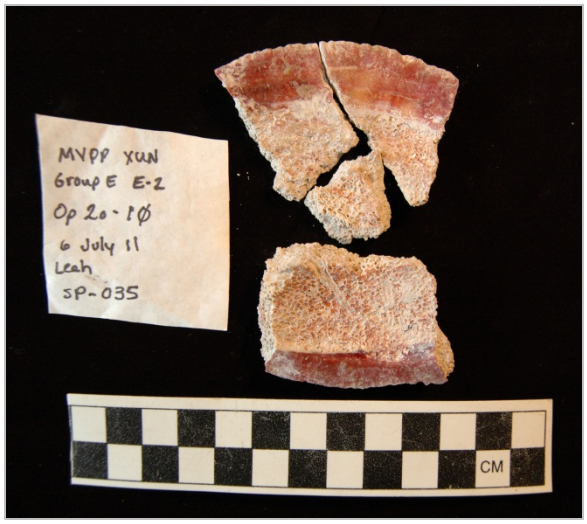

Figure 6. Photograph of *Spondylus* Ornament.

to date in Belize. Burials of this sort were much more common during the Classic period. As McAnany (2001, pg 133) states, "During the later Classic period, individuals of great status were memorialized through monumental architecture."

The eastern and northern walls of the chamber were more finely constructed, and we have suggested (see Brown et al. this volume) that these walls may have been part of the final construction phase architecture. The southern and western walls appear to have been added to form the rectangular burial chamber. The chamber was reentered in antiquity as evidenced by the partial dismantling of the northwestern corner. The chamber may have been reentered on other occasions as the summit surface above the chamber had not been patched. The contents of the chamber were removed including the remains of the individual placed inside. We found only three fragments of bone and one complete Middle Preclassic ceramic vessel. The ceramic vessel was a Savanna Orange miniature jar and appears to be an heirloom piece as the construction fill that surrounds the burial chamber contained a few sherds dating as late as the Late Preclassic. It is possible, however, that the individual buried within the masonry chamber was a prominent ancestor who was reinterred in the chamber with the Middle Preclassic vessel. In order to test this hypothesis, we hope to run an AMS date on one of the fragments of bone recovered from the burial location. At the time of excavation, the chamber was filled in with construction fill and a carved slate slab and other large flat stones were laid on top. It is unknown if the chamber was filled originally or if it was an open chamber, however, I suspect it was filled.

The chamber had an irregularly shaped slate slab placed on top. It was extremely eroded and much of the surface layers of the slate had peeled away. Further examination in the laboratory showed that one side of the stone was lightly incised with a figure in profile. The slate slab had been placed on top of the chamber with the incised side facing up. Although, extremely eroded, the figure appears to have been wearing a headdress and possibly holding something in front of his body, perhaps a staff. The analysis and reconstruction of the slate object is ongoing, and we hope to have a better understanding of the iconography of this unusual object.

As we were clearing the summit of the structure east of the chamber, we encountered a rectangular cut on centerline. Further examination of this feature indicated that this was actually a Xunantunich Archaeological Project (XAP) 2x1 meter test pit on the summit. Ironically, the XAP test pit missed the burial chamber by less than 5 centimeters.

Additional excavations on the summit near the burial chamber uncovered fragments of a *Spondylus* shell ornament, possibly an earflare (Figure 6). We believe that this broken shell ornament was displaced when the contents and individual were removed from the chamber. A Late Preclassic burial within the eastern structure of the E-Group at Chan, (Burial 10) was interred with several artifacts including a *Spondylus* shell ornament as well as an heirloomed Middle Preclassic figurine fragment (Novotny 2012). *Spondylus* shell was highly valued by the ancient Maya and symbolized the watery underworld. This exotic material appears to have been a symbol of power and authority for early Maya kings (Freidel et al. 2002, pg. 44). Although we did not recover all the contents from the burial chamber, it is clear that this was an important individual, quite possibly an early ruler at Xunantunich.

It is interesting to note that the Group E ceremonial center was abandoned at the end of

the Late Preclassic. It appears that when the inhabitants abandoned this location, they purposely retrieved the bones of the important individual buried in the eastern pyramid, quite possibly with the intention of reburial at a new location. The manipulation of ancestor's bones is well documented in the Classic period and appears to be associated with ancestor veneration. This practice extends back to the Preclassic and has been documented at several sites including the nearby sites of Cahal Pech and Chan (Jaime Awe personal communication 2010; Robin et al. 2012). In fact, Burial 8 from Chan provides an interesting parallel to the Xunantunich's Group E example. Burial 8 was a Late Preclassic burial placed in the central pyramid of the eastern E-Group structures at Chan. This burial was of a young adult male interred with six ceramic vessels, an exotic chert blade, and a jade pendant (Novotny 2012; Robin et al. 2012). The grave had evidence of reentry and manipulation of the bones. The head of this individual was placed in a Sierra Red dish (Robin et al. 2012). The placement of skulls in bowls was a common practice in the Maya lowlands and appears to be associated with ancestor veneration. This ritual practice has a long history extending back at least to the Middle Preclassic (Garber and Awe 2008; Robin et al. 2012).

Disinterred remains were often given special treatment. For example, Jaime Awe (personal communication 2010) excavated an elaborate offering in the Late Preclassic construction phase of Structure B4 at Cahal Pech. The central component of this offering was a skull in two ceramic bowls set lip-to-lip. It was surrounded by long bones that are possibly the remains of the body associated with the head, together with other offerings. This offering demonstrates that the Maya not only disinterred skulls for veneration, but sometimes exhumed entire skeletons of revered ancestors. This lends additional support to my interpretation that an individual was buried in the chamber on Structure E-2, only to be later removed, with the exception of three stray bone fragments.

The removal of bones from ancestor graves coupled with the ritual reburial plays an important role in the rise of complexity in the Maya lowlands. Robin et al. (2012, pg. 213) suggest that communicating with the ancestors through reentry into graves and utilizing their bones in ritual practices is deeply rooted in ancient Maya agrarian ideology (see also Robin 2012). McAnany argues (2001, pg 132) that during the Preclassic, burial rituals that both emphasize the individual and create a group's ancestors, were becoming more elaborate. By the Late Preclassic, "emphasis on ancestors culminated in the collection and reinternment of select ancestral bones at focal locales prior to building a nonresidential, monumental structure" (McAnany 2001, pg 133). The removing and redepositing of certain important ancestors suggest that "bones of the ancestors 'paved the path' to the institutionalization of religious power represented by pyramid construction" (McAnany 2001, pg 133).

Conclusion

Recent investigations at Xunantunich's Group E have shed light on the development of ceremonial architecture and ritual at the site of Xunantunich and added to our knowledge of this dynamic time period in the Belize River valley. The discovery of a Middle Preclassic E-Group is significant. The early community of Xunantunich constructed a ritual center with an E-Group at its core, emphasizing the east/west path of the sun. The presence of a perishable altar in front of the central staircase of the eastern central pyramid is suggestive of public ritual activities and further supports the importance of this central location to the community. Of course, aspiring rulers may have overseen rituals at this location, connecting themselves to important ancestors and the supernatural. By the Late Preclassic, the physical remains of an important ancestor were placed within a simple masonry chamber at the summit of the eastern pyramid. This chamber was reentered at least once, possibly additional times, and the bones were retrieved. A single Middle Preclassic vessel and three fragments of bone were all that remained. The inclusion of a Middle Preclassic vessel is intriguing and may suggest that the individual was an ancestor from this period, reinterred within the chamber with his or her processions. If the incised slate slab placed on top of the chamber was a depiction of

the individual, it would seem most likely that the chamber housed the remains of an adult male, quite possibly an early ruler at the site. The timing of the manipulation and removal of the bones is unclear, but appears to date to the abandonment of Group E late in the Preclassic. The fact that the chamber was reentered and the bones removed possibly coinciding with the site abandonment is interesting. This suggests that this ancestor was central to the communities' identity and was retrieved for reburial at a new location. This illustrates the importance of ancestor veneration in the Preclassic and the role of the physical remains of the ancestors in the strategies of their living descendents. As McAnany (1995, pg 162) states, "The practice of ancestor veneration ultimately is not about the dead, but about how the living make use of the dead."

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7 HATS KAAB: A NEWLY DISCOVERED E-GROUP AT THE CLOSING OF THE 13TH BAKTUN

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Since 2011, the Belize River East Archaeology (BREA) Project has been surveying and mapping a wide range of cultural features spanning over two millennia in a study area centered on the middle Belize River Valley. Some of the sites identified are now also being excavated. One such site is Hats Kaab, an architectural complex of ritual commemoration known as an E-Group, located just north of Saturday Creek in the vicinity of Belmopan. Agricultural clearing in this region over the last ten years has greatly affected the preservation of archaeological remains. Here, we focus on the identification of the E-Group and the mapping of its features, and on the range of characteristics that make it similar to the first such complex identified at Uaxactun, Guatemala nearly a century ago. We discuss a program of systematic surface collection over the entire complex, and excavation of selected areas. Both of these efforts constitute the basis for our suggestion that the construction of this E-Group dates to the Late Preclassic period. Lastly, as a great cycle of Maya time reckoning concludes, we report on observations recorded on the last summer solstice of the 13th baktun at this newly discovered E-Group.

Introduction

In January 2011, the Belize River East Archaeology (BREA) Project began reconnaissance of a large study area spanning the middle Belize River Valley (Figure 1). The focus of this survey and mapping campaign is to establish the distribution of cultural features and identify sites for future excavation. The site of Hats Kaab is one of those newly-located sites; it warrants further attention due to its unique configuration of mounds, consisting of a large western mound facing a plaza circumscribed to the east by a north-south running platform capped by three individual mounds. This architectural complex is identified as a potential civic-ceremonial E-Group, aligned to commemorate astronomical events (Figure 2).

This paper discusses the surveying and excavation procedures followed at the site of Hats Kaab, including results of a systematic pedestrian survey carried out over the entire complex. The impact of recent agricultural activities at the site is also addressed, along with ramifications for determining the duration and intensity of occupation. We also describe the configuration of the E-Group as it compares to other well-known E-Groups (Uaxactun, Tikal, Caracol). Based on architectural similarities, we believe that construction of the Hats Kaab E-Group began in the Late Preclassic period (c. 250 B.C.–A.D. 250), and continued to be used at least into the Early Classic (A.D. 250–600). At the close of the 13th Maya baktun, we also include observations carried out at this E-Group on the summer solstice of 2012 (June 20, 2012).

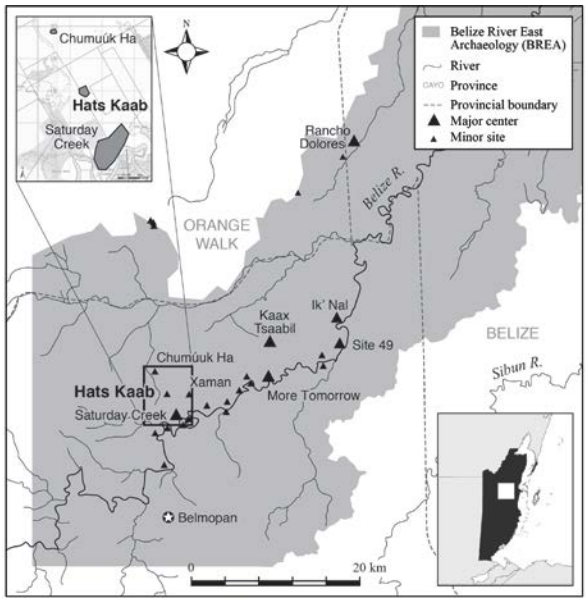

Figure 1. Overview of the BREA Project Study Area (Hats Kaab and Nearby Sites Highlighted).

Background

The site of Hats Kaab lies about 1 km north of the previously-excavated site of Saturday Creek (Lucero 1999, 2002; Figure 1), and about 19 km north of Belmopan. It is located east of the southern stretches of the Colorado Lagoon. There are a few nearby sites with limited Late Preclassic occupation, including Saturday Creek (Lucero 1999, 2002), Chumúuk Ha, and Xaman (Harrison-Buck 2011). The relationship between these sites and

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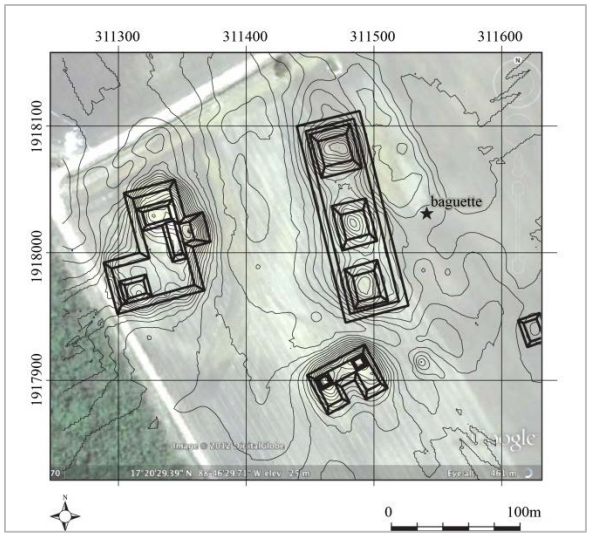

Figure 2. Topographic Map of Hats Kaab Area and Estimated Building Outlines (Adapted from S. Murata).

Hats Kaab remains unclear, as does the boundary of the latter site itself. Hats Kaab could possibly be a very distant northward extension of Saturday Creek, or a westward extension of Xaman. Alternatively, material remains collected from Chumúuk Ha by Kaeding and Murata during the initial survey in 2011 indicate Late Preclassic continuity with Hats Kaab in the presence of the same ceramics types. The location of both sites along the edge of the lagoon warrants future testing of this area to locate some of the earliest settlement in this region.

In the past 10-15 years, the land on which Hats Kaab lies has been subject to intense forest clearance and agricultural development. These activities have greatly impacted the preservation of the archaeological record. In fact, during the period of active fieldwork at Saturday Creek (1998-2001), the area remained shrouded in dense scrub vegetation. Today, aerial photography of the fields along the eastern edge of the Colorado Lagoon, accessed through Google Earth and Bing Maps, suggests that circular color change patterns consistent with known mound sizes represent mounds that once existed to the north and south of Hats Kaab. These mounds have recently been razed by agricultural activity, in particular for rice cultivation. The extent to which past people inhabited the area directly surrounding the Hats Kaab E-Group has been difficult to infer from surface and aerial survey alone. We do know that there was some occupational continuity at the nearby site of Saturday Creek, where Late Preclassic, Classic, and Terminal Classic deposits have been found (Lucero 1999, 2002). Radiocarbon samples from Hats Kaab are currently being processed so dates are not yet available; however, the ceramic assemblage of this site and of areas along the edge of the lagoon provides further support for Late Preclassic construction and occupation.

2012 Excavation

In January 2012, the BREA team opened a 12 x 2 m trench (Operation 7) that transected the central mound on the eastern platform of the E-Group. This trench was laid out along the central east-west axis of the mound, within a recently planted sorghum crop. We did not expect the mound structure to be well preserved, due to the extent of recent agricultural clearing of stones that interfere with plowing. However, the excavation goal of determining the extent of plow damage and stratigraphy of the mound were deemed worthwhile.

A platform or terrace wall was uncovered at the interface of the plow zone and underlying layers (Figure 3a). These stones fronted architectural fill consisting mostly of clayey dirt with some small limestone inclusions. It seems likely that the majority of this clay and mud fill probably derived from the nearby river floodplain. Stratigraphic levels were thus determined by paying close attention to differences in color and texture. A number of earthen lenses were uncovered, probably the result of basket-load construction methods.

The western end of the trench was most informative regarding the sequence of mound construction. Here, three stone courses were found that likely made up the retaining platform wall of the mound, and possibly an access step given their central location. In front of this stone coursing, an oval-shaped cut containing cobbles (between 5-10 cm in diameter) was uncovered (Zone 13). We interpret this cut as patching work carried out on the heavily trafficked surface of the central access point of the mound staircase. Intruding into this ‘patchwork’ cut was a smaller circular pit initially considered a possible cache or burial (Zone 6); however, the

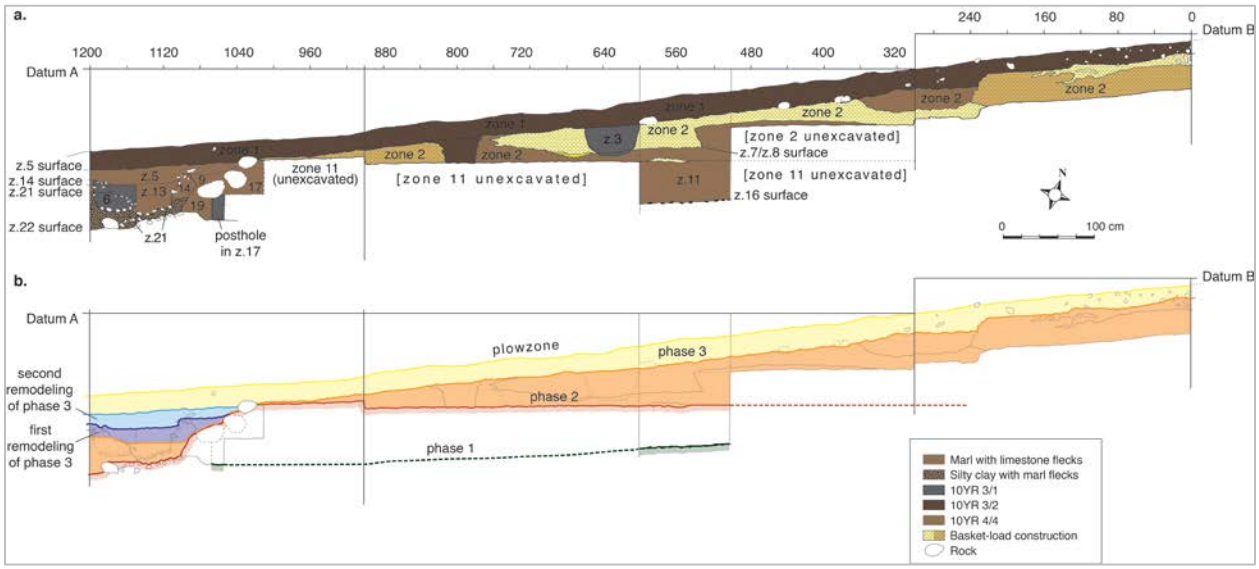

Figure 3. Operation 7 Profile (a) and Phases (b) of Construction/Occupation.

lack of material remains within the pit suggests either that the pit contained perishable offerings or was created for some other, unknown purpose. In total, five floor surfaces were uncovered (Zones 5, 14, 16, 21, and 22), two of which (Zones 16 and 22) may belong to the same phase.

Based on these findings, we were able to reconstruct the building phases comprising the investigated portion of this central mound. In total, we observe three main phases of construction, with additional remodeling events (Figure 3b). The earliest phase (phase 1) consists of a surface laden with sherds and charcoal, which is markedly different in the number of artifacts present. For comparison, we note that most other zones and surfaces contained very few artifacts. We have submitted a charcoal sample from this phase to corroborate the oldest age of this layer. Phase 2 is distinguished by construction of the platform/terrace wall indicated by the stone coursing mentioned above. During this phase, height was added to the platform by mounding roughly half a meter of clay and dirt on top of the previous layer. A charcoal sample from this phase was also submitted for AMS analysis, to determine the relationship of the sherd-laden phase 1 and the artifact-poor phase 2. Phase 3 construction preserved the stone coursing of phase 2, but added additional height to the platform (c. 25–40 cm). Two remodeling phases were carried out in front of the central staircase of the mound, which lends support to the interpretation of this area being heavily used.

In May-June 2012, the BREA team returned to the site of Hats Kaab and opened a new trench on the north end of the central eastern mound (Operation 9). The goal of this trench was to follow out the platform/terrace wall found in Operation 7. To place the new trench, we projected the lines of the platform wall NNW with a total station, at a distance of 10 m. As predicted, in the eastern section of this 14 m long trench, we uncovered stone coursing very similar to that found in Operation 7. This finding, in conjunction with the fact that the rest of Operation 9 was nearly devoid of artifacts and stone, reaffirms our assumption that these stones are part of the same platform/terrace wall.

Operation 9 reveals another interesting feature: the intrusion of several postholes into the terrace surface, spaced in rough intervals of 1 meter, along the same east-west axis of the mound. No cultural materials were found in these postholes. While these postholes may have been part of perishable structures atop the mound, we suggest that they may have been used as freestanding posts that were part of solar observation practices and rituals. For comparison, three large postholes have been found in front of the central eastern structure at

Cival's E-Group Plaza (Structure 7; Estrada Belli 2011: Figure 4.9).

On the last day of the field season (and during a particularly rainy week), a pit was discovered on the westernmost end of the Operation 9 trench. In the westernmost corner of this pit, an articulated jawbone and maxilla were uncovered. In addition, at the eastern edge of the pit and at the base of the cut, a complete inverted jar was found. While the jar was excavated, the burial was left intact because of the very challenging and waterlogged conditions of the pit. Thus, one of the primary goals of future excavation will be to investigate this possible burial and offering to understand how mortuary and offertory events at this location compare with other ritual activity at known E-Groups.

Surface Collection

The excavations at Hats Kaab are instructive because they recovered considerable detail in the construction sequence at the site - in an area where mechanized agriculture is quickly obliterating features of archaeological heritage. However, the meager number of artifacts recovered (most of which consist of highly fragmented pottery sherds lacking in diagnostic features) leave much to be explained regarding the temporal aspect of the occupation. To remedy this issue in an expedient way, we decided to conduct a systematic surface survey of the entire E-Group complex. In addition to gathering a broader range of artifacts, this surface collection is also useful as a way to determine the extent of post-depositional disturbances from the clearing and plowing of the field.

In the field, a regular grid was set up, using the spacing of the sorghum rows (each conveniently 1 m in width) as a guide. Each grid unit was 6 x 25 m; we set up 36 columns running north-south and 10 rows running east-west, for a total of 360 grid units spanning an area 216 x 250 m (total surface area was 54,000 m^2). The grid was anchored in the northeast corner of the site, just north of the northernmost eastern mound. A GPS point was taken at this point to help georeference the grid later on. The extent of grid units was highlighted with metal pins and flagging tape for project members to identify when walking the surface collection area.

Students, project staff, and workers all participated in the surface collection. Eight individuals walked per pass, and thus four and a half passes were undertaken (for a total of 36 walked columns). Before each pass, participants were given 10 empty Tyvec bags, one bag for each individual grid unit. For example, the participant walking in column one would collect all visible artifacts lying on the surface in their "column 1, row 1" bag, until they reached a pin flag demarcating the beginning of row two. At this point, the participant would close the first bag and begin collecting in the bag marked "column 1, row 2." These bags were returned to the field lab, washed, and processed. Their contents were tabulated and entered into a database for analysis, which also allowed the materials to be displayed visually.

At this point, we undertook spatial analysis of the surface collection. In ArcGIS, the 216 x 250 m grid was overlayed on a DEM of the Hats Kaab structures, and a relational database was constructed such that each individual grid unit was linked to a table containing information on all types, counts, and weights of artifacts found in that grid. Next, the database was queried to portray the location, density, and weight of artifacts from across the Hats Kaab E-Group complex (Figure 4a, 4b, 4c). While we have created displays of both counts and weights, here we provide illustrations of the weight representations as a better visual approximation of volume distributions across the grids.

When all grid cells with no material culture were queried, we observed good correspondence with negative evidence and a location in the plaza (Figure 4a). However, we also note that a number of grid cells on top of the western platform mound returned no artifacts. Whether this is due to long-term post-depositional processes, and/or intentional or recent clearing and cleaning of this mound platform cannot be determined at this stage, but informant data suggests that this area was most heavily bulldozed to fill in hollow spots elsewhere, and this practice may be precisely what is visible in the distribution of materials recorded through our methods. Other artifacts

(e.g., ceramics, groundstone, chipped stone tools, debitage, and obsidian) also tend to fall on, or in close proximity, to the mounds (Figure 4b, 4c). Also noteworthy is the distribution of what we call "baked clay material," a category into which building daub belongs, but which additionally entails more recently burned clay. As the surrounding soils of Hats Kaab have high clay content, we must recall that any recent burning of brush (which often accompanies agricultural clearing), can lead to the inadvertent creation of what otherwise would be called daub. When the distribution of baked clay material is examined, a north-northwest/south-southeast running line appears. We believe that this baked clay material is primarily the result of farmers creating linear piles of woody debris and then burning the woodpiles, a practice we have observed occurring over the last two years in surrounding fields. The heat from the burning would have darkened and hardened much of the underlying clayey soil. For this reason, we disregard the distribution of so-called baked clay material as a marker of ancient human behavior. This is yet another example of how post-depositional agricultural clearing can hamper understandings of the archaeological record.

E-Group Morphology

The distinctive morphology of E-Group architectural complexes (first identified at the Group E section of Uaxactun) consists of a western pyramidal mound (the "viewing mound") that faces a raised, north-south oriented platform capped by three evenly spaced mounds and separated by a level plaza surface. Some E-Groups display additional buildings, such as north and/or south building(s) and in some cases, even a ball court (e.g., Blackman Eddy, Cahal Pech, El Pilar, Ucanal, Uxul, Xultun, and Xunantunich; Aimers and Rice 2006). Other E-Groups differ in their degree of openness, or the extent to which they were accessible to all community members (Aimers and Rice 2006: 90).

E-Groups are specialized architectural arrangements, designed and constructed by the Maya as a way to observe and/or incorporate astronomical symbolism into daily and spiritual practice (Aimers 1993; Aimers and Rice 2006; Aveni 2003; Cohodas 1980; Estrada-Belli 2011;

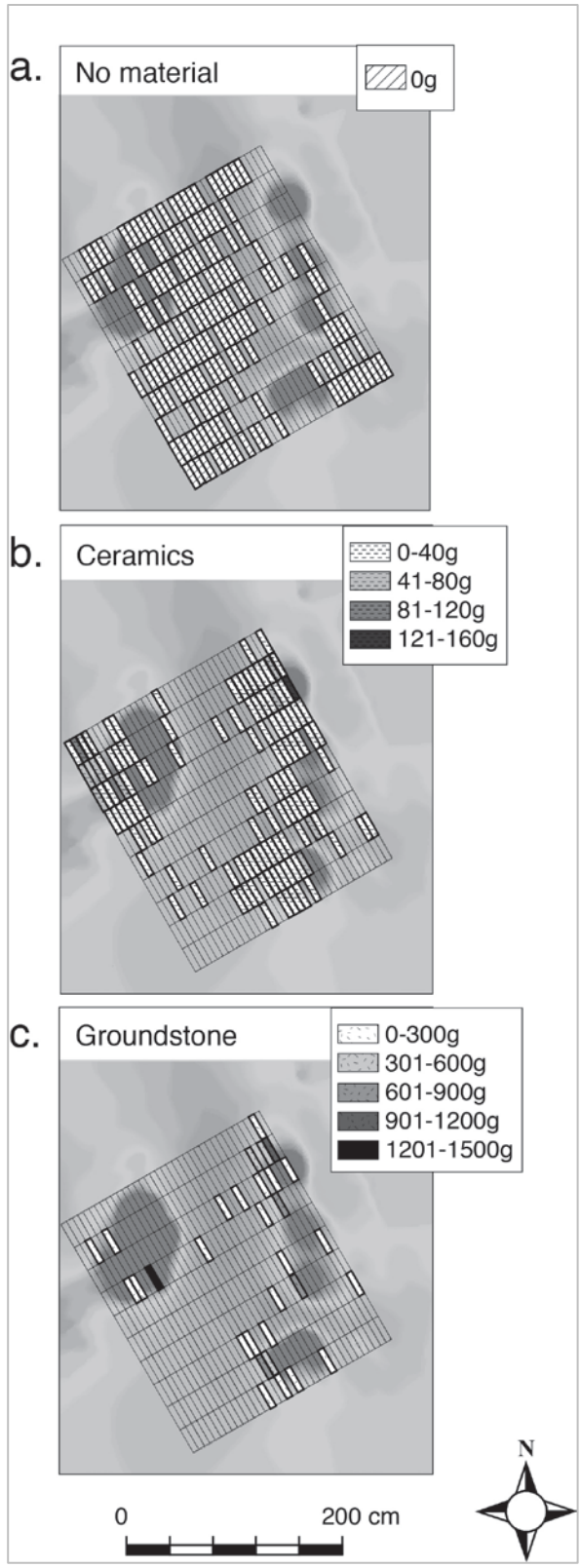

Figure 4. Surface Collection Grid Depicting Distribution of No Artifacts (a), Ceramics (b), and Groundstone (c).

	Angle					
Site	WM dimensions (m)	WM surf. area (m^2)	EP dimensions (m)	EP surf. area (m^2)	Plaza dimensions (m)	Plaza surf. area (m^2)
Uaxactun	24 x 23 (main mound), 14 x 13 (southern platform)	734	70 x 40	2800	92 x 44	4048
Tikal	60 x 60	3600	89 x 21	1869	135 x 69	9315
Caracol	63 x 58	3654	115 x 52	5980	65 x 48	3120
Hats Kaab	94 x 52	4888	156 x 54	8424	171 x 97	16,587

Table 1. Comparison of Size and Volume of Select E-Groups (WM = western mound; EP = eastern platform).

Guderjan 2006). When viewed from atop the western mound, all E-Groups mark the location of the rising sun, with varying degrees of accuracy (e.g., Aimers and Rice 2006; Guderjan 2006). Around the summer solstice (20-21 June), the sun rises over the northern mound of the east structure; around the winter solstice (21-22 December), the sun rises over the southern mound of the east structure; around the spring and fall equinoxes (20 March and 22-23 September), the sun rises over the central mound. In this manner, E-Groups function as architecturally-inscribed calendars that encompass the total span of the sun's movement along the horizon throughout the astronomical year, which is produced by tilting of the earth and the angle at which the sun passes overhead at different times of year (the so-called day arc).

Three form-based types of E-Groups have been described (Chase 1983: 1301; Chase and Chase 1995), and some additional 'pseudo' forms have also been identified (Guderjan 2006). The first type, "Uaxactun Style Group E," consists of the three eastern structures located atop a single platform and displaying uniform size (Chase 1983: 1301). The second type, "Cenote Style Group E," is distinguished by less regularity among the eastern structures: the central eastern structure tends to be enlarged and elaborated, while the north and south buildings are diminished. The third type, "Cenote Variant Style Group E," is a catchall group for those E-Group-*like* structures that do not conform in a consistent way to the above characteristics.

E-Groups are also some of the earliest examples of monumental, formalized architecture produced by the Maya for public performance (Estrada-Belli 2011: 74). The earliest examples derive from the Middle Preclassic (by 800–600 B.C.), including sites such as Nakbe (Hansen 1998), Tikal (Laporte and Fialko 1995), Cival (Estrada-Belli 2011), and most recently Ceibal (Inomata 2012). These early astronomically aligned structures may have given rise to the development of triadic arrangements in later times, in which the central building of the eastern alignment is pushed back or eastwards, and the orientation of the north and south buildings in this alignment are turned to face each other (Estrada-Belli 2011: 67-68; Hansen 1992: 55-56; Hansen 1998: 78).

Comparison of E-Group Morphologies

In this section, we present a discussion of the distinguishing morphology of some Middle and Late Preclassic E-Groups (Uaxactun Group 'E,' Tikal-Mundo Perdido, Caracol 'A' Group) and compare them to the Hats Kaab E-Group. These E-Groups display similar architectural configurations and would be placed in Chase's "Uaxactun Style Group E" category. Apart from layout, however, the building proportions, plaza volume, alignment of the complexes, and line-of-sight angles between buildings are not uniform.

At Uaxactun, the western pyramidal mound is roughly 24 x 23 m, with a southward projecting platform of 14 x 13 m, and with a total surface area of c. 734 m^2 (Table 1). The

	Angle						
Site	A	B	C	D	E	F	G
Uaxactun	17 30’	18 30’	36	73	89 30’	90	71 30’
Tikal	18	17	35	74	88	89	74
Caracol	12 30’	13	25 20’*	74 30’	93 30’	100 30’	67
Hats Kaab	20	19	39	79	79 30’	77 30’	84

Table 2. Comparison of Angle Measurements of Select E-Groups (*Source*: Aimers 1993: Table 5).

*Note: There appears to be a miscalculation of angle C at Caracol reported in Aimers’ 1993: Table 5, as angles A and B should be equal to angle C. In both this publication and Aimers and Rice 2006: 88, angle C for Caracol is reported as 15 20’. Even with our new calculation of 25 20’ for angle C, it is still the smallest number in the range.

western pyramidal mounds of Tikal and Caracol are nearly five times as large as Uaxactun’s (Caracol: 63 x 58 m, surface area of 3654 m^2; Tikal: 60 x 60 m; surface area of 3600 m^2), lack a platform, and display nearly uniform proportions. All three complexes have an eastern platform on which the three eastern structures are placed. These structures are generally uniform in size (although we must recognize that later constructions obscure Late Preclassic platform shape); the central buildings of each have stairways that extend to the plaza (Uaxactun, Tikal) or lowest retaining wall (Caracol). Eastern platform dimensions also differ: Caracol’s is the largest (c. 115 x 52 m, surface area of 5980 m^2), twice as large as Uaxactun’s (c. 70 x 40 m, surface area is 2800 m^2), and more than three times as large as Tikal’s, which is longer and narrower (c. 89 x 21 m, surface area is 1869 m^2).

Intervening plaza size is inversely related to the size of eastern platforms. Caracol’s E-Group plaza covers an area of 65 x 48 m (surface area of 3120 m^2); Uaxactun’s plaza measures c. 92 x 44 m (surface area of 4048 m^2); and Tikal’s plaza spans 135 x 69 m (surface area of 9315 m^2). The ratio of length to width of the plazas reveals that Tikal and Uaxactun’s plazas are roughly twice as long as they are wide (i.e., rectangular; ratio of 2.0), whereas Caracol’s E-Group plaza is closer in shape to a square (ratio of 1.4). While all three of these E-Group architectural configurations fall into the same type designated by Chase (1983), we can see that their proportions vary in unpredictable ways. When the astronomical alignment of the buildings is considered, we see that these

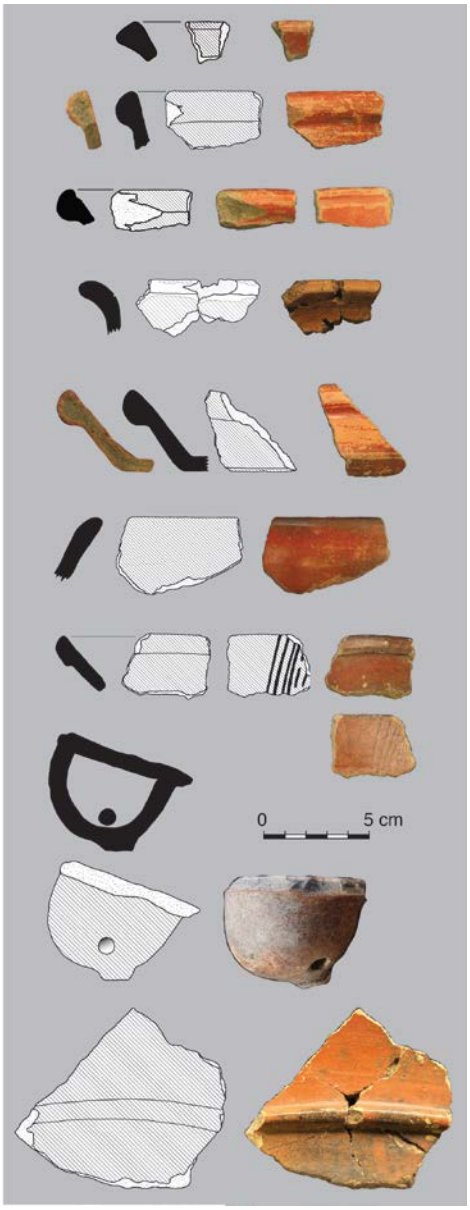

Figure 5. Sierra Group Variety Sherds.

differences persist. The angle marking the extent of yearly solar movement along the horizon (angle C; see Aimers and Rice 2006: 87 for angle descriptions) is 36° at Uaxactun, 35° at Tikal, and only 25.3° at Caracol (Table 2; Aimers 1993: Table 5). Further, while both the Tikal and Uaxactun E-Groups are "semi-restricted plazas" (Aimers 1993: Table 3), Caracol's E-Group is characterized by an open plaza and a ballcourt within a 100 m distance.

The E-Group at Hats Kaab comprises a western pyramidal structure that bears structural similarities to that found at Uaxactun (i.e., there appears to be a southward projecting platform, although disfigurement due to agricultural clearing hampers better inference). This pyramidal structure is even larger than that found at Tikal or Caracol (about 1.5 times: c. 94 x 52 m, total surface area of 4888 m^2). The eastern mounds appear to sit on a shared platform, positioned along a rough north-south axis. This platform also exceeds the size of the largest seen at Caracol by about 1.5 times (c. 156 x 54 m, total surface area is 8424 m^2). The plaza at Hats Kaab is more difficult to approximate, due to the absence of a circumscribing structure to the north, but conservative estimates suggest a size that is almost twice as large as that at Tikal's (c. 171 x 97m, total surface area 16,587 m^2). These comparisons highlight just how large the Hats Kaab group is: to reiterate, in all three dimensions discussed above (surface area covered by the western pyramid, the eastern platform, and the intervening platform), the Hats Kaab E-Group outpaces those of Uaxactun, Tikal, and Caracol (noted in the literature as large E-Groups) by factors of about 1.5 times the scale. The only other E-Group of similar scale appears to be that of Wakna/Güiro as noted by Hansen (1998: 66), in which the eastern platform measures 200 m in length.

Consideration of structural alignments at Hats Kaab reveals some differences when compared with those at Uaxactun and Tikal (Table 2). The angle measuring the solar movement along the horizon (angle C) varies slightly from Uaxactun and Tikal (39º vs. 35-36º). Otherwise, the angles do not vary greatly, and we maintain that much of the difference could be due to drag and disturbance caused by agricultural clearing, which impede better approximations of structure center points.

Finally, we note that the E-Group at Hats Kaab also features a large southern mound, containing sufficient patio space for construction of a triadic group or other type of civic-ceremonial/domestic structures. As noted above, the construction of rice fields and a deep drainage ditch north of the complex has destroyed any potential structures that may have existed. Given the current structural evidence, we argue that Hats Kaab had a semi-restricted plaza, much like the E-Groups of Uaxactun and Tikal (Aimers 1993: Table 3).

The above comparison reveals that the Hats Kaab E-Group is larger in various dimensions than E-Groups typically considered representative of Late Preclassic E-Groups. This must be considered from a regional perspective. Unlike Uaxactun and Tikal (large urban sites themselves), Hats Kaab has only a few associated mounds. In fact, the closest established urban center during the Late Preclassic would have been either the area of Xunantunich and Cahal Pech to the southwest or Lamanai to the northeast, both of which lie at a distance of more than 40 km. The apparently isolated position of Hats Kaab raises some very pressing questions: why was this E-Group so large, who used it, and for what purposes? While not within the scope of this paper, we are considering these issues as we continue to develop BREA Project strategies to understand sites in our research area within their regional context.

Artifact Assemblages

The systematic surface collection yielded a larger and more diagnostic sample of artifacts, including ceramic sherds, than that recovered from excavation alone. The majority of the ceramic assemblage was Late Preclassic/Terminal Preclassic in date, with a small amount of Late Classic and Terminal Classic sherds.

Sherds with well-preserved exterior slip were further analyzed. A Protoclassic red-slipped vessel with mammiform supports was recovered, along with a broad range of Sierra Group plates (everted rims) and bowls (inward curving rims; Figure 5). Other sherds are

representative of additional Chicanel types, including Polvero Black, Flor Cream, and various Dichromes. The ceramic types preliminarily identified fall into the Late Preclassic period and slightly later (e.g., unslipped Sapote Striated, plain and with impressions and applique; Society Hall Red; Laguna Verde Incised; Alta Mira Fluted; Puletan Red-and-Unslipped; San Antonio Golden-brown; Quacco Creek Red/Vaquero Creek Red).

Regarding other material culture, we recovered several marine shell fragments, one of which was perforated and carved with a step-fret motif; three obsidian cores, some reused and transformed into projectile points; *mano* and *metate* fragments of granite, limestone, and slate; greenstone axe and celt fragments; and a large chert biface weighing over 9 kg. The latter was found at the surface but off mound, and its position closest to the eastern central structure suggests that it may have been an item associated with eastern shrines, as occurs with few other similar artifacts in Belize (Jaime Awe and Arlen Chase, personal communication 2012; Figure 2). An elaborately notched eccentric specimen from Colha, which is similar in scale to the otherwise plain Hats Kaab biface, points to clear ceremonial use (Barrett et al. 2011: 25; Figure 6).

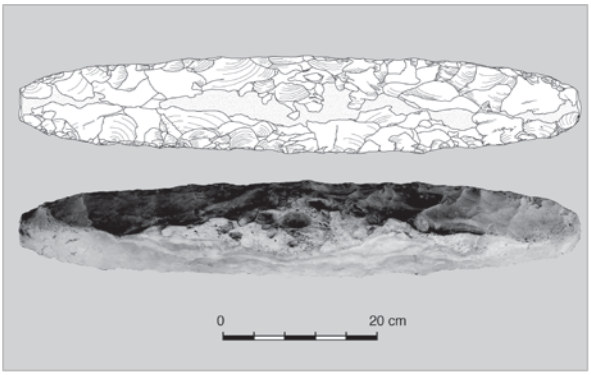

Figure 6. Chert Biface Found East of Hats Kaab E-Group.

Figure 7. June 20, 2012 Summer Solstice Observation at Hats Kaab.

Summer Solstice Observations

The site of Hats Kaab lies at a latitude/longitude of 17°20’29.35” N, 88°46’29.00” W, at which point the summer solstice sun rises at 24° north of true east when viewed on a flat horizon (Figure 7). Past studies have shown that despite the shared appearance of building components, many E-Groups do not conform to a strict geometric template (loosely clustering around similar angle values), and most trace only the general path of celestial events (Aimers and Rice 2006; Cohodas 1980). Instead, the orientation and scale of many E-Groups appears to be more closely linked to the surrounding landscape, which likely provided a set of external guidelines for the planners of these monuments. Having missed the opportunity to test the astronomical orientation of Hats Kaab during the May-June 2011 and January 2012 field trips (due to uncooperative cloud cover), we were finally able to establish that the sun clearly rises over the northeast mound on the summer solstice (20 June 2012) when viewed from the western pyramidal mound.

Summary and Conclusions

The E-Group complex of Hats Kaab is a unique case among the known repertoire of such architectural assemblages. Many E-Groups are located in the center of large urban sites (perhaps representative of an axis mundi; Cohodas 1980: 219), often atop a raised acropolis-type area and/or within large plaza complexes. However, Hats Kaab is located in an entirely rural locale (unless there is some nearby large Late Preclassic site that has yet to be discovered), in relative isolation from the influence of regional dynastic lineages. Recent scholarship suggests that rather than functioning primarily as an astronomical predictive tool, E-Groups were more likely seen as ritual architectural complexes where the observance of solar events

became intertwined with important cyclical themes of agriculture, time, life, birth, and death. As noted by Cohodas, there are various examples of E-Groups as the sole civic ceremonial construction at a site (Cohodas 1980: 214). The site of Hats Kaab appears to be one such 'isolated' E-Group; we believe that it may have provided an important public domain for the celebration of yearly rituals and the building of community identity for an area with dispersed settlement, where residents came together to commemorate solar calendrical events relevant to a shared rural farming lifestyle.

While the Maya mastery of time has been interpreted and reinforced by evidence from glyphs and murals, the concept of cyclical time can be seen in various other elements of Maya material culture, such as the E-Group complex. Especially in Belize, where comparatively few formal inscriptions and glyphic texts characterize the archaeological record, scholars are challenged to find evidence of Maya time keeping at work. The E-Group and its associated public congregation space may be our best evidence yet that time and time keeping was not limited to a priestly-astronomer rank, but rather was a concept that was important to the entire community, marking and regulating the lives of both elites and commoners. The planning and construction of E-Groups would have necessitated a detailed knowledge of the local landscape and sky, varying at each locale with the changes in topography and sight-lines, as well as the investment of labor and time by the local community. The presence of an E-Group in rural locations likely represented an important community calendar, depicting the rhythms of both the ritual and agricultural life, interpreted and utilized on an individual and community scale.

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8 A NETWORK OF WATERWAYS IN THE EASTERN BELIZE WATERSHED: RECENT SURVEY AND EXCAVATION OF THE 2012 BREA FIELD SEASON

Eleanor Harrison-Buck, Adam Kaeding, and Satoru Murata

The Belize River East Archaeology (BREA) project is examining the eastern Belize Watershed as a major network of waterways that facilitated the movement of goods and people in the ancient past. Our investigations show that most Maya settlement hugs the trunk of the Belize River, its tributaries, as well as a series of wetlands. Some waterways appear to be connected by overland routes. At least one north-south route is documented in the Spanish ethnohistoric accounts at the time of Contact, which connected the mid-section of the Belize River to the New River farther to the north. The projected path for this overland route was surveyed in 2012 and our finds along this route date from pre-Hispanic to Colonial times. Another north-south overland route may have passed by the ancient hilltop site of Kaax Tsaabil, one of the largest centers in the study area located 2km north of the Belize River. This site was mapped with a Total Station and further investigated in 2012. Additional survey farther downstream on the Belize River revealed both large and small settlements, several of which were mapped and excavated. Preliminary results from our survey, mapping and test excavations from 2012 are presented here. We conclude with a discussion of our future investigations of an expansive wetland area in the northern part of the BREA study area where we identified ancient hydrological features, including ditched and drained wetland fields that resemble others found in Belize.

Introduction

The eastern Belize River valley appears to have a long history that extends from the Formative period through Colonial times. Here, we report on investigations carried out this year during our second season of the Belize River East Archaeology (BREA) project. The BREA study area encompasses the eastern Belize watershed between Belmopan and Belize City (Figure 1). We find that most of the ancient Maya settlement hugs the bank of the Belize River, likely because it served as the ancient "highway" between the coast and inland centers. While the main trunk of the Belize River serves as the anchor for our archaeological investigations, the Belize Watershed comprises numerous creeks and a large expanse of wetlands to the north. These bodies of water formed a network of waterways that facilitated the movement of people and goods from Preclassic through colonial times. Ethnohistoric accounts suggest that while waterways were critically important, there also was at least one primary north-south overland route that connected these rivers and creeks, linking settlement along the middle Belize River to sites farther north, such as Lamanai (Figures 1 and 2).

One of our goals for the January 2012 season was to carry out further intensive pedestrian survey along this projected route in order to pinpoint the location of this north-south overland route (Figure 2). We also continued to survey the western portion of the study area in the mid-section of the Belize River, between Banana Bank and the confluence with Labouring Creek. Much of this area has been cleared for farming and has good visibility. Unfortunately,

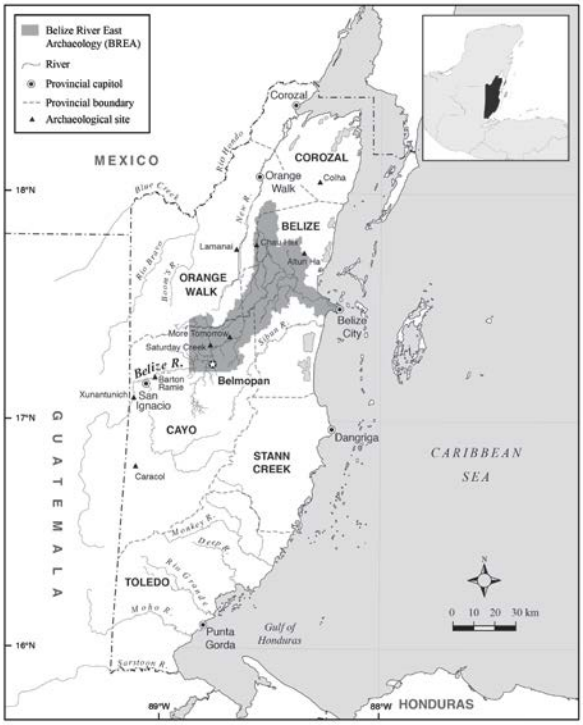

Figure 1. Map of Belize showing BREA study area (map prepared by M. Brouwer Burg).

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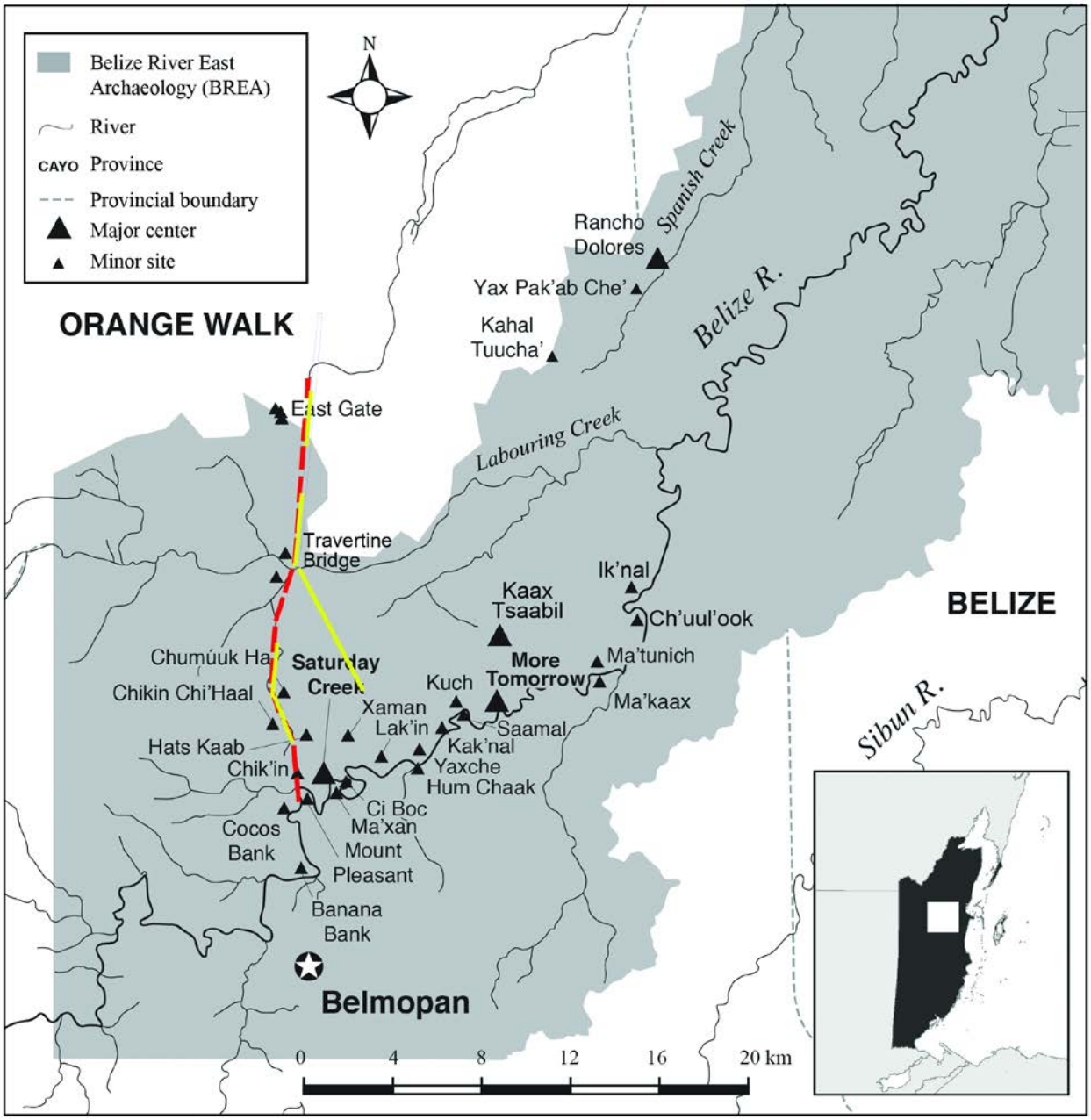

Figure 2. Western half of the BREA study area. Projected north-south overland route in red and our survey transect in yellow (map prepared by M. Brouwer Burg).

the sites in this area have been the victims of extensive bulldozing and repeated plowing over the years and are at high risk of destruction. Therefore, we aim to document the sites (map as many as we can with a Total Station and, minimally, sketch map them) before further destruction occurs. Here, I present the results of our settlement survey season during the month of January 2012, which was followed by a five-week summer season of mapping and excavations at several of the sites in the middle Belize Valley, including the sites of Hats Kab, Kaax Tsaabil, Huum Chaak, and Ik'nal. Our investigations continue to reveal the dense and long history of occupation in the middle reaches of the Belize Valley. Our excavations at Hats Kab showed evidence of substantial Preclassic occupation in the form of an E-Group (see

Runggaldier, Brouwer Burg, and Harrison-Buck, this volume). Additionally, we continue to identify a heavy Terminal Classic occupation in the area and during the summer 2012 season, we conducted archaeological excavations at two sites with Terminal Classic circular architecture – Huum Chaak and Ik'nal. A third site—Kaax Tsaabil—revealed an unusual burial and a possible termination of the main elite residence, both dating to the transition between the Terminal Classic and Early Postclassic. Below I discuss the survey and mapping, as well as the preliminary results of our excavations.

Survey and Mapping

During the 2012 season, numerous settlements, both large and small, were documented in the western part of the study area by the BREA survey team. One of the largest sites we have identified in this area is Kaax Tsaabil (Figure 3). The site of Kaax Tsaabil is located roughly 2 km north of the Belize River (refer to Figure 1). Proximate to this large site is a cavernous modern quarry that appears to have taken out at least one of the four main hilltops with ancient Maya structures on top. Local informants tell us that there were at least four or five structures that were destroyed when the area was quarried. In January 2012, it came to our attention that the hilltop site and 7000 acres surrounding the site that were in bush had been sold to Green Tropics Ltd. and they would begin clearing the land that spring. This prompted us to spend most of January mapping the site of Kaax Tsaabil with a Total Station. We also met with the land owners who agreed not to clear the hilltop. We are currently negotiating with them not to clear the mounds in the low-lying areas as well (visible in Figure 3).

Also during the January 2012 season, we conducted additional pedestrian survey along a projected north-south overland route, which was recorded by the Spanish in the sixteenth century. Figure 2 shows the projected north-south overland route in red and our pedestrian survey transects in yellow. According to the Spanish accounts, the north-south overland route stemmed from the headwaters of the New River (Ram Goat Creek) where the Spaniards (led by Maya) docked their canoes and walked across an extensive *pinal*, or "pine ridge" until they

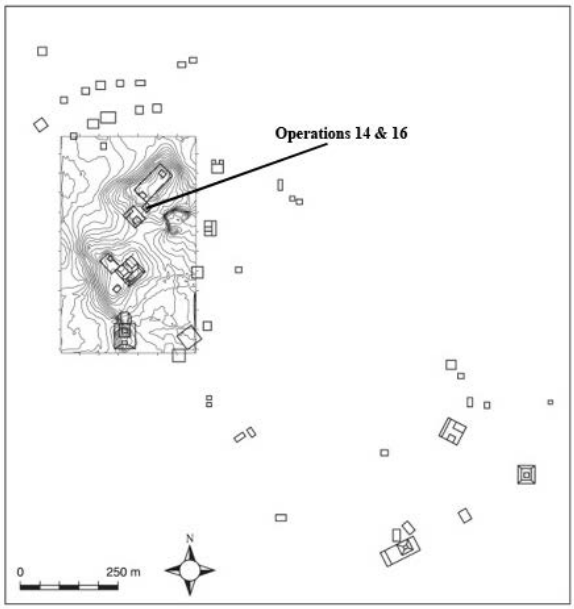

Figure 3. Site map of Kaax Tsaabil (map prepared by A. Kaeding and M. Brouwer Burg.

Figure 4. BREA survey team crossing the natural travertine bridge across Labouring Creek (photo by T. Divoll).

reached Labouring Creek, known then as Cancanilla (Jones 1989:138). They crossed over Labouring Creek on a partially submerged "natural bridge" of travertine stone and continued south toward the Belize River (Jones 1989:138, 312 [Note 35]; see also Scholes and Thompson 1977:45). In our pedestrian survey, we confirmed what the Spanish recorded—that most of this route consists of awful swamp. When the survey team reached Labouring Creek, they found a travertine dam, which was the only noticeably high spot to cross Labouring Creek (Figure 4). We believe this is the same "natural

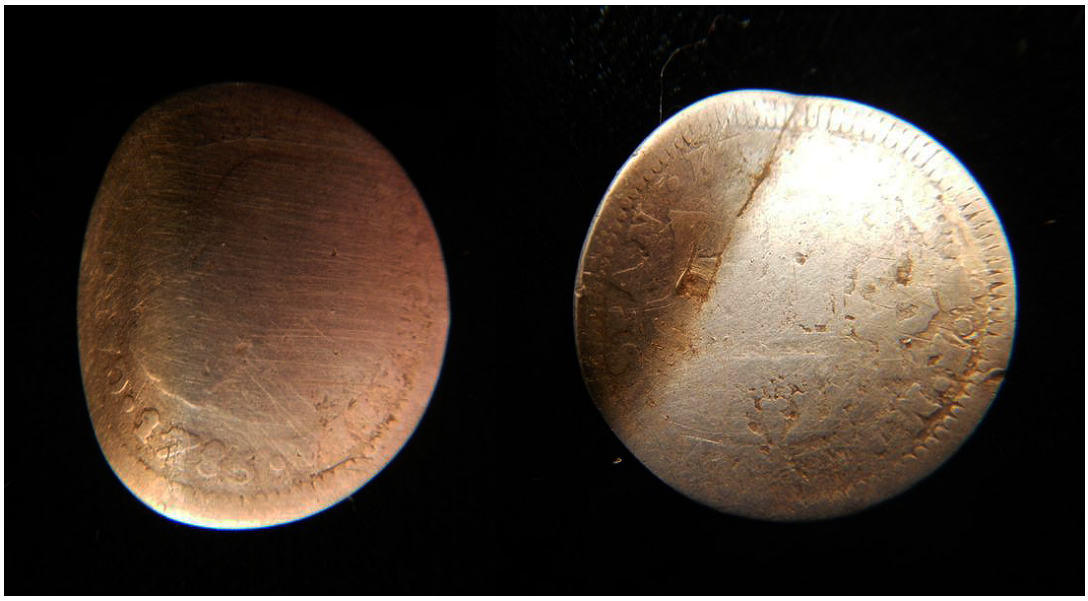

Figure 5. Spanish coin found at the site of Chi'kin (photos by E. Harrison-Buck).

bridge" that the Spanish described. Here, we found abundant evidence of ancient Maya settlement on either side of Labouring Creek and also found a good deal of colonial artifacts, but nothing on the surface looked to us to be from the Spanish colonial period. That said, our survey of the area was not exhaustive and we plan to go back next season to perform additional reconnaissance around the natural bridge and along the length of this projected north-south route.

The Spanish reported traveling from the "natural bridge" six leagues to the south where they arrived at the site of Lucu, located on the banks of Belize River (Scholes and Thompson 1977:45). Grant Jones (1989:287-288) notes that this arrival point on the Belize River was named "literally, 'the hamlet where Chantome had been,'" suggesting that this site was no longer occupied when the Spanish arrived. In contrast, Lucu (which appears to be in the same vicinity as Chantome) was "rated an important settlement" by the Spanish (Scholes and Thompson 1977:47), who described it as a "prosperous place with many cacao groves and noted for its annatto and vanilla" (Roys 1957:163). Scholes and Thompson (1977:45) surmised that Lucu was located roughly in the vicinity of Never Delay or Mount Pleasant, former villages that are now farmland under cultivation by local Mennonite farmers. Looking at our projected north-south overland route (Figure 2), we would generally agree with this assessment (see also Harrison-Buck 2010). Our survey team identified two ancient Maya settlements at both Never Delay and Mount Pleasant. In the summer of 2011, BREA surveyed and mapped the site of Ma'xan, located at the site formerly known as Never Delay, and we conducted two test excavations at this site (see Harrison-Buck 2011, ed.). Investigations of the largest mound group at Ma'xan, located closest to the river, appears to have been abandoned by Terminal Classic times. However, another smaller mound group located farther back from the river on a slightly higher terrace in a heavily plowed field revealed a dense surface deposit of Late Postclassic material. Our subsequent test excavation on this mound group revealed no Spanish colonial artifacts and very little *in situ* Postclassic material as most of the final occupation had been disturbed by plowing (Murata 2011).

Both Ma'xan and the mound group at Mount Pleasant may have been part of the larger site of Saturday Creek, which is directly across the river. During the January 2012 season, we heard reports from two different locals that they found (on two separate occasions) a total of five Spanish coins around the Saturday Creek site in

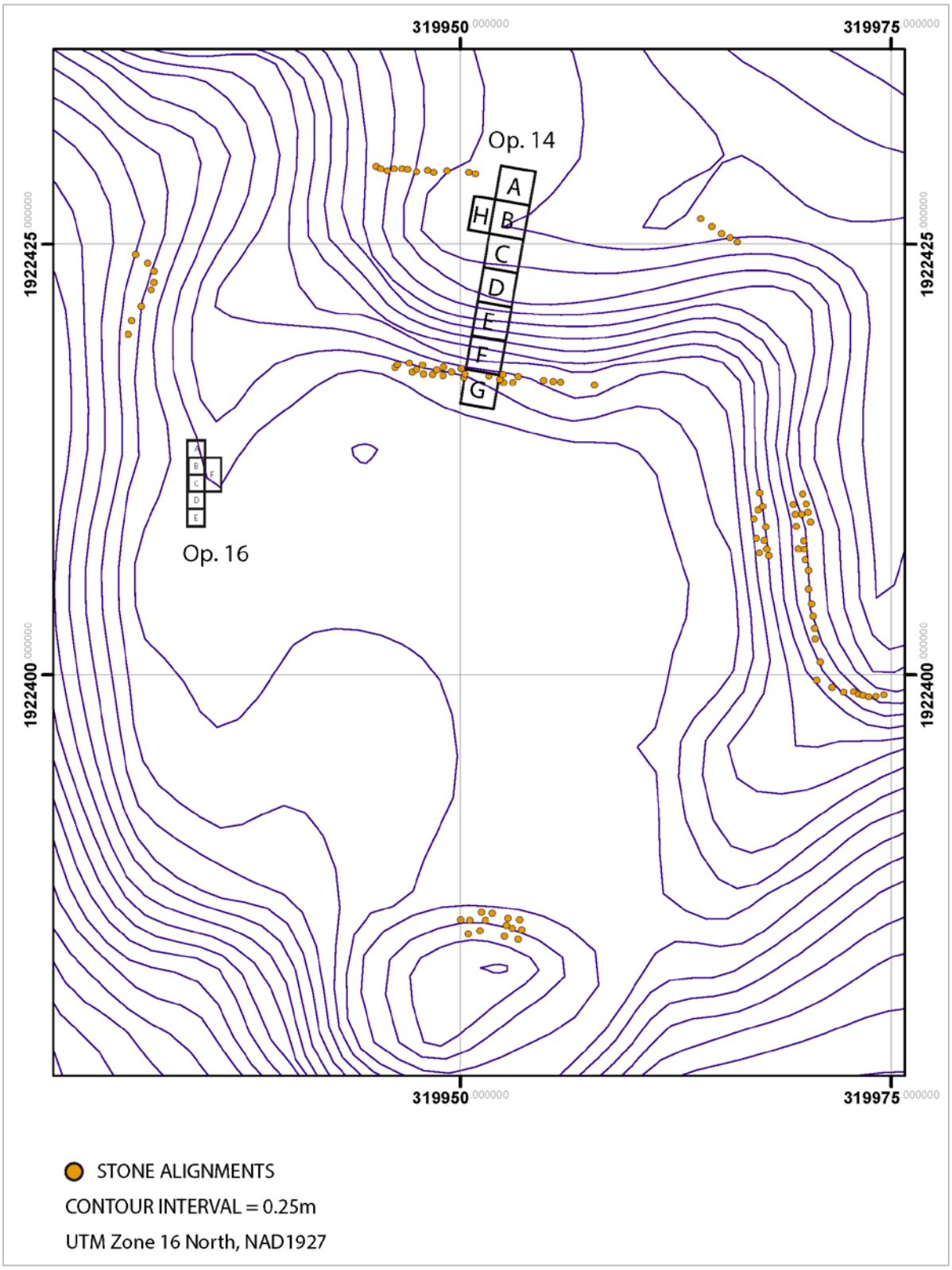

Figure 6. Map of Plaza B at Kaax Tsaabil showing locations of Operations 14 & 16 (map prepared by S. Murata).

a low floodplain, locally referred to as "Otley's Flat" (Figure 2). Unfortunately, no one could produce the coins they had found nor were they able to recall the dates on them. Nevertheless, in our continued search for Spanish colonial remains we conducted a test excavation and surface collection around the only mound group visible in Otley's Flat during the January 2012 season. Our investigations yielded primarily ancient Maya artifacts (Terminal Classic and Postclassic material) as well as a high density of British colonial material. No Spanish colonial artifacts were apparent in the assemblage. However, while conducting surface collection in the vicinity of the excavation unit, Adam Kaeding discovered a Spanish coin on the surface of the recently plowed fields with a date of 1785 (Figure 5). Heavy plowing of this low floodplain has obscured the archaeological contexts and it may never be known how or why this many Spanish coins came to be deposited in this particular location.

While we have yet to find definitive evidence of a sixteenth century Spanish colonial presence in this area, there is little doubt that this location along the Belize River marked an important junction and served as a major cross-roads from pre-Hispanic through colonial times given the wealth of ancient Maya and British colonial artifacts visible on the surface of the plowed fields. Based on the size of the Saturday Creek archaeological site (that Ma'xan and Mount Pleasant were likely a part), we suspect that this was the ancient site of Chantome, which was no longer occupied when the Spanish arrived. It is possible that the contact period Maya site of Lucu encompasses the numerous Postclassic mound groups that we have identified dispersed across the Saturday Creek "hinterlands" at Otley's Flat, as well as the neighboring sites of Chi'kin and Ma'xan (see **Figure 2**). Our plan is to continue to map and investigate these sites in future seasons for Postclassic and colonial occupation.

Excavations and Preliminary Findings

Kaax Tsaabil We returned in May 2012 to find the area surrounding the hilltop site of Kaax Tsaabil totally cleared of forest, which revealed further mounds in the low-lying areas, including one large pyramidal complex about a half a kilometer to the south in the direction of the river (Figure 3). Further efforts are being made to preserve these mounds as the land currently is being developed by Green Tropics Ltd. for sugar cane. We are continuing to define the aerial extent of the site. As of now, we have identified at least three large platforms with multiple buildings, including range structures, a main central plaza group circumscribed by structures including a pyramid measuring about 12 meters in height (Figure 3). Plaza B was the focus of excavation during this summer season. We placed two excavation units (Operations 14 and 16) on two different structures in Plaza B (Figure 6). Operation 16 was placed in a corridor between two structures on the western mound in Plaza B and a rich assemblage of Terminal Classic artifacts were revealed on the surface, suggestive of a termination deposit. In contrast, very few artifacts were found over top of the range structure where a staircase was exposed on the southern side of the northern range structure in Plaza B. Here, we placed Operation 14. This long 2 x 14 m excavation unit was placed on the central axis of the large range structure that was built up onto a natural hill slope. Excavations revealed at least two different construction phases consisting of a stairway with another later stairway later built overtop.

At the highest point of the range structure, Square H, an extension of Operation 14 was added to be able to expose several special deposits that were encountered, which may represent discrete ritual events. First, a cluster of ceramic vessels was uncovered, including an outflaring dish with a ring base with a kill hole in the bottom of this vessel (Figure 7a). The form is reminiscent of a Roaring Creek Red type, although the orange and tan slip is similar to the Zakpah Orange-red type that the first author recorded in Early Postclassic contexts in the Sibun Valley (Harrison-Buck 2007). Another portion of a similar vessel was found in the Kaax Tsaabil ceramic deposit, but with a very high pedestal base reminiscent of Thompson's (1939) San Jose V pedestal based redware vessels and more closely resembling the Zakpah Orange-red types recorded in the Sibun Valley. Similar types with high pedestal bases also were found in Early Postclassic contexts at

a.

b.

Figure 7a-b. Two reconstructed vessels from ceramic deposit above Kaax Tsaabil burial (photos by S. Murata and E. Harrison-Buck).

Cerros and defined as Zakpah Orange-red by Debra Walker (1990:80-82). The other vessel from the Kaax Tsaabil ceramic deposit is a small outflaring dish that is unslipped and is reminiscent of the form of a Miseria spiked censer, but without the spikes (Figure 7b). We do have carbon collected and plan to radiocarbon date the deposit in the future to clarify the chronology.

The ceramic deposit at Kaax Tsaabil overlay a burial feature containing a single individual who was, for the most part, in an extended position (Figure 8). There were three indications to us that this individual may represent a sacrificial victim, rather than a venerated ancestor. First, while the individual had filed teeth and their torso and head lay in a defined pit, the individual's legs were found propped up on the side of the burial pit, as if the person was pushed into the pit and did not fit entirely. The pit that cut into the latest floor was in-filled, but did not appear to have been formally capped by plaster. This was followed by the placement of the ceramic deposit containing vessels that were inverted and one had a kill hole, suggesting a termination (rather than dedicatory) ritual. The interment appeared to be buried in an expedient fashion, certainly not the way one would inter a venerated loved one. Another indication that this was a sacrifice was the position of the arms, that appeared crossed and possibly in a bound position (this awaits further osteological analysis). Finally, the third indication was the lack of obvious grave goods directly associated with the body, with the exception of a couple of sherds and two broken ground stone tools that may well represent fill debris rather than purposeful grave goods interred with the body. These circumstances combined with the position of the burial on one of the highest residential structures, suggests that the sacrifice could represent an elite member of this residential compound. We hope that future osteological analysis can help to clarify the cause of death for this individual and determine if our assessment of a sacrifice is correct. Further investigations in this plaza group are planned for the summer 2013 season.

Huum Chaak During the summer 2012 season we conducted excavations at two other sites—Huum Chaak and Ik'nal (Figure 2). Both sites are located along the Belize River and yielded a strong Terminal Classic component. Huum Chaak is located just up stream from the village of More Tomorrow on the south side of the river (Figures 2 and 9). At this modest size site there are two adjoining plaza groups. Excavations during the summer of 2011 revealed a Terminal Classic circular structure in the northern corner of western plaza group (see Figure 9 [Harrison-Buck 2011; Harrison-Buck et al. 2012]). The main elite residence, straddling the two plaza groups, was badly looted on its western side and a burial was encountered based on the bones seen in the looter's pit and backdirt. We laid out an excavation unit (Operation 15) on the eastern side of this structure, along a staircase that was facing an elevated, open plaza (refer to Figure 9). Here, our aim was to expose the latest phase of construction for the elite residence and define the presence of any earlier construction and associated artifacts in order to date the earliest levels of occupation. Our overall goal was to

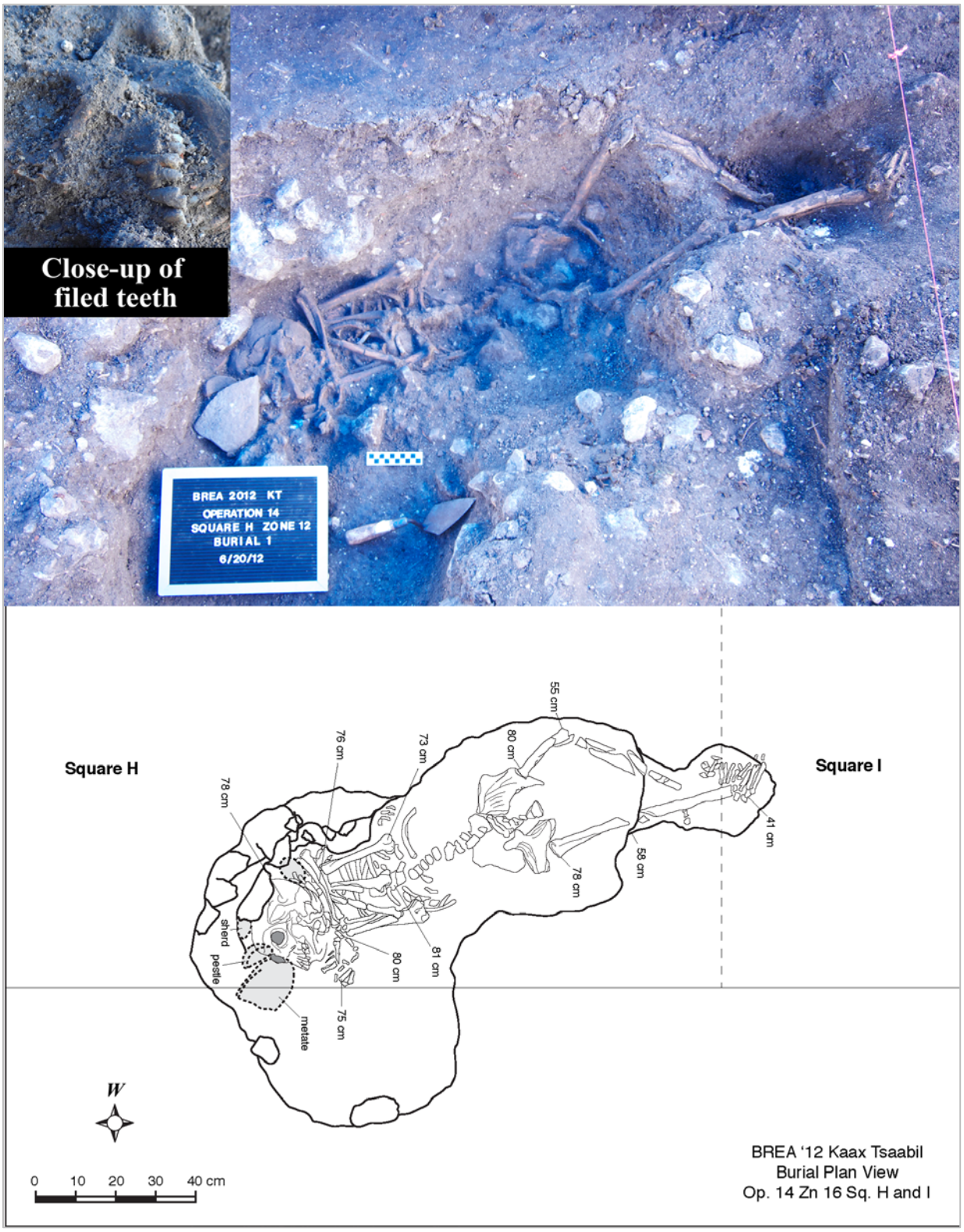

Figure 8. Kaax Tsaabil burial. (Photos and drawing by BREA staff, digitized by M. Brouwer Burg).

determine whether Terminal Classic sites with circular architecture in the eastern Belize Valley, like Huum Chaak, date strictly to this time period or whether they have an earlier phase of occupation.

Excavation of Operation 15 revealed a staircase covering an earlier phase platform that was built of large limestone blocks. We found a ceramic assemblage in the earlier occupation that may pre-date the Terminal Classic. While there is not a large assemblage present, the ceramics from this phase, including distinctive red-lipped jars, appear to date to the Late Classic II period. These jars, referred to as Runaway Creek Red-Lipped, differ from the later Sibun Red Neck jars, which are characteristic of the Terminal Classic period in the middle Belize Valley. Elsewhere, the first author has argued that the red-lipped jars may predate the Sibun Red Neck jars, showing evidence of modal continuity between the Late and Terminal Classic assemblages (Harrison-Buck 2007:255-257). The Runaway Creek Red-Lipped jar has a less outflaring, more direct rim with red slip that covers only the tip of the exterior rim and interior neck. In some cases, a tan or light orange wash occurs on the exterior of the jar. During the summer of 2013, we plan to devote additional time in the lab so that further analysis of these ceramic assemblages can be carried out and a firm chronology ascertained.

Ik'nal. As noted above, our excavations at Huum Chaak last summer revealed a Terminal Classic circular shrine structure. Therefore, we were thrilled when our recon team this past January identified another example of circular architecture at the nearby site of Ik'nal, located on the opposite (northern) side of the Belize River farther downstream (Figure 2). The site of Ik'nal is similar to Huum Chaak in that it is modest in size (Figure 10). The main elite residence defines one side of a partially enclosed plaza group with the all-stone circular shrine occupying the plaza's southeast corner. Like the Huum Chaak circular structure, the latest phase consists of a circular superstructure with an interior room accessed by a single, narrow doorway (Figure 11). In its final building phase, this room was in-filled and appears to have been transformed into a round platform at

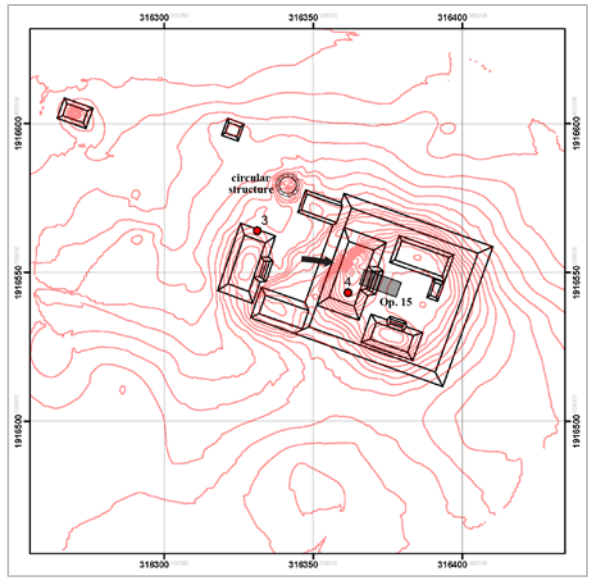

Figure 9. Plan view map of Huum Chaak showing location of Operation 15. The arrow is pointing to the area where intensive destruction of the platform/mound has taken place (map prepared by S. Murata).

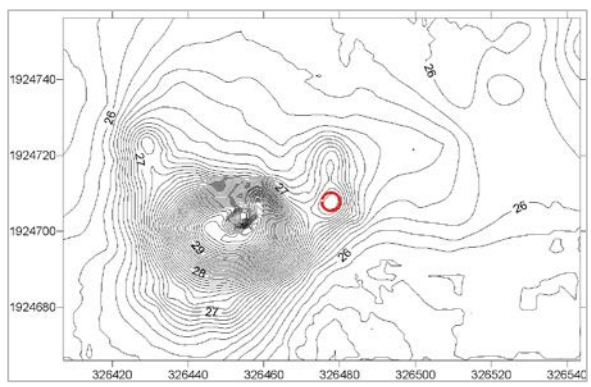

Figure 10. Site map of Ik'nal with circular structure in red (map prepared by A. Kaeding and S. Murata).

the very end of the Terminal Classic period. Tree disturbance on the surface made it difficult to discern if this platform held any superstructure in this final building phase. Ceramic sherds associated with the interior room fill appear to date almost exclusively to the Terminal Classic with only a few possible Early Postclassic sherds securely identified in our excavations on the surface. The vast majority of the ceramics belong to the Ik'hubil ceramic sphere, a Terminal Classic assemblage that has been discussed in detail elsewhere (see Harrison-Buck 2007, 2010, 2012).

At Ik'nal, only half of the interior of the circular room was excavated during the summer

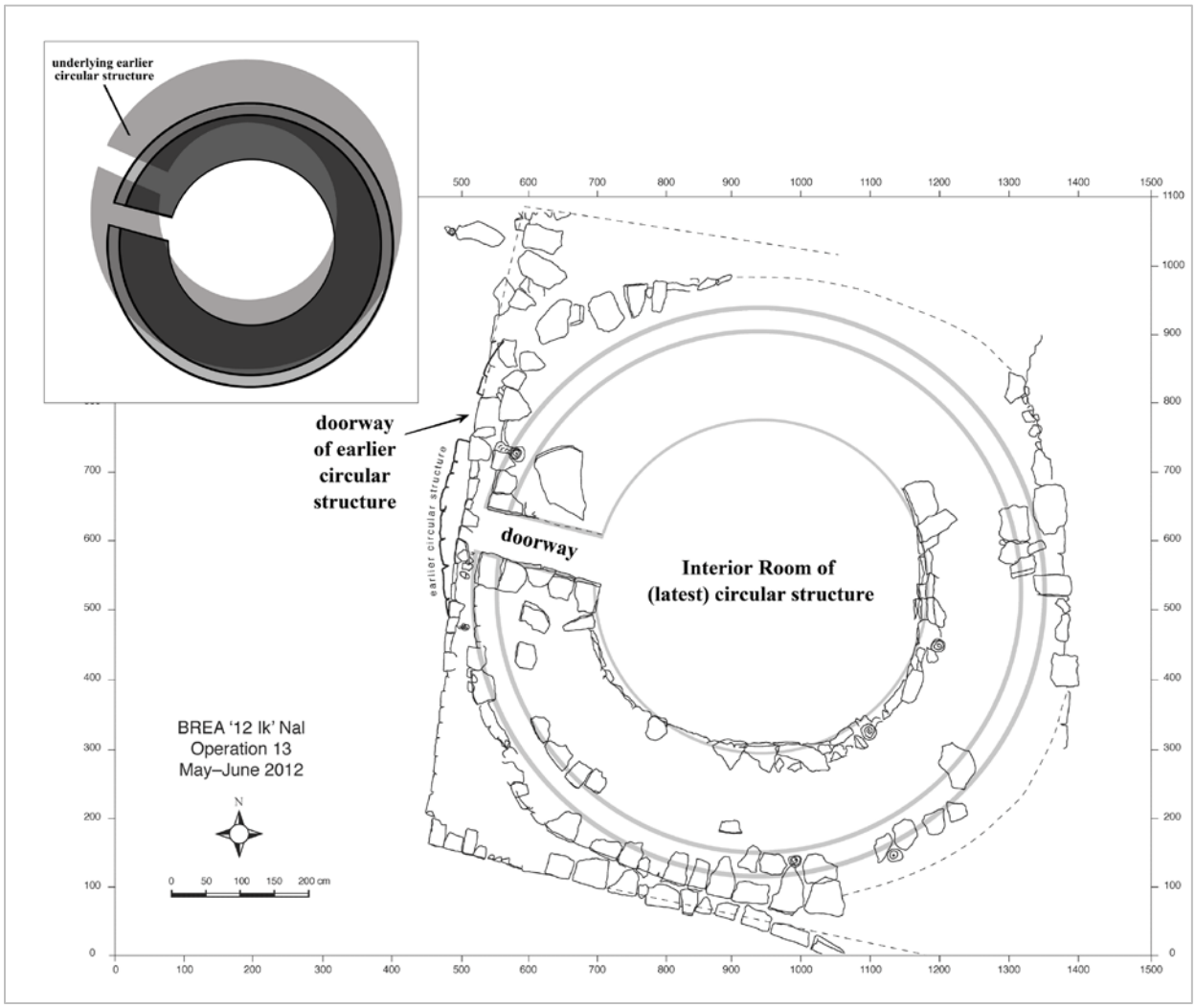

Figure 11. Planview of Ik'nal circular structure (**inset:** schematic showing the earlier and late circular structures superimposed; drawings by E. Harrison-Buck; digitized by M. Brouwer Burg).

season. We also focused our attention on excavating the exterior of the structure. Here, we defined the exterior of the circular superstructure walls with a low plinth or bench surrounding the superstructure walls and a narrow 75 cm wide doorway leading into the interior room. A high density of broken, partially preserved serving vessels were found deposited right around the exterior of the structure and consisted primarily of Roaring Creek Red, Daylight Orange/Darknight, and Achote Black ceramic types. All of these distinctive serving vessels date to the Terminal Classic period. Like the building at Huum Chaak, the final phase of the circular structure at Ik'nal likely dates to the Terminal Classic period based on the bulk of the associated ceramic material found in the fill of the interior room and directly over top of the exterior floor surrounding the outside of the building.

A rectilinear platform was found lying directly below the circular superstructure walls (Figure 11). We had a similar rectilinear platform at Huum Chaak and my initial impression was that the platform was built at the same time as the final phase of the circular superstructure. However, I am less certain of this after my excavations at Ik'nal. The rectilinear platform may represent an independent phase of construction. At Ik'nal, directly below the rectilinear platform we found an earlier circular structure. Through the course

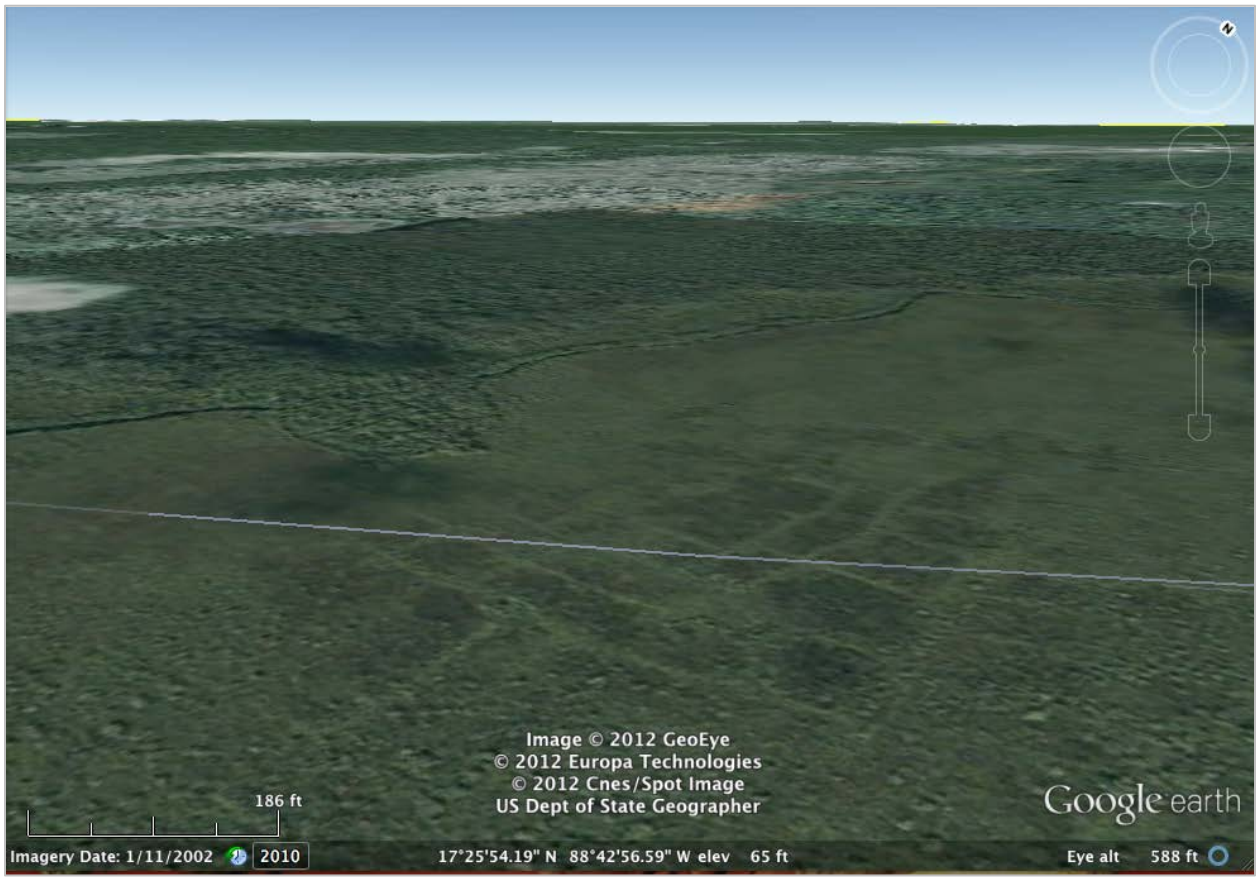

Figure 12. Satellite Image of Jaeger Wetlands showing fields and canals (Google Earth).

of our excavations, we exposed a portion of another doorway that is exactly the same dimensions in width (75 cm) as the doorway of the later circular structure. The presence of a door indicates the earlier circular building had an interior room with a layout that may have been virtually identical to (or perhaps just slightly larger than) the later circular building (see Figure 11).

Although some variation exists in the layout of circular architecture, particularly in the substructures of these buildings, the overall design of the superstructure, with a single doorway and interior room, are architectural traits that are shared among other Terminal Classic examples from sites in Belize, such as Nohmul, the Rosita Group at Blue Creek, and several other examples found in the Sibun Valley (Harrison-Buck 2007, 2012). The shared construction style and the distribution of these buildings at sites along the coast and river courses in the eastern Maya Lowlands suggest that these shrine buildings represent a network of interactive sites and may reflect growing influence from centers in Yucatan, like Chichen Itza and Uxmal, and other Terminal Classic centers with circular architecture in the Gulf Coast Lowlands, such as the site of El Tigre in the Candalaria Drainage (Harrison-Buck and McAnany 2013).

Future Research

The BREA study area straddles the interface of two markedly different environments—the uplands to the west where we find many large Classic Maya centers and the low-lying wetland coastal zone to the east where we find an abundance of Terminal Classic settlement. Notably, the coastal zones are where most of the circular architecture has been found and also where ancient Maya drained, ditched, and raised fields have been identified. Some well-known examples of wetland fields are found in the Candalaria drainage proximate to

the El Tigre site (Siemens and Puleston 1972; Siemens 1983) and also in northern Belize where recent investigations of wetland fields have been conducted near the site of Blue Creek (Guderjan and Krause 2011; Luzzadder-Beach et al. 2012; among others). While scanning Google earth our friend Nathan Jaeger, the co-manager of the Banana Bank Farm, showed us features in the BREA study area that resemble the ancient Maya ditched fields found near Blue Creek and elsewhere in northern Belize (Figure 12). These are located in a low-lying swamp area along a tributary of Labouring Creek where no modern development (such as roads or houses) exists. Further inspection of publically available satellite imagery by the authors have detected countless other wetland features, including drainage ditches, transportation canals, and other ancient hydrological features throughout the perennial wetlands of the BREA study area. A future goal of the BREA project is to document the extent of these features and the chronology of wetland use and examine how the environment, wetland agriculture, and ancient Maya society operated together in this part of Belize.

Perennial wetlands are exceedingly rare in the Maya Lowlands and are found only in the periphery or so-called “margins" of the Classic Maya world, including the Candelaria drainage in the Gulf Lowlands of Mexico, southern Quintana Roo, and parts of central-northern Belize. Yet, within the 6000 km^2 BREA study area there are over 122 km^2 of perennial wetlands (28% of all wetlands in Belize). Research has shown that perennial wetlands provide a rich repository of sediments, fauna, and plant remains that offer important proxies for gauging climate change, such as drought, and for understanding human-environment interactions and adaptive responses to stress in the Maya area (Emery and Thorton 2012a, 2012b; Luzzadder-Beach et al. 2012). Timothy Beach and others (2009) suggest that climate change at the end of the Preclassic and again during the Late Classic impacted these marginal lands and that we have much to learn from these past interactions in terms of societal vulnerabilities and sustainable strategies of resilience during times of stress. Our future investigations of the perennial wetlands in the BREA study area have the potential to reveal not only important climate data, but also greater insight into these biologically diverse environments that were intensively managed by the Maya and used for hunting, aquaculture, and agriculture throughout their long history (Beach et al. 2009; Pohl 1990; Turner and Harrison 1983; among others). Our first challenge for the BREA project will be to figure out how to get to these wetland fields that are in some of the more remote parts of the study area, but local hunters who have visited these areas, such as the Jaeger Wetlands (Figure 12), have reported substantial ancient Maya settlement. We feel confident that further study of the wetlands and the network of waterways that cross-cut these low-lying zones in the BREA study area will shed great light on the transformations that occurred at the end of the Late Classic period when many large centers in the uplands declined and sites in the coastal zone reach their apex.

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9 ACTUNCAN'S NOBLE COURT: NEW INSIGHTS INTO POLITICAL STRATEGIES OF AN ENDURING CENTER IN THE UPPER BELIZE RIVER VALLEY

David W. Mixter, Thomas R. Jamison and Lisa J. LeCount

In ancient Mesoamerica, some long-occupied centers cycled through periods of prominence, decline, and resurgence. Actuncan was one such center. It rose to prominence in the upper Belize River valley during the Terminal Preclassic period, declined in the Early Classic period, and resurged again during the Terminal Classic period. We suggest Actuncan's position on the landscape and the collective memory of its past were a source of social capital for political leaders and dissidents alike to manipulate, making the site a powerful agent of change. This manipulation can be seen in the reworking of Actuncan's Structure 19 into a noble palace when the site was subsumed into the Late Classic polity of Xunantunich. Although Structure 19's substructure dates to the Terminal Preclassic period, much of the summit architecture and ancillary buildings that formed a noble court were built in the Late Classic period. Later, the complex was razed late in the Late Classic period before a new Terminal Classic integrative building (Group 4) was built to the east. Based on these data, we suggest these actions are symptomatic of Actuncan's dissidents' rejection of Xunantunich's divine authority and their rapid adoption of a new form of authority during the Terminal Classic period.

Introduction

Claims to a primordial homeland and a local ancestral lineage were the primary method for legitimizing a Classic Maya leader's right to rule (Ashmore 1998; McAnany 1995). These connections were materialized through the construction of monumental architecture and the erection of monuments that memorialize dead kings (Schele and Freidel 1990). As these buildings and monuments aged, they continued to emanate authority due to the collective memory of their erection, the reading of hieroglyphic texts, and the performance of rituals by leaders attempting to reinforce their connections to the past (Inomata 2006; Leventhal and Jamison 1996). However, the dynamic politics of the Maya lowlands often led to breaks in dynastic lines and the founding of new centers of power. In these cases, new rulers could not claim the right to rule through direct patrilineal ancestry to a local house. Instead, they grafted their families onto those of local dynasts through the repurposing of ancient landscapes and civic monuments that placed the new regimes within historical power structures (Martin 2000; Stuart 2000). Actuncan is one place that sees its powerful history repurposed.

Actuncan, like Cahal Pech, Xunantunich's Group E, and Blackman Eddy, has been a location of monumental construction for thousands of years making it a permanent part of the local landscape of memory (Awe 1992;

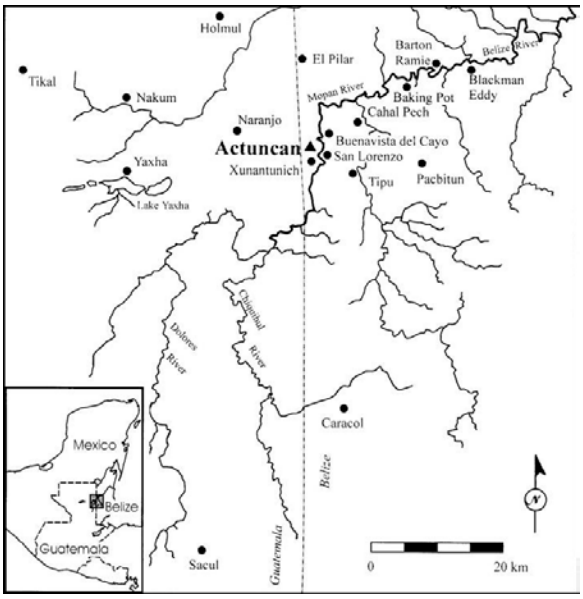

Figure 1. Map showing the location of Actuncan in relation to nearby archaeological sites (LeCount 2004:Figure 1).

Brown et al. 2011; Brown and Garber 2008). The ridge-top on which Actuncan sits was settled by 1000 B.C., and the ceremonial center was well-established in the Late Preclassic period (LeCount and Blitz 2005; Mixter 2012). By the Terminal Preclassic, Actuncan was the political center of the region (McGovern 2004). Its architecture includes many hallmarks of early civic construction, such as a 32-m high triadic pyramid group, an E-Group, and a ballcourt (Estrada-Belli 2011; Hansen 1998). A Preclassic

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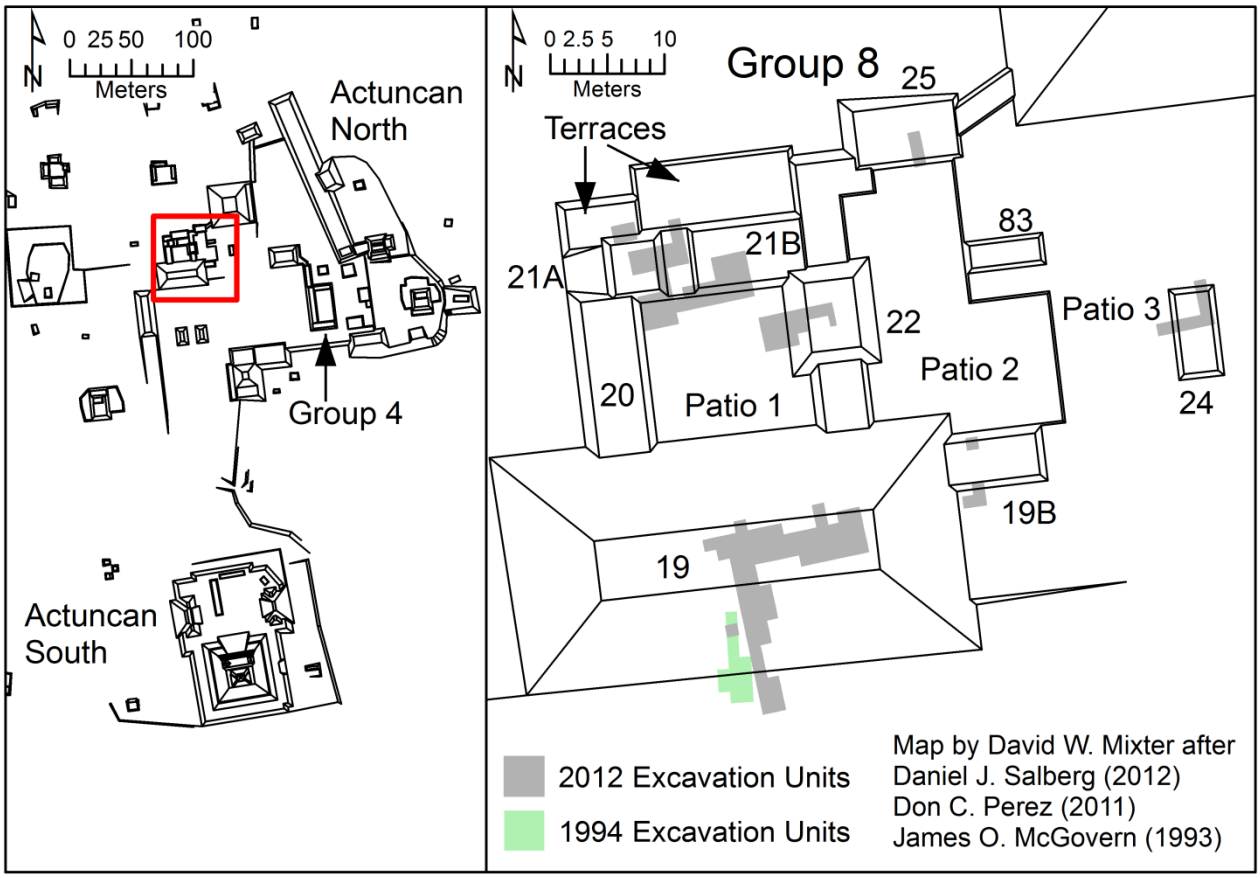

Figure 2. Map of Actuncan showing the location and layout of Structure 19 and Group 8. The inset image indicates the location of James McGovern's 1994 trench into Structure 19 and the Actuncan Archaeological Projects 2012 excavations. Note the low terraces located on the northern side of Group 8. Also note the location of Group 4, a new civic group constructed during the Terminal Classic following the abandonment of Structure 19.

carved stela points to the early adoption of kingship at the site (Fahsen and Grube 2005:79). Despite the center's early authority, construction of monumental architecture halts during the Early Classic period and several large elite households were ritually terminated and abandoned (Mixter 2012; Simova 2012). These actions signal the end of Actuncan's role as the seat of a local polity and the beginning of a three hundred year long hiatus of civic construction. Although Actuncan was no longer a center of power, its prominent silhouette on the landscape would have perpetuated the memory of the site's ancient rulership and position of authority. Due to this memory, the ancient center served as both an opportunity and an obstacle to later groups or individuals aspiring to power.

Actuncan's presence on the landscape almost certainly played a political role during Xunantunich's rapid rise to authority in the Late Classic period. Wendy Ashmore (1998) has long hypothesized that Actuncan was the "ancestral seat" of power for Xunantunich. Its location 2 km north of Xunantunich would place the older site in the direction the Maya associated with the heavens. However, to date, archaeological evidence for the connection between these sites has not been found.

Here, we report on the Actuncan Archaeological Project's 2012 excavations of Structure 19 and its attached compound, Group 8, which together formed the Late Classic ruler's residence. Our excavations revealed that Structure 19's substructure was built almost entirely in the Terminal Preclassic period from 0 to A.D. 250. However, renovations to the Preclassic masonry building on its summit were undertaken during the Late Classic period, and

termination rites marked the deconsecration of the structure during the Terminal Classic period. We attribute these activities to political manipulations of the site by leaders of Xunantunich and other local power seekers. While our excavations help us to reconstruct the long history of Actuncan, perhaps more intriguingly, they also point to the ways the site's deep history and prominent position on the landscape served as a place of memory and cultural capital for later populations' claims of sovereignty even after the site's decline in the Early Classic period.

Actuncan

Actuncan is situated on a low ridge overlooking the Mopan River near the present day border between Belize and Guatemala (Figure 1). The goal of the Actuncan Archaeological Project is to investigate the roles households played in the rise of Maya kingship. To that end, we have excavated commoner plaza-focused groups and elite houses finding a complex pattern of household construction, abandonment, and reoccupation that speaks to both the site's complex political history and the entanglement of urban households in that history (LeCount et al. 2011; Mixter et al. 2012). Our 2012 excavations at Structure 19 and its ancillary structures were designed to understand the development of the ruler's house and a noble court during the transition from the Preclassic to Classic period.

Structure 19, Actuncan's largest range structure, and the attached Group 8 are considered the most likely candidate for a Classic period ruler's residence at the site (Figure 2). The compound's location at the western edge of Plaza C, the site's largest public space, and the northern end of the *sacbe* that leads from the Triadic Temple Group, lend evidence to suggest that it played important roles in regal, ritual, and administrative functions at the site. In the mid-1990s, James McGovern (2004) excavated a 2 by 8 m trench into the southern flank of the substructure and encountered a poorly preserved staircase, two Late Preclassic retaining walls, and two associated floors. Based on the length and width of the building and McGovern's work, we hypothesized that, in its final configuration, Structure 19 was a multi-staged platform that supported a vaulted masonry building composed of five lateral rooms.

Group 8, a small, but formal compound is attached to the north side of Structure 19 and conforms to the organization of a structure-focused patio cluster (Ashmore 1981). Remapping of the structures identified three patio groups attached to Structure 19 (Figure 2), which point to the incipient expansion of Group 8 into a multi-patio palace complex. Despite its spatial complexity, Group 8 is decidedly unimposing. The small sizes of the structures indicate a brief occupational history. Excavations were designed to determine the layout of the terminal superstructures, their use, and construction histories. In the remainder of this paper, we report on our findings.

Excavations at Structure 19

Excavations directed by Thomas Jamison uncovered the eastern half of Structure 19's terminal summit architecture and penetrated the building's substructure. The excavations revealed two buried construction phases within the substructure and several sub phases related to Structure 19's superstructure.

While the steep form of the unexcavated Structure 19 mound suggested the presence of an intact vaulted building on a relatively short substructure, our investigations revealed a taller, steeper substructure that supported only the partial remains of masonry walls, up to a maximum height of 90 cm. As a result of the substructure's steep form, very little of its exterior treatment remains in place. We encountered only a small portion of the central staircase (Staircase 1) preserved at the base of the structure (Figure 3). On the summit, excavations discovered three rooms of Structure 19-1st's masonry palace with three south facing doors and a continuous north wall (Figure 4). Because the Maya typically built range structures with a great deal of symmetry, we reconstruct the summit building as having had 5 rooms, numbered 1 to 5 from the east to west.

Clearing Rooms 2 and 3 revealed five distinct subphases of construction. During the building's earliest subphase, Rooms 2 and 3 formed a single contiguous space that extended into the unexcavated Room 4 to the west, and a

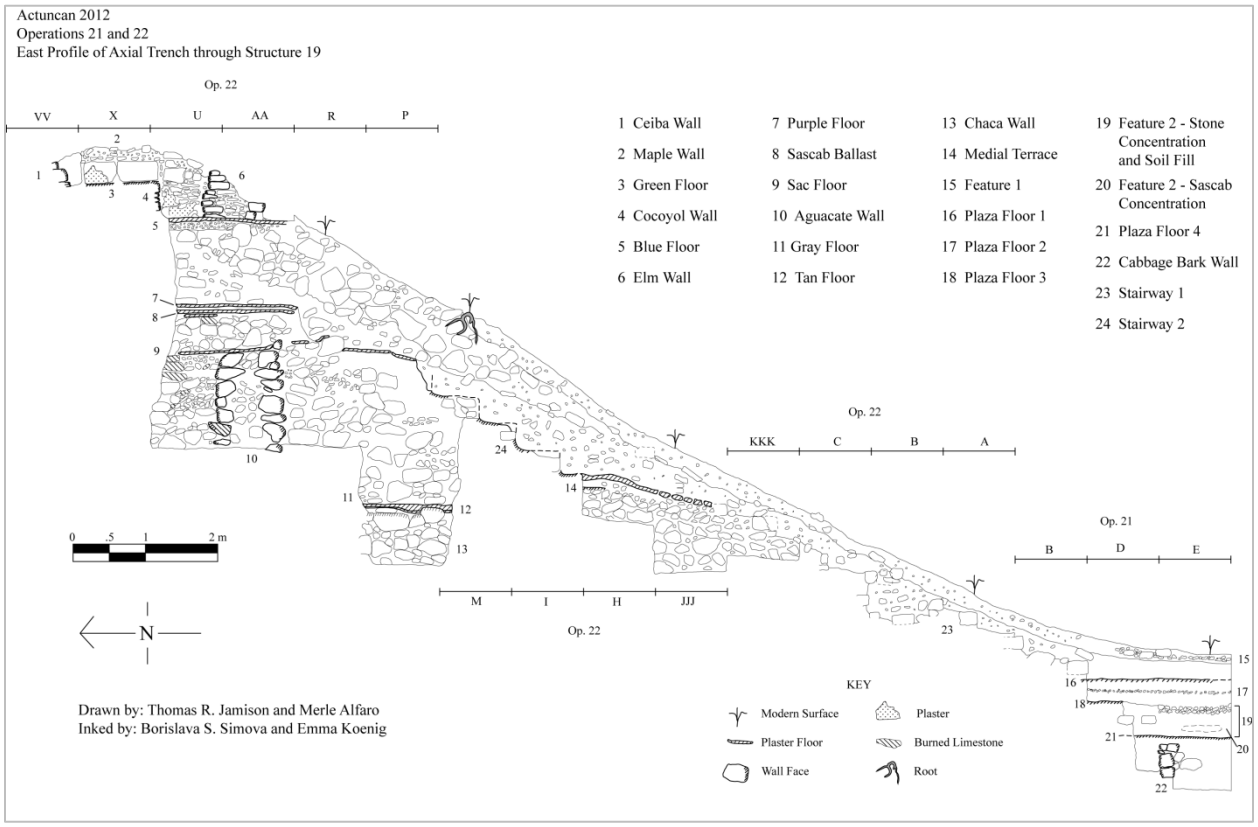

Figure 3. Structure 19 profile. Note that three phases of construction can be identified in this profile.

large continuous bench ran along the back wall of the rooms. In the second subphase, a 50 cm thick interior wall (Cedar Wall in Figure 4) divided Rooms 2 and 3. In the third subphase, the bench in Room 3 was reconfigured into a C shaped by extending the ends forward perpendicularly to meet the south wall on either side of the central door. In a fourth subphase, the wall between Rooms 2 and 3 was thickened to 2 m in width by constructing Maple Wall (Figure 4), greatly restricting the size of Room 3 and transforming the C-shaped bench into an L-shaped bench (Figure 5).

We surmise the series of small alterations to Rooms 2 and 3 stemmed from structural instability during its occupation. Some of the walls such as the door jamb between Rooms 2 and 3 (Elm Wall in Figure 4) are slumping to the south. When Cedar Wall was constructed to divide rooms 2 and 3, it filled in the slumped face of Elm Wall indicating that the slumping occurred prior to Cedar Wall's construction (Figure 6). We posit that these increasingly thick interior walls were constructed to support the building's ever more unstable vaulted roof. Although little evidence of such a roof remains today, the thickness of the wall stubs are within the range of vaulted rooms at other sites (Andrews et al. 2003; Mongelluzzo 2011; Yaeger 1997), particularly Early Classic vaulted rooms (Stanley H. Loten, personal communication, 2012).

The construction date of Structure 19-1st may further explain the building's instability. Excavations into sealed fill contexts within the substructure below Room 3 encountered only Late and Terminal Preclassic ceramics. Based on the secure Terminal Preclassic construction date of Structure 19-1st's building platform, we also place the initial construction of the masonry superstructure in Terminal Preclassic period. In comparison, ceramics from the fill of Maple Wall supports a Late Classic date for the sequence of internal renovations described previously. Importantly, this Early Classic hiatus in construction marks a likely gap in the

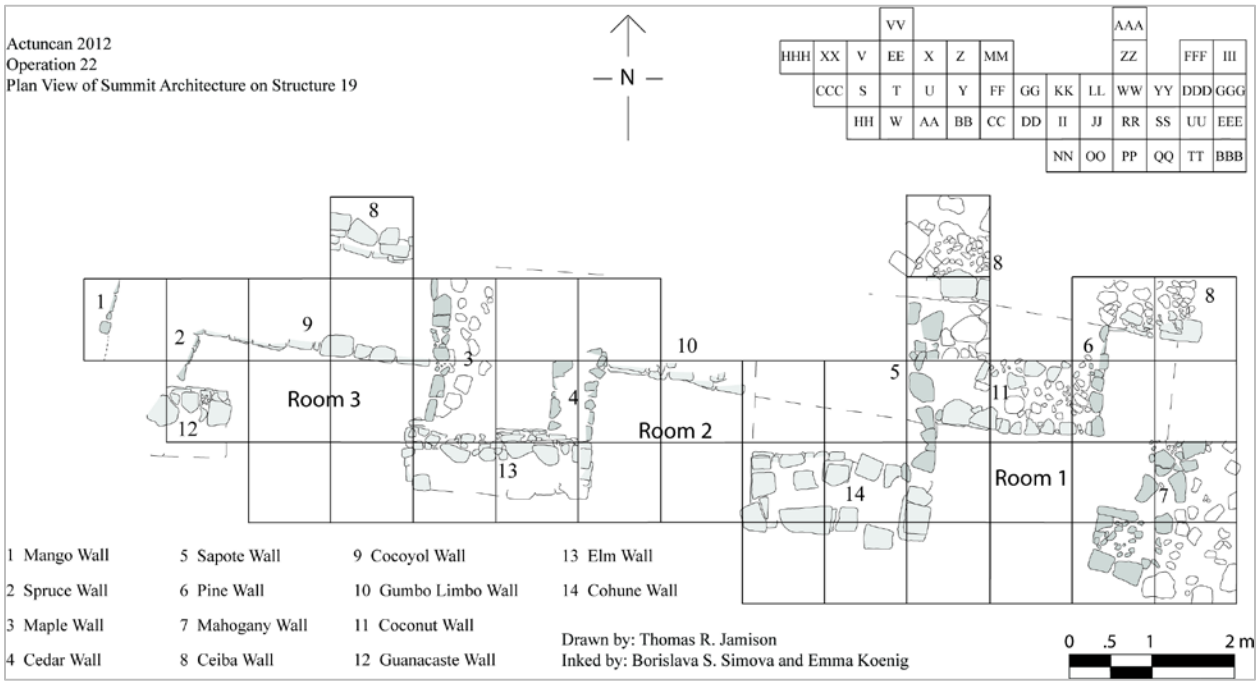

Figure 4. Plan showing the terminal architecture of Structure 19-1st prior to the final subphase of construction when rooms 2 and 3 were filled with limestone rubble.

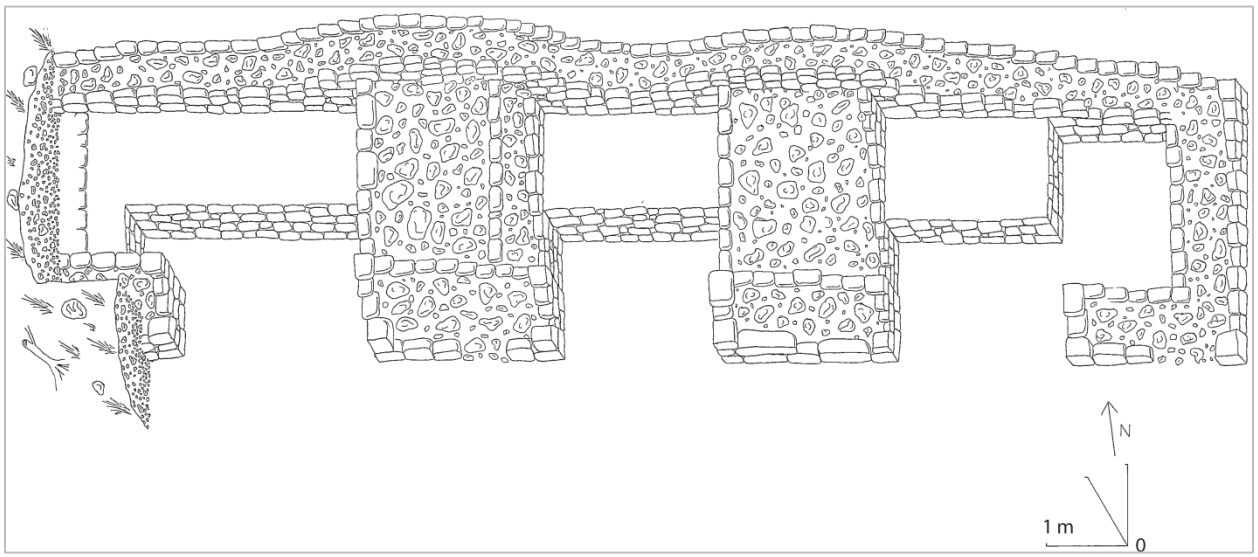

Figure 5. Axiomatic reconstruction of Structure 19-1st.

building's use and maintenance. Upon the building's reoccupation in the Late Classic period, internal modifications were used to reinforce the walls after 300 years of neglect.

During the final modifications, Rooms 2 and 3 were filled with fine sediments packed around rough and cut limestone blocks, including the placement of a single large vault cap stone in each doorway. The fill extended evenly throughout the rooms and over their benches. In Room 2, well-preserved remnants of a plaster floor covered this fill, indicating that the room was intentionally filled rather than filled naturally during the building's collapse.

Figure 6. Image of the collapsing southern wall of Structure 19. Note how the internal wall addition was constructed to fill in where the outer wall has pushed outwards.

Figure 7. Materials found in the Terminal Classic termination deposits located on Structure 19 and south of Structure 21A. (a) Carved marine shell pendant. (b) Carefully halved Belize Red Incised ocarina.

The very limited amount of collapse debris found on Structure 19's summit, as well as the presence of cap stones in the doorways, indicates that the building's roof was dismantled, either intentionally or catastrophically, and scavenged for building materials prior to the filling of Rooms 2 and 3. Ceramics from this filling episode date the removal of the building's roof and filling of the rooms to the Hats' Chaak phase near the end of the Late Classic period. The Maya also may have cut down the walls to a uniform height to construct a building with a perishable roof using posts footed into the wall stubs, given the presence of a plaster floor in Room 2 above the fill. The absence of Terminal Classic occupation on Structure 19, however, indicates that this reoccupation would likely have been limited in time. Alternatively, it is possible that collapsing the roof and filling the rooms served to terminate the building's use and marked the end of its functional life. The placement of cap stones in the doorways of rooms lends evidence for the ceremonial closure of the building.

On the eastern end of the masonry structure, Room 1 was not subject to the same complex set of modifications. This room contains a bench stretching partway across the northern wall abutting the western wall of the room. We found no evidence of the wall modifications or filling seen in Rooms 2 and 3, though the articulation of the bench with the west wall indicates that it was constructed after the wall layouts were complete. A concentration of ceramics that included a Terminal Classic Mount Maloney bowl and fragments of a carved marine shell pendent were found at the eastern end of the bench resting on the floor (Figure 7a). This deposit provides the only example of Terminal Classic ceramics from the summit of Structure 19. Based on their location and temporal uniqueness, we interpret these materials as part of a termination ceremony following the building's abandonment.

In sum, Structure 19-1st's construction sequence indicates that the substructure and vaulted superstructure were initially built during the Terminal Preclassic period. After a hiatus in the Early Classic period, Structure 19-1st's superstructure was refurbished and structurally reinforced in the Late Classic period. Although abandonment may be the best explanation for the building's structural failings, it is possible that natural disasters or benign neglect was the cause. Because the timing of Structure 19's reoccupation is contemporaneous with the rise of Xunantunich (LeCount et al. 2002), we suggest that this space was recommissioned at the behest of that site's ruler.

Two earlier construction phases were revealed by excavations in a 2 m wide by 17 m long axial trench that ran from the bottom to the top of the substructure and a 2 by 4 m deep sounding below Room 3 (Figure 3). Both structures—19-2nd and 19-3rd—date to the Terminal Preclassic period. Of Structure 19-2nd, we exposed a section of a medial terrace, the upper portion of Staircase 2, and a small portion of the structure's summit platform surface (Purple Floor). Staircase 2 was dismantled in antiquity as most of the limestone blocks making up the risers had been removed prior to the construction of Structure 19-1st. Additionally, a large amount of sculpted and painted plaster was found scattered over the top of the stairs indicating that a frieze or other sculpture was dismantled before the structure's interment. The floor of Structure 19-2nd had been burned in several areas, hinting that rituals may have terminated the building's use. This floor was about 1.5 m down from the earliest floor of Structure 19-1st.

Structure 19-3rd was exposed in a 1 by 2 m sounding 4 m down from the earliest floor of Structure 19-1st. Structure 19-3rd consists of a well-made plaster floor (Gray Floor in Figure 3) constructed on large chert boulder fill. Like Structure 19-2nd, it dates to the Terminal Preclassic period. While Structure 19-3rd is the earliest version identified, we expect earlier phases exist further below because of the thick Late Preclassic plaza floors found immediately to the south of Structure 19 in our 2 by 2 m test pit there.

Excavations at Group 8

Excavations also targeted Group 8, the compound attached to the north and eastern sides of Structure 19. Group 8 consists of four structures (20, 21A, 21B, and 22) aligned around a central patio immediately to the north of the range structure and five structures (19B, 22, 25,

83, and 24) that form two additional auxiliary patios attached to the east (Figure 2). Based on the form of Group 8 and its attachment to Structure 19, we hypothesized that it served as residential space for rulers administrating from Structure 19 during the Late Classic period. The small size of Group 8's structures does not seem to fit the model of complex Late Classic palace architecture typically seen at long occupied sites such as Tikal, Cahal Pech, and Buenavista del Cayo (Ball and Taschek 2001; Harrison 1970;Yaeger et al. 2012) or the grand palace spaces built at upstart regional powers constructed during the Late Classic period (Demarest et al. 2003; Yaeger 2010). By mapping the group's terminal architecture and determining its construction history, we hoped to understand the reasons for this unusual architectural arrangement.

Axial excavations at Structure 22, hypothesized to be the eastern shrine of Group 8, were directed by Carolyn Freiwald. Units were placed into the patio immediately to the west of the structure and into the platform to locate burials or other evidence of ancestor worship. At Group 1, a commoner patio-focused group located nearby, Freiwald (2012) had previously encountered multiple overlapping and entwined burials in an analogous context. The placement of ancestors in a similar pattern within the ruler's residence would both speak to long term occupation of Group 8 by one lineage and continuity of burial practices across social classes. Freiwald's 3 m by 3 m excavation unit was designed to test these ideas. Although the excavations discovered a sequence of four plaster floors dating from the Late Preclassic to Late Classic periods, no burials were found. While this finding does not rule out Structure 22's function as an ancestor shrine, it does mean that the rulers were following a different pattern of burial than commoners living nearby. A small looters' trench in the top of Structure 22 may have destroyed a central burial and other features; however, cleaning of the looters' pits and expanded summit excavations found no evidence that the looters had disturbed any such deposits. Further investigations deeper into the structure may find burials beyond the current limits of our excavation.

Our axial trench into Structure 22 exposed two construction episodes---Structures 22-1st and 2nd---both dating to the second half of the Late Classic period. Structure 22-1st is a 2 m tall platform constructed of large, cut limestone blocks that likely held a perishable structure since we found no evidence of masonry walls on the summit. Atypically of eastern shrines, Structure 22-1st does not have an outset staircase on the building's western side (Becker 1999). Structure 22-2nd, on the other hand, has a three stair staircase that was blocked off by the construction of the later structure's platform edge. This earlier platform was 90 cm high with a partial freestanding masonry wall on its eastern side. Unlike the later platform, it could have held a partial masonry structure with a perishable roof and a perishable wall on the building's less public western side where no masonry wall was found. The freestanding masonry wall is the only one of its kind we have found on a comparably sized structure at Actuncan and is likely an indication of the elite status of the occupants.

David Mixter's excavations in the northwestern portion of Group 8 explored the unusual nature of two structures: 21A and 21B. Structure 21A is located in the northwest corner of Group 8 and faces both the plaza to the west and the courtyard buildings to the east. Structure 21B is a low platform that runs east to west across the northern end of the group abutting Structure 22 and Structure 21A. A bajareque wall footed in a trench between two lines of upright limestone slabs (Chichem and Gumbolimbo Walls in Figure 8) may have been constructed along the northern edge of Structure 21B to provide more privacy to interior space located around the patio. On the north side of this wall, terraces protruding from both structures may have served as auxiliary space for activities performed outside the bajareque fence. The function of this space may reflect a more modest version of the attached palace kitchens that served the royal residence at Xunantunich (LeCount 2010).

Structure 21A-1st is a low square platform about 4 m^2 high and raised slightly above the level of the adjoining structures (Figure 8). Excavations defined two phases of construction both dating to the later part of the Late Classic period. Structure 21A-1st consisted solely of a

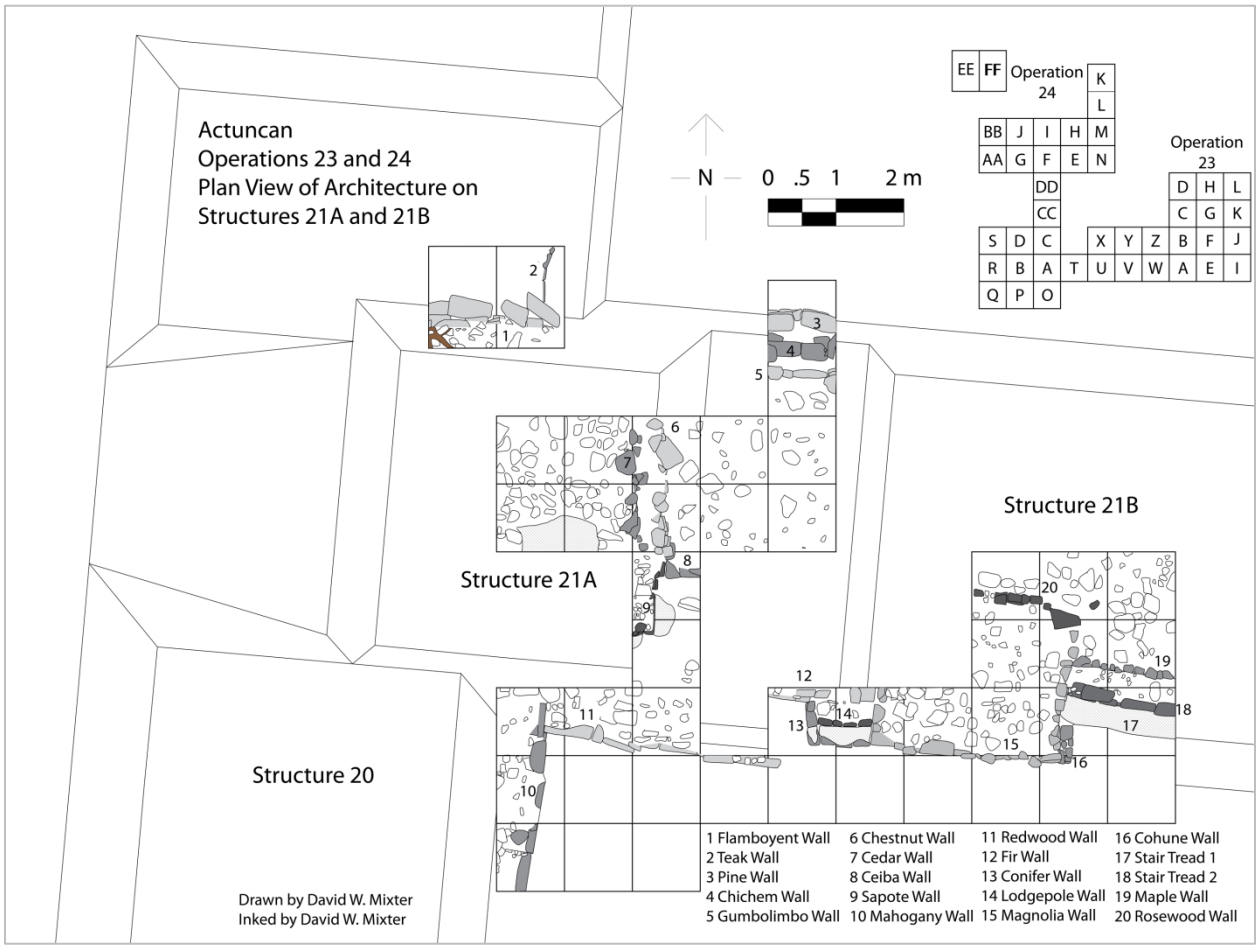

Figure 8. Plan of excavations on Structures 21A and 21B showing both buildings' terminal phases of construction.

raised platform that may have supported a small perishable superstructure. The broken remains of stairs point to access from the top of the structure down to Structure 21B to the east. In contrast, Structure 21A-2nd was a sunken room with a step up to the east onto Structure 21B and a freestanding wall to the south. Within Structure 21A-2nd, the walls and plaster floor were painted red. A large round inscribed monument was found within the fill of this room (Figure 9), likely placed there as a dedication cache aimed at ensouling the later construction phase (following Freidel and Schele 1989). Because this building appears to have had access to both inside and outside Group 8's patio, we suspect the building served as a point of interaction between the ruling family and other members of the community.

Excavations elsewhere in the Group 8 patio also revealed a very limited time frame of

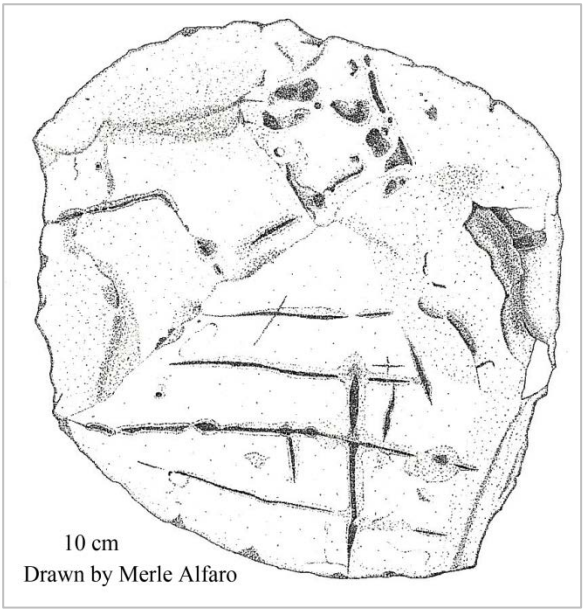

Figure 9. Drawing of the rounded incised limestone monument found in the fill of Structure 21A-1st.

construction. Structure 21B was built in only one construction phase and dates exclusively to the later part of the Late Classic period. This platform likely held one or more perishable structures and served as residential space similar to Structure 20 to the west. A single step provided access down into to the noble courtyard to the building's south. Structure 20, the group's western structure, was excavated in 2004 field season at which time Lisa LeCount and John Blitz (2005) found a low residential platform built solely during the Late Classic period.

After Group 8 was abandoned in the Terminal Classic period, the compound was the scene of termination rituals. In the northwest corner of the Group 8 patio, we encountered partial smashed ceramic vessels, two manos, and an incised ocarina carefully halved lengthwise (Figure 7b). This deposit represents the only Terminal Classic ceramics found in Group 8. Similarly, the only Terminal Classic ceramics on Structure 19 were in the deposit found sitting on the floor of Room 1. To us, these deposits indicate that this complex was abandoned in the Late Classic, but not ritually terminated until the Terminal Classic period. This action is significant because most of Actuncan's other households have a robust Terminal Classic occupation (Mixter et al. 2012).

Conclusions

Maya palaces typically served a multiplicity of functions beyond serving as a residence (Inomata and Houston 2001). They served as the setting for a broad array of public events, such as political meetings, tribute collection, religious rites, and feasts that frequently took placed inside and on the steps of large, centrally located range structures (Reents-Budet 2001). As Actuncan's largest and most centrally located range structure, Structure 19-1st likely served as the location for many of these kinds of events. However, the building's single row of publically oriented rooms lack the private spaces typical of residential palaces, which often exhibit floor plans in which tandem rooms are flanked by transverse rooms (Christie 2003). Therefore, Structure 19 likely was the scene of public functions, but not the location of the ruler's residence. Its position at the northern end of Actuncan's *sacbe* opposite the site's major ceremonial group and immediately behind the site's only ballcourt indicates that it served as a stage for public performance and an endpoint for ritual processions. Group 8, immediately to the north of Structure 19, appears to have been a briefly occupied noble residential group established during the Late Classic period and abandoned before the Terminal Classic period. The lack of historical depth to Group 8 indicates that Structure 19 stood alone during Actuncan's Terminal Preclassic apogee, diminishing the possibility that the complex served as domestic space during that time period. Instead, the Terminal Preclassic ruler's residence must have been elsewhere at the site.

Of significance to this paper, we note the close timing between the abandonment of Actuncan's Structure 19, the closure of its noble court, and the dismantling of Xunantunich's palace before the start of the Terminal Classic period (Yaeger 2010). We suggest that during the Late Classic period, Xunantunich placed a steward at Actuncan to reoccupy Structure 19 and construct the Group 8 compound. Because of Actuncan's Terminal Preclassic legacy of power, placing a vassal at Structure 19 would have allowed the rulers of Xunantunich to draw on the memory of Actuncan's past to legitimize their rulership of the region. Structure 19's central location and its ancillary court area signify the occupants' high noble status, but the short use-life of its ancestor shrine may indicate that the occupants were new to the Actuncan community, possibly derived from an offshoot of the Xunantunich court.

Xunantunich's control over Actuncan lasted only a short time. Coincident with the abandonment of the ruler's residence at Xunantunich at the end of the Late Classic period, Actuncan's noble court was abandoned, signaling a rapid political disconnect with the overlords at Xunantunich. Concurrent with this abandonment, some long-occupied residential structures were expanded and other previously abandoned domiciles were reoccupied and refurbished. Soon afterward, a new integrative Terminal Classic political organization, centered on Group 4, replaced old institutions once anchored by Structure 19's palace compound (Figure 2; Mendelsohn and Keller 2011).

As Jason Yaeger (2008) has noted, while divine authority faltered at Xunantunich, claims of authority were increasingly made by neighboring centers. At Buenavista del Cayo and Cahal Pech, these claims are identified through the construction of rich tombs (Awe 2012; Helmke et al. 2008). There, local elites may have attempted to perpetuate the system of Classic divine ruleship; but at Actuncan, people formed a new kind of authority, one in which groups participated more equitability in decision-making. Just as Late Classic Xunantunich had partially rooted its legitimacy in Actuncan's deep history, the Terminal Classic residents of Actuncan used the site's pre-royal origins to authenticate their post-royal community.

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10 THE IMPORTANCE OF THE PAST TO THE ANCIENT MAYA POLITICAL PRESENT: RECENT INVESTIGATIONS AT CALLAR CREEK, BELIZE

Sarah Kurnick

The politicization of the past is integral to the acquisition and maintenance of political authority. To justify their authority in the present, rulers frequently invoke past leaders, emphasize their ties to predecessors, and suggest themselves heir to certain already-accepted ideological traditions. Recent research by the Mopan Valley Archaeology Project (MVAP) at the site of Callar Creek – located approximately halfway between Xunantunich and Buenavista in the Mopan Valley of Belize – has explored how the low-level leaders at Callar Creek acquired and maintained their political authority. Research suggests that they used a combination of strategies, including sponsoring communal gatherings and stressing their connections to nearby, larger centers. Primarily, however, they emphasized their ties to ancestral members of their own community. Like other ancient Maya rulers – and like rulers in other societies in various times and places – who used the past to justify and naturalize the present, the Callar Creek leaders used the past for their own political ends. This paper will present the results of MVAP's investigations at Callar Creek, and will consider the importance of ancestors to the exercise of political authority, and of the past to the ancient Maya political present.

Introduction

The exercise of centralized political authority is a hallmark of complex polities, both past and present. Institutionalized asymmetrical political relationships are prominent and persistent features of past, other, and our own lives. Not surprisingly, understanding and explaining the operation of political authority have been, and will continue to be, integral aspects of anthropological research. Particularly important is the study of politically authoritative relationships in early complex societies. Pierre Bourdieu (1994), among others, has suggested that studies of the origins, or genesis, of social institutions provide a means by which to understand and question those institutions. For Bourdieu (1994:4), this "reconstruction of genesis" brings "back into view the conflicts and confrontations of the early beginnings and therefore all the discarded possibilities, [and] retrieves the possibility that things could have been (and still could be) otherwise."

Over the last four field seasons, the Mopan Valley Archaeology Project (MVAP) has researched the formation and perpetuation of politically authoritative relationships among one particular early complex society, the ancient Maya, at one particular archaeological site: Callar Creek. This article will briefly consider the concept of political authority before summarizing and synthesizing the recent research conducted by MVAP at Callar Creek. It is argued that the leaders at the site used a variety of strategies to acquire and maintain political authority, but that they spent considerable time and effort emphasizing their connections to ancestral members of their community. Put differently, the veneration of ancestors, and the politicization of the past, was one of the primary ways they reinforced their authority and bolstered their position in the sociopolitical hierarchy.

Political Authority

Max Weber (1978:212) classically defined authority as the "probability that certain specific commands . . . will be obeyed by a given group of persons" and argued that authority necessarily implies a "minimum of voluntary compliance," or an "interest in obedience." Stated simply, authority is the ability to give commands that others choose to obey. This definition raises several questions. How does authority function? How are politically authoritative relationships created and reproduced? Why do individuals often choose to recognize and acknowledge authority? And, how do those exercising authority encourage their followers to obey? Importantly, attempts to acquire and maintain authority are not always successful. Individuals can – and do – reject authority, disobey orders, and revolt against regimes. Nevertheless, throughout time and in various places, individuals have exercised, and

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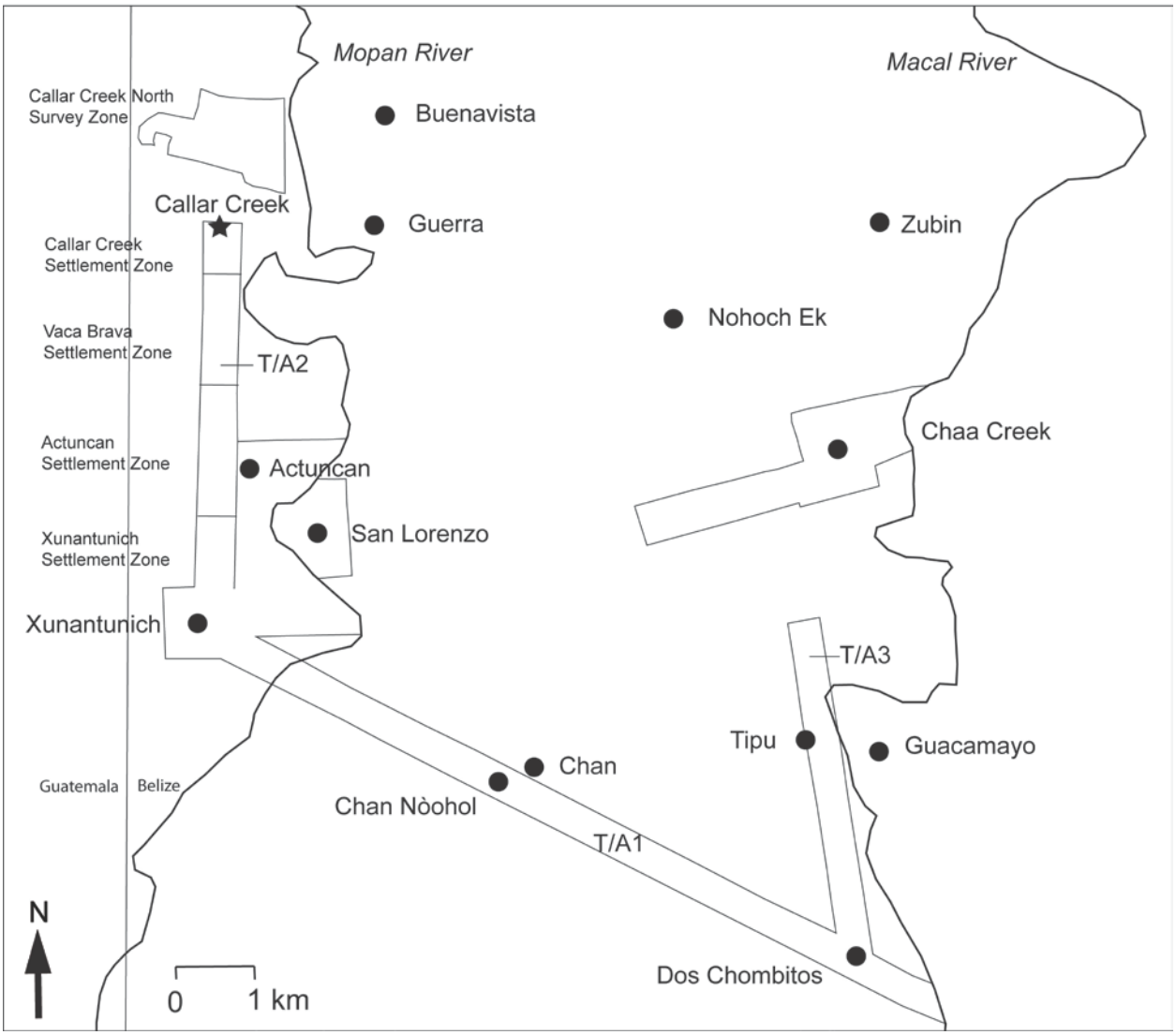

Figure 1. The site of Callar Creek is located along the Mopan River, near the Belize-Guatemala border. It is shown here in relation to nearby sites and survey zones. Redrawn after Leventhal et al. 2010 Figure 1.3 and Yaeger et al. 2011 Figure 8.

have chosen to acknowledge, political authority, and it is important to understand how and why.

Archaeologists studying the ancient Maya have offered a diverse set of explanations of how Maya rulers, in different times and places, engendered and perpetuated politically authoritative relationships. These explanations generally fall into one of three categories: those that focus on the appropriation by rulers of familiar practices such as ancestor veneration or household rituals, those that focus on attempts by rulers to cultivate or manipulate relationships with followers by either sponsoring events that create and reinforce communal identities or by making themselves essential to the daily lives of their subjects, and those that focus on attempts by rulers to monopolize control over esoterica. Perhaps the most prevalent view in the literature is that ancient Maya rulers derived their authority from their unique ability to communicate with the supernatural and to act as intermediaries between their followers and deities.

Although authority is most commonly understood in terms of difference, separation, and the monopolization of ideological, economic, and military power – scholars commonly believe that individuals acquire and

maintain authority by being utterly distinct – authority is best understood in terms of the negotiation of contradictions. Rulers must reinforce social inequality and bolster their own unique position at the top of the sociopolitical hierarchy, yet at the same time emphasize social similarities and the commonalities of all. In addition, rulers must also emphasize their difference from, and similarity to, their followers as well as rulers of other communities and past leaders of their own community. They must be distinct from, yet the same as, those around them. Put simply, rulers must be uniquely other, yet at the same time part of a community and part of geographically broad customs, and temporally lengthy traditions, of rulership.

Callar Creek

The archaeological site of Callar Creek is located along the Mopan River in the Cayo District of Belize. It lies between Buenavista and Xunantunich, slightly closer to Buenavista but on the Xunantunich side of the Mopan River (Figure 1). Members of the Xunantunich Archaeological Project and Xunantunich Settlement Survey first located and mapped Callar Creek in the early 1990s, and placed a series of shovel test pits to determine approximate chronology of occupation (Ehret 1995; 1997). MVAP revisited the site in 2009 and conducted excavations there in 2010 and 2011. Analysis of artifacts found during those excavations continued in the 2012 field season.

The site consists of four plazas and eleven structures (Figure 2), including an ancestor shrine complex (Structures 14 and 1), a central pyramidal shrine (Structure 2), and a series of small range structures that likely formed an enclosed residential area (Structure 3, 5, 6, and 7). Two parallel lines of stones run along part of the southern edge of the site. Monument 1, a large limestone slab found just to the south of the site, likely served as an entrance marker. The site's location, features, size, and layout suggest it was a low-level residential and administrative center (LeCount and Yaeger 2010:347; Yaeger 2010a:247).

Ceramic analysis suggests that Callar Creek was first inhabited, or at least visited, during the Middle Preclassic period. Excavations below a looters' trench in Structure

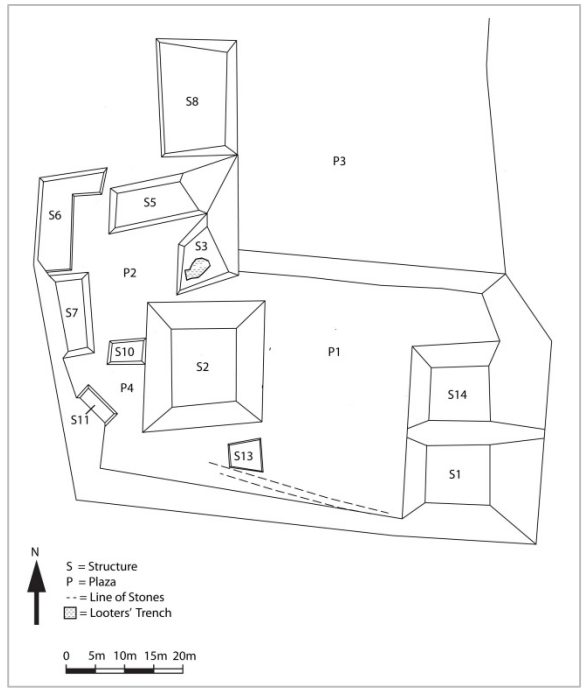

Figure 2. Callar Creek consists of four plazas and eleven structures. The site is shown here as mapped by the MVAP in 2010. Drawing by author.

3 revealed an exceptionally dense Middle Preclassic jute deposit: there were over 13,000 jute shells in approximately 0.4 cubic meters of soil. This deposit may have been created through a few large depositional events, suggesting the site was a locale for feasting, or through many smaller depositional events, suggesting the site was continuously or repeatedly occupied over an extended period of time. Regardless, both possibilities provide evidence that Callar Creek was a locus of activity during the Middle Preclassic period.

There is limited evidence of Late Preclassic and Protoclassic occupation, and Callar Creek was likely abandoned during this time. The site as visible today was first occupied during the transition between the Early Classic period and the Samal phase (CE 600-670) of the Late Classic period. It was at this time that the first of the currently-visible residential structures, Structure 7, was constructed and occupied. Subsequently, there was a significant increase in activity at the site during the Hats' Chaak (CE 670-780) and Tsak' (CE 780-890) phases. Occupational debris located to the west of Structure 6 suggests that structure to have been in use primarily during

Figure 3. Five sherds excavated from an Early Classic/Samal phase deposit to the west of Structure 7 have hieroglyphs painted on them. The logogram CHAB appears on the sherd in the upper left corner. Photographs by Alex Alas and author.

the Hats' Chaak phase. The final construction phase of Structure 14 occurred in the Hats' Chaak or early Tsak' phase, and a burial was placed in the structure during this same time period. The parallel lines of stone located along the southern edge of Plaza 1 were placed during the early Tsak' phase. And, notably, the final construction phase of Structure 2 occurred in the early Tsak' phase, shortly before that structure was terminated, also in the early Tsak' phase. Because this termination event was never cleaned up, it likely marks the final abandonment of the site by the ancient Maya.

The Exercise of Political Authority at Callar Creek

The goal of the MVAP investigations at Callar Creek was to ascertain the specific strategies that leaders of the site used to engender and reproduce politically authoritative relationships, and the reasons why their followers might have chosen to participate in such relationships. Excavations and analyses were designed to determine whether the Callar Creek leaders acquired and maintained their authority by emphasizing their connections with their followers, through communal gatherings such as feasting, construction events, and public performances; by emphasizing their connections with leaders of other sites, through the possession and display of non-local ceramics and objects made from exotic raw materials; or by emphasizing their connections with past members of their own community, through the construction of ancestor shrines and the erection of monuments.

Space does not permit a discussion of all of the project's findings. In brief, it appears that the leaders at Callar Creek initially acquired authority by sponsoring feasts and by possessing and displaying non-local ceramics. Evidence of feasting includes, in an Early Classic/Samal

phase deposit to the west of Structure 7, faunal remains such as a fragment of a deer calcaneus and an ear stone from an animal of the order artiodactyla, as well as a high proportion of ritual serving vessels: eighteen of the thirty-six recovered rim sherds were from plates. Evidence of the possession and display of non-local ceramics includes the presence, in that same deposit, of five sherds with hieroglyphic writing (Figure 3) – sherds unlikely to have been produced at Callar Creek. On one sherd, MVAP epigrapher Christophe Helmke (personal communication) identified the logogram CHAB. The nearby major center of Naranjo was commonly referred to by the ancient Maya as 6-[CHAB]NAL. The presence of the CHAB logogram, the style in which it was written, and the close physical proximity of Naranjo suggest the possibility that the sherd is referring to, or was even produced at, Naranjo.

Later, the descendents of those first leaders maintained authority by continuing to possess and display non-local ceramics, and specifically those produced at Buenavista, and, perhaps most prominently, by venerating ancestors. At Callar Creek, eight sherds found in Hats' Chaak or early Tsak' phase deposits were from vessels produced at Buenavista. One sherd is the base of a Chinos Black on Cream vase. Dorie Reents-Budet (Reents-Budet et al. 2000:103; Yaeger 2010b:178–182) argues that a "conjunction of stylistic, chemical, and contextual data . . . together point to Buenavista as the location of the workshop(s) where these particular vessels were created." The other seven sherds are from vessels of the Group 1a subtype of Cabrito Cream-polychrome. According to Reents-Budet (Reents-Budet et al. 2000:107–116; Yaeger 2010b:178–182), although Cabrito Cream-polychrome vessels were produced at various sites in western Belize and eastern Guatemala, those produced at Buenavista are chemically and stylistically distinct. Among other characteristics, they occur in a wide range of vessel forms, were painted with two shades of red rather than many, and exhibit blue paint around their rims and bases. The sherds from the Callar Creek Cabrito Cream-polychrome vessels fit solidly into Reents-Budet's characterization of the Group 1a subtype produced at Buenavista. Perhaps most diagnostically, all exhibit blue paint around their rims and bases

The Hats' Chaak and early Tsak' phase leaders at Callar Creek, however, appear also to have venerated ancestors as a means to maintain their political authority. Ancestor veneration creates a community that extends beyond an individual lifetime, and connects present community members with past ones. At the same time that it creates this community and these connections, it also provides a rationale for existing social inequality: references to past unequal social relationships can be used to justify present ones (McAnany 1995). Consequently, by venerating ancestors, the Callar Creek leaders were able to compare and contrast themselves with their predecessors, and to emphasize their similarity to, and difference from, previous members of their community. Their followers, in turn, may have chosen to participate in politically authoritative relationships, at least in part, because of the ability of the past to naturalize the present, the potency of the past in the creation of identity, and the force of tradition.

Ancestor veneration can be detected archaeologically through the identification of ancestor shrines. Such shrines permanently mark the location where an ancestor is buried and provide a space where descendents can commemorate ancestors' lives. These shrines tend to be located within larger plaza groups and are sometimes, though not always, located on the east side of those groups (Ashmore 1984; 2007; Becker 1971; Chase and Chase 1987; 1994; Leventhal 1983). They can often be distinguished from other structures by their height or by their distinctive form (Leventhal 1983), and tend to have certain associated features including evidence of on-floor axial burning, benches and altars, and particular types of caches or other special deposits, such as finger bowls (Becker 1971; Chase and Chase 1994; Leventhal 1983). Although ancestor shrines are not domestic structures, their central axis is frequently located over a single or multiple burials, and the skeletons in those burials are often incomplete and lacking crania and/or long bones (McAnany 1995).

The importance of ancestor veneration at Callar Creek is suggested by the presence of a

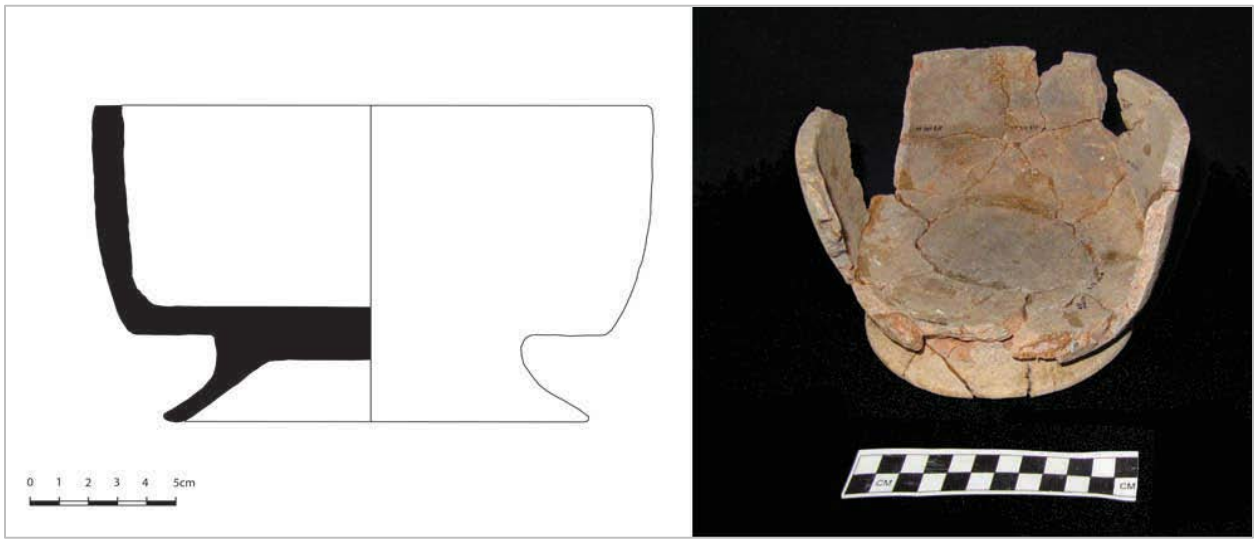

Figure 4. This vessel was excavated as part of a Hats' Chaak or early Tsak' phase burial interred along the centerline of Structure 14. Photograph and drawing by author.

large, elaborate ancestor shrine complex: Structures 14 and 1. These structures are located on the east side of the main plaza; they are the second and third tallest structures at the site; and they have a distinctive architectural form including two summits, an inset staircase, and a red-painted stucco frieze complete with iconographic elements. Although they lack evidence of on-floor axial burning, benches, or altars, they do contain human remains and caches. A human burial was interred along the centerline of Structure 14, along with three vessels stacked upside down. The top vessel was a Chunhuitz Orange dish with three nubbin feet, the middle vessel a Belize Red bowl with a pedestal base, and the bottom vessel an oddly-shaped unslipped bowl with a pedestal base (Figure 4). Below the burial, and also along the centerline of the structure, was a lip-to-lip cache. Upon opening the cache, only soil and roots remained inside.

The End of Political Authority at Callar Creek

As mentioned, attempts to acquire and maintain political authority are not always successful and, even when successful, are not always lasting. Followers may choose to reject authority, outsiders may choose to challenge authority, or natural causes may make certain politically authoritative relationships untenable. The end of political authority at Callar Creek is marked by a termination event.

Termination events involve the purposeful destruction of architectural features, ceramic vessels, and other objects (Inomata 2003; Mock 1998; Pagliaro et al. 2003; Stanton et al. 2008). These events frequently involve extensive structural damage to buildings, intensive burning, and rapid deposition of materials, including large sherds from smashed vessels and fragments of relatively rare ceramic types and forms (Ambrosino 2007; Harrison-Buck 2012). Two broad categories of termination events are normally distinguished: reverential and desecratory. Reverential termination involves the respectful decommissioning of all or parts of a structure, and often associated objects. Desecratory termination involves the defiling of a structure and other associated objects, and is often the result of violent conflict (Freidel 1998; Freidel and Schele 1989; Pagliaro et al. 2003; Stanton et al. 2008).

At Callar Creek, excavations along the south side of Structure 10 and west side of Structure 2 revealed extensive architectural dismantling and significant burning. Parts of Structures 10 and 2 had been intentionally destroyed. Structure 10 had cuts in its floors and in its walls and much of the western façade of Structure 2 had been removed, leaving a 1.3m high construction wall. That wall was

heterogeneous and constructed of various sized cobbles rather than uniform limestone blocks. Several piles of large cobbles were found to the south of Structure 10. As Jason Yaeger (personal communication) noted, many of these cobbles are too large to have come from Structure 10, and were too far from Structure 2 to have fallen from that structure naturally. Consequently, the cobbles were likely placed there intentionally. This argument is supported by the presence of approximately a quarter of a Mount Maloney bowl sitting directly on top of one of these clusters of large cobbles. In addition to the architectural dismantling, a large fire had been set in this same corner. Portions of Structures 10 and 2 and Plaza 4 exhibited extensive burning and, on top of them, was a thick layer of ash measuring approximately 45cm at its deepest. Bits of carbon and large ceramic sherds were found throughout the layer of ash.

Along the centerline of Structure 10 was a burned plaster floor, cut along the south side, with nine concentrations of ceramics (Figure 5). One concentration was sitting directly on top of the floor, and the others were sitting on 1-3cm of ashy matrix. Some of these concentrations were broken sherds. Some were broken but articulated fragments of vessels. And some were whole or partial vessels sitting upright. Partially reconstructable vessels include two storage jars and, stacked on top of one another, three Belize Red Incised variety footed plates (Figure 6).

As mentioned, this termination event dates to the early Tsak' phase. The ceramic assemblage recovered from the operation includes a mix of Hats' Chaak and Tsak' sherds, and the vessels directly associated with the termination event include a Mount Maloney bowl with a Hats' Chaak phase diagnostic lip (LeCount 1996:147), and three Tsak' phase Belize Red Incised variety footed plates: Arlen and Diane Chase (2012:8) have argued that such plates with horizontal bottoms and bulbous feet with frontal vents and rectangular incisions date to the Terminal Classic period (Figure 6). Unfortunately, it remains unclear whether the termination event at Callar Creek was desecratory or reverential – whether it was an attack on the site's central structure or a ritual killing of that structure. Reverential and desecratory termination events are notoriously difficult to distinguish archaeologically (Pagliaro et al. 2003).

Figure 5. Nine concentrations of ceramics were found along the centerline of Structure 10. Some of these sherds were sitting directly on top of a burned plaster floor and some were sitting on 1-3cm of ashy matrix. Note the 1.3m high construction wall in the back right of the photograph. Photograph by author.

Figure 6. These three Belize Red Incised variety footed plates were found, stacked one on top of the other, along the centerline of Structure 10. Photographs and drawings by author.

The Politicization of the Past

The presence of an ancestor shrine complex at Callar Creek should not be surprising. The importance of ancestor veneration to the operation of ancient Maya political authority is well-documented. Epigraphic, iconographic, and archaeological

evidence suggest that ancient Maya political legitimacy was based, in part, on connections to past rulers, and that rulers were deemed legitimate, in part, because of their predecessors. Short-term connections were often based on records of lineal descent, and long-term connections were often based on a title identifying each ruler's position in a line of successors beginning with a dynastic founder (Sharer and Traxler 2006:699). To take one example, Altar Q from Copan famously depicts the succession of rulers that formed the Copan dynasty. On the west side of the altar, the dynastic founder, K'inich Yax K'uk' Mo', is shown handing his scepter, a symbol of his authority, to Yax Pasaj Chan Yopaat, the sixteenth ruler in the dynastic sequence. This image visually demonstrates the importance of the past, and specifically of K'inich Yax K'uk' Mo', to the political authority of Yax Pasaj Chan Yopaat.

Ancestor veneration was important not only to the ancient Maya, but also to other complex societies both past and present. It is a critical component of political relationships in the contemporary world. Current world leaders frequently make use of their ancestral predecessors by invoking past leaders in their speeches, by erecting monuments to those past leaders, and even in mundane aspects of their life. Barak Obama, President of the United States, for example, keeps a bust of past president Abraham Lincoln in his office, making the point that he, Obama, is Lincoln's legitimate ideological heir.

This discussion raises several questions: Why is the past so powerful? Why is the politicization of the past so common among the ancient Maya, other early complex societies, and contemporary nations? And, how exactly does the past legitimize the present? How does the past aid in the acquisition and maintenance of political authority, and how does it facilitate followers' acknowledgement of that authority? Although it is frequently stated that the past is important to the political present, few examine why and how.

First, the past can be used to naturalize the present. Put differently, the past can be manipulated to make the present appear as the inevitable result of everything that has preceded it. Second, the past is critical to creating, changing, and negating identities. Individuals define themselves in large part by their place in history and in reference to those who came before them. Altering the past is thus one way to alter how individuals think about themselves and their place in the world. Third, the past carries with it the force of tradition, either real or constructed. Traditions are often idealized or considered sacred, leading individuals to emulate the actions of their ancestors. Changing what is known about the past may thereby change how individuals act in the present. And fourth, perceptions of individuals or groups are based in large part on previous interactions. By refashioning the past, those perceptions can be altered. Individuals or groups can either eliminate negative aspects of their image or create positive ones, thereby making themselves more favorable or more likeable.

It is perhaps for these reasons that ancestor veneration was so crucial to the exercise of political authority among the ancient Maya. It is perhaps for these reasons that the past was so important to the ancient Maya political present.

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11 OBSIDIAN FORM AND DISTRIBUTION AT ACTUNCAN, BELIZE

Sara C. Shults and Lisa J. LeCount

Current research on the frequency and distribution of obsidian in Mesoamerican sites provides evidence to suggest that production and exchange mechanisms varied widely. This paper draws together information from multiple sites in the upper Belize River Valley to discuss production and exchange of obsidian in this region. New data from Actuncan, Belize, is presented and added to the discussion of obsidian workshops and marketplaces in the Maya lowlands. Little evidence for production or whole blade trade exists at Actuncan, but data from other nearby sites indicates a regional network of exchange whereby obsidian was traded into the upper Belize River valley as pre-reduced polyhedral cores. Although most cores were further reduced to whole prismatic blades or smaller bladelets at a few discrete workshops before being distributed around the valley, some itinerant merchants processed blades for consumers at large sites, possibly in marketplaces.

Introduction

While obsidian tools have been widely used throughout Mesoamerica for thousands of years, their production and distribution mechanisms varied across time and space. These patterns are especially marked in the southern Maya lowlands, because obsidian had to travel over long distances and though numerous hands to reach the region and its consumers. Distance and exchange modes may explain the distribution of obsidian in sites, but it also may condition its form because the smaller the quantity of obsidian available, the more efficiently it will be shaped into a usable product. This paper offers new data on the form and distribution of obsidian at Actuncan, a long occupied site in the upper Belize River valley, and how exchange mechanisms may have changed over time at the site. While access was likely restricted at Actuncan, as it appears to have been at other sites in the region, obsidian was both a functional and highly valued item that was widely available to all households even as exchange mechanisms shifted through time.

A Brief Summary of Obsidian Form, Production, and Distribution in the Maya Lowlands

High transportation costs likely necessitated the shipment of obsidian to the lowlands as preformed cores or blades because these forms would have eliminated any unnecessary weight (Braswell and Glascock 2011; Hirth and Andrews 2002). Yet despite the long distances from their sources in Guatemala and Mexico, obsidian is found in the majority of residential units in the southern Maya lowlands, but in much lower quantities than it is found in highland Maya areas or in central Mexico (Ford 2004). Southern Maya lowland sites are located a minimum of 300 km from the nearest known obsidian sources in Guatemala but prismatic blades are found at nearly every lowland Maya site in both residential and ceremonial contexts (Ford 2004). Aside from workshops at Tikal in Guatemala, El Pozito in Belize, Ojo de Agua in Chiapas, Mexico, and Laton (site 272-136 near El Pilar) in Belize, few obsidian workshops have been identified in the southern Maya lowlands. Evidence of small scale "point-of-sale" blade production has also been found at Xunantunich (Keller 2006) and Buenavista del Cayo (Cap 2011) in multi-use plazas in upper Belize River valley, but these are not considered workshops. Although it is possible that more large-scale workshops are simply not being identified since debitage was often removed from the workshop and deposited elsewhere (Hintzman 2000; Moholy-Nagy 1990), it is clear from the small number of production sites that obsidian blade manufacture was specialized and restricted to a small number of individuals or workshops, at least outside Tikal. While the Laton workshop may have supplied many upper Belize River valley merchants and consumers with prismatic blades, it is unclear whether it was the only workshop in the region and how obsidian was distributed to sites in the region.

Long-distance import of obsidian into the Maya Lowlands began as early as 1300 B.C. (Hammond 1982). In the Belize River valley, prismatic blades appear as early as the Middle Preclassic period (Awe and Healy 1994; Healy 2006). Obsidian tool technology at Cahal Pech

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began as flakes removed from spall cores in the early Middle Preclassic period before shifting to prismatic blade production in the late Middle Preclassic period, a trend seen in other upper Belize River valley sites, such as Pacbitun and Barton Ramie, as well as other Maya sites in the central Lowlands, such as Seibal and Altar de Sacrificios, and those along the Pacific coast of Guatemala (Awe and Healy 1994; Hintzman 2000).

Source analyses of samples from Cahal Pech and Pacbitun indicate that at least three obsidian sources---San Martin Jilotepeque, El Chayal, and Ixtepeque---were used by the Preclassic Maya (Healy 2006; Kersey 2006). These sources continued to be used throughout the Classic period, but there are consistent diachronic patterns in the frequencies of these sources found at sites through time. Nelson (1985) suggests that San Martin Jilotepeque was the primary source in the Middle Preclassic before a shift toward El Chayal in the Late Preclassic period. He proposed that this shift occurred when the Olmec began to lose control over obsidian trade (Nelson 1985). El Chayal dominated during the Classic period, but over time Ixtepeque slowly gained in frequency, especially at southern sites along the Caribbean coast during the Late and Terminal Classic periods. In the Postclassic period, Ixtepeque obsidian sources and trade networks was dominant (Nelson 1985).

Norman Hammond (1972, 1976, 1982) proposes that the differential frequencies of Ixtepeque and El Chayal obsidians found in Classic Maya sites are the results of different trade routes. He suggests obsidian from El Chayal was traded to lowland sites through river valleys originating in the Guatamalan highlands; therefore, this source predominates at inland sites. On the other hand, Ixtepeque obsidian was trade via a competing route that followed the Rio Motagua to the Caribbean Sea before moving north along the coast; therefore, this source dominates assemblages at coastal sites (Dreiss and Brown 1989; Hammond 1982). In addition to these sources, a variety of outcrops in central and western Mexico were also obtained by the lowland Maya, but it only arrived in very small quantities. The most common of these highland sources is Pachuca obsidian, which is known for its characteristic green hue and superior quality. Likely, this source was controlled and distributed by Teotihuacan (Dreiss 1988; Spence 1996).

Despite the upper Belize River valley's location far from sources of obsidian, this valuable resource is ubiquitous in household and civic contexts. Annabel Ford's (1991) Belize River Archaeological Settlement Survey (BRASS) found that 56 percent of residences tested contained obsidian. At San Lorenzo, a community near Xunantunich, obsidian is found in all 19 commoner households and special-use structures, where Jason Yaeger (2000:1068-70) found 651 artifacts. Almost all these artifacts were prismatic blade fragments except for one complete blade, four blade tools, and two fragments of eccentrics. At Xunantunich proper, prismatic blades make up almost 40 percent of the tools ("formed artifacts") in Angela Keller's (2006:478) civic center sample, despite the fact that obsidian only comprised seven percent of all lithic artifacts. Evidence from the Laton workshop and Xunantunich proper indicate that blade cores had been pre-shaped when they arrived at these sites (Hintzman 2000:16-17; Keller 2006:536). At Chaa Creek, Samuel Connell (2000) found 206 pieces of obsidian in his excavations of commoner settlements and minor centers near Xunantunich, but noted a dramatic increase in access from the early (AD 600-660) to later (AD 660-780) Late Classic phases. Interestingly, in early Late Classic phase obsidian counts and counts per cubic meters at commoner settlements are five times higher than at minor centers (Connell 2000:545-547).

Marc Hintzman's (2000) research looked more closely at blade production at the Laton workshop. While he found direct evidence for blade production, it appears cores were arriving at the site prepared for production or previously reduced due to the lack of core preparation blades and debitage. In addition, early series blades only represent a small percentage of the assemblage, a pattern which indicates that the cores were at least partially reduced when they arrived at the workshop. His research also supports the claim that craftsmen at workshops in large centers would exchange cores that had reached the end of their use-life to hinterland

populations where they were further reduced (Hintzman 2000).

At Tikal, evidence for the trade of pre-shaped cores is also found. Moholy-Nagy (2002) suggests that obsidian arrived in the form of large polyhedral cores that were further reduced on site based on evidence of "bag wear" and the lack of cortex on finished tools. At Tikal, like at other sites, the majority of obsidian was then reduced into prismatic blades, but large flakes were occasionally fashioned into scrapers or bifaces. Obsidian occurred in all types of Classic period Tikal structures and ritual deposits; therefore, it was widely distributed at this large political capital (Mohloy-Nagy 2002). Hattula Moholy-Nagy claims that there is no evidence to suggest that elites controlled the distribution of prismatic blades or thin bifaces at any time, but rather obsidian was probably distributed in a marketplace. However, eccentrics and incised obsidian objects do appear to be limited to elite or ritual contexts. The crafting of these special objects began by the early part of the Late Classic period, and were produced from macroflakes or macroblades removed from large polyhedral cores (Moholy-Nagy 2002). According to Moholy-Nagy (2002), the crafting of novel ritual objects from a material that had served utilitarian purposes for hundreds, maybe thousands of years, implies a secure supply.

Geoffrey Braswell and Michael Glascock (2011) compared obsidian assemblages at Tikal and Calakmul (which are located approximately 100 kilometers apart in the Peten region of Guatemala) to investigate obsidian exchange mechanisms. While excavations at Tikal have revealed millions of pieces of obsidian, Calakmul contains strikingly less. Braswell and Glascock (2011) postulate that Tikal was a linchpin for obsidian in the Maya lowlands, and elites controlled its exchange through redistribution or administered market exchange. It's possible that Calakmul was only allowed access to Tikal's surplus obsidian through serendipitous exchange relationships with allies. Tikal's great demand for obsidian, as well as its ability to regulate distribution, had an impact on obsidian distributions at sites throughout the lowlands.

According to Braswell and Glascock (2011), obsidian was likely distributed through administered market exchange or redistribution in the Maya lowlands during the Classic period. A bounded exchange system at Tikal would explain the disparity between the quantities of obsidian found there compared to other lowland sites like Calakmul. Ford (1991) also asserts that the distribution of obsidian in the upper Belize River valley was restricted since obsidian frequencies in lowland sites are much lower than those in highland Mexican sites, with the exception of Tikal.

Currently, debates revolve around how elites may have been involved in the production and distribution of obsidian, and how this involvement varied on a site-by-site basis (Aoyama 2011; Braswell and Glascock 2011; Ford 2004). Investigations at the rural community of Laton, located near El Pilar, found evidence that a large elite residence was highly involved in obsidian production due to the high concentration of production by-products throughout the residence (Ford 2004). The minimum quantity of obsidian found at the residence was 3,000 pieces per m^3. Ford (2004) asserts this evidence demonstrates that while there may have been centralized control of the distribution of obsidian, production of obsidian was not centralized. Elites at rural centers may have used the production of obsidian as a way to demonstrate their connection to larger centers (Ford 2004). Alternatively, the elites may have placed these producers on the outskirts as a way to protect the resource and maintain control.

Raymond Sidrys' (1976, 1983) work emphasized the difference in elite and non-elite consumption of obsidian at El Pozito and Lamanai located in northern Belize. At El Pozito, 4,993 obsidian artifacts were found in a Late Classic elite tomb, while only 60 obsidian pieces were found in the 50 test pits excavated at Late Classic house mounds. Even when standardized by the number of stratigraphic levels, he found that elite residential contexts had much more obsidian artifacts than non-elite residences. Similarly, a seventh century offering of 1,025 obsidian cores and 7,503 blades and chips was found in elite contexts at Lamanai (Sidrys 1983). This abundance of obsidian is never seen in non-elite contexts.

It is no surprise that major centers had much greater access to obsidian than minor centers given their ability to control trade routes and monopolize exchanges (Sidrys 1976:454-456). In 1976, Raymond Sidrys created a trade index value by multiplying obsidian density (g/m^3) by distance to source. By his calculations, Tikal has the highest trade index at 4361, followed by Yaxha, Mayapan, and Copan. Comparatively, minor centers with the highest indices, Zacualpa, Seibal and El Baul, have a mean trade index of near 200. Sidrys (1976) calculated the index for Baron Ramie, located downstream from Actuncan in the Upper Belize River valley, and found a trade index of 95. Based on these calculations, it appears that the region was near the tail end of the trade routes, but exactly how these exchanges worked has not been explored.

The goals of this study are to understand the production and distribution of obsidian at Actuncan. Documenting the frequencies of forms (polyhedral cores, whole blades, or prepared blades) will allow a better understanding of trade networks at Actuncan, as well as the nature of its production at the site (or lack thereof). In addition, determining the distribution of obsidian at the site can reveal what mechanisms of exchange brought obsidian to Actuncan and how it changed through time. While no evidence of a formal marketplace has been observed at Actuncan, market exchange may have been occurring nearby during the Classic period.

Actuncan: A Major Mopán River Center

Actuncan is situated on a low ridge overlooking the Mopán river valley 2 km south of Xunantunich (Figure 1). Actuncan is arranged in two parts connected by a broad causeway: Actuncan South, dominated by a Preclassic Triadic temple complex, and Actuncan North, a formal civic zone containing a ball court, range structures, pyramids, and households.

The site was settled by 1000 BC, but the ceremonial center as we know it today was likely founded during the Terminal Preclassic period (Figure 2). By the Terminal Preclassic period, Actuncan was the political center of the upper Belize River valley when the triadic

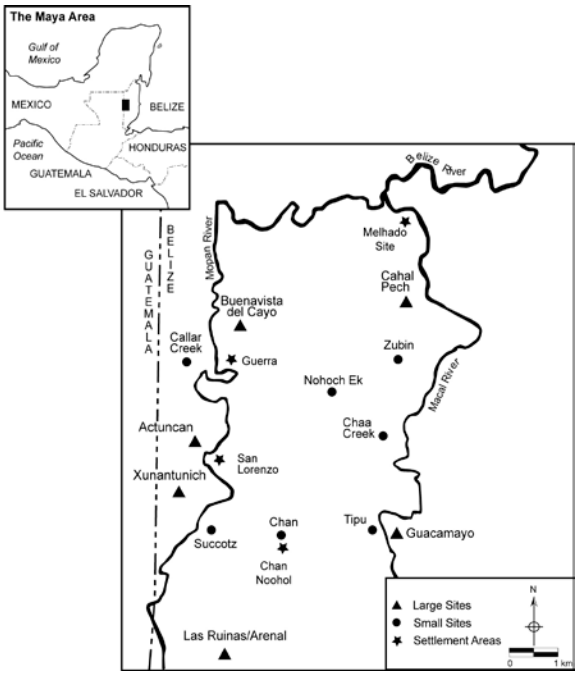

Figure 1. Sites in the upper Belize River valley. Map drafted by Bernadette Capp.

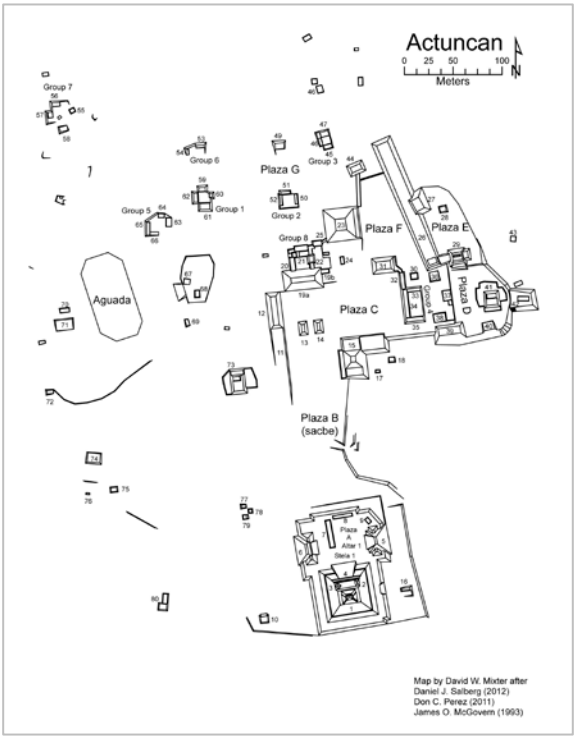

Figure 2. The Site of Actuncan, Belize.

temple group and other major civic structures in Actuncan North were greatly expanded. Despite the center's early authority, construction of monumental architecture halts in the Early

Classic period. Later, Actuncan was subsumed within the nearby Xunantunich polity during the Late Classic period, when Structure 19 (the largest range structure at the site) was remodeled befitting a vassal noble (Mixter, Jamison, and LeCount this volume). However, Xunantunich's control over Actuncan lasted only a short time. By the Terminal Classic period, Actuncan's noble residence at Structure 19 was terminated, signaling a rapid disconnect with the overlords at Xunantunich. Coincident with this termination, the domestic structures within the site began to experience new life (Mixter, Rothenberg, and Hahn 2012). During this time, a new integrative civic building centered at Group 4---a large platform surrounded by shrines---was built (Keller and Mendelsohn 2011). Although the exact nature of this architectural group is still debated, this group was the center of a revitalized community situated at Actuncan.

Data for this research comes from excavations at a noble residence (Structure 19 and 20), three elite households (Structures 73, 41, 40 and 29), and six non-elite residential patio-focused groups (Groups 1, 2, 3, 5, 6 and 7). These excavations were undertaken in the 2001, 2004, 2010, and 2011 field seasons under the direction of Dr. Lisa LeCount. When the obsidian assemblage at Actuncan was analyzed in the middle of the summer of 2011, it was comprised of 594 pieces of obsidian, but the final count at the end of the 2011 field season was 795. The initial 594 pieces were analyzed for form, while the final count of 795 was used in the distributional analysis.

Methods

In order to measure the differential access of obsidian to elite and non-elites over time at Actuncan, Sara Shults examined standardized counts and weights of obsidian. She chose to calculate these measures based on the weight of obsidian since weight better accounts for breakage particularly when standardizing against other materials like ceramics and lithics. Three ratios are calculated based on the weight of obsidian divided by the 1) weight of ceramics, 2) weight of chert lithics, and 3) volume of excavation matrix. Shults found that she preferred the obsidian-to-sherd ratio because it offers the most accurate correlation of obsidian consumption to other household activities. Obsidian weight to excavation volume ratio is affected by the drastically different amounts of architectural construction at elite and non-elite households. Obsidian weight to lithic ratio measure should correlate to household activities, but it could be affected by production locales for stone tools. If commoner households were more likely to be producing tools with local lithic materials, then the amount of lithics would make the amount of standardized obsidian look very small in comparison to elite households where local lithic production is less likely to have occurred. Obsidian weight to ceramic weight is the most standard means to measure consumption, but it is affected by ritual activities like termination rituals that inflate the amount of ceramics found at households where these ceremonies were held. Nonetheless, both the obsidian-to-ceramic and obsidian-to-lithic ratios show similar trends that correlate well with the rise of centralized power at Actuncan (Shults 2012).

In order to examine the difference in access to obsidian, the ratios were calculated for both status (elite vs. non-elite groups lumped together) and individual households. Therefore, the total weight of obsidian in the group or household was then divided by the total weight of ceramics and lithics for that group or household.

The smaller obsidian assemblage of 594 pieces was analyzed for physical attributes. The type (prismatic blade, flake, core), condition (proximal, medial, distal), the percent of cortex, presence of retouch, platform preparation, number of dorsal ridges, amount of usewear (light or heavy), mass (g), length (mm), width (mm), thickness (mm), and specific color/texture categories were recorded for each piece of obsidian. These variables were used to determine efficiency of use and stage of production. As explained earlier, the larger assemblage was used to document the distribution of obsidian across structures.

Distributional Results

The disparity in obsidian distributions described in Sidrys' studies of Lamanai and El Pozito is not seen at Actuncan (Sidrys 1976,

Table 1. Count of obsidian by household and time period.

Context by Period	*Late Preclassic*	*Early Classic*	*Late Classic*	*Terminal Classic*	*Postclassic*	*Not Established*	*Total*
Group 1	16	73	75	95	-	5	264
Group 2	-	1	4	-	-	-	5
Group 3	-	6	3	-	-	-	9
Group 4	1	2	-	1	-	1	5
Group 5	-	-	42	36	-	13	91
Group 6	1	19	9	7	-	-	36
Group 7	1	7	18	1	-	15	42
Structure 18	-	41	26	-	-	-	67
Structure 19	1	-	-	-	-	-	1
Structure 20	-	-	5	-	-	-	5
Structure 29	-	-	1	-	-	-	1
Structure 40	-	4	19	7	-	9	39
Structure 41	15	13	61	75	36	5	205
Structure 73	-	20	-	-	-	5	25
Total	35	186	263	222	36	53	

Table 2. Total count and weight of obsidian excavated at Actuncan.

Preclassic		**Early Classic**		**Late Classic**		**Terminal Classic**		**Post Classic**	
Count	*Weight*	*Count*	*Weight*	*Count*	*Weight*	*Count*	*Weight*	*Count*	*Weight*
43	26.97g	185	146.65g	265	200.79g	224	173.8g	36	25.28g

1983). All households excavated at Actuncan contained obsidian, but the amount of obsidian they had varied over time (Tables 1 and 2). Not surprisingly, the largest quantities of obsidian are reached in the Late and Terminal Classic periods, which appear to correlate with the rise in population at Actuncan based on our volumetric information. Overall, the access to obsidian increased dramatically in the Classic period, starting in the Early Classic period.

While all households had access to obsidian, determining exchange mechanisms is more difficult (Shults 2012). While the majority of households appear to maintain a relatively steady quantity of obsidian through time based on the ceramic-to-obsidian ratio, Structure 41, an elite residence, increased its quantity in each time period. By the Terminal Classic period it contained the most obsidian of any household excavated at Actuncan (Shults 2012). Group 6, a structure though to be a special-use area associated with commoner residents at Group1, also has notably high quantities of obsidian in the Late Classic period. Therefore, obsidian consumption is determined by both activities and social status.

As discussed above, Maya elites are often characterized as regulating access to obsidian, but based on our data, they were not tightly restricting access. Further, exchange relationships between local elites and commoners appear to have shifted over time. Overall, the obsidian-to-sherd ratio lends evidence to suggest that access to obsidian did not equalize over time as predicted in market-based models (Hirth 1998), rather, elites gained more access to this resource. But they did so only in the Late Classic period (Table 3 and Figure 3). Before the Late Classic period, elites and commoners appear to have relatively equal access to obsidian. Relatively even distribution across status in earlier time periods may mean

Table 3. Standardized obsidian weight by status across time.

	Late Preclassic		**Early Classic**		**Late Classic**		**Terminal Classic**	
Variable Weight (g)	*Elite*	*Non-elite*	*Elite*	*Non-elite*	*Elite*	*Non-elite*	*Elite*	*Non-elite*
Obsidian	8.24	9.66	36.27	63.24	69.57	107.86	56.93	116
Ceramics	66925	115827	162936	209238	253344	711589	94700	669181
Lithics	11630	26967	24680	50589	63844	186957	25856	264079
Volume	10.25	8.96	11.52	9.65	38.42	23.62	13.93	29.70
Obs/Sherd Ratio x 1000	.123	.083	.222	.302	.275	.152	.601	.173
Obs/Lithic Ratio x1000	.709	.358	1.47	1.25	1.09	.577	2.2	.439
Obs/Volume	.80	1.07	3.14	6.55	1.41	4.57	4.09	3.91

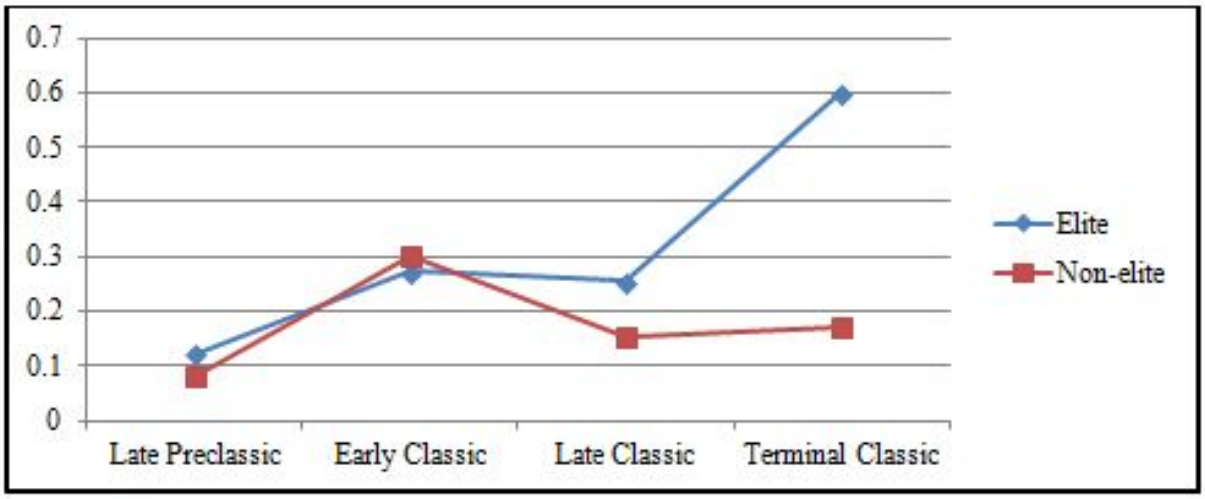

Figure 3. Obsidian-to-sherd Ratio in Elite and Commoner Households by Period.

that obsidian was initially circulated through 1) reciprocal relations, 2) redistribution by corporate governance, or 3) markets. I suggest the more parsimonious explanation for the distribution of obsidian before the Late Classic period is either reciprocal relations or redistribution.

Braswell (2004) suggests that "down-the-line dyadic exchange" or reciprocal relations appears to have been the primary way cores and tools from the San Martin Jilopeteque source were exchanged prior to the Classic period since there is no evidence of a controlling polity at the source during that time. Once these materials arrived at sites, it is possible that Preclassic corporate leaders redistributed obsidian relatively equitably across households as a means to consolidate political power. According to Richard Blanton and colleagues (1996), the Preclassic Maya may have been ruled by a corporate rather than network strategy. In corporate governance strategies individuals in ruling positions emphasize power-sharing assemblies rather than hierarchical bureaucracies and redistributive mechanisms that function to allocate the flow of wealth from upper to lower

social ranks rather than centralize wealth. This may have been the case at Actuncan.

However, after the Classic period, elites appear to manipulate the distribution of obsidian because by the Terminal Classic period elite households had three times as much obsidian than commoners when the obsidian-to-ceramic and obsidian-to-lithic ratios are considered (Table 3). This is an intriguing shift in the distribution of obsidian, since according to Kenneth Hirth (1998), a more even distribution of imported artifacts would be expected if a marketplace offered goods equally to all. At Actuncan, the opposite appears to have happened. During those periods in which markets are thought to have appeared at Xunantunich (Keller 2006) and Buenavista del Cayo (Cap 2011), access was more limited than in previous times. This pattern could be a result of more established hierarchies during the Late Classic period. Elite may have felt it was no longer necessary to recruit followers by redistributing obsidian and preferred to redistribute it to elites more often than to commoners. It is also possible that obsidian was for sale in markets, but that its price was fixed by elites at a level that prohibited its equitable distribution as predicted by unregulated market models (Hirth 1998).

Formal Characteristics of Actuncan's Obsidian

Actuncan's obsidian collection is largely composed of prismatic blades with only 6.5 percent of the assemblage representing flakes and production refuse (Table 4). Two of the cores were found in Group 1, a commoner plazuela, and the other two were found at Structure 41, an elite structure, but the blades were distributed across elite and non-elite households. These data suggest no correlation between socioeconomic status and blade production. John Clark (1997) states that around 180 blades could be produced per core; therefore, it is technically possible that the four cores could have produced the almost 600 blades found at the site since. However, Actuncan's blades are very narrow (mean width 10 mm) with the largest ones measuring approximately 2 cm and the smallest around 3 mm in width (Table 5). None showed noticeable signs of core preparation which reflects the absence of first series blades (De Leon et al. 2009). These data suggest that the blades were not being produced at Actuncan, or at least not at any of the structures excavated thus far. Braswell and Glascock (2011) suggest that travelling blade producers may have sold expended cores, particularly at sites where obsidian was especially rare.

Clark (1987) and others (Clark and Lee 1984; Jackson and Love 1991) have come to the consensus that blades were traded exclusively between producer in the highlands and consumers in the lowlands for nearly 1,000 years before cores began to be traded. Once cores were traded, blades continued to be traded but in a number of different forms (De Leon et al. 2009). Jason De Leon and colleagues provide a methodology for determining how blades were exchanged. Blades were traded in three primary modes: whole-blade trade, processed-blade trade, and local-blade production. In whole-blade trade, they expect to see evidence of the trade of complete blades without corresponding cores and the processing of blades into smaller pieces at sites where consumers used them. This reduction sequence should result in one proximal section, one distal section, and two or three medial sections for each blade. Some complete blades would also likely be found (De Leon et al. 2009). If the blades were processed prior to trading, then distal segments of late series blades would have been discarded since their more extreme curvature makes them less desirable for fine cutting tasks. This should results in proximal-distal and medial-distal ratios of near 6:1 (De Leon et al. 2009:118). Finally, in local-blade production cores were reduced on site or within the region by local craftsmen or travelling merchants (De Leon et al 2009: 118). In this case, some complete blades would be expected along with proximal-distal ratios of 1:1 and medial-distal rations within the range of 2:1 or 3:1. In addition to these indices, secondary production evidence should also be present in the form of core preparation flakes, first series blades, and microdebitage. This methodology is helpful in determining whether blades were produced on-site or imported as whole or processed blades in all time periods at Actuncan.

Table 4. Frequency of obsidian artifact types found at Actuncan.

Cores	*Flakes*	*Proximal Blades*	*Medial Blades*	*Distal Blades*	*Reworked Flakes or Blades*	*Total*
4	33	128	402	20	4	591
(0.6%)	(5.4%)	(22%)	(68%)	(3.4%)	(0.6%)	(100%)

Table 5. Mean and range of prismatic blade fragment measurements.

	Dorsal Ridges	*Mass (g)*	*Length (mm)*	*Width (mm)*	*Thickness (mm)*
Mean	*1.98*	*.68*	*18.9*	10.5	2.6
Range	*(0-5)*	*(.004-2.48)*	*(3.39-51.88)*	(3.07-21.59)	(0.92-14.16)

Table 6. Mean CE/M ratio, width, and thickness by time period.

Variables by Period	Late Preclassic	Early Classic	Late Classic	Terminal Classic	Postclassic
CE/M ratio	7.04	8.89	7.44	7.56	8.5
Mean Width (mm)	10.95	10.6	10.58	10.43	10.96
Mean Thickness (mm)	2.61	2.77	2.71	2.79	2.71

At Actuncan, the majority of the blades are small, processed fragments with proximal ends making up 22 percent of the assemblage, medial fragments making up 68 percent, and the remaining 3 percent are distal ends (Table 4). The proximal-distal ratio is just under 6:1, and the medial-distal ratio is 17:1. While is possible that a few distal ends were misidentified during analysis, an error De Leon and colleagues (2009) warn to avoid, it is unlikely that so many were misidentified. This implies that blades were being imported already processed to Actuncan.

Early in the analysis, it was clear that the blades were all very narrow and most were short fragments of blades (Table 5). Not only were the blades small, but there were no large tools or eccentrics and only four cores. Since Actuncan is located approximately 300 km from the nearest source, access was limited and each piece was used to its full extent. When a resource is scarce, individuals will likely take care to use it as efficiently as possible (Fowler 1991).

Sidrys (1979) found that on average sites farther from the source were more efficient with their use of obsidian. He used the "cutting edge to mass" ratio (CE/M) to measure this efficiency. This ratio is calculated by taking the cutting edge length in centimeters for both sides of blade (basically length multiplied by two), then dividing it by the mass in grams. He estimated that sites beyond 300 linear km from an obsidian source would have highly efficient CE/M ratios ranging from 5 to 7. If Actuncan falls into the same pattern as the sites in Sidrys' study, then a ratio of between 5 and 7 is expected since Actuncan is located 294 km from El Chayal and 315 km from Ixtepeque. The data shown in Table 6 make it clear that at Actuncan, blades were being produced and consumed highly efficiently, in fact, even more efficiently than at any site Sidrys analyzed. The mean CE/M ratio at Actuncan for the entire occupation was 7.84, the mean width was 10.58 mm, and the mean thickness was 2.74 mm (Shults 2012).

Discussion

Currently, there is little evidence for blade production in the households at Actuncan. Nor does it appear that whole prismatic blades were traded or exchanged to the site. Instead they may have been produced and processed into smaller pieces at another site nearby and exchanged to Actuncan through redistribution or

markets. Since sites in the upper Belize River valley are located 300 linear kilometers from the nearest source, it seems logical that the long-distance traders from the highlands would have transported the obsidian in the most energy efficient manner to the area. This would mean leaving behind all excess material and transporting cores or processed prismatic blades into the lowlands.

How obsidian changed hands from long-distance traders to consumers is unclear, but it is evident that elites had a fair amount of involvement in its exchanges. At Actuncan, obsidian was available starting in the Middle Preclassic period, but during the Late Classic period, elites had greater access to it than commoner households by a three-to-one ratio. Actuncan elites may have had greater access to obsidian through preferred trade partnerships, redistribution from paramounts, or buying power at an administered market at another site nearby. Based on the form of obsidian, consumers at Actuncan received their obsidian as ideally sized bladelets produced from whole prismatic blades. Processing of blades and bladelets occurred at workshops like Laton near El Pilar (Ford 2004; Hintzman 2000) or perhaps at elite residences in large centers nearby. There is also evidence that local merchants processed and exchanged them at markets in centers (Cap 2011; Keller 2006).

Evidence provided by this study indicates that obsidian was not exchanged in a fully commercial market during the Classic period. While other nearby sites like Buenavista del Cayo and Caracol are purported to have had marketplaces, it is unclear whether obsidian was exchanged the same way as local and perishable items that have been identified in market contexts (Cap 2011; Chase and Chase 2001). Even if obsidian was exchanged in the marketplace, it is likely that the elite administered the amount in circulation or fixed its price at a level that prohibited its equitable distribution.

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12 RECENT EXCAVATIONS AT THE BUENAVISTA DEL CAYO WEST ACROPOLIS

Jason Yaeger, Sylvia Batty, Sara Bratsch, Bernadette Cap and Jason Whitaker

The Mopan Valley Archaeological Project investigates the social, political, and economic complexity of the Mopan River valley, with special attention paid to the shifting relationship between Xunantunich and Buenavista. In 2011, we began excavations in and around the West Acropolis, the likely residence and administrative center for the polity's ruling family. In this paper, we present a brief synthesis of MVAP's results since 2007. We then present the results of two seasons of field efforts in the West Acropolis, paying special attention to its construction history and regulation of access to different spaces within the complex. We offer tentative interpretations of these data in light of Buenavista's long history on the Mopan valley landscape, its rulers' ability to maintain a large and integrated polity, and enduring competition with other centers in the valley.

Introduction

The Mopan Valley Archaeological Project (MVAP) was initiated in 2007 to better understand the role of the major center of Buenavista del Cayo (Buenavista hereafter) in the social and political history of the upper Belize River valley, with two particular research foci. The first is the study of the shifting relationships and political dynamics between Buenavista and other major centers in the region (Figure 1), such as Xunantunich, Cahal Pech, and Actuncan, and the competition and conflict that likely characterized some of those relationships, particularly during the Classic period. The second focus examines the relationships between Buenavista and the minor centers, communities, and households in the surrounding hinterland, and the ways in which those relationships both evolved in response to larger socio-political and ecological changes, while in turn helping to structure those larger changes.

In annual summer field seasons since 2007, the project has focused primarily on four investigative programs, three of which have been completed. One program of investigations has entailed the survey of settlement zones around Buenavista and on the opposite side of the Mopan River (Yaeger et al. 2012; Figure 2). These investigations are on-going, as we survey additional zones each year. Two interesting results are apparent to date. First, the population density immediately surrounding Buenavista is not much higher than the density of the surrounding valley, suggesting that, much like Xunantunich (Yaeger 2003), Buenavista did not exert a significant draw on local populations and

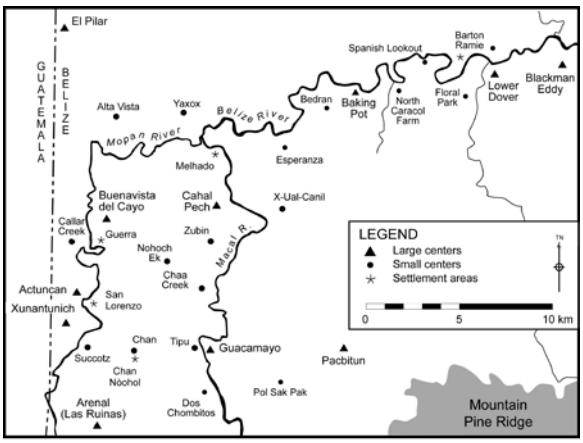

Figure 1. The Upper Belize River Valley, showing sites mentioned in text.

did develop into a nucleated urban settlement, despite its long history (also Yaeger 2008). Second, there is a remarkable degree of heterogeneity in settlement distribution, both in terms of the density of settlement and the types of settlements. Some settlement zones are dominated by smaller residential groups, while others have more large groups, presumably the homes of wealthier and/or higher status households (Yaeger et al. 2012). Interestingly, the settlement distribution around Buenavista does not conform to a concentric pattern, in which higher status groups live closer to the polity's capital. The complex interplay of political, economic, and environmental factors that structured where people founded their settlements and how those settlements developed remain important issues that MVAP is addressing through its on-going survey efforts.

In a second research program, Meaghan Peuramaki-Brown (2012) addressed some of

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these issues through her detailed study of the Buenavista South settlement cluster, located immediately south of Buenavista's site core (Figure 2). The population history of this area strongly parallels that of Buenavista, suggesting a settlement whose fortunes were strongly tied to those of the adjacent political center. While Xunantunich may have waxed more powerful than Buenavista in the Late Classic II (AD 670–780), the Buenavista South settlement saw a very modest drop-off from the Late Classic I (AD 600–670) to the Late Classic II period, from a 93% to 87% occupancy rate, followed by a steep Terminal Classic (AD 780–890) decline. The stability in the Buenavista South settlement cluster during the Late Classic suggests that its proximity to Buenavista provided some buffering against the putative competition between Xunantunich and Buenavista. This contrasts with situation in the Callar Creek settlement zone, which lies closer to Xunantunich, just south of the Callar Creek minor center, which was largely abandoned by the end of the Late Classic I period (Yaeger 2008).

The third research program was Sarah Kurnick's investigation of the Callar Creek minor center, the largest architectural complex between Actuncan and Buenavista (Figure 1). Kurnick (2013) found light occupation in the Preclassic and in the Early and Late Classic I periods, followed by significant construction in the Late Classic II period. This suggests that Callar Creek's growth and the prosperity of its residents were related in some way the rapid rise of Xunantunich during the Late Classic II period.

Of the four major MVAP research programs undertaken to date, only the fourth was located within the Buenavista site core (Figure 3), where Bernadette Cap conducted a comprehensive study of Buenavista's East Plaza in order to assess whether it served as a centralized marketplace. Multiple lines of evidence demonstrate that this was in fact the case, at least during the Late Classic period (Cap 2011; Heindel et al. 2012).

As the investigative programs described above were completed, MVAP began to shift its focus to the Buenavista West Acropolis and the adjacent West Plaza (Figure 4). This research

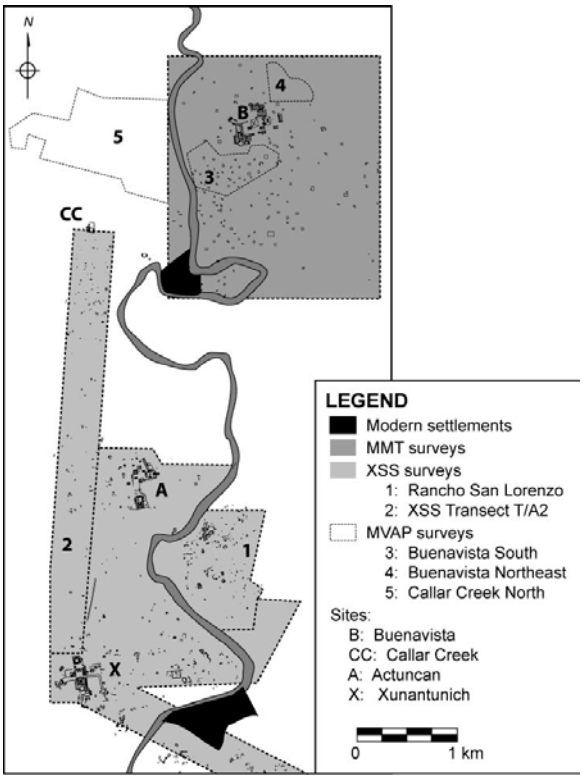

Figure 2. Buenavista del Cayo and its Immediate Hinterland

has benefited in particular from our ability to build on previous research at Buenavista conducted by Joseph Ball and Jennifer Taschek.

Mopan-Macal Triangle Archaeological Project Investigations

Ball and Taschek undertook extensive excavations at Buenavista as part of a larger regional study, the Mopan—Macal Triangle Archaeological Project (MMT), that began with a pilot season in 1981 and continued through 1992 (Ball and Taschek 2004: 150). Their excavations examined many sectors within the site (Ball and Taschek 2004; also Ball 1993; Ball and Taschek 1991) and surrounding settlement zones (e.g., Ball and Kelsay 1992; Taschek and Ball 1986).

In the area around the West Acropolis, their excavations in the alley between the West Acropolis and the South Plaza Group revealed an Umbral phase (550–200 BC) monumental platform, painted red (Ball and Taschek 1994: 153), demonstrating the ceremonial or political use of this part of the site by at least the Late Preclassic.

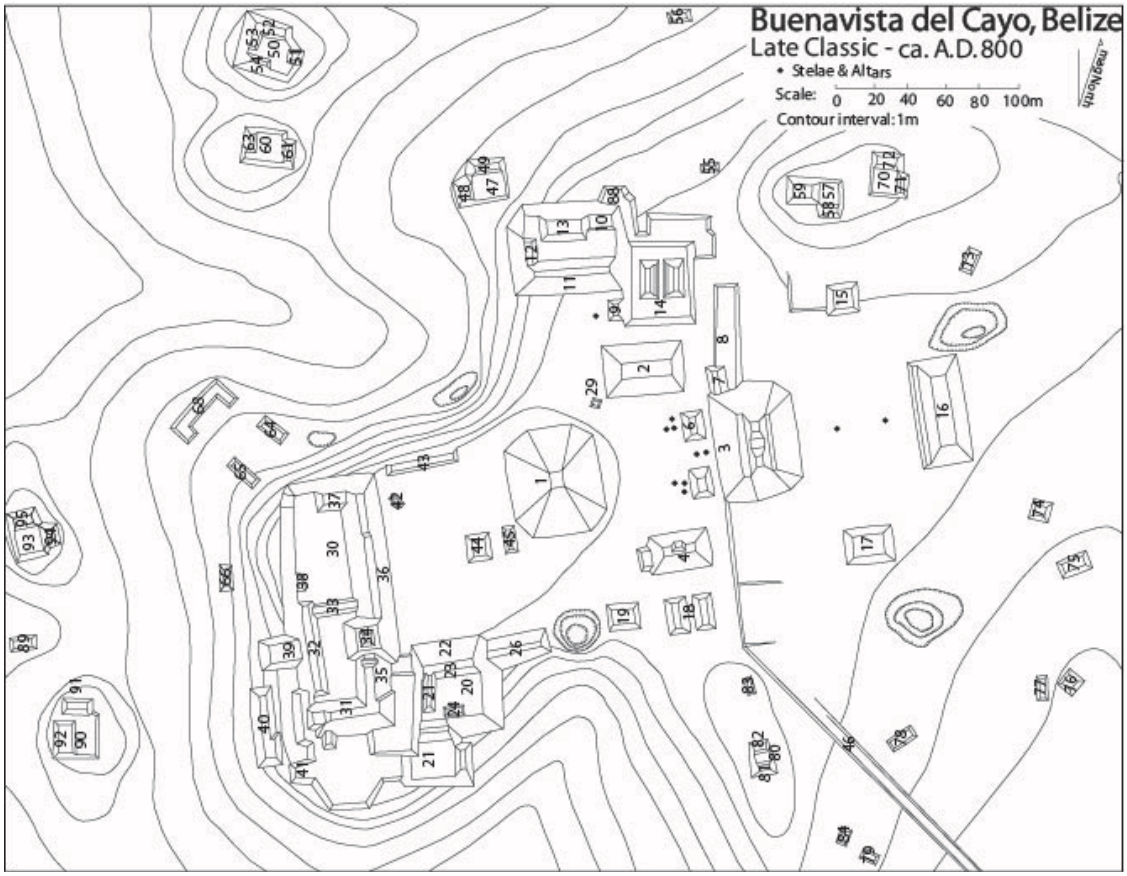

Figure 3. Buenavista del Cayo.

Regardless of the date of its founding and subsequent history of development, it is clear that the West Acropolis was an important venue for political activities during the Late and Terminal Classic periods. MMT excavations in the southern of the two main patios within the West Acropolis and its surrounding structures revealed several deposits of interest, particularly in the alley between Strs. 31 and 32 (labeled Tea Passage) and in the ancillary patio just to the west (called Tecpan Annex). In an area designated HUT, along the far eastern side of Tecpan Annex and abutting the main western face of the West Acropolis—Ball and Taschek found a dense midden, interpreted as evidence of ritual feasting (Clowery 2005). The nature of the deposit and the ceramic material it contained led Ball to infer that it was deposited relatively quickly between ca. AD 780 and 820, dates supported by radiocarbon dating of the deposit (Ball, cited in Clowery 2005: 19). These dates

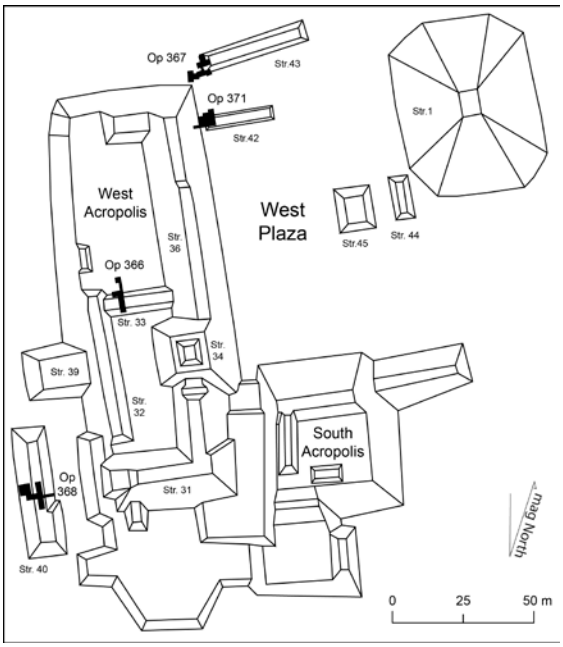

Figure 4. Buenavista del Cayo: West Acropolis and West Plaza, showing areas excavated by MVAP in 2011 and 2012 (map courtesy of Bernadette Cap).

would place the HUT deposit at the transition between the Late Classic II and Terminal Classic periods, which conform closely to the Hats' Chaak and Tsak' phases at Xunantunich (LeCount et al. 2002).

Ball and Taschek also excavated Str. 34, the elevated patio complex located on the eastern edge of the southern patio. They suggest that this complex, given the field designation Mount Olympus, was the venue for ritual activity for small and select groups of Buenavista's elite during the Late and Terminal Classic periods (Helmke et al. 2008: 43). Of particular note is a Late Classic-to-Terminal Classic burial of a nobleman (Burial BVC88-1/2) who was laid to rest with a bone carved with a hieroglyphic text that labels it as personal possession of an *ajaw* (king) of Puluul (Helmke et al. 2008). Because owners of high value items like this carved bone sometimes gave them to others as valued gifts (e.g., Ball and Taschek 1992; Houston et al. 1992), we cannot thus discount the possibility that the bone is not buried with its original owner. That said, the parsimonious interpretation of this object is that it names the person with whom it was buried, and thus it is likely that Puluul refers to Buenavista (Helmke et al. 2008). Regardless of this matter, BVC88-1/2 is important because it strongly suggests that Buenavista was governed by its own powerful rulers as late as the 9th century AD, as Christophe Helmke and colleagues (2008) observe.

Finally, Ball and Taschek found a rich midden in the southwest corner of the southern patio of the West Acropolis, deposited on the final patio surface between Strs. 31 and 32. This midden dates to the Terminal Classic period and was rich in exotic goods (Lumsden 1994), facts that suggest that the ruling elite like the man buried in BVC88-1/2 continued to live in the West Acropolis during the Terminal Classic period. Additional accumulations of Terminal Classic midden were located in the corridor between Strs. 31 and 32 and where it opened up to the west.

MVAP Investigations

MVAP has used MMT's previous findings as a springboard for further research designed to accomplish the following four goals:

1. To reconstruct the spatial organization of the West Acropolis and West Plaza in order to identify how architecture channeled movement through various spaces in the putative royal court and the adjacent West Plaza, restricting access to some space.

2. To locate middens and other primary deposits that reflect activities that occurred in those spaces.

3. To refine our knowledge of the construction history of the plazas and associated structures and document the changing use of space in this part of the site, with an eye toward understanding the site's political history.

4. To search for evidence of competition and conflict, including defensive features and signs of warfare, such as sacking and desecratory termination rituals.

Due to space constraints, we will focus our presentation here on data from the West Acropolis. While the investigation of the West Plaza is on-going, we have recovered indications that Strs. 42 and 43 formed a defensive feature protecting the plaza's northern edge (Luzmoor 2013). Furthermore, evidence of ephemeral burned buildings—fired daub along with ash and charcoal lenses—on the final surface of the West Plaza suggests that it might have functioned as a redoubt in the site's last years (Cap 2012). These hypotheses are the focus of our on-going fieldwork in the West Plaza, and we plan to present a fuller discussion of that research in future publications.

Structure 33: Channeling Access within the West Acropolis

In 2011, Sylvia Batty supervised excavations on Str. 33, a low mound that divides the West Acropolis into northern and southern halves. The northern half is bounded on the east by Str. 36, a massive range structure that likely had an *audiencia* layout, probably with a central corridor that served as the main point of access into the West Acropolis from the West Plaza. Smaller structures framed the north and west sides of the patio that lies west of Str. 36, providing open vistas toward the Mopan River. This open patio seems likely to have been more

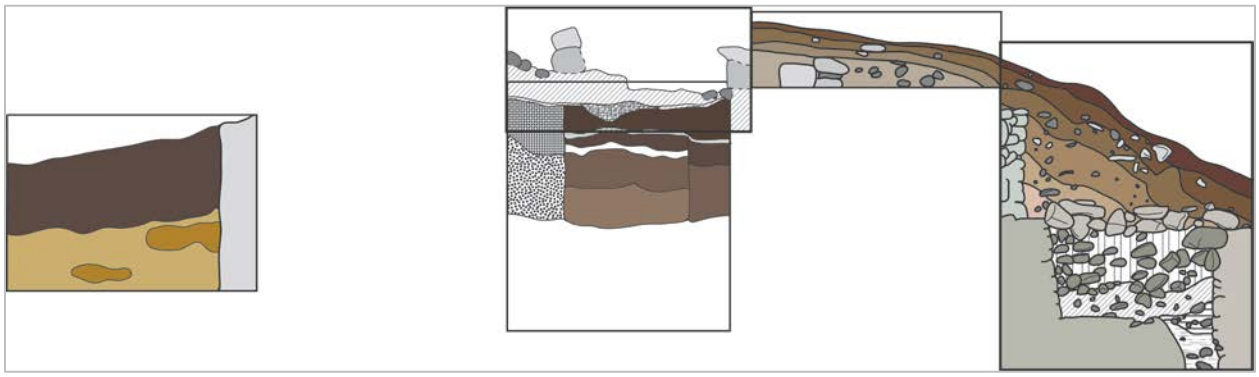

Figure 5. Profile drawing of excavations through Str. 40.

public gathering space, given its relative ease of access and small surrounding buildings.

Excavations by Ball and Taschek (2004) revealed that the southern half of the West Acropolis was bounded by more imposing range structures and the elevated, restricted-use Str. 43 complex ("Mount Olympus") discussed above. This southern zone of the West Acropolis was likely the venue for residential and administrative functions of Buenavista's ruling court. A corridor leading to the west between Strs. 31 and 32 would have provided easy access to ancillary patios to the west and south, as seen in other palaces in the region, such as Xunantunich's Plaza A-III complex (Yaeger 2010).

In order to assess the way in which movement was channeled between the two sectors of the West Acropolis, we placed a line of eight excavation units across Str. 33 to clear its final-phase architecture. These constituted Op 366 and covered 31 square meters. The excavations revealed simple facings made of small- to medium-sized faced limestone blocks. The blocks were not uniform in size nor neatly coursed, like the masonry of many low platforms of the Late and Terminal Classic periods in this region. Ceramic material recovered support a late date for the construction of this platform. In addition to the northern facing of the main body of Str. 33, our excavations revealed the west face of a northern extension of the structure out into the patio. We were unable to clear much of this extension, so we cannot be certain of its architectural function, but it is centrally positioned and likely related to access. We found no evidence of a stone building or other superstructure on Str. 33, nor any postholes that would suggest a perishable superstructure.

The final phase of Str. 33 likely was associated with the final surface of the West Acropolis' northern patio. In Op 366A, we continued our excavations downward below the eroded final patio surface to better understand the patio's stratigraphy, and thus that of the West Acropolis. We were surprised to find that a very thick, nearly sterile layer of heavily leached clay with lenses of river cobbles. The occasional sherd and the cobble lenses suggested that this unusual stratum was not natural sub-soil, but a massive fill episode. This inference was borne out after 4 meters of excavation, when we found a feature that appears to be the edge of a low platform, faced with unworked cobbles. Lack of time and the restricted exposures at the bottom of our unit kept us from revealing any more of this feature.

Structure 40: An Ancillary Structure

Str. 40 is the westernmost structure associated with Buenavista's West Acropolis, framing the west side of an ancillary patio just off the southern patio of the main body of the acropolis. The function of this complex remains unknown. Str. 40 is a long platform measuring approximately 13 by 30 meters and 2 meters high. Portions of Str. 40 were previously excavated by MMT, and their excavations revealed a rich midden associated with the structure and its patio (Joseph Ball, personal communication, 2010). This finding led us to target Str. 40 for excavations in 2011 and 2012.

Excavations supervised by Sara Bratsch and Jason Whitaker focused on revealing the form of structure's final phase, uncovering any associated deposits, and reconstructing the structure's architectural history. A total of 13 excavation units comprised Op 368, which sampled a total of 48 square meters. Most of these units uncovered the structure's final phase; a few penetrated the structure, both by removing backdirt from MMT's previous excavations and by undertaking new excavations. Our units revealed at least two major phases of architecture (Figure 5), the last of which shows evidence of heavy burning.

The final phase of Str. 40, Str. 40-1st, sat on a substructure of nicely faced limestone block masonry. Its rear, western facing rose over 2 m from the surrounding landscape in two terraces. The face of lower terrace was set roughly 2 m west of the face of the upper terrace to create a broad rear terrace surface. The face of the upper terrace showed signs of burning on some of its basal courses, as the limestone blocks were noticeably gray in some areas. This is one of several indicators that Str. 40-1st was heavily—perhaps systematically—burned at the end of its use-life. The platform's front, eastern side rose approximately 1 m above the patio surface, but its facing is poorly preserved, perhaps due to ancient stone robbing. The front facing is associated with the final surface of the patio.

The Str. 40-1st superstructure was poorly preserved, due in part to its lack of protection from the tropical elements and its apparent intentional destruction. Its plaster floor is very poorly preserved and discontinuous. While we cannot fully reconstruct the superstructure's floorplan, its rooms were demarcated by walls of large limestone blocks, preserved to two courses high (Figure 6). The paucity of architectural collapse, the absence of vault stones, and the thinness of the walls suggest that the superstructure was pole and thatch, with low walls of limestone masonry reinforcing the poles. This interpretation is strengthened by the presence of daub and large amounts of ash and charcoal—the burned remains of the superstructure—found directly on top of the building's plastered floor and intermingled in the uppermost collapse layers.

We believe that Str. 40-1st was

Figure 6. Ops 368G and 368H, oblique view showing ashy matrix on final floor of the summit of Str. 40-1st and the fire-altered facing of the interior wall of the superstructure.

Figure 7. Base of Op 368H/6, showing vessel fragments in the ashy matrix on the summit of Str. 40-1st.

intentionally destroyed, first burned and then partially dismantled. We found evidence of burning on many of the architectural surfaces that were exposed in the building's final phase. These included the lower courses of the uppermost terrace facing on the substructure's west side, the low masonry foundation walls of the superstructure, the lower courses of platform's east face, facing the patio, and the poorly preserved plastered floor on the summit of the substructure. In some areas, the plastered floor was covered with an ash-rich matrix, several centimeters thick, further supporting the notion that the structure was burned immediately prior to being abandoned.

Intermixed with the ashy matrix on the plastered floor of Str. 40-1st, we found several

clusters of large sherds, including some nearly complete vessels (Figure 7). Some of these sat several centimeters above the plastered floor surface. These included fragments of a jar and several dishes and a nearly complete Mount Maloney Black bowl, the latter with a lip form diagnostic of the Late Classic II period. These deposits are not dense enough, nor the sherds fragmented enough, to suggest a midden. Instead, they likely either represent vessels that were in use related context when the structure was destroyed, or vessels that were deposited as part of the destruction in some kind of termination event, whether desecratory or reverential. We lean toward the former interpretation, given the evidence currently available. The sherds' position within the ashy matrix could be the result of them falling from the buildings rafters during the burning event. In one area, we recovered several bone tools and awls that showed signs of burning, consistent with our working hypothesis that the materials found in the ashy lenses are materials that were being used or stored in the building when it was burned.

In Op 368H, we found a second plaster floor just under the first floor, suggesting there were two subphases of Str. 40-1st. This is further supported by the unusual pattern of burning on one of the interior faces of one of the superstructure walls. At the north end of the wall, both courses are greyed from burning, but to the south, only the top course is burned. The unburned masonry is likely a "ghost" of a low bench, some 25–30cm high, that covered the lower course and thus protected from the heat of the fire (Figure 6). The bench was later removed, as we found ashy matrix all across the entire unit. This latter finding suggests a second burning episode. Thus, both identified subphases of Str. 40-1st were destroyed by fire.

The stratigraphy overlying Str. 40-1st's lower terrace further supports our interpretation that Str. 40-1st was intentionally burned and dismantled. The terrace's surface is carpeted by a layer of large stones, likely the dismantled and/or collapsed remains of the facing of the upper terrace and the foundation walls of the superstructure. If the upper terrace had disintegrated through the gradual decay and collapse that accompany abandonment and neglect, one would expect to find these stones interspersed throughout the collapse layers of the stratigraphy, embedded in a matrix of slumping and redeposited fill and sediment accumulation. In contrast, here the large stones are found in a single layer that is covered with layers of eroded fill and sediment. This suggests a more rapid collapse, of the sort caused by either a structural engineering failure or the intentional dismantling of the structure. As noted above, the Mount Maloney bowl fragments found in the ashy matrix on top of its final floor suggest that the burning and abandonment of Str. 40 occurred in the Late Classic II period.

While Str. 40-1st many have been abandoned during the Late Classic II period, the patio to its east continued to be used into the Terminal Classic, although perhaps not intensively. This is indicated by the presence of a few Terminal Classic Mount Maloney Black bowl sherds found above the final surface of the patio on the east side of Str. 40, and it accords well with the Late Classic II-Terminal Classic and Terminal Classic midden deposits found by Ball and Taschek in association with Strs. 31 and 32, mentioned above.

Our excavations into the fill of Str. 40-1st suggest that this zone had witnessed the deposition of middens in earlier times, too. We sampled the fill of the Str. 40-1st substructure at the structure's summit and under the surface of the lower terrace on the structure's western side. In both areas, the fill consisted of relatively homogeneous fine sediments that contained many large and well-preserved sherds. In the upper terrace, the layers of fine sediment and redeposited midden were capped with a layer of gravel-sized limestone ballast in preparation for the plaster floor that capped the platform's summit.

While the assemblage has not yet been formally analyzed in its entirety, it included many painted sherds; a relatively high frequency of objects that were elaborate in their manufacture and/or made of non-local raw materials; and an unusual density of charcoal. We believe the bulk of these materials come from an elite midden that was redeposited here as fill for Str. 40-1st. The sherds show little erosion of their surfaces or edges, suggesting that the midden was redeposited shortly after its

original deposition.

The putative midden that was the source of the fill of Str. 40-1st may have been analogous to the later HUT midden found by Ball and Taschek on the east side of this same patio group, as mentioned above. The presence of many medial-ridge dish fragments dates the hypothesized earlier midden to the Late Classic I phase (ca. AD 600-670), however, making it over a century older than the HUT midden.

Our penetrating excavations revealed earlier architectural elements associated with Str. 40. They indicate a deeper history in this location, although the details of that history remain unclear due to our limited exposures of earlier architectural units and the fact we did not reach sterile soil. We exposed two terraces that face west that together represent a construction episode immediately antecedent to Str. 40-1st's western terraces. The upper terrace lies directly under the facing of the upper terrace of Str. 40-1st, which was likely positioned there precisely because of the extra stability provided by using the earlier facing as a foundation. The lower terrace is set approximately 1 meter in front of the upper terrace. The terrace faces are made of nicely dressed limestone blocks, and they are slightly battered. Both were covered by the fill behind the facing of Str. 40-1st's lower terrace. The top of the upper terrace is roughly at the same level as the final floor of the patio to the east of Str. 40, and thus it is possible that these terraces are not part of a substructure for a building, but instead retained the fill that formed the patio. Further excavation would be required to evaluate these possibilities.

Discussion

Our excavations to date in the West Acropolis, while relatively limited, allow us to speak to some of the larger questions raised at the outset of this article. First, we will consider the occupation history of the West Acropolis and its related structures. The final-phase architecture that we have excavated dates to the Late Classic II period. Given the substantial drop in population in the Buenavista hinterland by the end of the Late Classic II period, the relative paucity of Terminal Classic modifications is not surprising. Terminal Classic sherds around Str. 33 and in the patio east of Str. 40 corroborate Ball and Taschek's finding that the West Acropolis continued to be used after the Late Classic II period, and that it likely served as the residential and administrative complex for the polity's ruling family. Just as population shrunk as the valley entered the Terminal Classic period, so did the ruler's court, however. Str. 40-1st was never refurbished in the Terminal Classic period, and the Late Classic II deposits that lay on its ash-covered summit remained largely undisturbed. As was the case at Xunantunich (LeCount and Yaeger 2010; Leventhal 2010), it seems that the West Acropolis—and likely the site more generally—was shrinking, as buildings and sectors of the site that were used during its Late Classic apogee were abandoned as the valley's population shrunk and the Buenavista polity declined in the Terminal Classic period.

Our few penetrating excavations revealed evidence of earlier construction activity in the West Acropolis. Most striking was the clay fill episode over 4 meters thick in the northern sector of the West Acropolis. While additional testing is needed to confirm its presence elsewhere in this area, our working hypothesis is that it was placed to build up this northern half of the West Acropolis in one massive construction episode.

The repeated burning of Str. 40-1st also speaks to the larger questions we raised above. It is possible that the pole and thatch buildings associated with the two subphases of Str. 40-1st burned as the result of an accident, such as a kitchen fire or wild fire, but it is equally plausible that they were burned during an attack on the site. The intensity of the burning, which turned the east and west facings of the substructure platform grey, as well as the interior walls and plaster floors, is remarkable. Of greater interest, the fact that the structure was partially dismantled is consistent with destruction as part of a sacking, rather than an accident.

While this isolated observation is inconclusive evidence of sacking in-and-of-itself, it becomes more convincing when viewed within the broader context of evidence of competition and violent conflict in the Mopan valley during the Late and Terminal Classic periods. The valley's carved monuments and

texts show military themes and record war events (Helmke et al. 2010), the people of both Buenavista (Luzmoor 2013) and Callar Creek (Kurnick 2013) erected defensive features late in those sites' histories; the settlement zone south of Callar Creek was largely abandoned by the end of the Late Classic I period (Yaeger 2008), and Xunantunich's palace was sacked (Yaeger 2010). Interpreted within this broader context, the data from Str. 40 raise the distinct possibility that the building was burned during attacks on Buenavista.

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13 RECENT INVESTIGATIONS OF THE MOPAN VALLEY PRECLASSIC PROJECT AT XUNANTUNICH, BELIZE

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The Mopan Valley Preclassic Project has been investigating the site of Xunantunich, in the Belize River valley, since 2008. Over the past five years, the project has conducted intensive investigations of a Preclassic ceremonial center designated Group E. This group is dominated by an East/West pyramid complex. Recent investigations at Group E, suggest that the east and west pyramids of this group form an E-Group. This E-Group dates to the Middle Preclassic and may represent one of the earliest E-Groups found to date in Belize. Although much of the research by the Mopan Valley Preclassic Project has focused on the Preclassic ceremonial center, we have expanded our investigations to include excavations at Group D and within the site core (Group A) including El Castillo. Innovative methods, such as 3D modeling, coupled with targeted excavations, have enhanced our understanding of El Castillo. In this chapter, we detail our latest findings at Group E and present some preliminary results from the site core and Group D.

Introduction

The Mopan Valley Preclassic Project (MVPP) has been investigating the site of Xunantunich since 2008. Although much of the research by MVPP has been conducted at Xunantunich's Group E, we have expanded our investigations to include excavations at Group D and within the site core (Group A). In this chapter, we detail our latest findings at Group E and present some preliminary results from the site core and Group D (Figure 1).

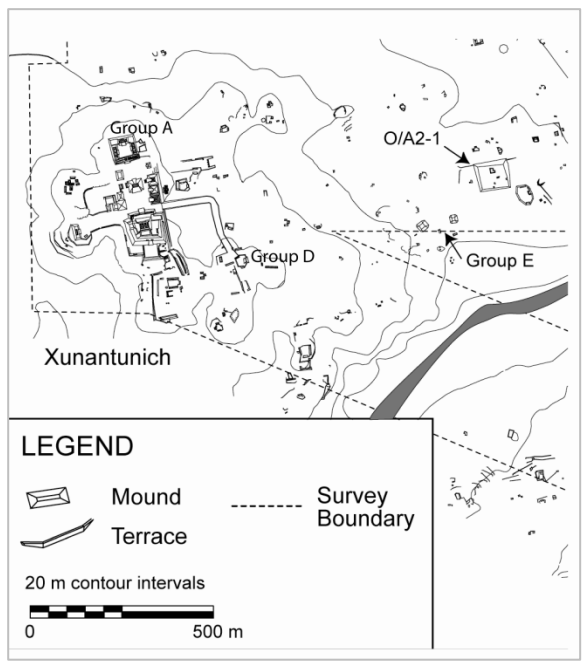

Figure 1. Map of Xunantunich (Courtesy of Keller and Yaeger).

Investigations at Group E

MVPP's investigations at Group E began in 2008 focusing on the eastern building of this Preclassic complex, Structure E-2. Previous investigations conducted by the Xunantunich Archaeological Project (XAP) (Robin et al. 1994) provide important foundational data and a base survey of Group E and its surrounding areas. Investigations at Group E are carried out with the main goal to shed light on the Preclassic occupation of Xunantunich and to better understand changes in political structure at Xunantunich over time. MVPP research has focused on the nature of Preclassic ritual practices and the origins of the institution of Maya kingship in the Belize Valley.

Structure E-2 of Xunantunich's Group E sits as the eastern structure paired with Structure E-1 directly to the west (Figure 2). Previous excavations on Structure E-2 uncovered several construction phases with the final phase dating to the terminal Late Preclassic. In 2011 and 2012, the objectives for excavations at Structure E-2 included: 1) uncovering the southwest corner of the building in order to understand the overall dimensions and extent of the structure; 2) to conduct clearing excavations on the southeast quadrant to reveal and record each construction phase individually; 3) to investigate the possibility of architectural stucco decoration on the final and penultimate construction phases; 4) clear the summit of the building to examine the form and look for possible caches and/or burials. Funding for this research was provided by National Geographic Society and the University of Texas at San Antonio.

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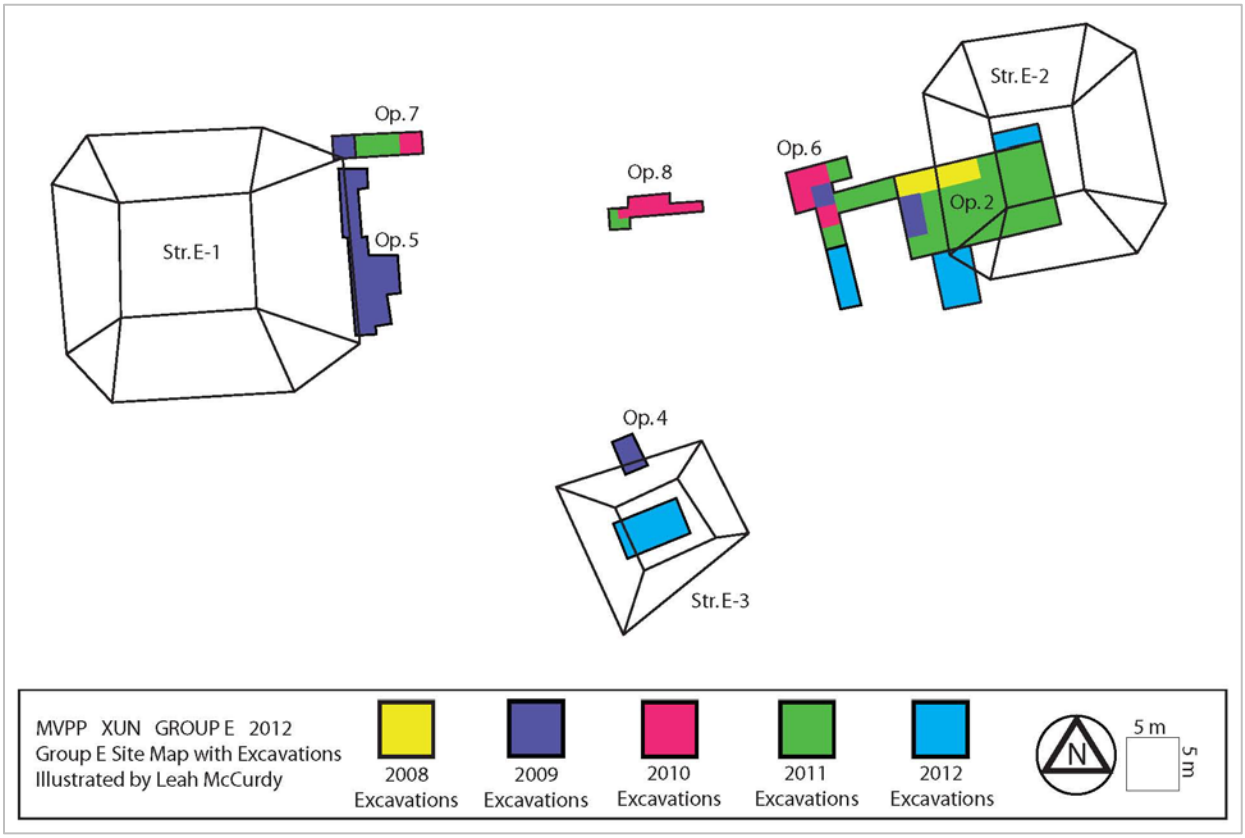

Figure 2. Map of Group E Showing Excavation Units.

Continuing from three previous field seasons at Group E (Brown 2009, 2010; Brown et al. 2011), MVPP's 2011 clearing excavations on Structure E-2 covered approximately 8 meters (north-south) along the building's base by 20 meters (east-west) running from the base to the summit of the structure. Excavations were designed to uncover each successive phase in its entirety before clearing to the next phase. Of particular note is the formal burial chamber encountered at the summit of Structure E-2 (see Brown, this volume for details). We have been able to better identify the construction phases of Structure E-2 based on these extensive excavations. We broadly outline a tentative construction history below.

Structure E-2's terminal construction phase (E-2-1st-a) is represented by a poorly preserved small rubble layer encountered on the summit and upper portions of the building. No signs of a superstructure or plaster surfaces are present for this terminal phase based on current excavations. Possible alignments of larger stones in the south may indicate architectural elements of the southern façade during this phase. Due to collapse and slumping, dating of this final phase is tentative. Ceramic data, however, suggests a Late Preclassic date. Our best assessment of this phase is that it may represent an addition to the penultimate phase and therefore we have designated it Structure E-2-1st-a.

At the summit of Structure E-2, we encountered a rectangular burial chamber that had been filled in with what appeared to be construction fill. This architectural chamber feature was badly preserved and is discussed in more detail in Brown 2013 (this volume). The northern and eastern walls of the summit burial chamber are quite distinct from the southern and western walls (Figure 3). Based on this, we tentatively suggest that the northern and eastern walls constituted a distinct architectural element of E-2-1st that was modified to construct the tomb-like burial chamber. The southern and western walls were added to form a rectangular

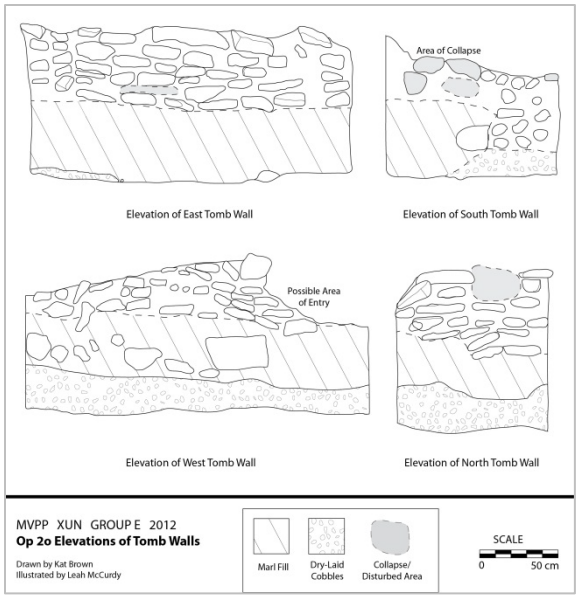

Figure 3. Elevation Drawings of Burial Chamber Walls.

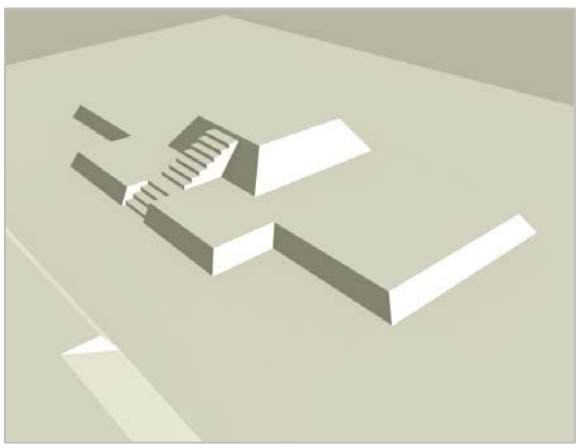

Figure 4. Isometric Drawing of Structure E-2-2nd.

chamber feature. This explains the poorer quality on the southern and western sides. It is unclear if this feature was associated with Structure E-2-1st-a or E-2-1st- b, however, it does appear to date to the Late Preclassic based on the construction sequencing.

The penultimate construction phase (E-2-1st-b) is badly preserved and, therefore, difficult to understand. This phase is represented by a distinct cobble construction fill encountered throughout the lower sections of Structure E-2. Aligned cut stones found midway up the building may be the remains of a central stair of E-2-1st-b. Additionally, dry-laid rubble above these cut stones may be stair backing of the upper portions of the same central stair. Floating corners encountered at the base of the building probably represent construction pins or retaining walls used during the construction of E-2-1-b. Artifacts associated with the cobble construction fill and these other areas indicate a Late Preclassic date for this penultimate construction phase. Excavations on the summit of the structure during the 2012 field season revealed patches of intact plaster from the summit floor surface of this construction phase. A layer of humus and rubble fill overlaid this poorly preserved plastered summit indicating that it was indeed from Structure E-2-1st-b (and not E-2-1st-a).

Of the construction phases investigated to date, E-2-2nd is the best preserved. This phase consists of a central stair exposed in 2008 and 2009 as well as the associated outset block to the south. E-2-2nd's architectural form consisted of inset corners and a lower terrace at least five courses in height. Due to the form of the building, we had hoped to find intact stucco masks on the lower and upper terraces. Unfortunately, we did not uncover any evidence of stucco masks present or any fragments of painted stucco within the collapse indicating that this form of decoration was most likely not used on Structure E-2-2nd. All cut stones associated with this phase are large and embedded in thick, white marl. A distinct marl was exposed over the upper portions of the building and represents the structural fill of E-2-2nd. Such extensive use of marl is characteristic of Middle Preclassic structures throughout the Maya lowlands. Ceramics recovered from the base of this phase and throughout the collapse suggest a Middle Preclassic date. Additionally two AMS dates from charcoal recovered directly on the associated plaza surface confirm this date (see Brown this volume).

MVPP continued working on Structure E-2-2nd during the 2012 summer field season in order to locate the basal southeastern corner of E-2-2nd (from which overall basal dimensions could be determined). Locating the corner of Structure E-2 proved time-consuming and eventually fruitful. Figure 4 indicates the newly interpreted form of this eastern Preclassic structure (E-2-2nd), showing the inset corner and overall dimension. The low, broad basal platform on which the two-tiered pyramid sits

has the form of an eastern architectural arrangement of an E-Group. When paired with the western pyramid, it appears that Group E is a very early example of an E-Group (Middle Preclassic). From our excavation data, it appears that the basal platform of the eastern structure is approximately 36 meters wide.

During the 2012 field season, we re-opened the centerline trench initiated at the base of the structure in 2008 and extended the trench to the summit. Excavations revealed that the upper portion of the phases of Structure E (E-2-1st-a, E-2-1st-b, and E-2-2nd) were poorly preserved and we did not encounter any intact portions of the central staircase. We removed the collapse and slump from the uppermost phases (Structures E-2-1st-a and b) and continued down to the distinctive packed marl fill of Structure E-2-2nd. Excavations revealed that the upper portion of Structure E-2-1st-b was constructed using dry-laid rubble. Within this rubble construction fill we encountered a broken fragment of a sculpture carved in the round, possibly a leg element of an individual. This broken sculpture is very interesting and suggests that at least by the Late Preclassic carved monuments were present at the site. Why it was broken and re-deposited in construction fill of an eastern pyramid is unknown at this time. Beneath the rubble fill, we encountered the intact summit surface of the earlier, Middle Preclassic construction phase, Structure E-2-2nd. We plan to further investigate the summit during the 2013 field season as well as penetrate the basal portion of the staircase to look for caches and/or burials associated with the eastern structure of this important Middle Preclassic E-Group.

The earliest construction phase of Structure E-2 (E-2-3rd) documented to date is poorly understood yet represented by a well-preserved terrace wall facing first uncovered in 2008. Based on 2011 excavations, this facing appears to be partially dismantled and was completely encased in marl during the construction of E-2-2nd. A small test pit behind this terrace facing in 2008 (Brown 2009) produced only compact marl and very small fragments of Savanna Orange ceramics. We suggest that this terrace facing is part of a low Preclassic platform built as the original eastern structure at Group E. It is interesting to note that the eastern structure of a Middle Preclassic E-Group at the site of Cival is a low platform structure suggesting that this form is not unusual for early E-Groups (Estrada-Belli 2011). We hope to further investigate this construction phase during the 2013 field season.

Excavations at Group E have demonstrated the great importance of horizontal and vertical exposure in plaza areas. Since 2008, excavations in the plaza area between Structures E-1 and E-2 at Group E have uncovered remains of Postclassic ritual activity (Brown 2009: 2011), Late Classic craft production activity and occupational remains (Brown et al. 2011; Chapman, forthcoming; Sword, forthcoming), a Protoclassic ritual deposit (Brown et al. 2011; McCurdy and Brown 2011; Kokel forthcoming), as well as a large terraced platform directly to the west of Structure E-2-2nd. Additionally, plaza investigations have revealed a buried paleosol layer with a Preceramic occupation layer. Eastern Plaza excavations (Operation 6) are located directly west of Structure E-2 while Western Plaza excavations (Operation 7) are located directly east of Structure E-1 (see Figure 2).

MVPP's excavations in Plaza E have been on-going since 2008 and much of the collected data has been presented elsewhere (Brown 2011, 2012; Brown et al. 2011). Recent investigations have focused on exposing the large terraced platform located to the west of Structure E-2, as well as the space between this platform and the base of Structure E-2. Investigation of the area immediately in front of Structure E-2's basal steps was supervised by Whitney Lytle. A trench was placed between Operation 6 and Operation 2 in order to investigate the plaza area directly in front of Structure E-2's central staircase (Figure 2). In the upper levels of these excavations, thousands of worked chert blades and flake debris were encountered. This unusual lithic assemblage represents the remains of Late to Terminal Classic crafting activities (Brown et al. 2011). In order to understand the craft production that occurred here, Tom Chapman is undertaking a complete analysis of the lithic assemblage including formal analysis and use-

wear analysis, complimented by micro-artifact analysis and experimental archaeology.

Below this concentration in the humus, various peculiar features were encountered. This area appeared to be affected by water accumulation in antiquity. Some cobble concentrations and/or linear features may represent attempts at water control in this area, and particular attempts to prevent severe flooding at the base of Structure E-2. Of additional peculiarity was a small circular burned feature found in front and on centerline of Structure E-2 (see Brown 2012 for a more detailed discussion). Excavations continued down to the plaza surface associated with Structure E-2-2nd. Several postholes were encountered in the plaza area directly in front of the central staircase. These postholes formed a rough circular pattern. Several of the posthole appeared to have been covered with a thin layer of plaster. We believe that a perishable structure (most likely a small wooden altar feature) was erected and then removed and the resulting postholes were patched. The erection of a wooden feature appears to have happened on several occasions as a number of the concentric postholes were overlapping. Brown has argued elsewhere (Brown 2012) that these postholes most likely represented the remains of a wooden altar temporarily placed on centerline for ritual purposes (Figure 5). We continued excavations below the postholes and surrounding plaster floor. Beneath the plaza surface, we encountered a buried paleosol, similar to the paleosol located in the western side of Plaza E, discussed elsewhere (Brown et al. 2011). We removed a section of the paleosol to bedrock and collected all matrix for flotation.

Additional excavations in Plaza E have concentrated on defining the larger terraced platform just west of Structure E-2. These excavations were supervised by Eleazar Hernandez. The terraced platform has been discussed elsewhere (Brown et al. 2011; McCurdy and Brown 2011). Our goal for the 2012 field season was to follow the frontal east facing to the south in order to locate a formal access way. We had anticipated finding a staircase, however, we encountered a limestone paved ramp. The ramp feature is inset into the platform facing and is at least 5 meters wide

Figure 5. Reconstruction Drawing of Altar Feature in front of Structure E-2-2nd.

(Figures 6 and 7). Excavations terminated prior to locating the south edge of the ramp feature due to time constraints. Excavations in 2013 will investigate this ramp and its extent to the south with the objective to better understand the form and function of this unusual terraced platform. We suggest that the initial construction of this terraced platform dates to the Middle Preclassic based on preliminary ceramic data.

When glancing at the site map of Group E, it is clear that the architecture is dominated by the east/west pairing of Structures E-1 and E-2. Structure E-3 is a small mounded architectural feature that is oddly placed just south of these two prominent structures. The unusual placement of this structure suggests that this mound was not related to the Preclassic ritual center at Group E. Initial investigation of this structure in 2009 confirmed that the final phase of this structure dates to the Late to Terminal Classic. Our excavations, discussed above, in Plaza E have encountered evidence of Late to Terminal Classic crafting activities. Evidence suggests that Structure E-3 may have been the household of the craft producers. Additional excavations on Structure E-3, supervised by Catherine Sword, were initiated in 2012 to test this hypothesis. Preliminary excavations suggest that Structure E-3 was an L-shaped household group organized around a raised patio. Excavations within the raised patio encountered two Late to Terminal Classic cyst burials. Preliminary analysis of the burials by Caroline Freiwald, suggest that both were adult

Figure 6. Photograph Showing Ramp in Plaza E.

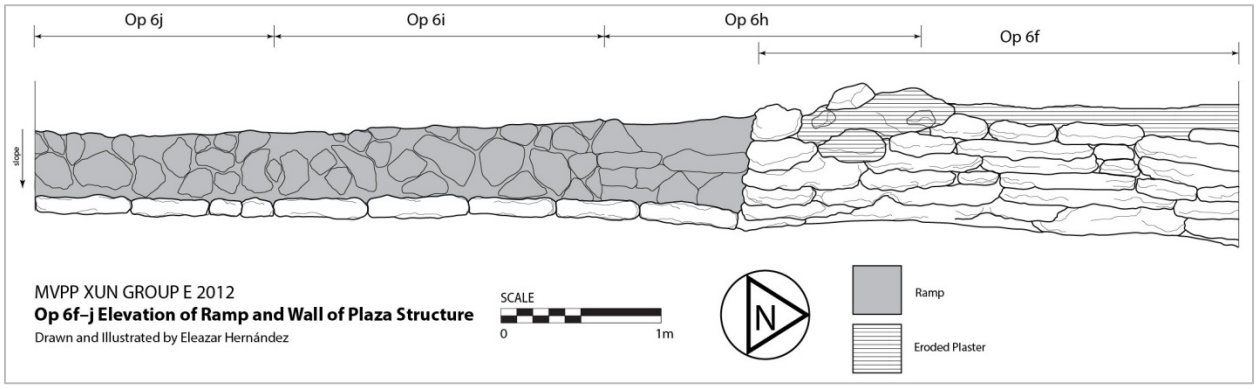

Figure 7. Elevation Drawing of Ramp in Plaza E.

males. Of special interest, a worked chert implement and raw piece of slate were placed next to the hand of one of the burials. This suggests a link between human remains and the craft production activities seen within Plaza E. Catherine Sword will be conducting further investigations on Structure E-3 during the 2013 field season for her MA thesis research project.

Investigations at Group D

Extensive research of Group D was conducted by the Xunantunich Archaeological Project (XAP) supervised by Jennifer Braswell (1998, 2010). Braswell's research examined the role of Group D within the Xunantunich polity. XAP only conducted limited investigations on the largest of the structures within this group, Structure D-6. MVPP initiated investigations at

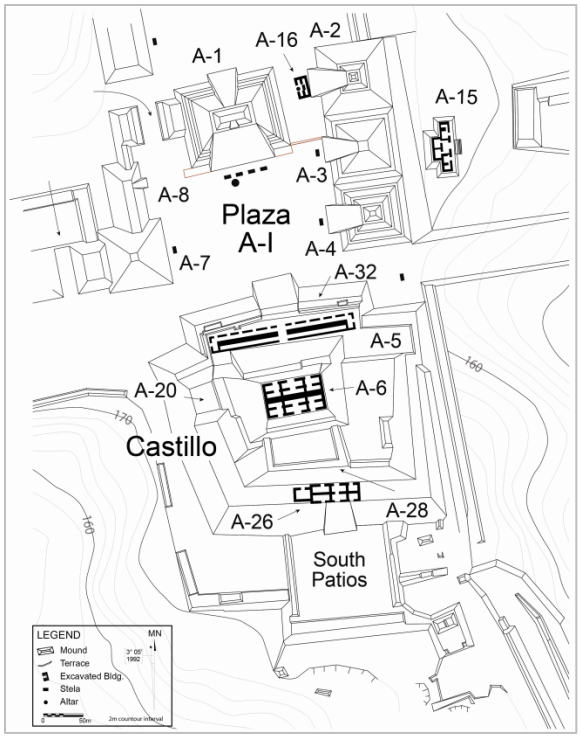

Figure 8. Map of Plaza A-I and Surrounding Structures (Courtesy of Keller and Yaeger).

Group D to investigate Structure D-6, the eastern shrine pyramid within the group (see Figure 1). These excavations were supervised by Whitney Lytle and form the basis of her dissertation research. The goals of the 2012 field season at Group D were to evaluate the use of the plaza directly in front of Structure D-6 and to expose the frontal staircase of Structure D-6. A stela and altar pair was placed in front of Structure D-6. The fact that Group D was located close to the ceremonial core of Xunantunich and had stone monuments suggests that the members of this household group (or groups) were elite members of the community (Braswell 1998, 2010). Lytle's research focuses on the importance of ancestors in legitimizing social status. Structure D-6 was selected for investigation because it most likely houses the remains of generations of ancestors from this group. Additionally, Structure D-6 has suffered severe looting damage over the years and is in danger of further destruction due to collapse and erosion. We placed a test pit at the base of the structure and encountered a poorly preserved terminal construction phase. At least one stair tread was discovered, the measurements of which align with lower tread stones previously excavated by Braswell (1998). Due to time constraints we did not conduct penetrating excavations into the staircase.

Excavations were also conducted in the plaza area in front of Structure D-6 to gain chronological data as well as look for buried features. We were surprised to encounter a fairly large platform structure within these excavations. This structure appears to have been truncated in antiquity and buried beneath the final plaza surface. The dating of this structure is unknown at this time, however, we suspect that it dates to the Classic period. We plan to further investigate this structure during the 2013 field season.

Investigations at Group A

Alongside the investigations described above, MVPP continued work within Group A in the site core of Xunantunich (see Figure 1; Figure 8) in 2011 and 2012. Previous MVPP excavations at the site core in 2008 revealed possible Early Classic occupational remains underlying the Late Classic plaza floor of Plaza A-III (Brown 2009). In 2011, preliminary investigations for Leah McCurdy's doctoral dissertation research were initiated at El Castillo. In 2012, McCurdy conducted limited pilot excavation for her dissertation research. Small testing excavations were also initiated in Plaza A-I in 2012 to address the possible significance of Structures A-3, A-4, A-5 (on the east) and A-8 (on the west) as a Preclassic E-Group.

MVPP began investigations of El Castillo in 2011. Investigations at El Castillo (see Figure 8) will enhance the understanding of its architectural form and function, construction practices and processes as well as the social dynamics at play during its construction and use. Previous excavations at El Castillo, principally conducted under the Xunantunich Archaeological Project (XAP) (Church 1997; Clancey 1998; Hays 1998; LeCount and Yaeger 2010; Miller 1996, 1997; Neff 1996; Robin 1995; Sanchez 1994) and the Belize Tourism Development Program (TDP) (Can in prep; Getty 1994, 2002) provide important foundations for investigations at El Castillo.

In 2011, Leah McCurdy initiated a 3D architectural survey at El Castillo as a

preliminary investigation of architectural features at the acropolis. The methodology of 3D architectural survey consists of observational survey and electronic distance measurement (EDM) techniques of mapping and architectural documentation. Observational survey includes the creation of hand-drawn sketch and measured maps as well as written records describing observed features and materials (McCurdy 2012). This manual observational survey is complemented with EDM utilizing a total station for capturing coordinate data and computer software for map creation. Details of architectural form are carefully recorded so as to contribute to a detailed representation of the architectural remains. The process of 3D mapping and observation allows for intimate awareness of architectural features. This experience of architectural survey, involving both observation and 3D digital mapping, allows for better interpretation of form and construction and sets the stage for well informed and more accurate virtual reconstructions (McCurdy 2013).

EDM was initiated using MVPP's project total station. McCurdy recorded coordinates of the building's basic architectural form as it survives today. All station points are based on survey monuments previously established by XAP in the 1990's (Jason Yaeger personal communication 2011). This procedure allows for the incorporation of the new dataset into the previously-established site grid and the relation of any previously collected data at El Castillo to this new project. Nearly 400 coordinates were recorded in 2011 (McCurdy 2011). Approximately 2000 additional coordinates are required to complete a satisfactorily detailed architectural survey of El Castillo.

During the 2012 field season, pilot excavations were initiated at El Castillo. The eastern and southern terraces were targeted as areas of limited testing by previous XAP investigators. On the eastern terraces, small ancillary structures lining the broad substructure of Structure A-6 were targeted for chronological and architectural form data. Additional excavations on the eastern side, at the lower level of Structure A-5 (what is now designated as A-5-2nd) encountered significant exposures of intact architecture. Well-preserved wall plaster and red paint (on both interior and exterior surfaces) were recovered and recorded. A doorway was located that most likely originally served as an entrance to Structure A-5-2nd. This doorway was blocked in antiquity, most likely during the construction and/or modification of Structure A-5-1st. These limited excavations suggest considerable architectural change at this intermediate level of El Castillo and potential additional buildings extending from the southeast corner of A-5 to the southeast corner of the acropolis. Excavations on the southern intermediate terraces of El Castillo revealed significant plaster surface maintenance. Connected with XAP excavations on El Castillo's southern-most building, Structure A-28, this testing confirms that the southern areas were still of architectural concern during later periods of occupational contraction in the Xunantunich site core (LeCount and Yaeger 2010). Additional EDM data was recorded during the 2012 field season to bolster the 3D architectural survey of El Castillo. Future excavations will again target the eastern side of the acropolis with the goal of exposing additional intact architectural features and uncovering evidence for more accurate reconstructions of El Castillo's architectural form.

In connection with the investigation of the Preclassic occupation at Group E, MVPP also investigated potential Preclassic remains in Group A. Through tunnels into El Castillo, XAP investigators (Miller 1997) discovered very early occupational remains, with Cunil phase ceramics, buried beneath the Late Classic iteration of Structure A-6. This coupled with the large Preclassic ceremonial center to the northeast (Group E), suggests that additional Preclassic occupation may be buried beneath the Late Classic architecture within the site core. Additionally, the formal arrangement of Structures A-3, A-4, and A-5 on the eastern side of Plaza A and Structure A-8 on the west, is similar to that of an E-Group (Jamison 2010) (see Figure 8). E-Groups are most common during the Preclassic and are oftentimes incorporated into Late Classic site arrangements. XAP conducted only limited investigations on this possible E-Group. In 2012, MVPP placed a single 2 x 2 test pit in front of Structure A-8 to

gain a better understanding of the plaza floor sequence and to look for evidence of Preclassic occupation. The unit was taken to bedrock and only a few diagnostic ceramics were found, none dating to the Preclassic. Additional testing on Structure A-8 is necessary in order to evaluate the possibility of Preclassic construction events in this area. This is planned for the future.

Summary and Conclusion

MVPP's investigations at Xunantunich over the past five years have contributed significantly to our understanding of the long and dynamic history of this important site in the Belize River valley. Our future goals include expanding excavations within Group E to fully uncover the Middle Preclassic E-Group composed of Structures E-2 and E-1. This important architectural arrangement may be the earliest of its kind found to date within Belize. Additionally, future research is planned within Group D and Group A as discussed above. Building upon the important work of previous projects, we are slowly filling in the gaps and expanding our knowledge of Xunantunich Preclassic occupation as well as adding new insight into Classic period occupation.

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14 OF SHELLS, SODA STRAWS, CAVES, AND KINGS: CRAFTING, BODY PRACTICES, AND IDENTITY MAKING AMONG THE ANCIENT MAYA OF PACBITUN, BELIZE

Jon Spenard, Teresa Wagner and Terry G. Powis

Nearly 30 years of archaeological research in and around the ancient Maya site of Pacbitun, Cayo District, Belize has revealed evidence of shifting patterns in the identity formation practices throughout the site's occupational history. We argue that Pacbitun was linked to a larger network of sites throughout central Belize during the Middle Preclassic period (900-300 BC), which together would have been recognized as a shell bead production region for the Southern Maya Lowlands. This collective identity shifted to individualized statuses during the Classic period (AD 250-900), a time after which many settlements had recently transitioned from small egalitarian villages to socially stratified cities. Nevertheless, shell objects continued to be used in identity production. In particular, marine shell objects were regularly interred in elite burials, suggesting that this material was indicative of elevated social status. Recent research at Actun Lak cave, a locus of elite ritual activity approximately 1.5 km to the southeast of Pacbitun, has recovered limestone and speleothem jewelry that was likely worn by a local king. The finding of these "cave jewelry" pieces represents the discovery of a previously unrecognized artifact class of elite body practice.

Introduction

Archaeological research at the ancient Maya site of Pacbitun on the outskirts of San Antonio village has been undertaken periodically over the last 30 years (Figure 1). The Pacbitun Regional Archaeological Project (PRAP) has been investigating the site and its surrounding landscape for the past five years. Overall, the research spanning this time has shown that Pacbitun was initially inhabited around 900 BC in the Middle Preclassic period and abandoned around AD 900 in the Postclassic period, a span of nearly 2000 years (Healy et al. 2007). Excavations at the site have shown that body ornament production was a major focus over that time. Our evidence indicates that some of these objects were traded away from the area (Hohmann 2002; Wagner 2009) while others were retained for personal use as social identity markers, particularly during later times. Marine and freshwater shells represent the most common permanent media from which these ornaments were produced, followed by greenstone, or jade. Archaeological investigations at Actun Lak cave in the site's periphery have uncovered ornaments made from other media, particularly limestone and soda straw cave formations that were likely part of a royal costume. This paper discusses some of the finds from the thirty years of excavations in and around Pacbitun, and what these objects tell us about shifting identity practices among the people who inhabited and used the landscape in the past.

Theoretical Overview

Our discussion is founded on the idea that craft production plays a significant role in identity formation and maintenance (c.f. Costin 1998), and on Turner's (1980:114) concept of the "social skin," which is a individual's costume, decoration, and body modifications that symbolically communicates their social status in a particular setting. This type of signification via body practice was prevalent throughout Pre-Columbian Mesoamerica and continues to exist in many of the descendant communities today. For example, some Formative period age groups in Mexico distinguished themselves using particular hair treatments that included shaving, parting, and the wearing of headdresses (Joyce 1998:156). For the Classic period Maya, identity was understood to be located in an individual's head, and rulers were frequently depicted in art wearing headdresses that bore their names (Houston et al. 2006:68), a practice that may have roots dating back to Olmec times (Kelley 1982). Today, the Maya communities that surround Lake Atitlan, Guatemala distinguish themselves from their neighbors by their clothing designs (Hendrickson 1995).

Hieroglyphic and iconographic evidence from the Classic period Maya Lowlands also offer examples of body decoration signifying

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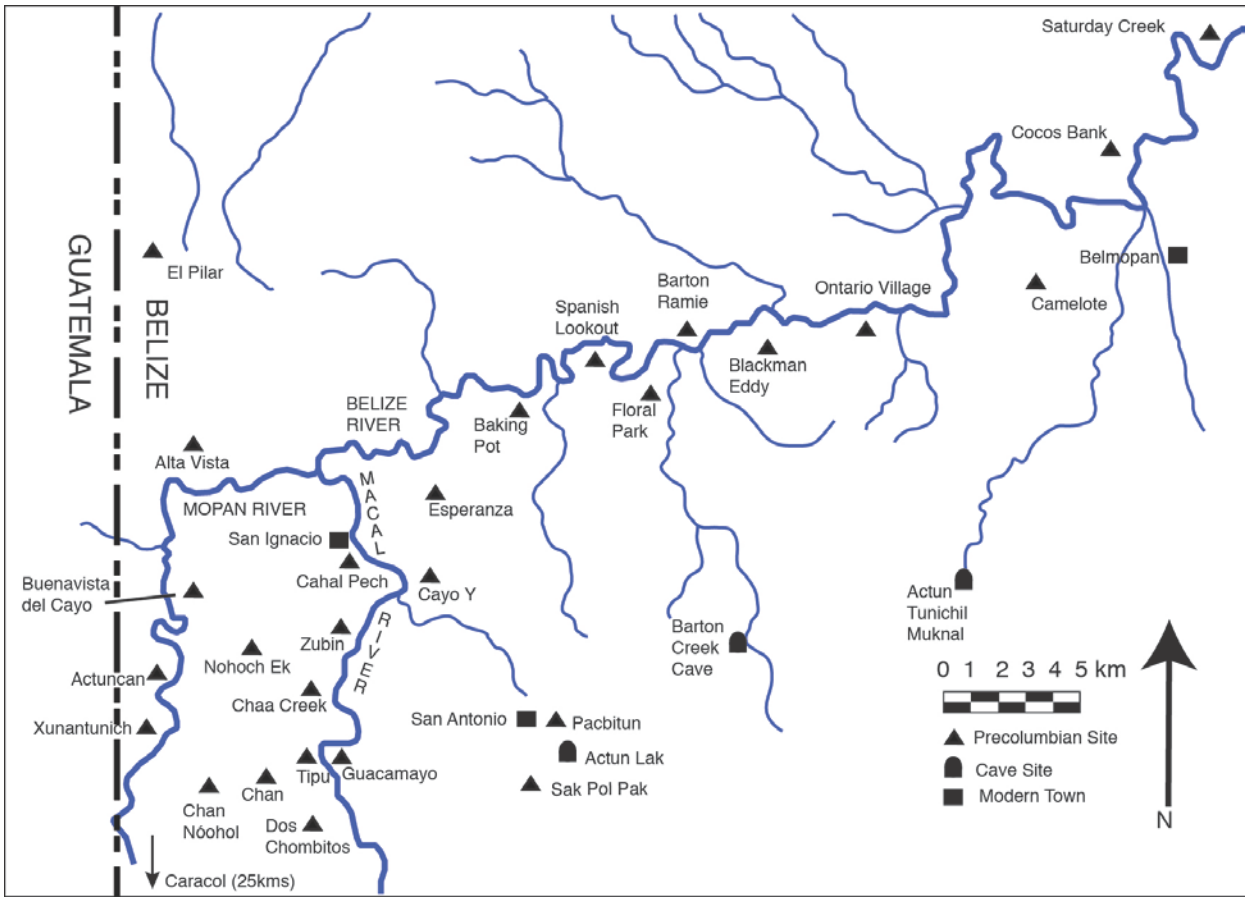

Figure 1. Map of Belize Valley.

social status. For example, one of the hieroglyphs used for accession roughly translates as "to tie the headband," suggesting that wearing a particular headpiece demonstrated whom the king was. Meskell and Joyce (2003:23) note that Maya rulers depicted dancing on monuments are costumed so heavily with the regalia of their statuses that their physical bodies become subordinate to the ornamentation. In other words, the costume objects were just as significant, if not more so, than the regent's physical body to the identity of that social station.

Archaeological Investigations

Middle Preclassic Period (900-300 BC) at Pacbitun

The best evidence for Middle Preclassic shell bead production at Pacbitun comes from the excavation of several building platforms below Plaza B, such as Sub-Structure B-2, which produced a total of 8,722 freshwater and marine specimens. That total includes 5,657 artifacts showing evidence of intentional modification and 3,065 pieces of fragmented marine shell detritus (Powis 2010). A total of 378 chert microdrills and macroblade spalls were also recovered alongside the shell deposits (Figure 2). These data clearly demonstrate that the early Maya at the site were focused on shell bead craft production. All of these remains were found in direct association with one another. They were regularly embedded into structures' floors and in the alleyways between platforms. We know that the Maya during this time wore these objects in at least one case because we excavated a feature where 52 shell beads were found as if strung together like a necklace. Nonetheless, Pacbitun was not the only site in central Belize to produce shell beads at this early time. Other sites like Barton Ramie (Willey et al. 1965), Blackman Eddy (Cochran 2009), Cahal

Pech (Awe 1992), Caracol (Cobos 1994), Chan (Keller 2008), Dos Chombitos (Robin 2000), and Zubin (c.f. Ferguson 1995) also produced them. In all of these cases, the numbers of beads produced far outweighed local demand, and many were destined beyond the local market. But, the question remains as to where? We argue that they were mostly traded further inland to the Peten, to large sites like Tikal where they have been found in abundance (Moholy-Nagy and Coe 2008), and because very few to none have been found to the north or south of central Belize at this early time. Overall, the early artifact assemblages from throughout central Belize suggests a more regional identity based on shell bead production than is seen later on.

Archaeologists have long recognized the relationship between production and identity because the act of crafting materializes social relationships, mores, customs, etc. We follow Costin (1998) who argues that the act of crafting creates and reinforces specific social roles, or identities. In the case of Pacbitun and the other sites in central Belize mentioned above, the identity that was created was based on shell bead production. Therefore, we tentatively suggest that one of central Belize's prominent identities during the Middle Preclassic period was as a shell bead-manufacturing region for the Southern Maya Lowlands.

Classic Period (AD 250-900) at Pacbitun

Craft specialization continued to play a prominent role in identity production at Pacbitun during the Classic period though it became more diverse as indicated by a slate workshop in the site's epicenter (Healy et al. 1995) and a ground stone production area recently excavated by PRAP in the summer of 2012 (Ward and Powis 2013), and a possible shell workshop discussed below. Nonetheless, shell remained one of the most commonly crafted objects from permanent media, but its role in identity production changed as overt symbols of social status became prominent. These symbols likely began to manifest during the Late Preclassic period, though we currently have little evidence from that time. The prominence of shell beads as social status markers is present in the Early Classic period, but reaches its peak in the Late Classic. Social and architectural changes abound

Figure 2. A representative sample of shell beads, shell detritus, and chert microdrills recovered from platforms below Plaza B at Pacbitun.

at Pacbitun during this latter time. Several monumental construction projects were realized, caching activities increased, and burials became more elaborate, all of which suggests more complex social stratification compared to the preceding periods (Healy 1990:257; Wagner 2009).

A significant difference exists between the Core and Periphery Zone shell assemblages in terms of the quantity of material, and in the varieties of species and artifact types represented. Excavations in the Periphery Zone recovered several hundred specimens of shell though less than 5% were recovered from burials, and all but two were from freshwater sources. On the other hand, marine shell ornaments dominate the Core Zone assemblage, and most were recovered from burials.

Two *Spondylus* sp. disk pendants were recovered from an elite female's crypt dating to the Early Classic period (ca. AD 250 to 500). The pendants are incised with a representation of

Figure 3. Photo and drawing of one of the *Spondylus* sp. shell pendants from Burial 1-6 dating to the Tzul phase (AD 300-550) (courtesy of Paul Healy).

a human figure, possibly a ball player, with a bead at the tip of the nose (Figure 3). This individual's high-ranking status can be inferred from hers being the only known Early Classic period burial at Pacbitun, and her elaborate burial goods, including the intricately carved pendants. *Spondylus* shell is known to be a prestige material that is regularly found resting atop the skulls of interred elite individuals for example at Pacbitun (Healy et al. 2004:231), Tikal, (Moholy-Nagy and Coe 2008) and Piedras Negras (Coe 1959:56).

Rosemary Joyce (1992:5) has observed that ancient Maya art depicts females wearing their labor products such as elaborately decorated cloth, and more extensively modified materials than their male counterparts. On the other hand, she argues that male costumes reinforced an association with nature because the materials are typically minimally worked or in a raw state, such as drilled, whole shells. This pattern is consistent with the shell artifacts recovered from Pacbitun's Early Classic period elite burial from which highly modified *Spondylus* shell artifacts were recovered in a female burial. Nonetheless, Joyce's (1992:5) observation is neither supported nor rejected by the material remains from Pacbitun Burial 1-1 dating to the Late Classic period. This later internment held an individual's remains tentatively identified as female, and it contained the largest quantity of shell ornaments recovered from any context excavated throughout the site's settlement. More than 2,500 freshwater and marine shell ornaments and beads were recovered including thousands of whole shell beads and dozens of highly modified ornaments.

Social status appears to have been the major determinant for access to marine shell ornaments at Pacbitun, rather than biological sex. Both whole shell specimens, and those that were cut and ground, appeared only in elite burials but of both sexes. Neither artifact class appeared in any of the low-ranking interments. This lack of differential access to shells between the sexes seems to hold true for most aquatic species at Pacbitun. The only exceptions are seen in the presence of *Oliva reticularis*, *Dentalium* sp., and *Dinocardium robustum* in female burials only, and eight Pacific *Oliva porphyria* tinklers recovered from male interments. The other remains of Pacific Ocean univalves represented in the Classic period Pacbitun shell assemblage were *Jenneria pustulata* tinklers from the double burial of a male and female. Though these tinklers may have been associated with the female individual, their frequent appearance in male costumes in

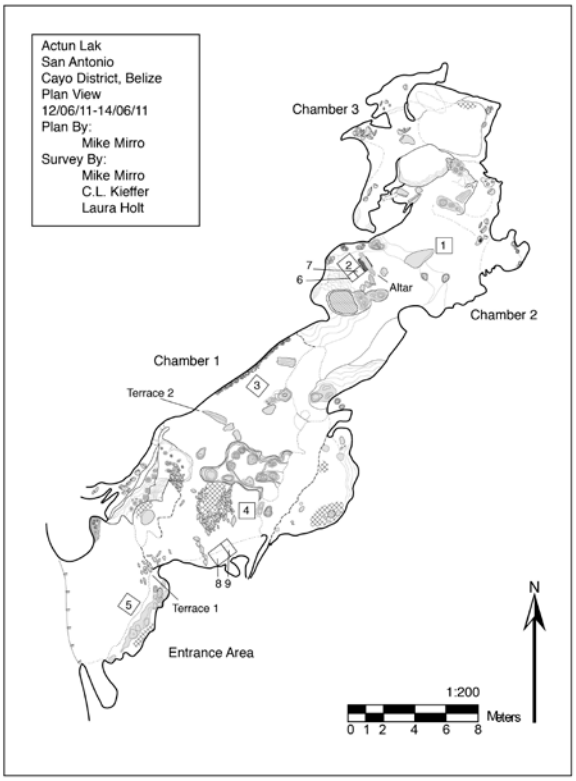

Figure 4. Plan view map of interior of Actun Lak.

Maya art (e.g., Tikal Stela 22), suggests that they were associated with the other individual.

While the evidence for sex-based differences in access to exotic shell species among Pacbitun's elite inhabitants may be limited, a relationship between an individual's biological sex and shell ornament types seems to have existed. However, this relationship counters Joyce's (1992:5) finding that males in Maya art are associated with nature and thus adorn themselves with minimally modified ornaments. For example, a complex shell mosaic object was recovered from a male burial, as were several ceremonially killed *Spondylus* sp. shell artifacts.

Our evidence suggests that wearing marine shell ornaments was indicative of high or elite status at Pacbitun in the Classic period. However, excavations in an undated mound in the Periphery zone recovered large quantities of marine shell detritus. This finding suggests that lower-status individuals may have been involved with manufacturing marine shell ornaments, even if they were not permitted to wear their products.

Late Classic to Early Terminal Classic Periods (AD 650-900) at Actun Lak Cave

Shell objects were just one of the types of ornamentation used to distinguish social identities during the Classic period. Our investigations over the past two field season in Actun Lak cave, located approximately 1.5km to the southeast of Pacbitun, has uncovered examples of other types of Maya body decoration used in the Late to Terminal Classic periods (AD 650 to 900). These decorations include ear spools, and beads made from greenstone, limestone, and soda straw cave formations. The presence of these objects suggests that the cave was a locus of royal rain ritual, and that the items themselves were part of the Pacbitun royalty's costume. A description of the cave and our other findings in and around it is necessary to understand why we attribute these ornaments to the site's royalty.

Demarest (1992) argues that one of the primary roles of ancient Maya kings was ritual communication with various sacred forces and deities on their polity's behalf. These performances involved much pageantry and showmanship that included the ostentatious displays of wealth, conspicuous consumption, and the use of elaborate goods. Therefore, we expect the material remains of royal rituals to have the same characteristics in the Pacbitun region.

Actun Lak is a heavily modified space, and the artifacts recovered from within it suggest that it was used for polity-level rituals throughout the Classic period (Figure 4). The cave's physical structure is relatively simple. It is 43m long, has three main chambers, and is located halfway up a steeply sloped hillside. The slope below the cave and its immediate entrance area was extensively modified with steps, low terraces, and a platform. These modifications continue for at least 30m downhill, and head towards another large cave into which a seasonally active stream drains. Actun Lak's entrance was modified by an earthen and rubble platform measuring 5m north-south by 3.5m east-west. Our excavations revealed that the Maya dug into the native soil and bedrock for nearly 2m, after which they refilled the hole with a mix of dry core fill and

broken ceramic sherds in order to build the level platform. A modified slate cache was uncovered in the approximate center of the platform, below which a prismatic obsidian blade fragment was recovered.

The cave's name translates to "Pottery Cave," the meaning of which becomes immediately apparent upon entering. Sherds are ubiquitous from the front of the cave to its rear. The entrance passage is steeply sloped and ends at a 70cm tall, dry laid, uncut stone terrace adjacent to modified drop, below which begins Chamber 1. Excavations in the terrace revealed that it is actually over 2m deep with an artificial slate floor buried 1m below the surface. This terrace creates the only flat area in the otherwise steeply sloped entrance passage, and its depth and slate floor demonstrates a heavy investment into modifying the Entrance Area that would have necessitated building up the entire 10m long passage, in addition to the modifications immediately outside of the cave.

The terrace's positioning suggests that physical access to the cave was restricted because such constructions are often located in large, open, interior chambers in other caves (e.g., Ferguson 2000) presumably to act as stages upon which rituals were performed in front of an audience. The Actun Lak terrace is positioned in such a way that individuals standing on it are easily visible from the platform area outside while a large formation jutting out of the cave wall blocks its visibility much beyond the drop into Chamber 1. This positioning suggests that the terrace was built as a stage for performances to be seen from the cave's exterior, but also that entering was restricted only to ritual performers. If this restriction were not the case, then we would expect that the terrace would have been constructed along the opposing passage wall, which would have made it highly visible to anyone standing below in Chamber 1 and beyond.

Chamber 1 is the largest in the cave, and its floor is populated with several stalagmitic formations, which were all broken in the past. One of the stalagmites near the cave's approximate center has a naturally cemented-over boulder area that extends from it for nearly 2m towards the entrance. Excavations adjacent to this paved area encountered a density of pottery unseen in other portions of the cave. In fact, the pottery took up more volume than even soil. Several burned residue clumps and sherds around which the material had melted were recovered, suggesting that some resin, likely copal, was among the offerings given in this area.

We argue that Chamber 1 was likely used to perform rituals to the rain god, Chaak. The connection between caves, rain, and rulership has been well documented throughout the Maya area. For example, Andrews (1961) recorded numerous Tlaloc censers surrounding the large column at the rear of Balankanche cave in Yucatan, Mexico. Ishihara (2008) recovered musical instruments, miniature vessels, and human offerings in the Main Chasm of Aguateca, Guatemala, which she argues were offerings to the rain god. In La Pailita cave in the Peten, Guatemala, the ancient Maya carved and plastered a formation at the cave's entrance to appear in the guise of the rain deity seated on a throne (Graham 1997). This transformation of a cave formation into the rain god, as well as the other noted connections between the two, suggests the tantalizing possibility that the ancient Pacbitunecos considered the columns in Actun Lak as manifestations of that same deity, and thus the cave to be one of his homes.

Chamber 2 is much smaller than Chamber 1 in both width and height, and is divided roughly in half by a natural, raised ridge. Fire-blackened walls dotted with occasional sections of spall mark the transition into the smaller room. A dense charcoal lens surrounding a table top altar constructed from cave-formations sits on the upper portion of the chamber. The base of the altar is constructed from a series of round, broken columns on top of which is a laid-flat, roughly rectangular block likely removed from a nearby formation. Excavation units placed adjacent to the altar proved to be the most shallow in the cave reaching bedrock at around 15cm, though they revealed evidence of the extensive burning that charred the walls. The first level lacked any significant soil matrix. Instead the matrix was mainly charcoal mixed with ceramics, possible copal residue, and the body ornaments made of jade, limestone, and

soda straw cave formations mentioned earlier (Figure 5).

The case for royal utilization of Actun Lak is further suggested when considering the quantity and symbolic significance of greenstone that was recovered near the altar. Over 100 biconically-drilled, round bead fragments of varying sizes, pieces of two ear spools measuring 2mm thick, and a tubular bead, all made from the same material were collected. Taube (2005) argues that jade, or greenstone, is synonymous with Maya kingship. Rulers appear on carved stelae ornamented with items such as belt celts, necklaces, ear spools, and crown-like head ornaments made out of it. Taken as a whole, the artifact assemblage recovered from Actun Lak, the conspicuously consumed pottery, greenstone, copal incense, and intensive burning, in addition to the modifications that restricted access, point to royal activities that centered around petitioning for rain on the behalf of the polity.

Speleothem ornaments have gone largely unidentified in the archaeological record up to this point. We suggest that this relatively unknown use as an ornament may be due to the fragile nature of the cave formations from which they were created. Only a small handful of the hundreds of formations that we recovered during our excavations were definitively beads. The majority of the recovered formations were highly fragmented and had sharp, jagged edges. We identified the few modified samples as beads based on the presence of smooth, angular cuts on their ends. Their association the large quantities of jade and limestone beads, which are understood in this case to be royal body ornaments, suggests that they also decorated Pacbitun's royal bodies.

Figure 5. Jade, limestone, and soda straw beads recovered around speleothem altar in Actun Lak. The soda straw beads are on the far right, and they have been cut diagonally. The left side of each shows a heavily polished wear consistent with having been cut. The limestone beads are in the bottom row.

Conclusion

In this paper, we have discussed the role that body ornaments and their production played in forming identity at the ancient Maya site of Pacbitun. The Middle Preclassic period was a time where identity was based on the shell bead production primarily. We have argued that Pacbitun was one of several egalitarian villages that may have been collectively considered the shell bead production area for the Southern Maya Lowlands at this early time. As social inequality begin to appear sometime in the Late Preclassic to Early Classic periods, the collective community identity based primarily on shell bead production gives way to body ornamentation as a form of status differentiation. Beads become more elaborate, are made from prestige materials, such as *Spondylus* shell, and differential access to those types of materials appears in the archaeological record. Nonetheless, shell was only one of several media from which elite body ornaments were made in the Late Classic period. Our excavations in Actun Lak cave have uncovered ornaments likely from a royal costume that were crafted from jade, limestone, and soda straw cave formations. Other objects similar to these latter jewelry pieces have to this point gone largely unrecognized by archaeologists, making them the king's new clothes, or at least new to us.

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15 AT THE END OF THE ROAD: INVESTIGATION OF A TERMINI COMPLEX AT PACBITUN, CAYO DISTRICT, BELIZE

Jennifer U. Weber and Terry G. Powis

Over the past few field seasons, the Pacbitun Regional Archaeological Project (PRAP) has begun to intensively examine a number of features in the periphery, including settlement, caves, rockshelters, aguadas, terraces, and an extensive causeway system. The causeway system, containing four separate roadways, has been of particular interest not only because of their combined lengths, totaling more than three kilometers, but also for the locations where they originate and terminate. During the 2012 field season we targeted a large termini complex lying at the end, or beginning, of the Mai Causeway located in the site core. Our primary objectives were: (1) to identify the different construction episodes, and how they relate to the Mai Causeway itself; and (2) to determine the function of the complex, and how it relates either politically, socially, economically, and/or religiously to other structures located in the site core, and to other structures located in the periphery. This paper presents preliminary results of our findings to date.

Introduction

Pacbitun is an ancient Maya site located in the foothills of the Maya Mountains in the Cayo District of Belize (Figure 1). Since the mid-1980s, archaeologists have conducted research in and around the core of the site. Since 2010 this has included studying Pacbitun's extensive causeway system. While we have focused on the construction histories and functions of the causeways in the periphery over the past two seasons, in the summer of 2012 we targeted a large temple-pyramid structure in the site core. This structure, identified as the only termini complex at the site, lies at the end, or beginning, of the Mai Causeway. Excavations here were set out to identify construction periods and relations of the structure to the Mai Causeway, as well as determining the socio-political function of the complex and its role in the site core and periphery.

Pacbitun Background

Pacbitun is situated at the juncture of two eco-zones: the lowland tropical rainforest and the Mountain Pine Ridge. The surrounding terrain is hilly with naturally fertile soils trapped in low-lying catchment basins and valley-like depressions. First inhabited about 800 BC (Healy et al. 2007), the site reached its peak of cultural development during the Late Classic Period (AD 600-900). At this time the site likely controlled an area of nine square kilometers. Ceramic analysis indicates that the site was possibly abandoned by the beginning of the tenth century (Healy et al. 2007).

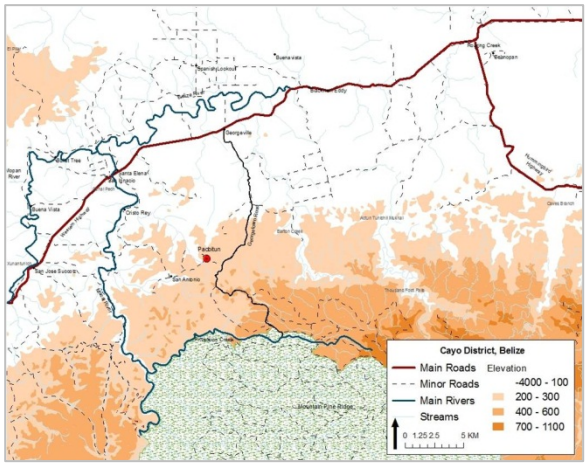

Figure 1. The location of Pacbitun in the Belize Valley.

The core zone of Pacbitun consists of five primary plazas (A-E), surrounded by a variety of masonry structures. Plaza A is situated about six meters above the other plazas, marking the highest level ground and thus, the ritual and ceremonial center of the site (Healy et. al 2004:209). To the west of Plaza A lies Plaza B. Plaza B presents three enclosed courtyard groups on its south side, each of which is surrounded on four sides by multi-chambered range structures, and a large range building on its north side (Healy et. al 2004:208). Excavations have unveiled evidence for a Middle Preclassic village below Plazas B-D (Powis et al. 2009). Plaza E is marked by a ballcourt, situated to the north of it. Excavations have revealed several caches and burials in the core zone (Healy et. al 2004:214-216). To the very east of the site core lies structure 10, the large termini complex

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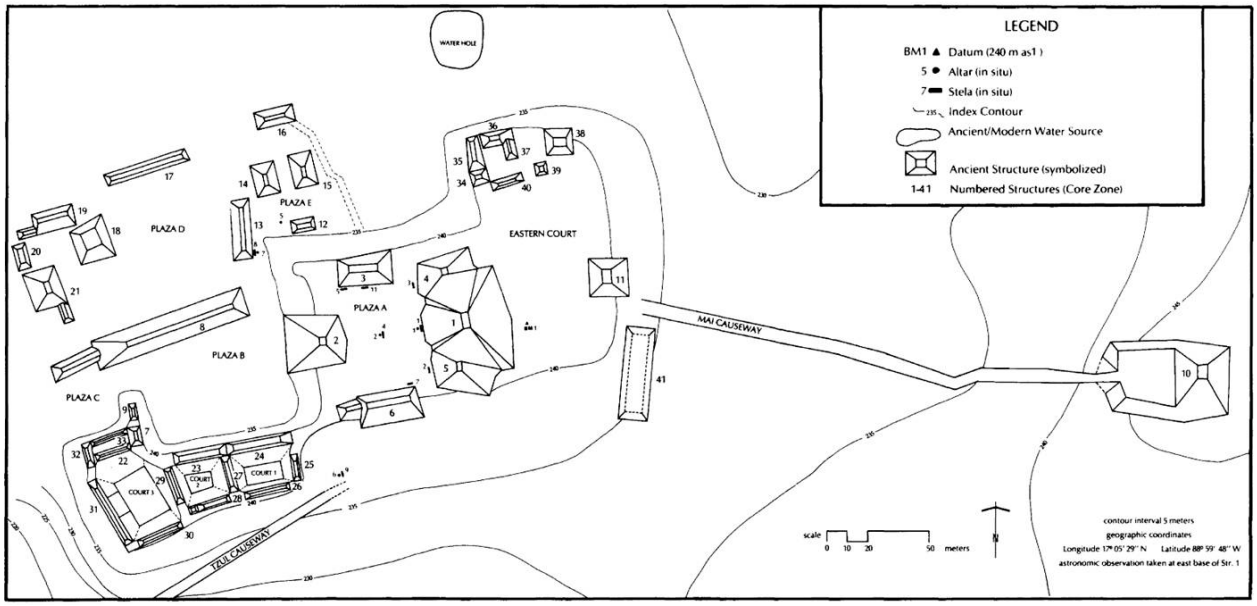

Figure 2. The Pacbitun Site Core.

associated with Mai Causeway, an intrasite road (Figure 2).

Pacbitun Causeway System / Mai Causeway

In general, typologies between causeways, or sacbeob, concentrate on form and length. Based on the collected information on 190 causeways in the Maya Lowlands, Shaw (2008:84) constructed a classification system on road length, designating three sacbe types: (1) the local intrasite sacbe, less than one kilometer in length; (2) the core-outlier intrasite sacbe, one to five kilometers in length; and (3) the intersite sacbe, five or more kilometers in length (Shaw 2008:84). Identifying causeways based on form proofs to be more difficult since construction materials and methods might differ according to the terrain and materials available in the environment (Shaw 2008:83). For longer causeways that would mean that throughout their course, they could change form and display different building materials, making a typology rather difficult.

A peripheral survey at Pacbitun, conducted in 2010, located several cultural features, including the extended causeway system. This road system here consists of three named causeways, Mai Causeway, Tzul Causeway, and Tzib Causeway. Mai Causeway is a local intrasite sacbe, about 273 meters in length. In the Pacbitun site core, the Mai Causeway starts adjacent to Structure 11 running east at an approximately 120 degree angle before terminating in front of Structure 10. It is about 13 meters wide, though after clearing the feature during the 2012 field season, it was revealed that about half of that width might be part of a platform extension of some sort and not actual part of the proper causeway. Tzul Causeway also starts in the site core (Figure 3) and runs into the periphery, intersecting after approximately 900 meters with another ancient Maya road, which was named Tzib Causeway. It then continues into the foothills, running for about 1.2 km until it terminates in front of Tzul's Cave. Tzib Causeway is about 600 m in length, and connects a plazuela group to a minor center (Figure 4) (Weber 2011). Preliminary results of the 2011 field season excavations into the peripheral causeway intersection displayed the well-defined boulders of Tzib Causeway connecting to Tzul Causeway, revealing a complex construction pattern that differs in style and methodology even at such a compact location, where these ancient roads come together.

As mentioned, one of the research foci of the 2012 field season lied with the Mai Causeway in the site core and its connection to Structure 10. The construction methods of this

intrasite road differed greatly from the construction observed at the causeway intersection in the periphery during the 2011 field season. While the excavation units at the causeway intersection successfully identified the architectural assemblages of Tzib Causeway, consistent associations between construction styles and visible features between Tzul and Tzib Causeways were sometimes lacking. The absence of a visible directional boulder alignment for Tzul Causeway in most units contrasted with the clear rock alignment found for Tzib Causeway. In the absence of such well developed architectural deposits, several unit extensions were intended to define sensitive archaeological areas in the intersection. However, in terms of simply locating the boulder layouts of the different causeways, the intersection provided a bit of a test of the effectiveness of the systematic excavation approach.

Research has shown that the construction methods of causeways were similar to those of house foundations (Normark 2006:27; Shaw 2001:26). Predominantly, large stones lined the edges to be then filled with construction fill in form of cobbles which gradually changed to fine gravel near the surface of the road (Normark 2006:27; Shaw 2001:26). In general, large uncut boulders were placed at the bottom, in order to level the road bed, with gradually decreasing sized rocks placed on top (Normark 2006:27). The rock foundation found in Unit 1 and Extension 1 is an example of such a construction method, though no gradual decreasing rock deposit could be observed. The boulder alignment stops where Tzib Causeway, running from or to a plazuela group located southeast of the intersection, meets Tzul Causeway (Figure 5). One boulder points into the direction of Tzul Causeway running towards Pacbitun. From there, a directional alignment can be observed but not in the form of large boulders.

The construction of Mai Causeway seems to follow a more systematic approach, similar to the Martinez Sacbe that is associated with the Zopilote Group at Cahal Pech (Cheetham et al. 1993). Throughout the 2012 field season we placed three test units into this road in order to record the construction methods. As with Martinez Sacbe, the humus level consists of a

Figure 3. Tzul Causeway in the Site Core.

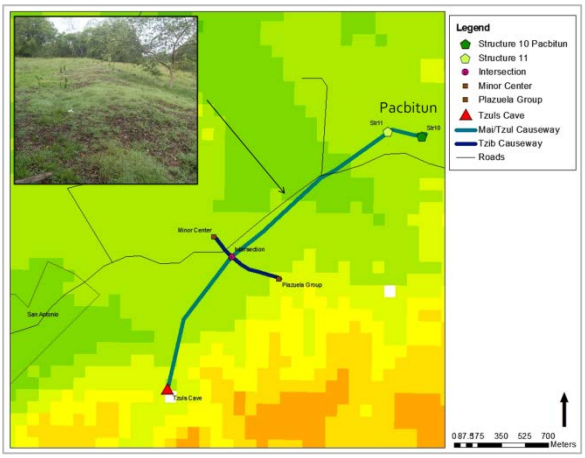

Figure 4. Map showing the recently surveyed causeway system at Pacbitun. The Mai Causeway runs from Structure 10 to Structure 11 in the site center. The Tzul Causeway runs from Structure 11 to Tzul's Cave. The Tzib Causeway runs from a plazulea group to a Termini Complex in the site core.

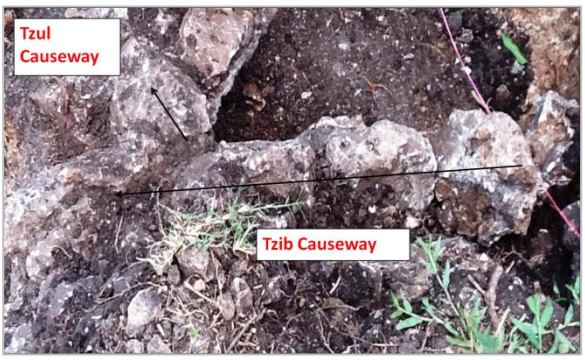

Figure 5. Tzib- and Tzul Causeway Boulders at Causeway Intersection.

Figure 6. Mai Causeway Excavations.

Figure 7. Excavations at the base of Structure 10.

depth of approximately 10 to 15 cm, followed by a layer of small- to medium-sized gravel fill and isolated patches of limestone plaster. Below that follows a larger layer of soil that ends with the presence of foundation boulders about 80 to 90 cm below topsoil (Figure 6). Bedrock was encountered about 5 to 10 cm below the large rocks, at approximately 90 to 100 cm depth. Ceramics collected immediately above bedrock were dated to the late Middle Preclassic Period

Figure 8. View of the pottery vessels in Cache 1, Structure 10.

(600-300 BC). Detailed ceramic analysis for the causeway is still underway.

Structure 10 / Termini Complex

As noted, Structure 10 is the pyramidal structure associated with a termini complex that lies to the east of the site core and is connected to the center through a sacbe (Mai Causeway). Structure 10 is approximately eight meters high and 13 meters wide. It was decided to conduct excavations here in order to investigate the relationship of the structure to the site core as well as clarify chronology and construction methods. The 2 by 2.5 meter unit was placed along the primary axis on the western side of the structure, extending into a platform by about 1.25 meters (Figure 7). Excavations yielded three construction levels for the plastered plaza floor in front of the structure. Ceramics found in each level were dated to the Late Classic Period (AD 600-900).

Excavations revealed an intrusive cache at the base of the structure. The cache consisted of two vessels that are 53 cm in diameter (Figure 8). The lip to lip cache vessels were embedded

into the plaster floor at about 90 cm in depth and were dated to the Late Classic. Associated with the cache was a speleothem fragment, a spondylus shell, and several fragments of an infant's cranium.

Discussion

All in all, the different construction styles between the intrasite and peripheral causeways suggest a different construction intent and care for the quality of the road, hinting towards a more everyday usage of the peripheral Tzul Causeway versus the connection of the ritually charged Structure 10 at the end of Mai Causeway in the site core. However, sometimes hints towards construction periods can be derived from the causeway alignment itself as well, since ancient Maya causeways were often constructed to connect monumental architecture and most of them follow straight lines, sometimes showing angle changes (Shaw 2008:65). Shaw (2008) argues that the roads themselves may follow basic geometric principles, as they seek to connect two points in the shortest distance, consequently using the least effort and cost by maintaining a true course (Shaw 2008:67). This would suggest a one-term building phase for all causeways, meaning that each causeway production was pre-determined, planned, and executed without ever changing or adjusting the construction plan. However, Shaw (2008) also acknowledges human error and technical adjustments in regards to the environment causing angle shifts, influencing road construction. Trombold (2001:235) calls these adjustments "sharp angle jogs", stating that they appear in many causeways and may in some instances be compensations for the inaccurate determination of an intended direct line between two points. At Pacbitun, these angle jogs can be observed at the Mai causeway (Figure 9). Here, they might be either the consequence of following the natural topography or modifications through time.

A preliminary least cost path analysis from Structure 10 to Structure 11, conducted through ArcGIS and based solely on slope increase and decline, presented the most direct route for a causeway construction running north before heading west towards Structure 11. Excavations along the causeway however have

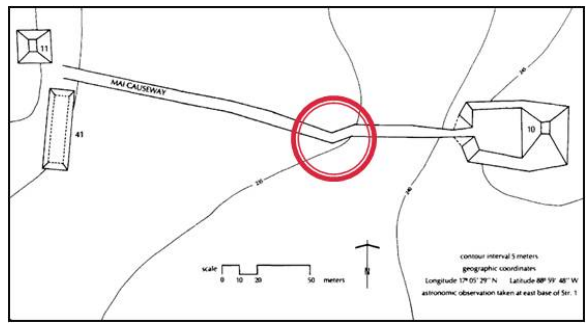

Figure 9. The red circle highlights the Mai Causeway Angle Jog.

Figure 10. Speleothem (left) and unmodified Spondylus shell (right) in Cache 1, Structure 10.

shown that the ancient Maya at Pacbitun manipulated the landscape to the west of Structure 10 by leveling the slope with core, creating an extended platform. This would have influenced the causeway construction, displaying a connection between both structures, aside from the visible link. While speculative, this might also suggest that there used to be an earlier structure in place of the Late Classic temple we see today. The Mai Causeway then might have been constructed as Structure 10 was modified and gained religious and ceremonial importance. However, further excavations into Structure 10 would be needed to investigate this hypothesis.

It has been suggested that the Zopilote Group in the periphery of Cahal Pech similarly functioned as a formal ceremonial/sacbe grouping (Cheetham et al. 1993:167). Here, the modified structures display an increased social-political and religious significance from the Late Preclassic through the Late Classic period, with the sacbe connection serving as a political link to

the site center. While the Zopilote Group lies about one km south of the site core of Cahal Pech, the Pacbitun termini complex is located only 300 to 400 meters east of Plaza A, which is considered to be part of the site core. Therefore, a solely integrative function of the sacbe might be considered redundant. Rather, the Structure 10/Mai Causeway group might have been constructed under the pressure of increased ideology towards the Late Classic, portraying a shift from a political to a growing religious ideology and serving as a platform for ceremonial, as well as socio-political interpretations.

The speleothem fragment found in the cache could be interpreted as a link to Tzul's Cave, in the periphery of Pacbitun (Figure 10). As mentioned, the causeway system extends from the site core to the cave. This link would again raise the question as to why we have a causeway running to and from a ritual focus on Tzul's Cave and not to any of the other caves utilized in the periphery of Pacbitun. This connection needs to be more fully investigated.

Conclusion

Since the Mai and Tzul Causeways start and terminate around Structures 10 and 11, respectively, excavations in these locations will aid in dating the structures as well as investigating the possible construction date of the terminating causeways. Pacbitun displays a unique connection between the site center, various structures in the periphery, and caves being partly displayed in form of the peripheral causeway system. Aside from their function as transport and communication routes, causeways also reflect different levels of political- and social activity and meaning in the past. By conducting a thorough analysis of the function(s) and date(s) of the causeways, caves, and associated structures, like Structure 10, we might be able to identify increased ideological motivation, displayed in the archaeological remains in the site center and the periphery, towards the decline of Pacbitun as an elite site center.

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16 INTO THE DEPTHS OF CARA BLANCA: EXPLORING THE MAYA UNDERWORLD

Lisa J. Lucero and Colleen Lindsay

This paper presents an update of the Valley of Peace Archaeology (VOPA) diving expedition at Cara Blanca, Belize. Divers used trimix gases to explore the depths of Pool 1 at 60 m deep to collect artifacts and paleoenvironmental data. The nearby structures, likely ceremonial, suggest that the Maya considered this and other cenotes as portals to the underworld and made appropriate offerings. We also present preliminary results of pollen analysis of a 3 m sediment core collected from Pool 6 (17-18 m deep). Pollen signatures indicate how environmental and anthropogenic interactions worked together to change the botanical structure of the landscape. These analyses are used to explore how the Maya modified their landscape during the Late Classic period, especially between c. A.D. 800-900 when several multi-year droughts struck the Maya lowlands.

Introduction

The Maya considered water sources sacred. Standing water, in particular, was sacred because it emerged from openings in earth (sinkholes and caves), features found throughout the karstic landscape of the southern Maya lowlands. Openings in the earth also were considered portals to the underworld, where the Maya petitioned gods and ancestors for bountiful crops and rain (Bassie-Sweet 1996). Cara Blanca in central Belize has many such openings (Figure 1). In fact, Cara Blanca ('white face') has 25 pools along the base of a limestone escarpment c. 80 to 100 m high. We have surveyed the 22 of the 25 pools (Nos. 1-21, 24), five of which have associated settlement: Pools 1, 7, 8, 9, and 20 (Kinkella 2009, 2011). Survey of the surrounding cliffs to the north and *bajos* (seasonal swamps) to the south has thus far revealed little additional settlement. With the abundant year-round water and good agricultural land just beyond the pools, one would expect to find dense settlement, especially given the annual dry season when water was critical.

Exploratory dives and excavations at Pool 1 (Lucero 2011b, 2012) have yielded intriguing clues suggesting that the Maya considered Cara Blanca a special place, likely for pilgrimage (Lucero and Kinkella in press), and that they began to increase their visits to Cara Blanca at the end of the Late Classic (Lucero 2011a). One possible reason may have been similar to that found for caves, where the Maya increased their ceremonial visits in response to a series of multiyear droughts that struck the Maya area between c. 800 and 900 C.E. (Medina-Elizalde et al. 2010; Moyes et al. 2009). In this paper, we briefly present the results of several seasons of the Valley of Peace Archaeology (VOPA) project at Cara Blanca pools, especially Pool 1. We also present the preliminary results of the pollen analysis of a sediment core from Pool 6 to assess landscape and climatic transformation.

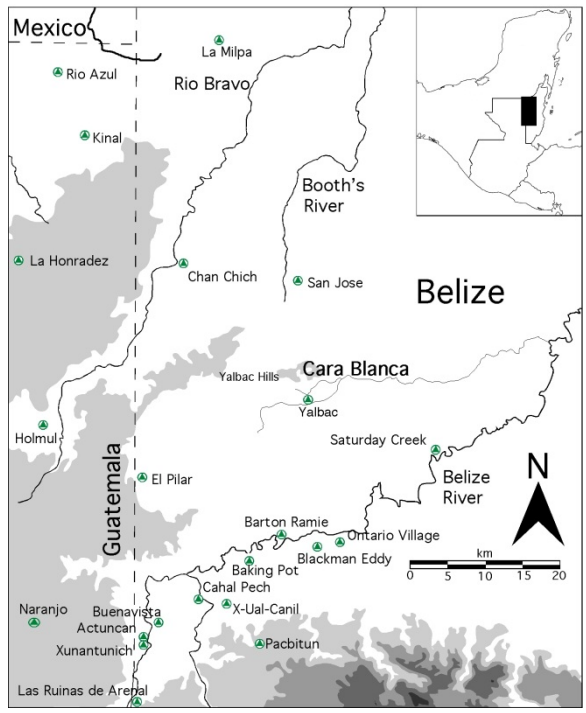

Figure 1. VOPA area with Cara Blanca.

Cara Blanca Pool 1

Pool 1 stands out among the pools. It is a steep-sided *cenote* (c. 60 m deep, 100 x 60 m) surrounded by seven structures. Looters' trenches show that the largest structure (Str. 1, 20 x 10 m, 3.3 m tall) is a vaulted L-shaped

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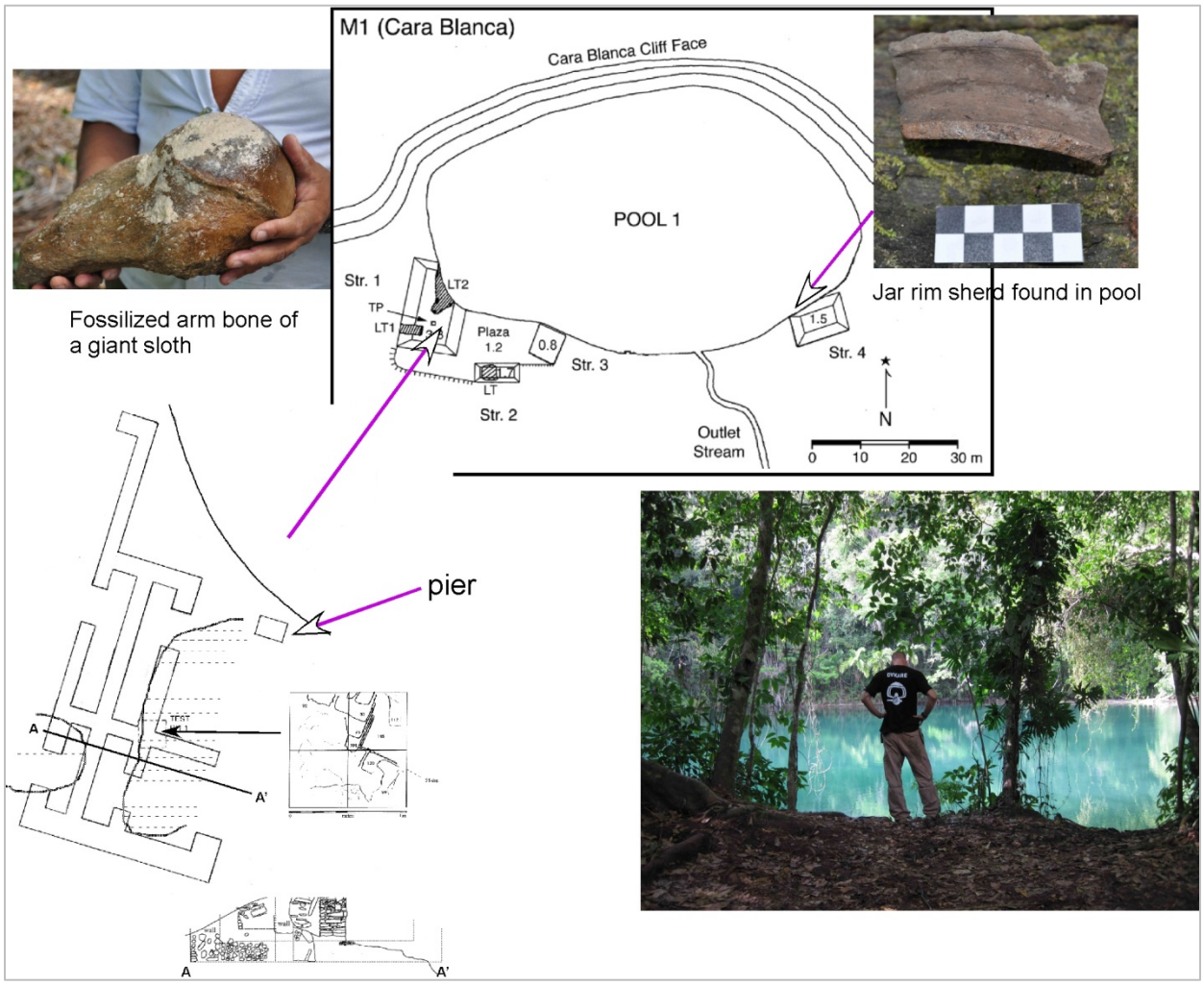

Figure 2. Pool 1.

building with six rooms, three to a side and radiating out from a central spine wall with a series of four pillar-like walls that run the poolside length of the structure (Figure 2). The structure sits so close to the pool's edge that part of its eastern side has collapsed into the water. It may have served as a sweatbath or other ceremonial purpose (Kinkella 2009:176). Looting over the years, as recent as 2011 or 2012, has left it structurally compromised, and it continues to be a problem. Three of the six rooms have been destroyed and emptied of their contents. The untouched rooms we plan to excavate in the near future will reveal another side to the ceremonial story and tie into what we will find in the *cenote*.

Earlier test excavations at several structures at Pool 1 yielded mostly jars (63%) dating to the end of the Late Classic period, or c. 800-900 C.E. (Kinkella 2004), indicating a specialized rather than a residential function (e.g., Lucero 2001:Table 5.2). The Maya may have collected sacred water in jars for special ceremonies that took place either at the pool or at the closest centers, similar to that found in Chiapas, Mexico at present. At Zinacantecos, for example, shamans use water from sacred waterholes in curing ceremonies and for other ritual ablutions (Vogt 1993:63-65). And as mentioned earlier, the Cara Blanca area may have served as a pilgrimage site, similar to that found at the Sacred Cenote at Chichén Itzá (c. 750-1150 C.E.) in Yucatán, Mexico, where the

Maya built a ceremonial structure so close to its edge that part of it has collapsed into the water. Edward H. Thompson dredged the cenote in the early 1900s and recovered ceramic vessels and figurines, masks, bells, jade, ritually "killed" objects, representations of the Maya rain god Chaak, gold, silver and copper items, textiles, copal incense balls, wood items, shell, chert and obsidian objects, rubber, and human and faunal remains (Coggins 1992). The analysis of some of the skeletal remains indicate that the "inhabitants of the well" (23 males, 12 females, and 43 subadults) suffered violent death—that is, ritual violence (Anda 2007). Bishop de Landa recorded in the 16th century that the Maya sacrificed adults and children to the rain god Chaak in times of drought (Tozzer 1941:180, n. 948).

In future, once we have more artifacts from Pool 1, we can compare Cara Blanca jars and artifacts with collections from Yalbac (c. 7 km distant), San Jose (c. 11 km distant), Saturday Creek (c. 11 km distant) and others, to determine if people from different areas deposited offerings in pools and collected sacred water, similar to the situation at Lake Amatitlán in highland Guatemala. There, divers recovered over 400 ceramic vessels depicting spider monkeys, various fruits, flowers, snakes, lizards, and human heads that largely date to the Classic period (c. 250-950 C.E.) (Borhegyi 1961). Chaak and Tlaloc were also represented, as well as fertility and death gods. The stylistic diversity of materials from Teotihuacan in central Mexico, the central Mexican highlands, the Maya area, and other regions indicates that the lake was a place of pilgrimage for different ethnic groups from throughout Mesoamerica. Further, the waters at Lake Amatitlán are quite warm, and people may have used the lake for curative purposes since structures along the shore may have served as shrines.

The main goal in 2011 was to assess the feasibility of conducting underwater explorations at depths over 60 m at Pool 1 (Lucero 2011b; for site reports and maps see http://www.anthro.illinois.edu/faculty/lucero/index.html; for photos and videos see http://scientistatwork.blogs.nytimes.com/author/lisa-j-lucero/). Exploration divers (Kim Davidsson, Marty O'Farrell, Chip Petersen, and Patrick Widmann) used trimix gases (oxygen, nitrogen, and helium) and open-air or closed-circuit rebreathers, which allowed them to safely dive deeper for longer periods of time to explore the *cenote* bottom, as well as to map the large underwater cave on the north side, Actun Ek Nen (Black Mirror Cave). They collected several megafauna fossil fragments from a geological bed c. 20 to 25 m below surface, as well as pieces of wood and the matrix from which fossils were extracted. According to H. Gregory McDonald, Senior Curator of Natural History of the National Park Service, one of the fossil fragments, a large "ball joint," appears to be a medial condyle of a femur of an extinct *Eremotherium* (giant sloth), which are found from the southeastern United States to southern Brazil and date anywhere from 4.9 million to 11,000 years ago (Cartelle and De Iuliis 2006; McDonald and Lundelius 2009). While the preliminary work has only identified this single taxon, the extent of the bone bed suggests that numerous other species could be recovered (McDonald 2011). AMS radiocarbon dates on wood fragments, soil, and gastropods from the fossil bed date between c. 9000 and 39,000 years BP, possible within the realm of human occupation.[1]

In 2012 (May 7-10), we began underwater excavations at Pool 1 (Lucero 2012). The pool bottom is roughly half the size of its surface because of the slope beginning on the south side down heading towards the cave entrance. Several shelves ring the pool, which are still visible despite the transformation induced by slumping, landslides, or tree fall. The underwater topography (bathymetry) determined where divers (Marty O'Farrell, Chip Petersen, and Andrew Kinkella) began excavations; if the Maya proffered offerings from Str. 1, we assumed they either landed on one of the shelves found at 1.5, 5, or 20 m deep, or rolled down to the bottom at 60+ m. Using a bucket and shovel, divers excavated 1 x 1 m or 2 x 2 m areas at 1.5, 5, 20.4, and 54.3 m below Str. 1 (Table 1). We devised a pulley system to bring up buckets once divers brought them to the surface using lift bags (and from where GPS readings were taken). All materials were screened by hand and yielded, especially from between 1.5 and 20 m, 11 body sherds, two jar

Depth below Str. 1 in same line	Artifacts	Features
1.5 m	Large jar neck sherd c. 1 cm thick & c. 45 cm diameter, 4 small body sherds, 2 body sherds, 1 body broke into 4 fragments in washing tub (all body sherds unslipped), 1 bone fragment, 18 shells of various species, 1~fossilized bone fragment, 2 chunks, 2 small flakes, 3 biface chips	TuTu Camp or Cayo Unslipped (800-900 C.E.)? Or Preclassic? A little clay mixed with gravel and rocks.
4.8 m	Jar neck sherd, rectangular chunk, 1 chunk, flat ls piece. Photos only (discarded): muli-layered clay/gravel (looks like varves), conglomerate	TuTu Camp or Cayo Unslipped (800-900 C.E.)? Or Preclassic?
20.4 m	Jar rim sherd with some volcanic ash, 5 different body sherds (4 quite thin and flat=> large vessels, including ~jar sherd), 2 biface chips, 1 smooth ovoid ls, 5 small flakes, 2 haft tips, 1 haft mid-section, 12 chunks (5 of which look like part of eroded exhausted chert cores), 18 complete shells of various species, c. 6 shell fragments, 1 bone fragment	TuTu Camp Striated (800-900 C.E.)? Or Preclassic (Achiote; see Adam 1971; comparable to Jocote Orange-brown or Jenny Creek, 1000-300 B.C.E.)?
21.3 m	Fossil ball joint, one large fossil limb fragment, several other fragments (3 large, c. 20 small) from same limb	
33.5 m	Twig (c. 10 cm long, 1 cm diameter)	Collected from silt c. 40 cm deep
54.3 m	Conglomerate rock w/ embedded shell, ~chert cobbles, 3 fish bone, 1 bone fragment, 1 vascular ls, 1 ~seed (though quite hard), 3 small crystals, 1 crystalline fragment, 23 complete shells of various species, c. 15 shell frags, 3 tiny blade fragments, 2 flakes (1 crystalline chert), 4 small chunks, 3 small ~unworked lithics	Lots of gravel, some silt

Table 1. Underwater Pool 1 artifacts by depth.

necks, one jar rim sherd, as well as shell, lithics (chunks, cores, microflakes and blades, and biface chips), and small pieces of bone. The jar sherds may date to the latter part of the Late Classic period when the several multiyear droughts struck, but we need more ceramics for better chronological evaluation. The predominance of jar sherds, likely water jars, found at several of the pools (see Kinkella 2009) suggests that the Maya visited these pools to conduct water rituals.

As Table 1 shows, divers recovered most artifacts from immediately below Str. 1 at 1.5 m and 4.8 m (Figure 3). That said, most of the excavations took place closer to the building. Further, an unknown number of the artifacts likely came from looters' debris and building collapse. Eleanor Harrison-Buck and Astrid Runggaldier, who briefly evaluated the three jar neck sherds, think they might be Preclassic, based on them having relatively small and shallow striations and fine paste (vs. Cayo Unslipped, which typically has a coarser paste) (Figure 4). That said, Laura Kosakowsky, who looked at the Cara Blanca ceramics at the BAS ceramic workshop in 2007, stated that the ceramic collection is more similar to the Petén and northern Belize than the Belize valley ceramics. For example, we do not see much Mt. Maloney (black slip) bowls—I have yet to see one come out of Cara Blanca or Yalbac (center c. 11 km distant). Also, there are more striated

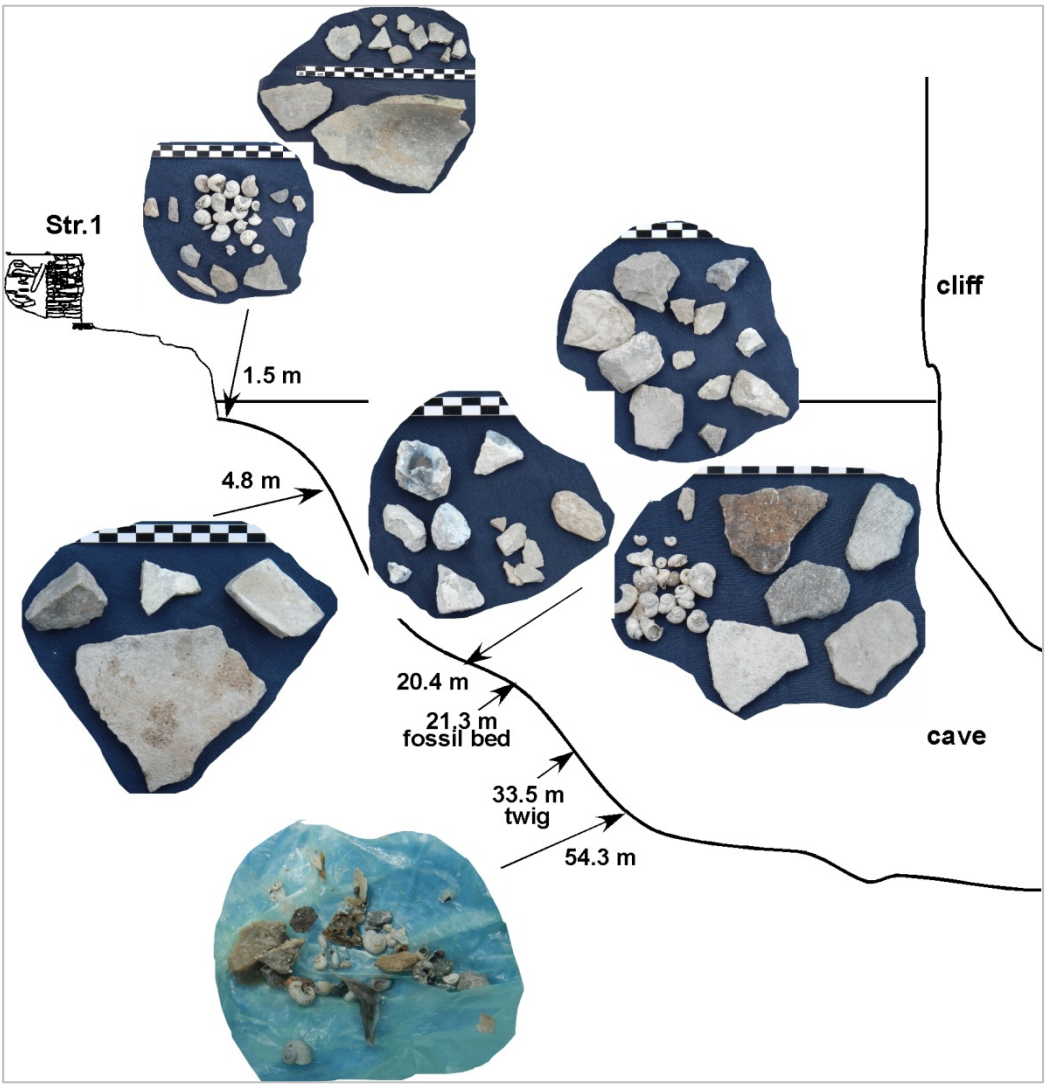

Figure 3. Pool 1 schematic profile.

Figure 4. Examples of Pool 1 jar sherds.

jars than one finds in the Belize valley. Further, Yalbac ceramics tend to have calcite/ash paste, even in Preclassic, clearly a local variation. We need to collect more sherds to determine an accurate chronology. Finding the jar sherds is quite interesting since previous test excavations, as mentioned, yielded predominantly wide mouth jars—that is, water jars. And if do date to the later time period, it likely relates to rituals performed to appease the gods during a period with several multi-year droughts.

Preliminary Results of the Pool 6 Sediment Core: Landscape History

Several studies have used pollen analysis of sediment cores to assess the impact the Classic Maya had on their landscape and have used them to track evidence for droughts, especially during the Terminal Classic (850-950 C.E.) (e.g., Curtis et al. 1996; Hodell et al. 1995; McNeil et al. 2010; Mueller et al. 2010; Neff et al. 2006; Wahl et al. 2006). Using oxygen isotope analysis, pollen concentrations, sedimentology, geochemistry, magnetic susceptibility, phytolith and chemical analysis, these studies demonstrate how the analysis of sediment cores are important and useful for botanical research, especially since pollen records indicate which species of plants and trees grew at a given time. These analyses also are used to track evidence for deforestation and erosion, evidenced by greater volumes of sediment deposition in lakes (Atran 1993). Given these implications, the sediment and pollen analysis of Pool 6 can generate an idea as to the botanical composition of the Yalbac area during the Classic Period.

In 2010, divers extracted a 3-meter sediment core from Pool 6 (18 m deep) using a 10 cm diameter PVC pipe (Beddows 2011; Lucero 2011a). AMS radiocarbon dates show that the core covers a period before and after the Late Classic period (c. 550-850 C.E.), the time when Maya population was the highest and kings their most powerful. The base of the core (302 cm) dates to b. 2300 years BP (350 B.C.E.) (Figure 5). Ongoing sedimentological analysis is being undertaken at Northwestern University by Patricia Beddows. Lindsay is conducting pollen analysis. Her research began with 12 one-centimeter slices of the core that were

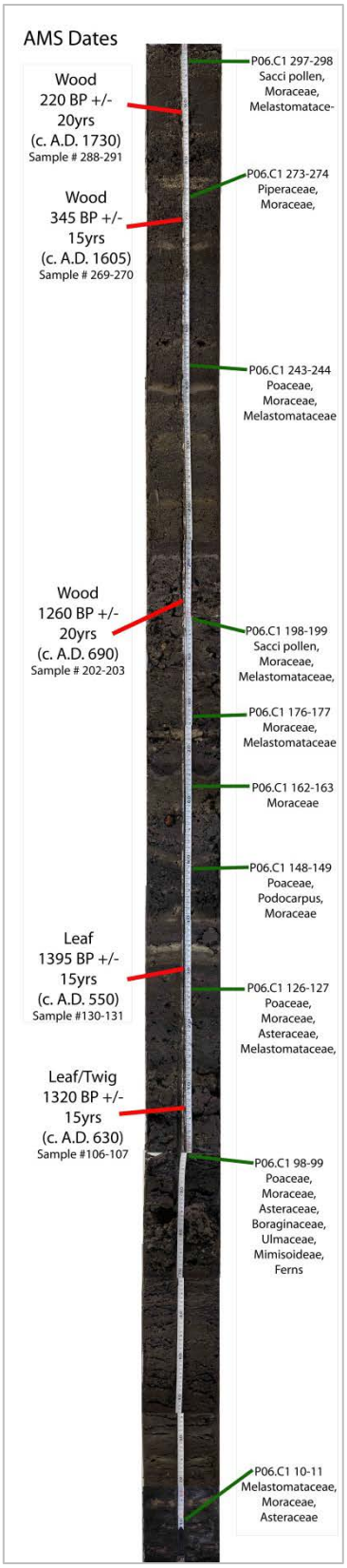

Figure 5. Pool 6 core composite. Photos by E. Mallon. Composite by C. Lindsay.

processed in plant biologist Surangi Punyasena's wet lab at the University of Illinois at Urbana-Champaign. The samples were processed using standard palynology techniques and included the use of hydrochloric acid (HCl), potassium hydroxide (KOH), hydrofluoric acid (HF), ecetolysis, effer, centrifuging and a gooching technique to remove unwanted material from the sediment. Microspheres were added to the sediment and were used to test the overall pollen content of each slide.

After the sample had been prepared, the material was placed on slides and thinned, and the coverslip sealed with wax and nail polish. These samples were then examined for content and the pollen concentrations were compared between samples. Pollen concentrations are still preliminary, pending comparison with pollen identification books and examination by experts in Punyasena's lab. Despite the preliminary nature of the identification, clear patterns have emerged. For example, near the leaf sample dated c. 630 C.E. (106-107 cm), the sediment sample (98-99 cm) indicates the presence of some Poaceae grains and an abundance of Asteraceae pollen, indicative of a cleared landscape. Near the wood sample dated at c. 1730 C.E. (288-291 cm), the sediment sample (297-298 cm) still has abundant Poaceae, but with a few *Pinus sp.* grains (Figure 6). This example is one of many that indicate that the landscape was possibly cleared throughout the Classic period, due to Poaceae grains in the sediment from the first sample (10-11 cm), but mixed with *Pinus sp.* grains as early as the 126-127 cm sample (close to material dated at 550 C.E.) and continuing in five of the remaining nine samples to the end of the core (297-298 cm).

The family Poaceae includes grass species, including *Merostachys sp.* and *Paspalum sp.*, among others. Bamboo (*Merostachys sp.*) was used historically for hunting weapons, for example, for fish spears (Nations and Nigh 1980) and small animal traps (Gann 1918). *Paspalum* is a domesticate that could have been used by the Classic Maya, or, as otherwise suggested, been a weedy species (Lentz 1991). The most common Poaceae domesticate present in the Maya region, however, probably was *Zea mays*, or maize.

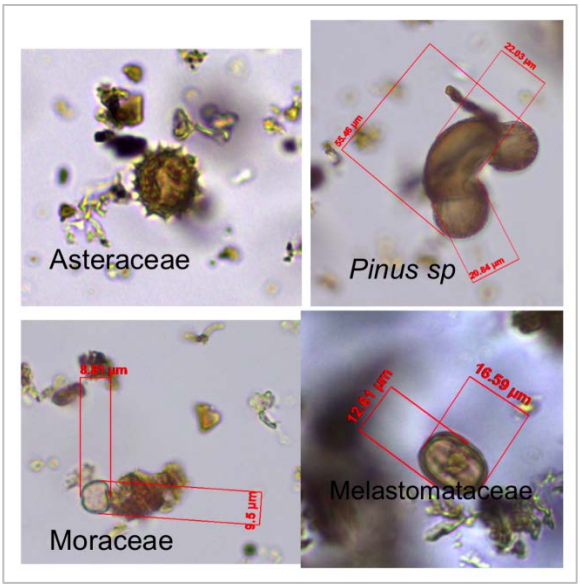

Figure 6. Some examples of Pool 6 pollen. Photos by C. Lindsay.

The Asteraceae family includes flowers and other "composite" species. However, the species holding prominence in a particular region most likely indicates that the trees were largely or completely cleared. Some common tree families that would indicate the presence of trees are Moraceae and Melastomataceae, both common in the Pool 6 sediment core (Table 2).

With these preliminary results, we can begin to assess whether or not the Classic Maya were practicing sustainable agriculture and even forest management. If the Maya were practicing sustainable landscape management, then we should not find evidence for noticeable degradation in the sediment core. Mueller and colleagues (2010) demonstrate degradation in soil and flora through sediment core analysis of Lake Petén Itzá of Guatemala. For example, they documented a change in flora from Moraceae and other dominant forest species, to *Pinus sp.*, Asteraceae and Poaceae. Based on previous sediment core analyses in similar regions, we should find tree pollen, indicating forested landscapes, changing to Poaceae, indicating forest clearance and human exploitation; Asteraceae, indicating disturbance; and charcoal, indicating burning of landscapes in preparation for agriculture (Piperno and Pearsall 1998). Finally, if the prehispanic Maya were conducting rituals at the pools, then one would expect to find pollen from plants and/or

Sample (cm from the bottom)	**Pollen concentration**	**C14 Dates** **yrs BP and C.E.**
10-11	Melastomataceae, Moraceae, Asteraceae, Poaceae,	
98-99	Poaceae, Asteraceae, Moraceae	~1320 BP (sample 106-107) 630 C.E.
126-127	Poaceae, Asteraceae, Melastomataceae, *Pinus sp.*, Moraceae	~1395 BP (sample 130-131) 555 C.E.
148-149	Poaceae, Moraceae	
162-163	Poaceae, *Pinus sp.*, Moraceae	
176-177	Moraceae, Melastomataceae, Poaceae, *Pinus sp.*	
198-199	Poaceae, Asteraceae, Melastomataceae, Moraceae	~1260 BP (sample 202-203) 690 C.E.
226-227	Poaceae, Melastomataceae, Moraceae	
243-244	Poaceae, Moraceae, Melastomataceae	~345 BP (sample 269-270) 1605 C.E.
273-274	Piperaceae, Moraceae, Melastomataceae, Pinus	~220 BP (sample 288-291) 1730 C.E.
297-298	Moraceae, Melastomataceae, Poaceae, Melastomataceae, *Pinus sp.*, Moraceae	

Table 2. Pool 6 sediment core preliminary pollen analysis.

trees commonly used in ceremonies, such as *Pinus sp.* and copal (Lentz et al. 2005). Even though the Classic Maya were clearing the landscape, as indicated by the presence of Poaceae and Asteraceae in the pollen core, they likely implemented some form of sustainable landscape modification, as indicated by the presence of the *Pinus sp.*

More detailed analysis of pollen concentrations throughout the core, specifically focusing on the Classic period will further show evidence for how the landscape changed over time. Lindsay will continue to compare pollen

analysis with botanical specimens from the Yalbac and Cara Blanca areas. She has already found patterns that may reflect ancient Maya forest management (Lindsay 2011) that tie into the preliminary results just presented. For example, since *Pinus sp.* pollen is found throughout the core in samples dating to before and after the Classic period, we can determine that trees were present even after the Classic period, when some claim that erosion and deforestation had eradicated most of the trees around Classic Maya centers.

Concluding Remarks

Natural features embody the sacred at Cara Blanca. Its isolation, concentration of openings in the earth, and the relatively sparse but unique settlement indicate that it served as a special place to the Maya, likely as a pilgrimage center. There are 25 pools at Cara Blanca, and we have only begun to plumb their depths. Evidence is growing indicating that the Maya periodically visited Cara Blanca to supplicate gods by performing ceremonies and leaving offerings. Such supplications would have become even more critical at the end of the Late Classic (800-900 C.E.) when several droughts struck the lowlands and the Maya began intensifying their ceremonial activities. It was to no avail, however, and the Maya abandoned Cara Blanca and most southern lowland centers by c. 900-950 C.E. It is clear that Cara Blanca will continue to yield more information about sacred landscapes, underwater offerings and ritual intensification, as well as the history of changing climate and landscape via pollen and soil analyses of sediment cores.

[1]Radiocarbon Dating Laboratory, Illinois State Geological Survey (http:/www.isgs.illinois.edu/)

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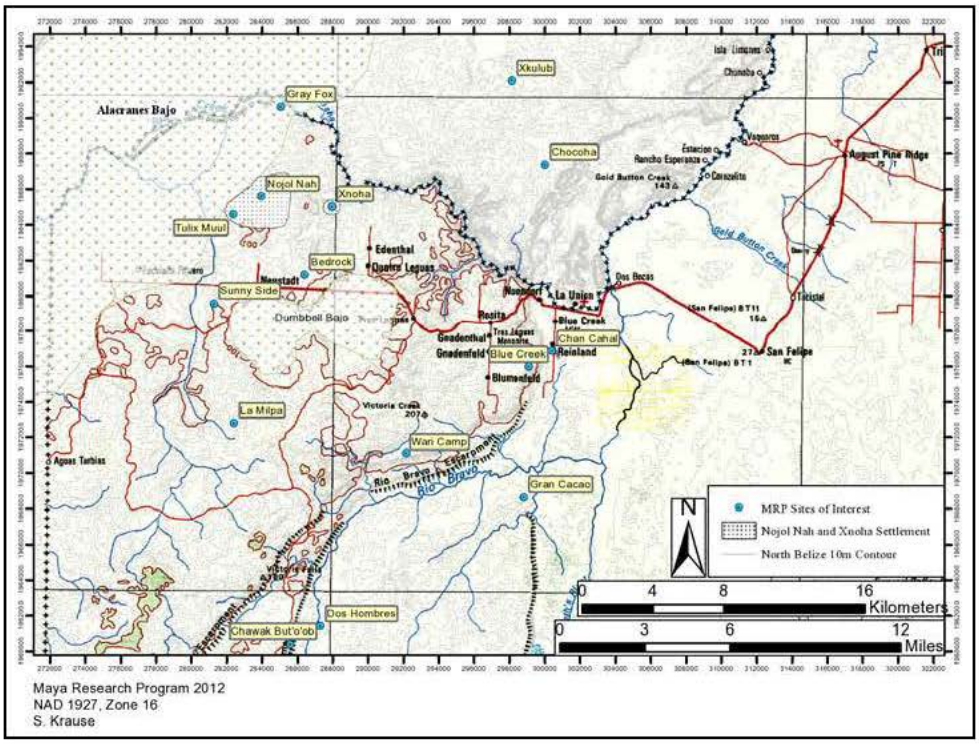
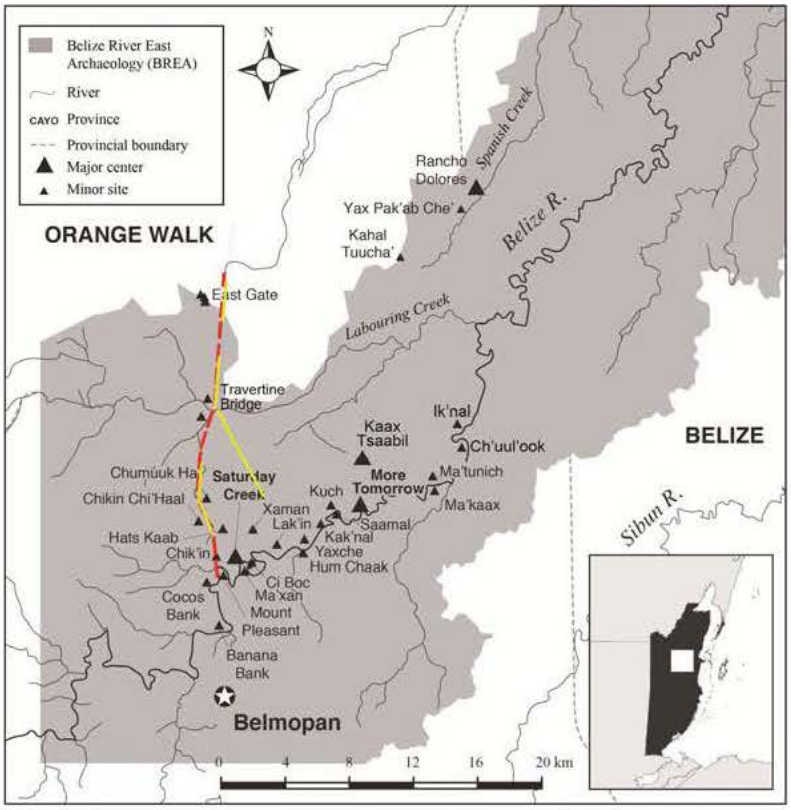
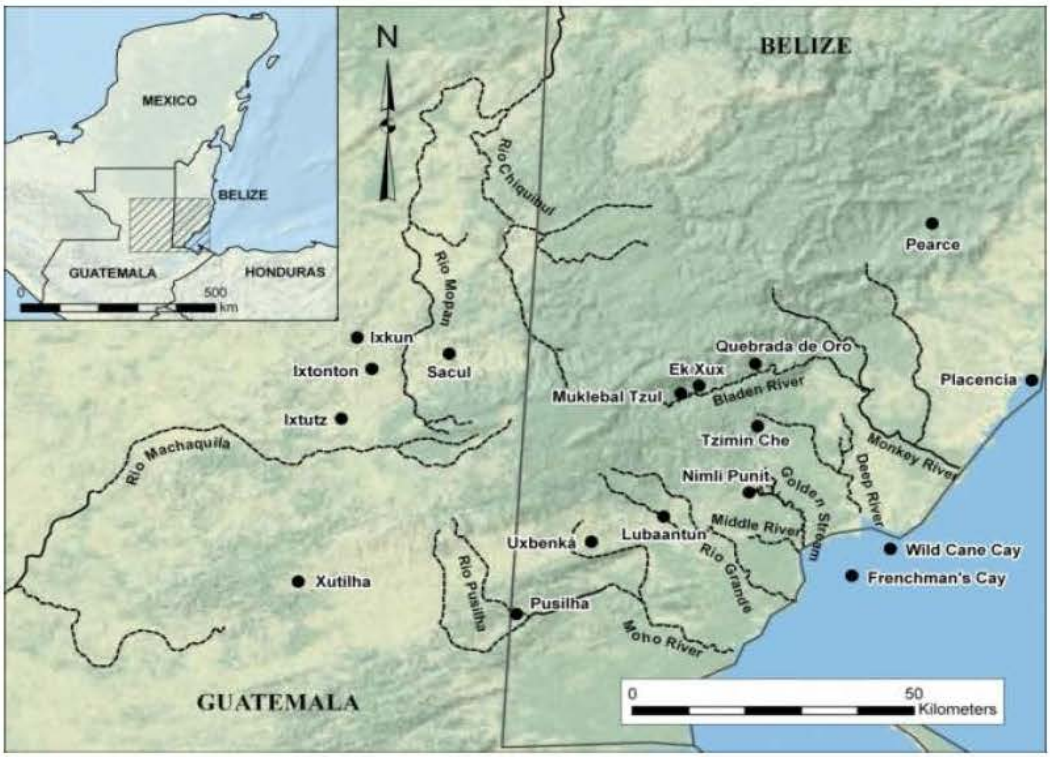
SECTION TWO: GENERAL RESEARCH PAPERS



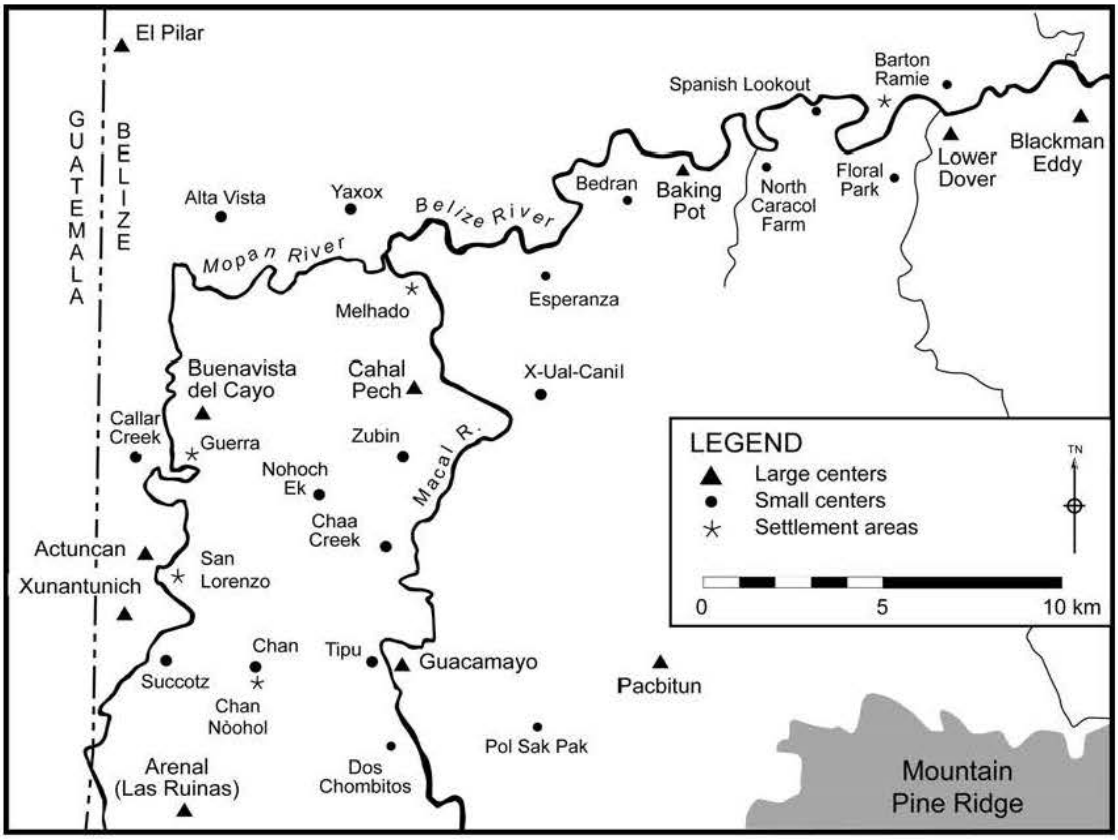
Maya sites in Northern Belize (Courtesy Maya Research Program)



Maya sites in Central Belize (Courtesy Belize River East Archaeology Project)



Maya sites in Toledo District (Courtesy Uxbenka Project)



Map showing sites in the Belize Valley (Courtesy Mopan Valley archaeological Project)

17 THE 2012 INVESTIGATIONS AT CHAN CHICH AND KAXIL UINIC

Brett A. Houk, Matthew C. Harris, Krystle Kelley, and Vincent M. Sisneros

The 2012 season of the Chan Chich Archaeological Project, its first since 2001, had three main research agendas: plaza excavations in the Upper Plaza at Chan Chich, assessing the prehistoric ruins of Kaxil Uinic, and locating the historic Maya village of the same name. The Upper Plaza work documented a series of Middle and Late Preclassic floors all capped by a large, presumably Late Classic, construction event that raised the plaza floor to its current height. The work at Kaxil Uinic ruins established a preliminary chronological framework for the architecture at the site beginning in the Late Preclassic and extending to the end of the Late Classic. Early activity in the area is suggested by a Cunil-like sherd from a mixed context, and abandonment and post-abandonment related activities are indicated by a Terminal Classic surface deposit of artifacts on one of the structures and Postclassic, or perhaps Colonial, offerings placed at the base of the stela at the site. The project also successfully identified the location of the San Pedro Maya village of Kaxil Uinic, 500 m south of the prehistoric ruins.

Return to Paradise

The Chan Chich Archaeological Project (CCAP) operated for five seasons between 1996 and 2001 with investigations limited to the site core of Chan Chich. Following the departure of the managers of Chan Chich Lodge after the 2001 field season, the project went on an 11-year hiatus, and did not renew investigations until the 2012 season. The revival of the project came in the form of an archaeological field school sponsored by Texas Tech University, under the direction of the senior author.

Chan Chich is approximately 4 km east of the border between Guatemala and Belize in the southwestern corner of the 135,000-acre Gallon Jug Ranch (Figure 1). The boundary between Gallon Jug Ranch and Yalbac Ranch passes through the ruins of Chan Chich, south of the Upper Plaza. In 2012, the CCAP conducted research at Chan Chich and the nearby site of Kaxil Uinic, also known as E'kenha. This article summarizes the results of those investigations.

Chan Chich Upper Plaza Investigations

The main architecture at Chan Chich is grouped around two connected plazas, the large and open Main Plaza and the smaller, restricted Upper Plaza (Figure 2). Both plazas have long construction sequences beginning as early as the Middle Preclassic and extending to the end of the Late Classic, the period during which most of the visible structures were built. In 1997, during the CCAP's first season of excavations, the project encountered a Terminal Preclassic tomb in Upper Plaza at Chan Chich (Houk et al. 2010). With the renewal of the project, we

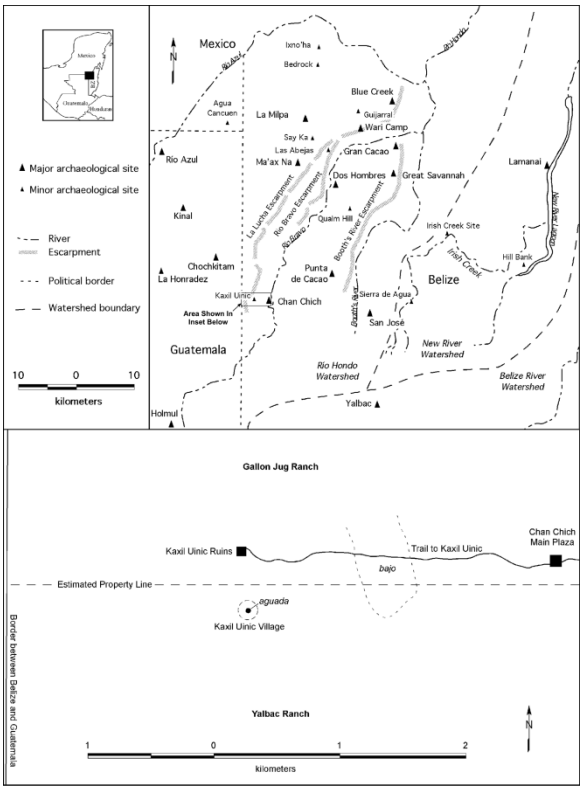


Figure 1. Map of the Three Rivers region (top) with inset (bottom) showing the locations of Chan Chich, Kaxil Uinic ruins, and Kaxil Uinic village.

decided an intensive investigation of the Upper Plaza would be a primary component of our research. The goal of these investigations was to target the oldest part of the site to expand our understanding of the founding of Chan Chich and the evolution of the architectural core of the city. The Upper Plaza work was planned as a 2-year study, and the 2012 work included preliminary remote sensing work by Dr. Chester

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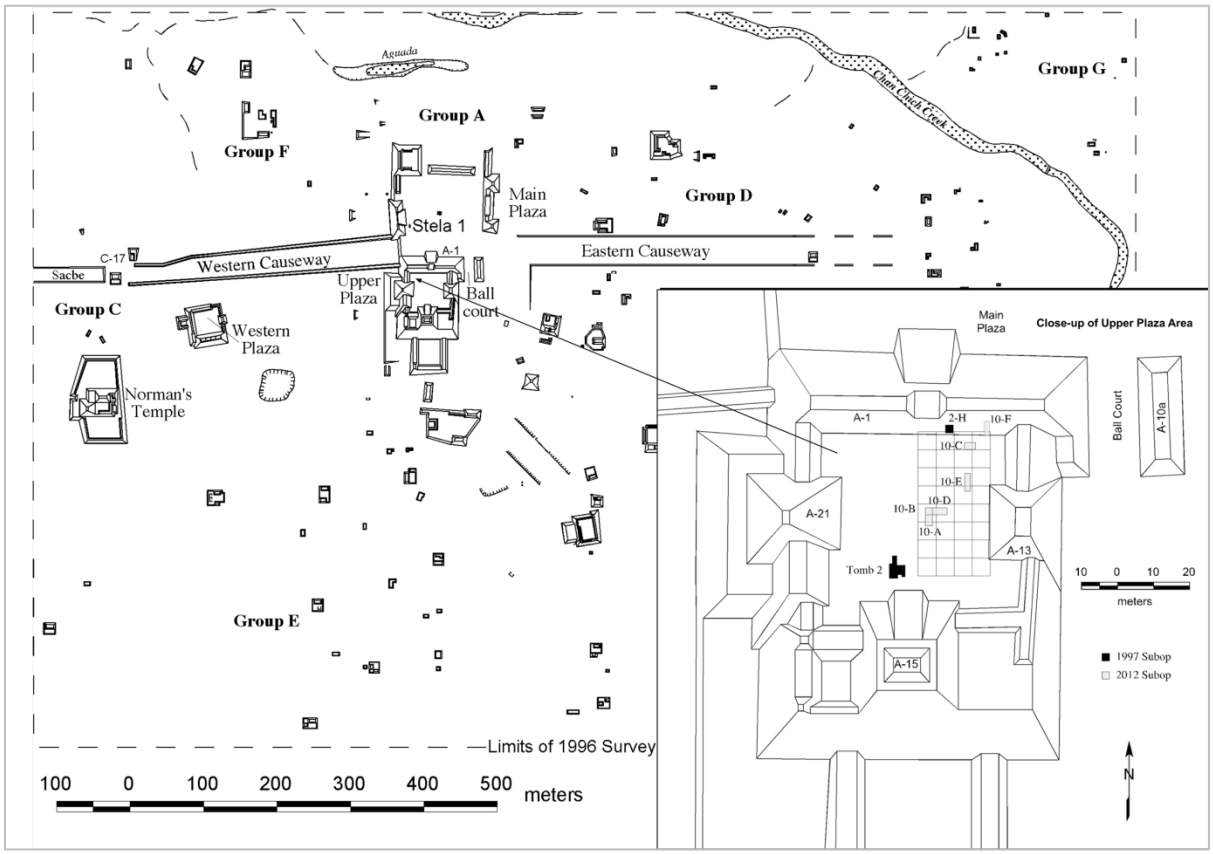

Figure 2. Map of Chan Chich with inset of the Upper Plaza showing the location of 2012 excavation units in relationship to remote sensing grid and plaza excavations from 1997.

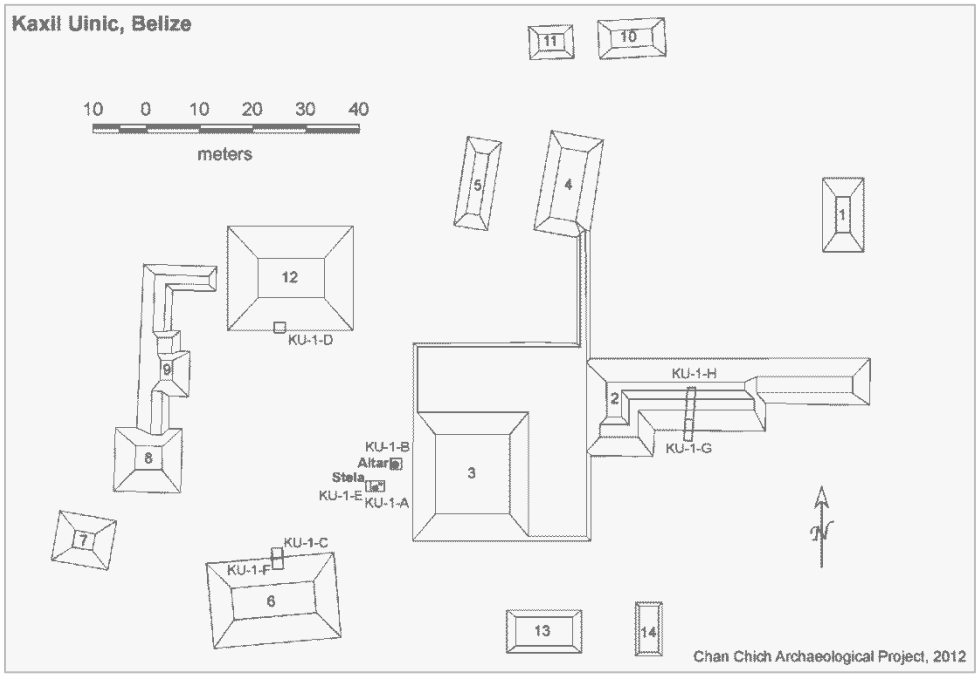

Figure 3. Map of Kaxil Uinic ruins and 2012 excavations, based on Guderjan et al. (1991:Figure 33).

Walker (2012) followed by exploratory excavations (Kelley et al. 2012).

Walker's (2012:11) ground penetrating radar (GPR) survey of a 20-x-40-m gridded section of the Upper Plaza identified a number of high reflection anomalies between 80 and 100 cm below the surface of the plaza. Excavations, however, encountered only dry-laid cobble fill at that depth, suggesting the anomalies were created by the irregular voids between boulders and cobbles used in the fill (Kelley et al. 2012). Although the GPR data guided the original placement of excavation units in the Upper Plaza, additional units were opened at the discretion of the project staff based on early excavation results.

In all, six suboperations were excavated in the Upper Plaza in 2012; five targeted plaza deposits, and the sixth was intended to expose the final plaza floor where it meets the base of Structure A-1 (see Figure 2). The plaza excavations were a series of discontinuous units that provide us with an incomplete picture of the buried architectural sequence. The four southernmost units (Suboperations CC-10-A, -B, -D, and -E) encountered consistent stratigraphy. The most recent plaster floor was very badly deteriorated and in most places undetectable; it corresponds in most areas of the Upper Plaza with the modern ground surface. This floor was associated with a large construction event that raised the level of the plaza by approximately 1 m using dry-laid fill, which ranged from extremely large cobbles and small boulders to smaller cobble fill. The anomalies revealed in the remote sensing study were found to be portions of this fill composed of large cobbles and air pockets.

Below this meter of construction fill excavations uncovered a series of floors with little to no fill between them. The first was a compact dirt surface made of silty loam that was about 20 cm thick. There were some small rocks and ceramics within this layer, as well as a few pieces of burnt limestone, jute shell, and obsidian. The next surface uncovered was a plaster floor that was approximately 10 cm thick in the areas of good preservation, which was built directly on top another plaster floor with almost no construction fill in between. Fewer artifacts were found in these layers. Below this floor, excavations encountered a series of closely spaced floor surfaces and separate floors became increasingly hard to distinguish from resurfacings. This series of floors was variably preserved from one floor to the next, and between different areas of the same floor. Unfortunately, the ceramics from the southern suboperations have not yet been analyzed, and dating the various construction episodes is dependent on comparisons to the northern plaza unit, discussed below, and excavations from prior seasons.

Subop CC-10-C documented a different stratigraphy sequence than the southern units. The fill beneath the latest plaza floor—corresponding to the ground surface—was 50 cm thicker than in the other units, and the compact dirt surface seen elsewhere was not present in Subop CC-10-C. Directly below the final construction phase was a series of four plaster floors that does not match the sequence seen in the other units, although these floors were also relatively close to one another vertically. Underlying these floors was a dense, 35-cm thick midden, first documented in 1997 in one of the CCAP's initial test pits (Robichaux 1998). Large amounts of jute shell, numerous ceramic sherds, a broken polished stone celt, and a small piece of jade were found in this deposit (Lot CC-10-C-7). Below the midden was an extremely eroded plaster floor; its subfloor fill of dirt and rock covered bedrock. In this suboperation, bedrock was uneven, occurring 2.10 to 2.27 m below the modern plaza surface.

Subop CC-10-C is the only excavation unit for which we have ceramic data from 2012. All lots contained Late Preclassic ceramics, except for the midden and lowest floor, which contained Middle Preclassic sherds. Although we believe that at least the upper part of the plaza (Lots CC-10-C-1 and -2) is Late Classic in age based on earlier excavations by Robichaux et al. (2000), the Late Preclassic and Middle Preclassic age assessments for the lower floors are consistent with the previous investigations in the plaza (e.g., Houk et al. 2010; Robichaux et al. 2000).

The final excavation unit, Subop CC-10-F was placed on the southern face of Structure A-1, but was too low on the mound to encounter architecture other than the final plaza floor. This

final plaza floor was better preserved in this unit than anywhere else in our excavations due to the substantial amount of collapse debris covering it.

Although our excavations in 2012 did not encounter any buried structures or caches in the plaza, the preliminary data provide us with questions to address in subsequent seasons. For example, the variations in floor depth and sequence between Subops CC-10-C and -E indicate that some type of architectural interface must exist between the two excavation areas. Targeting that interface and extending the excavations south to connect to the 1990s tomb excavation unit will be research priorities going forward.

Kaxil Uinic Ruins and Village

The second research focus in 2012 was an assessment of the nearby ruins of Kaxil Uinic. The name Kaxil Uinic applies to a ruin, also known as E'kenha (see Guderjan et al. 1991), and a historic Maya village/early twentieth century chicle camp. The ruins and historic village are important to the history of archaeological research in Belize because Sir J. Eric Thompson (1963) had planned to excavate the ruins using labor from the village in 1931. Thompson was forced to change plans when the Belize Estates and Produce Company relocated the villagers to San José shortly before his arrival.

Our research interest at Kaxil Uinic ruins centered around the hypothesis that it was connected to Chan Chich by a sacbe (see Houk et al. 1996). Our focus included assessing the age of the prehistoric site and documenting the stone monuments reported there by both Thompson (1939) and Guderjan et al. (1991). We also wanted to find and document the historic Kaxil Uinic village, depicted by Thompson (1963) as being situated around a small aguada. As described below, we succeeded in all of our goals to various degrees, although our investigations were severely hampered by damage related to Hurricane Richard, which crossed over the area in 2010. We also determined that the ruins of Kaxil Uinic are on Gallon Jug property, as suspected, but the village is approximately 500 m to the south, on Yalbac Ranch (see Figure 1 inset). The site of Kaxil Uinic is 2.6 km west of Chan Chich, with a bajo located between the two sites, and 900 m east of the La Lucha Escarpment (Harris and Sisneros 2012).

Kaxil Uinic Ruins

The focus of the investigations at Kaxil Uinic ruins included determining the extent, condition, and nature of the prehistoric site; the age of the site; the conditions of the monuments at the site; and the site's relationship to Chan Chich. The results of our investigations, which are reported more fully in Harris and Sisneros (2012), are summarized here. In the San José report, Thompson (1939:280) published a brief description of Kaxil Uinic and the structures associated with it: "[m]ounds, sculptured stela, plain altar…" Guderjan et al. (1991:59) recorded the site as E'kenha (see Houk [2012] for a discussion of this issue) and mapped 12 structures and "a very badly damaged carved stela and altar" at the site.

During the 1996 CCAP field season, mapping crews discovered a sacbe running west from Chan Chich in the general direction of Kaxil Uinic (Houk et al. 1996). In 2012 we planned to test the hypothesis that the two sites are connected by a sacbe. Unfortunately, due to the large number of felled trees at the site, we were unable to conduct as thorough a survey as we planned. Two short brechas, placed east of Kaxil Uinic, were cut north to south, crossing the suspected path of the sacbe, but they did not encounter clear indications that a sacbe connects the two sites.

The ruins include 14 documented structures, which include two not previously recorded by Guderjan et al. (1991), arranged around a small (40-x-60-m) plaza (Figure 3). Structure 3, which may be the most massive mound at the site, is on the eastern side of the plaza; the stela and altar are associated with this structure. The plaza is bound by Structure 6 to the south, Structures 8 and 9 to the west, and Structure 12 to the north. Structure 2, a long and complicated mound, is east of the plaza, as are most of the other known mounds at the site. With our original research plans thwarted by the hurricane debris, we only cleared a few areas at the site for excavation: Structure 2, the areas around the monuments, and the bases of Structures 6 and 12.

The two monuments at the base of Structure 3 were a focus of our 2012 investigations. Stela 1 is in two fragments (designated Fragments 1 and 2) approximately 2.5 m southeast of Altar 1, an atypical arrangement that suggests one (or both) of the monuments has been moved from its original location. Fragment 1 was found lying flat, but Fragment 2 was in an upright position, perpendicular to Structure 3. Our interpretation is that Fragment 1 is the bottom of the stela and the side to the west would have originally been placed in the ground or connected to a piece broken off in the ground, although our search for a stela socket proved unsuccessful. The top surface of Fragment 1 and the corresponding surface of Fragment 2 have faint traces of carvings; however, the carvings are so eroded that we can only state that the monument was once carved. No details are discernible. Regardless, as Harris and Sisneros (2012) note, the presence of a carved stela is significant because so few are known from the region. When refit, the stela measured 1.95 m tall, 75–80 cm wide, and 50–55 cm thick.

Multiple incensario sherds (Figure 4) were found in the topsoil around the stela fragments. Classified as Chen Mul modeled by the project's ceramicist (see Valdez and Houk 2012), the incensarios represent either Postclassic visitation to the site or perhaps even Colonial activity associated with the historic Maya village, as suggested by Jason Yaeger (personal communication, 2012). If they are in fact Postclassic in age, the offerings fit well with the previously documented pattern of pilgrimages to the abandoned centers in the region (see Houk et al. 2008).

The altar is one of the largest in the region at 130 cm in diameter and 30 cm thick. Unlike the stela, the altar showed no evidence of having ever been carved. Excavations beneath the altar did not locate a cache, suggesting that it, too, is not in its original location. Postclassic monument movement and resetting has been documented in the region (see Houk et al. 2008), and it is possible that both the stela and altar at Kaxil Uinic were moved as part of the monument veneration activities suggested by the incensario sherds.

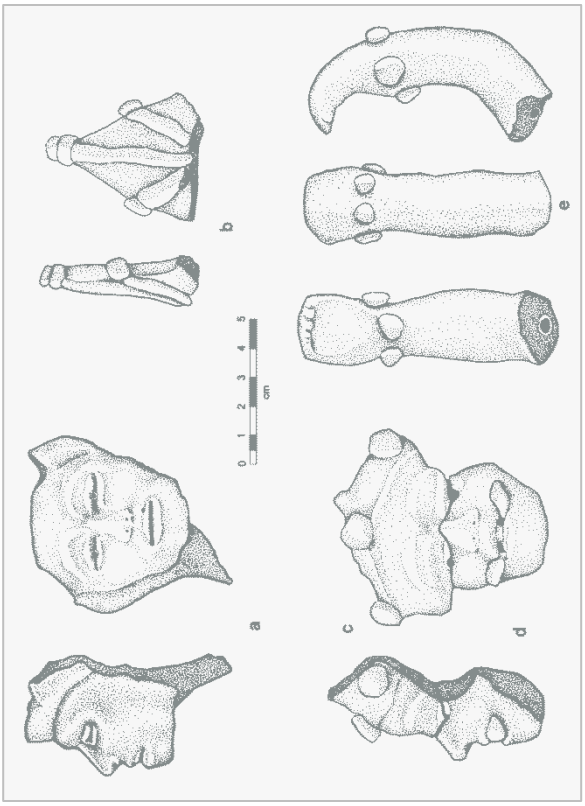

Figure 4. Chen Mul modeled incensario fragments from around Stela 1. Illustrations by Margaret Greco, after Harris and Sisneros (2012:Figure 5.4).

The excavations below the altar continued to bedrock, which was approximately 2 m below the modern ground surface. Two eroded plaster floors were documented in the sequence, and ceramic data suggest the oldest is Late Preclassic in age (Harris and Sisneros 2012:Table 5.3). Interestingly, a Cunil-like sherd was found in a mixed context in Lot KU-1-B-4, which was construction fill associated with the final plaza floor. This sherd closely resembles Cunil sherds from the Belize Valley and suggests an Early Preclassic occupation in the vicinity of Kaxil Uinic ruins (Jaime Awe, personal communication, 2012).

Excavations at the base of Structure 6 on the southern side of the Plaza encountered a dense artifact deposit on the surface of the mound that included multiple speleothem fragments (Harris and Sisneros 2012:59). Associated ceramics include Tepeu 3 types, suggesting the speleothems may be part of a Terminal Classic surface deposit associated with the abandonment of the site.

In summary, the work at Kaxil Uinic ruins was hampered by hurricane debris, and we could not complete all of our planned work. We were unable to determine if Kaxil Uinic is connected to Chan Chich by a sacbe, and we were not able to revisit all of the mounds at the site. We did, however, document that the site appears to have been founded in the Late Preclassic, but the Cunil-like sherd from the area of the altar indicates that an Early Preclassic occupation is nearby. The final plaza floor construction and presumably the final phase of visible architecture date to the Late Classic. Terminal Classic activity at the site is suggested by the artifact deposit on the steps of Structure 6, and Postclassic (or Colonial) visitation and possibly monument resetting is indicated by the incensario fragments at the base of the upright stela fragment. The stela, though heavily eroded now, was once carved on at least one face, and the altar is larger than most in the region.

Kaxil Uinic Village

The Maya living at Kaxil Uinic were a splinter group that had migrated from the Chichanha region of Mexico into the area following the Caste War in 1857 (Jones 1977). This group, which moved into an unoccupied region of Belize and Guatemala, became known as the San Pedro Maya, named after the principal village south of Labouring Creek (Jones 1977:141). Jones (1977:157, 162) reports that Kaxil Uinic was settled in the 1880s as the third village in what he calls the San José Minor Cluster, speculating that migrants from a Holmul cluster village named Holuitz that was abandoned sometime after 1868 may have originally settled Kaxil Uinic village.

At this stage in our research, we have not located much information about the size of the historic village, but it is clear from correspondence on file in Thompson's files at the Field Museum in Chicago that in 1931 the village had a courthouse (or *cabildo*), that would have been suitable for Thompson's project headquarters. Thompson (1963:233) notes the village had a "score of huts scattered around a dirty waterhole," but makes no mention of the size of the population or nature of the settlement.

When Chan Chich Lodge was opened in the late 1980s, the aguada—Thompson's dirty waterhole—around which the village was located was found by lodge staff, and until the late 1990s the trail to "Xaxe Venic" was kept open and maintained by the lodge. Long-time lodge guide Hilberto Vasquez (personal communication, 2012) reported the lodge staff used to put bananas by the aguada to attract tapirs and that at one point a guide had found "the big stones the Maya women used to wash clothes" at the edge of the aguada and placed them at the base of a tree.

Our 2012 reconnaissance, using the prehistoric ruins as a starting point, located the aguada and artifacts associated with the historic village. The area around the aguada is a dense cohune forest made thicker by hurricane debris. As we cut a line south from the ruins, the first indication that we were near the aguada was the large number of beer bottles scattered about the ground. In fact, glass bottles are the only remnant of the historic settlement that we discovered, other than one metal pot. The few bottles that were collected or photographed include three beer bottles from the early 1900s (two from New York and one from Detroit) and a hair tonic bottle (Houk 2012). Church et al. (2010:187) report finding "a tremendous number of bottles" at San Pedro Maya sites, and they conclude that it is likely the bottles were reused as containers for local products and did not represent alcohol consumption by the villagers.

Conclusions

The 2012 season of the CCAP was a successful reboot of the project, although not all of our initial research goals could be met. We succeeded in assessing the age and condition of the prehistoric ruins of Kaxil Uinic, but could not determine if the site is connected to Chan Chich by a sacbe. We successfully identified the location of the historic Maya village of Kaxil Uinic. Given the recent interest in the Colonial period of Belize's history (Jaime Awe, personal communication, 2012), Kaxil Uinic village would make a timely research project. Certain logistical issues would need to be overcome, however, before a project could be undertaken there. Nevertheless, the project holds great potential to collect new data about not only the San Pedro Maya but also Colonial commercial enterprises in Belize during the early twentieth

century. Finally, the work at the Upper Plaza at Chan Chich provided important information on the construction sequence in two areas of the plaza and allows us to formulate more specific research questions moving forward.

Acknowledgments The authors wish to thank the staff of the Institute of Archaeology for considering this paper for publication, in addition to encouraging and permitting the research reported here from Chan Chich and Kaxil Uinic. In particular, we would like to thank Dr. John Morris and Dr. Jaime Awe for being supportive of our work and for issuing a permit to conduct the research in 2012. We are extremely grateful to the Bowen family, particularly Mr. Michael Bowen and Mr. Zander Bowen, for inviting us to work at Chan Chich. We are very grateful to the staff of Chan Chich Lodge, particularly Mr. Elder de Leon and Ms. Letty Martinez, for being so kind and helpful and to the manager of Gallon Jug Ranch, Alistair Macpherson, for being extremely supportive of the field school and archaeology in general on the property. Finally, we would like to thank the students and staff of the Chan Chich Archaeological Project and all the departments and offices at Texas Tech University that provided support in 2012.

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18 CASTING A LIGHT IN THE WILDERNESS: THE ANCIENT MAYA SITE OF KA'KABISH, NORTHERN BELIZE

Alec McLellan and Helen R. Haines

Investigations of the ancient Maya site of Ka'Kabish, in Northern Belize, have begun to reveal the history of this medium sized center. Excavations of the site core, along with survey and reconnaissance of settlement in the periphery has provided a means for understanding the size and chronology of Ka'Kabish. These methodological strategies have allowed archaeologists at the site to document the distribution and density of ancient structures, as well to understand the developmental trajectory of the monumental core. These investigations have revealed that the ancient Maya occupied the site as early as the Middle Formative (1000 BC – 400 BC), until its abandonment, in the Terminal Classic (AD 800 – 1000). The settlement zone remained occupied following the Terminal Classic abandonment of the site core, with evidence suggesting occupation at late as the Late Post-Classic (AD 1300 – 1542). These studies are allowing archaeologists in the greater Maya subarea to understand the variability in the rise and fall of ancient Maya polities. Investigations at Ka'Kabish add to this growing body of literature, providing yet another example of the transformations occurring during the Late to Terminal Classic period.

Introduction

During the course of the Ka'Kabish Archaeological Research Project (KARP), archaeologists uncovered several major developmental trends in the monumental center, as well as the periphery. Data was generated from a variety of approaches that included clearing and mapping of looters' trenches in key structures, excavations into two areas on the main plaza and into two structures, along with survey and reconnaissance of the settlement areas both immediately adjacent to the site as well as further out from the monumental centre.

Information gathered from the clearing and mapping of various looters' trenches and excavations into the plaza, documented the construction sequences at the site, thereby providing us with insights into the architectural, spatial, and chronological changes of the site core (Tremain 2011). While the survey and reconnaissance of areas surrounding the site yielded data on the density and distribution of residential settlements, suggesting several developmental trends for the commoners and lower echelons of society. By comparing the chronological and distributional relationships provided in previous publications, and in the research completed in the periphery, we aim to gain a greater understanding of the dynamics of the site, allowing us to provide another example of the rise and fall of particular ancient Maya polities. This analysis is largely based on settlement data that was collected over the course of three field seasons (2010-2012), as

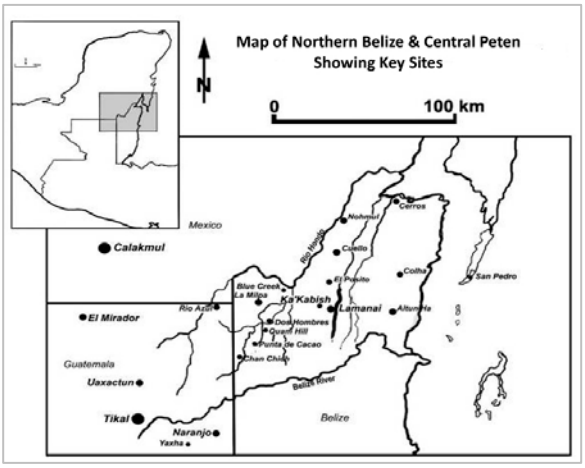

Figure 1. Location of Ka'Kabish.

well as several publications that were presented during the 2011 Belize Archaeological symposium, and the 2011 Society for American Archaeology conference (Aimers and Haines 2011; Haines and Aimers 2011; McLellan 2013). In this paper we will focus our discussion on the research conducted in the settlement zone during the 2010 and 2011 field seasons. The intent of this research is to further our understanding of the chronological and spatial extent of the residential occupation of Ka'Kabish. A corollary outcome of this research is the contribution this data makes to our understanding of the relationship between the inhabitants of Ka'Kabish and the nearby site of Lamanai.

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Overview of the Site Core: Location and Chronology

The ancient Maya site of Ka'Kabish is located on a limestone ridge, near the modern day village of Indian Church, in the Orange Walk District of Belize (Figure 1). It is situated approximately 10 km from one of the largest ancient Maya sites in the region, Lamanai, which has undergone multiple seasons of study (Graham 2004; Pendergast 1981, 1985, 1986). Several other sites are documented in the region have also been the focus of archaeological investigation, such as Blue Creek, Cuello, El Pozito, Nohmul, and La Milpa; however, the nearest of these sites (El Pozito) is roughly 20 km distance, almost twice as far as Lamanai raising interesting questions about the social and political relationships between Ka'Kabish and Lamanai.

After initially reviewing the site and assessing the viability of conducting archaeological work in area 2005, the Ka'Kabish Archaeological Research Project (KARP) was created in 2007 and began mapping Ka'Kabish that same year. An earlier map created by the Maya Research Program was used as a guide to the site. This map, although function, lacked several details due to the environmental conditions and time-constraints under which it was produced. Consequently, initial work by KARP focused on re-mapping the site core. During the course of the first two field seasons (2007 and 2009) five distinct complexes, comprised of 56 individual structures, separated by the construction of a modern road were identified (Figure 2). Over the subsequent seasons (2010-2012), survey work continued along two separate avenues of research: 1) to circumnavigate the area of the site core still under jungle cover mapping discernible mound and topographic features; and 2) survey the ploughed fields immediately adjacent to the centre as well as those along the road toward Lamanai. Additional research was done in the site core including mapping the construction sequences of several key structures that had been exposed in the numerous looters' trenched that pockmark the site along with targeted excavations into the Group D plaza and several surrounding structures to gather chronological information.

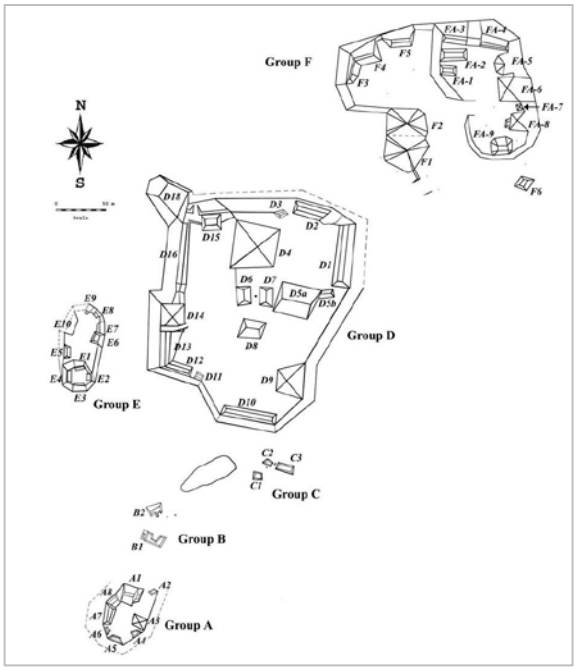

Figure 2. Map of the Epicenter of Ka'Kabish.

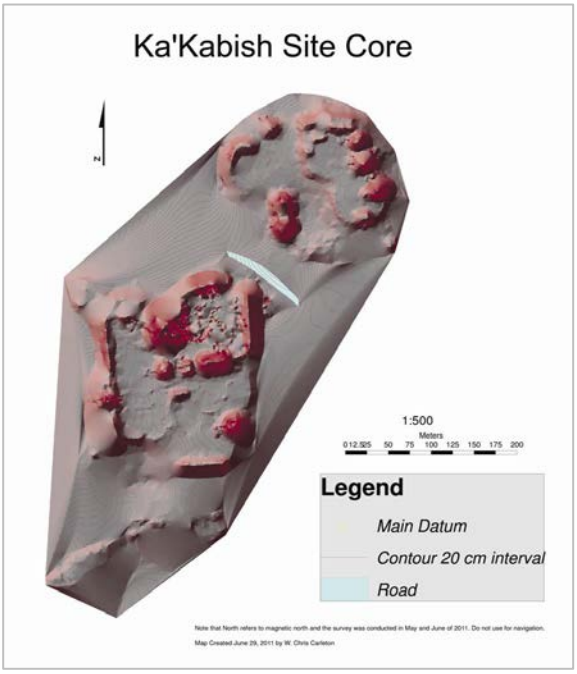

Figure 3. Shaded Relief Map of Epicenter of Ka'Kabish.

Mapping of the site core in 2011 was conducted using a Sokkia 530R3 Total Station and a Nomad data-collector with TDS Survey-Pro software and produced a detailed ArcGIS map topographic map of the known monumental core area. This topographic map allowed for a comparison of differences in the elevation of

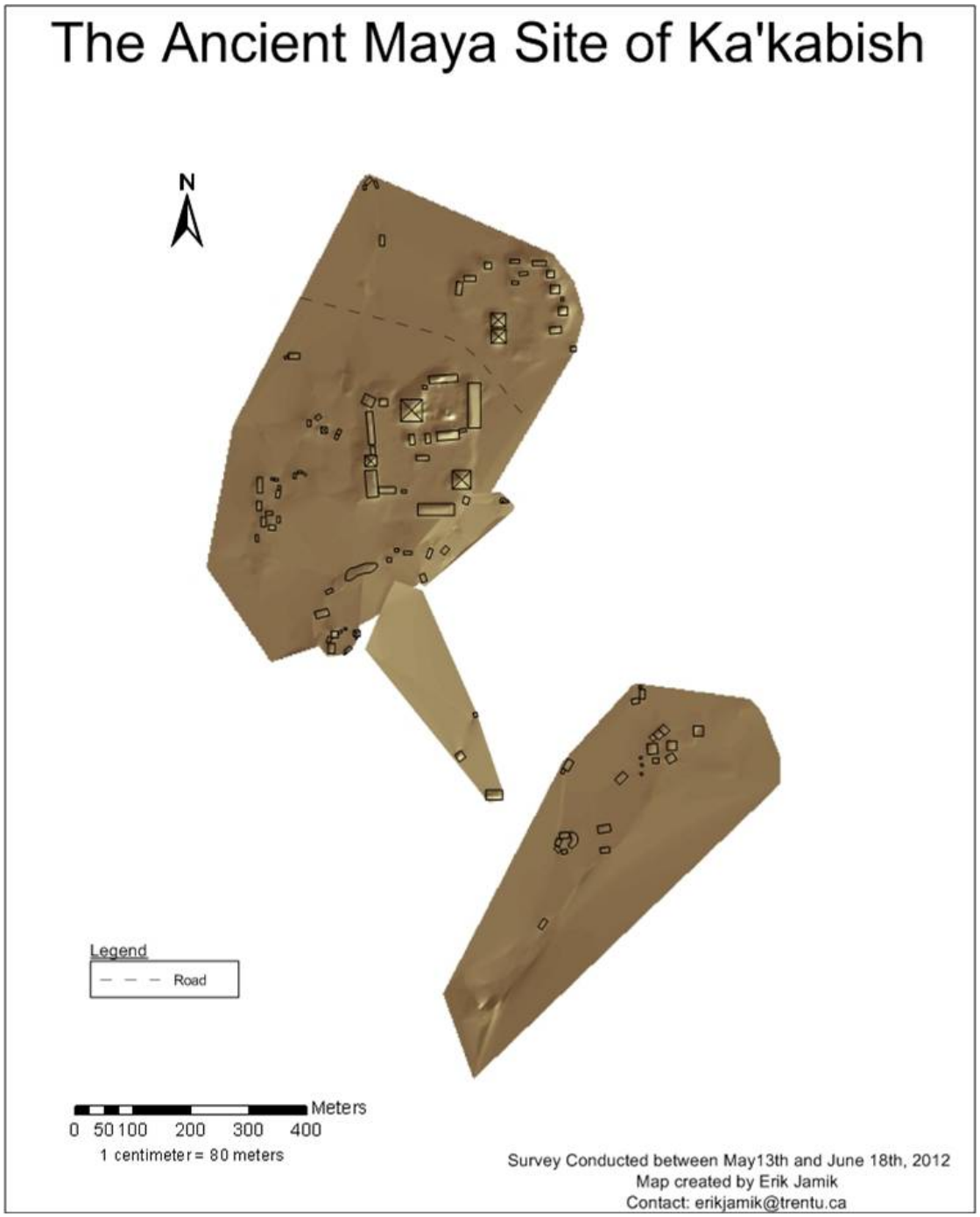

Figure 4. Updated Map of Greater Ka'Kabish Settlement.

particular features, such as the height of the plaza in various areas of the site (Figure 3). Continued surveying of the surrounding region has expanded the known area further with the discovery of two additional plazuela groups and several isolated mound structure, increasing the number of structures to 96 (Figure 4). Additional mound structures likely existed, and may still exist, in the in blank areas between the two mapped zones in Figure 4, however, this area is under extensive cane farming making mapping of the area problematic.

Excavations into the Group D plaza between structures D-9 and D-5 have uncovered

the oldest deposits to date at the site. Ceramic material deposited on the surface of Floor 2 in front of a buried platform included 36 individual, broken and intact vessels (Figure 5). Ceramic analysis conducted by James Aimers identified several of these as Consejo Red vessels (Aimers and Haines 2011), which according to Kosakowsky and Pring are characteristic of the Swasey/Bladen Complexes at Cuello (Kosakowsky and Pring 1998; see also Kosakowsky 1987). Using the more conservative estimates of 800-600 BC suggested by Kosakowsky for the Bladen Complex, these materials suggest that this deposit indicates that the earliest occupation for the site core dates to the latter part of the Middle Formative period. This assumption is further supported by a series of four radiocarbon samples taken from this ceramic deposit that returned a suite of dates falling between 762-399 BC (Table 1). Two additional radiocarbon dates from this area, one from a deposit of shells on Floor 2 immediately in front of the north-east corner of the buried platform that yielded a date of 753-388 BC (AA100166), and one from below Floor 1 inside a vessel identified by Kerry Sagebiel as a Consejo Red bowl (pers. comm.) that returned a date of 799-511 BC (AA100168), support attributing the early occupation period of Ka'Kabish to the Middle Formative period.

The chronology of the site was augmented by the clearing and mapping of several looters trenches from a collection of structures in the Southern Complex. Three distinct construction phases were documented in Structure D-4, and four different construction phases were recorded in Structure D-9 (Tremain 2011). The earliest construction for both of these structures, which was based on artifact analysis, mapping, and comparative studies, date to sometime between the Middle and Late Formative Period. A radiocarbon date yielded a calibrated date of 825-417 BC +/- 66 years for the second construction sequence of Structure D-9. This Middle Formative date was supported by associated Tiger Buff ceramics (Aimers and Haines 2011; see also Kosakowsky and Pring 1998 and Kosakowsky 1987).

The latest secure date reported from the site core comes from Structure D-14. Excavations into this building uncovered a

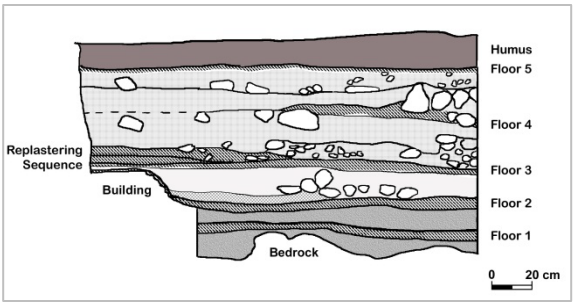

Figure 5. Operation 8 West Wall Profile of Units 1 and 2.

number of Late and Terminal Classic vessel fragments, including pieces that Aimers identified as resemble the chalices at Lamanai (Aimers and Haines 2011). Additionally, a large construction episode that raised the enclosed plaza space in the north-east quadrant of Group D to the east of Structure D-4 may also date to this period (Tremain 2011).

Currently, it appears that the core area of Ka'Kabish was settled sometime during the middle or latter part of the Middle Formative period. Construction, and therefore likely occupation of the core area, continued through the Early Classic period and into the Late Classic period. In this regard the settlement history of Ka'Kabish follows a standard trajectory of many other ancient Maya site with occupation starting in the Formative period and declining during the Terminal Classic period. However, as with other sites in the area, such as Blue Creek, it appears that the area was not entirely abandoned and residential occupation continued in the areas surrounding the site.

Discussion of the Settlement Zone

During the 2010 and 2011 field seasons, archaeologists surveyed two areas south of the site core. The first survey location extended in a south-westerly direction, 0.8 km into the periphery. The second survey zone was roughly 1.3 km from the site core, and extended in a south-easterly direction for 1 km. The transect width varied somewhat depending on the composition of the agricultural fields, but generally averaged 0.2 km. The second survey zone was roughly 1.5 km from the site core, and extended in a southeasterly direction for 1 km. The width of the survey zone was roughly 0.92 km. In total, archaeologists found 84 ancient

Table 1. Radiocarbon Dates for Group D Operation 8 Plaza Excavations and Structure D-9.

AMS#	Project ID	d13C	F	14C age BP	Calibrated Date	Context
AA92052	KKB-2010-04	-16.9	0.7276 +- 0.0060	2,554 +- 66	825-417 BC	D-9 sub-IIa
AA96420	KKB-282-2011-2	-27.4	0.7374 +- 0.0034	2,447 +- 37	754-408 BC	Ceramics associated with Floor 2
AA96421	KKB-353-2011-3	-28.8	0.7372 +- 0.0034	2,449 +- 37	755-409 BC	Ceramics associated with Floor 2
AA96422	KKB-353-2011-4	-26.9	0.7400 +- 0.0034	2,418 +- 37	750-399 BC	Ceramics associated with Floor 2
AA96423	KKB-353-2011-5	-26.1	0.7357 +- 0.0034	2,466 +- 37	762-414 BC	Ceramics associated with Floor 2
AA100166	KKB-2012-520-2	-26.8	0.7424 +- 0.0048	2,393 +- 52	753-388 BC	In front of platform
AA100168	KKB-2012-438-4	-26.3	0.7308 +- 0.0038	2,520 +- 42	799-511 BC	Below Floor 1

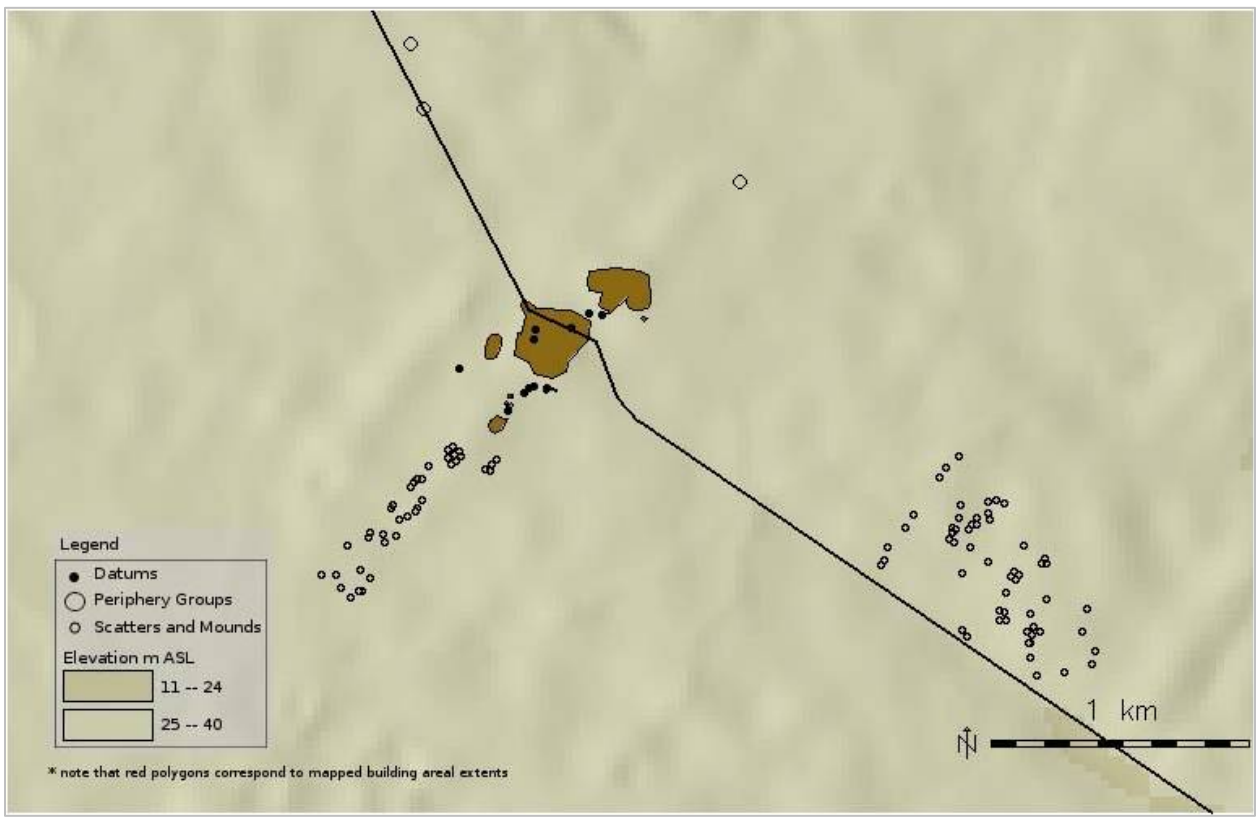

Figure 6. Distribution of Structures in the Settlement Zone.

structures in an area that covered 1.08 square km (Figure 6).

Survey Methodology

The survey team used strategies common in Maya archaeology (see Ashmore 2007:24-36) to document the settlement surrounding Ka'Kabish, using architectural elements (e.g., elevated terrain or mounds with high concentrations of limestone and ceramic materials), as well as the presence of sherd scatters to define sites. The purpose of this survey was multifold; along with identify the chronology and density of structures in the

Table 2. Definition of Types of Settlement.

Designation	Definition
Type 1	Isolated mound less than 2 m high
Type 2	2-4 mounds informally arranged, all less than 2 m high
Type 3	2-4 mounds orthogonally arranged, all less than 2 m high
Type 4	5 or more mounds informally arranged, all less than 2 m high
Type 5	5 or more mounds with at least 2 arranged orthogonally, all less than 2 m high
Type 6	1 or more mounds with at least 1 with a height between 2-5 m
Type 7	2 or more mounds with at least 1 with a height over 5 m

Table 3. Types of Settlement at Ka'Kabish.

Settlement Zone	Unit Type							Total
	1	2	3	4	5	6	7	
South-west Fields	5	2	5	0	1	1	0	14
South-east Fields	20	3	7	1	0	1	0	32
TOTAL	25	5	12	1	1	2	0	46

Table 4. Percentage of Types of Settlement at Ka'Kabish.

Settlement Zone	Unit Type							Total
	1	2	3	4	5	6	7	
South-west Fields	35.7%	14.3%	35.7%	0.0%	7.15%	7.15%	0.0%	100%
South-east Fields	62.5%	9.4%	21.9%	3.1%	0.0%	3.1%	0.0%	100%
TOTAL	54.3%	10.9%	26.1%	2.2%	2.2%	4.3%	0.0%	

settlement zone, these investigations also sought to reveal information about the organization, or distribution, of ancient Maya structures. For comparison purposes, a typology originally employed at Xunantunich by Ashmore and colleagues (1994) was used to record areas of occupation in the settlement zone at Ka'Kabish. This typology defines various forms of settlement based on the composition and orientation of structures (Table 2).

A pedestrian survey strategy was employed, with individuals evenly spaced, walking in stratified patterns across the entire survey zone. The team used a handheld Magellan Explorist 100 Water Resistant Hiking GPS to record each mound and scatter, along with the extent of the survey zone. In the fields to the south-west of the site, surveyors also used a Total Data Station to map mounded structures and the size of the survey zone. Surveyors used sherd scatters to define sites only in specific situations, as some agricultural areas had a prolonged history of use, decreasing the likelihood that architectural elements survived. The transect survey to the south-west was conducted on heavily used agricultural fields that have witnessed repeated modern plowing and bulldozing, over multiple years.

Clearing of the area to the south-east of the site was started by Mennonites from the local

Shipyard community in 2010 and additional jungle clearing occurred only a few months prior to our 2011 and 2012 field seasons. In discussion with the local farmers we discovered that this work not only involved the expected chaining of the forest followed by subsequent burning, but also the manual collection and removal of large stones and debris. This later activity is worthy of note as it has a direct impact on any architectural material displaced by the deforestation activities. The area was ploughed prior to the survey, with plough generally disturbing the area to a depth of roughly 25 cm.

In this newly opened or cleared location, architectural elements were surprisingly well preserved, with large scatters of artefacts accompanying each mounded structure. The survey team determined the size and extent of the survey zone by following the natural boundaries of the agricultural areas under investigation, as permission was required from landowners prior to the survey. Surveyors collected ceramic, lithic, and faunal remains from the surface of noticeable material cultural concentrations and mounded structures. The team collected concentrations containing a minimum of five pieces of material for every 30 cm, as lower quantities were less likely to represent permanent occupation. Material artefact concentrations were visibly marked by flagging each individual artifact prior to collection. This allowed surveyors to visually estimate the density of materials. Collection strategies focused on "visibly diagnostic" artefacts. Ceramic objects identified as 'visibly diagnostic' included neck, rim, appendages, or bases of vessels, or included bichrome, polychrome, or decorated (e.g., incised, stamped) ceramic features that were larger than 5 cm in diameter.

Survey Results

Using Ashmore and colleagues' typology, the most abundant form of settlement was characterized by Types 1, 2 and 3 (Tables 3 and 4). Generally, mounds in the Ka'Kabish settlement areas ranged in height from 1 to 3 meters, although several smaller areas of occupation were recorded with heights less than 1 meter. Also, in keeping with many other settlement studies in the Maya subarea, surveyors noted several larger structures, over the height of 5 meters that were surrounded by clusters of smaller structures. Multiple functions have been attributed to these forms of construction, from elite households surrounded by servants and retainers to buildings serving religious functions; however, without excavations, it is difficult to interpret these forms of settlement.

When comparing these two areas of settlement without indicators of chronology, the density of structures, as well as number of ceramics surface collected, was greater in areas closer to the site core – mirroring the organization of many sites in the Maya subarea. If the number of known structures in the settlement zone is expanded and calculated so as to represent a square km, it is estimated that a total of 169 structures per square km existed in the first survey zone adjacent to the core, while 62 structures per square km were present in the second survey zone further to the east.

For chronological purposes, ceramics from the surface of structures in the settlement zone were collected and compared to existing typologies (Chase 1982; Fry 1987, 1989; Gifford 1976; Graham 1987; Masson and Rosenswig 2005). The dates provided from this analysis were used to recreate the spatial and temporal dynamics of the settlement zone. On a cautionary note, these dates will likely be revised as more data is collected, possibly changing the outcome of this reconstruction. Also, as these ceramics primarily came from surface contexts, it is possible that earlier periods of ancient Maya history are poorly represented.

With this in mind, the earliest evidence of occupation in the settlement zone likely dates to the Late Formative or Early Classic period as indicated by the presence of Sierra Red ceramics. When reconstructing the dynamics of the settlement zone in this area these two periods were presented simultaneously, as Sullivan and Valdez (1996), among others, have argued that the ancient Maya used some forms of Sierra ceramics in later periods of prehistory. This contextual overlap of Late Formative and Early Classic forms also occurs in the site core of Ka'Kabish (Aimers and Haines 2011; Haines

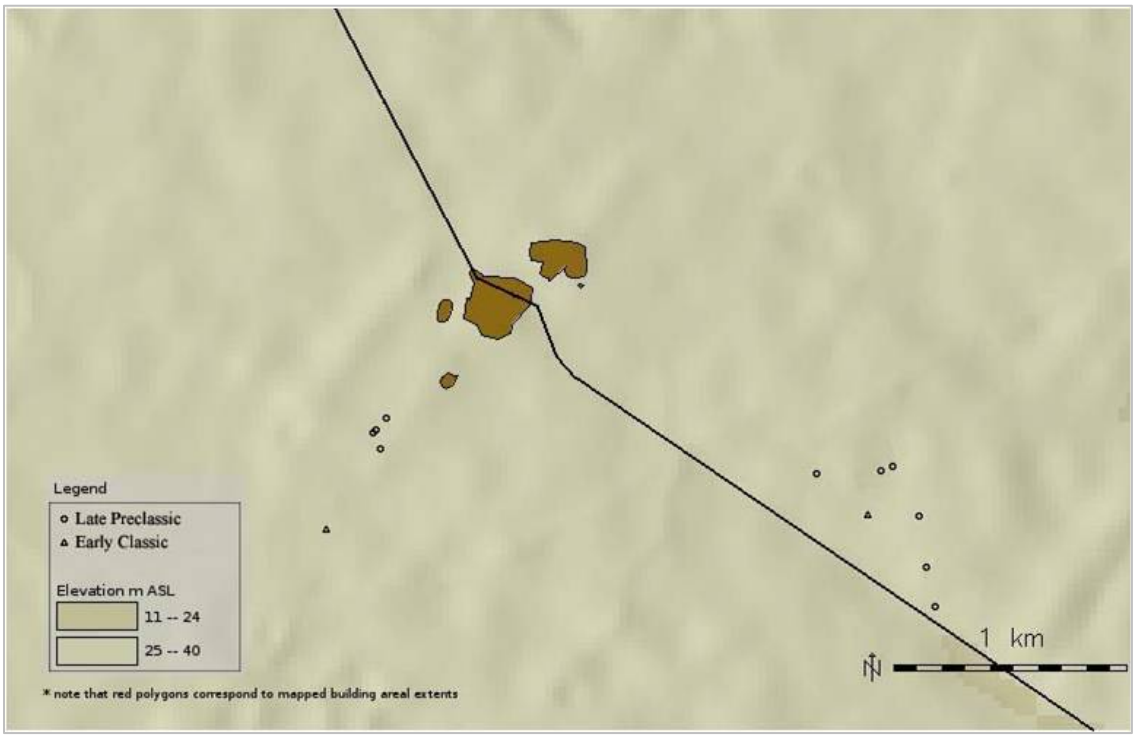

Figure 7. Distribution of Structures during the Late Pre-Classic and Early Classic.

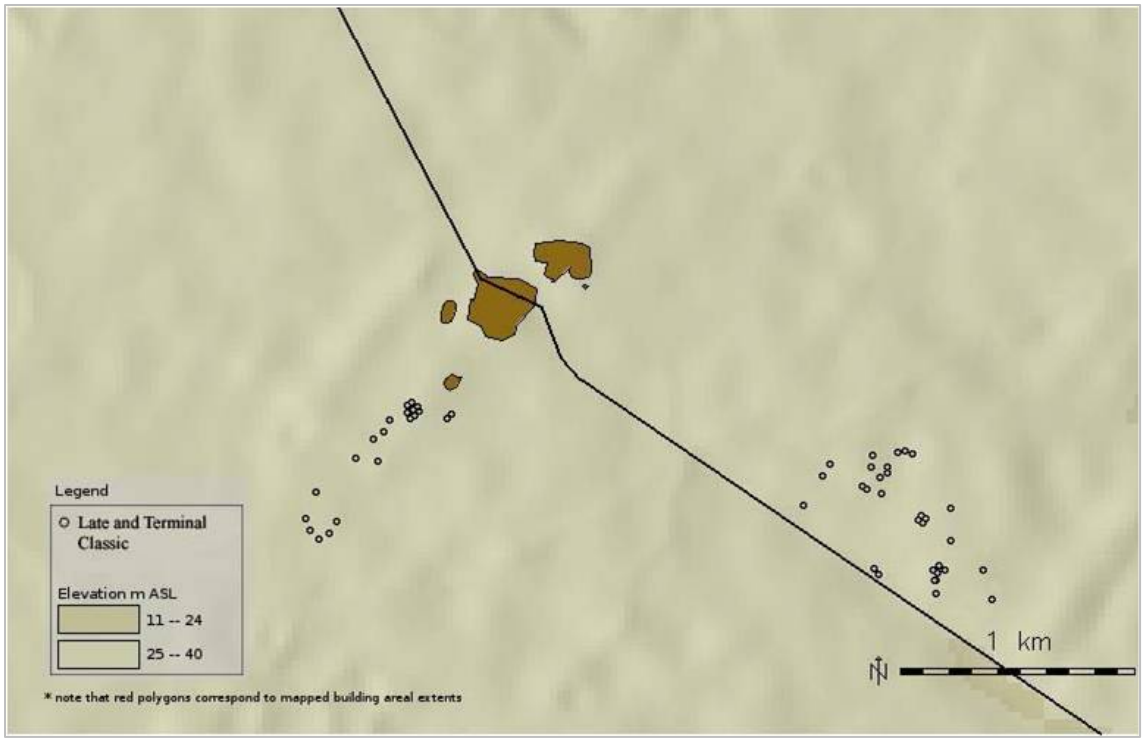

Figure 8. Distribution of Structures during the Late and Terminal Classic.

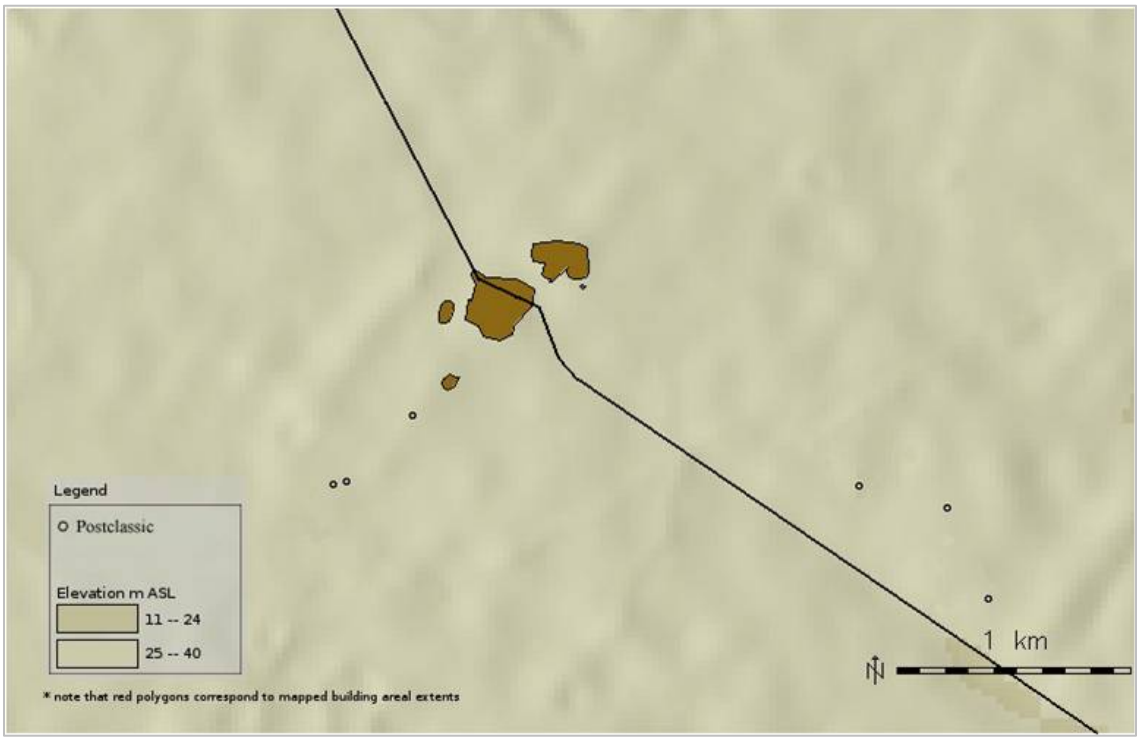

Figure 9. Distribution of Structures during the Post-Classic.

and Aimers 2011). Using this information, archaeologists at Ka'Kabish identified a total of 12 structures that date to these periods (Figure 7). However, the most abundant evidence of occupation in the Ka'Kabish settlement zone comes from the Terminal Classic Period. In total, surveyors found 51 structures that dated to this period (Figure 8).

The most recent materials came from a bulldozed mound in a Mennonite field east of the site. Ceramics collected from this mound included a red-slipped solid conical foot vessel, resembling Rita Red from Santa Rita, and a tripod support that also resembles Rita Red (Aimers and Haines 2011; Haines and Aimers 2011). Other objects from this assemblage included an animal effigy head, a frying pan censer handle from the Navula Unslipped system and an incised unslipped jar rim which resembles proto-historic Yglesias complex ceramics at Lamanai. These ceramic indicators suggest that the settlement zone was occupied from the Middle-to-Late-Post-Classic, possibly until the eve of European contact in the area. In total, surveyors found six structures with evidence of Post-Classic occupation (Figure 9).

In 2012, surveyors identified another 21 structures located 4 km southeast of the site core, towards the ancient Maya site of Lamanai. Although these structures have yet to be fully investigated and incorporated into the Ka'Kabish data set they appear similar to other structures located in the settlement zone. Ceramic analysis dated these constructions to the primarily Terminal Classic Period (Aimers pers. comm; Sagebiel pers. comm).

Chronology of the Greater Ka'Kabish Area

Based on the combined evidence from the site core and the two settlement areas investigated it is clear that the greater Ka'Kabish area had a long history of occupation. Settlement in the area appears to have started in or around Group D during the Middle Formative period and flourished during the succeeding Late Formative period. It appears that both of the main temples (Structures D-4 and D-9) were initiated during this period, and that Structure D-9 went through several remodeling episodes during this time and the subsequent Early Classic period.

Thus far, surveyors have yet to identify any materials that date to the Middle Formative period in the settlement zone, although future excavations in areas surrounding the site may yield earlier dates. Currently, the earliest evidence of occupation from the settlement zone dates the Late Formative and Early Classic Periods. This is not unsurprising as this corresponds to a period of intensive construction in the site core with several structures showing architectural phases dated to these periods. Both the monumental centre and the settlement areas appear to have flourished during the Early and Late Classic periods although there currently is some indication that there may have been a hiatus in construction at Ka'Kabish during the early part of the Late Classic period. This contrasts with Lamanai where Pendergast (1981) noted that during the Late Classic Period Lamanai had a very active architectural construction episode.

During the Terminal Classic period the site underwent various changes, with construction episodes and other activity at several locations occurring in the site core. In the settlement zone, the size of the community seemingly expands, as the density of structures greatly increases. Perhaps, as Tremain (2012) suggested, the site experienced a large growth of population sometime between the Late Classic and Terminal Classic, as attested by the number of structures in the periphery, and the periods of construction in the site core.

Unlike the settlement area, occupation in the monumental core zone does not last into the Post-Classic period. Construction in the core area appears to cease at the end of the Terminal Classic period. Occupation in the settlement zone persists throughout the Post-Classic area. Those areas closest to the site, however, appear to date only to the early part of the Post-Classic period, while areas future to the south-east are occupied into the Late Post-Classic and possibly early Contact periods.

The later occupation of this latter area may be linked to the settlement history of Lamanai which persisted through the Post-Classic and into the Contact period (Graham 2011; Pendergast 1981, 1985, 1986). Previously, residential structures were identified along this same trajectory toward Lamanai approximately 6 km from Ka'Kabish (Haines and Patterson 2008; Patterson 2007; see also Baker 1995). Additionally, a small site or plazuela group called Cocochan, consisting of seven structures (five of which were identified as "major temple structures" [Baker 1995:111]) was identified roughly 5.5 km south-east of Ka'Kabish (Baker 1995:111-113, Figure 43). These findings suggest that the area between Ka'Kabish and Lamanai was continuously occupied and that it is possible that the inhabitants of the inter-site zone turned to Lamanai to provide them with ritual, political, and economic foci during the Post-Classic period.

Conclusions

Work at Ka'Kabish has revealed the site enjoyed a longer history of occupation than initially thought, both in the monumental centre and in the surrounding periphery areas. Like many ancient Maya cities, the monumental centre appears to have been abandoned long before the settlement zone, indicating that commoner populations persisted in the area after the collapse of the political centre. The close geographic location of Ka'Kabish to Lamanai, coupled with the longevity of the later site and evidence suggesting that settlement areas closer to Lamanai were occupied even longer than those around Ka'Kabish suggests that populations from Ka'Kabish may have moved closer to Lamanai to take advantage of its' Post-Classic economic prosperity.

Clearly more work is required to understand how, and if, the populations of Ka'Kabish and Lamanai interacted. One area where more study is undoubtedly warranted and planned is along the survey transect between Ka'Kabish and Lamanai. Using the road as a guide for the initial part of the survey radiating out from Ka'Kabish, surveyors will use the cleared agricultural fields on the north side to map evidence of occupation using the pedestrian survey discussed above and used previously. As not all the area between the two sites has been cleared, in areas of dense jungle 100 m lines will be cut perpendicular to the main transect and test pits will be excavated at 10 m intervals to identify possible areas of occupation. Where the Ka'Kabish-Lamanai road intersects with the

Shipyard-Indian Creek road, the surveyors will continue in a direct line south-east to Lamanai, cutting transects as necessary. It is believed that this research, as with continued exploration and excavation of the core area of Ka'Kabish will help us better understand the relationship between Lamanai and Ka'Kabish, while also providing a window into the distribution and density of settlement surrounding these two cities.

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19 THE SITE OF DOS HOMBRES AND NEARBY HINTERLAND HOUSEHOLDS: A MULTISCALE PERSPECTIVE OF PREVIOUS AND ONGOING INVESTIGATIONS

Rissa Trachman

Ongoing investigations at the site of Dos Hombres are being conducted towards a multiscale analysis of social organization. Earlier investigations in the hinterlands of Dos Hombres have revealed much about household and community organization there based on architectural, material culture, and water management feature remains. Evidence in the civic ceremonial center of Dos Hombres is being gathered towards a greater understanding of its role economically in the region, its occupation history, and socio-political organization. The goal is to articulate these two sets of data in order to have a holistic understanding of the ancient Maya at Dos Hombres and northwestern Belize. The current investigations at Dos Hombres are focused in the northern plaza, a very public space that could be assumed to have been a place of commerce and public ritual. Architectural data support this conclusion along with material data though it will take several more seasons of work to add depth to the socio-economic and political organization at the site of Dos Hombres. Preliminarily these ongoing investigations at the site of Dos Hombres combined with previous research reveal the possibility of a heterogeneous set of concerns toward economic organization that are dependent on chronological and social context.

Introduction

The site of Dos Hombres, located in northwestern Belize (Figure 1), is a medium sized ancient Maya site with a robust settlement in its hinterlands. The site of Dos Hombres is located just below the Rio Bravo Escarpment, east of the Rio Bravo, within the Rio Bravo Embayment (Brokaw and Mallory 1993). Ancient settlement in the area extends in each direction past the limits of the Dos Hombres site proper and to the west much settlement is located on the face of the Rio Bravo Escarpment itself (Lohse 2001; Trachman 2003; Walling et al 2005; Walling et al 2006).

The previous investigations in the hinterlands have been in the form of household archaeology conducted towards a microscale analysis of household organization (Trachman 2006, 2007, 2009 and 2010a; Trachman et al. 2011; Trachman and Valdez 2006) and macroscale studies of settlement patterns (Hageman and Lohse 2003; Lohse 2001). Trade of material culture both in the site proper and in the nearby households is evidenced through obsidian, shell, and ceramics. Hinterland household occupations from the Late Preclassic through the Late to Terminal Classic may indicate much about the ways in which households negotiated their material world, access to goods, and its fluidity related to both social status and chronology. Investigations are continuing in the Dos Hombres hinterlands and

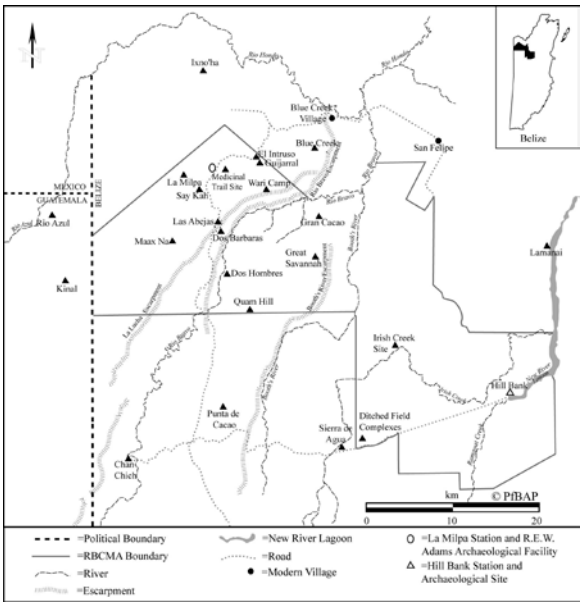

Figure 1. Map of the RBCMA with Dos Hombres noted (©PfBAP, map compiled by Rissa Trachman).

are focused on the management of resources across the landscape such as water in addition to expanding the sample of household data.

The Dos Hombres site center (Figure 2) was initially investigated in the early 1990's (Houk 1996). Houk's endeavored to establish the first chronology of the site and to analyze the layout of the site comparing the site's layout and size to other contemporaneous sites in the region. In order to do this the site had to be mapped and he did so by tape and compass. Houk found that the site was similar in layout to

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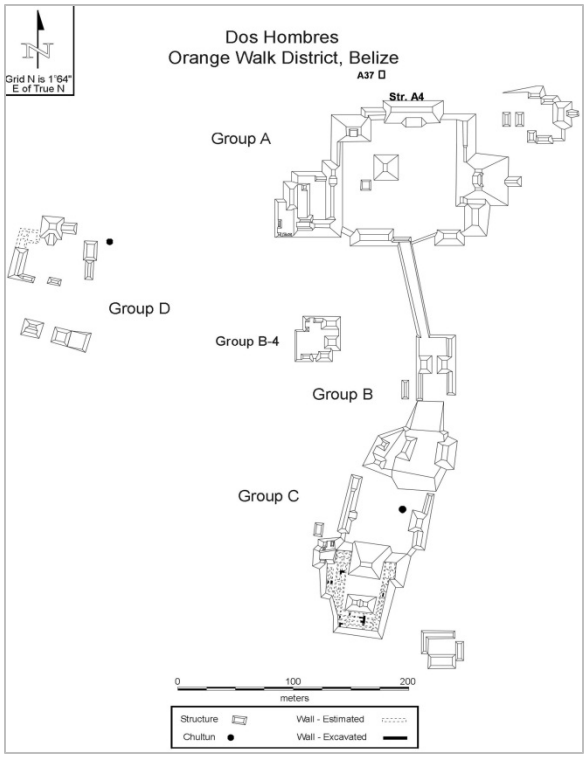

Figure 2. Map of Dos Hombres (after Houk 1996; Lohse 1999; © PfBAP).

other major sites in the area such as La Milpa and proposed the possibility that many of the sites in the Petén were laid out according to Maya cosmology.

Three other investigations were carried out in specific groups associated with the Dos Hombres center. Brown (1995) conducted excavations into the A-2 courtyard group located adjacent to Plaza A and determined this to be a residential group. Subsequently, Durst (1998) initiated an investigation of an elite residential courtyard group, Group B-4 (Figure 2), just west of the ballcourt. The excavations revealed the first documentation of Early Classic (A.D. 250–600) occupation in the Dos Hombres civic ceremonial center. Durst's (1998 a, 1998 b) excavations were focused on Structure B-16. While excavating the fill from inside the room of this Early Classic structure, a patch was encountered in the plaster floor. Further investigation of the patch led to the discovery of an Early Classic tomb with a lens of obsidian artifacts (see Trachman 1999a; 1999b; 2002).

In the spring of 2001, Mary Jo Galindo led excavations in Plaza A of Dos Hombres opening a set of units on Structure A-4 and one plaza floor unit. Investigations in Group D by were conducted by Aylesworth (2005; see also Lohse 1999) (Figure 2). Aylesworth's (2005) investigation established the chronological sequence for the hilltop group as well as assessing much of the architecture.

The current project which I am leading is an ongoing project begun from a pilot season in 2009. The research is focused in the Dos Hombres center and dubbed the Dos Hombres Archaeological Project (DHAP) (see Trachman 2010b; Trachman and Canterbury n.d.; Trachman and MacDonald n.d.). The Research Goals for the current site center investigations are: 1) to refine the chronology of the site; 2) to determine the economic organization of the site and test Scarborough and Valdez' (2003) "resource specialized community" model in a city/state context; 3) to elucidate the ancient city's socio-political organization and its boundaries of ideological and economic influence; and 4) place the site in regional context socially, politically, and economically. To these ends the DHAP began with excavations in Plaza A of Dos Hombres (Figure 2).

This paper will address what is known to date about Dos Hombres and the economic production and consumption in and around the site, taking holistically the data from both hinterland and civic ceremonial center contexts. Preliminarily the multiscale analysis of these suggests variation in approaches by the ancient Maya through time and between contexts.

Dos Hombres Culture History

Chronologically what we know thus far about the occupation history of Dos Hombres stems from Houk's (1996) previous investigations along with the current DHAP project efforts (Trachman 2010 b; Trachman and Canterbury n.d.; Trachman and MacDonald n.d.). The site was occupied from the Middle Preclassic (±800–600 B.C.) to the Terminal Classic (A.D. 800/850–900) with only visitations to the site in the Postclassic as evidenced by a surface find by Galindo. After the initial settlement in the Middle Preclassic, the population grew enough in the early part of the Late Preclassic (400 B.C.–A.D. 100) to form a village positioned in the northern portion of the

site (Houk 1996). Houk (1996) also suggests that there was a slight population decline at the end of the Late Preclassic and stayed low during the Early Classic (A.D. 250–600). Two temples, C-2 and C-3 were built in the Early Classic (Houk 1996) as well as the B-4 Group, an elite residential group just west of the ballcourt (Durst 1998), and there was a significant Early Classic occupation documented in Group D (Aylesworth 2005) (Figure 2).

Major construction was obvious at the site at the beginning of the Late Classic (Tepeu 1, A.D. 600–700) with a major expansion of Plaza A, with subsequent construction projects in Groups B and C, as well as the construction of the ballcourt (Houk 1996). Group D also underwent an expansion in the Late to Terminal Classic (Tepeu 2-3, A.D. 700–900) as exemplified by the very large structure D-1 (Aylesworth 2005) (Figure 2). In addition to expansions in the civic ceremonial center, there appears to have been a significant population growth in the settlement areas as most of these residences date to the Late to Terminal Classic (Tepeu 1-3, A.D. 600–900) (Lohse 2001; Robichaux 1995).

It was in the Terminal Classic that the site core of Dos Hombres was abandoned as signified by the termination of the Acropolis, Group C, by sealing the entryway to the upper platform, along with scattered occurrences of smashed vessels (Houk 1996). The Postclassic material at the site is very limited and indicates only pilgrimages or visitations (Houk 1996).

While there is little evidence for fortification in the form of defensible features, walls or moats, Lohse (1999) has suggested that the location of Group D on the hilltop would have been a defensible vantage. There is only one water management feature in the site core, specifically a reservoir just to the south of Group C. Architecturally, Dos Hombres has typical construction for the terminal occupation phase (Tepeu 2-3), vaulted structures, as well as some with perishable roofs, red plaster on both interior and exterior of walls, and dry laid construction fill (Houk 1996; Trachman 2010b; Trachman and Canterbury n.d.; Trachman and MacDonald n.d.). These architectural elements were combined to create complexes of range and temple structures intermingled with elite residences and the elaborate Acropolis configuration of the southern group (Houk 1996; see also Trachman 2010b) (Figure 2).

Dos Hombres Early Classic Household

In 1997 Durst (1998a, 1998b) excavated the B-4 Group in the Dos Hombres site center 75 meters west of the ballcourt (Figure 2). Both Structure B-12 and B-16 were excavated revealing domestic debris such as the granite mano and metate found outside of the western wall of B-16. Structure B-16 had red painted masonry architecture. The walls were formed by a single thickness of cut stone spanning a height of approximately 1.5 meters and stuccoed. Inside Structure B-16 the very well preserved plaster floor was painted red (Durst 1998b). Since the floor was so well preserved, a patch was apparent and excavation of it was pursued by the excavators.

Beneath the patch in the plaster floor of Structure B-16 were several layers of stratigraphy which included a layer of obsidian artifacts. The total number of obsidian artifacts was 21,730 beneath the patch (Trachman 2002). The collection of obsidian artifacts included percussion cores, exhausted pressure cores, first and second series blades, core rejuvenation flakes, second series blades and an assortment of flakes. Preliminary sourcing of this assortment of production debris revealed predominantly El Chayal obsidian.

Below the lens of obsidian artifacts and more construction fill a tomb was encountered. Durst (1998b) reported numerous artifacts accompanied the individual buried in the tomb including ten Early Classic vessels, at least 8 spondilys shells, two greentone ear spools, obsidian blades, cores and debitage, hematite fragments and a spherical ball. The Structure B-16 architecture was also consistent with the Early Classic along with the presence of a few green obsidian blade fragments, obviously from the Pachuca source located in central Mexico, that were encountered in the excavation of the exterior of the structure and the entryway. The Pachuca obsidian third series blades were likely imported as finished products.

The El Chayal obsidian appears to have been transported to Dos Hombres as percussion cores and production completed locally.

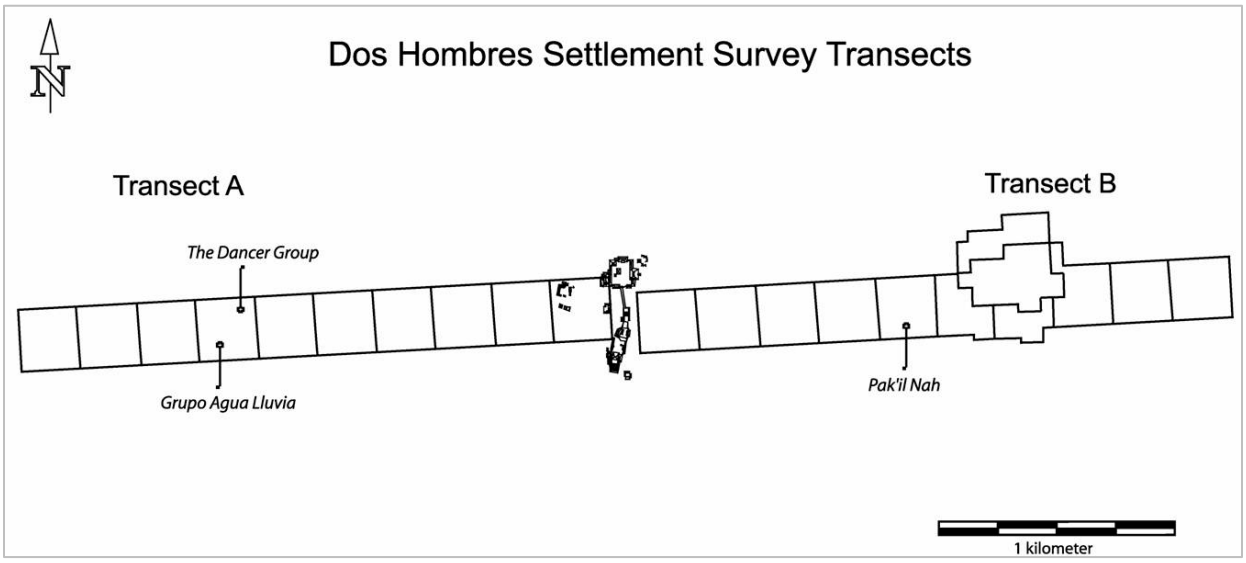

Figure 3. Map of East and West Transects with hinterland households noted (after Lohse 2001, figure 5.1).

Macrocore stage II cores were made into two cores using pecked initiations (Trachman and Titmus 2003). The overwhelming evidence for local production and the presence of the obsidian production debris above the tomb and inside suggests that either the production of obsidian blades or the procurement of the resource was likely very important to the person buried in the tomb.

Dos Hombres Plaza A Architecture

Ongoing excavations of Structure 4 in the large open Plaza A of Dos Hombres (Figure 2) have revealed architectural elements that may indicate the exchange of ideas in an architectural format. Structure A-4 has been the focus for the past two seasons. It is extremely well preserved and faces the center of the plaza. The architectural style of the outset stairway of Structure A-4 is comparable and contemporaneous to that found in recent excavations of Structure 4 in the northern plaza at La Milpa indicating the possibility of an eastern Petén regional architectural style.

The orientation of the Structure 4 at La Milpa is towards the open alley way of the primary ballcourt in the plaza. Its staircase has a rise and run similar to stadium style seating. The staircase may have served as a viewing stand for the ballgame at La Milpa. At Dos Hombres the stairway has the same proportions of rise and run as at La Milpa and also similar to stadium style seating. Structure A-4 at Dos Hombres faces the open space in front of Temple A-1 (Figure 2). This outset stairway may have served as a viewing stand of sorts for public ritual or other activity taking place on or in front of Temple A-1.

Hinterland Households

A settlement pattern survey was conducted in the late 1990's by Lohse (2001), who placed two 2500 m long transects to the east and west of the Dos Hombres center. Once these two transects were laid out, archaeological survey, testing, and environmental assessment was carried out by Lohse's team (2001). Survey was also conducted just to the north of the site (Hageman and Lohse 2003). I (see Trachman 2007) conducted a microscale investigation of household organization excavating three households within the east and west transects (Figure3) as a sample of households within the Dos Hombres hinterlands.

Pak'il Nah

The first of the households, Pak'il Nah, is located just over 1 km east of the Dos Hombres center at the transitional margin of a bajo that spans the distance between the two. In general Pak'il Nah was occupied during the Tepeu 2-3 phase of the Late to Terminal Classic Period,

A.D. 700–900. Material culture excavated at Pak'il Nah included ceramics with pastes that likely originated from an area around 25 km southeast of Dos Hombres and a fragment of a cylinder vase with one remnant hieroglyph visible in the decoration. Also, included in the artifact assemblage were stone tools, but a predominance of utilized flakes as is often the case with domestic deposits. No greenstone or shell artifacts were recovered at the household.

Pak'il Nah is a plazuela group with three cobble platforms, likely supporting perishable structures, and one masonry vaulted structure (Figure 4). The cobble platforms at Pak'il Nah were actually very similar to many Late to Terminal Classic examples that have been found across northwest Belize with somewhat informal cobble construction. Structure 1, however, is a single roomed rectangular structure oriented east-west and situated on the southern portion of its rectangular platform. The structure has a north facing doorway and walls of cut stone masonry approximately one meter thick. Masonry vaulted structures such as this are somewhat uncommon amongst domestic groups in the Dos Hombres hinterland (see Aylesworth 2005, Houk 1996, Lohse 2001, Robichaux 1995, Walling et al 2005; Walling et al 2006).

Structure 1 was covered with what initially appeared to be collapse debris but as the excavations progressed it became clear that the fill inside and covering the building was not completely the result of collapse. The interior room fill consisted of a high quantity of loose limestone marl, tan in color, which was mixed with cobble and large stones. The same loose marl and cobble fill was also covering the exterior of the structure and was overlying the platform as well. The presence of vault stones in the fill inside the room of the structure indicated the likelihood that the structure had a corbel vaulted ceiling.

Prior to excavating the loose fill inside the room of Structure 1, at the east end, an unusual deposit was encountered in the entryway. The fill was very dense in the doorway opening and directly back from it, inside the room, almost all the way to the south or back wall of the structure. It was a different texture of fill than any inside the room or covering the structure. Though similar in composition to the wall core,

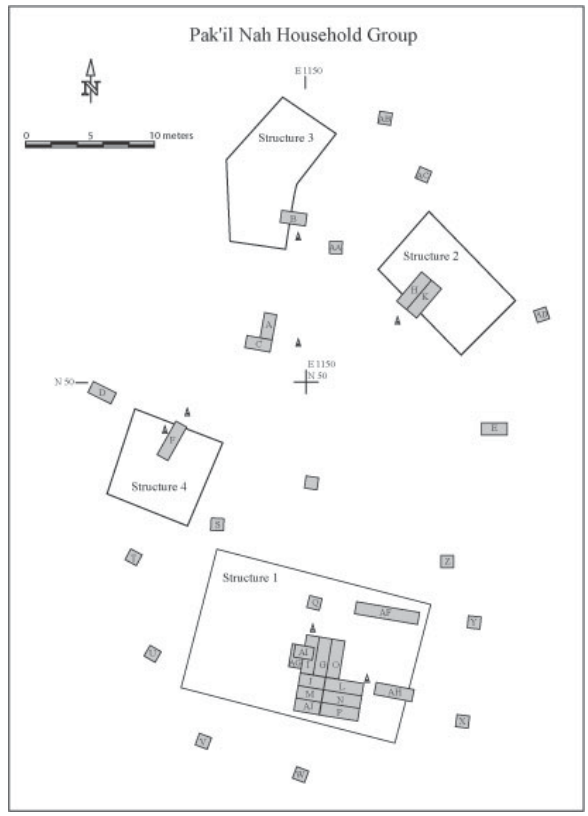

Figure 4. Pak'il Nah household group (illustration by author; © PfBAP).

plaster, cobble, and gravel, it was white and clearly wet laid. It was also compact, dense, hardened, and very difficult to remove.

Another deposit was discovered inside the structure, specifically within the loose marl fill of the eastern portion of the room. Just 20 cm above the plaster floor the loose marl fill turned grey and it became clear that a burning episode had taken place inside the structure. A discrete deposit of charcoal was uncovered in the center of the eastern portion of the room along with a brown, possibly organic, stain in the soil adjacent to and east of it. More than 637 g of charcoal was collected. A red pigment or ochre was also uncovered at the same level adjacent to and south of the charcoal concentration. The red pigment was spread across an area of approximately 1 x 2 m reaching the south structure wall. Evidence for burning was also present in a discoloration from scorching on the interior stucco of the north wall and part of the east wall. The burning appeared to have been localized to a small discrete area this east end of the room.

Altogether, these deposits indicate an important ritual activity. The deposits of plaster/wet fill in the entryway may be a symbolic deposit representing the sealing off of the doorway or structure related to terminating it. Other deposits like this have sometimes been found in different forms, such as filling the doorway with trash, in terminated structures (see Inomata et al 2002). The loose fill present both inside the room and over the exterior, including on top of the platform of the structure are all the same color texture and composition and likely represents an intentional burying of the structure. The fill laid over the platform was so significant as to have skewed completely the morphology of the mound. Prior to excavation the mound appeared U-shaped. Subsequent to excavations and the discovery of the very intentional burial of the structure it was clear that the basal platform was rectangular and very low while the structure was rectangular and not U-shaped at all.

Dancer Group

The two remaining households (of the three in the sample) are situated on the face of the Rio Bravo Escarpment. The first of these, the Dancer Group household (Figure 5), is located on a residential terrace approximately 1.5 km west of the Dos Hombres site center. One of the smaller household groups in the immediate area of settlement, the Dancer Group was occupied primarily during two different time periods, the Tepeu 2-3 phase (A.D. 700–900) of the Late to Terminal Classic Period with an earlier occupation during the Chicanel phase (400 B.C.–A.D. 250) of the Late Preclassic.

The Dancer Group household is the humblest of the three households in this sample. It is comprised by an L-shaped platform courtyard group. The Late to Terminal Classic platform supports two small structures with low stone wall foundations, with perishable walls and roofs. The terminal phase platform is a typical informal cobble construction. I did identify, however, an earlier architectural component in the construction sequence as evidenced by a buried remnant substructure below Structure 2, and corroborated by stratigraphic chronology.

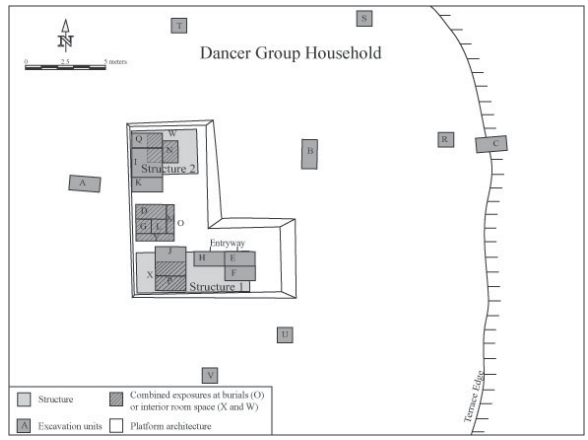

Figure 5. The Dancer Group household (illustration by author; © PfBAP).

The chronological sequence at the Dancer Group was also mirrored in the sequence of three sets of multiple burials (or episodes) located under the basal L-shaped platform in the construction fill between the two terminal phase structures. One of these episodes of multiple burials is clearly Tepeu 2-3, while the other two burial episodes, the deepest in stratigraphic sequence, date to the Chicanel phase of the Late Preclassic.

The total number of people represented in the three multiple burial sets or episodes is 13, with a possible 14th individual (see Trachman 2007). The individuals buried were both adults and children who ranged in age from as young as 2-4 years to as old as 20-34 years. A number of grave goods were distributed through the three episodes, including eight whole vessels, an engraved shell "dancer," a bivalve pendant, seven shell tinklers, four greenstone beads, three shell disc beads, and a large chert anvil.

Burial episode 1 is from the Late Classic, dating to the Tepeu 2-3 phase, with two whole vessels associated with it (Sullivan 2003). Skeletal data show that episode 1 has a minimum number of individuals (MNI) of four, classified as: one young adult (possible female), two other adults with no teeth recovered, therefore age was unassigned, and one child approximately 12 years in age (± 2 ½ years).

In addition to the two whole vessels an anthropomorphic engraved shell ornament engraved was recovered. It is likely that the shell ornament was either sewn or strung so that the depicted person's head was upright. Drill

holes were positioned such that hanging the ornament like a pendant would have been awkward and difficult to position upright. It is possible that the anthropomorphic shell ornament was sewn to a piece of cloth, clothing, or blanket.

Two whole vessels were found in association with episode 2 dating to the Chicanel phase in the Late Preclassic (Sullivan 2003). An MNI of three was determined for episode 2, two of which are young adults, and one is a young/middle adult (Saul and Saul 2003). Four greenstone beads were found in association with cranial fragments and the mandible of one of these adults. In addition, a discrete cluster of freshwater mussels *Nephronais* were recovered from this burial.

Episode 3 also dates to the Chicanel phase with four whole vessels recovered (Sullivan 2003), two of these were nested. Episode 3 has the highest MNI with six individuals, consisting of two young adults and four children. One child died at age 2-4, two at age 3-4, and one at age 5-7 (Saul and Saul 2003). A high proportion of grave goods were recovered in episode 3, likely related to the greater number of people interred. These include one greenstone bead and an array of marine shell artifacts: three small shell disc beads, one irregular shell bead, seven tinklers, a small bivalve (pelecypod) with a drilled hole, a univalve (gastropod) relatively unmodified, and finally a larger bivalve (pelecypod) with at least two holes. The larger bivalve is likely of the genus *Spondylus* and has a natural red band present around its rim. There are at least two drill holes discernable and two engraved lines on the inside of the shell rim (ventral side). The position of the drill holes and engraved marks indicate the likelihood that it did hang as a pendant.

Grupo Agua Lluvia

The third of the three households, Grupo Agua Lluvia (Figure 6), is located approximately 1.7 km west of the site center, situated on a partially modified knoll extending from the face of the Rio Bravo Escarpment. The evidence for construction sequence indicates that this was a household that grew over time architecturally, occupied as early as the Tepeu 1-2 phase (A.D.

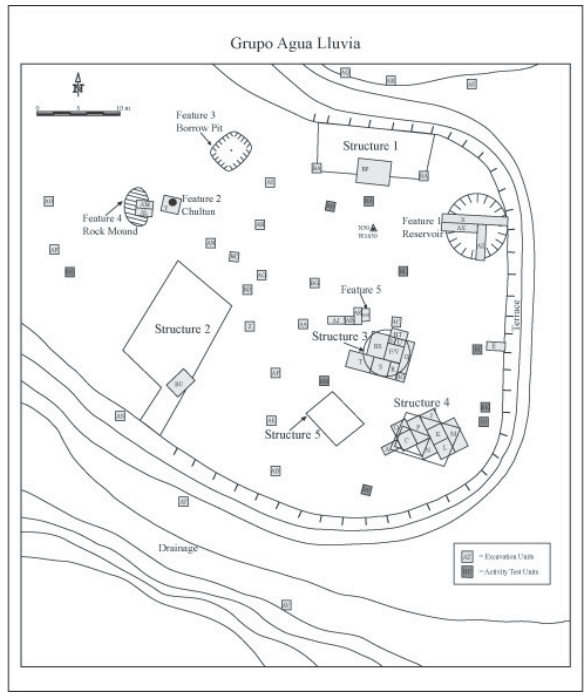

Figure 6. Grupo Agua Lluvia household (illustration by author; © PfBAP).

600-800/850) until its abandonment during the Tepeu 2-3 phase (A.D. 700-900).

The plazuela group is comprised of two linear platforms and three small structures around a central open plaza space. Structure 4, a small structure with walls that were partially of stone, was supported by a rectangular basal platform. Structure 3, a Late Classic round structure, had formally constructed walls supported by a round basal platform. Structure 3 also represents the earliest construction efforts at this household as evidenced by the buried plaza floor adjacent and attached to its exterior. Structures 1 and 2 were likely the final construction efforts. Structure 2 is actually an unfinished or partial platform. Some important subsurface features were also investigated at the Grupo Agua Lluvia household, including a possible borrow pit, a chultun, and a domestic water reservoir.

In terms of ritual at the Agua Lluvia household, two types of ritual were present in the excavations, dedication and mortuary. Starting with the mortuary data, a total of one secondary and two primary burials were encountered at the Agua Lluvia household. Burial 1 was discovered under the floor in the

western portion of the interior of Structure 4, inside a cist. Since there were no grave goods accompanying the individual in Burial 1, the chronology for it is based on the ceramic sherds in the subfloor fill deposits surrounding the burial. The burial dates Tepeu 2-3 (A. D. 700–900), though there were earlier sherds also mixed in. The individual in Burial 1 was tightly flexed with head South and hips North lying on left side facing west (Saul and Saul 2003).

Burial 2 was also located below the floor of Structure 4. Burial 2 was found below the interior floor of Structure 4 in the easternmost portion of the unit exposing both burials 1 and 2. As such, the chronological assessment is very similar to Burial 1, however there was no cist present for this burial nor any grave goods. It was a primary burial, flexed and lying on her back with head west and hips east (Saul and Saul 2003). The burial was poorly preserved and therefore fragmentary with fragments of cranium and long bones represented.

Burial 3 was a primary cist burial found in the subfloor deposits of Structure 3. The cist had been formed much like that in Burial 1 with large flat stones standing on end oriented vertically for a single course forming the perimeter of the cist except the area around the skull. The cist had a very large capstone on top covering primarily the skull of the individual with three stones placed around the perimeter of the head that were not flat or on end, but rectangular. Again, no grave goods were found in the cist or associated, although a dedication cache was documented under the doorway in close proximity.

The dedication cache of water jars dating Tepeu 1-2 (A. D. 600–800/850) indicates that Structure 3 dates earlier than the rest of the structures in the Agua Lluvia household group. The burial however dates later as indicated by the only other ceramic material located in this exposure which was in the cist itself and the fill directly above it, dating Tepeu 2-3 (A. D. 700–900). This was the result of an intrusion detectable in the stratigraphy. Both the stratigraphy and the ceramic material indicate that the floor was penetrated well after the structure was built in order to place this primary cist burial.

The person in the Burial 3 cist was biologically sexed as a definite female based on pelvic and cranial morphology corroborated by long bone measurements and density (Saul and Saul 2003). She was a middle adult, 35-50 years of age at the time of her death, assessed on the basis of antemortem tooth loss combined with atrophy and resorption of the mandibular bone (Saul and Saul 2003). She was tightly flexed, perhaps bundled, prior to interment. With her head to the south and hips to the north, she faced west positioned on her left side (Saul and Saul 2003). I believe that the use life or function of Structure 3 changed over time from the original domestic structure to a shrine with the placement of the burial.

Non-mortuary ritual at Grupo Agua Lluvia consisted of two caches. First, the cache already mentioned found inside the doorway and under the floor of Structure3 consisted of two water jars. Both vessels that formed the cache had long since collapsed in place. They were excavated in fragments, but were clearly were reconstructable striated water jars dating Tepeu 1-2 (A. D. 600–800/850). No artifacts were found inside or otherwise associated with the two jars, although it does not preclude the possibility that they were originally filled with organic or perishable items as offerings.

The other cache was found in association with the small domestic reservoir. It was positioned in the “entryway” or more specifically the lowest point of altitude on the reservoir rim along the portion of the rim that adjoins the plaza floor (note: the actual lowest point of the rim opposes this point, but does not adjoin the plaza floor). I had originally proposed that rainwater running across the plaza would enter the reservoir at this point. The cache was located immediately below the plaza adjoining low rim point or “entryway” and was comprised of an incomplete Tepeu 2-3 red slipped plate that was overturned and lying on the bedrock embedded in the plaster of the reservoir lining. Enough plaster had eroded off of the plate to expose it such that it was detected without penetrating the plaster. No other artifacts were found near it or under it. I previously posited a symbolic connection between Structure 3 and the reservoir based on these data presented here. The new data

resulting from my Summer 2009 investigations may make this connection take on a slightly new configuration and more significant symbolism.

Recently I documented a system of interconnected reservoirs and canals originating from the "Agua Lluvia" group cascading down slope and away from it. Two large reservoirs with a small reservoir in between empty into a 35 m canal at the bottom which once carried water horizontally along the face of the escarpment. The canal which is connected to these was not the canal I had anticipated documenting, but is some 15 meters down slope of it and approximately 60 m in length. Both canals run perpendicular to the face of the escarpment and it is as yet unclear as to the origin of now designated Canal 2. I am hypothesizing that the system of three reservoirs leading to Canal 1 and originating from the reservoir originally documented at the "Agua Lluvia" household was actually spring fed (which may require a new name for the household group). There is a large natural ravine that would have provided drainage in the rainy season for the area. So water removal would seem unlikely. There are several terraces on this part of the escarpment which at first glance seem to be residential, however, the number of terraces far outnumber the instances of occupation.

Conclusions

There are several elements at the Pak'il Nah household that I believe demonstrate its connectedness to the Dos Hombres social and political sphere. First the architecture exhibited at Structure 1, evidence for a vaulted ceiling, is unusual for a household in this particular area. The same structure, even more incriminating, was terminated. The ritual termination of a structure is usually reserved for structures in site centers, some of which are domestic, but elite certainly (Freidel et al 1998, Garber et al 1998, Mock 1998, Walker 1998).

Ceramics of interest at Pak'il Nah are the tradewares. The clays or ceramics imported from the Irish Creek Marsh area are not matched at the Dos Hombres site center, but they do indicate that there was an ability held at Pak'il Nah to extend its economic interaction further distances geographically. The ability to do so may be an indication of a "rural elite" presence at Pak'il Nah. In this case, it may have been an extension of the Dos Hombres central political authority. Also of note is the observation that only two occurrences of hieroglyphs have been found to date in or around Dos Hombres. Both were painted on ceramics in similar styles and timing. One was found at Pak'il Nah and one was found in the Dos Hombres center.

The Dancer Group, a very humble household having two phases of occupation, clearly had much greater access to trade goods in the Late Preclassic as evidenced in the corresponding phase of burials comparatively to the Late/Terminal Classic phase of occupation and burials there. The Dancer Group is a great example for diachronic assessment. It may well be that these goods were more available to the local population as a whole than in the Late/Terminal Classic.

Grupo Agua Lluvia, primarily occupied during the Late/Terminal Classic, Tepeu 1 to Tepeu 2-3 was a larger and likely more powerful group of ancient Maya than those occupying the Dancer Group. Grupo Agua Lluvia, did have shell beads and may have even produced or perforated their own after receiving the blank beads from coastal areas. The people of Agua Lluvia though had something of more local value, water. An upland spring located inside the perimeter of this household fed a water system built by the ancient Maya of this community. The system of reservoirs and canals had to be maintained and cleaned regularly. Since the capacity of the system was far greater than 10,000 gallons, maybe even twice this volume, and the trajectory of the canals that they gravity fed is parallel to the face of the escarpment over a distance that connected several households, the water management system provided spring water to a number of households and their occupants. It is likely that these other beneficiaries of the spring water traded their labor to maintain the canals and reservoirs to those at Grupo Agua Lluvia in return.

The B-4 Group household, the Early Classic household near the ballcourt and center of Dos Hombres, had a different set of economic relationships still. Apparently the tomb collection of obsidian production debris was

very important to the individual buried in the tomb. That person may even have been responsible for either trading in the material and/or completing the pressure portion of the production process as indicated by the typology of the obsidian artifacts. Therefore in the Early Classic at Dos Hombres, obsidian from the Guatemala highlands was very much accessible and the members of the B-4 household group had an economic relationship with sites near those sources either directly or via Tikal.

The data set from Dos Hombres reveals a regional connectedness economically to the Petén from the Late Preclassic through the Terminal Classic region. Ongoing investigations will continue to reveal the nature of these relationships both synchronically and diachronically for both the occupants of the site center and its hinterland households. Thus far these data suggest a heterogeneous set of economic strategies from hinterland to center and Late Preclassic to Terminal Classic.

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20 DECIPHERING A TERMINAL CLASSIC SURFACE ARTIFACT DEPOSIT AT COURTYARD 100, LA MILPA: THE VIEW FROM THE CERAMIC DATA

Lauren A. Sullivan, Brett A. Houk, Gregory Zaro, and Lindsey R. Moats

The Terminal Classic in the Three Rivers region is marked by cultural transformation and a large-scale abandonment of the area. At a number of sites Terminal Classic activity is represented by a large number of sherds and other artifacts placed on elite residential courtyard floors and the steps to buildings. Different hypotheses proposed to explain these deposits range from termination rituals with whole vessels smashed in place to feasting events to middens. Similar deposits were located in Courtyard 100 at La Milpa, and the ceramic analysis demonstrates that, while such deposits often appear to be similar, they may in fact represent a number of different activities. For the moment, however, the jumbled nature of the Courtyard 100 deposit continues to hinder reliable separation of Tepeu 2 and 3 ceramic assemblages in the area.

Introduction

The Terminal Classic in the Three Rivers region has typically been characterized by a significant reorganization and transformation, with sites and landscapes that were heavily utilized in the Late Classic effectively abandoned (Sullivan et al. 2007; 2008). Original data suggested that La Milpa (Figure 1) was relatively quickly deserted by about AD 850 with some evidence of limited Terminal Classic squatting in the Main Plaza (Hammond and Tourtellot 2004). Recent excavations, radiocarbon dates, and the analysis of several dense artifact deposits at Courtyard 100 in the southern portion of the site suggest that construction of the courtyard began during the Early Classic period, with occupation continuing through the Late Classic period and well into the Terminal Classic, long after the site was thought to have been abandoned (Houk and Zaro 2010; Zaro and Houk 2012).

At a number of sites across the lowlands, Terminal Classic activity has been represented by large numbers of sherds and other artifacts placed on elite residential courtyard floors and steps to buildings above the final construction/occupation phase of a building where one would typically not expect to encounter a midden (Adams 2004 et al.; Houk 2000; Moats 2012). These types of deposits were first distinguished on the Tikal project in order to differentiate them from more straightforward middens or burials (Coe 1982) and have typically been referred to as "problematic deposits" or "special deposits" (Coe 1982), "occupational debris" (Helmke 2006), and/or "de-facto refuse" (Chase and

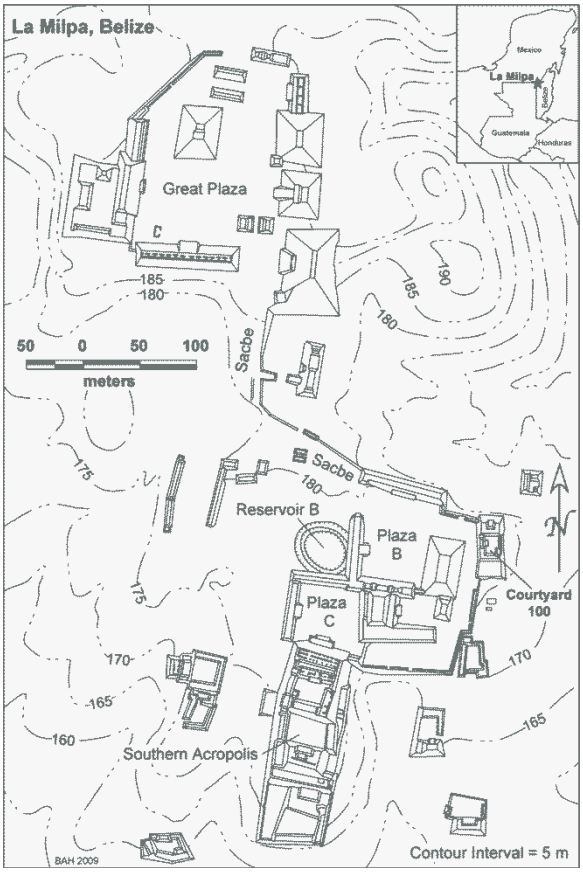

Figure 1. Map of La Milpa with the location of Courtyard 100 indicated, after Houk and Zaro (2011:Figure 1).

Chase 2004). These types of deposits are often located on the centerline of monumental architecture (Clayton et al. 2005), and different hypotheses proposed to explain the behavior behind these deposits include termination rituals with whole vessels smashed into place (Guderjan 2004), feasting events (LeCount 1996), primary middens (Culbert 1973; Houk

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2000), and/or transposed ritual middens (Clayton et al. 2005; Garber et al. 1998). Similar deposits, referred to by Houk (2011) as surface deposits, were located in Courtyard 100, from Structures 102, 104, and 105, and from the middle of Courtyard 100B, with the Structure 104 deposit being the most extensive and most intensively studied (Figure 2). The ceramic analysis of the four deposits, discussed chronologically below, demonstrates that, while they often appear to be similar, such deposits may in fact represent a number of different activities (Sullivan 2012).

Goals and Methods

The goals of the ceramic analysis were to more completely understand what activities are represented by these types of ceramic assemblages and to better delineate the transition from Tepeu 2 to Tepeu 3 in the regional ceramic sequence. There is a high percentage of ceramic types such as Achote Black, Cayo Unslipped, and Subin Red, but one of the problems in the region is trying to isolate a clear "break" between Late Classic/Tepeu 2 and Terminal Classic/Tepeu 3 (Sullivan et al. 2007). Part of this problem may be due to the fact that Terminal Classic ceramics might represent occupations of earlier (Tepeu 2) structures without the addition of new construction layers to aid in clearer chronological separation (Graham 1986) as well as the continued use of utilitarian types from the Late Classic into the Terminal Classic. Another issue is the virtual absence of typical Terminal Classic ceramic "markers" such as Daylight Orange: Darknight variety, Fine Orange, Plumbate, and other Terminal Classic "finewares" at the majority of sites in the area. In the case of the Structure 104 deposit at Courtyard 100, the Terminal Classic markers occur at different levels and are mixed with more general Late Classic types, so we were not able to refine our chronology as much as originally anticipated (Sullivan 2012).

The ceramics collected were analyzed using the traditional type: variety analysis (Gifford 1976). The ceramics from each lot were sorted into body and rim sherds and then counted. In order to more completely understand what activities this ceramic assemblage represents, efforts were made to refit sherds (rim

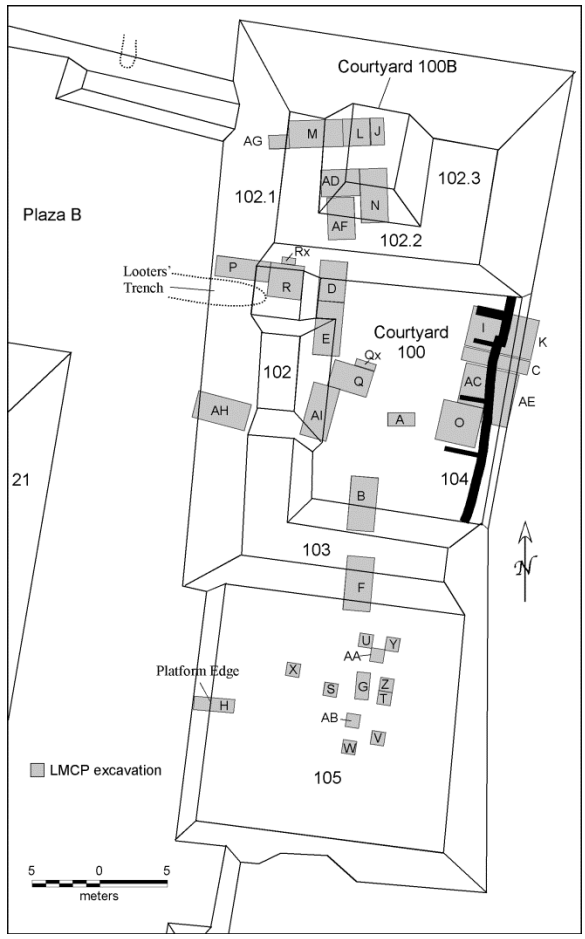

Figure 2. Map of Courtyard 100 (after Moats et al. 2012: Figure 18).

and body sherds) from all levels of the deposits and to establish the minimum number of vessels present (Sullivan 2012). While both rim and body sherds were counted and placed into types, rim sherds were the primary focus of this analysis and were used to identify a minimum number of vessels (see Chase and Chase 2007; Clayton et al. 2005). To determine the original nature of these deposits, vessel form and possible function (based on rim sherds) were considered, although we do acknowledge that determining function can be problematic in that vessels may be used for multiple tasks (e.g., Rice 1987). The forms were broken down into several groups: small serving vessels, larger serving or food preparation vessels, and larger food storage for preparation vessels (see Clayton et al. 2005).

Sample Prov.	Context	Radiocarbon Age (BP)	1 sigma range	2 sigma range
B6-O-2	Str. 105 surface deposit	590 ±15	1318AD (54.9%) 1352AD 1390AD (13.3%) 1398AD	1309AD (71.4%) 1361AD 1386AD (24.0%) 1406AD
B6-AC-1	Str. 104 surface deposit	710 ± 15	1275AD (68.2%) 1288AD	1268AD (95.4%) 1294AD
B6-C-5(1)	Str. 104 surface deposit	1040 ± 40	906AD (3.2%) 911AD 971AD (65.0%) 1026AD	892AD (93.9%) 1043AD 1106AD (1.5%) 1118AD
B6-C-5(2)	Str. 104 surface deposit	1080 ± 40	898AD (17.5%) 920AD 946AD (50.7%) 1014AD	888AD (95.4%) 1022AD
B6-M-3	Courtyard 100B floor surface	1160 ± 15	827AD (9.5%) 840AD 864AD (42.6%) 896AD 923AD (16.1%) 940AD	780AD (4.8%) 792AD 805AD (69.8%) 900AD 918AD (20.8%) 950AD
B6-K-2f	Str. 104 surface deposit	1205 ± 15	779AD (44.2%) 828AD 840AD (24.0%) 865AD	775AD (95.4%) 882AD
B6-AE-2b	Str. 104 surface deposit	1210 ± 20	777AD (43.9%) 829AD 838AD (24.3%) 868AD	724AD (3.6%) 739AD 770AD (91.8%) 886AD
B6-AC-7	Str. 104 surface deposit	1220 ± 15	772AD (49.8%) 826AD 840AD (18.4%) 863AD	769AD (86.8%) 879AD
B6-AE-5a	Str. 104 surface deposit	1240 ± 20	694AD (44.8%) 748AD 765AD (14.3%) 780AD 792AD (9.0%) 805AD	686AD (95.4%) 870AD
B6-K-11e	Str. 104 surface deposit	1270 ± 20	689AD (40.3%) 723AD 740AD (15.5%) 753AD 760AD (12.4%) 770AD	678AD (95.4%) 776AD
B6-R-9	Str. 102 construction	1310 ± 20	664AD (50.5%) 692AD 750AD (17.7%) 763AD	658AD (69.9%) 720AD 741AD (25.5%) 770AD
B6-R-10	Str. 102 construction	1605 ± 15	417AD (25.1%) 438AD 488AD (43.1%) 530AD	411AD (95.4%) 534AD
B6-R-12	Str. 102 construction	1590 ± 60	415AD (68.2%) 540AD	336AD (95.4%) 602AD

Table 1. Results of Radiocarbon Analysis for Samples from Courtyard 100, La Milpa.

The Courtyard 100 Surface Deposits

Structure 102 is the highest mound associated with the courtyard and defines the western boundary. The west side of this structure faces the back of Structure 21, the fifth largest mound at La Milpa. Excavation of Structure 102 identified a construction sequence that began during the Early Classic and continued into the Late Classic (Table 1, Figure 3). A small concentration of sherds was excavated across the courtyard in front of Structure 102 and appears to represent a single deposition event (Moats 2012). This deposit had 21 rims and 562 body sherds and most likely represents an earlier deposition than what is observed on Structure 104. Based on rim sherds, the minimum number of vessels is 14, including two possible recontructable Cayo Unslipped vessels. The ceramics recovered are typical for Late Classic/Tepeu 2 deposits in the area with no distinct Terminal Classic markers (as observed on Structure 104), possibly indicating an earlier depositional date for the scatter of artifacts at the base of Structure 102. This deposit is characterized by a high number of food preparation/food serving vessels, which represent 73.86 percent of the assemblage. It seems highly likely that the vessels were left in

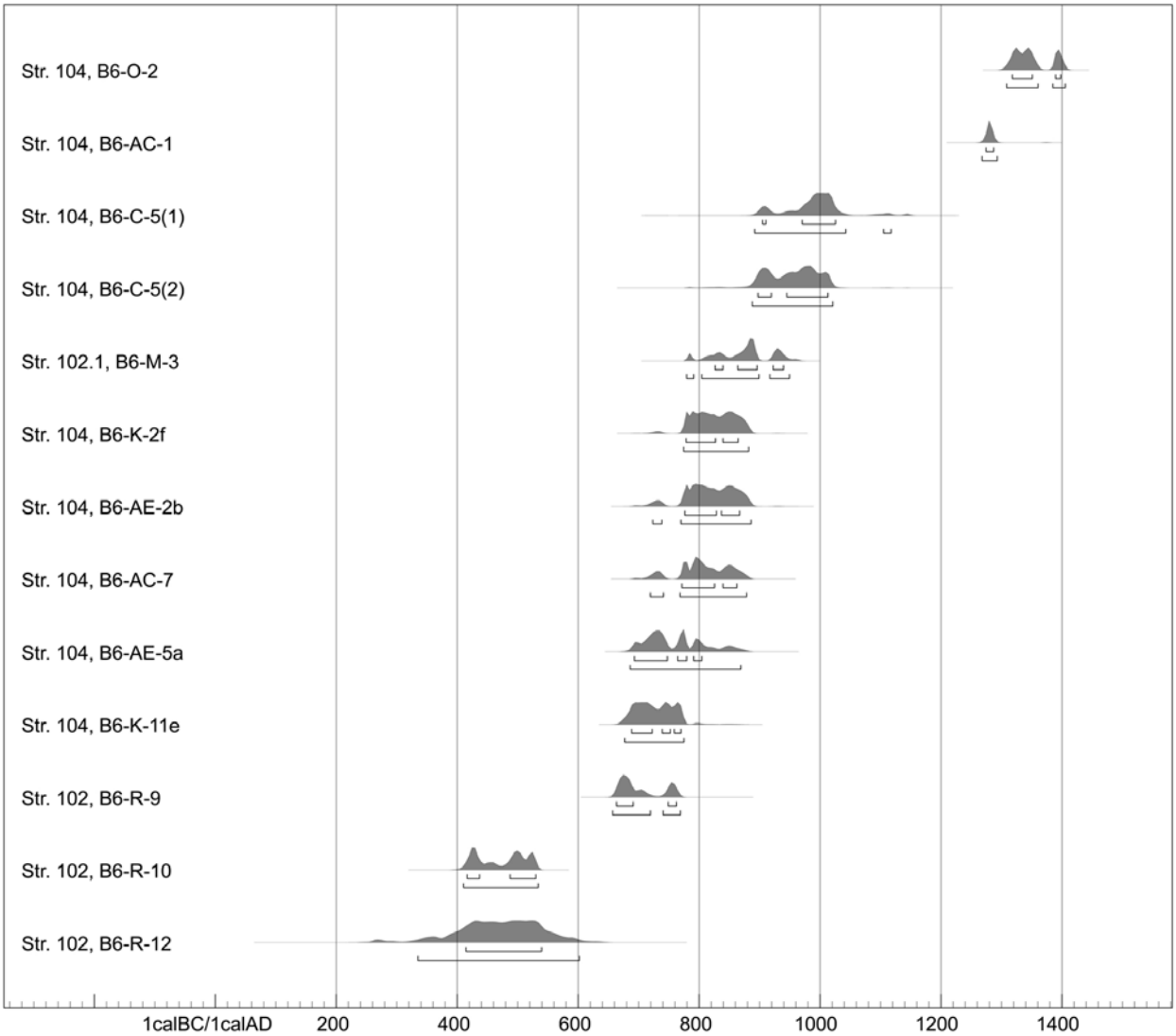

Figure 3. Radiocarbon probability curves from Courtyard 100 samples. Calibrated dates were produced using OxCal v4.1.7 following Bronk Ramsey (2009) and the international calibration curve described in Reimer et al. (2009).

place after whatever activity occurred and are, therefore, de facto refuse (e.g., Chase and Chase 2004).

Structure 105 is a low platform on the southern end of the courtyard with another surface artifact deposit with ceramics, lithics, and a number of obsidian blades scattered across the earthen floor surface on the structure (Moats et al. 2012). The initial 1-x-2-m excavation unit into the deposit yielded 19 rims and 133 body sherds, with a minimum number of 13 vessels based on rim sherds. As with Structure 102, there were no Terminal Classic markers in the deposit. However, unlike Structure 102, there were no reconstructable vessels recovered and no rim sherds from food storage or food preparation vessels. Instead, small serving vessels make up 56.25 percent of the assemblage, and larger serving bowls make up 25.0 percent (18.75 percent of the rims were too small or eroded to identify form). The lack of utilitarian storage vessels in this deposit indicates that it most likely did not result from everyday domestic activities. This deposit may be related to a feasting event, as middens associated with such events typically have a higher ratio of serving vessels as compared to storage vessels (Clayton et al. 2005; Fox 1996).

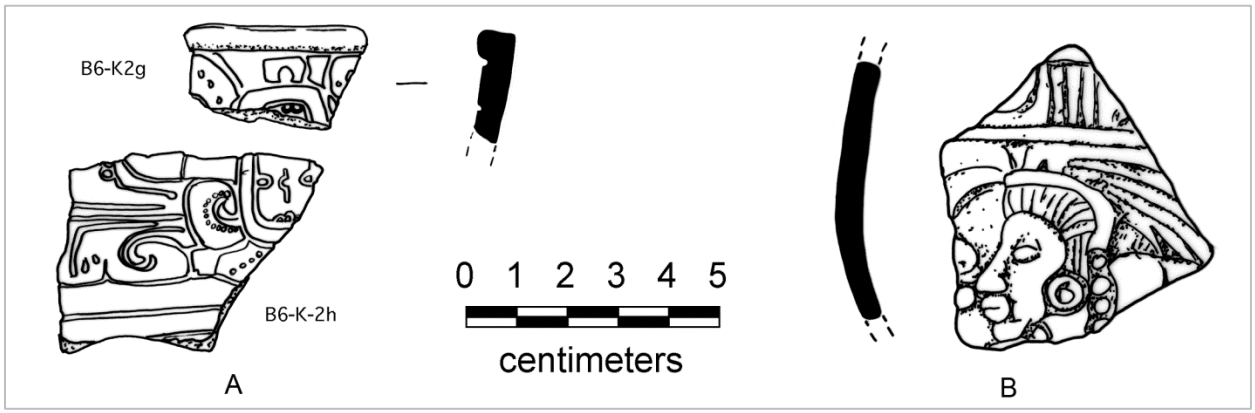

Figure 4. Terminal Classic ceramics from Courtyard 100 surface deposits: A) Unnamed Fine Orange; B) Pabellon Modeled Carved (Illustrated by Jennifer Bryan).

While smaller, the overall composition of this deposit is similar to that of Special Deposit 1 at Blue Creek, where about 60 percent of the vessels were classified as serving vessels and are thought to be the result of a secondary deposit stemming from "an undiscovered primary midden that accumulated from a feasting ritual held in or near Plaza A at Blue Creek" (Clayton et al. 2005:128).

The largest Courtyard 100 surface deposit, by far, was recovered from Structure 104. Initial excavations here were focused on exposing the final phase of architecture in order to assess structure form, function, and preservation. Excavations along Structure 104 determined it to be a low wall that defines the eastern margin of the courtyard (Moats 2012). A dense artifact deposit was encountered on both sides of the wall, containing broken ceramics, lithics, obsidian, and faunal material. This deposit was also mixed with collapse debris and/or other secondary material. Due to time and space constraints, only a 25 percent sample of pottery (rim and body sherds) from the two largest suboperations was analyzed. Overall, the analyzed sherds included 1,501 rim sherds and 5,754 body sherds. Based on the analysis of the rim sherds, the minimum number of vessels represented is 1,326 with only 10 possible reconstructable vessels (3.7 percent of the rims were too small or too eroded to identify form or vessel size). The types and forms recovered range from large storage vessels like Cayo Unslipped, small bowls like Achote Black, larger serving bowls like Rubber Camp Brown and Garbutt Creek Red bowls/basins, as well as fine orange sherds, which are rare in this area (Figure 4).

Considering the large number of sherds recovered there are very few reconstructable vessels, which suggest that this deposit does not represent some kind of termination ritual or in situ feasting event with whole vessels smashed in place. This pattern is the same for those deposits immediately inside or outside the courtyard as defined by the Structure 104 wall. While partial vessels have been associated with ritual feasting deposits (e.g., Brown 2007), the same archaeological signature is not seen here. The sherds recovered from outside of the structure had ratios of 26.98 percent small serving vessels, 17.59 percent large serving vessels, and 55.43 percent large food preparation/food storage vessels. The forms recovered from the inside of the structure have virtually the same breakdown with 28.48 percent small serving vessels, 18.04 percent large serving vessels, and 53.48 percent large preparation/food storage vessels. The fact that over 50 percent of the rims are from large utilitarian jar types suggests that this deposit may be an elite domestic midden or a transposed elite domestic midden, rather than the result of a transposed ritual midden.

One of the more remarkable things about this deposit is the recovery of clear Terminal Classic markers that are not common in this area (see Sagebiel 2005; Sullivan et al. 2007). The fine orange pieces, which may be local imitations of forms found in other parts of the

Maya area or trade wares, have not been found in non-elite contexts. Fragments of Tumba Black-on-orange and Buyuk Striated body sherds were also recovered. This pattern is also seen at Caracol where Chase and Chase (2007) suggest that elites are using new styles while commoners continue to use older more traditional ceramic types. Radiocarbon dates from various levels of this deposit range from the Late Classic to the Post Classic. The earliest date obtained from a lower level produced a 2-sigma calibrated age range of AD 678–776, while the latest date associated with this deposit came from an upper level and produced a 2-sigma calibrated age range of AD 1309–1409(Table 1, Figure 3). This supports the idea that the Structure 104 deposit accumulated over time rather than during one specific event, and that it may be the result of multiple visitations during the Terminal Classic and perhaps even extending into the Postclassic (Moats 2012). A similar set of artifacts was found at Chan Chich on the steps of two palace structures. In this case, partial vessel fragments, exotic artifacts, human skeletal material, and a jaguar canine were recovered (Houk 2011). As with Structure 104, Terminal Classic markers were also identified with a partially reconstructable Pabellon Modeled-carved Fine Orange and vessel sherds from an imitation fine orange vessel. The Chan Chich deposit may represent multiple and varied events at the same place, spanning years or even decades (Houk 2000, 2011; Sullivan et al. 2007).

The fourth deposit analyzed was recovered from the middle of Courtyard 100B. Excavations here recovered 35 rims and 385 body sherds with a minimum number of vessels of 33. Rim forms indicate that small serving vessels make up the majority of the assemblage (48.48 percent), with 21.21 percent large serving vessels, 21.21 percent large food preparation/food storage vessels, and 9.1 percent of the rims too small to identify size and/or function. While the Pabellon Modeled Carved (Figure 4) and Unnamed Fine Orange paste sherds recovered date this deposit to the Terminal Classic, the composition of the assemblage is very different from the deposit on Structure 104, where the majority of the assemblage was made up of large food preparation/food storage vessels such as Cayo Unslipped.

Summary and Conclusions

Excavations at La Milpa's Courtyard 100 clearly demonstrate a long history of cultural activities in this area of La Milpa that continued well after the presumed abandonment of the monumental site core. The contextual analysis of the Courtyard 100 materials also calls for more careful excavation and analysis of these types of deposits in light of the fact that they represent different behaviors, and one interpretation cannot be offered to explain them all (Chase and Chase 2004, 2007; Clayton et al. 2005; Moats 2012). In this one area of La Milpa we see that the dense concentrations of artifacts appear to represent very different activities occurring at different times and further highlight the variable nature and complexity of this time period across the Three Rivers region.

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21 MAYA POTTERY PRODUCTION AND EXCHANGE: WHAT WE THINK WE KNOW AND WHAT WE WISH WE KNEW

James Aimers

In this paper I discuss some of the ideas archaeologists and others have about the production and exchange of ancient Maya pottery. In other words, in what contexts were Maya pottery objects produced, by whom, how were they moved around, and how did these change through time? The discussion is very a broad overview of the questions we have about pottery production and exchange, and some of the cultural insights pottery research can provide. Pottery indicates the variability and complexity of ancient Maya production and exchange, and Maya economics generally.

Introduction

In recent years, discussions of ancient Mesoamerican and Maya economics have become more sophisticated and data-driven. In an influential article, Hirth (1998) used pottery and obsidian distributions to identify marketplace exchange in Central Mexico, and markets are now of major interest across Mesoamerica (Dahlin 2009; Masson and Freidel 2012; McAnany 2010). Still, there is much that we do not understand about ancient Maya economies, and even questions about the production and exchange of one of our most common artifact classes, pottery, are hard to answer based on archaeological data alone. For example, the vast majority of pottery we excavate is from or from near places of consumption, which ideally include primary contexts like on floor deposits, caches or burials, but typically also trash dumps and other non-primary contexts. As a result, we have much more information on consumption than production and exchange.

Economic Models

As Dahlin (2009:342) notes, archaeologists have traditionally linked political formations (e.g., bands, tribes, chiefdoms, or states) to the economist Polanyi's three modes of exchange (reciprocity, redistribution, and market exchange). In these schemes, the Maya were usually considered to have had chiefdom-like or early state organization and thus the dominant mode of exchange would have been redistributive. In a redistributive system, important people and groups collect goods which are then redistributed back out to supporters. This is usually associated with chiefdoms, but complex states like the Inka occasionally had strongly redistributive economies. In the last quarter century, however, ideas about redistribution have been strongly critiqued, and a consensus has emerged that Maya exchange included other mechanisms. But, understanding distributive mechanisms from patterns of artifact distribution is difficult because artifacts get where they are through varied relationships among producers, consumers, and various sorts of middlemen. Distribution patterns may or may not be the result of use, disposal, curation, theft, and other secondary and tertiary movements of pottery, and the movement of pottery is entangled with social meaning (Pool and Bey III 2007:13). Furthermore, the movement of different kinds of goods should be considered separately, even within an artifact class such as pottery (see Rice 2009a). We think we know, for example, that ordinary cooking wares versus incense burners were produced and distributed in different ways (Fry 2012; Rands and Bishop 1980). Pottery also confounds the distinctions we might like to make between subsistence and wealth goods, or the distinctions between tools and symbols.

Production

Despite these issues, we think we know a few basic things about Maya pottery production. Firstly, most pottery was produced in domestic contexts although even domestic production could include "impressive levels" of craft specialization and some nondomestic production" (Pool and Bey III 2007:35). Outside the Maya area, Feinman (1999) showed that households in Oaxaca could produce quantities of pottery archaeologists might

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assume could only be produced by a specialized workshop.

Some authors distinguish part-time household industries which provisioned people beyond the household (Stark 2007:155) from workshop industries in which pottery production would have been the main activity of the household. We are reasonably sure these both existed but we have had real trouble finding pottery production loci and the identification of specialization from densities and proportions of forms and types is notoriously difficult (Aimers 2004:69-145). The issues are even more complicated when we posit the existence of nucleated workshops which involved people beyond the family and were located in specialized facilities. Nucleated workshops are examples of independent production directed toward "a general market of potential customers" (Costin 1991:11). As Rice (2009a) pointed out, however, we do not yet have certain remains of these sorts of production structures, which may not have been special places. Many Maya archaeologists thus assume that most pottery was produced in households as a part-time industry, and in small workshops that are difficult to detect archaeologically (see e.g., Becker 2003).

A rarefied version of a nucleated workshop might be a palace school (also called attached production; Costin 1991:11). Cross-culturally, attached production is generally used for luxury items and weaponry (Pool and Bey III 2007:10). Charlton and colleagues (2007) showed that pottery incense burners at Late Postclassic Aztec Otumba were produced only by elite households and Ball (1993), Inomata (2001) and others have argued that the finest Maya polychromes were produced in elite contexts, and in some cases at least, by elites.

Rice (1987:78) notes that both highland Maya ethnography (Rice cites McBryde 1947; Reina and Hill 1978) and the localized distribution of pottery around Palenque, Tikal, and Lubantuun suggest community specialization by vessel form at least for ordinary pottery. There is little evidence of pottery production within monumental site cores, with the exception of remains that suggest painting of fine polychrome vases (Becker 2003). Rands and Bishop (1980:43) showed that the paste associated with the site core at Palenque was used for "incensario supports, cache vessels, figurines and some serving wares" (Rice 1987:79). Neutron activation analysis of censer stands widely distributed across the Palenque region showed that 93% of them were produced at Palenque (Bishop, et al. 1982; Rands, et al. 1979; cited in West 2002).

Maya Potters

I wish we knew more about ancient Maya potters. Foias and Bishop (2007:233) have argued that "ethnohistorical and ethnographic evidence suggests that Maya potters were generally male" but the sex of the ancient potters is still an open question in my opinion since women are also ethnographically well-documented pottery makers. The finest polychromes, some of which are signed, may have been a male specialization, but we just do not know this for sure, and there is no reason to believe that this did not vary among polities and/or through time. The sex of pottery producers could have real value for our understanding of Maya gender roles and household economics. Ethnographic research by Arnold (1985:226) showed that when women produce pottery it can be somewhat prestigious for them because it augments household income (e.g., from farming) but when land is scarce and men are forced to pot as an alternative to farming, the status of potters seems to be lower. Pottery production may have been a diversification strategy because it provided an alternative (or additional) income stream if access to land was becoming problematic, for example in the Late and Terminal Classic, but we cannot assume that it was always a last resort.

Overall, pottery production appears to have been largely domestic and production was typically local because of the "widespread availability of suitable raw materials" (Stark 2007:149). In the contemporary Maya highlands, Deal (2007:52) found that 75% of pottery was produced locally in the village or one of its satellite communities. Foias and Bishop (2007:217) concluded that 95% of Petexbatun pottery was produced within the Petexbatun region. Calculations of coefficients of variation for modal qualities like wall

thickness of various pottery typed indicated large numbers of localized pottery production loci around each settlement. At Tikal micaceous-paste slipped bowls appear to have circulated within 15 km of their presumed source and Fry (1979:495) suggests that unslipped widemouthed jars were rarely found more than 4-5 km away from their hypothesized production area, which were probably individual households given the variation in their paste recipes.

Pottery and Identity

We have evidence that pottery style and technology sometimes reflect social boundaries, although how consistently this is true is still unclear and this may have varied through time. Deal (2007:57) notes that "in the Maya highlands…. both production and distribution of traditional forms appear to be closely linked to ethnic boundaries" so, for example, Tzeltal Maya do not buy functionally equivalent Tojolabal jars, they buy their own. Foias (2004:156) provided a concise overview of the ethnoarchaological research, concluding that "chemical sourcing, stylistic and modal analyses can identify and differentiate between the products of different production communities or even individual potting groups." At Palenque, the site's four paste groups taken together "coincides with the area demarcated by the distribution of Palenque's emblem glyph in the Late Classic period, suggesting a correspondence between Palenque's economic and political spheres" (West 2002:152). Scarborough and Valdez (2009) suggest that we also pay more attention to the interaction of small, often resource-specialized communities among themselves, rather than by default as subordinates of larger centers (looking at paste compositions of monochrome serving wares would be one way to do this). The connection between archaeologically defined pottery units (e.g., forms or types/styles) and cultural units (e.g., polities or other forms of sociopolitical identity) is an old and contentious question in Maya archaeology and after nearly a century of work, much still remains to be resolved (see comments in Aimers 2012:232-233).

Elite Control and Dual Economies

A long-standing issue is the degree of elite control over Maya pottery production. Looking at the distribution of resources is one way to investigate elite control but this is complicated by the nature of Maya craft production. In the Colonial period Lopez de Cogolludo observed that "What causes wonder is that there are many Indians who work at four or six trades where a Spaniard would have one" (cited in Rice 2009a:140). For Oaxaca, Feinman and Nichols (2007:194) noted that most households were "producing basic as well as status-related goods in part for exchange" and therefore "the economy would not be easy to manage politically through centralized redistribution (especially given the nature of prehispanic transportation)." This may be true in the Maya area as well. In the Petexbatun region, Foias and Bishop (2007:234) argued for decentralized political organization with some elite control over the prestige economy but the localized nature of pottery manufacture in the Petexbatun region would have made elite control "unmanageable." They argue for a general economy dealing with utilitarian or subsistence items, and a prestige economy for prestige or wealth items. This type of binary model is considered too simplistic by an increasing number of investigators, who argue for a continuum of production and distribution mechanisms that may have fluctuated through time and among sites (e.g., Feinman and Garraty 2010; Graham 2002; Masson and Freidel 2012).

Rice (1987:84) suggests that elite power at Maya centers was based on geneology rather than economic control. Control of agricultural land would also have been crucial for Maya elites. Wells (2006) introduced the concept of the ritual economy, in which symbolically charged goods such as ritual items help create and sustain a worldview which has major social and economic implications far beyond the world of religious practice (see also McAnany 2010). The fundamental social order is shaped by ritual and the objects and places used in it. In this perspective, ritual knowledge and ritual access is a form of capital or wealth, just as good land is. Furthermore, as Helms (1993) and others have shown, goods from afar were symbolically valued in Mesoamerica as they often are in

contemporary culture. Generally, archaeologists are moving away from the notion of strong elite control of production, although elites would have been important and influential consumers due to their economic, social, and ideological roles in ancient Maya society from the Preclassic period onwards.

Distribution/Exchange

Distribution and exchange link producers to consumers, often through various sorts of middlemen, and "distribution is the economic phenomenon most imbued with social meaning" (Pool and Bey III 2007:13). The links of distribution to other social factors was the basis for Polyani's influential typology of reciprocity, redistribution, and market exchange, which links exchange mechanisms to the basic organization of society. The oldest models of Maya distribution focus on taxation, tribute, and especially redistribution "If prehispanic Mesoamerican economies were basically redistributive, than the general expectation would be that economic networks would have been small and politically bounded. Craft specialization would have been minimal, highly centralized, and in large part restricted to the manufacture of elite goods" (Feinman and Nicholas 2007:189). Households would have made most of their own goods. While some elements of this are certainly applicable to the Maya, most people are now persuaded that marketplace exchange played a bigger role than previously thought for the Postclassic and even the Classic period.

Deal (2007:52) found that provisioning of pottery in the contemporary highlands normally took place in three ways: gift-giving (e.g., at marriage), borrowing (for special events), or exchange (through barter e.g., a medium sized pot for a bowl of beans); middlemen were also sometimes involved. Petty traders probably sold pottery they made and there were probably part-time retailers and professional itinerant traders who sold to other merchants. Gifting and feasting was an important distributive mechanism, especially for fine pottery. In the 16th century, Bishop Landa (Tozzer 1941:92-93) observed that Maya feasts often included the presentation of "a little stand and vessel, as beautiful as possible" to guests.

Marketplace exchange was clearly important in the Postclassic period, but it seems increasingly clear the marketplaces existed by the Classic period, for example at Early Classic Chunchucmil (Dahlin 2009; Shaw 2012) and Calakmul. The Yucatec Maya word for plaza (*k'iwik*) is also the word used for market (Barrera Vásquez, et al. 1995; Shaw 2012:130). There is still some skepticism about markets, though. Restall's (1997:185-188) examination of colonial documents found no evidence of large centralized markets in Yucatan. Instead, itinerant traders moved from town to town across large distances and provided most goods as middlemen (Rice 2009b:80). West (2002:154) suggested that "pottery producers may have traded their wares at Palenque" in periodic markets like Friedel's (1981) shifting, periodic pilgrimage fairs. West (2002:154) concluded that "It is probable that goods were exchanged in both localized markets, and at central periodic markets, a common pattern in contemporary and historic regional agrarian systems."

Transshipment points or ports of trade were particularly important along the coast in the Postclassic period. In May of 2012 I looked at ceramics excavated by Guderjan, Garber and colleagues at the sites of Chac Balam, Ek Luum and San Juan (Guderjan and Garber 1995). The diversity of the types at those sites and at other Ambergris Caye sites like Marco Gonzalez and San Pedro suggests extensive trade networks that brought a large variety of types of vessels, at least some of which come from quite far away (e.g. Plumbate pottery from the Pacific Coast). Ports of trade along the coast may have been supplying markets inland at places like Lamanai. The movement of vessels can, of course, be a side-effect of movement of commodities they held. Restricted neck jars with handles are likely candidates (e.g. Mama Red). Tozzer (1941:92-97) and Pina Chan (1978) provide evidence that goods such as salt, copal, cottonseed oil, and honey moved interregionally in the colonial period.

Rice (2009a) has pointed out that the movement of different items must be assessed independently: "Items can circulate simultaneously through different systems of exchange with different sets of social meanings"

(Pool and Bey III 2007:13). Obsidian and pottery were both used in what could be called the domestic or utilitarian economy and the wealth or prestige economy. The frequent occurrence of average-quality polychrome pottery--what Ball (1993) has called "village tradition" polychromes-- in various Late Classic contexts, which could be generally characterized as elite and commoner, suggest they were acquired by ordinary people through middlemen or markets rather than only through gift exchange. Beaudry's (1984) study of Copador polychromes showed a large scale of production, including one workshop that may have focused exclusively on the production for export to El Salvador. The distribution of Copador pottery was widespread and apparently unrestricted. In contrast, the finest polychromes may have been produced on demand (Fry 1981) rather than on speculation, and were likely exchanged in more limited ways, through gifting and at feasts, and are often found in elite or ritual contexts.

In the Valley of Oaxaca, Feinman (1982, 1986) found that more heterogenous pottery assemblages were found at administrative sites than at non-administrative sites, whereas Hirth (2009; Hirth and Webb 2006) argued that households using the same markets will have more homogenous artifact assemblages than those that did not use markets. So, assemblage diversity in public and domestic loci at sites like Lamanai might indicate their important roles in regional distribution systems which seem increasingly likely to have included markets.

Pool and Bey (2007:36) concluded that "It is unlikely that centralized redistribution accounted for much, if any, of the distribution of utilitarian pottery and common serving wares from specialized producers to consumers. Rather, reciprocal obligations and gift-giving probably continued to be significant mechanisms of distribution in most places for much of the pre-Hispanic era, and it is unlikely that the emergence of marketing systems completely eradicated them." An increasing number of archaeologists now believe that marketplaces probably existed by the Early Classic, if not earlier (Masson and Freidel 2012:479). The stylistic homogeneity of serving wares (e.g., Sierra Red) suggests shared communication networks among emerging elites. Blanton (1983) suggested that market systems are often generated in contexts of increasing agricultural systems as labor saving devices since if ordinary people can get some pottery at a market they can focus on agricultural production.

Conclusion

Pottery, because of its durability and versatility, provides an opportunity to assess the complexity of ancient Maya production and exchange systems, which likely varied along a number of axes including artifact class, type, form/function, time, and space. This short overview only touches on some of the issues with which we are grappling. As we acquire and use more data our conceptualizations of Maya pottery production and exchange are becoming more fine-grained. This in turns makes our overall understanding of Maya economics more nuanced.

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22 LANDSCAPES AND MAYA SETTLEMENT IN NORTHWESTERN BELIZE

Thomas H. Guderjan

In this paper the topography, natural landscapes and resources of northwestern Belize and adjacent portions of Mexico and Guatemala are reviewed. Major features of the area include the Alacranes and Dumb-bell Bajos, the Bravo Escarpment, the wetlands at the base of this escarpment, and the Río Azul Canyon. Important resources such as wetland and upland agricultural lands, stone for toolmaking and reliable water sources will also be discussed. Then the placement of Maya centers in relation to these features and resources, including sites such as Blue Creek, Bedrock, Grey Fox, Nojol Nah and Xnoha are reviewed.

Introduction

Most Belize archaeologists are only vaguely familiar with northwestern Belize. Largely for their benefit and to contextualize our other work, I will review the topography, natural landscapes and resources of northwestern Belize and adjacent portions of Mexico and Guatemala. An additional purpose of this paper is to compile and describe the sites that I and my colleagues are currently investigating. For the most part, I will be describing the area of Belize north of the Programme for Belize' Rio Bravo Conservation Area. Major features of the area include the Alacranes and Dumb-bell Bajos, the Bravo Escarpment, the wetlands at the base of this escarpment, and the Río Azul Canyon. Important resources such as wetland and upland agricultural lands, stone for toolmaking and reliable water sources will also be discussed. Then I will review the placement of Maya centers in relation to these features and resources, including sites such as Blue Creek, Bedrock, Grey Fox, Nojol Nah and Xnoha.

Topography and Natural Landscape

Most of northwestern Belize is located in the La Lucha uplands, west and above the Bravo Escarpment, a 100-150 meter tall uplift that runs rough SW to NE (Figure 1). When driving from Orange Walk Town, this escarpment becomes visible shorty after leaving the village of Yo Creek. Another parallel and similar uplift is located a few kilometers west of Belize in Mexico and Guatemala. The zone between these uplifts has been termed the La Lucha Uplands by Nick Dunning (2003).

The La Lucha Uplands are transected by two rivers, the Rio Bravo and Rio Azul which join near the Mexican town of La Union to become the Rio Hondo, which then becomes Belize's border with Mexico. From the confluence, the Hondo is a slow, sluggish stream which can be canoed in approximately three days to its mouth in Chetumal Bay (Guderjan 2007).

The nature of the Rio Azul has been often confused by archaeologists, especially those interested in riverine access from the Peten of Guatemala and the Caribbean Sea. Most maps, including Brown and Witschey's "The Electronic Atlas of Ancient Maya Sites" show the Rio Azul as a navigable water way along the entirety of the Belize – Mexico border and then into Campeche and then Guatemala terminating at the Maya center of Rio Azul. The excavator of Rio Azul clearly and incorrectly believes that canoe traffic could regularly reach the city from Chetumal Bay (Adams 1999:113). In reality this is not the case. The river only flows 3-4 kms. above the mouth of the Rio Azul canyon until is not normally navigable. Further, the ancient Maya built a dock and dam facility at that location (Barrett and Guderjan 2006). From the dock and dam facility eastward, the river downcuts rapidly and is fed by numerous permanent springs. Upstream in the canyon, it is an underfit stream that only flows during heavy rains. Near the site of Grey Fox, it is barely discernable as a drainage in the dry season. Then, many miles to the southwest, a disconnected part of the Rio Azul passes by the large Maya site of Rio Azul (Adams 1999) and then empties into the Bajo Alacranes. Again, despite what is depicted on most maps, these rivers (perhaps better termed, Rio Azul A and Rio Azul B?) are not connected.

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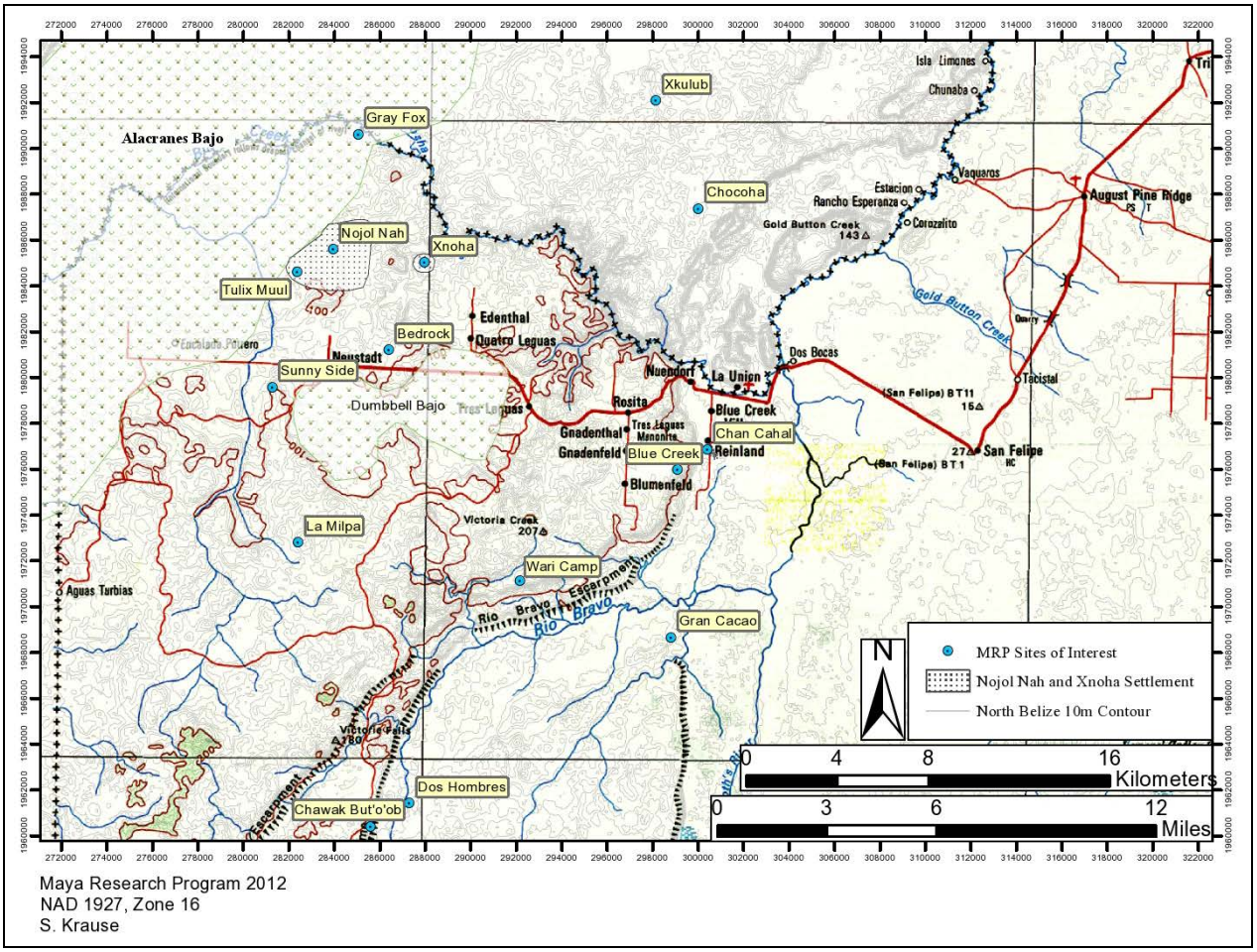

Figure 1. Sites and locations of interest in northwestern Belize (by Samantha Krause).

On the other hand, the Rio Bravo flows intermittently from near the site of Chan Chich to not far below the bridge known as Cedar Crossing on Gallon Jug Agribusiness lands. From there, it can be regularly canoed the entire distance to the Rio Azul confluence. Along the Rio Bravo floodplain and elsewhere along the base of the Bravo Escarpment are numerous wetlands that were channelized by the Maya including the Chan Cahal fields and the Birds of Paradise Fields (Beach, et al 2009; Beach, et al., in press).

The most obvious and significant landform in the area is the Bravo Escarpment. Maximum elevations below the escarpment are in the range of 40-60 m amsl, while the top of the escarpment is in the range of 150 m amsl. Above and west of the escarpment, the La Lucha uplands consist of an uplifted and eroded, karstic limestone plate with hills commonly as tall as 60 m. and bajos and bajitos surrounding them.

Bajos are well known as depressions in limestone into which water drains and little or no water exits, creating a funnel into underground water systems. Continuing an imaginary east to west transect of northwestern Belize, the first encountered is the Dumb-bell bajo, named in 1990 by Jet Propulsion Laboratory staff testing a version of Side-Looking-Aerial-Radar. This bi-lobed bajo covers approximately 40 sq. kms and was a constant and easy point of reference in SLAR imagery. The Dumb-bell bajo is immediately west of the access road to the PfB conservation area and its northern portion is crossed by the main east-west road through the area. The bajo today is primarily used for rice agriculture and cattle pastures.

Throughout the La Lucha uplands are also bajitos or little bajos that are less well defined than tradiotionally known bajos. Bajitos are typically 1-2 sq. kms and often merge with each other in highly irregular patterns. Most importantly, bajitos, like bajos have deep, rich, agriculturally important soils and were a resource for the ancient and contemporary inhabitants. Typically, they are ringed with karstic hill upon which Maya residences, especially elite residences were built. Rarely have we found Maya occupation with such bajitos except on top of small, erosional remnants. Consequently, it appears, though it is difficult to demonstrate, that bajitos were agriculturally important to the ancient Maya.

The second bajo encountered is the Bajo Alacranes, a truly massive feature covering approximately 500-600 sq. kms. and located along the SW-NE running escarpment in Mexico and Guatemala. Dunning and I have agreed to term this the "Alacranes Escarpment" (personal communication, 2012). From the Belize side, the Alacranes Escarpment is easily seen across the Alacranes Bajo. In recent years, we have invested significant effort on the eastern side of the bajo as numerous sites have been damaged and/or are threatened by very recent forest clearing. We have just begun to understand the diversity of resources and agricultural systems that may have been in place during the Classic Maya period within this massive bajo. However, we have already identified wetlands systems in the lower portions of the bajo and specialized landscape medication on the margins. At its far southern end, the Rio Azul empties into the Bajo Alacranes, near the site of Rio Azul, creating a great alluvial fan which likely was exploited using additional, specialized agricultural techniques.

We have also now located four caves in the La Lucha uplands. All of these have been used by the Maya, particularly in the Early Classic period (Holley Moyes, personal communication, 2012) and are located on the north and east side of the Dumb-bell bajo. There is also one occupied rock shelter just north of the PfB property line and east of the PfB access road.

Locations of Critical Resources

Water

Obviously the rivers and their associated drainages, especially below the Bravo Escarpment where streams such as Cacao Creek converge with the Rio Bravo in and around an area known as Booth's Swamp. However, additional sources of water include cenotes and springs.

At least 6 cenotes are located in the La Lucha uplands within a 10 kms. radius of the central precinct of Blue Creek, located on top of the Bravo Escarpment. All of these are projected to be within the geographic limits of the Blue Creek polity (Guderjan, Lichtenstein and Baker 2003; Guderjan 2007). Immediately north of the Rio Hondo is a large, deep, blue water cenote adjacent to the village of La Union and north of La Union, exists a dramatically beautiful landscape that includes a half dozen large cenotes.

Several other cenotes are located on the eastern margin of the Bajo Alacranes near the site of Nojol Nah. Further, midway between the Bajo Alcacranes and the Brovo Escarpment is the site of Xnoha on top of a large ridge system. At the northern base of the Xnoha hills is a small set of wetlands that drain, via an un-named stream, into the Rio Azul Canyon.

Springs are also important in that they form the permanent water source for the Rio Hondo. Many such springs have been found emptying underwater into the Rio Azul canyon and the river is navigable from the previously mentioned dock and dam downstream. There are also many springs along the base of the Bravo Escarpment south of the Azul. However, many or perhaps all, of these are highly sulfuric and not useful for agriculture. In fact, a local farmer attempted to use water from one of these springs to spray irrigate a test plot. The test plot is now a circular dead zone with nothing growing in it. The removal of such water was clearly the goal of ditched field systems at Chan Cahal, a residential group part of Blue Creek and located at the base of the Bravo Escarpment (Beach, et al., 2009; Beach, et al., in press).

Agricultural Lands

The single greatest resource available in northwestern Belize to the Classic Maya people was its scale and diversity of agriculturally productive lands. Previously, I have calculated that approximately 50 - 60% of the 100 sq. kms of the polity of Blue Creek was used for some sort of agriculture in the Classic period (Guderjan 2007; Guderjan and Krause 2012). In the La Lucha uplands, both bajos and bajitos offer distinctly different agricultural opportunities. Bajitos generally have deep, rich soils and have no standing or running water in them. Consequently, these are best used for what I have called "upland, dry" farming. However, a better description might be "non-irrigated, rainfall based" farming. Bajos are far larger and more complex with numerous micro-niches which can be exploited by a wide range of techniques including ditching, non-irrigated, rainfall based farming, and modification of the gentle slopes leading into them. On and at the bases of hills surrounding both bajos and bajitos are a wide range of agricultural features such as terraces, check dams and other cross drainage features and growing platforms (Guderjan 2007).

In addition to these upland agricultural opportunities, large expanses of ditched agricultural fields along the base of the Bravo Escarpment, first by Jeff Baker (2001) then by Tim Beach and Sheryl Luzzadder- Beach (Beach, et al., 2009; Beach, et al., in press). The Birds of Paradise fields were likely controlled by the neighboring city of Gran Cacao rather than Blue Creek. Nevertheless, the lack of modern impacts has shown this complex of ditches to be highly organized and rectilinear with primary and feeder canals. Further, recent Geo-Eye imagery has revealed that the Chan Cahal fields were highly organized and integrated and designed to drain a low-lying area at the base of the Bravo Escarpment into first one reservoir then into a second before draining to the Rio Azul.

Other specialized environmental niches probably had special agricultural purposes. As Blue Creek is located on an ecotone, several such natural areas exist. Among these, rejolladas had the greatest potential for agriculture. Like cenotes, rejolladas are sinkholes in the karstic topography. Cenotes, however, provide access to underground rivers and are important water sources. Rejolladas do not have water at their bottoms and serve as sediment traps and retain moisture well. Elsewhere, rejolladas are highly prized agricultural lands where farmers are able to cultivate two crops a year. In early colonial sources, rejolladas were used for growing fruit, including cacao, and were often controlled by elites. A number of rejolladas are located in the rolling hills of the Bravo Escarpment, including three adjacent to the site core. One is an enormous sediment trap with deposits approximately three meters deep that receives all surface water runoff from the monumental architecture. The Blue Creek royal elite likely controlled these features during the Classic period much like their colonial counterparts in the north and may also indicate why the site core was established at this particular location. So, while such specialized niches were relatively small components of the overall agricultural system, perhaps less than 1%, they were highly productive and important.

Another component of the Blue Creek agricultural production system is the kitchen gardens associated with individual households. Today, such gardens are located within the solares or walled compounds surrounding residences in traditional villages such as Yaxunah, Yucatan. Prehistorically, these walled compounds did not exist and kitchen garden would have been placed just beyond the open area around individual houses. Such kitchen gardens almost certainly existed at non-elite residential groups at Blue Creek. Elite residential groups, such as Kín Tan, were organized in a manner that precluded such kitchen gardens. However, Kín Tan apparently controlled large tracts of agricultural lands and probably did not need such gardens. Equally so, their presence at Chan Cahal, despite the fact that Chan Cahal was surrounded by ditched fields, indicates that the residents of Chan Cahal did not control the ditched fields but were probably workers in them. A conservative estimate of the impact of kitchen gardens on the overall agricultural productivity of Blue Creek would be in the range of 1%.

Stone for toolmaking

The distribution of knappable cherts is extremely heterogeneous in the area. Many areas have few or no resources while others have such abundance that large chert cobbles and small boulders are commonly used as building construction fill. East of the Bravo Escarpment, the only significant chert deposits we have discovered are those large cobbles and small boulders (using the Wentworth scale) that we have found are in clay deposits adjacent to the Rio Azul between where it exits the canyon and its confluence with the Rio Bravo. Similarly, chert cobbles and boulders are abundant in the Rio Azul canyon below the dock and dam feature.

In the vicinity of the central precinct and upland elite residences of Blue Creek, chert resources are meager. In the central precinct, relatively few stone artifacts were found and no nearby stone resources were discovered. Formal tools from Colha were found in ritual settings in the central precinct and a cache of exotic (non-Colha) bifaces was found in a plaza cache at the elite residential group of Kín Tan (Hanratty 2002) and the Early Classic ballcourt may have been terminated with the deposition of nearly 100 flakes from a single core or possibly the ballcourt was abandoned then re-purposed as a very casual workshop. Aside from these anomalies and crude masonry tools in construction fill, non-obsidian lithics found.

However, in the western half of northwestern Belize, the situation is quite different. When the center of Bedrock was discovered on the north side of the Dumb-bell bajo, it was apparent that there were at least some, small, lithic workshops present. Excavations at Sotohob, an elite residential group on the east side of Bedrock revealed numerous, large scale workshops (Barrett 2004). Further while excavations at Aak Witz revealed no new workshops, chert was used a minor component of construction fill (Graeves and Guderjan 2011). Barrett also excavated another workshop, Buena Vista, on a low erosional remnant in the eastern lobe of the Dumb-bell bajo (2004).

The greatest quantities of high quality cherts, however, have been located on the eastern side of the Alacranes Bajo. Workshops in the area of the site of Nojol Nah were excavated by Jason Barrett (2004) and numerous others have been located in the vicinity. Chert was also used as a minor component of construction fill at Nojol Nah and as a significant component of fill at Tulix Mul. But, by far, the most dramatic deposits of chert cobbles and small boulders were found at Tulix Mul on the gradual slopes down to the bajo. Throughout a 30 meter long backhoe trench, we encountered a slightly subsurface pavement of chert embedded in the clay subsoil. These cherts were not only resources for toolmaking and construction but may have functioned as "tempering" material making the clay soils useful for agricultural purposes (Timothy Beach, personal communication, 2012).

Major sites and their placement

Understanding the inter-relationships among Maya communities has been the goal of numerous efforts over the past several decades. Hammond devised a simple set of scalar categories that was helpful, yet insufficient (Hammond 1975). Adams attempted to rank order sites by the number of elite residential courtyards present (Adams 1981) and I attempted to revise this by incorporating the presence of critical architectural elements (Guderjan 1991). Most recently, Robichaux, in a discussion at the third Belize symposium, attempted to categorize sites in the Three Rivers area as cities and/or towns (2005). Again, while this was helpful, this approach, like the others did little to suggest causal factors is what we have all been seeing in the settlement patterns of the Maya of NW Belize. Further, neither older, strictly hierarchial models nor newer, heterarchial models of Maya political organization well fit the situation in NW Belize.

There are four Ku'i'k sites in our study area: Blue Creek, Bedrock, Xnoha and Grey Fox. A ku'i'k is a central place with at least one public plaza, large temple-pyramids that may also have a ballcourt and/or stelae. Additionally, I will mention three neighboring ku'i'k sites (Chocoha, Gran Cacao and La Milpa) for contextual purposes. My colleagues and I have also been working at a number of non-ku'i'k sites including Nojol Nah, Tulix Mul and La

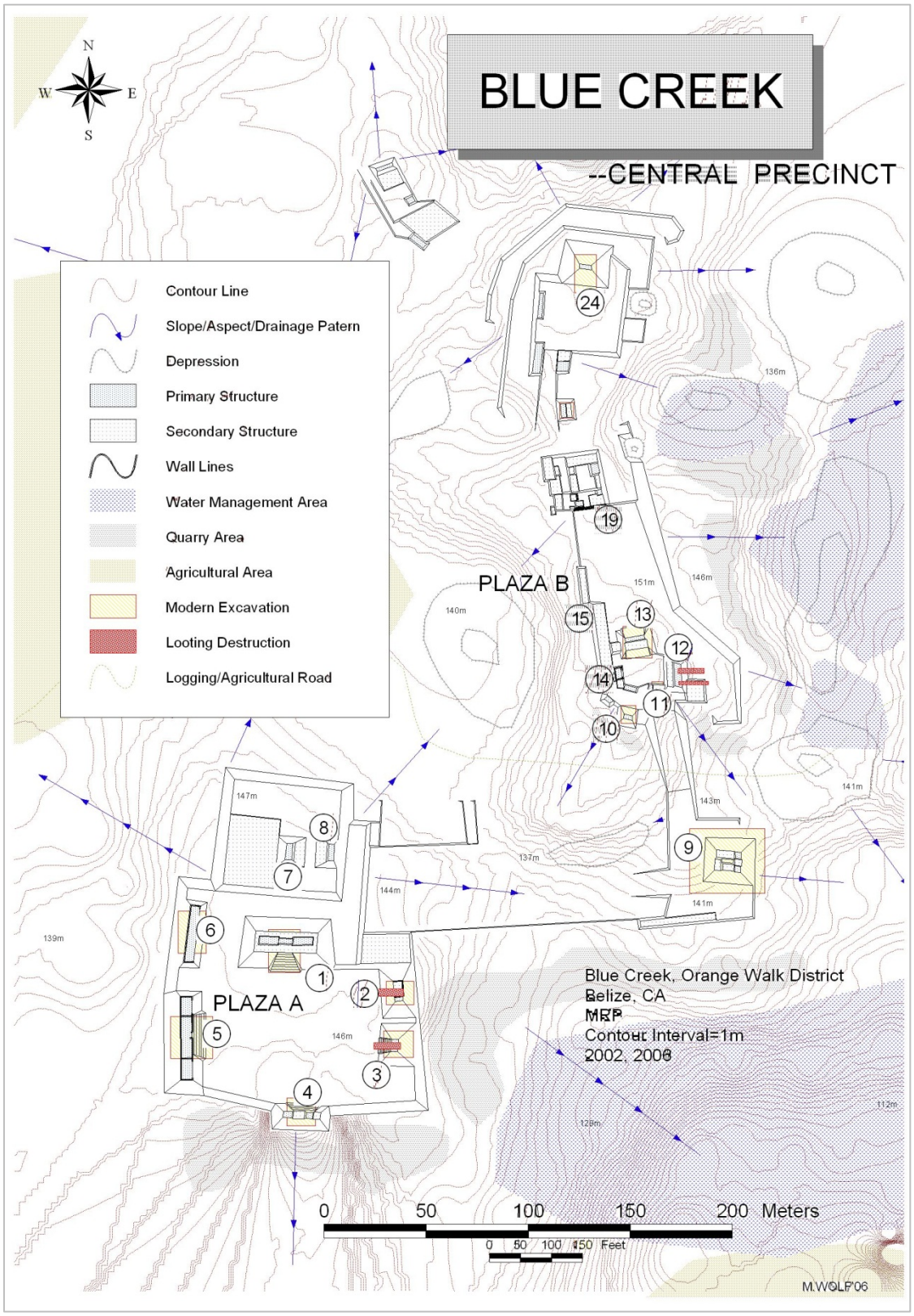

Figure 1. Map of the Blue Creek (by Marc Wolf).

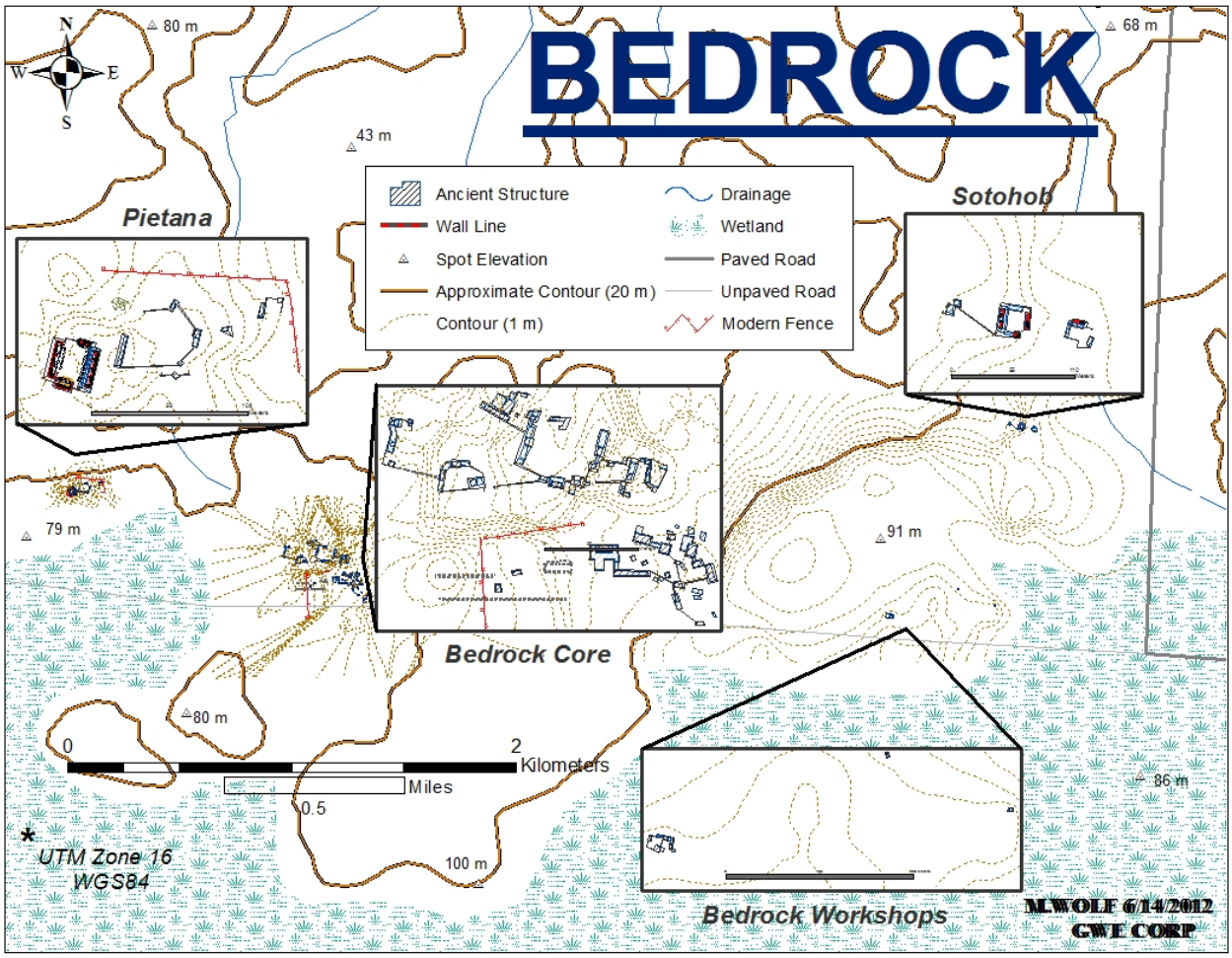

Figure 3. Map of Bedrock (by Marc Wolf).

Milpa North. I will briefly discuss each and some of their inter-relationships.

Blue Creek

Blue Creek is a medium-sized Maya center which has been studied for more than two decades (i.e., Guderjan 2004, 2007) (Figure 2). The central precinct consists of two large plazas surrounded by public buildings, includes an Early Classic ballcourt and there were once at least two stelae in the Main Plaza. Late Classic construction added a pseudo-E-Group to the Main Plaza (Guderjan 2006). Central Precinct construction was begun in the Terminal Preclassic at about AD 100/150 and continued through the early part of the Late Classic (Tepeu 1/2; AD 600-750AD) and the precinct was abandoned at about AD 800-850 at the end of the Late Classic or Early Terminal Classic period (Guderjan, Hanratty and Preston 2013).

The central precinct is set atop the Bravo Escarpment and overlooks the confluence of the Rio Bravo and Rio Azul and the wetland agricultural fields at the base of the escarpment both of which it controlled. Blue Creek certainly controlled the entrance to the Rio Azul canyon and probably the canyon itself where a complex dock and dam feature had been constructed (Barrett and Guderjan 2006).

Importantly, we have intensively surveyed more than 100 square kms. around the central precinct and documented more than a dozen residential groups that are both bounded and each distinctly different than each other (Guderjan, Baker and Lichtenstein 2003). These are generally located on the tops of limestone hills and little or no occupation is found in the bajitos between them, supporting the idea that bajitos were heavily cultivated. Our surveys give us a peak population estimate of Blue Creek

in the range of 20-25,000 persons (Guderjan and Krause 2011).

The Central Precinct at Blue Creek is the largest in an area bounded on the east by the Rio Bravo and Booth's Swamp and on the west by the Dumb-bell Bajo. Its southern neighbor is Gran Cacao, a somewhat larger site located on a lower terrace of the Bravo Escarpment and its northern neighbor is Chocoha, a somewhat smaller, but poorly known site located about ten kms. north of the Rio Azul canyon in Mexico (Guderjan, Preston, and Bedford 2002). Consequently, we see Blue Creek as the central place for the eastern portion of the NW Belize study area, controlling both wetland and upland agricultural systems and major riverine accesses in an area in the range of 100-150 sq. kms.

Bedrock

The site of Bedrock (Figure 3) is located on the north side of the Dumb-bell bajo and between the two lobes of the bajo and thus likely controlled the northern portion of this important research. While the site has been badly damaged by forest clearing, it has two large plazas with Late Preclassic initial construction and the most recent date from the site comes from a nearby tomb found during agricultural activity which contained several Terminal Classic (Daylight Orange: Darknight variety) vessels. Similarly, an important Classic period carved vessel was recovered from a bulldozed area of the main plaza (Haines 2011).

Relatively little investigation has been undertaken in the central precinct and there is not a ballcourt and no stelae exist. More effort has been invested in the associated elite residences both west and east of the central precinct on the same ridgeline (Greaves and Guderjan 2012). The eastern residences, known as Sotohob ("Site On Top of Hill Overlooking Bajo"), include large scale, Early Classic lithic workshops (Barrett 2004). Bedrock's southern neighbor, visible across the bajo, was La Milpa, which is the largest center in the area. Given the relatively small size and strategic location controlling both important lithic and agricultural resources, I strongly suspect that Bedrock was not an independent polity for most of its existence but was situated to consolidate La Milpa's control over the resources of the Dumb-bell bajo.

Xnoha

Xnoha is a small center located less than to kms. north of Bedrock. Like La Milpa and unlike other centers in the area, Xnoha is located on a high ridge without apparent proximity of critical resources such as water, agricultural land and lithics (Hammond 2009). Instead, Xnoha is located in an inter-resource area where it may have hierarchical control over communities at the margins of both the Alacranes Bajo and the Dumb-bell Bajo. Again, its relationship with Bedrock is very ambiguous. The central precinct consists of a complex plaza with a small ballcourt (Figure 4). Excavations in the residential area by Gonzalez were aimed at understanding its relationship to La Milpa with very ambiguous results (Gonzalez 2003, 2005; Gonzalez and Knippe 2004). Our current research at Xnoha is aimed at understanding its elite residential interaction with the k'u'ik, access to resources and potential role as a market as well as to compare its processes of abandonment with Blue Creek and other sites.

Alacranes Bajo Sites

The Alacranes Bajo includes parts of Campeche, Quintana Roo, Belize and Guatemala. Thanks to Ivan Spajc's decade long survey in Campeche (2008), and ours in Belize, as well as work at the site of Rio Azul (Adams 1999) we know a great deal about the area. The bajo is ringed with major and minor sites, the largest being Rio Azul at the southern end. Rio Azul is strategically located to take advantage of the adjacent floodplain and likely the nearby alluvial fan sediments created by the river dispersing into the bajo. The largest sites in Campeche include Los Alacranes, Mucaanah, Altar de los Reyes and Los Angeles along the edge of the bajo. The largest is El Palmar located somewhat distant from the bajo but it likely had hierarchical control over some of the bajo sites.

On the eastern side of the bajo, in Belize, the apparent largest site is Grey Fox, located near the Mexicon-Belize border. We have mapped Grey Fox and two of its three plazas, but no other work has been undertaken (Figure

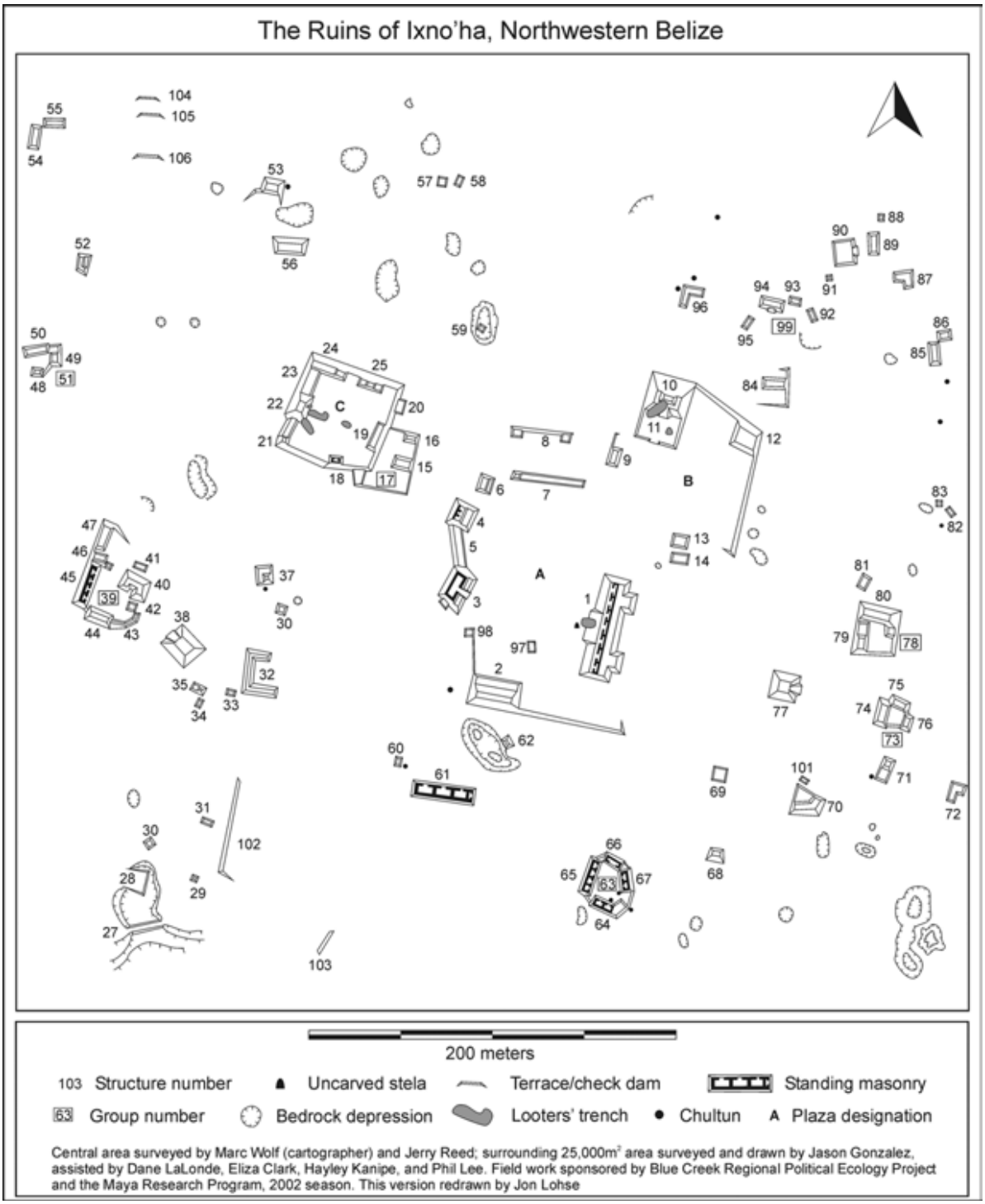

Figure 4. Map of Xnoha (by Marc Wolf, redrawn by Jon Lohse).

5). Today, the land is owned by Maya Research Program in order to strengthen government efforts for conservation.

Additionally, there are numerous other sites along the eastern edge of the bajo with small pyramids, shrines and similar central places. These include Nojol Nah, Tulix Muul, Sunnyside, La Milpa North, a site known as La Caldera, which is yet to be visited as well as other yet un-named sites (Hammond 2012).

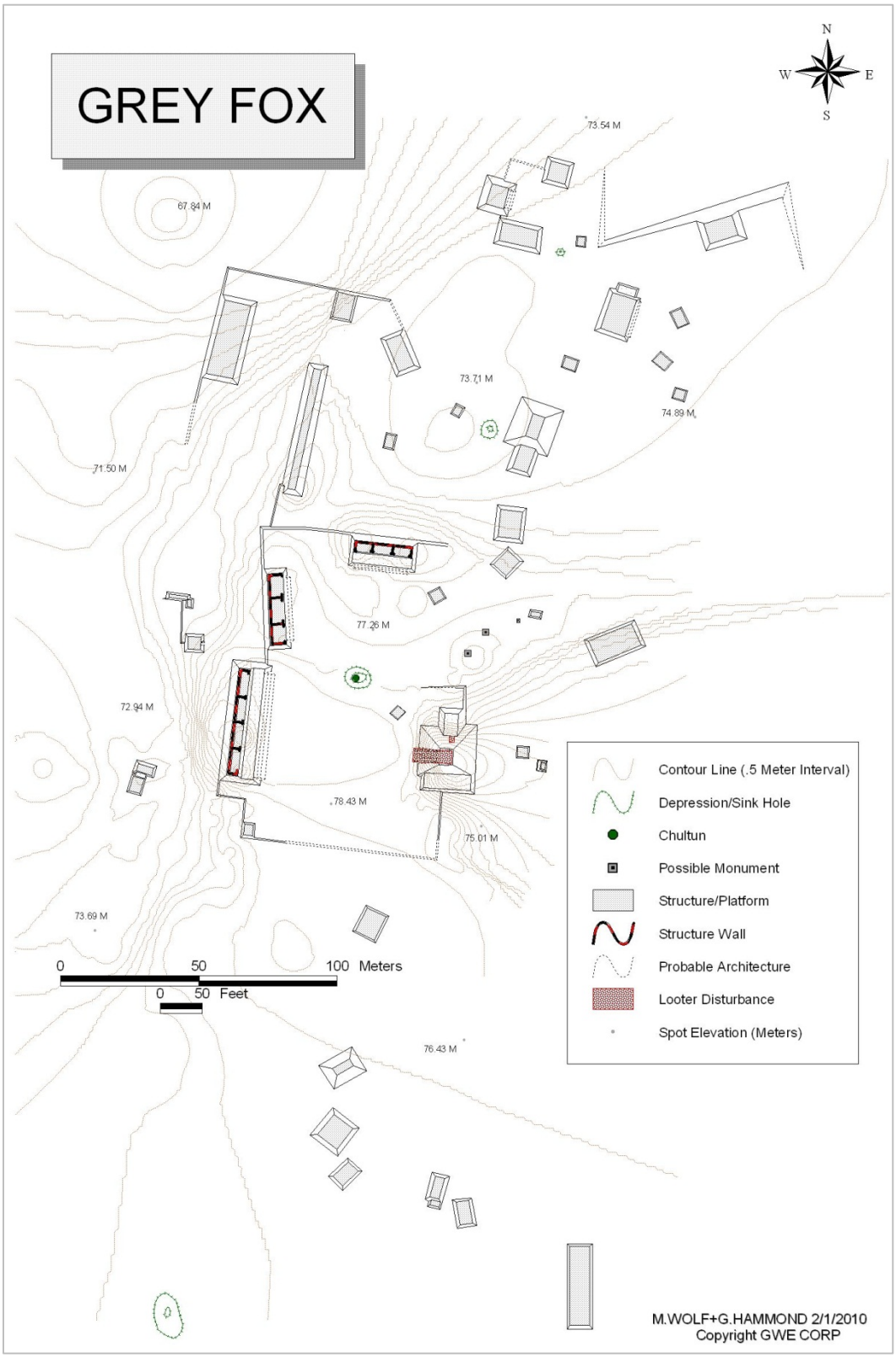

Figure 5. Map of Grey Fox (by Marc Wolf and Gail Hammond).

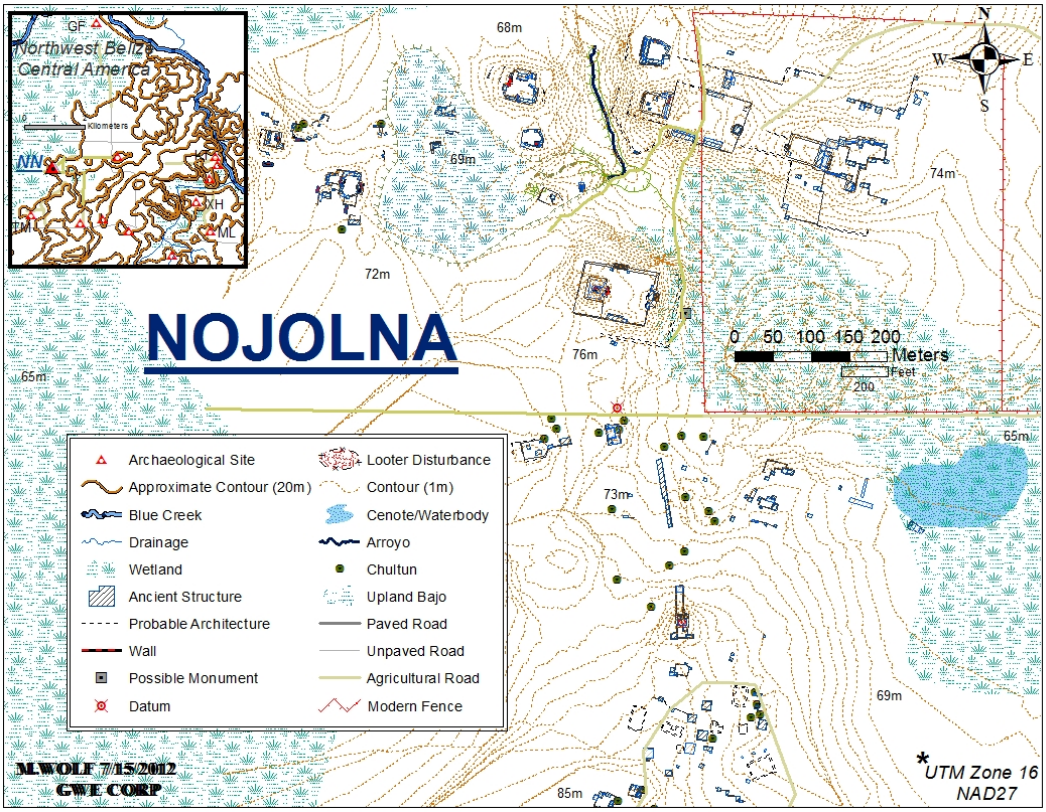

Figure 6. Map of Nojol Na (by Marc Wolf).

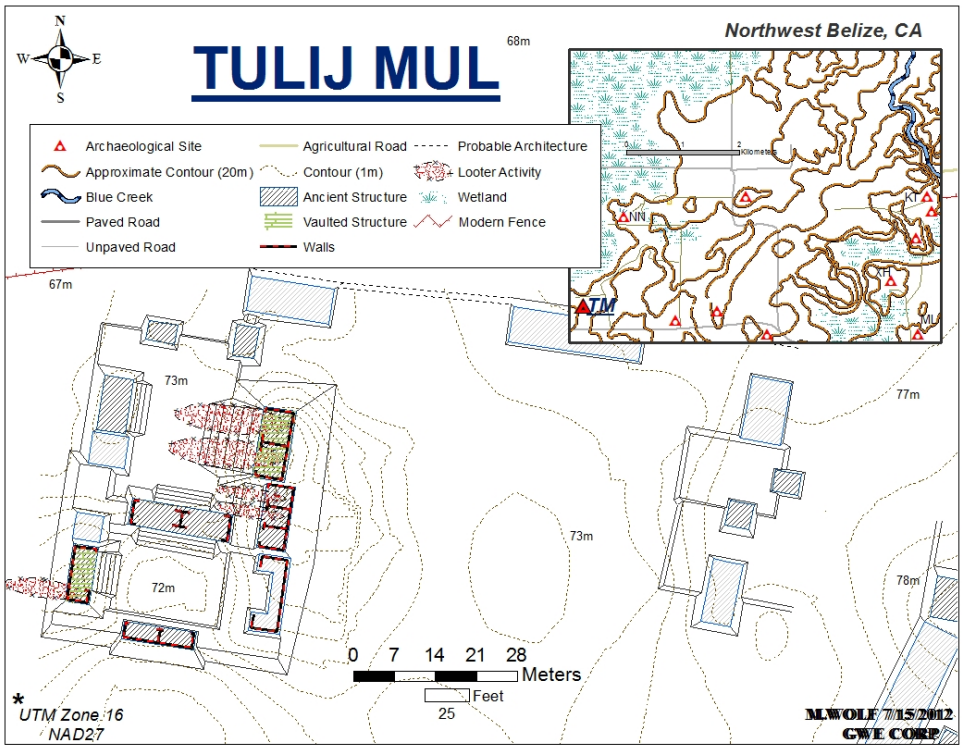

Figure 7. Map of Tulix Muul (by Marc Wolf).

Each of these had access to bajo resources such as agricultural lands and lithic resources as well as several nearby cenotes. We have undertaken several years of fieldwork at Nojol Nah (Barrett and Brown 2009; Barrett and Majewski 2010; Brown 2010, 2011; Brown and Plumer 2012) which consists of a group of elite residences surrounding an aguada and including a small plaza with a single pyramid (Figure 6). Only a few hundred meters east of Nojol Nah are a group of large lithic workshops (Barrett 2004).

Tulix Muul is a shrine group and elite residential group, less than a kilometer south of Nojol Nah, which has direct access to the Alacranes Bajo. Our efforts there, like at Nojol Nah, were begun in 2012 prompted by imminent threats to its existence by current agricultural work.

About 5 kms. south of Tulix Muul is the Sunnyside site which is organized north-south on a ridge that overlooks both the Alacranes and Dumb-bell Bajos (Figure 7). This site was known before the 2011 forest clearing and has been heavily looted. However, mapping in 2011 shows three small plazas or large courtyards. Lastly, La Milpa North, believed to be the northern outpost of La Milpa's authority by Gair Tourtellot (Heller 2011; Tourtellot, et al., 2003), is a small shrine group and elite residence (Heller 2011). In disagreement with Tourtellout, whose model does not seem to adequately integrate control over resources, I see this site as another in the bajo-centric pattern in the rest of the northwest corner of Belize. If there is a "La Milpa North", Bedrock is a much better candidate.

Summary

The purpose of this short summary was to introduce the readers to the geography and archaeology of "far" northwestern Belize and to provide context for the often confusing array of site names and places used by myself and my collaborators. While further refinements can be expected, we can now, after more than two decades of field work, be confident that we now understand the general nature of the landscapes and archaeology of the area.

Acknowledgments Many thanks to the staff of the Blue Creek Archaeological Project…past, present and future…for their efforts which have been too briefly summarized here. Special thanks to Samantha Krause who generated Figure 1 and Marc Wolf, whose tireless (and windshield-less) efforts generated the site maps used as illustrations here. Figure 4 (Xnoha) was modified from its original form by Jon Lohse. I also wish to express my appreciation for the close relationship we have with the staff of the Institute of Archaeology, especially Dr. John Morris and Melissa Badillo with whom we work most closely. And, if not for the support of the community of Blue Creek, we could not carry on this effort.

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23 RETURN TO THE KINGDOM OF THE EAGLE: ARCHAEOLOGICAL INVESTIGATIONS AT NIM LI PUNIT, BELIZE

Mikael Fauvelle, Chelsea R. Fisher and Geoffrey E. Braswell

Since 2010, the Toledo Regional Interaction Project (TRIP) has conducted excavations at Nim li Punit, Belize. Our goals are to better understand how the various sites of the Southern Belize Region interacted, to develop detailed chronologies for three of the sites (Pusilha, Lubaantun, and Nim li Punit), and to excavate and consolidate structures. At Nim li Punit we are particularly interested in understanding the structure of the royal court and the activities conducted in different buildings in the palace. Excavations conducted in 2012 focused on two platforms: Structure 7 and Structure 8. Structure 8 was built and expanded in four stages beginning in the Early Classic and was used into the Terminal Classic period. Its architectural configuration and the lack of kin-group related offerings suggest that it functioned as a council house. Structure 8, in contrast, was built in at least two stages (perhaps more) and served as the royal residence. Numerous offerings—including tooth caches—in the Late to Terminal Classic addition tie it to one lineage or family. An important Early Classic burial also was found in Structure 8. Among its content are three slab-footed tripod vessels of a form linked, most likely indirectly, to Teotihuacan.

Introduction

Southern Belize is one of the most fascinating regions in the Maya area (Figure 1). In a relatively small area circumscribed by the Maya Mountains to the north and west, by infertile pine ridge to the east, and by swampy lowlands to the southwest, five important centers thrived during the Late Classic period. Uxbenka was the first of these communities to be settled at the end of the Late Preclassic. Nim li Punit was first occupied sometime in the Early Classic period, and during the 6th century A.D. the Maya city of Pusilha was founded by settlers with strong ties to the southwestern Peten. During the 8th century, Lubaantun, and Xnaheb also were occupied. During the Late Classic period, the rulers of all five sites commissioned carved monuments containing hieroglyphic texts glorifying their actions. Two things stand out: first, how could so many sites each with divine and seemingly independent kings be packed into such a small area? Second, why is it that the numerous hieroglyphic texts of these sites do not contain even one clear reference to another known site within the region?

In 2009, we formed the Toledo Regional Interaction Project (TRIP) out of the previous Pusilha Archaeological Project in order to try to answer these questions and to understand better how the sites and their constituent polities functioned together as a region (Braswell 2010; Braswell et al. 2011a, 2011b; Fauvelle et al. 2012). After eight years of work at Pusilha, we have concentrated the last four seasons at

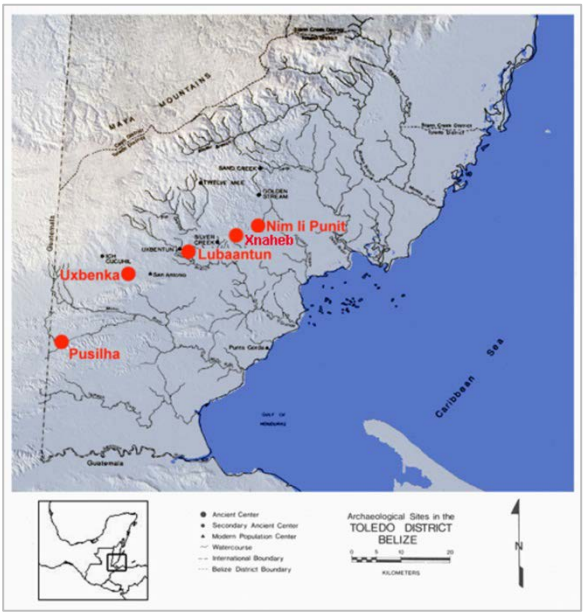

Figure 1. Location of principal sites in the Southern Belize Region (after Leventhal 1990:Map 8.1).

Lubaantun and Nim li Punit, where we have conducted horizontal excavations in important structures and also consolidated them (Figure 2). Our chapter in this volume discusses one theoretical aspect of our work—the comparative study of Maya palaces—and focuses on research conducted in 2012 in the Classic royal palace compound of Nim li Punit. We stress the identification of the function of buildings within the palace compound, a process that is not always obvious or easy, and speculate about what building function might tell us about political organization. Along the way, we

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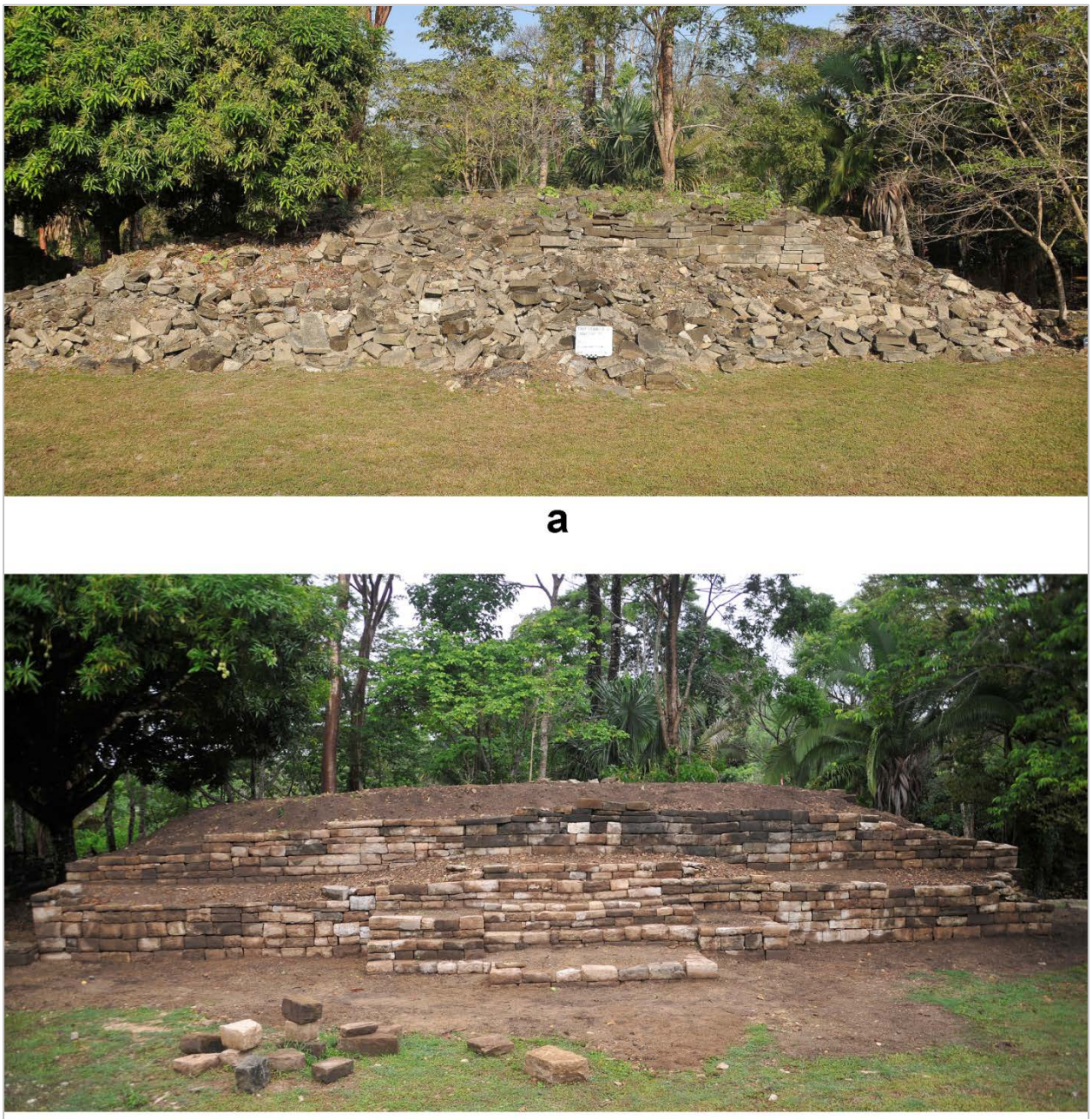

Figure 2. Lubaantun Structure 34 before excavation and after consolidation.

update our discoveries at the site, both those made in the field and in the laboratory.

Maya Palaces

In the late 1980s and 1990s debates about the centralized versus decentralized nature of Maya polities dominated our discipline. Now that the dust has settled, many survivors of this debate are happy to acknowledge that there may have been as many different kinds of Maya states as there were Maya states. The architecture of power—specifically, of the palace—should give us some clues about the different ways Maya polities were organized

(Barrientos 2011; Christie 2003; Christie and Sarro 2010; Evans and Pillsbury 2009; Inomata and Houston 2001a,b).

Group 10L-2 of Copan, the palace compound of the last king of that site, looks like an elaborate version of a typical Maya house group organized around a patio (or, in this case, two patios; Figure 3a). In comparison, the immense acropolis-style palaces of sites like Tikal, Palenque (Figure 3b), and Calakmul seem to suggest that palace life at those cities was much more complicated, specialized, and further removed from everyday household life than at Copan. These two kinds of palaces—the elaborate household group and the acropolis style—are found throughout the southern Maya lowlands. If form follows function, it is reasonable to think that different types of palaces reflect differences in the constitution of the royal court, the kinds of activities conducted by that court, and even the structure and organization of the polities run from the palace.

Lubaantun has a small acropolis-style palace just south of—and perhaps including—Structure 33. On Hammond's (1975) map (Figure 4), this acropolis appears to be a plain platform, but it is in reality a complex set of rooms and corridors. Hammond realized that this could not be adequately mapped without further excavation, and hence depicted it simply as a platform.

Nim li Punit, in contrast, has a habitation group-style palace in the South Group above and just west of the Stela Plaza (Figure 5). Today it is called the Plaza of the Royal Tombs because of three collapsed tombs that were investigated in the 1980s and 1990s. The most elaborate of these—Tomb 1—contained the bodies of four to five individuals, some 39 ceramic vessels, jade diadems, stingray spine fragments, and other objects associated with kingship. Tomb 1 is located in front of Structure 5, a small eastern shrine. This is a household pattern quite commonly found in much of Belize and the eastern Peten and associated with ancestor worship. Tombs 2 and 3 were found partially under the steps of Structure 8, a 37.5 m long by 7.6 m wide range structure of a sort not seen elsewhere at the site. Also noteworthy is Structure 7, a large platform that is roughly square in plan, located at the north end of the courtyard and associated with two small outbuildings. Our goals in 2012 were to excavate Structures 7 and 8 in order to determine their functions within the habitation group-style palace of Nim li Punit. Before turning to that topic, however, we update some important chronological discoveries and our current understanding of the political history of Nim li Punit.

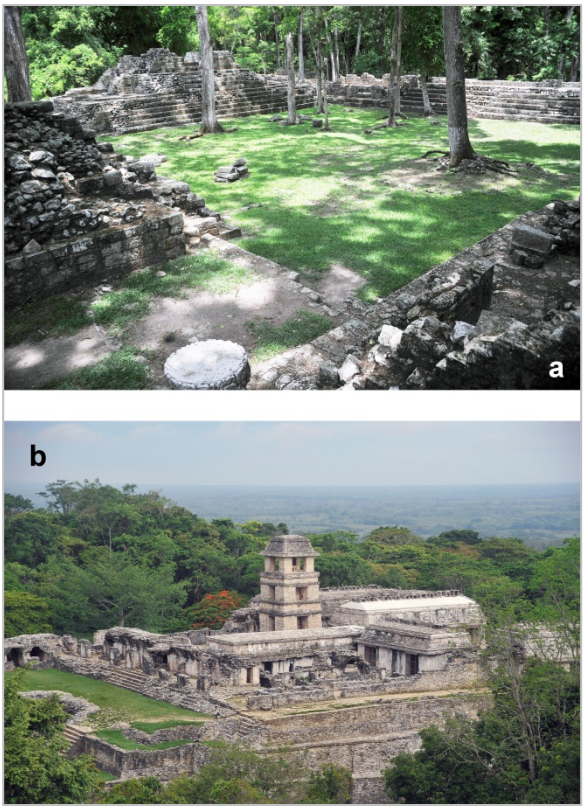

Figure 3. Two Maya palaces: (a) Copan Group 10L-2; (b) Palenque acropolis.

Nim li Punit Chronology and History

In 2011, we presented results of our analysis of pottery recovered from 17 test pits at Nim li Punit (Fauvelle et al. 2012). This work resulted in a preliminary typology and two-phase chronology for the site. We drew chronological conclusions chiefly from test pits in the West Group where we could clearly distinguish an earlier stratigraphic context from a later one. The earlier complex is characterized by—among other things—significant quantities of locally produced Hondo Group ceramics and imported Belize Red. In contrast, the later phase is characterized by crudely made utilitarian pottery

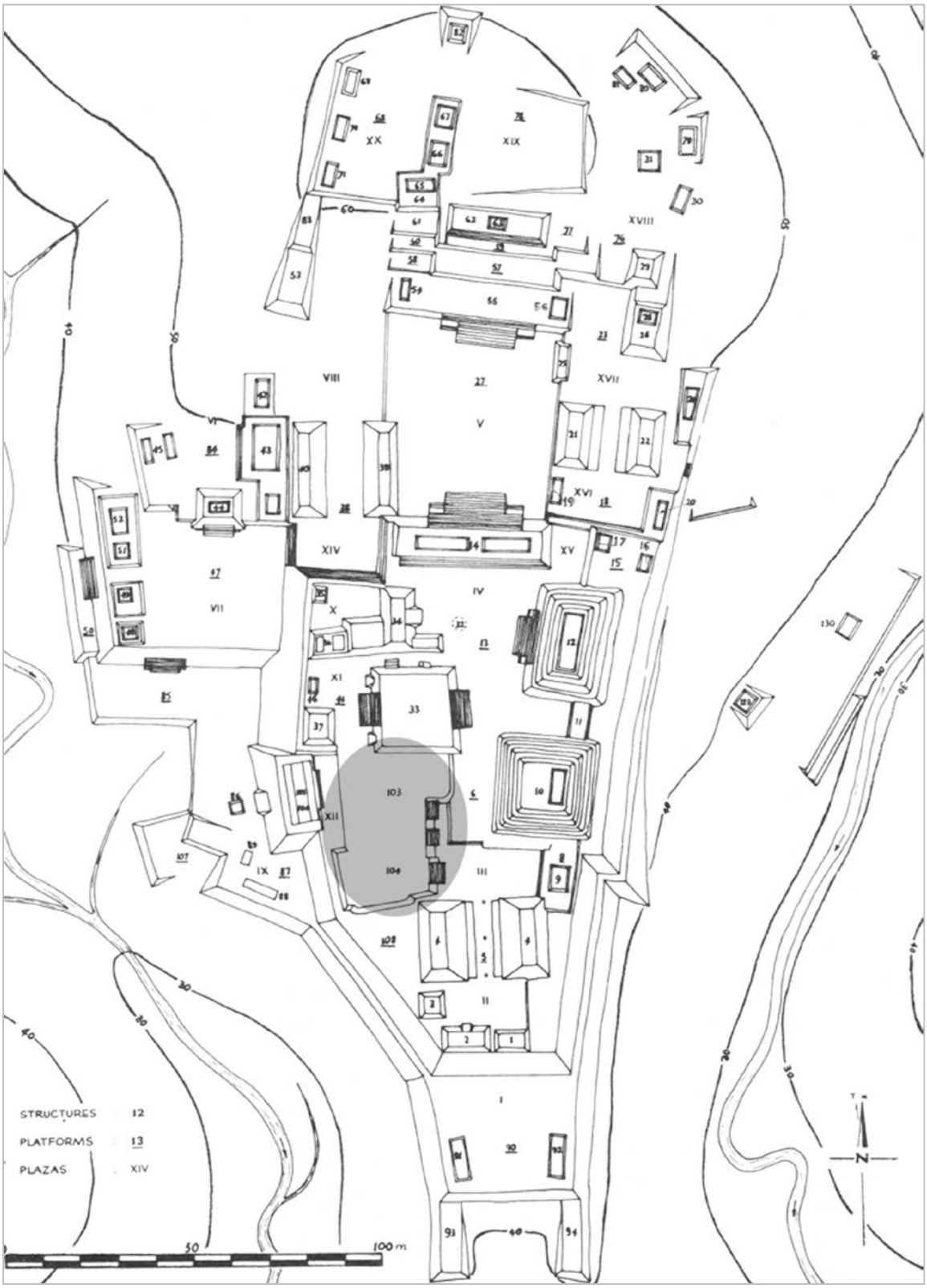

Figure 4. Location of palace at Lubaantun (after Hammond 1975).

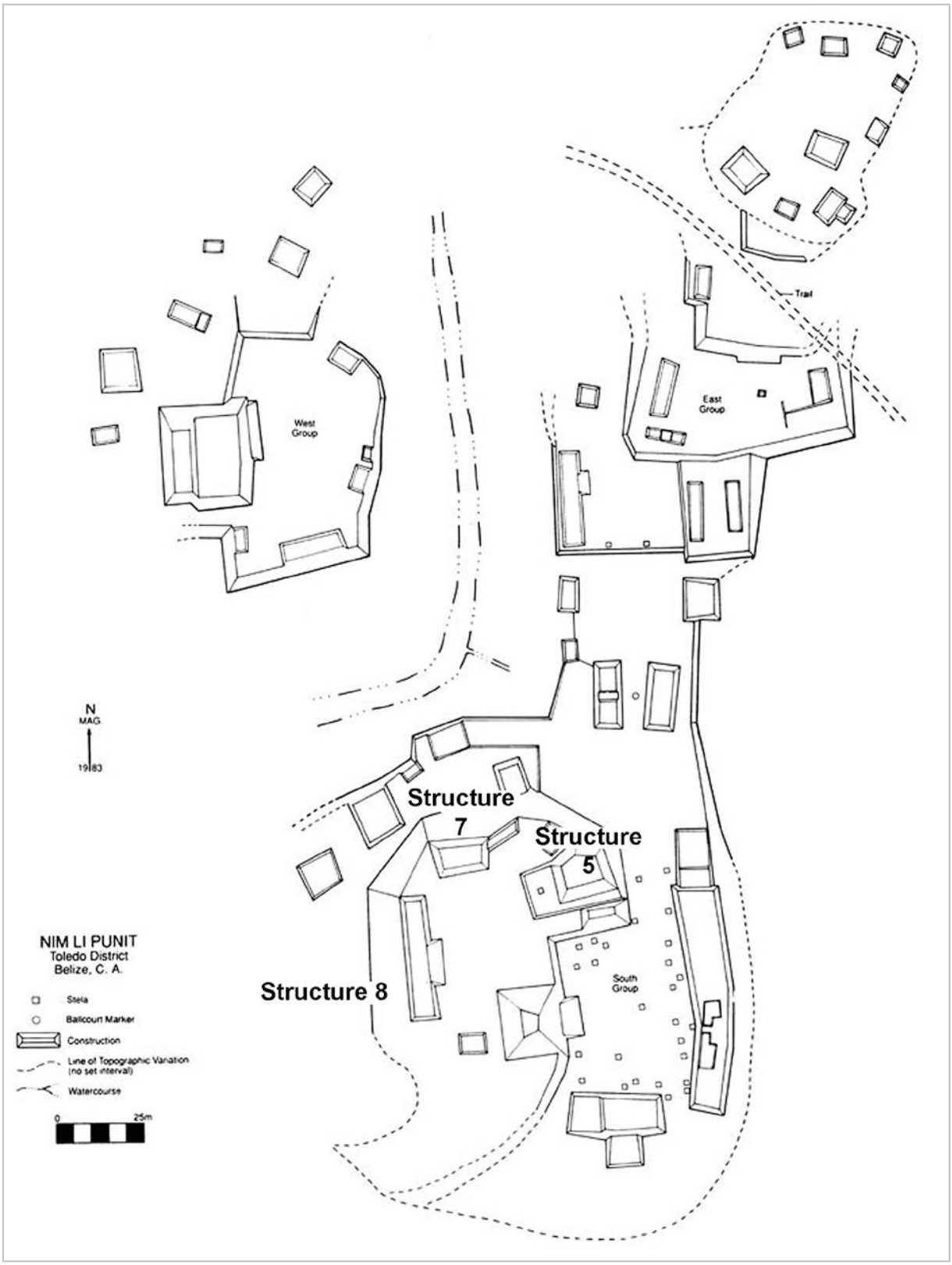

Figure 5. Map of Nim li Punit, showing Structures 5, 7, and 8 of the Palace Group (after Leventhal 1990:Map 8.2).

(very little of which is slipped) and trace amounts of Fine Orange super-system pottery. We now tentatively date the later complex from the West Group to the late facet of the Terminal Classic (AD 830-850/900) and the earlier complex to the Late Classic and early facet of the Terminal Classic period (AD 600-830). We hope soon to be able to divide this 230-year period into two phases.

Much pottery excavated in the South Group in 2012 can confidently be dated to the Late and early Terminal Classic. We also have identified a vibrant Early Classic component both in fill and in primary contexts. Thus, we are now working on a three-phase ceramic chronology for a site that seems to us to have been occupied roughly from about A.D. 400 to 850/900.

Most of what we know about the political history of Nim li Punit—which is not much—comes from its eight carved monuments with hieroglyphic texts. Three issues strike us as especially noteworthy, and have either been overlooked or underemphasized in the past.

First, the eight hieroglyphic monuments of Nim li Punit have dedicatory dates of A.D. 721-831, but they are not spread evenly over this 110-year period. Instead, carved monuments were erected in two short bursts separated by a long interregnum. Four early monuments have dedicatory dates spanning A.D. 721-741. If we consider the latest historical date on a monument to be its earliest possible carving date, the temporal range of these monuments is less: A.D. 734-741, that is, just seven years. The second burst of monument carving took place during the early Terminal Classic period, A.D. 790-831, so there is a period of 50 years when no carved monuments were erected. What happened at Nim li Punit—and at other nearby sites—during the hiatus between these two periods of monument erection? A clue may be found at nearby Xnaheb. There, the only dated monument was erected in A.D. 780 (Wanyerka 2003), during the Nim li Punit hiatus. It may be that Xnaheb directly or indirectly profited from a decline in the fortunes of the Nim li Punit lords, or—to speculate even more—that the dynasty and some of the population moved to Xnaheb during the middle of the 8th century. Careful and precise analysis of ceramics from Xnaheb might help evaluate the hypothesis that it thrived as an important place only during this 50-year interval.

Second, the "Ek Xukpi" or "Black Leafnosed Bat" title that is so well known at Nim li Punit is limited just to the early set of monuments, in fact, to monuments carved between A.D. 734 and 738. Xukpi, of course, is the main sign of the Copan emblem glyph. Wanyerka (2003) has used the presence of this title to argue for the involvement of Nim li Punit in a Copan-centric hegemonic political structure. The full title "Ek Xukpi Ajaw," however, was never used at Copan. It was employed at Quirigua by the king Kak' Tiliw Chan Yopaat who captured and killed the 13th ruler of Copan (Looper 1995). What is particularly fascinating to us and what has gone unnoticed is that this title makes its *first* monumental appearance at Nim li Punit and does not appear at Quirigua until more than a decade later. Moreover, the last appearance of the Ek Xukpi title at Nim li Punit was written in A.D. 738, the same year that the Copan king was killed by his rival at Quirigua. This may be meaningful or it may be a simple coincidence. Either way, there is no unambiguous claim to a tie between Nim li Punit and either Quirigua or Copan any time before or after the four-year period of A.D. 734-738, when Nim li Punit discussed individuals who used this title.

Third, it is intriguing that both Nim li Punit and Quirigua first employed emblem glyphs in A.D. 734, even though they both had significant Early Classic occupations. In contrast, the last firmly dated use of an emblem glyph at the great southern Belize site of Pusilha was A.D. 731 (Stela U and the Hieroglyphic Stair employ the Pusilha emblem glyph in undated—and possibly later—contexts). Thus, the appearance of divine kings at Nim li Punit may be somehow related to a decline in power of nearby Pusilha and perhaps as well to the rise of more distant Quirigua. What is clear is that the 730s were a dynamic time when established cities like Copan and Pusilha saw downturns and new, smaller sites like Quirigua and Nim li Punit employed royal titles for the first time.

Nim li Punit Structure 8: The Council House

Structure 8 is a long and narrow range structure stretching the entire length of the west side of the Palace Group (Figure 5). The platform has a complex construction history comprised of at least four stages (Figure 6). Each of these stages preserved the same basic design of the structure. The earliest ranging platform was built in the northwest corner of the plaza. It was first enlarged a couple meters south and east by expanding the platform in those directions during Stage 2. This expansion seems to have been motivated by the collapse of part of the east and south walls of the Stage 1 platform. The width of the Stage 2 platform was 7.6 m, and would not be increased in later stages. Next, during Stage 3 the platform was significantly expanded southward to a length of 19.6 m. Thus, the Stage 3 structure ran about half the length of the plaza edge. Finally, the Stage 4 structure encased Stage 3, but left much of the northern portion of Stage 2 and even the north wall of Stage 1 exposed. The final platform is 37.5 m long. It is important to stress that until Stage 4, the southern half of the western edge of the plaza was not incorporated into Structure 8. We strongly suspect that beneath a huge fig tree growing on the southern half of Structure 8 there might be found the remains of a separate early structure that was later engulfed and built over by the Stage 4 expansion. Tombs 2 and 3—which are not aligned with Structure 8 and which were built over in part by the last construction stage—seem to pertain to this other buried structure rather than to Structure 8 itself.

Despite the complex architectural history of this important building, the artifacts we have recovered from it are all from fill or surface contexts. We could find no caches either on the centerlines or at the corners of various construction stages. We found no middens or accumulated garbage at the base of any construction stage. We also found no burials either within or in front of Structure 8, and again, we think Tombs 2 and 3 pertain to a different building. The lack of middens, burials, and caches—albeit negative evidence—suggests that Structure 8 supported neither a temple nor a house, but instead served a different function. One strong possibility is that it was a council house, called *popol nah* in the northern lowlands and *nimja* in the Maya highlands during the Postclassic period. Popol nahs were buildings where people met to discuss and make decisions on the issues of the polity or lineage. At Postclassic centers they were defined on the basis of great house or lineage. They were the physical manifestations of group identity and decision-making rather than of centralized and hierarchical authority. The ethnohistorical literature also indicates that they served as men's houses and as the location for the storage of important ritual objects (Bey and May Ciau n.d.).

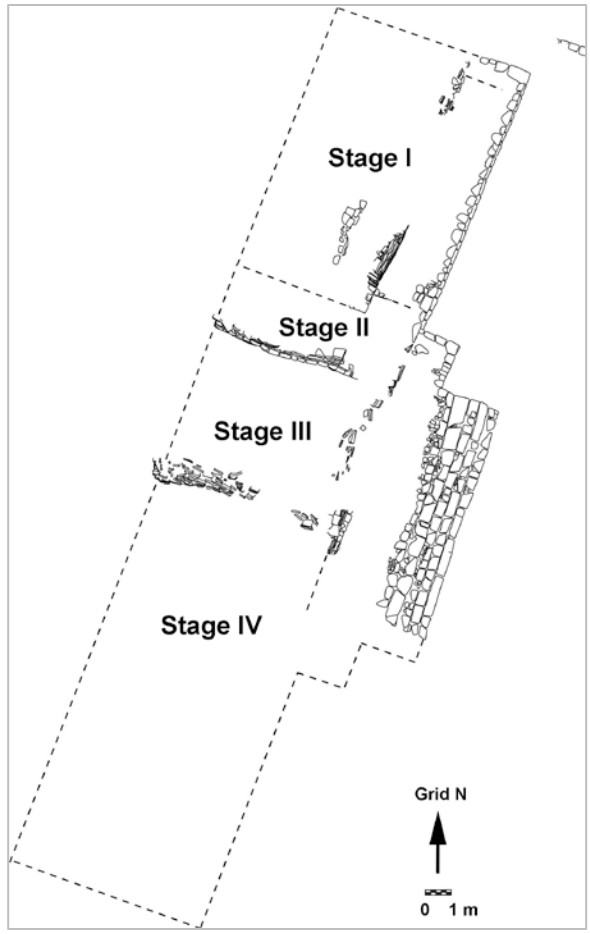

Figure 6. Plan of Structure 8, Nim li Punit.

The most famous Classic period *popol nah* is Structure 10L-22A of Copan, built in A.D. 746 during the reign of the 14th king. It is an anomalous example in many ways, but it does share a few characteristics with many other examples known from the northern lowlands and southern highlands. Chief among these is the

use of multiple doorways as entrances to a single, long room. These doorways are thought to represent the different constituencies represented in the council house. Beyond Copan, *Popol Nahs* typically have a single long bench running the length of the back wall, and many also have benches on the sidewalls. Other important characteristics *of Popol Nahs* are large landings at the top of the steps or incorporated into them, and the very long yet narrow form of the range structure (Bey and May Ciau n.d.). Because the superstructure of Structure 8 was made of perishable materials, we will never know how many doors it had or if it had a single, long bench. It does, however, have an exceptionally large landing at the top of the stair and has dimensions in the range known for Late Classic *popol nahs* in the northern Maya lowlands.

Nim li Punit Structure 7: The Royal Residence

The function of Structure 7 is clearer. This platform supported the royal residence of Nim li Punit. Our argument is based on the architectural form and elaboration of the platform, its articulation with two outbuildings, and the number and kind of caches found within it.

Structure 7 was built in at least two major construction stages that we can date to the Early Classic and Late Classic/early Terminal Classic periods (Figure 7). But we need to excavate more into the core of the platform to see if there are other stages. The Stage 1 structure was a simple ranging platform facing south. On top, a low superplatform supported the house of the Early Classic ruler. During the Late Classic or at the beginning of the Terminal Classic period, the platform was expanded in front—yet at the same time narrowed—in a complex way involving staggered corners and stair-side outsets. The most curious feature is the incorporation of a partially inset stair on the west side of the building. There is also evidence of a similar stair on the east and still unexcavated side, leading down to a small courtyard and two outbuildings that could have been kitchens, storage rooms, or subsidiary domiciles. A larger superplatform with a step or landing in front of it was added to Structure 7 during the Late to early

Figure 7. Structure 7, Nim li Punit: (a) during excavation; (b) after consolidation.

Terminal Classic period. The floor of the superplatform itself was made of paving stones. The multiple stairs—on three sides—of different sizes are not consistent with a function as a temple. The articulation on the east with small outbuildings is consistent with a residential function. Finally, the large number and nature of caches found in the Terminal Classic construction phase—as well as an interesting Early Classic elaborate crypt—are consistent with a house.

Just east of the centerline of the final stage structure and beneath the flagstone floor, we found a simple, roofless crypt measuring about 2 m to a side. Within this crypt were three imported Belize Red vessels in Late to Terminal Classic forms, scattered redeposited human remains (including teeth with jade inlays, mandible fragments, and part of a leg), a vessel containing numerous stringray spines, other bloodletters made of both El Chayal and Ixtepeque obsidian, a red-slipped bowl on top of

Figure 8. Three slab-footed tripod vessels from the Structure 7 elaborate crypt burial.

a plate, a flute made of bone, a ceramic flute, a broken jade bead, two ground beads made of carnivore cheek-teeth (probably a large feline), a fragment of *Spondylus* worked to make beads, a bone needle and other carved bone tools that are possibly associated with women, a broken stone biface made of imported chert, numerous slate fragments, and a variety of animal bones suggesting either feasting or the deposition of food in the crypt. Outside of the crypt proper we found two clear tooth caches in partial vessels, a third concentration of teeth, a single phalanx in a partial bowl or plate, a second bowl with phalanges, a fragment of a gadrooned Belize Red vase, a near complete red-slipped plate, and at least two small strings of shell beads painted green.

The concentrations of human teeth—both inside and outside the crypt and within vessels or without them—suggest ancestor veneration and strongly indicate that Structure 7 was a house. At Pusilha, the Operation 3 structure contained an extended burial (Bu. 3/1) with two associated tooth caches, one in a plate and one placed east of the head of the principal individual. Strontium isotope analysis reveals that at least one set of cached teeth was not local, and it is possible that the principal individual also came originally from a place other than Pusilha (Pitcavage and Braswell 2010). This suggests that the practice of caching teeth might have occurred as a way of moving ancestors when changing house location or moving site to site.

Also at Pusilha, the Operation 6 structure contained a very similar crypt with a tooth cache (and some maxillary bone fragments), *Spondylus* shell, a jade bead, a pyrite and slate mirror, elaborate shell ornaments, hematite, four vessels both within and outside the crypt, and two batons that seem to be badges of rank (Braswell et al. 2007). Many of these items are duplicated in the crypt at Nim li Punit. Both of the Pusilha deposits—with a set of three tooth caches among them—were found in houses, one of them at the heart of the royal acropolis. An additional example of a tooth cache associated with a house was excavated at Lubaantun by Norman Hammond (1975), and the yet another has been found at Uxbenka in a domestic context (Willa Trask, personal communication 2012). Thus, including the new examples from Nim li Punit, we now have eight to nine identified tooth caches in the southern Belize region. This caching pattern is not widely reported elsewhere in the Maya area, suggesting it may be a regional tradition. Most importantly, all known examples come from probable house platforms, reinforcing our identification of Structure 7 as the royal residence of Nim li Punit.

Immediately below and south of these Late to early Terminal Classic caches and incorporated into the Early Classic platform of Structure 7, we located a small elaborate crypt covered by six capstones. This tomb had been reopened, probably during the construction episode in the Late to early Terminal Classic period. Most skeletal elements had been removed, and we suspect that one of the tooth caches re-deposited above could be from the individual who once lay in the tomb. We did find a couple of small, green-painted shell beads in the tomb, strongly suggesting that the beads deposited in the Late to Terminal Classic fill originally came from this context and were moved. Immediately outside of the tomb was a large plate of the type Dos Arroyos Orange-Polychrome. Inside the tomb proper were four whole vessels, three of which are still completely intact. These are a simple and crude bowl placed over the knees and thighs of the buried individual and three slab-foot tripod vessels of a form linked to Teotihuacan and dating to the Early Classic period (Figure 8). The contents of the two black vessels included small faunal bones, three tiny mandible fragments, charcoal, and—in one vessel—an obsidian bloodletter and two pieces of chert. We also found this chert eccentric and two large cowrie shells near the three tripods. The opening, resealing and re-consecration of the tomb, as well as the redeposition of materials found in it are consistent with ancestor worship and also support the notion that Structure 7 was the house of the leader of Nim li Punit during the Early, Late, and early Terminal Classic periods.

Conclusions

The first season of our study of the Plaza of the Royal Tombs at Nim li Punit has generated data regarding ceramic chronology, the political history of Nim li Punit, the growth of royal power, the construction sequence of the palace complex, the function of buildings, and even has provided some insights into the nature of political organization. First, we now have a working three-phase ceramic chronology corresponding to the Early Classic, the Late Classic to early Terminal Classic, and the late Terminal Classic periods, a period of about 400-450 years. Second, the hieroglyphic monuments seem to indicate two short bursts of royal activity separated by a 50-year hieroglyphic hiatus. The Terminal Classic construction stage that we identified in the royal residence might correspond to the second burst of stelae erection. Third, we have identified Structure 7 as the residence of the king and argue that Structure 8 probably was a council house. The long and complex construction history of this structure suggests continuity in function perhaps even during the Nim li Punit hiatus. Finally, the presence of a council house in this elaborate household-group-style palace complex is consistent with the notion that decision making processes and governance were more decentralized at Nim li Punit than at other more hierarchically organized Maya sites lacking council houses and having acropolis-style palaces.

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24 SHIFTING DYNAMICS AND USE OF SPACE AT UXBENKÁ

Amy E. Thompson, Claire E. Ebert and Keith M. Prufer

The Classic Period Maya site of Uxbenká has a dispersed settlement system extending over 4km^2 with almost 60 documented household groups. Excavations at three large settlement groups (Group L, SG 25, and SG 37) suggest changing functions of large residential and administrative compounds during an 800 year occupation. We explore the variation between architecture and assemblages in each group. Shifting use of residential to public space, along with various landscape alteration and construction are also considered in the context of agricultural potential, water availability, and viewshed. Comparisons may demonstrate chronological, functional, or wealth differences between household groups, perhaps related to proximity to the elite site core.

Introduction

Variations between artifacts and architectural features within households can indicate differentiation in social status and power within a community. This paper examines three ancient household groups from throughout the Classic period (AD 250 – 900) site of Uxbenká, in the Toledo District of southern Belize. By comparing the architectural features and material goods present in domestic areas, we can examine the ways in which the social status of households changed over time in relationship to household function, why certain households were able to gain and maintain power over others, and the dynamic nature of relationships between households at the site. Uxbenká is an ideal area for studying the development and continued presence of social hierarchies, as it is the earliest and longest-occupied Maya center in southern Belize, with evidence of occupation from the Late Preclassic (BC 400 – AD 250) up through the Terminal Classic (AD 800/900 – AD 1000).

Uxbenká is a mid-sized Classic Maya polity, located in the foothills of the Maya Mountains in southern Belize. It is geographically circumscribed by the Maya Mountains to the west, pine barrens to the north, the Caribbean Sea to the east, and swampy bajos to the south. Nearby Maya centers in southern Belize include Pusilhá, Lubaantun, Nim Li Punit, and Xnaheb, situated roughly along a southwest to northeast axis running along a fertile upland ridge (Figure 1). Investigations into the political and economic interactions between the Maya polities of southern Belize are currently being undertaken by various

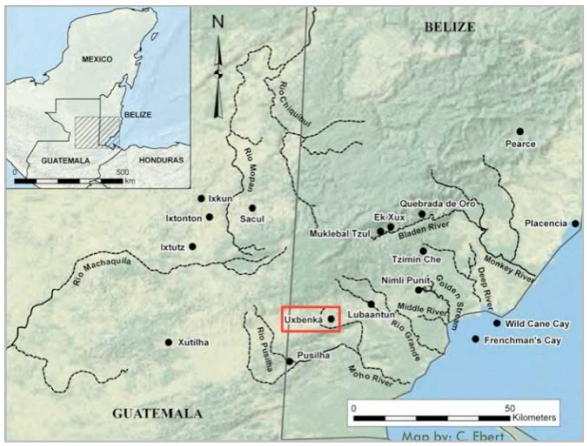

Figure 1. Map of the southern Belize region with the location of Uxbenká.

archaeological projects (Braswell and Prufer 2009). The spatial relationship between these sites, a shared carved stela traditions, their associations with distant centers (such as Tikal during the Early Classic), and similarities in architecture (e.g., lack of corbel vaults) suggest similar histories (Leventhal 1990, 1992; Braswell and Prufer 2009). Nevertheless, differences in ceramic assemblages and density of architecture in site cores have been suggested by Braswell and Prufer (2009) and others (Fauvelle 2012) to indicate a general lack of political affiliation between these sites.

While southern Belize has yielded Archaic Period artifacts, the earliest evidence of settled villages in the region is found in the Middle Preclassic (1000 BC – 400 BC) phase at Uxbenká (Prufer et al. 2011). Evidence of human occupation is present in paleosols of agricultural fields dating to the Middle Preclassic (Culleton 2009, 2010). Small household platforms were present at Uxbenká in

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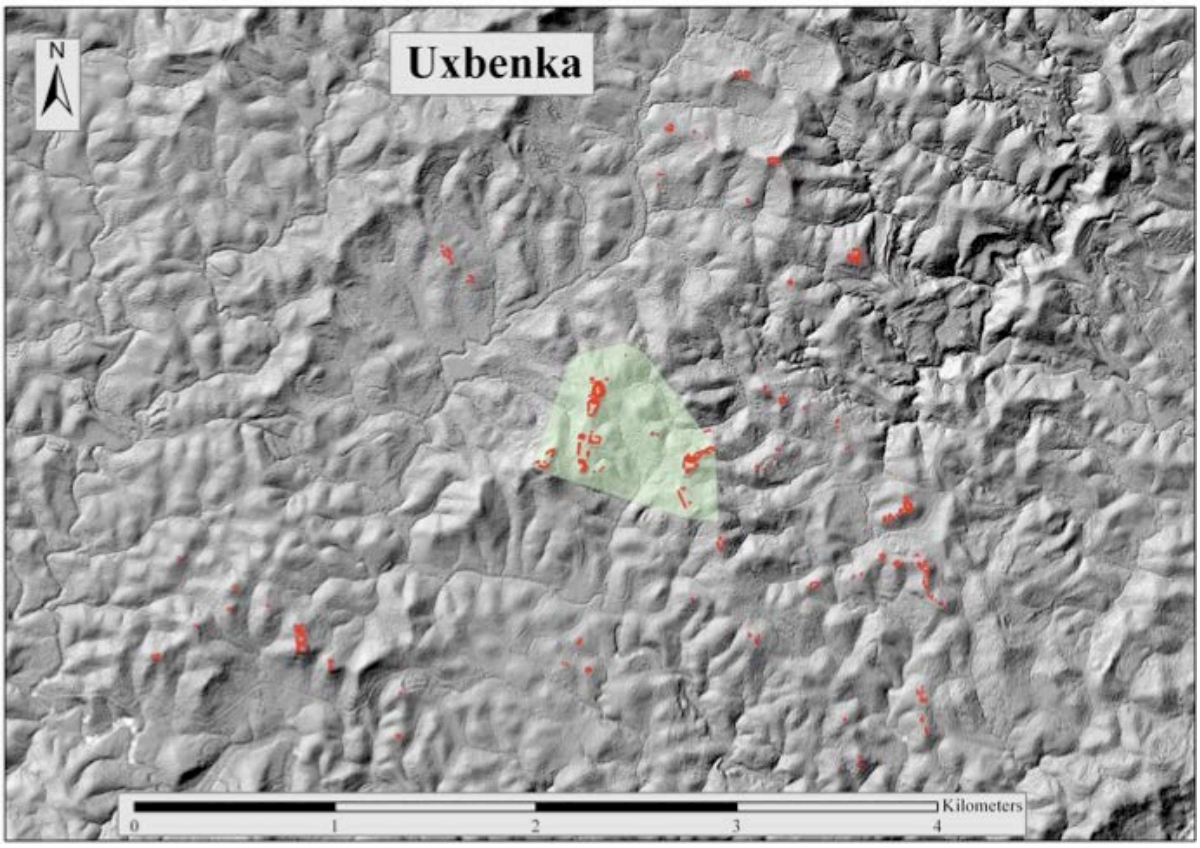

Figure 2. Location of settlement groups associated with Uxbenká.

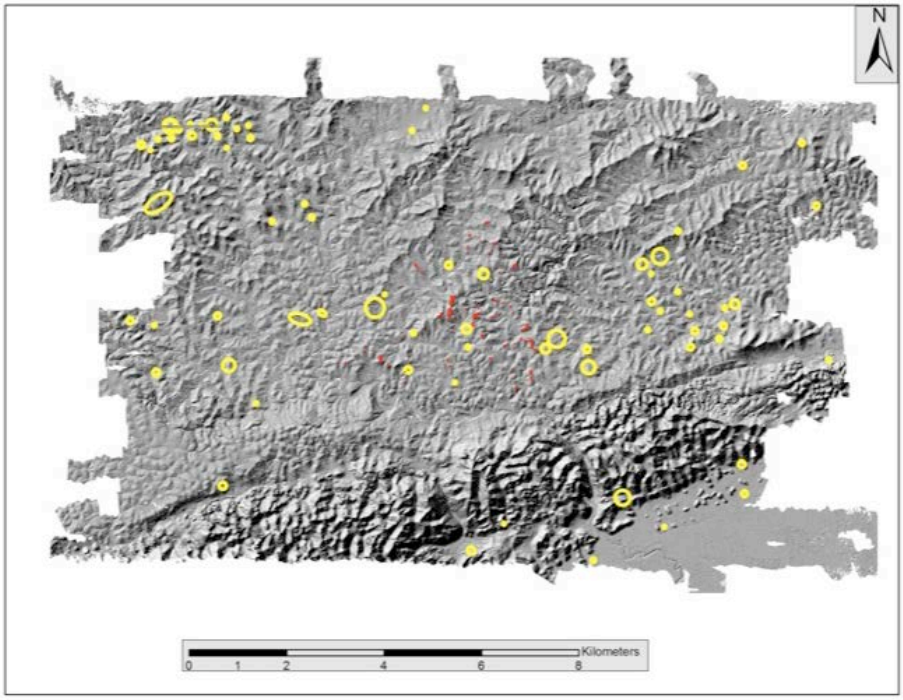

Figure 3. Proposed locations of un-surveyed settlement groups based on LiDAR data.

Group A, and Settlement Groups (SG) 18, 20, and 21 beginning in the Late Preclassic (Schrag 2008; Prufer et al. 2011). Large-scale hilltop modifications occurred in Group G prior to AD 80, suggesting organized construction works and investment of resources during the Late Preclassic (Thompson and Trask 2012).

The Early Classic (AD 250 - 600) was a time of population growth and centralization of the administrative areas at Uxbenká (Prufer et al. 2011). The site core expanded, as the first monumental constructions were completed in Groups A, B and D. The presence of elite residential areas at Group I, Group F, and SG 25 indicates that higher degrees of social and political variation were present among the residents of Uxbenká during the Early Classic period. The development of a heterarchical nodal power structure is evident, as the clusters of elite buildings at Group I and SG 25 are located approximately 2 km away from the site core, while Group F is located within the administrative area of Uxbenká. The Late Classic period included continued building episodes in the site core and increasing numbers of households in the peripheral areas. Continued expansion of populations in the hinterlands occurred during this period (Prufer et al. 2011). While the last dated monument at the site bears a date of AD 780, radiocarbon dating at SG 37 and SG 42 indicates that people were residing around Uxbenká through the Terminal Classic and possibly into the Postclassic period.

Recent Settlement Survey and the Use of LiDAR

Ongoing settlement survey and excavations have been a priority of the Uxbenká Archaeological Project (UAP) and are key to understanding the variations within and between domestic areas. To date, over 60 household groups have been identified (Figure 2) (Ebert et al. 2012), with archaeological testing occurring in the majority of these ancient house groups (Kalosky and Prufer 2012: 261). The intensive settlement survey undertaken by Ethan Kalosky and colleagues (see Kalosky and Ebert 2009, 2010; Kalosky and Prufer 2010, 2012; Kalosky et al. 2011; Kalosky et al. 2012) has been that settlements at Uxbenká are dispersed across the landscape, and situated entirely on hilltops. Groups range in size from one or two buildings to groups with more than two dozen buildings situated among multiple *plazuelas*, and are located up to 2km from the site core. The architectural complexity of residential spaces also varies throughout the settled region at Uxbenká. Some households have simple, low-lying platforms with one or two courses of stone, while others have stepped platforms, walls consisting of several courses of cut stones, central stairways, and large connected patios. It does not appear that distance to the site core has any impact on the size of settlement groups or the architectural complexity of buildings, suggesting that households groups may have functioned as their own nodes of power, rather than being centrally controlled by the elite site core. Earle (1991) has proposed that the primary way emerging elites in chiefdoms mobilize labor and control resources is through property rights. This may be the case at Uxbenká where the occupants of large settlement groups represented local nodes authority.

In addition to understanding the variations in settlements located near the Uxbenká center and in the immediate hinterland, secondary sites located near Uxbenká have the potential to provide insight into fluctuating nature and location of power at the site. In 2011, UAP acquired Light Detection and Ranging (LiDAR) imagery for an area of approximately 135 km^2 around the site core of Uxbenká. LiDAR has also been used with great success at other sites in Belize, namely Caracol (Chase et al. 2011). The LiDAR data revealed several new settlement groups (Figure 3), as well as an outlying center that was previously unknown to UAP. The location of these sites will be ground-truthed in upcoming field seasons. Among the largest of the secondary sites identified is Ix Kukuh'il, located 6.7 km northwest of the Uxbenká site core (Figure 4). According to local sources, archaeologists investigated Ix Kukuh'il in the early 1990s, but information about the site was never formally reported. Therefore, UAP undertook a one-day reconnaissance of the site, which appeared to be a minor center. The site's primary plaza is larger than Uxbenká's Stela Plaza (Group A), measuring 108 m north-south while Uxbenká's Stela Plaza is approximately 85 m in diameter.

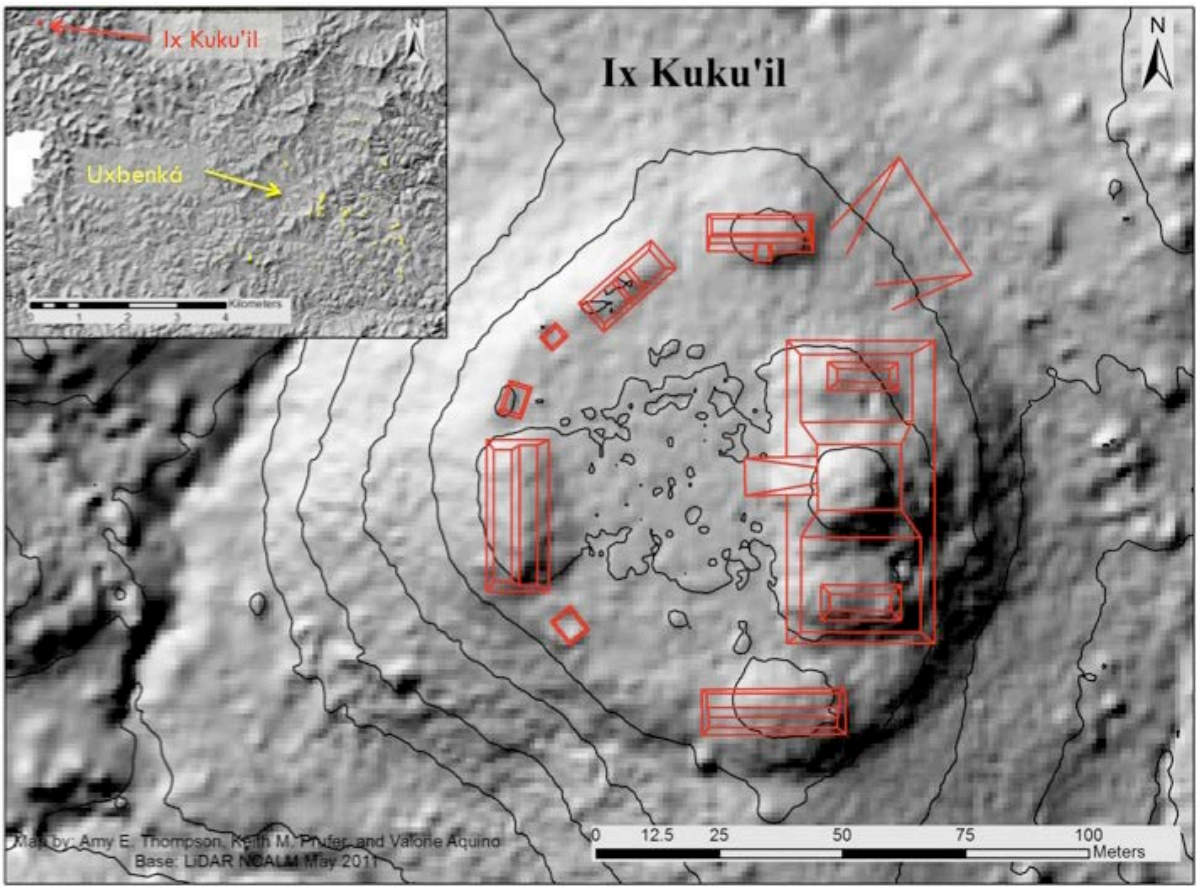

Figure 4. The location of Ix Kukuh'il (inset) and plan view of the main plaza of Ix Kukuh'il.

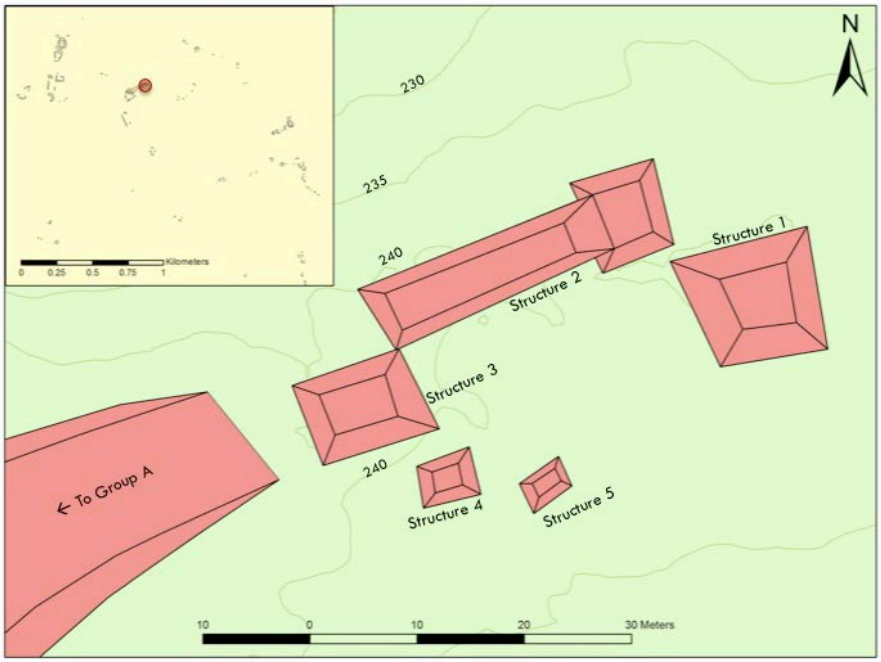

Figure 5. The location of Group Lin relation to the Uxbenká site core (inset) and plan view of Group L.

A single, uncarved stela measuring 4.2 m in length was located on the western edge of the plaza at Ix Kukuh'il. LiDAR data also showed several architectural groups on the hills surrounding Ix Kukuh'il. These sites present opportunities for future research on the populations at this smaller outlying center, and their interactions with both the occupants of Uxbenká and the broader region of the Maya lowlands.

Excavations in household groups located in the hinterlands of Uxbenká have been ongoing since 2008. In addition, in 2011 and 2012 test units were placed in areas hypothesized to be elite residential spaces, based on their architectural elaboration and proximity to the site core. The remainder of this paper will focus on the results from excavations in three residential areas: Group L, SG 25, and SG 37. These three residential groups date to different periods of occupation at Uxbenká. Excavations at Group L yielded Sierra Red ceramics suggesting Late Preclassic/Protoclassic occupations in several of the house mounds, as well as cream-colored polychromes, indicating Late/Terminal Classic activity in Tomb L2. SG 25 has produced two radiocarbon dates from the late 4th century AD and contained several polychrome sherds, suggesting late Early Classic through Late/Terminal Classic occupations. SG 37 dates to the Late/Terminal Classic based on 2-σ calibrated radiocarbon dates.

Group L

Group L is situated approximately 200 m east of Group A, the Stela Plaza. A freshwater spring is located 150 m south of Group L, providing year-round access to water (Kalosky and Prufer 2012). The close proximity of Group L to the Uxbenká site core and the presence of large, formally constructed house mounds up to 3 m in height in the group suggest that Group L served as a residential space for elites at Uxbenká, since most house mounds are relatively small in size (see proposed typology in Kalosky and Ebert 2009; Kalosky and Ebert 2010). Being located downhill from Group A, it lacks the viewshed of other areas at Uxbenká. Especially significant is the lack of a view of the administrative complexes associated with Groups B through F. However, certain ideologically prominent areas are visible from Group L, including the important nearby ceremonial site of Kayuko Cave and a large cleft in a nearby cliff face. These two local landmarks both carry connotations of the underworld.

Group L was initially identified in 2006 as an elite residential area (Prufer 2007). During the 2012 field season, excavations at Group L focused on examining each structure located within the group with the exception of Structure 5, which had been almost entirely destroyed by looting activity. The five structures in the group are arranged around a formal plaza, with Structures 2, 3, and 4 restricting accesses from the Stela Plaza (Figure 5). Excavations in Structures 1 and 2 found evidence of extensive landscape modification. Bedrock in these excavations was covered with fill, representing an episode during which the early occupants of Group L enlarged the plaza by raising the slopes of the natural hill with crushed mudstone bedrock (*nib*) before architectural construction took place. The architecture in the group consists of stone platforms with packed dirt fill and floors; no plaster floors are present in Group L. The highest building is approximately 3 m tall from the plaza floor and the smallest building is approximately 0.5 m in height.

Excavations and survey in 1989 by Dr. Richard Leventhal (1990, 1992) identified a looted tomb in Group L. This tomb was documented by UAP as Tomb L1 in 2012. The tomb contained a stepped entryway; the unusually high level of formal construction in this feature suggests an increased amount of investment in commemorating the deceased. During the 2012 field season, two previously unknown tombs were also located in Group L, designated Tomb L2 and Tomb L3. Tomb L2 is located in Structure 2, in the same range structure as Tomb L1. Tombs L1 and L2 have the most complex architecture of any burials investigated at Uxbenká, including stepped entryways leading down into the burial chambers. Tomb L2 contained multiple individuals and vessels with complex intermixing of stratigraphic relationships. Ongoing analysis by project osteologist Willa Trask is focused on determining the exact nature of the tomb contents. Tomb L3, is located in

Structure 1 of Group L. Tomb L3 was excavated into the bedrock and then covered with cut-stone architecture. The interment contained two whole vessels, which appear to be of early, possibly Late Preclassic, ceramic styles, while the ceramics in Tomb L2 included a cream-slipped tripod vessel typical of the Late/Terminal Classic (Foias 1996). The simpler, earlier Tomb L3 can be contrasted with the more complex and later Tombs L1 and L2, suggests increasing labor investment in the final resting places of the residents of Group L, which reflects an enhanced social status of the residents over time.

While burial contexts can be informative, other types of deposits in residential structures can provide different types of evidence for the social status of ancient occupants. Features located within Structure 1 included a layer of ritually smashed vessels between two layers of rocks. An inverted *olla* and a lip-to-lip cache of Preclassic style Sierra Red vessels were found in this deposit (Figure 6a and Figure 6b). Another deposit, located directly on top of the bedrock in Structure 1 contained broken ceramics, several intact *candelarios*, and charcoal; this deposit is suggestive of household based ritual activities.

Evidence for the presence of high- status individuals at Group L includes both high-quality utilitarian items not found in smaller households at Uxbenká, as well as more prestigious goods. Shells beads (Figure 7a), jade bead fragments, a bone lip plug (Figure 7b), polychrome ceramics, a possible chocolate spout from a vessel, and ceramic figurines (Figure 7c) suggest elevated social status among the residents of Group L. Exotic goods such as conch (Figure 7d) and other marine shells and jade indicate long distance trade or perhaps elite control of craft production. In a comparable case at San Lorenzo, Yaeger and Robin (2004) suggest that the people who resided in the larger households were involved with the production of marine shell items (see also Webster [1989] at Copan and Aoyama [2005, 2007] at Aguateca). The presence of these exotic goods and the rarity of their presence among commoners indicate status differences between elite structures and other San Lorenzo residential spaces (Yaeger and Robin 2004). Similar trends may exist at Uxbenká. Large amounts of obsidian blades,

Figure 6a. *In situ* Sierra Red lip-to-lip cache in Group L Structure 1.

Figure 6b. Reconstructed vessel from the Sierra Red lip-to-lip cache from Group L Structure 1.

flakes, and core fragments, chert debitage with cortex, *jute* shells, and ceramics were found in the fill of Structure 1, suggesting the possible presence of elite artisans or local craft producers such as those discussed at the palace of Aguateca (Aoyama 2007:19). Structures 2, 3, and 4 contained significantly less debitage and debris, indicating a difference in function between these structures and Structure 1. Archaeologists have often noted a relationship between developments in craft specialization and the emergence of elites (Brumfiel and Earle 1987). Ideology legitimates elite power and authority, and is expressed through the possession and display of specialized items

Figure 7a. A shell bead from Group L Structure 1.

Figure 7b. A bone lip plug from Group L Structure 1.

crafted from exotic raw materials or produced using complex technologies (Peregrine 1991).

SG 25

SG 25 was identified during the 2008 field season (Kalosky and Ebert 2009). The wide, bowl-shaped hill contains 36 structures and four formal *plazuela* groups (Figure 8). SG 25 is one of three architectural groups defined as a Type 5, the largest group, according to Kalosky and Prufer's (2012) settlement typology. A nearby river, locally known as the *Ha'il Ch'eb*, provides year-round access to water in this area and may have made this an ideal location for settlement

Figure 7c. A ceramic figurine from Group L Structure 1.

Figure 7d. A conch shell from Group L Structure 1.

(Kalosky and Ebert 2009). SG 25 is located 1.3 km from the Group A Stela Plaza. The cleft in the cliff face and Kayuko Cave, both of which were ideologically important to the ancient inhabitants of Uxbenká, are visible from SG 25, as are the Uxbenká site core and the surrounding hinterlands. Currently, it is known that this group has a late Early Classic occupation based on two radiocarbon dates; one sample was taken from 90 cm below datum in Structure 15 (UCIAMS- 57043) and the other from Structure 8 (UCIAMS- 105374). The 2-σ calibrated date ranges for these dates are AD 546 - 618

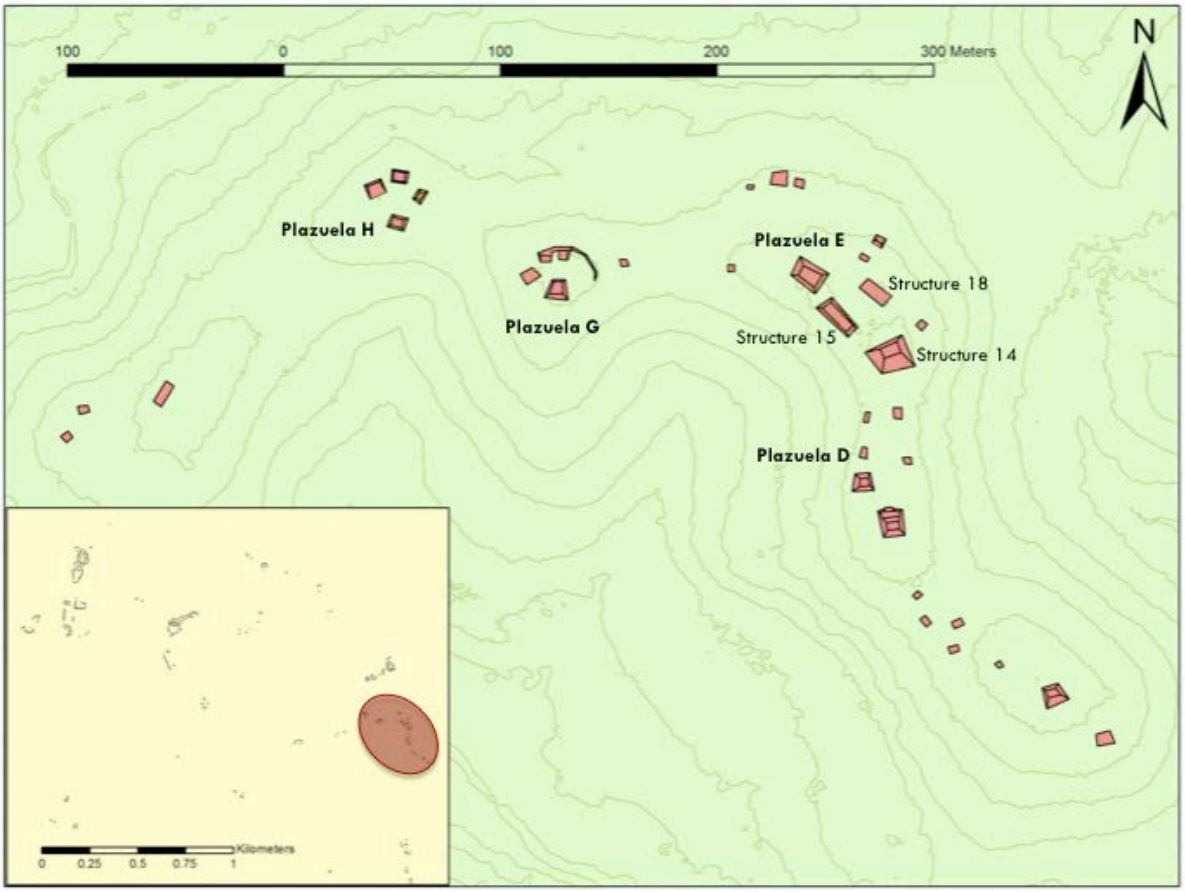

Figure 8. The location of SG 25 in relation to the Uxbenká site core (inset) and plan view of SG 25.

(UCIAMS- 57043) and AD 537 – 608 (UCIAMS – 105374). In addition to the C14 samples that reflect a late Early Classic occupation, the presence of cream-colored polychrome ceramics suggests a Late/Terminal Classic occupation as well. Architectural complexity varies throughout SG 25, from low-lying single course platforms, to stepped buildings and buildings with central stairways, and structures with multiple courses of stone architecture. Excavations during the 2012 field season focused on Plazuela E (Structures 14-18; Figure 8) and revealed architectural elaboration not present in other household groups at Uxbenká. For example, SG 25 Structure 18 has a central stairway leading up to a platform and a smaller platform on top. Early occupation and construction at the group, however, was likely small-scale. Structure 18 possessed a posthole cut into the bedrock, suggesting that a perishable structure was present prior to the construction of the terminal building phase. Excavations in Structures 18 and 15 found steep slopes in the natural bedrock, with boulder fill used to raise and widen the original hilltop. Though initial construction of the structures in SG 25 was small and may have not required much labor investment, it seems that a considerable amount of labor was focused on leveling out the site before large scale construction took place.

Further elaboration of architecture at SG 25 is visible in looter's trenches in Structure 14, which uncovered multiple masonry walls, atypical of Maya architecture in southern Belize (Braswell and Prufer 2009). The multiple construction phases of large boulder construction fill, packed cobble fill, eroded plaster floors, and finally possible masonry superstructure, reflect a great deal of labor investment at Structure 14. Artifacts recovered from Structure 14 during 2008 salvage excavations included jade artifacts, inlaid teeth,

a starburst bone pendant, and bone beads (Trask 2009). This investment, combined with the large size of Structure 14, leads us to believe that it may have functioned as an outlying temple for the elite residents of SG 25.

Salvage excavations of several looted tombs in SG 25 occurred during the 2008 field season and four new burial features were identified during the 2012 field season. These excavations found variations in the patterns of interment and status indicators of SG 25 residents. Burials vary from inhumations under benches and informal cists, to stone slab-lined crypts and formal tombs with cut stone architecture. The majority of tombs are located in buildings in the western *plazuelas* and typically have a north-south orientation. While most structures contained a single burial feature, Structure 15 contained at least two and possibly three different types of burials: one informal inhumation, one stone-lined crypt, and one possible formal tomb which will be investigated during the 2013 field season. The informal inhumation was located approximately 20-30 cm beneath the surface and contained high densities of broken ceramics and lithic debitage (Figure 9a). The stone-lined crypt did not contain human remains, but had two broken polychrome vessels (Figure 9b and Figure 9c). The body may have been removed during antiquity or the ceramic vessels may have been cached in place of the interred individual. The variation in burial styles at SG 25 suggests the presence of both high and low status individuals, while the time and labor involved in interments indicate the generally elevated status of SG 25 residents.

During the 2008 field season, artifacts found in Plazuela E included a jade-inlaid tooth and polychrome pottery. The presence of these items, which are unusual in households at Uxbenká, encouraged us to readdress this domestic group. During the 2012 excavations, utilitarian items found at Plazuela E included chert, obsidian, ceramics, hammerstones, and mano and metate fragments. Items indicative of higher status included polychrome pottery, jade bead fragments, figurines, and a jade plaque with a *kinich ahau* face carved into it (Figure 10). As at SG 37 and Group L, the presence of exotic items such as marine shell and jade indicate that the residents of this area had access

Figure 9a. Inhumation burial located in SG 25 Structure 15.

Figure 9b. Stone-lined crypt located in SG 25 Structure 15.

to more distant trade goods than other households at Uxbenká, which lack these items. Unusually high concentrations of chert cores, flakes, and flakes with cortex suggest intensive production of expedient tools, which dominate the Uxbenká lithic assemblages. The analysis of artifacts from the 2008 and 2012 field seasons will provide further insight into these

Figure 9c. Reconstructed polychrome vessel recovered from within the stone-lined crypt in SG 25 Structure 15.

Figure 10. Jade carved *kinich ahau* face.

preliminary conclusions regarding the social status of SG 25 residents.

Excavations in 2008 were performed in different areas throughout SG 25 and suggest differences in household wealth based on variations in architectural elaboration and the artifact types recovered throughout the mound group. Plazuela E's complex architecture and the high frequency of prestige goods set it apart from the other *plazuelas* in SG 25, which lack the prestigious items of Plazuela E and have significantly smaller platform footprints; Plazuela E has a footprint of just over 640 m^2, while the buildings of Plazuela D have a footprint of about 250 m^2. Plazuela E may have been the initial settlement of SG 25 and acting as a center for local elites as others continued to settle along the ridge.

SG 37

SG 37 was identified during the 2008 field season, and consists of seven structures arranged along the slope of a small, elongated ridge (Kalosky and Ebert 2009; Kalosky et al. 2012). SG 37 is located approximately 300 m east of the Group A Stela Plaza on an adjacent ridgetop. While no overall formal arrangement is noted for the group, Structures 1, 5, and 7 sit at the highest point on the ridge and bound an informal plaza space. The focus of inquiry at SG 37 was the largest structures in the group (Structures 1, 5, and 6). Structures 1 and 6 were also chosen for excavation, due to prior disturbance by looting activity (Figure 11). The location of the group, architectural styles, and artifacts recovered suggest a strong association between SG 37 and the Stela Plaza. Excavations in 2011 by Claire Ebert focused on Structures 1 and 5 located in the main plaza, and Structure 6 to the east.

The majority of household architecture at SG 37 consisted of the low platform mounds typical of households at Uxbenká. Foundational alignments were well-defined in some instances (e.g., Structure 5). Examples of more formal architecture include a north-south aligned tomb uncovered during salvage excavations within Structure 1. The tomb was first excavated into bedrock at a depth of 1.5 m below ground surface, packed with loose fill, and then faced with a single course of cut stone blocks. Similar construction was partially visible at the exposed edge of another looted tomb in Structure 6. Artifacts recovered from these contexts include prestige goods such as a jade ear spool (Figure 12), a small jade nugget, a polished black stone bead, and polychrome pottery sherds. The construction of the tomb is similar to those located in the Stela Plaza (Leventhal 1990, 1992) and other larger settlement groups (e.g., Group L) at Uxbenká (Kalosky et al. 2011). The greater formality of the architecture at SG 37 compared to other settlement groups suggests a greater investment of time and labor in its

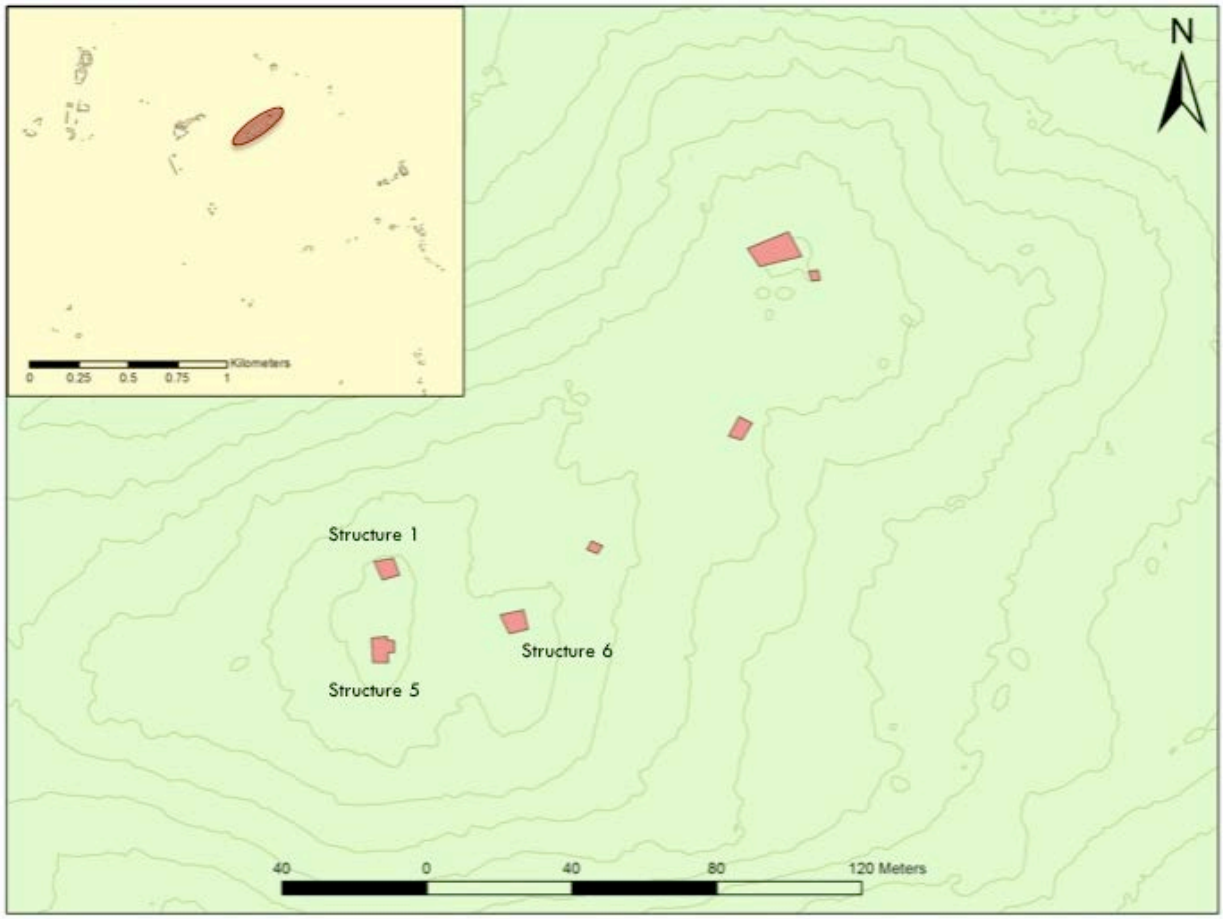

Figure 11. The location of SG 37 in relation to the Uxbenká site core (inset) and plan view of SG 37.

construction, a characteristic consistent with identification as an elite residential group.

Most of the ceramics from SG 37 were sherds from utilitarian coarse-ware vessels. Diagnostic features in this assemblage included thick walls with *bas*-relief designs such as concentric rings, round bulbous appliqué or circular holes. Remnants of *incensarios* associated with other prestige goods and fragments of fine-ware polychrome ceramics were also recovered from salvage excavations in an associated looted tomb. The presence of high quality polychromes and other vessels associated with ritual activity suggest that the inhabitants of SG 37 were on the higher end of the socioeconomic spectrum, or that they had access to a broader economic network than other inhabitants of the Uxbenká polity.

The lithic assemblage from SG 37 is comprised of items produced from both local and exotic materials. Locally produced artifacts include chert tools (primarily retouched flakes and cores), with cortex present on more than 50% of the total assemblage. This suggests local material acquisition and expedient tool production. An abundance of chert debitage and tools recovered from Structure 7 was associated with a small ground-stone celt that exhibits evidence of battering. It is hypothesized that the western portion of the main plaza may have functioned as a household lithic production area. An eccentric chert biface (15.2cm x 12cm), shaped into an axe blade and associated with a shallow *incensario*, was recovered from excavations in Structure 5. No other eccentric bifaces have been found at Uxbenká, and the presence of this artifact type may be related to changing occupation patterns or settlement group function. The exotic portion of the lithic assemblage was composed entirely of obsidian

items, slightly over 60% of which were finished blades. All but one of these artifacts was chemically sourced to the El Chayal source (Nazaroff and Prufer 2012). The presence of large numbers of finished obsidian tools indicates the continuity of trade through the Late and Terminal Classic at Uxbenká.

Two radiocarbon samples were recovered from 90 cm below datum, directly below the east wall of the patio feature on the east side of Structure 5. These samples were associated with a concentration of smashed ceramics found at the outside corner of the patio, also located beneath the east wall. The deposition of these ceramics is interpreted as having taken place before the construction of the building. The 2-σ calibrated date ranges for these dates are AD 684-780 (UCIAMS-102521) and AD 685-806 (UCIAMS-105382)**.** SG 37 is currently the only settlement at Uxbenká with dates extending into the Terminal Classic Period (Kalosky et al. 2012). Previous ^{14}C dates place the main period of occupation at the Uxbenká site core and surrounding settlements prior to AD 780. The latest major construction activity in Group A (a re-plastering event) took place sometime between AD 550-770, just prior to the placement of Stela 15 (AD 780). A modeled stratigraphic sequence for SG 37 places the construction of Structure 5 contemporaneous with final construction activities at Group D between AD 680-870 (Culleton et al. 2012).

The presence of large amount of prestige items at SG 37 indicates that at least some wealthy families retained access to wider social and economic networks in this later period, with prestige and trade items serving as a form of wealth used to maintain sociopolitical status into and after the Terminal Classic. Some researchers have argued for a more protracted sociopolitical disintegration and the persistence of local populations long after the dynastic collapse in several regions based on evidence from household contexts (Webster et al. 2004). The last recorded long count date at the Uxbenká site core (AD 780, Stela 15, Group A) is thought to mark the decline of elite authority and the decentralization of the political economy at the site. This is consistent with the termination of epigraphic records at other sites in southern Belize, starting first at Pusilhá (AD 731) and

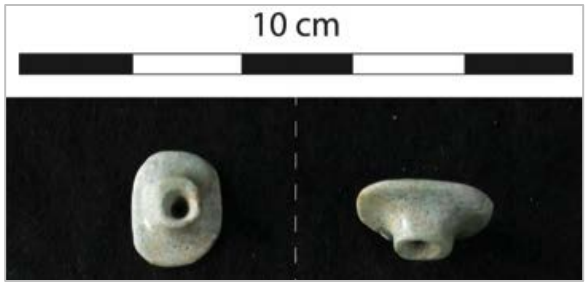

Figure 12. Jade ear spool from salvage excavations of a looted tomb in SG 37 Structure 6.

then extending northeast towards Nim Li Punit (AD 810). This pattern suggests a relatively rapid regional collapse, but work on settlements associated with these centers has been minimal. About half of the probability distribution of the modeled age for Structure 5 at SG 37 (based on a cumulative probability analysis) falls after AD 780 and suggests that this elite residential unit persisted for a short time after the Uxbenká dynasty lost control of the polity. However, dating is poorly constrained and requires additional work.

Comparisons between Residential Groups

Group L, SG 25, and SG 37 vary in their proximity to the site core, as well as their physical size. Comparing the combined footprints of buildings within each group, it is obvious that SG 25 is the largest at 1538 m^2. Plazuela E of SG 25 has a footprint of 641 m^2, which is larger than the footprint of Group L at 426 m^2 and the footprint of SG 37, which is the smallest with a footprint of 207 m^2 (Figure 13). The variations in architecture suggest great differences between these areas, and yet the artifact assemblages and their proximity to natural features on the landscape are surprisingly similar to each other. Unlike many Maya sites, polychrome ceramics are unusual at Uxbenká (Jordan 2012). However polychrome ceramics appear at each of these larger elite groups, setting them apart from the ceramic assemblages found in other residential spaces at the site. Residents at all three groups also had access to exotic trade items. While long-distance imported goods such as obsidian are found in nearly every settlement group at Uxbenká, other items such as marine shell, jade, and polychrome ceramics are not as common. Their presence at

these three settlement groups suggests that the residents of these groups had greater access to these items than their neighbors. Additionally, all three households are located in close proximity to year-round water sources, making their locations ideal for settlement and possibly giving the residents an advantage over others who had to walk a greater distance for water.

Our preliminary conclusions are that Group L, SG 25, and SG 37 represent elite residential areas within the larger settlement system at Uxbenká, and their growth mirror general trends in the Maya lowlands. Starting in the Preclassic and extending through the Classic Period, ancient Maya society and economy underwent a considerable amount of change (Clark and Cheetham 2002). Some archaeologists believe that there may have been growing specialization at the household level. There is also a notable rise in evidence suggesting the presence of crafting and complex architecture in elite households (Brumfiel and Earle 1987) as the number of petty rulers and kingdoms increased over time.

At Uxbenká, Group L is the earliest occupied and has Late Preclassic through Terminal Classic components. While it may have initially functioned as an elite household, during the late Preclassic and Early Classic it became associated with the site core located at Group A. Later, during the Late and Terminal Classic, it may have been used as a place of ancestral veneration in conjunction with the Group A "memorial garden" (Prufer et al. 2008). Similarly, SG 25 was occupied during the late Early Classic through the Late to Terminal Classic, but it is possible that it had earlier components as well. The large and elaborate architecture and the prestigious items found at SG 25 indicate increasingly greater degrees of power and wealth, as well as access to goods from afar. SG 25 appears to be a node of power located in the geophysical periphery of Uxbenká, but still acting as a key player in the political economy and sociopolitics of the site. It is possible that Plazuela E was the initial area of settlement among SG 25 residents, and attracted others through time, acting as a center for local elites. SG 37 has a Late to Terminal Classic occupation, but has a clear association with the site core as indicated by both its

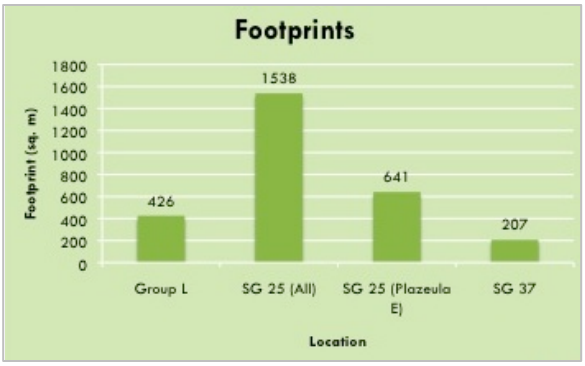

Figure 13. Structure footprints for Group L, SG 25, SG 25 Plazuela E, and SG 37.

physical location and the artifact assemblage recovered from the settlement group. The growth persistence of these elite household groups may have implications for evaluating the process of collapse at Uxbenká. As at Copan, the presence of large elite groups at Uxbenká after the collapse of the royal dynasty may indicate a more protracted decline of sociopolitical organization and population (Webster et al. 2004). Elite households may not have been abandoned until after AD 1000 and may have acted as a local socioeconomic authority.

Conclusions

It is important to highlight role of the elite households in social and economic changes over time as evidenced through changes in architecture and artifact assemblages. Households composed the most dynamic units of change in ancient Maya society. As households engaged more frequently and became more specialized in the production of craft items, their success and wealth began to blur distinctions between elites and commoners (McAnany 1993). Their shifting economic practices were responses to the challenges they faced as agrarian people. And it appears that their responses were varied. These three residential areas are representative of the multiple nodes of power spread across the landscape at Uxbenká that developed from the Preclassic through the Terminal Classic. While the artifact assemblages are fairly similar among these areas, they vary greatly in other aspects. This may suggest that emerging elites at Uxbenká had access to similar economic

networks, but locally had different response to social pressures. Future work will include the analysis of artifacts from these areas in order to gain a better understanding of the variations in ceramic assemblages and the presence of possible lithic production zones. Additionally, these areas should be compared to other potential elite domestic groups within the Uxbenká site such as Group I and Group F, as well as to other settlement groups. Such comparisons would lead to a better understanding of the variations in wealth and power, which developed over the course of time at Uxbenká. As new insights into the scale and timing of economic and social changes are developed and refined, they can help generate more models of the exact mechanisms through which sociopolitical development occurs at the household, community, and regional scales.

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25 CONSTRAINING THE AGE OF ABANDONMENT OF UXBENKÁ SITE CORE USING ARCHAEOLOGICAL STRATIGRAPHY AND AMS ^{14}C DATES

Valorie V. Aquino, Keith M. Prufer, Clayton Meredith, Brendan J. Culleton and Douglas J. Kennett

The Uxbenká Archaeological Project (UAP) high-resolution AMS radiocarbon dating program has generated over 120 absolute dates from archaeological contexts. Emphasis has been placed on establishing the age of settlements and of architectural sequences in the site core. Previous work has established Uxbenká as the oldest known polity in southern Belize, with both core and settlements dating to the Late Preclassic (ca. 60 cal BC – cal AD 300). However, poor preservation and heavily disturbed terminal Classic contexts have hampered efforts to assess the extent and timing of the final occupation phases at Uxbenká. In this paper, we present a set of AMS radiocarbon strategically selected from well-preserved terminal Classic deposits to expand and improve the previously established sequence for one of the more prominent civic/ceremonial plaza groups in the site core (Group B). These new radiocarbon dates help constrain when this plaza group was abandoned to the 9th century AD. These new dates are inconsistent with the hypothesis that relatively little construction was undertaken in the site core after the Early Classic. These new data improve our understanding of site development and will facilitate more accurate and precise comparisons with other archaeological, environmental and climatic datasets.

Introduction

Determining the age of archaeological deposits provides the foundation for establishing and interpreting cultural historical sequences. As Webster (2002: 209) candidly noted, "If you can't sort things out in time, you have nothing to explain". There are number methods available for building cultural sequences. Relative dating provides a sequence of cultural events relative to one another and whereas absolute chronologies specify when events occurred in relation to the present. The research question defines what chronological questions are of particular relevance to the project, and the selected dating method and its associated precision will limit or permit the resolution of subsequent interpretations.

The Uxbenká Archaeological Project (UAP) has engaged in an ambitious radiocarbon dating program utilizing high-precision AMS radiocarbon dates and stratigraphic sequences in order to develop an independent chronology of Uxbenká, a Maya polity in the Toledo District of Belize. Because a primary objective of the UAP is to model dynamic human behavioral responses to environmental transformations, precise age intervals are required to identify the timing or duration of specific events. While a number of Maya research projects employ ceramic typologies to give rough estimates of the age of sites (e.g., Hammond 1975, Demarest et al. 2004), ceramic data at Uxbenká or southern Belize in general were not yet analyzed in depth and insufficient for use as temporal markers. Furthermore, dates associated with ceramic types are commonly resolved at multi-century age intervals, thereby impeding precise comparison of timing and duration of events with other cultural or environmental datasets.

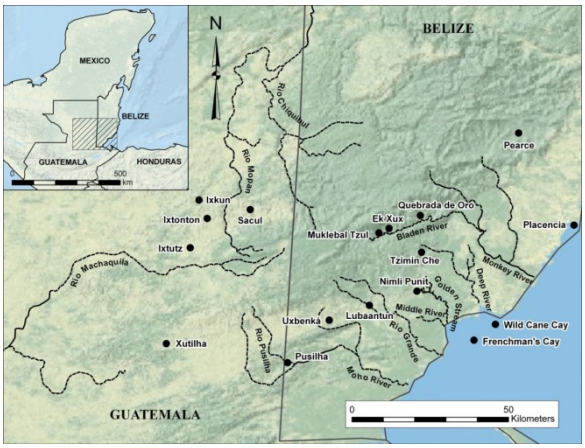

Figure 1. Surface hillshade showing locations of major Maya polities in southern Belize discussed in the text. (Map by C. Ebert, J. Bartruff, K. Prufer, and D. Kennett).

Norman Hammond first documented Uxbenká during a regional survey of southern Belize in 1971 (Hammond 1975). It was a small monument-bearing Classic Period site that was established during the Late Preclassic in a fertile valley (the Toledo Beds) within the foothills south of the Maya Mountains (Figure 1). In

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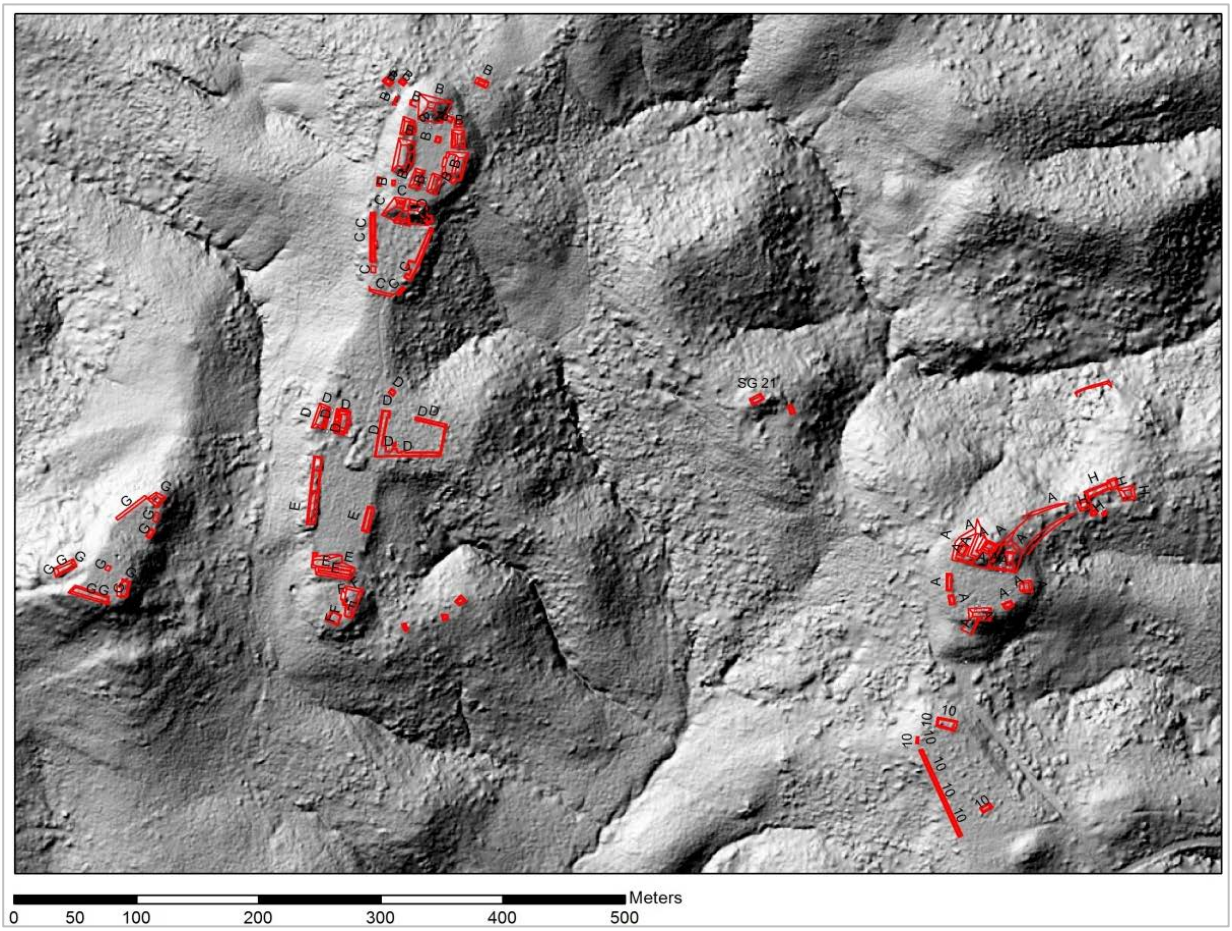

Figure 2. LIDAR base map overlain by structures mapped by GPS showing the site core.

1989 and 1990, Richard Leventhal organized surveys and limited test excavations, primarily in the site core, as part of the regional Southern Belize Archaeological Project (SBAP). He mapped the Stelae Plaza (Group A) and documented several other outlying plaza groups. Keith Prufer and Andrew Kindon continued work at Uxbenká in 2005 (UAP), with project excavations starting in 2007. Southern Belize has received only minimal archaeological attention compared to other parts of the Maya region, and the ceramic sequence is still poorly understood. Consequently, chronology building in this area remains a slow but continuous, dialectic process.

Preliminary understanding of site development in the region based on chronological information from stelae, ceramics and stratigraphic interpretation situated Uxbenká as having coalesced during the Early Classic

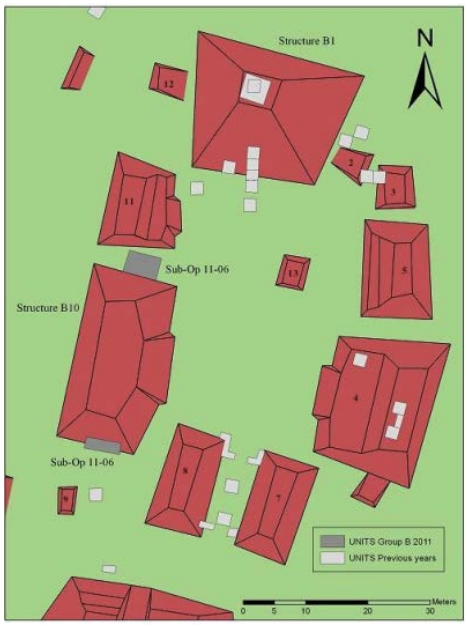

Figure 3. Detailed map of Group B showing UAP excavations from 2008 and 2011.

period (AD 300-600) (Hammond 1975, Dunham 1990, Leventhal 1992). One of the leading hypotheses for its formation implicated a potential dynastic linkage and strategic political relationship between Uxbenká and Tikal (Braswell and Prufer 2009, Dunham 1990, Wanyerka 2009). Our previous radiocarbon work, however, has demonstrated that the initial growth of Uxbenka's site core and outlying settlement groups occurred during the Terminal Preclassic. This is inconsistent with the hypothesis that rulers from Tikal founded the site during the Early Classic (Culleton et al. 2012, Prufer et al. 2011). Efforts to assess the timing and duration of terminal occupation phases, however, were notoriously difficult to find in secure context, due to bioturbation from modern farming practices, erosion, secondary growth, tree falls, looting and animals. Together with the jumbled nature of ceramics from the uppermost levels and preservation issues, age estimates for terminal occupation have remained poorly constrained and imprecise. Here we present new radiocarbon dates to help constrain the age of the terminal occupation in Group B.

Uxbenká Site Core

The site core of Uxbenká consists of eight architectural plazas that were built on three neighboring hilltops that formed a coherent civic-ceremonial cluster (Figure 2). The dispersed nature of core development is common for all southern Belize sites due to the naturally hilly topography (Leventhal 1992: 147). Group A, nicknamed the Stelae Plaza because of at least 23 sandstone stelae recovered there, was presumed to be the earliest political locus of the site (Prufer et al. 2011). The plaza contains a number of stelae identified as Early Classic in origin, including possibly the earliest known carved monument (Stela 11) in southern Belize (Leventhal 1992: 148, Wanyerka 2009: 27). The latest recorded long count date of 9.17.10.0.0 12 (deciphered by Linda Schele; Leventhal 1992: 148) at Uxbenká occurs on Stela 15 and corresponds to AD 780 using the Goodman-Martinez-Thompson correlation (Kennett et al. 2013).

First identified by Hammond (1975: 289-290) as "Santa Cruz North", Group B exhibits the highest estimated volume of masonry construction at the site, and the plaza group had developed into a relatively restricted space in its final configuration (Figure 3). It is located about 450m northwest of the Stelae Plaza and lies conspicuously at the apex of a 400m-long, artificially modified ridge running roughly north-south. Group B is at the northernmost end of a series of conjoined architectural groups (C-E), possibly representing administrative and public civic areas, before terminating in the south at Group F, an elevated three-structure elite residential group facing directly west toward Group G.

Nine sub-operations (Sub-Op) were excavated in the Group B architectural complex during the 2008 field season. Seven charcoal samples from those excavations were AMS radiocarbon dated and yielded an array of Early Classic dates. Only one sample dated to the Late Classic Period (Prufer et al. 2011). A later Bayesian age model of calibrated radiocarbon dates clearly associated with building episodes from the site core also suggested that major construction activities diminished considerably after the Early Classic (Culleton et al. 2012). Nonetheless, surface architecture, such as the ballcourt (Strs. B6-7), three patio structures (Strs. B3, B5 and B11) and a temple (Str. B1) indicated a more significant Late Classic component than suggested by the first set of radiocarbon dates. Excavations of the front stairway of Str. B1, in particular, produced a ceramic assemblage consistent with Late Classic types and indicative of elite ritual activities concentrated in front of the temple (Prufer et al. 2011: 212). We returned to Group B during the 2011 field season primarily to further resolve the plaza's terminal occupation.

Methods

Archaeologists are rarely interested specifically in the radiocarbon ages of organic material sent for analysis. It is the associated cultural material and the estimated duration of construction and occupation of a site that are of common research interest and represented by archaeological features, such as buildings, burials, middens and hearths. The inter-relationships of samples should also be considered, for example, analyzing several samples for a single event or groups of samples

UCIAMS-#	Provenience	Conventional ^{14}C age (BP)	Calibrated 2σ range (AD)
105422	B10-south Unit 4 Level 7; embedded in plaster	1780±20	140-332
105418	B10-north Unit 5 Level 9A; in mudstone construction fill	1760±20	224-344
105423	B10-south Unit 4 Level 8; in mudstone fill between walls 1-2	1730±20	250-382
105417	B10-north Unit 5 Level 8A; in burned soil feature in immediately below small pavers	1525±20	435-600
105419	B10--north Unit 5 Level 8B; above small pavers associated with construction of plaster floor	1485±20	544-624
105413	B10-north Unit 5 Level 4; in boulder fill burying B11 stairway	1235±20	690-871
105416	B10-north Unit 5 Level 7B; in boulder fill burying B11 stairway	1215±15	724-887
105396	B10-north Unit 5 Level 4A; soil float sample from ballast beneath terminal B10 stair	1245±15	686-857
105395	B10-north Unit 5 Level 4A; in ballast beneath terminal B10 first stair	1215±15	725-882
105394	B10-north Unit 2 Level 2; beneath in situ terminal paver	1210±20	725-882
105420	B10-south Unit 4 Level 3; associated with deposits above terminal pavers	1205±20	730-888

Table 1. AMS 14C dates from SubOp 11-06 at Group B used in the study.

with at least partially understood relative chronological relationships. The architectural stratigraphy at the Uxbenká site core generally reveals multiple occupation floors and building episodes, and these longer sequences are ideal for evaluating radiocarbon dates linked to a diachronic series of construction and use events.

The 2011 Group B excavations focused on construction sequences for the buildings framing the plaza group with an emphasis on identifying intact terminal deposits. We targeted areas with the greatest probability of providing detailed sequences of occupation and construction. For instance, excavations in the "alley" between structures B10 and B11 and structures B10 and B9 provided longer sequences of preserved stratigraphy than the shallower plaza floor. We excavated SubOp 11-06, which was comprised of eight units, five from the north of Str. B10 that eventually combined into one unit measuring 3.5m x 5.2m and three units to the south of the structure that cumulatively measured approximately 2m x 3.2m (see Figure 3). The ground surface between the north and south excavations differed by 2m; thus, we correlated the more spatially distant units using stratigraphy and characteristic

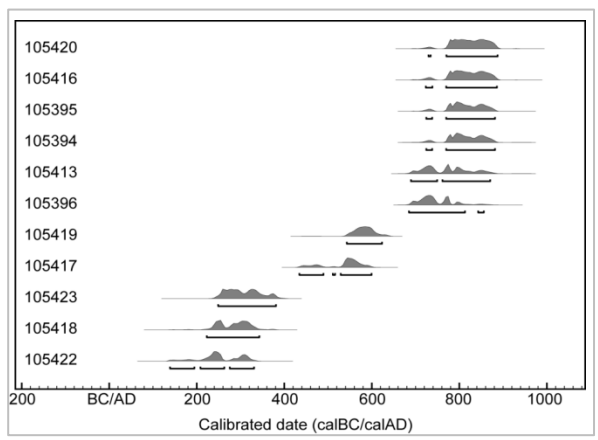

Figure 4. Plot of calibrated 2σ age ranges from SubOp 11-06 discussed in the text.

architectural features. During our excavations, we collected datable materials (mainly charcoal) from above, below and within cultural features. These included landscape modifications, architectural episodes and plaster and paver floors. To reduce the risk of sampling intrusive modern charcoal from the upper deposits closest to modern ground surface, we collected sediment samples from directly below in-situ terminal pavers and from the base of the terminal architecture to extract carbonized plant

Figure 5. Photograph facing south of Str. B10 showing elements of its penultimate and terminal construction phases.

materials via flotation. We also budgeted for a larger number of samples so that outlying dates and modern dates could be eliminated from the analysis.

Charcoal and other organic samples from well-documented stratigraphic contexts (see below) were prepared, along with standards and backgrounds, at the University of Oregon (now at Penn State) and the University of California Irvine Keck Carbon Cycle AMS Facility (UCI KCCAMS) following standard practices. Single pieces of charcoal were selected to avoid the averaging inherent in bulk samples, and pieces likely to be shorter-lived (e.g., twigs) were chosen where possible to reduce any old wood effect (Schiffer 1986; Kennett et al. 2002). After removing adhering sediment, samples were subject to acid/base/acid washes in 1N HCl and 1N NaOH (70°C; 30 min). The initial acid wash dissolved any carbonate contamination and repeated base washes extracted humates accumulated from soil organic matter. A final acid wash removed secondary carbonates formed during the base treatment. Samples were then returned to neutral pH with two 15 min baths in DI water at 70°C to remove chlorides and dried. Sample CO_2 was produced by combustion at 900°C for 6 hours in sealed evacuated quartz tubes using CuO powder and Ag wire. Sample CO_2 was graphitized at UCI-KCCAMS by reduction at 550°C using H_2 and a Fe catalyst, with reaction water drawn off with $Mg(ClO_4)^2$ (Santos et al. 2004). Solid graphite samples were pressed into targets in Al boats and loaded on the target wheel with standards and backgrounds for AMS analysis.

We analyzed 15 samples in total. Three samples considered to be in association with terminal phases returned bomb dates (UCIAMS #10593, 105415 and 105414), and another returned an outlier radiocarbon determination of 1095±20 BP from a buried and securely capped level that was likely intrusive via ground mole tunneling activities prevalent throughout the site core. The results of the 11 remaining samples used in this study are reported in Table 1 as conventional radiocarbon ages corrected for fractionation with measured $\delta^{13}C$ according to Stuiver and Polach (1977), and 2-sigma calibrated ranges (95.4% probability) were produced using OxCal 4.2 (Bronk Ramsey 2001, 2009) employing the IntCal09 atmospheric curve (Reimer et al. 2009). We graphically produced these results in Figure 4. Calibrated dates are discussed in terms of "cal AD" as distinct from dates derived from epigraphic and typological methods.

Results and Discussion

The northern units exposed three architectural phases, two of which represented the penultimate and terminal phases of Str. B10 (Figure 5) and another related to a buried construction in the alley (Figure 6A) that was only later identified in the 2012 field season as the first riser of an outset stairway and stair block modifying Str. B11 (Figure 6B). The northern excavations also revealed four floors; from earliest to latest, these included small pavers above mudstone fill and eroding bedrock, thick (>10cm) plaster floors below Strs. B10 and B11, and large thin terminal phase pavers whose overlying plaster floor has since completely eroded. The south units uncovered four floors and three walls separated by less than a few meters (Figure 7A). All three walls consisted of cut sandstone slabs facing west with the innermost and outermost walls oriented along a N-S cardinal direction. The middle wall (wall 2) exhibited battered tiers of multiple course levels and was oriented 25° east of magnetic north (Figure 7B). Interestingly, a buried structure east of Str. B1 that was identified in 2008 had similarly non-cardinal alignments. Due to safety

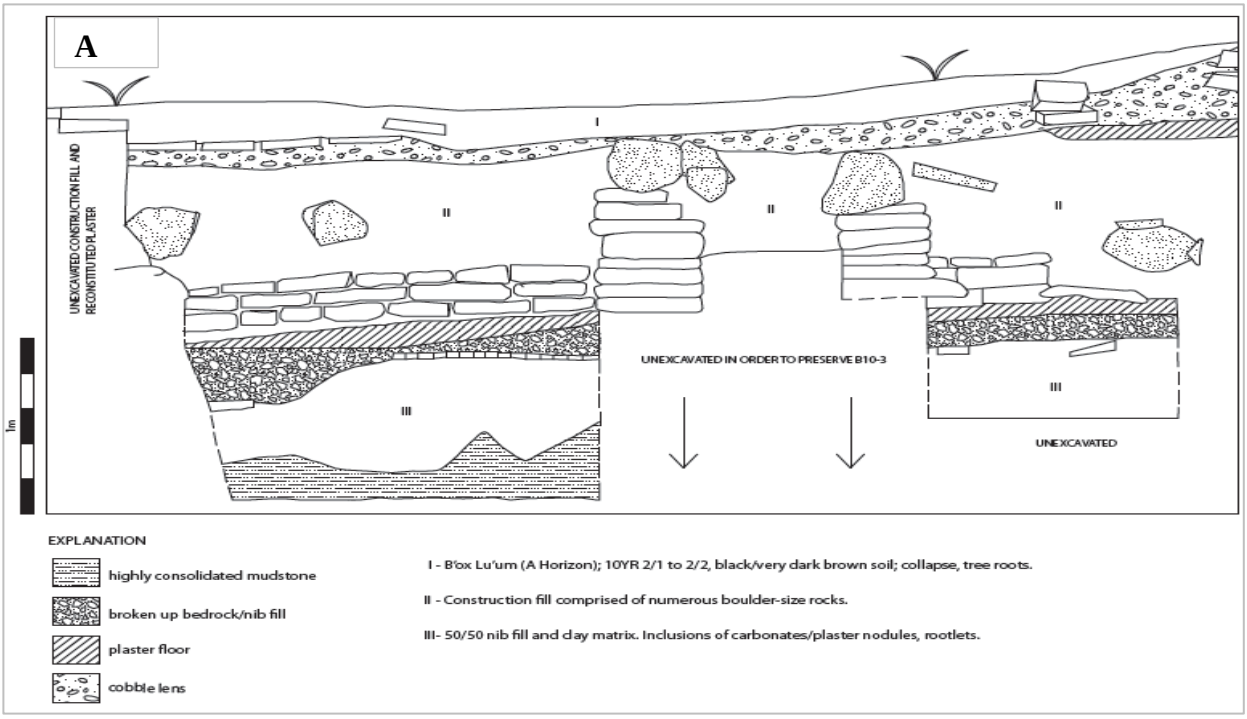

Figure 6. (A) North wall profile of north excavations showing extent of Str. B11 exposure in the 2011 field season.

and time constraints, reaching the base of any of the three walls was not accomplished, but the middle wall was over 2.1m in height.

Group B experienced a flurry of cultural activities to prepare and formalize the hilltop space during the Terminal Preclassic/Early Classic transition; events included landscape modifications and masonry construction of structures and at least one west perimeter wall (wall 1). Charcoal samples from the 2008 season (SubOp 08-07), associated with the initial cultural stratum immediately above bedrock and abutting a series of stones, yielded dates of cal AD 235-340 (UCIAMS #56361) and cal AD 250-390 (UCIAMS #56370). Between walls 1 and 2, a charcoal sample was retrieved from mudstone fill that is associated with the construction of wall 2. This sample dates to cal AD 250-382 (UCIAMS #105423). The unusual non-cardinal orientation presented by wall 2 is also followed by a buried structure uncovered in the 2008 field season between Strs. B2 and B3 (SubOp 08-09). A radiocarbon date from the base of that buried building dates to cal AD dates to 220-335 (UCIAMS #56362), supporting a Terminal Preclassic/Early Classic transition

Figure 6. (B) Photograph showing a more fully exposed architectural sequence of Str. B11, including an outset stairway, a stair block and terminal pavers.

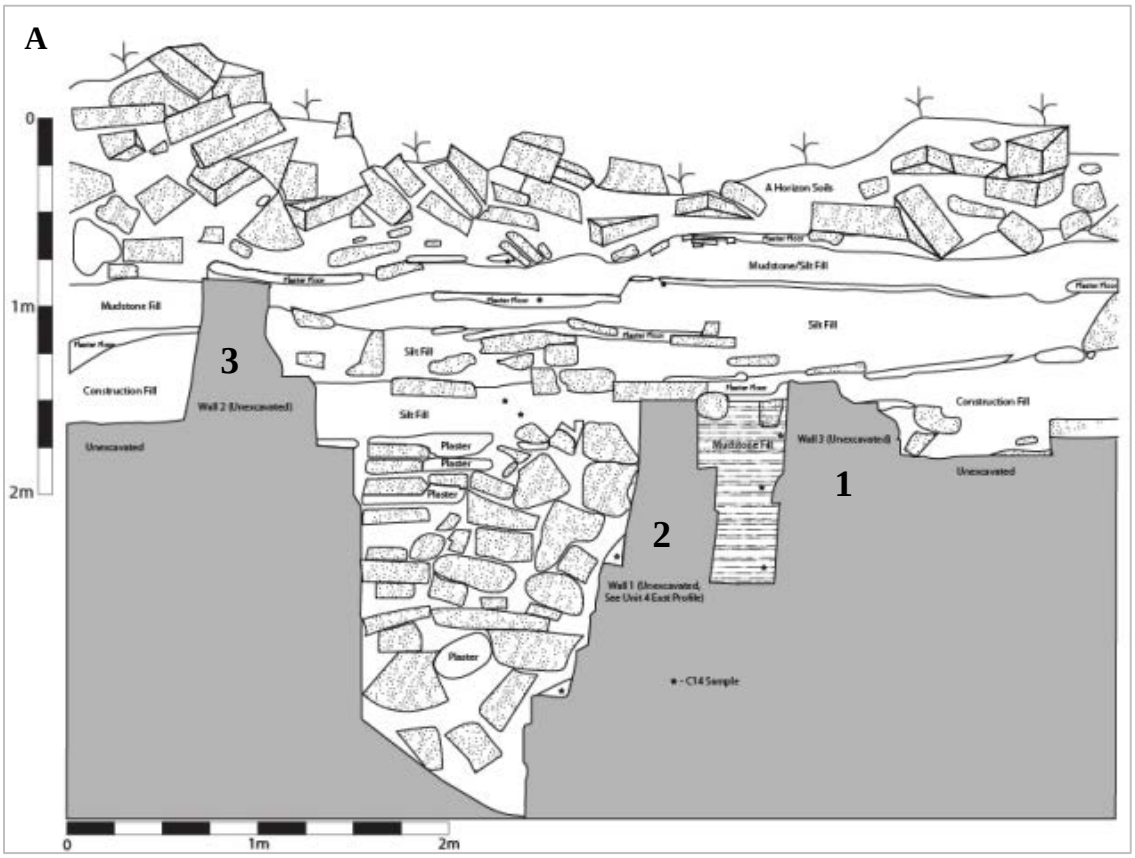

Figure 7. (A) North wall profile of south excavations showing location of walls discussed in the text.

timing for the construction of wall 2 due to their shared canon of architectural alignment. A carbon sample from the boulder fill recovered from the episode burying wall 2 and associated with the construction of wall 3 returned a date of cal AD 140-332 (UCIAMS #105422). Because wall 3 was built after wall 2 as part of continued horizontal expansion of the plaza surface, it was likely built after at least the 3rd century. Although one radiocarbon date would place its construction in the Late Preclassic/Early Classic transition, it is clear that older materials were recycled as fill in later building episodes.

In the northern excavation block, we exposed a thick stratum of eroding mudstone fill immediately above bedrock that was used to raise the plaza. A charcoal sample from within this mudstone fill dates to the Terminal Preclassic/Early Classic (UCIAMS #105418; cal AD 224-344) and is consistent with the radiocarbon date from similar mudstone fill between walls 1 and 2. These data are consistent

Figure 7. (B) Photograph facing east showing the tiered design of wall 2.

with the previous observations that Group B was leveled and formalized during the Terminal Preclassic Period (Culleton et al. 2012). Initial clearing to bedrock was rapidly followed by the construction of large masonry walls to demarcate the plaza and at least one stone building.

Strikingly little building activity occurred during the fifth century AD. The only dated material falling in this time interval was a charcoal sample collected from a burned soil feature within mudstone fill from the northern excavation block. This sample gave a broad calibrated age range of AD 436-600 (UCIAMS #105417). The isolated feature, which included ceramics and jute (river snail), was positioned directly beneath a floor of small flat pavers (Figure 8) and may have been part of a dedicatory ritual. The previous age model from Groups A, B and D also indicated a relative lack of construction during the late Early Classic (Culleton et al. 2012), and there is a multi-century gap in stelae dedication dates between Stela 23 (AD 455) and the next dated stelae (Stela 14, AD 672 or 692; Stela 19, AD 684; (Wanyerka 2009). These data suggest a significant political interregnum that impacted construction within the site core, but it is unclear if the occupation of outlying settlements was affected. Future analyses incorporating the data collected in the 2012 season on the east side of Group B and the history of construction at Strs. B10 and B11 will help flesh out the Early Classic Period construction sequence.

Construction resumed at Group B during the transition to the Late Classic. At this time, the plaza continued to be elevated and the terminal phase architectural elements were added to the plaza structures. A cemented plaster floor, which capped walls 1 and 2 and abutted wall 3, was exposed in the southern excavation block and may be associated with either Early or Late Classic occupation. At least one Zacatal sherd, identified by UAP project member Jillian Jordan, was recovered from above this floor east of wall 3. The sherd may have come from deposits associated with use of the floor, or more likely, was redeposited along with the large rocks used to raise the plaza for a later, mostly eroded, second plaster floor. A

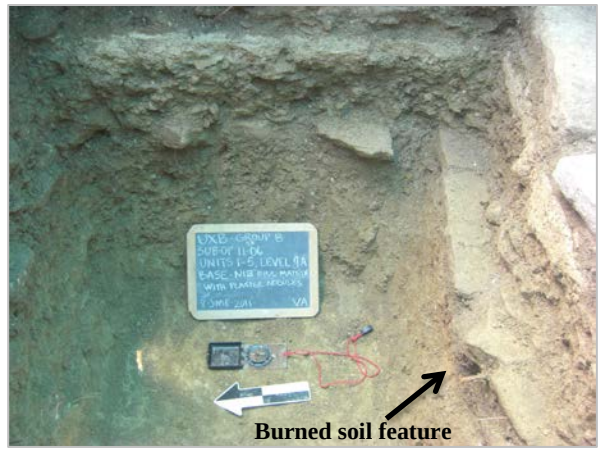

Figure 8. Photograph showing the burned soil feature below a level of small pavers in north excavations.

third plaster floor, thick (>10cm) and well-preserved, capped deposits between it and the earlier, cemented plaster floor. This floor abutted wall 3 just below the top course level and did not continue west. The half meter of deposits between this floor and ground surface included pavers, collapse debris from Str. B10 and a mixed assemblage of Late/Terminal Classic ceramic types (e.g., Chacluum Black, Remate, Puluacax, Turneffe) identified by Jordan. A charcoal sample from atop the terminal pavers in the southern excavations dates to cal AD 730-888 (UCIAMS #105420) and is consistent with data from the northern excavation block.

Clear evidence for major architectural expansion during the Late Classic was evident in the north excavation block. A well-preserved plaster floor underlain by loosely crushed mudstone ballast topped the level of small pavers (refer to Figure 8). A charcoal sample taken from the mudstone fill below the floor returned a date of cal AD 544-624 (UCIAMS #105419), placing the construction of the floor at the dawn of the Late Classic period. An outset stairway and a small stair block of Str. B11 sits directly upon this floor. The construction of these architectural elements logically occurred in the Late Classic because they are sandwiched between the floor below it and the plaster floor associated with the penultimate phase of Str. B10 that later fully buried the stair block and partially covered the stairway. Charcoal samples from the boulder fill associated with construction of the plaster floor that abutted the

Figure 9. Photograph showing remnants of a thick (≈15cm) plaster floor that extended from the base of the penultimate phase of Str. B10.

base of Str. B10 (Figure 9) date to cal AD 690-871 (UCIAMS #105413) and cal AD 724-887 (UCIAMS #724-887). The penultimate construction of Str. B10 displayed a well-preserved inset stairway on its north face that was made of finely cut and dressed sandstone blocks and flanked by at least the east balustrade. The architectural style is characteristic of the central Petén (Freidel 1979), but reduced in scale. During this interval, carved dynastic texts reappeared in Plaza A as evidenced by Stela 14 and Stela 19.

An outset stairway built during the terminal construction phase buried the penultimate Str. B10 inset stairway. Three charcoal samples collected in separate locations from the cobble ballast beneath the first riser of the terminal stairway and beneath a large, in situ flat paver are associated with the terminal construction phase. The two samples from the cobble ballast date to cal AD 686-857 (UCIAMS #105396) and cal AD 725-882 (UCIAMS #105395), and the sample from below the paver similarly dates to cal AD 725-882 (UCIAMS #105394). The first stair of the outset stairway modifying Str. B10 was also linked to Str. B11 by a low wall demarcating the west perimeter and potentially forming a small, shared courtyard.

Six radiocarbon dates constrain the age of the final occupation at Group B to the 8th and 9th centuries. This is consistent with the last dated stone monuments at Uxbenka (AD 780, Stela 15). Ceramic analyses for Group B assemblages are ongoing; however, identification of types diagnostic of the Terminal Classic by Jordan reinforce our estimate for terminal Classic Period occupation. Based on these data, abandonment of this prominent civic-ceremonial group took place by the beginning of the 10th century.

Conclusions

Our work in Group B confirms previous observations that the plaza was first leveled during the Terminal Preclassic period; moreover, it sheds new light on site development in multiple ways. First, this work provides the first targeted estimate of the duration and subsequent abandonment of Group B. Second, we have identified additional building phases not observed previously. Third, the work strengthens the observation that a hiatus in construction occurred in the site core during the 5th century AD. Finally, it is clear that there were two distinctive building campaigns at the site that required larger investments in managed resource mobilization, one associated with formal site planning in the Late Preclassic/Early Classic transition and another massive reorganization at the start of the Late Classic with continued architectural alterations into the Terminal Classic.

During the Late Classic, Uxbenká developed in dialogue with other southern Belize polities at the regional apogee of Maya polity development and long-distance interaction. Populations in southern Belize increased with over 100 smaller communities and at least 10 monument-bearing polities infilling the landscape. After ca. AD 500, the region of southern Belize had witnessed population increases with over 100 smaller communities and at least 10 monument-bearing polities infilling the landscape. Furthermore, epigraphic accounts of ties developing in the Late Classic between sites in southern Belize and the sites of Copan and Quirigua (Braswell et al. 2005, Grube et al. 1999, Marcus 2003), the western Petén (Bill and Braswell 2005, Prufer et al. 2006), the southeastern Petén (Prufer 2005) and the Belize Valley (Braswell et al. 2005, Prufer 2002) have been proposed, although archaeological evidence have not yet corroborated those relationships. Our data

suggest that the elite institutions of Uxbenká were coterminous with other major centers in the region, such as Lubaantun. Refinement of the sequence from the Uxbenká site core thus merits a reexamination of regional interactions during the transformative Terminal Classic period.

Our work at Uxbenká provides a more comprehensive picture of the construction history in the site core and facilitates a more nuanced view of site growth and abandonment, including a possible hiatus in construction that warrants further investigation. The intensity of construction at Uxbenká can be linked to development of political economy and network interactions with elites. This allows us to relate site core development to the overall settlement chronology, which may not always reflect the same processes that allowed elites to mobilize labor for monumental architectural projects embedded within this polity's political economy. On a last note, determining the age of cultural sequences is an imperative first step to the systematic, empirical study of historical processes in play during the integration and disintegration of complex political systems. More artifact analyses, however, should and will be performed to create a more textured understanding of group and site development through time.

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26 UNDERWATER EXCAVATIONS OF CLASSIC PERIOD SALT WORKS, PAYNES CREEK NATIONAL PARK, BELIZE

Elizabeth C. Sills and Heather McKillop

Underwater excavations are described at Early Classic Site 24 and Late Classic Site 35 salt works in Punta Ycacos Lagoon, Paynes Creek National Park in southern Belize. The salt works are associated with a massive coastal salt industry that produced salt for the inland cities during the Classic Maya, where salt was scarce. The salt works are submerged below sea level and associated with the only known wooden architecture in the Maya area. Both the wooden buildings and salt works are preserved because of their environmental location in an underwater mangrove peat bog. Transect excavations were conducted at both sites to establish the function of the wooden architecture. Marine sediment was excavated at both sites in order to examine anthropogenic disturbances in relation to the wooden architecture. Transect excavations reveal an abundance of briquetage—ceramic vessels used to evaporate brine over fires to make salt—indicating the function of the wooden architecture is for workshop production of salt.

Introduction

Classic Maya wooden architecture is preserved underwater in a peat bog below the seafloor in Punta Ycacos Lagoon—a shallow lagoon system in Paynes Creek National Park, southern Belize (Figure 1). The wooden architecture forms buildings and structures for workshop production of a biological necessity, salt (McKillop 1995, 2002, 2005a; Sills and McKillop 2010). Underwater excavations were undertaken at two ancient Maya salt works. These sites are Early Classic (A.D. 300-600) Site 24 and Late Classic (A.D. 600-900) Site 35. The salt works are associated with the Classic Maya salt industry that produced salt for inland trade. With the only known preserved ancient Maya wooden buildings, the underwater excavations have the advantage of exploring salt production inside and around actual structures.

Organic artifacts in the tropics usually have poor preservation due to exposure to warm, moist, and unprotected environments. However, underwater environments can preserve artifacts such as wood and other organics not commonly found at terrestrial archaeological sites. Underwater archaeology in the Maya area has focused on cenotes on the Yucatán Peninsula, coastal islands, and nautical investigations (Andrews and Corletta 1995). These particular environments have preserved extinct animal bones, Paleo-Indian skeletons, and charcoal from hearths in submerged caves near the coast in the Mexican states of Yucatán and Quintana Roo (González et al. 2008). Recent investigations of cenotes in the Yucatan have uncovered numerous well-preserved human skeletons (Rojas et al. 2008). Underwater diving in pools associated with Cara Blanca in Belize yielded well preserved fossilized mega fauna (Lucero et al. 2011).

Figure 1. Map of Belize and surrounding countries showing location of study area. Map by C. Sills adapted from ESRI® ArcMap™ 9.3.1 ©1999-2009.

Submerged archaeological deposits on the coast and cays of southern Belize can explore the nexus of human interaction and the environment. Excavations at the Classic to

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Postclassic (A.D. 300-1500) trading port on Wild Cane Cay in the Port Honduras nearby the Paynes Creek underwater sites revealed deeply buried deposits extending to 140 cm below the water table (McKillop 2005b). Offshore excavations at Wild Cane Cay yielded intact buried deposits submerged by eustatic sea-level rise (McKillop 2002, 2005b). Excavations of two mounds on nearby Frenchman's Cay yielded coral architecture platform foundations 80 cm below present-day sea level (McKillop et al. 2004). Transect surveys away from the coral architecture revealed midden deposits well below the water table, as at nearby Wild Cane Cay (McKillop et al. 2004).

Other Classic Maya sites with buried deposits in Port Honduras include Pelican Cay and Pork and Doughboy Point. At the small mangrove island of Pelican Cay, Late Classic deposits are found buried under 40 cm of mangrove peat (McKillop 2002). Stratigraphic excavations revealed mangrove peat underlain by mixed mangrove peat and clay that overlays a base layer of coral sand and finger coral. Sea-level rise occurred before the Late Classic occupation with the formation of mangroves over the base layer and then continued after site abandonment as the mangroves kept pace with rising seas. At the partially inundated coastal site of Pork and Doughboy Point excavations revealed at 55 cm below sea level that the site dates to the Late Classic and Terminal Classic periods (A.D. 600 to 900; Brandehoff-Pracht 1995; McKillop 2002). The presence of intact stratigraphy that is currently below sea-level indicates that sea-level rise occurred after site abandonment.

On the southern coast of Belize, specialized salt making sites are submerged below sea level in Punta Ycacos Lagoon, Paynes Creek National Park. The excavated sites of Stingray Lagoon, David Westby, Orlando's Jewfish, and the Killer Bee site have artifacts embedded in mangrove peat (McKillop 1995, 2002). Stingray Lagoon is at least one meter underwater whereas David Westby and Orlando's Jewfish are in shallower water. The Killer Bee site is located in a mangrove ecosystem inundated by tidal fluctuations.

Submerged archaeological sites that yield organic artifacts and materials not often found at terrestrial sites can add a new assemblage for interpreting sites that are on dry land. The conjunction of human occupation with environmental data has the ability to integrate different types of data sets for interpreting the archaeological record. Investigations at the underwater salt works in Paynes Creek have yielded an abundance of preserved wooden architecture as well as artifacts and are a good environment to explore the salt makers occupation and environmental conditions before, during, and after occupation.

Marine Landscape of Punta Ycacos Lagoon

Punta Ycacos Lagoon is an estuarine lagoon dominated by a typical mangrove ecosystem. The surface of the sea floor is firm mangrove peat overlain with a layer of loose silt. Rhizophora mangle (red mangrove) is the dominant species found fringing the edges of the lagoon and in isolated stands in the lagoon. Avicennia germinans (black mangrove) and Laguncularia racemosa (white mangrove) are found behind R. mangle away from the fringe of the lagoon. The successionary location of mangroves in Punta Ycacos Lagoon is typical of mangrove forest environments (Tomlinson 1986).

The lagoon system is supplied with salt water from the Caribbean Sea to the east and fresh water from Freshwater Creek. In the past, the lagoon system may have been part of the Monkey River deltaic system to the north (McKillop 2002; Wright et al. 1959). Water depths in the lagoon system reported by Purdy and Gischler (2003) range from 20 cm to 6 m in deeper channels. The deepest underwater sites in the lagoon discovered so far are 1.5 m below water at the seafloor surface of the sites. Field observations at Sites 24 and 35, located in the shallow Eastern Lagoon, recorded an average of 44 cm below sea level.

Microscopic analysis of excavated sediment from below the sea floor at the underwater site of K'ak' Naab' indicates the peat is composed of R. mangle (McKillop, Sills, and Harrison 2010a and b). R. mangle is the dominate species throughout the entire 1.5 m excavated sequence. Loss-on ignition testing of sediment indicates that the organic content of the excavated marine sediment averages over 65%,

Figure 2. Relocating wooden posts at Site 24 (photo by H. McKillop).

which is high and typical of mangrove peat sediment. Radiocarbon dating of the uppermost and lowermost samples shows a 4,000 year record of mangrove accumulation. The analysis of excavated sediment resulted in establishing an occupation surface at the time of the Paynes Creek Classic Maya salt industry of approximately 132.7 cm below the current sea level (McKillop, Sills, and Harrison 2010a and b).

Previous investigations of the Paynes Creek sites indicate that the artifacts lie directly on or are embedded in the sea floor (McKillop 2005a, 2007; Sills and McKillop 2010). The peat, an anaerobic sediment, creates an environment that preserves organic remains such as wooden posts and the only known ancient Maya canoe paddle from the site of K'ak' Naab' (McKillop 2005a; McKillop, Sills, and Harrison 2010a and b). The preserved wooden posts are embedded into the peat with only the worm eaten portions of the wood to mark their presence protruding above the seafloor (McKillop 2005a; Sills and McKillop 2010). The slightly acidic quality of the mangrove peat does not provide a suitable matrix for the preservation of bone or shell.

Investigations within Paynes Creek confirm that salt works were close to the source of brackish water required to evaporate in pots over fire to make salt. The presence of artifacts on the surface of the peat and wooden posts driven into mangrove peat indicates that the mangroves in Paynes Creek National Park were able to keep pace with sea-level rise until sometime after the Late Classic abandonment (McKillop, Sills, and Harrison 2010a and b).

Underwater Excavations

Underwater excavations were undertaken at Sites 24 and 35 in 2010 with a team of nine researchers, including the authors. Prior to underwater excavations, Sites 24 and 35 were relocated using a GPS unit to find the PVC datum marker for each site. The datum markers had been sunk into the seafloor to hide the sites, so once relocated, the PVC pipes were pulled up above the water to help relocate posts that had been discovered and mapped in 2007. The wooden posts were relocated by referring to a site map created in our project GIS. The paper map was placed into an archival plastic bag to keep the map dry in the water and attached to a clip board (Figure 2). The map was useful in determining the general location of the wooden posts and by feeling the sea floor for the markers that had been sunk into the seafloor on the north side of each post after discovery and total station mapping. The markers consisted of plastic flags labeled with the post number. The flags were furled and placed inside plastic drinking straws that were sunk into the seafloor. Furling flags into straws and sinking them protected the sites, since their locations were clearly marked by a sea of flags during each field season. Once the posts were relocated we placed a red pin flag into the peat on the north side of each wooden post so the post locations were visible above the water. A systematic flotation survey on research flotation devices (RFDs) was conducted across the site to determine the spatial extent of the artifacts. The boundaries of artifacts were marked by flags. The team snorkeled on the RFDs shoulder to shoulder, pivoting at the end of each row to cover the entire site, marking posts on the way.

Two transects were placed across Sites 24 and Site 35 respectively, forming a cross shape. The transects were placed to extend across the site—as defined by the surface distribution of artifacts—and to include inside and outside areas of buildings. The transects were laid out using a compass and a 30 m tape. The ends of each transect were marked with long PVC pipes pushed into the seafloor. The tape was stretched tight between the two PVC pipes. Short lengths

of ¼" PVC pipes were placed into the sea floor at each meter mark (Figure 3). Excavations proceeded along each transect using a metal grid frame measuring one by one meters. The frame was oriented by placing it along the PVC pipes that marked the meter marks. The grid was weighted down with five pound weights to keep it in place during excavations. Excavators placed their hands firmly on the seafloor and collected all surface artifacts. The artifacts were placed into a bucket with holes on all sides to drain the water. Each bucket with the excavator was photographed showing the relative amount of artifacts collected before transferring the artifacts into labeled plastic bags (Figure 4). Gross estimates of the excavated material and unit sediment descriptions were written in an underwater notebook. At night at our field camp, the notes were transferred into our daily field journals. The plastic bags were labeled using a black sharpie and included the site number, unit designation, date, and the collector's initials. Fragile artifacts were placed into separate labeled bags. The plastic bags were ordered by unit and placed into the Portable Research Station before transferring them to our larger ocean going vessel. The location of the transects were mapped using a Topcon GTS-725 total station and downloaded each evening and attached to the GIS GeoMedia® by IntergraphTM for analysis in relation to the previously recorded wooden architecture.

The artifacts were studied at the field lab in Belize. After fresh water rinsing and drying, the artifacts were separated into material classes. The ceramics were sorted according to the type-variety classification for Maya pottery which is useful for developing a site chronology. Most types fit within existing classifications for the Paynes Creek area (McKillop 1995, 2002). All ceramics and stone tools were drawn and photographed.

Marine sediment was excavated to explore the relationship of the environment to the salt works (Rosado, McKillop, and Sills n.d.). The purpose the study is determine the species composition of the sediment, the amount of organic material, and to establish an occupation level at the time the salt works were in use.

Figure 3. Setting up a transect at Site 24 (photo by H. McKillop).

Figure 4. Artifacts collected from a unit on the sea floor (photo by H. McKillop).

Figure 5. Roberto Rosado excavating a sediment column sample at Site 24 (photo by H. McKillop).

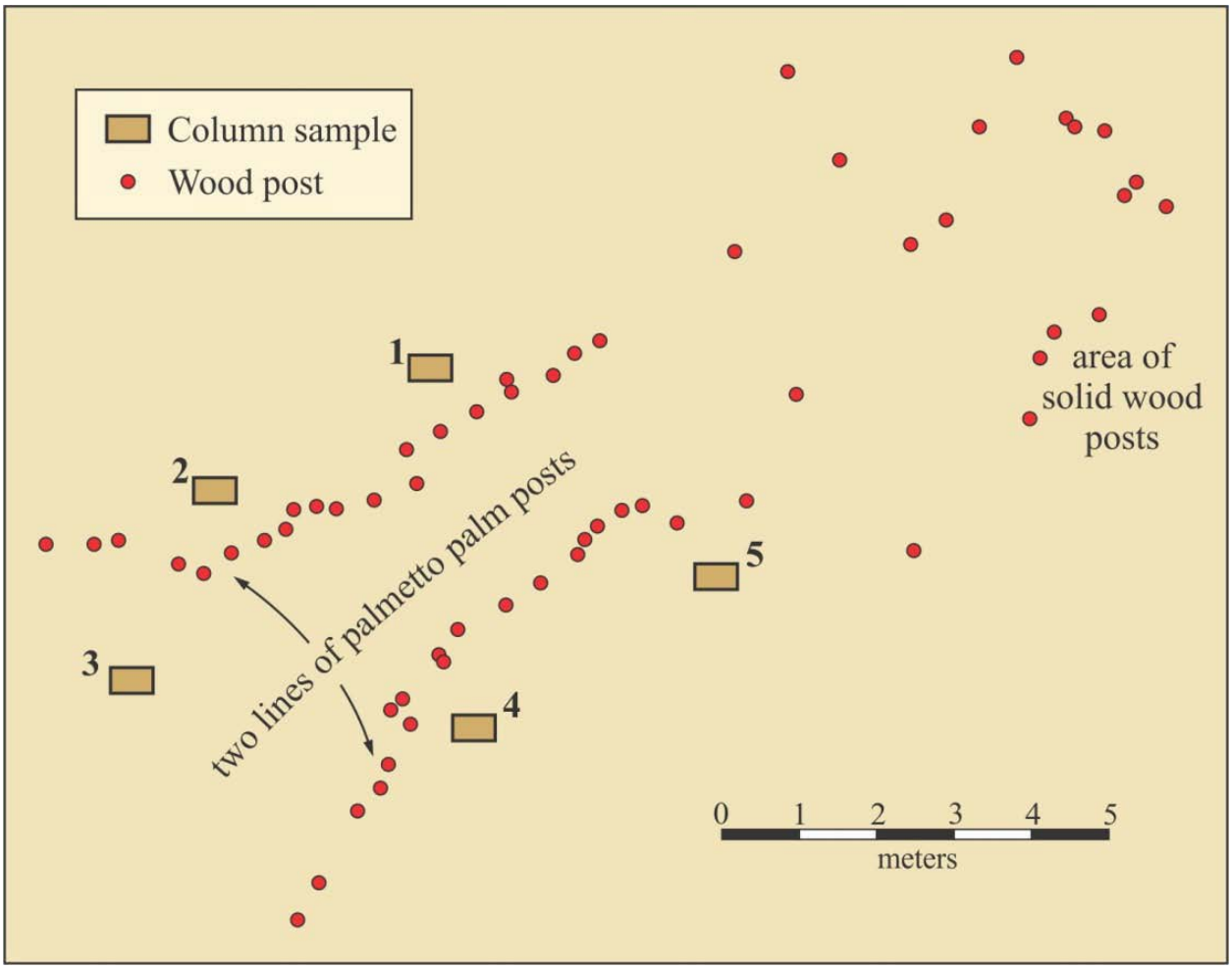

Figure 6. Map of Site 24 showing wooden architecture and excavation locations of sediment columns (drawing by Mary Lee Eggart from GIS map by H. McKillop).

Each sediment column was excavated to a depth of 60 cm. A hole was excavated in the sea floor to expose a vertical face from which to excavate 10 cubic cm blocks of mangrove peat. The mangrove peat was cut in 10 cm levels using a clean stainless steel knife. The depth of each excavated level was measured with a cloth tape (Figure 5). The excavated samples were wrapped in plastic cling wrap and placed into a larger plastic bag marked with provenience. The sediment was exported to the Louisiana State University Coastal Archaeology research lab under permit from the government of Belize Institute of Archaeology.

Excavations at Site 24 and 35

Site 24 consists of at least one rectangular building with room divisions. The site also has two lines of palmetto palm posts (Acceloracea wrightii) that fan out from the building (Figure 6). Two transects were placed perpendicular to each other in order to excavate the inside and outside of the building. Transect excavations were placed based on the layout of the structure and observations recorded during the 2006 systematic survey of the site conducted to locate wooden posts. The abundance of briquetage observed during the 2006 survey suggested that the architecture at the site is associated with a salt production workshop and not a residential structure.

Transect 1 was 18 m in length, placed to extend across the site in a northeast to southwest direction. The transect covered the inside of the wooden building and extended beyond in both directions to an open area defined on the outside

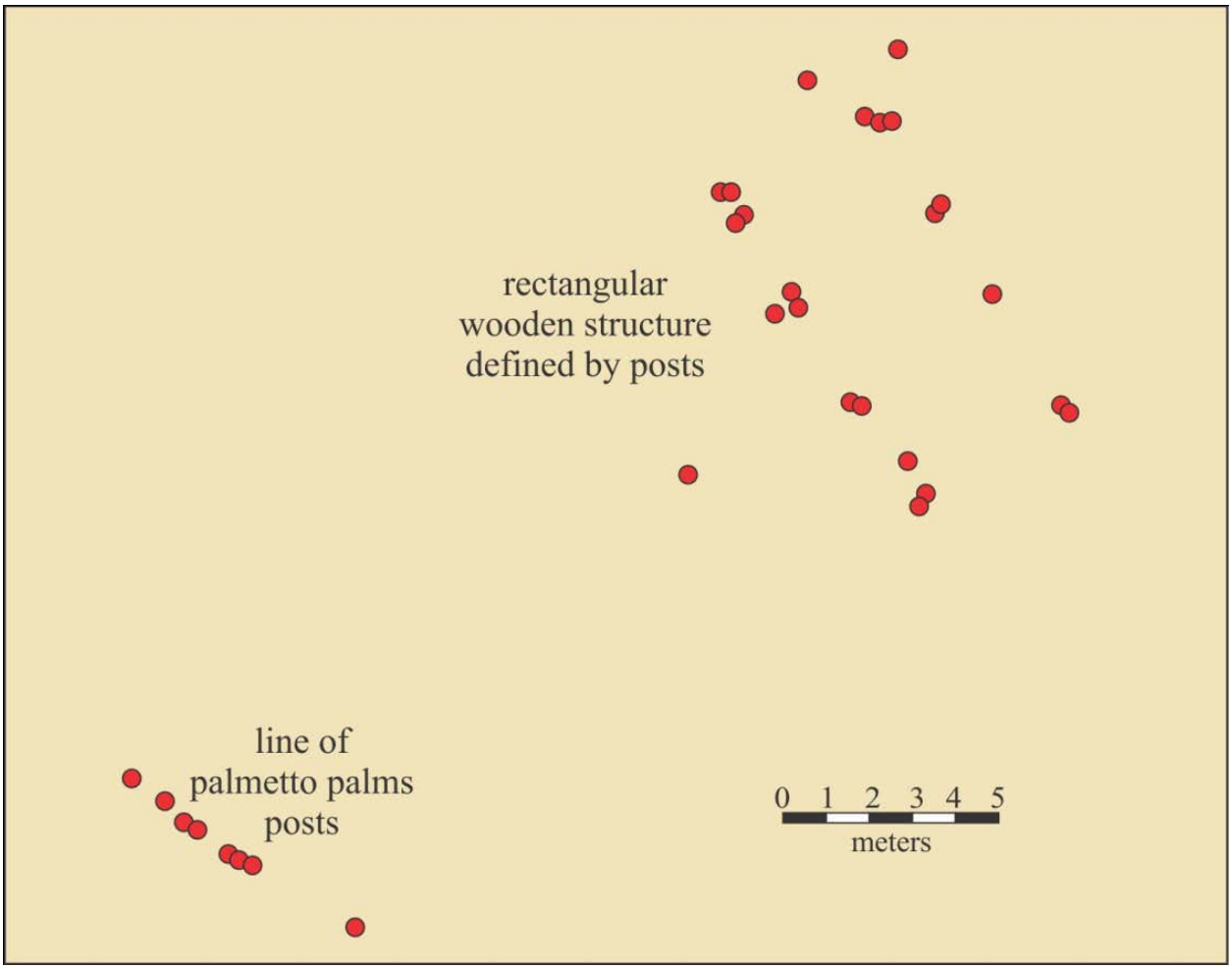

Figure 7. Map of Site 35 showing the rectangular wooden building and the line of palmetto palm posts (Drawing by Mary Lee Eggart from GIS map by H. McKillop).

by lines of palmetto palm posts. Transect 2 was 24 meters in length, at a right angle to Transect 1. Transect 2 also included the interior of the structure as well as the outdoor space defined by the two lines of palmetto palm posts.

Five sediment columns were excavated by Roberto Rosado for his M.A. research. Only Column's 1 and 3 were analyzed for research. Four of the sediment columns were excavated on the outside of the two lines of palmetto palm posts and one column was excavated between the two lines.

Site 35 was systematically surveyed for wooden architecture in 2006 and determined to be another salt work associated with wooden architecture. The site has one rectangular building with no visible room divisions (Figure 7). Seven palmetto palm posts that form a line were mapped 15 m to the southwest of the building. Underwater excavations were placed to examine differences in the presence, type, and abundance of artifacts inside and outside of the building.

Two long transects were laid out and excavated in 1 x 1 m units. Transect 1 was 15 m in length and placed along the interior of the rectangular wooden building. Transect 2 was placed perpendicular to Transect 1 and was 24 meters long. Transect 2 intersects Transect 1 inside the building and extends to the line of seven palmetto palm posts.

The two sediment columns were excavated directly to the north and the south of the seven palmetto palm posts. As with the sediment column at Site 24, these two columns were excavated to 60 cm below the sea floor.

The majority of artifacts at both sites are briquetage—ceramic vessels used to evaporate brine over fires to make salt. Both Site 24 and Site 35 had an abundance of briquetage inside the buildings. The term briquetage includes ceramics associated with salt production including pottery vessels, cylinders, spacers, sockets, bases, and amorphous clay lumps (ACLs). The majority of pottery vessels are Punta Ycacos Unslipped jars and bowls that are easily identifiable due to their friable nature and sand temper. There was also an abundance of ACLs that include the fragmentary pieces of the support structure for holding the pots over fires. The solid clay cylinders are vessel supports used to lift the pots over fires and are made from clay that is not well mixed as evidenced from the rolling formation of the cylinders visible in cross sections. Very few spacers, used to separate the individual pots, were collected. Few complete sockets, the part at the top of the cylinder for placing the pot, were recovered. Lacking also are bases which are the clay on the base of the solid clay cylinders. There was abundant charcoal, which was mixed with ACLs that may have been placed in the fires to help retain heat over the slow evaporation process of making salt.

Other types of pottery comprising a minimal amount of the overall assemblage were also found inside of the wooden buildings. These types include Mangrove Unslipped, Warrie Red, and Moho Red (see McKillop 2002 for type descriptions). Mangrove Unslipped and Warrie Red have the function of water jars and were used as vessels to store water or brine. Moho Red is defined as serving vessels. There are some artifacts used in ritual such as a figurine whistle fragment, candeleros, and fragments of an incense burner.

There is an absence of briquetage between the wooden buildings and inside the lines of palmetto palm posts. The diminished amount of artifacts in this area is as interesting as the presence of artifacts within the buildings. This absence of artifacts indicates that most likely no fires or salt making was occurring in this area. Instead, we interpret the lines palmetto palm posts as retaining walls to keep water out of the salt works (Sills and McKillop 2010). No artifacts were collected outside the lines of palmetto palm posts.

An NSF dissertation grant is providing funding for ongoing analyses of excavated material and typological analyses of artifacts. The ongoing analysis includes chemical testing of marine sediment, neutron activation analysis of pottery, 3D imaging, and radiocarbon dating. Three-dimensional imaging is under way at Louisiana State University on the Digital Imaging and Visualization (DIVA) Lab in order to scan pottery sherds.

Conclusions

The underwater excavations along with the sediment column excavations demonstrate the benefits of environmental and archaeological research. The artifacts lying on the surface and embedded in the mangrove peat have undergone cultural and environmental transformations. The settling of the salt makers in the lagoon along with rising sea levels and peat development has impacted the environment at the two sites.

Evidence of physical architecture in the Maya area includes the urban center temples made from limestone and sandstone, post molds located below the topsoil during excavation, and rarely, as at Cerén where a village is preserved by volcanic tephra, actual wood (Sheets 2002). The underwater sites in Paynes Creek National Park have the wooden architecture preserved due to peat, an anaerobic sediment. Sea-level increased sometime after the Late Classic period and inundated the salt works, protecting them in mangrove peat and saline water. The submersion of these sites preserved the wooden architecture, as well as large fragments of briquetage, the remains of salt making vessels.

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27 SUSTAINABLE ARCHAEOLOGICAL TOURISM OF THE UNDERWATER MAYA SALT WORKS IN PAYNES CREEK NATIONAL PARK, BELIZE

Heather McKillop and Elizabeth C. Sills

Isolated in a remote salt-water lagoon, the Underwater Maya project archaeologists discovered and mapped dozens of wooden buildings associated with a massive salt industry. The wooden buildings are preserved and protected in mangrove peat below the seafloor. The arrival of the survey and excavation team attracted the interest of local and foreign visitors to the area. With a Site Preservation Grant from the Archaeological Institute of America, and after consultation with the Belize Institute of Archaeology and then local NGOs, we initiated a program of sustainable Archaeological Tourism: A permanent exhibit at the Paynes Creek Ranger Station will help employ local marine guides to bring visitors. Workshops to encourage local craft workers to include designs from the project that visitors see at the exhibit at Paynes Creek or the one at the Tourism Building in Punta Gorda. Local public and school talks, discussions with restaurant, hotel, and business owners, and extensive media attention, especially PGTV and LoveFm, made the Underwater Maya Archaeological Tourism project a household topic of discussion.

Introduction

When boat drivers from Punta Gorda in southern Belize brought tourists to the excavations on the offshore island sites on Wild Cane Cay or Frenchman's Cay in southern Belize (McKillop 2005a; Figure 1), they knew they could get a tour of the site, which enhanced the tourism experience and put money in the pockets of the local boat drivers. In this way, the sites on the offshore islands benefitted from a measure of protection by the boat drivers, who derived income from bringing tourists to the sites. Boat drivers also knew that when the field season ended and the excavations were back-filled, the archaeological site was no longer part of the tourism experience. In this paper, we discuss implementation of a sustainable archaeological tourism project for the ancient Maya salt works located underwater in a shallow lagoon in Paynes Creek National Park, in the Toledo District of southern Belize. The goals are to invest the local community in protecting the underwater sites by providing opportunities for financial benefits associated with the sites. In 2012, we opened two permanent exhibits in southern Belize, held craft workshops, and carried out community outreach through posters, public and school lectures, and informal discussions.

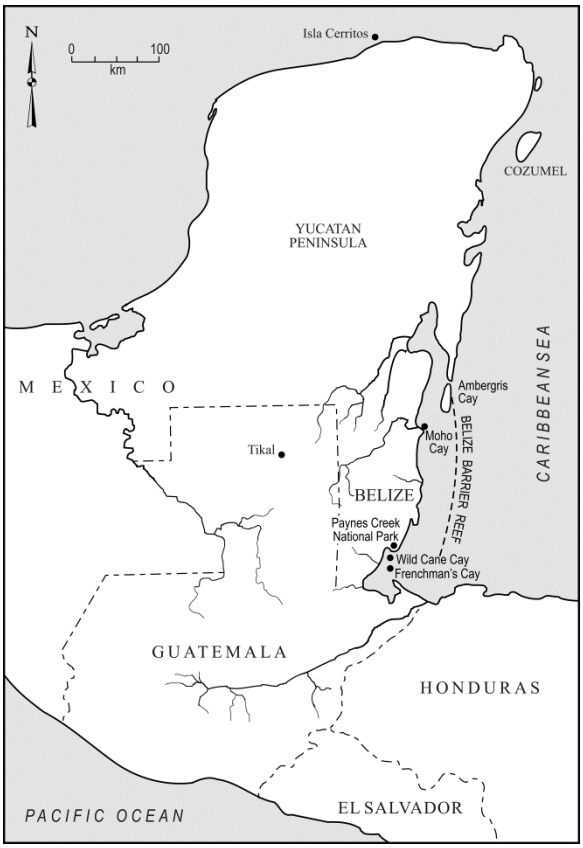

Figure 1. Map of the Maya Area Showing Location of Paynes Creek National Park. (map by Mary Lee Eggart, Louisiana State University).

Underwater Maya Sustainable Archaeological Tourism

We expand the use of 3D artifact scanning technology in archaeology to include its use creating exhibits with 3D printed replicas for heritage conservation and sustainable archaeological tourism. A number of researchers are using 3D scanning to obtain an accurate scientific record of artifacts and skeletal

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material (Kuzminsky and Gardiner 2012; Niven et al. 2009), to record collections (Apollonio et al. 2012; Hunter and Gerber 2010), to study fragile material (Lobb et al. 2010), and to study detailed parts of artifacts by zooming on digital artifacts (Bretzke and Conrad 2012). Dawson and colleagues (2011) created a 3D digital reconstruction of sites to make archaeology more accessible to descendant Inuit groups in Canada and to repatriate knowledge. Three-dimensional printing of artifact replicas for exhibits makes archaeological information accessible to people in areas such as southern Belize where access to computers and the Internet is not widespread, particularly for Indigenous Maya in remote villages.

The Underwater Maya Sustainable Archaeological Tourism project brought together different stakeholders to protect, promote, and develop grass-roots tourism from the archaeological sites in Paynes Creek National Park. Paynes Creek is co-managed by the Belize government Forestry Department and TIDE (Toledo Institute of Development and the Environment), the latter a local NGO (non-governmental organization) in southern Belize. TIDE's focus is the natural resources. The Belize government Institute of Archaeology maintains jurisdiction over the archaeological sites in the park and approves all aspects of the Underwater Maya Site Preservation project, as well as permits for the archaeological field research. The Archaeological Institute of America "Site Preservation Grant" was utilized to provide an opportunity to bring together research, conservation, and archaeological tourism at a local level. The Toledo Tour Guide Association, Toledo Belize Tourism Industry Association, and other NGOs involved in education and tourism also are participating in the project.

Background on the Underwater Maya Sites

Since wood normally decays in the tropical landscape of the Maya area, the preservation of wooden posts and artifacts in a peat bog below the seafloor in Paynes Creek National Park provides new information about Classic Maya architecture and culture (Figure 1). The Paynes Creek sites provide a unique record of the wooden structures that likely dominated ancient cities as in the modern villages of the indigenous Maya. The remarkable preservation of the Paynes Creek sites was due to sea-level rise that submerged wooden buildings below the seafloor (McKillop et al. 2010).

Survey between 2005 and 2009 resulted in the discovery and mapping of 4000 wooden posts at 104 underwater sites (McKillop 2005b, 2009, 2010a, 2010b, 2011a, 2011b; Sills and McKillop 2010; Somers 2007). Some of the posts defined the outlines of rectangular wooden buildings, including interior room divisions (McKillop 2009). The wooden structures were associated with briquetage—pottery vessels used to evaporate salty water by heating over fires. The Paynes Creek salt works produced salt during the Classic Maya civilization, evidently for trade to nearby inland cities, where this basic biological necessity was scares (McKillop 2002). Excavation of selected underwater sites between 2010 and 2013 underscores the extent of the Classic salt industry, with the recovery of abundant briquetage.

Pottery, wood artifacts, posts, and other botanical material removed from their archaeological context in the mangrove peat below the seafloor create a conservation nightmare due to their saturation with salt water: Pottery exfoliates from salt that moves to the surface when the object dries; wooden objects allowed to air-dry, shrink and become distorted in their shape, which also damages the structure of the wood, making species identification difficult. During the survey project, posts were mapped and left in situ. A limited number of diagnostic artifacts were mapped and collected for further study. Hundreds of wooden samples were cut from posts while they were still in the seafloor. In order to maintain the integrity of wood and pottery artifacts and posts for study, they were immediately placed in plastic bags filled with fresh water after they were removed from the sites. Selected artifacts were exported for conservation and study. The field lab in Belize and the archaeology lab at LSU became conservation labs housing plastic containers, each with a ceramic, wood post or post sample, or other organic artifacts in fresh water. Changing the water in order to desalinate the artifacts continues until they are either desalinated and allowed to dry, in the case of

ceramics, or transported to the Preservation Lab at Texas A & M University for polymer conservation, after which they are stabilized (Smith 2003). Even with conservation, wooden artifacts continue to deteriorate due to damage that occurred in their post-depositional environment (McKillop et al. 2010).

Digital imaging of waterlogged artifacts and posts has become an essential part of the Underwater Maya field and lab research, since the digital archives preserve a permanent record of the artifact, whereas the artifacts may deteriorate. Most of the imaging is by 2D or 3D scanning in the LSU Digital Imaging and Visualization in Archaeology (DIVA) lab. The DIVA Lab was established in 2009 to expand 2D imaging capabilities and to incorporate 3D imaging into archaeological research at LSU, using the Underwater Maya material as a case study. Equipment includes a Kreon laser scanner attached to a Microscribe arm, three NextEngine 3D desktop scanners, a Dimension Elite 3D printer, laptops, microscopes, and a portable XRF machine. CT-scans and SEM imaging are carried out elsewhere. The scanning equipment is used with a workstation computer in the DIVA lab, as well as laptops in the lab and at our field lab.

Since the goal of 3D scanning is to produce an accurate 3D digital replica of an artifact, obtaining good data from a 3D scan is critical, rather than correcting the 3D scanned image in editing software ex post facto. For the Underwater Maya research, obtaining accurate 3D digital replicas of artifacts is important for study, including salt-waterlogged wood and ceramics as well as sharp edges of stone tools. Therefore, we selected a hand-held, high-precision 3D scanner to control the capture of high-resolution 3D images. We use a Skiron laser scanner from Kreon Technologies attached to a MicroScribe G2X arm (Figure 2). We also use NextEngine 3D desktop scanners, which automatically scan an object and automatically align the separate scans to produce a 3D digital image. The NextEngine 3D scanners have the advantage of being in full color, whereas the Kreon scanner only scans the shape (capturing some 80,000 points/second) but not the color of the object. Both 3D scanners are portable in cushioned plastic cases. A sample of wood

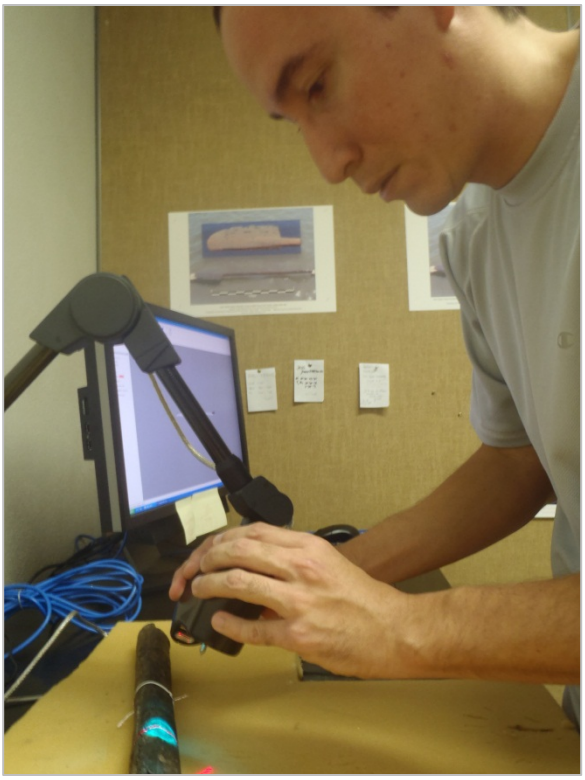

Figure 2. Microscribe arm with 3D laser scanner in the LSU Digital Imaging and Visualization in Archaeology (DIVA) lab.

Figure 3. NextEngine 3D Scanner at Field Lab in Belize.

samples from posts identified to genus or species have been archived by imaging thin-sections under a microscope or by SEM (scanning electron microscope) images. CT scans of selected artifacts provide both an exterior surface and the internal structure of the object.

In the 2011 and 2012 field excavation seasons, 3D imaging of selected excavated material was integrated into our field research,

Figure 4. Unifacial, stemmed points, including the original (on the right) and 3D replicas printed with the Dimension Elite 3D printer in the LSU DIVA lab.

using a NextEngine 3D scanner operated from a generator at our remote base camp north of Punta Gorda (Figure 3). Artifact processing and recording was carried out at a Lagoon Lab in the shallow water near the underwater excavations. Artifacts selected for 3D imaging were stored in zip-lock bags filled with fresh water and transported to the base camp for imaging. Following imaging, the artifacts were curated underwater in mesh sacs held in place in the seafloor by PVC pipes. The location of inventoried and curated artifacts was recorded with a GPS, allowing the opportunity for further study, while preserving the integrity of the artifacts. Three-dimensional scanning has become incorporated into fieldwork, reducing or obviating the need for storage and export except where conservation or further testing (such as C14 or chemical sourcing) is necessary.

Although most 3D scans are used exclusively as digital images, artifact replicas are printed for specific purposes using a Dimension Elite 3D printer.

The printer has a plastic platform on which the model is created. The printer head includes a nozzle for the support material and one for the model material, which is extruded in a fine plastic filament to slowly build the object. The software records the estimated build time, as well as the amount of support and model material used. A chert adze took 10 hours to print. A unifacial stemmed chert point took 2.5 hours at full size (Figure 4), 20 minutes at 20 % scale, and 6 minutes at 10% scale. Once the plastic model is printed, the support material is removed in the "Support Cleaning Apparatus," which chemically dissolves the support material in a heated solution. The plastic replicas are painted with model airplane paint and spray

paint, using the colors of the artifacts when discovered, even though they are discolored from immersion in salt water.

We found a variety of uses of the digital images and printed replicas. Exact replicas, both as digital 3D images and as printed "replicas," are a permanent record of artifacts that will be returned to Belize and/or that decay. Digital 3D replicas can be shared with colleagues and the public through email, web sites, and other media. Three-dimensional images of artifacts can be manipulated to answer research questions, such as comparing cutting edges of stone tools with cut marks on wooden building posts. Fragile and/or waterlogged artifacts can be viewed, studied, and measured in virtual space at various sizes and angles instead of handling them. Printing replicas is useful for display, teaching, educational outreach, showing artifacts to colleagues at conferences, and for research. We used 3D printed artifact replicas in exhibits in Belize (McKillop and Sills n.d.).

We used 3D printed replicas for two exhibits in Belize in March 2012. The use of replicas obviated government loans of actual artifacts to local agencies and reduced security requirements, since the objects on display have no value on the international Antiquities Market. Importantly, the artifact replicas are accurate copies, virtually indistinguishable from the original artifact, except by weight, since the replicas are printed from high-quality ABS+ plastic. The artifact replicas were printed using a 3D printer, from 3D scans of artifacts made both in our remote jungle camp in Belize powered by a generator, and in the DIVA Lab (Digital Imaging and Visualization in Archaeology) in the Department of Geography and Anthropology at Louisiana State University (see http://www.ga.lsu.edu/DIVALab.html). The potential for sharing the past by displays of 3D artifact replicas is tremendous for schools and for communities lacking museums or widespread access to the Internet for digital museums.

Permanent Underwater Maya Exhibits in Belize

In March 2012, two permanent exhibits were opened in Belize featuring the underwater Maya sites, including one exhibit at the Belize

Figure 5. Underwater Maya exhibit at the Belize Tourism Building in Punta Gorda, featuring 3D Replicas of Artifacts.

Tourism Center in Punta Gorda, and another at the Paynes Creek National Park Ranger Station, only accessible by boat some 30 km north of Punta Gorda. Each exhibit includes artifact replicas in a varnished wooden display cabinet with a lockable glass frame top (Figure 5). A laminated poster on the wall above the cabinet describes the Underwater Maya sites and their significance to archaeology and to local tourism. The exhibits were updated with additional artifact replicas during the May 2012 Toledo Cacao Fest. Maya archaeologist and AIA Director of Programs Ben Thomas believes "this project will have a tremendous impact on the local population where many descendants of the ancient Maya reside today and on visitors who come to the area. It will be great for people to see the wooden artifacts created by the ancestors of the local inhabitants—raising awareness is critical for the protection of the site" (see http://www.archaeological.org/news/currentprojects/1301).

The opening of the town exhibit at the Belize Tourism Center in Punta Gorda was at 10 am on Thursday March 15, 2012. Following an introduction by Paul Villafranco, Program Manager for TIDE, there was a presentation about the Paynes Creek sites and the exhibit. Questions and discussion followed, along with refreshments. There were about 20 people in attendance, which is the capacity for the building. Three tourists arrived during the opening. The opening was covered by PGTV (http://www.archaeological.org/news/currentproj

ects/8629) and by LoveFM correspondent Paul Mahung, also announcing a public lecture in the evening.

A second exhibit was opened at the Paynes Creek National Park Ranger Station on Monday 20 March 2012 at the suggestion of local marine tour guides, who would be employed to take visitors to the Ranger Station, accessible only by water. Local boat captain John Young was hired to take us, along with the exhibit and Paul Mahung, reporting for LoveFM. Also in attendance were two employees from a fly-fishing lodge near Punta Gorda that hires local boat guides to take people fishing in Paynes Creek National Park.

The boat ride took about one hour in calm seas, some 48 km north in uninhabited marine waters through the Port Honduras Marine Reserve, and then through the mangrove ecosystem of Punta Ycacos Lagoon, in Paynes Creek National Park. The PCNP Ranger Station is situated on the pine savannah edge of the lagoon. TIDE Terrestrial Manager Mario Muschamp and Head Ranger Leonard Williams helped bring the exhibit materials from the boat to the Ranger Station. The display cabinet and laminated poster were assembled in an alcove of the building. The artifact replicas included some items not in the town display, so the visit to the PCNP Ranger Station would not duplicate the town exhibit. Paul Mahung prepared an interview for LoveFm, which aired several times. Additional radio and television interviews at LoveFM in Belize City aired on Belize Watch and The Morning Show, March 21 and 22, respectively. Media coverage of the exhibits was essential to broadcasting information about the project. Much of the media is available through the Site Preservation page of the Archaeological Institute of America web site (see http://www.archaeological.org/projects/paynescreekbelize), along with a video showing McKillop lecturing in the water at one of the underwater sites (see http://www.archaeological.org/news/currentprojects/5232).

Public Outreach

The program includes workshops for tour guides who may incorporate archaeology into

Figure 6. Punta Gorda Business Owner with Underwater Maya Sustainable Archaeological Tourism Poster.

their marine tours for fishing, snorkeling, and bird watching. We provided the tour guides with laminated fact sheets about the Underwater Maya archaeology to keep in their boats. The Toledo Tour Guide Association said "the workshops and exhibits will put tourism dollars into our communities in Toledo" (personal communication, 2012). A lecture in the Methodist public school included distribution of laminated fact sheets about the ancient Maya for school teachers. Several days were spent discussing the Underwater Maya project with business owners in Punta Gorda and providing them a laminated poster with facts about the project and location of the exhibits. Subsequently, laminated photos were given to many of the business owners showing them with the poster (Figure 6).

Craft Workshops in Punta Gorda, Belize

Craft workshops at the Maya Women's Cooperative in Punta Gorda focused on introducing designs from the Underwater Maya exhibit, so that the craft workers could benefit from selling their goods to people who had visited the Paynes Creek exhibit or heard about the underwater Maya sites. Laminated fact sheets featuring designs from the exhibits were provided, with a book so the women could sign out the fact sheets for a week and take them to their villages. The craft workshop was repeated on different days, with different craft workers in attendance, since the women come to Punta Gorda from outlying Maya villages on different days, with limited communication among the

Figure 7. Maya Craft Worker with Design Fact Sheet, Maya Women's Cooperative, Punta Gorda.

group. Laminated photos of some of the craft workers at the store, holding the design fact sheets were provided on a return visit (Figure 7). They may help reinforce the concept of using designs from the Underwater Maya exhibit. A planned workshop with rosewood carvers did not occur: The bus didn't arrive from Crique Sarco, where most of the Maya rosewood carvers live.

Summary

Creating displays with 3D replicas underscores the potential for exhibiting 3D replicas that do not require loans of actual artifacts, or security for actual artifacts. The fact that we followed up on our statements about creating exhibits, about updating them with new replicas, taking the tour guides' ideas to create an exhibit in Paynes Creek National Park, and following through with providing laminated photos and fact sheets, generated a consensus that we were sincere in integrating the archaeological research in Paynes Creek with local economic development. The success of the project depends on the interest of the local people to maintain and expand the exhibits and workshops. People around the world know about the underwater Maya sites in southern Belize, so we are excited to be able to give something back to the people in the local communities so they can incorporate our archaeological research into sustainable archaeological tourism.

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28 BRINE ENRICHING SLAG HEAPS OR MOUNDED REMAINS OF SALT MAKERS HOMES? EARTHEN MOUNDS IN THE MANGROVES AT THE PAYNES CREEK SALT WORKS

Rachel Watson, Heather McKillop and Elizabeth C. Sills

Wooden architecture and artifacts associated with the Classic Maya salt industry are preserved underwater in Paynes Creek National Park, southern Belize. Lacking at these underwater sites is evidence of enriching the salinity of seawater the remains of which form mounds near salt works leaching brine through salty soil—virtually universal in ethnographic and historic case studies. Several earthen mounds in the black mangrove flats rise above the underwater salt works associated with wooden architecture. The mounds at Killer Bee and Witz Naab'are surrounded by briquetage in the tidal flats. Are these mounds the remains of domestic platforms or are they the remains of leached soils that were used to enrich brine before boiling the salt over fires? Data from excavations and survey are evaluated to interpret the ancient activities that produced the earthen mounds.

Introduction

Excavations were carried out in 2012 at two earthen mounds in the mangroves near the underwater sites in Punta Ycacos Lagoon, a large salt-water lagoon system in Paynes Creek National Park, southern Belize (Figure 1). Survey and excavation at underwater sites has provided informed about the Classic Maya economy, and in particular, about the production and distribution of salt. Salt, a basic biological necessity, was produced along the coast of Belize by evaporating brine in pots over fires (Graham 1994; MacKinnon and Kepecs 1989; Andrews and Mock 2004; McKillop 1995, 2002). Survey and excavations of the underwater salt works—submerged by sea-level rise--has revealed ancient Maya wooden buildings with an abundance of briquetage—the remains of pots used for evaporating brine over fires (McKillop 1995, 2002, 2005a-c, 2008; McKillop et al. 2010 a-b, 2011; Sills 2007; Sills and McKillop 2010; Somers 2007).

The focus of archaeological research in Paynes Creek National Park has been the wooden architecture, since its discovery during survey in 2004 (McKillop 2005a). In this paper, we report the excavations at two earthen mound sites, including Witz Naab'and the Killer Bee site, both dating to the Classic period. Killer Bee had been mapped and limited excavations, including a shovel test, had been carried out (McKillop 2002). The goals of the 2012 excavations were to understand the relationships of the earthen mounds to the inundated salt works with preserved wooden architecture. In order to estimate the function of the mounds,

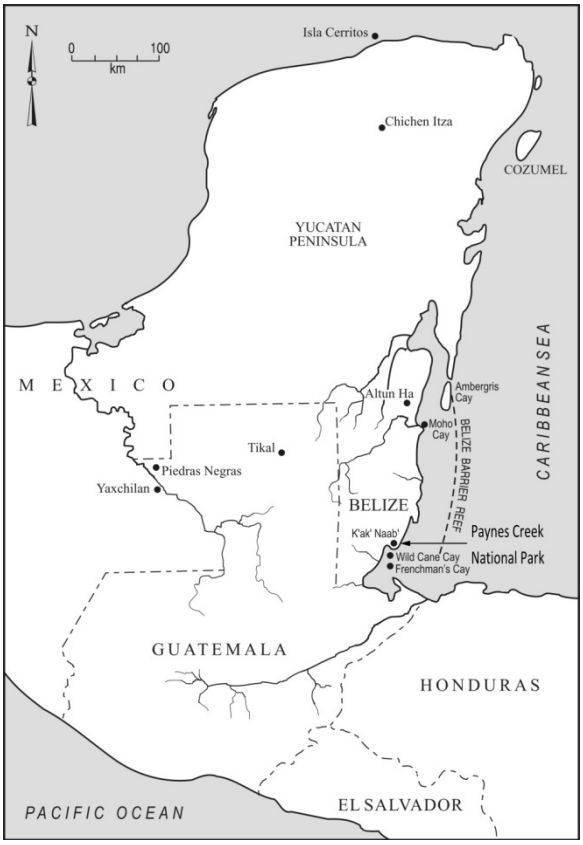

Figure 1. Location of Paynes Creek National Park, Toledo District, Belize.

several hypotheses were developed with test implications. The hypotheses were developed using ethnographic and archaeological data about low lying mounds and salt works in the Maya area. Four possible uses include leaching mounds where brine was concentrated by pouring it through salty soil before the evaporation process (MacKinnon and Kepecs

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Figure 2. Clearing Low-Lying Mound at Killer Bee Site.

1989; McKillop 1995, 2002; Nance 1992), residential platforms, administrative structures (Andrews 1983), or multi-functional platforms.

Leaching Mounds for Concentrating Brine

The earthen mounds at Witz Naab' and Killer Bee could be leached soil left over from pouring water through salty soil, as is carried out elsewhere in modern times, notably at the Maya highland community of Sacapulas (Reina and Monaghen 1981). The Guzman mound located on a salt flat along the Guatemalan coast was excavated by C. Roger Nance (1992) as part of salvage project. The mound dates to the Late Preclassic and is near modern-day salt operations. The mound's matrix contained leached soils, charcoal, and daub. The charcoal demarcated linear patterns in the mound, interpreted as evidence of evaporating brine in pots over fires to produce salt. The ceramics excavated from the mound were thick-walled pots similar to ceramics noted at salt production sites in the Yucatan (Andrews 1983) and coastal Belize (Graham 1994; MacKinnon and Kepecs 1989; Mock 1994; McKillop 2002). Excavation of the Guzman mound produced no clay cylinders, which were the vessel supports used at the Paynes Creek sites to hold the vessels over a fire. However, ethnographic examples at Sacapulas show stones being used for vessel elevation instead of cylinders (Reina and Monaghan 1981). Nance believes that rim fragments could have served a similar purpose at Guzman. If the Witz Naab' and Killer Bee mounds are similar to the Guzman mounds, then we should expect leached soils, charcoal, briquetage, and little evidence of domestic deposits. Pottery would be restricted to briquetage which includes thick walled jars, sockets and spacers, and solid clay cylinder supports used in evaporating brine over fires to make salt. McKillop (2002) has identified the coarse-fired ceramic jars and bowls found at the Paynes Creek salt works as Punta Ycacos Unslipped.

MacKinnon and Kepecs (1989) reported mounds at all the salt making sites in the Palencia lagoon area, Belize. The mounds are described as low lying, amorphous in shape, and range from a meter to a meter and half in height. The mounds consist of leached soils resulting from the evaporating brine over fires and briquetage. Little domestic evidence was found associated with the mounds leading to an interpretation that their use was for seasonal salt production (MacKinnon and Kepecs 1989).

McKillop (2002) previously excavated in a low lying earthen mound and in the surrounding tidal flat at Killer Bee (Figure 2). The low mound situated on the northern channel of the Punta Ycacos Lagoon is surrounded by a mix of broadleaf and mangrove forest. Artifacts were noted on the surface of the mound. A 1 x 1 m unit was excavated to locate diagnostic ceramics, to determine the function of the mounds, and garner information concerning sea-level rise. Few diagnostic ceramics were recovered from the unit. A shovel test was conducted 12 m west of the mound in an area where artifacts were noted upon the surface. Excavations carried out in 20 cm levels included briquetage, both above and below the water table, which was encountered at 40 cm depth.

Murata's (2011) research at Wits Cah Ak'al has added to the growing volume of research about ancient Maya salt production. Wits Cah Ak'al is an inland site located 12 miles west of Belize City on the coastal plain. The site consists of 28 mounds, clustered in groups of 2 or 3 mounds, along the edge of a mangrove

swamp system associated with Straight Lagoon. Murata identified briquetage commonly associated with salt production both on the surface and within the mounds of Cah Ak'al. No domesticate artifact assemblages were identified at the site. Cah Ak'al's artifact assemblage includes briquetage from the Paynes Creek salt works, so the earthen mounds at Cah Ak'al may have served a similar function. However, the Cah Ak'al mounds are inland, albeit only 12 miles, so we might expect some differences in use as compared to the low earthen mounds at Witz Naab'and Killer Bee site.

Residential Platforms

If the earthen mounds at Paynes Creek were residential platforms then we would expect to find evidence of house floors distinct from the surrounding soils matrices and deposits associated with domestic activities. In addition to finding floors, there should be evidence of a variety of vessel shapes for household use, as well as other objects used by householders, such as obsidian, chert, and faunal/flora remains associated with subsistence. The platform mound is a common architectural style in the Maya area. Early research focused on temples or monumental architecture of the larger urban Maya centers and over looked the lower lying platform mounds. Labor investment studied by such archaeologists as Abrams (1994) and Haviland (Haviland et al. 1985).

Separate material was sometimes used as a floor for a perishable structure. Compressed clay or marl has been identified as living surfaces at many sites (Awe and Healy 1994; Freidel 1979; Haviland et al. 1985; Healy 1990; McKillop 1996, 2005). Successive construction layers developed over time as the perishable structure was torn down and a new construction layer was added. The nearby island trading ports of Wild Cane Cay and Frenchman's Cay had hard-packed earthen floors on coral rock foundations (McKillop 2005; McKillop et al. 2004). Evidence of perishable structures has been recorded at several sites in the Maya area, most notably at the Paynes Creek salt works where the actual building posts form rectilinear patterns, including interior room divisions (McKillop 2005a; Sills and McKillop 2007). However, the earthern mounds at the Paynes Creek sites were not expected to have wooden architecture preserved due to immersion in mangrove peat.

Elsewhere in the Maya area, hints of wooden architecture are reported at many sites. Remnants of postholes have been noted at Tikal (Haviland et al. 1985), Cerros (Freidel 1979; Robertson and Freidel 1986), Cuello (Hammond et al. 1995), and San Juan (Guderjan 1988). Roofs were constructed of tightly interwoven native palms. Roofs were supported by single or multiple wooden upright poles and wooden crossbeams or lentils. According to Wauchope's (1938) observations, the Maya cooked outside their homes so chimneys and windows were not necessary.

Administrative Structure

The Paynes Creek earthen mounds may have had a ritual role in salt production, as suggested for the Paynes Creek underwater sites due to the presence of a limited array of ritual objects (McKillop 2002). Evidence of feasting—ocarinas and serving vessels—was found at some of the underwater saltworks in Paynes Creek, interpreted as rituals, perhaps associated with the beginning of the salt season each year (McKillop 2002). Salt rituals are carried out in the Maya highlands at San Mateo Ixtatán and Sacapulas in Guatemala (Reina and Monaghen 1981). Emal in the Yucatan contains a prehispanic temple platform, colonial and modern shrines, as well as large wooden crosses (Andrews 1983). Indigenous religion and Catholicism have been combined at some salinas. For example, a Catholic church with a shrine to the Virgin del Rosario is located at the Salinas Atzam in Chiapas. Virgin del Rosario is the patron saint that protects the sacred salts used by the local communities (Andrew 1983). Salt is used to subvert the power of witches and for exorcisms (Redfield and Villa Rojas 1934).

The presence of a manos and metates cache could indicate a ritual or household function of the mounds. There are four sets of mano and metates made from material to represent different colors. Four is a significant number in Maya cosmology and color and direction were associated with four deities: east-red, north-white, west-black, and south-yellow

(Thompson 1934). Tedlock (1996:220) noted in his translation of the Popol Vuh that four divisions referred to the gods that measured the surface of the Earth. This is believed to be associated with a corn field being laid out for cultivation. Furthermore, the Maya cosmogram is represented by four roads radiating from the center and colors are associated with the sun's daily cycle (Bassie-Sweet 2008).

Multi-Functional Platform

The function of the mounds under study in Paynes Creek may have changed over time and incorporated one if not more of the possible hypotheses discussed above. The mound excavated at Witz Naab' and Killer Bee site may have initially been used for leaching salty soil and later used as a residential platform, since the land would have been created. Perhaps local administrators lived on raised platforms overlooking the salt works as the demand for salt by the inalnd urban Maya increased during the Classic period (McKillop 1995, 2002, 2005). If the use of the mound did change over time, excavations should expose the construction. We would expect that the leached soils with little domestic refuse would be the deepest deposits. If the mound then became a domestic/scared space, excavations should reveal evidence of floors and structures.

Witz Naab' Excavations

Excavations were carried out at Witz Naab' and the Killer Bee site during the 2012 field season, both located near the underwater salt works in Paynes Creek. Witz Naab' (Figure 3) consists of two earthen mounds covered with palmetto palms (Acceloracea wrightii). The mounds are located in black mangrove tidal flats in the West Lagoon section of Punta Ycacos Lagoon. Abundant briquetage is visible on the surface of the tidal flats. The mounds are covered with modern vegetation. A surface inspection prior to excavations revealed that briquetage and charcoal is eroding from the mound. Field observations indicate that both mounds are impacted by tidal changes. During low tide, the surrounding mangrove tidal flats are dry. In contrast, at high tide the tidal flats are inundated and water encroaches on the lower parts of the mounds (Figure 4).

Figure 3. Witz Naab', Paynes Creek National Park, Belize.

Figure 4. Witz Naab'– Briquetage and Charcoal Eroding from the Mound.

Mound A was selected for excavation because the mound had easier access due to its location near open water and there would be less impact on the dense mangroves that colonize the area. We laid out a 1x4 m trench from the base to the top of the mound in an area with little disturbance from modern trees (Figure 5). We choose not to conduct excavations off the mound due to the inundated conditions, which were well-covered by the underwater excavations at other sites in Paynes Creek. Units were excavated in 20 cm levels to discover the stratigraphy. A screening station was set up on the mound. The excavated material was dry screened through ¼" excavation mesh except the lower levels that were wet. Initially, artifacts were hand-sorted from the sediment, but we changed to water screening, which recovered more material. The units were labeled 0-1 m starting at the base of the mound, with 3-4 m at

the top. Units 0-1 m and 1-2 m were excavated to a depth of 40 cm. Unit 2-3 m was excavated to a depth of 100 cm. Unit 3-4m was excavated to a depth of 205cm.

In this paper we focus on the results of units 2-3 m and 3-4 m, which revealed a complex stratigraphy. The first 0-20 cm consisted of top sediments and roots. The palmetto palm has a dense root system and is difficult to excavate even with a sharp shovel. Little cultural material was recovered in this level compared to lower levels. However, we did recover briquetage composed of amorphous clay lumps (ACLs) which are the remnants of salt making ceramics that are unrecognizable by form, as well as and an occasional solid clay cylinder vessel support.

Levels 20-40 cm and 40-60 cm consisted primarily of ACLs and solid clay cylinder fragments. The levels were densely packed with discarded briquetage. Little or no charcoal was noted. Below 60 cm, there are several distinct lenses of charcoal and clay that are clearly visible on the excavation walls. We continued to recover ACLs, with the addition of a few recognizable vessel sherds. We encountered the water table at approximately 128 cm depth. Alternating charcoal and clay layers continue to a depth of 185 cm. Below 185cm, the levels are almost exclusively charcoal. Shovel testing deeper revealed a hard cemented lens of grey clay about 205 cm depth.

Visible lenses of charcoal on the eastern wall of the trench suggest that there were two separate earthen mounds. At some point in the Late Classic period, perhaps when salt production reached its peak at the Paynes Creek salt works, the discard of briquetage and leaching sediment intensified, resulting in a single large mound. We had anticipated finding the mangrove peat that surrounds the mound once we hit the depth of the mangrove flats, but did not. Apparently the earthen mound was constructed before the mangroves developed in the area.

The wall profiles were cleaned, photographed, videotaped, and drawn. We collected a sediment column sample from the top to the base of the mound from the eastern wall of the trench. We also collected a set of 99 samples for magnetic susceptibility testing from the same wall, as well as samples of charcoal and other distinctive lenses (Figure 6).

Figure 5. View of Trench 1, Witz Naab,' Facing South.

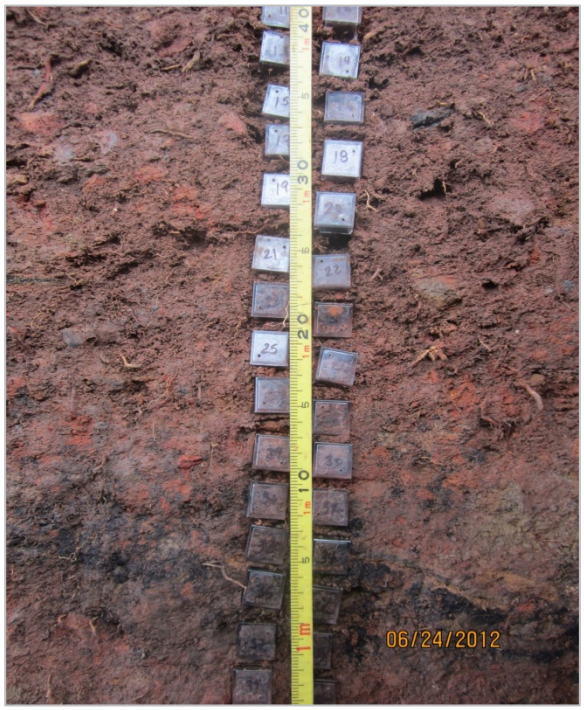

Figure 6. Sediment Collection for Magnetic Susceptibility Testing.

Excavations at the Killer Bee Site

The Killer Bee site is a low lying earthen mound situated on the northern channel of Punta Ycacos Lagoon. The site consists of briquetage on the surface in a black mangrove tidal flat as well as an earthen mound. Excavations in the tidal flat from previous fieldwork (McKillop 2002) indicated a Late Classic age of the site and abundant briquetage. Previous excavations in the earthen mound suggested it was a slag heap from leaching water through salty soil to enrich the salt content before evaporating the brine over fires to make salt.

After a hike through the mangroves and finding an area that was not completely covered with ping wing, a prickly native pineapple, we set up a 1x3 m trench. Units were excavated in 20 cm levels. The Killer Bee mound is lower in elevation than the mound at Witz Naab'. We encountered the water table at 50 cm (Figure 7). All sediment was hand sorted for artifacts. Like Witz Naab', the mound consisted of sediment mixed with briquetage. Although the artifacts were eroded at the Killer Bee site, there was still a larger amount of recognizable forms of the salt making assemblage including vessel supports (cylinders), spacers, sockets, and vessels. Unlike Witz Naab', no substantial amounts of clay or charcoal were found at the site.

Conclusions

Excavations at Witz Naab' and Killer Bee indicate that the earthen mounds are not the remains of domestic structures or residences. The excavations at Witz Naab' reveal briquetage and not the type of household assemblage that is typically associated with domestic occupation (see McKillop 2002). Excavations within the mound at Killer Bee reveal a similar artifact assemblage as that of Witz Naab'. The lack of variety among the artifact assemblage strengthens the evidence that these mounds were not used for domestic occupation but for salt production.

Furthermore, the mounds are not similar to other domestic mounds within the area, such as the coral foundations of pole and thatch buildings at nearby Wild Cane Cay and Frenchman's Cay (McKillop 2005; McKillop et al. 2004). No floors were encountered during excavation to indicate that there was once a

Figure 7. Excavation at Killer Bee Site.

living surface at either site. No evidence of multiple reconstruction episode was identified either. Multiple construction episodes have been noted at nearby Wild Cane Cay and Frenchman's Cay. Multiple floors were identified within the architecture of the mounds at Wild Cane Cay.

No evidence of any ritual or administrative function could be discerned through excavation. No artifacts associated with ritual practices have been recovered at either Witz Naab' or the Killer Bee site. Figuring whistles and fine ware ceramics have been recovered at other salt production sites within Paynes Creek.

The strongest case can be made that the earthen mounds at Witz Naab' and Killer Bee are in fact used in the brine enrichment process. The mounds were built up as a result of brine enrichment for salt production. Any brine-enriching mounds near the underwater salt works would have been washed away by tidal fluctuations and storm events. The two mounds in this study share characteristics the mounds described at Cah Ak'al. The presence of briquetage at Cah Ak'al indicates some level of salt production. However, not all the mounds at Cah Ak'al are associated with salt production. Furthermore, Murata's (2011) description of various other ceramic, artifact, and faunal assemblage have not been noted at other salt sites and indicate that Cah Ak'al has a complex history.

Although the mounds served a similar function at both sites there are some differences among the two sites. The mounds at Witz Naab'

are substantially taller than those at Killer Bee. The mounds at Witz Naab' are approximately 1.5m in height. The single mound at Killer Bee is a little over .5m high. This difference in size may have implications for the scale of production that occurred within the Paynes Creek National Park salt sites.

Soil and charcoal samples for Site 50 and Killer Bee will be submitted for standard C-14 and Accelerated Mass Spectrometry (AMS) dating to establish the chronology of the site. Are these sites contemporaneous? If so, why are there differences in the size and internal structure of the mounds at the two sites? As previously stated, the artifacts at Killer Bee appear eroded more than the assemblage at Witz Naab'. However, the vessel form and function was still recognizable in most of the assemblage at Killer Bee. The majority of the assemblage at Witz Naab' is what we have identified as ACL. Is the mound at Killer Bee older than Witz Naab'? If the mounds are not contemporaneous, then interpretations concerning the scale of production through time can be made for the salt production sites within the Paynes Creek National Park.

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29 TEACHING SECRETS OF CONSERVATION AND PROSPERITY IN THE MAYA FOREST

Anabel Ford and Cynthia Ellis

The Maya forest is a garden, so say the economic botanists. Indeed, the traditional Maya home gardens are hailed as the most diverse in the world, yet it is practiced in ever fewer numbers. The old Maya farmers, who use the forest as a garden and built utility in their farms based on the Milpa cycle, have few followers and they know this is the case. As a consequence, a group of Maya farmers joined together to make a school garden in their community, Santa Familia. This acre plot is now four years old and with a grant from National Geographic Society, The Maya Forest Alliance and the El Pilar Maya Forest Garden Network developed the Känan K'aax model school garden. Now, they can educate their children and other visitors in the strategies and practices of forest gardening. The work culminated with a teacher's workshop that begins to integrate school curriculum in the garden and promoting "no child left indoors!"

Introduction

Conservation of scarce cultural and natural resources is the challenge facing the 21centrury. Deforestation is a common threat, and nowhere is this graver than in the tropics (TNC 2012). Protecting these forests is a major concern, yet it has been with an approach that rests on the western conservation model of removing the human element from the equation. Tropical research on ecology and botany of the Maya forest of Mesoamerica demonstrates that it is dominated by useful plants (Ford 2008). This is the result of the domestication of the landscape.

Many of the native Maya forest plants have played a significant role in the global economy—cacao for sweets, vanilla for flavor, logwood for fabric dye, mahogany for wood, chicle for chewing gum, and annatto for food coloring (see Schwartz 1992). The traditional Maya who have managed the forest and its gardens represent a technological legacy of skills, strategies, and practices that have a direct link to the Maya past and may prove to explain the rise of the Maya civilization (Ford and Nigh 2009, Ford et al. 2012).

Traditional Maya practices and strategies serve to manage the water cycle, enhance soil fertility, and provide essential family nutrition. This knowledge has been fostered since the conquest 500 years ago, handed down through generations, and active today (Teran and Rasmussen 1995). Global land use strategies have eclipsed the traditional processes but not their potential (Hernandez X 1995; Gomez Pompa and Kaus 1999). Persistent traditionalists, the original permaculturalists and heroes of the Maya forest are ready to share their secrets of prosperity and conservation and this is beginning in the village of Santa Familia at the Santa Familia Primary School. The new Maya Forest Garden *Känan K'aax* (well-tended forest in Mayan) offers an innovative venue of learning about the Maya traditions before it is too late.

Collaboration between Exploring Solutions Past~The Maya Forest Alliance and the El Pilar Forest Garden Network has worked to enhance a school garden space as beginning in 2008. Over the course of the past years this focused project has developed a model school garden, the Känan K'aax, and a school program of study that highlights health, environment, and science based on Belize education curriculum. This program links the traditions of Maya forest gardening with the current education curriculum, bringing outdoor learning to young students in the area of the ancient center of El Pilar.

The Santa Familia School Conservation Project

The forest gardeners understand their practices are vanishing as the traditional practitioners grow old and conventional mechanical and technological agriculture expands. In the time of our project period, three elder Maya farmers and two collaborators, key to the conservation of the Maya forest garden project, are no longer with us to help promote the fundamental local traditions. Since the accumulation of knowledge has been past through practice, the school garden project extends the potential of spreading the knowledge

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by engaging the teachers and their classes to leave no child indoors (Coyle 2010; Neill 1997; Rea and Waite 2009).

Clearly, support of the model primary school garden project, Känan K'aax, comes at a critical time and is of major importance. The forest garden project, endorsed by the Ministry of Education and the local Santa Familia Primary School programs, promises to link contemporary global teaching goals with local traditional environmental awareness. It is a means to honor local traditions and to propagate local forest garden strategies and practices for the youth of the area.

The Maya forest garden project successfully implemented the goals defined in the proposal. We established basic infrastructure to protect the model school site and promoted a teacher introductory workshop. We involved the school principal and all the schoolteachers in the program development and initiation by implementing curriculum activities that connected their current teaching requisites. On-site actions in at the Känan K'aax model garden were designed to promote involvement in health, nutrition, and environment. Other ancillary learning components touched on math, writing, and science. In sum, this project was able to:

1) Engage the traditional forest gardeners in the development of the school site for their teachers and children,
2) Create a working map of the site with the new installations of the fencing and gates, roofed galleria, and latrines,
3) Establish trails, plot signage, and labels of the 20 dominant plants of the Maya forest,
4) Institutionalize the model garden at the school with the workshops, and
5) Link local traditions of forest gardening to the Major Maya center of El Pilar.

Objective: No Child Left Indoors

The model school garden Känan K'aax is a community-teaching site and a magnificent tool for the primary school. It now serves as a model for other schools in the areas and beyond as a resource on traditional Maya practices. Currently under the stewardship of the Santa Familia Primary School administration, Känan K'aax is now a fenced, gated, and welcoming site (Figure 1). This is critical for the primary school students, but also for the youth engaging with the El Pilar Forest Garden Network to apprentice with their elders to build a focus for visitors from around the world. The plan to formalize the Känan K'aax will set it as *the* Maya forest garden educational site of Belize with a hands-on and accessible forest garden aimed to teach fundamentals of traditional practices for children and other interested groups. The establishment of the model Känan K'aax provides a basis to teach and understand the importance and inherent value of the conservation traditions of the Maya.

Securing the Site

Major effort was devoted to construction, making the Känan K'aax safe and accessible for the school children as well as visitors. The forest gardeners had animals walking into the garden, including horses and chickens, resulting in plant damage. Further, valuable plants, like orchids were removed from their setting, degrading work at the site. Visits to the garden were largely restricted to dry periods and there was a distant walk to a toilet. These were the first order of business.

Fencing was the first to go up. This required the collection of the building materials, including the chain link fencing, the wood posts, and the lumber for the gates. The perimeter was measured and the materials were procured. The posts were collected from the reserves of the forest gardens, lands that make up nearly 60% of these gardeners lands. The arduous process required a group of at five individuals to pull the chain link taught. It was a major enterprise and resulted in a secure area for the garden with locked gates at the east road and west school entrances.

Next was the construction of the latrine. This required knowledge of the landforms, soil deposits of the valley, and the impact of rain. Unlike the latrines in the hard limestone areas such as El Pilar where we had constructed latrines into the solid rock, the latrines at the Känan K'aax were to be placed in alluvium and would require supports for the long drop. It was determined that 55-gallon drums would serve the purpose and they were set in an excavated trench and stabilized with packed earth form the

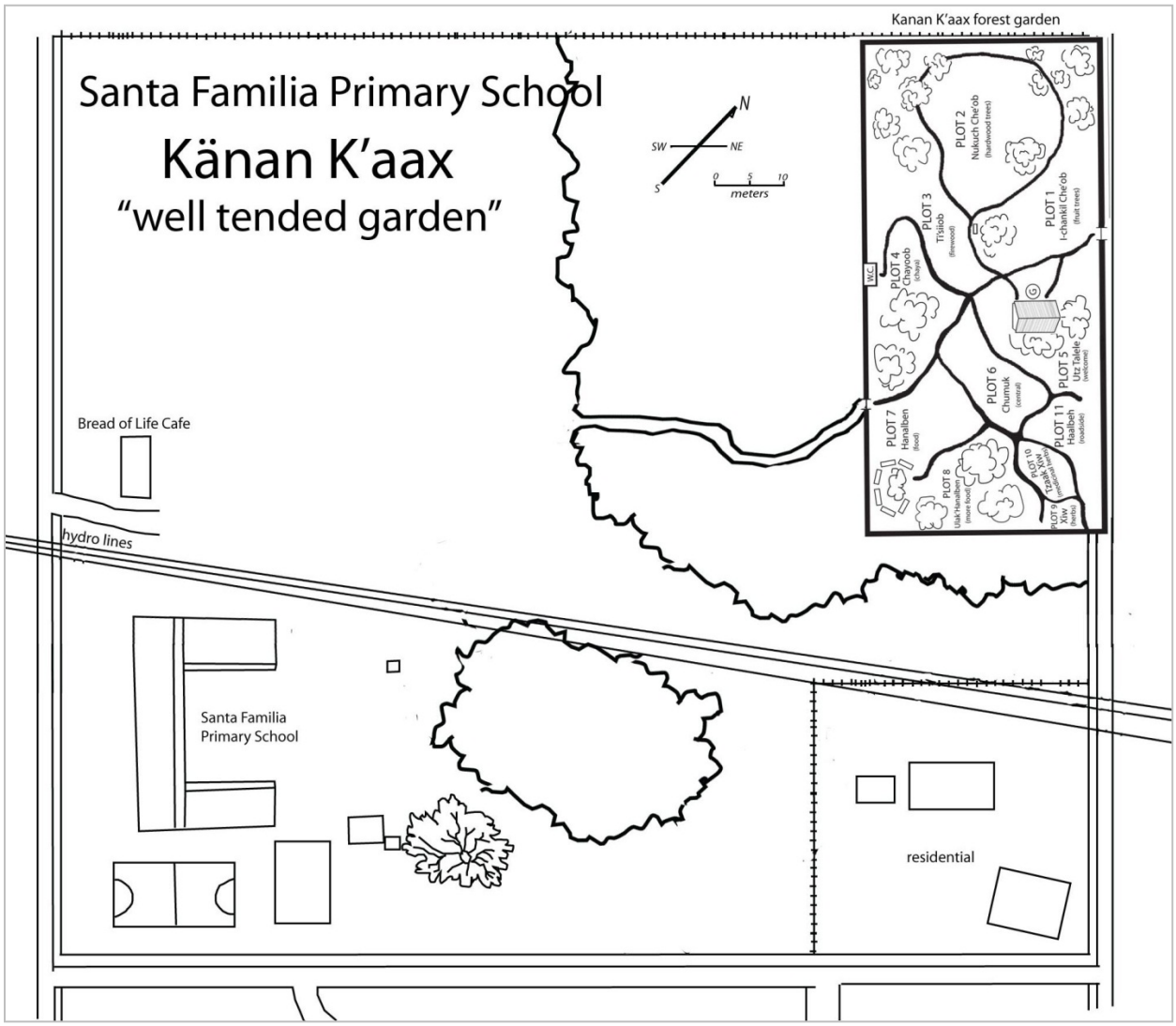

Figure 1. Sketch plan of the Santa Famlia Primary School and the location of the Känan K'aax Model Forest Garden.

excavation. A simple siding, with doors, and corrugated iron roof were selected to finish the construction. A two-stall latrine was completed with padlocked doors. At the same time the latrines were constructed, a water line was drawn in and a faucet was established nearby for washing hands and watering the plants when needed.

Finally there was the construction of the galleria. This was established in two phases: the setting of the poles and corrugated roofing in June of 2011and then the creation of the perimeter wall with the marl floor November 2011. Getting the galleria sited, the poles and roofing set, and determining the finishing was the main activity and was completed before the rains. Roofed and dry made it possible to complete the second phase of finishing. It also provided a dry space for the teachers and students in outdoor learning programs. For the second phase, the youth group gathered bamboo for the perimeter wall and brought in white marl for the flooring. The result is a very nice setting for appreciating the garden and learning. This was put to test with our teacher's workshop.

Mapping the Setting

Mapping the area of the garden required sketches of the entrances, location of the trails, marked with white stones, and the identification

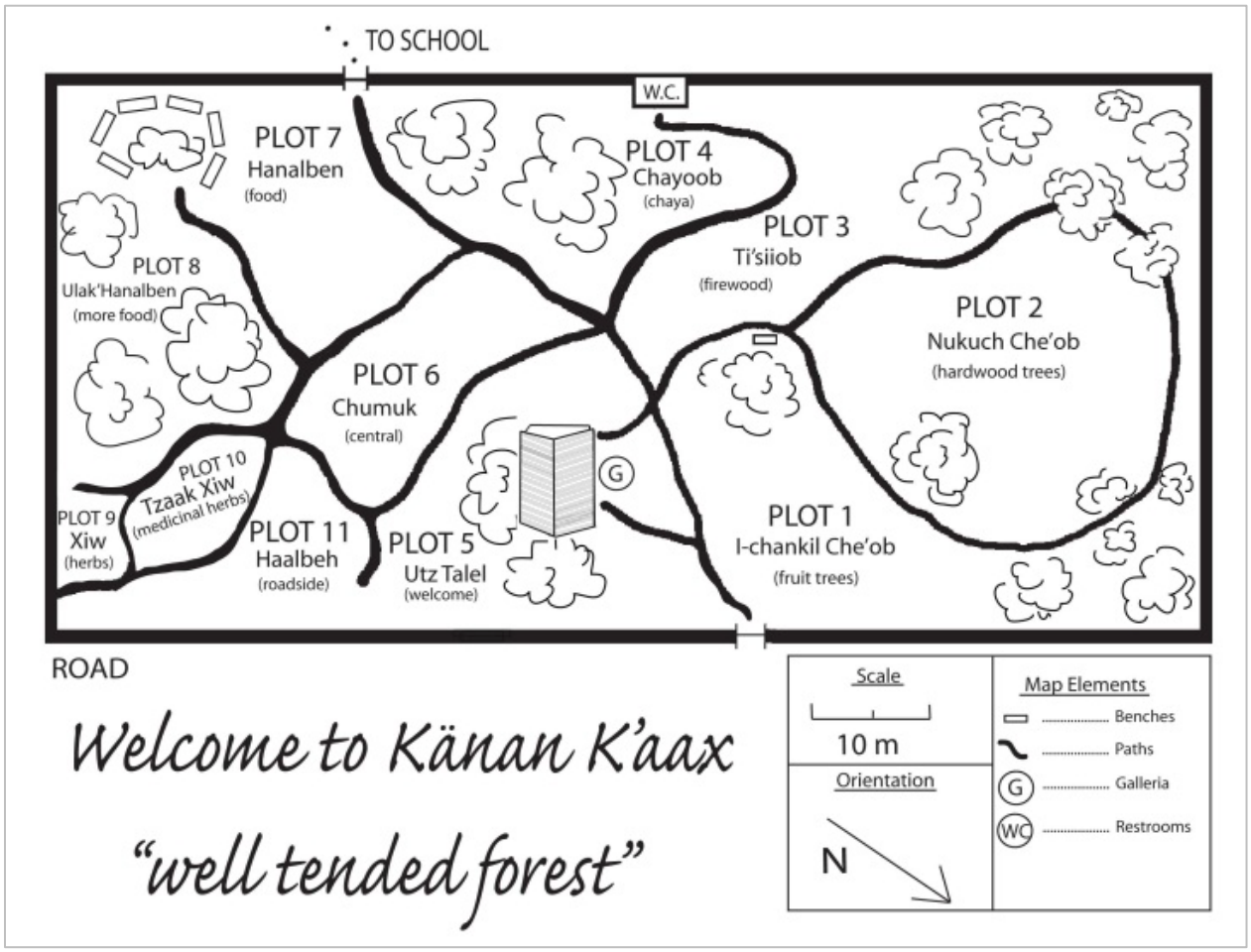

Figure 2. Map of the school garden Känan K'aax.

of plants and their locations (Figure 2). The site plan, with the trails and the plant plots were all included. While the master forest gardeners known the plants and their locations, we needed to make this accessible to those who would be teaching and learning. Consequently, we had to develop a botanical identification database and based on this list create prominent labels for the plants listed as the dominant in the Maya forest. Working with the master gardeners, we enumerated the plants of the plots within the garden area and developed a list of the locations of the dominant plants and identified where we needed more plants of the Maya forest. We also included 20 native plants illustrated in the children plant book that we wrote and printed in English and Spanish as part of the project.

We developed a sketch map of the site with trails and plot names in Mayan with translations to build on the Maya roots. This was the foundation of the garden improvements. This map was for the plot lists as a data base and plant labels that would go into the garden. We worked with craftsmen of Cayo and, based on our fieldwork and experience with signage at El Pilar, we developed a way to print, laminate, and mount labels for the plants and plots that could be renovated easily as needed. Galvanized holders were specially made to fit the labels and listings as well as the posted map of the site. The site maps were placed at each entrance, the gate from the school and the gate from the road. These labels, of readable size, provide local names as well as scientific names and cover the range of plant habits and light requirements. All were in place and ready for the teacher's workshop.

The Professional Training Workshops

The culmination of the Känan K'aax development was the institutionalization of the garden site with the teachers. They all knew of the garden and were using primarily as a refuge on hot days and for reading periods. This is an excellent activity for the garden as it motivates the children and supports our motto of no child left indoors. Now with the galleria, there is greater incentive to use the site as a refuge for assignments that can be managed out of doors. But our real objective for the site is for the teaching of the traditional Maya forest gardening and to inspire children to recognize plants, to seek to learn more about.

We have grand hopes and plans for the Känan K'aax and with the support of the school principal; we developed the teacher's workshop. Slated for the 10-12th of July, the workshop focused on the standard curriculum requirements for the study of health and nutrition, environment, and science. Each day we posted an agenda; Day 1 was focused on concepts, Day 2 was designed to be practice, and Day 3 was the field trip to El Pilar (Appendix 1). Workbooks were provided for all the teachers and master gardeners participating in the workshop.

Our workshop proved revolutionary. We funded the entire program when normally these are self-funded by the teachers. We provided traditional foods for lunches, reviving the old experience with foods from childhood: chaya, ramon, and horchata de maize. Professional teaching workshops normally involve classroom settings with lectures and note taking. Our workshop was designed with workbooks and hands-on activities of reflection and action.

The Results

The Santa Familia Primary School garden initiative has been designed to insure that the traditional Maya practices are not lost. On the school property, the Känan K'aax garden site is dedicated to student education and village participation to bring alive the excitement and inspiration of the garden and the out-of-doors. For safety and utility, the project investment in facilities makes the site easy for class use. It is fenced with marked trails, proper signage, latrines, and the galleria. It is well known that children excel in the outdoor setting, and now the village of Santa Familia has a garden available for outdoor learning directly with field activities designed from our workbook and indirectly for outdoor sessions for reading or writing projects. The classroom is appropriate for the basics, but the wider application of learning is vital. The Känan K'aax school garden offers a versatile and secure site for education.

The Känan K'aax model garden has designated areas featuring annual and perennial plants. Weaving around the planted areas are trails, clearly marked with white stone, guiding students around the forest garden. Along the trials students will read about the foods, herbs, as well as fruits and flowers. They will also observe the plants that revel in the sun and those that need to be sequestered in the shade. Observation is one of the most important aspects of activities in the Känan K'aax garden and promises to bring gardens from school into the home.

In the course of the project, we developed a close rapport with the Department of Education and the school Principal Donicio Escobar. Together we created appropriate didactic literature for educational programs designed for schoolteachers. A map of the site with trails and plant communities was created based on the knowledge of the forest gardeners. In addition, we printed a new forest garden plant book in English and Spanish to supplement the school teaching efforts and for sale to support the ongoing forest garden aim of the Känan K'aax. These materials were developed in the context of the first teacher workshop that we coordinated for professional development credit. Our workbooks were enthusiastically received by the school principal and formed the basis of our professional development workshop with the local schoolteachers. The school has requested that we offer this every year is a testament to its importance.

The workshop, scheduled after the close of classes, was a remarkable and challenging event that brought the teachers into the Känan K'aax garden setting and worked with student activities designed to meet the curriculum requirements of the Belize school curriculum. The teacher workshop culminated the on site developments and served as the first step to

bringing the model Känan K'aax garden into the school programs.

Within the context of the school linkages, we scheduled field trips to El Pilar. The school visits to El Pilar, with the leadership of the forest gardeners, helps to connect the children to their ancestral past. These events were filmed by local television and aired nationwide on the program *Belize Watch* and has helped to showcase the value of community work in conservation.

Conservation Outcomes

The educational Känan K'aax project acknowledges the need to bring continuity of knowledge that will promote the survival of the Maya farming heritage and conservation legacy. Specifically the school garden project invests environmental education that links elder traditional knowledge to youth and time-honored practices to the ancient Maya of El Pilar. Through the involvement of the school children, traditional forest garden strategies have the opportunity to live on.

Regional and international involvement through the non-profit Exploring Solutions Past~The Maya Forest Alliance will build recognition of the valuable skills and strategies of the Maya forest gardeners, the original permaculturalists, through the internet and other venues. The outcome provides an opportunity for the youth to learn profitable and sustainable domestic living practices built on the foundation of the Maya forest gardeners and to link the well-known connections of the traditions to the ancient Maya at El Pilar.

Knowing children are open to learning, thirsty for new experience, and excited to engage with the forest garden is a platform for conservation. They are the hope for the future of conservation of the native resources and can keep the Maya forest alive connecting the traditions with the fundamentals of the Belize educational environmental curriculum. Without the traditional knowledge and understanding of the flora and fauna of the Maya forest, the next generation will lose their connection to their landscape, the Maya forest. The model of Känan K'aax, named by Alcario Cano who is not passed provides the potential to maintain the links and to use the traditions with our modern knowledge to build a sustainable future. The Känan K'aax model school garden provides a context for children to learn from their elders and to forge their connection to their Maya ancestors. Further, the garden site offers a space and opportunity to learn about the Maya forest that cannot exist without the community.

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30 GRAVE TYPES AND BURIAL THEMES AT THE EARLY ENGLISH CEMETERY ON ST. GEORGE'S CAYE, BELIZE

James F. Garber, Lauren A. Sullivan, J. Heath Bentley, Matthew Elverson and Jaime J. Awe

St. George's Caye is a small island 8 miles off the coast of Belize. Due to its strategic location controlling access to the mouth of the Belize River, it played a key role in the early history of Belize serving as its capital into the late 1700s. The Caye also served as the transshipment point for the export of logwood and mahogany. The owners of the mahogany works had their homes and headquarters on the Caye. Archival research has shown that the St. George's Caye cemetery is the country's oldest English Baymen cemetery. Ground penetrating radar revealed a series of anomalies that possibly indicated a substantial number of unmarked graves. Excavations conducted in the 2011 field season confirmed this and revealed the presence of several graves at a level beneath the graves located in previous field seasons. This lower level of graves consisted of mahogany or Santa Maria wood coffins which differ from the stone and brick box graves of the later period. This paper presents the grave types and examines the cultural influences on the mortuary practices of the Baymen.

Introduction

St. George's Caye played a vital role in the history and development of Belize as an independent nation. This small caye is one of hundreds of islands off the coast of Belize that are part of large reef system, the second largest in the world. Its predominant role in the early history of the English settlement was due to its position and shape (Figure 1). Because of the difficulties of navigation, these waters provided safe haven for merchants, buccaneers, and pirates. In order to reach the Belize River, the country's main river system, one must pass by St. George's Caye, thus its strategic location guarding the port (Garber et. al. 2010).

St. George's Caye was the primary habitation for the initial English settlement and served as Belize's first capital. In 1677 Dominican Fray Joseph Delgado, traveled from Vera Paz (Guatemala) to Bacalar (Mexico) via southern Belize and across the Sarstoon River and then up the coast, where the English seized him, led by Bartholomew Sharpe, who had his headquarters at St. George's Caye. This incident confirms from Spanish records the presence of Englishmen in Belize in 1677. It is not clear when St. George's Caye was initially occupied but it was established as the first capital of Belize by the early 1700s.

Within the historic records the British occupants of the Belize area are referred to by a variety of terms depending on the time period and authors of the records: 1550-1620 English corsairs, Lutheran heretics, or pirates; 1620-1700 buccaneers and pirates; 1700-1798 English logwood cutters and Baymen.

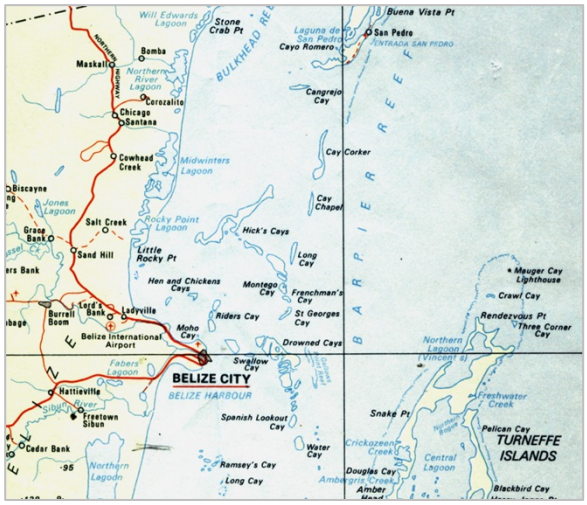

Figure 1. Map showing location of St. George's Caye.

The Cemetery

The primary focus of the 2011 field season was the St. George's Caye cemetery. Were it not for a one modern era burial crypt and a few modern memorial markers, one would hardy know the St. George's Caye cemetery was a burial ground much less the oldest non-Maya cemetery in Belize. Storm surges, hurricanes, vandalism, and the ravages of time have obliterated virtually all signs of its once striking appearance (Garber et. al. 2011; Sullivan et al. 2012).

Records indicate that the cemetery was reasonably well maintained into the 1920s. Destruction began with the hurricane of 1931

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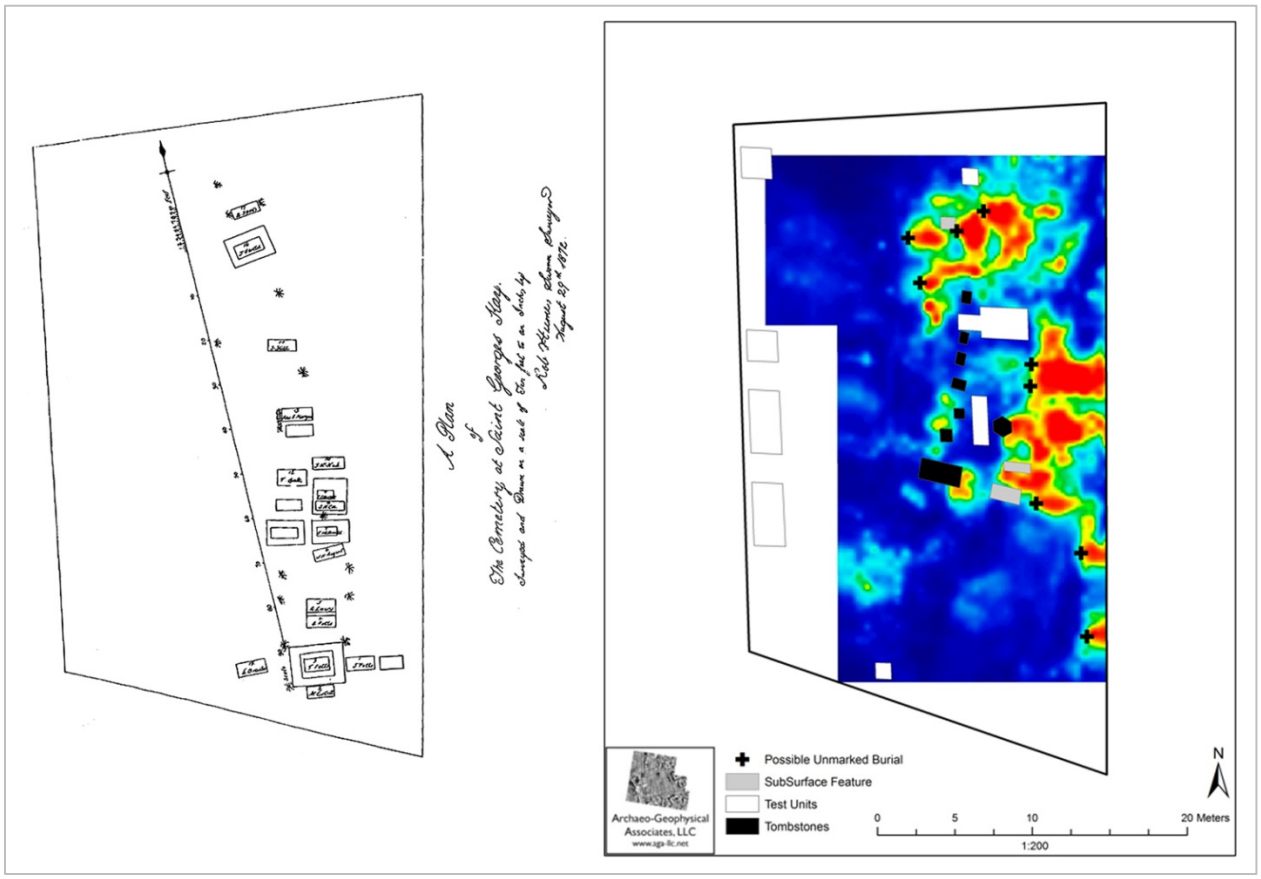

Figure 2. St. George's Caye Cemetery: left, 1872 map; right, ground penetrating radar map by Chet Walker.

followed by hurricanes Hattie in 1961 and Greta in 1978. Hurricane Hattie did significant damage to the cemetery cutting an E-W channel across the width of the island, removing the southern edge of the cemetery and the cemetery's most notable marker, the elaborate above ground burial crypt of Thomas Potts. According to residents, the tomb slid into the cut, which was later filled in to prevent additional erosion. The exact location is not known but it is apparently now outside the limits of the cemetery wall.

Photographs of the cemetery taken prior to the hurricanes indicate that it was once very similar in appearance to Yarbrough Cemetery in Belize City. The graves typically consisted of a low rectangular platform composed of coursed red bricks held together by coarsely tempered cement capped with a large white marble or black sandstone slab upon which is an inscribed epitaph. These bricks were brought over from Europe as ballast in the hulls of ships and were used in a variety of building constructions such as St. John's Church and older buildings in Belize City.

The cemetery on St. George's Caye is the earliest known European cemetery in Belize. It and the slightly later Yarbrough Cemetery were known as the burial grounds for the congregation of St. John's Church, which was built in 1812. Records do not indicate when the St. George's Caye cemetery was initially established. The earliest carved stone on record is 1787 and our excavations this past summer confirmed the presence of several earlier unmarked graves that probably date to the first half of the 1700s. A map made in 1872 (Figure 2) documented the location of 20 graves in the cemetery prior to the destruction of the hurricanes and James Purcell Usher recorded 21 epitaphs in 1907 (Usher 1907). In 1926 Thomas Gann noted an additional epitaph (Gann 1926). Mary Check-Pennel (1989) also documented eight additional burials in her comprehensive

study of cemeteries in Belize. In modern times, only a few memorial stones have been placed in the cemetery along with one modern burial (Garber et. al. 2010, 2011).

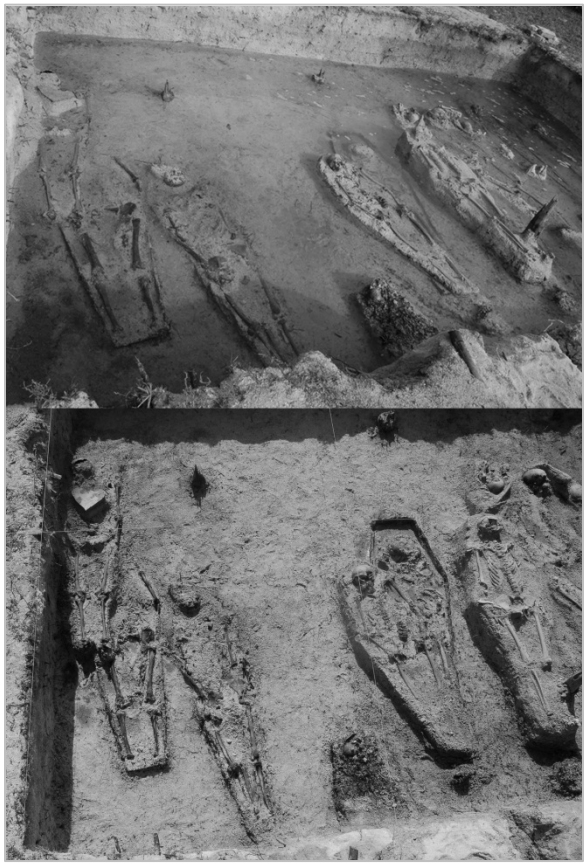

Figure 3. Excavations in St. George's Caye cemetery showing pinch-toe coffins: top, pump not running; bottom, pump running.

2011 Excavations

During the 2011 field season we continued the excavations in the cemetery that were initiated in the summer of 2009. Because of consistent heavy rainfall and the fact that the Caye is low-lying, the water table remained not far from ground level throughout the 2010 and 2011 field seasons. In most areas of the cemetery, the water table was between 20-30 cm below surface. In-situ remains were encountered at about this depth and thus excavations were severely hampered. In response, we developed a method for temporarily lowering the water table in order to more accurately conduct and document excavations. This included using a high volume

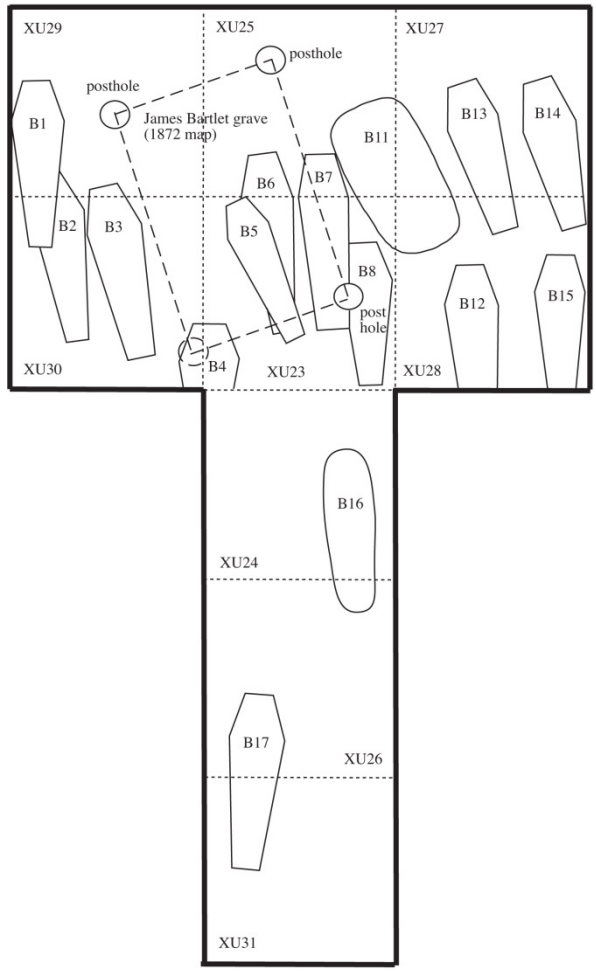

Figure 4. St. Georges's Caye excavation plan map showing pinch-toe coffins.

gasoline powered bilge pump to remove water from a 1m x 1m hole located in proximity to the excavation units. This temporarily lowered the water table for a large area surrounding the 1m x 1m hole facilitating the excavation of in-situ remains (Figure 3).

Previous excavations had shown that there were burials in areas other than those indicated on the 1872 map (Garber et al. 2010, 2011; Sullivan et al. 2012). In June of 2011 we conducted a ground penetrating radar (GPR) survey of the cemetery in an attempt to locate burials that were not on the map or evident from the surface (Figure 2). The GPR survey indicated several areas of the cemetery that contained probable burials not indicated on the map. The 2011 excavations confirmed this.

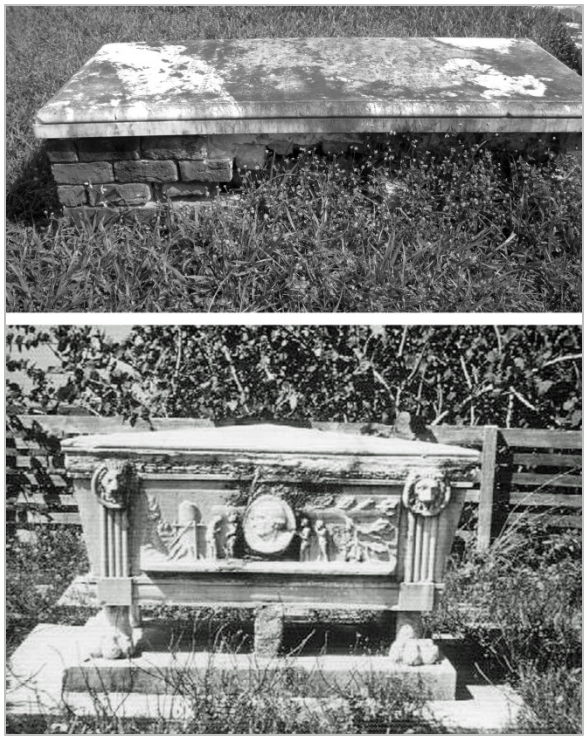

Figure 5. Grave types; top, box-grave in Yarbrough Cemetery, Belize City; bottom, above ground burial vault of Thomas Potts, St. George's Caye. Note: all of the box-graves in the St. George's Caye cemetery have been severely disturbed by hurricanes.

Grave Types and Themes

Our research has revealed the presence of three distinct grave types in the St. George's Caye cemetery (Figures 4 and 5). These grave types closely parallel grave types and themes found in England and the American Colonies and reflect the burial traditions of English culture. The grave types are: 1) pinch-toe coffin; 2) box grave; and 3) above ground box vault. Type 1 (pinch-toe coffin) is the earliest and given their position below graves of known age, we suspect that the earliest date to the first half of the 1700s. Most are made of mahogany or Santa Maria, and pine.

It must be remembered that the English occupants of St. George's Caye were actively involved in a vigorous trade network of logwood and later mahogany that connected England, the American Colonies, and the Mosquito Shore. The commercial ties with colonial Boston were particularly strong in the first half of the 1700s. Historical records indicate that Baymen merchants and captains provided logwood in Boston to be auctioned off - the proceeds of

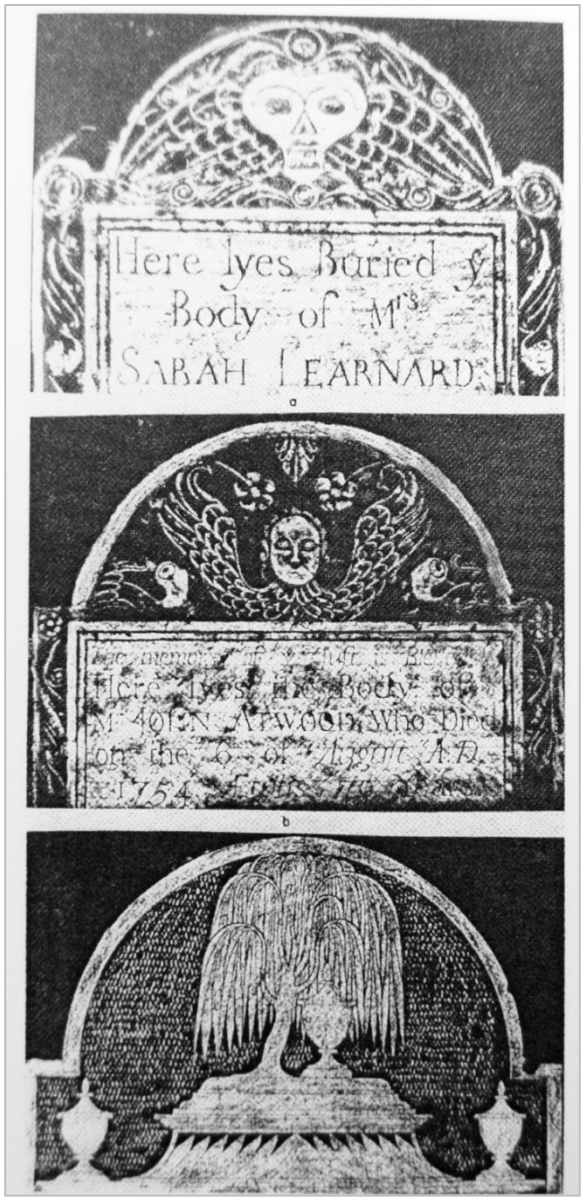

Figure 6. Colonial New England grave themes; top, death head, center, cherub; bottom, willow-urn. From Dethlefsen and Deetz 1966.

which were to fund the construction of a spire for the infamous Old North Church in Boston (Finamore 2008:75). The ties with Boston were sufficiently strong that a pew in that church was specifically reserved for the "Gentlemen of the Bay of Honduras". The plaque in that pew reads:

"The Bay Pew"
This Pew
for the use of the Gentlemen
of the Bay of Honduras
1727

It should also be noted that English loyalists such as James Yarbrough became disgruntled with events in the American Colonies and moved to the Settlement in the Bay (Belize). Cultural ties between the American Colonies and the Bay Settlement were strong and we would expect to see this reflected in burial types and themes.

A well-known and now classic study of burial marker themes in Colonial New England was conducted by Edwin Dethlfsen and James Deetz (1966). In that study, they report three time periods each with a distinct iconographic theme that reflects religious/cultural attitudes towards death (Figure 6). These are:

Period 1: 1680-1740 Death heads
Period 2: 1740-1760 Cherubs
Period 3: 1760-1820 Urn and willow

Period 1 (1680-1740) represents the grimness of death and expresses themes of decay, fear, and the inevitability of death. Skulls and death heads are sometimes combined with depictions of bones, hourglasses, and coffins. Period 2 (1740-1760) reflects the Great Awakening and Beautification of Death Movement and is more upbeat, optimistic, and cheerful, emphasizing life after death and resurrection. This is revealed in the emphasis on an afterlife as seen in the use of winged human heads and Cherubs. Period 3 (1760-1820) is a continuation of the Beautification of Death Movement and emphasizes memorialization. This characterizes the Victorian era and is still a common theme in modern times.

These same themes, reflective of English/American Colonial culture in general, are clearly present in the graves of the St. George's Caye burials. Phase 1 burials are simple pinch-toe coffins. One St. George's Caye burial (B13) contained a candlesnuffer. Candle snuffers are a part of the Phase 1 iconographic program seen on some Colonial New England grave markers on which a skeleton death figure is seen holding a candle snuffer extinguishing the candle of life (Figure 7). Another St. George's Caye burial (B3) had a silver Spanish real on the forehead. It was heavily weathered but enough of the details were present to determine that it was a coin from the reign of King Phillip V (Figure 8). Throughout

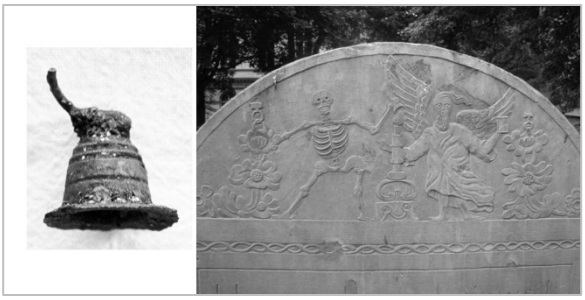

Figure 7. Candle snuffers: left, snuffer from burial on St. George's Caye; right, gravestone in Boston Massschusetts.

Figure 8. Spanish silver real: left, St. George's Caye burial; right, coin of same type.

the Helenistic world coins were frequently included in burials as payment to the ferryman Charon who would take the soul to the land of the deceased. No above ground grave markers were found with any graves of Phase 1. Burial 1 (B1) overlaps B2 and is thus one of the later pinch-toe coffins. Interestingly, this coffin had a heart-shaped lead coffin plate nailed to its top (Figure 9). This plate was inscribed with a name, place of birth, date of birth, date of death, and age of death. Unfortunately, due to weathering, only portions of the inscription can be read but indicates a shift in tradition towards the Phase 2 and 3 themes.

Phase 3, memorialization, is expressed in many of the graves shown on the 1872 map. These graves are of the box-grave and above ground vault types. In Belize, both types are still in use today. The "box" of the box-grave is composed of a rectangular aboveground enclosure of bricks four or more courses high. These bricks were made in England and were brought over to the Bay Settlement as ship ballast. The body was placed beneath this brick feature in a sub-terrainian cement enclosure. The brick feature was topped with a large slab of

Figure 9. Heart-shaped coffin plate from Burial 1 (B1), St. George's Caye cemetery.

Figure 10. Photo showing what remains of James Bartlet grave, St. George's Caye cemetery.

marble or sandstone on which was inscribed a sometimes long and detailed memorialization epitaph (see below). The inscription below was recorded by James Purcell Usher (1907). This grave was severely disturbed by subsequent hurricanes. Local informants indicated that the marble and sandstone slabs were broken up and used by lobster fishermen as ballast in their traps. In the 2011 excavations we were able to locate the scattered remains of this burial (Figure 10).

To the Memory
OF
JAMES BARTLET, ESQUIRE
NATIVE OF ABERDEEN
MANY YEARS INHABITANT OF THIS SETTLEMENT
WHO, AFTER HAVING FAITHFULLY DISCHARGED
THE DUTIES OF THE SEVERAL OFFICES
TO WHICH HE WAS CHOSEN, AND EMPLOYED
WITH UNREMITTING ASSIDUITY HIS SUPERIOR
TALENTS TO PROMOTE THE WELFARE
OF THE COMMUNITY
DEPARTED THIS LIFE ON THE 24TH DAY
JANUARY, 1800, IN THE 47TH YEAR
OF HIS AGE.

These slabs were no doubt added quite some time after the initial burial as they were imported and carved in England. The most elaborate of the Phase 3 burials is the spectacular above ground vault of Thomas Potts regarded by many as the father of the Settlement (Figure 5).

The 2011 excavations in the cemetery on St. George's Caye revealed the presence of a previously unknown layer of burials. Based on depth and superposition, these predate the earliest dated burials and probably date to the first half of the 1700s. Although the early Bay Settlement was a remote outpost, the burial types and themes closely parallel those found in England and the American Colonies and reflect the burial traditions of English culture.

Acknowledgments We are grateful to the Institute of Archaeology for their support and encouragement to initiate this project. We also thank John and Linda Searle for their hospitality and immeasurable logistical support of this endeavor.

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31 RESULTS OF THE SKELETAL ANALYSIS FOR THE 2011 ST. GEORGE'S CAYE ARCHAEOLOGICAL FIELD SEASON

Lauren C. Springs

A total number of eighteen individuals were excavated during the 2011 St. George's Caye Archaeological Field School, which took place in July of 2011. The individuals were in single, unmarked graves and had few identifying artifacts associated with them. Both non-metric and metric data were collected for the individuals in an attempt to estimate age, sex, and stature. There were a high percentage of males in comparison to females represented in the cemetery at St. George's Caye and the age distributions indicate that the population was relatively young. Stature and long bone metrics were compared to ancestrally similar populations in an attempt to estimate relative health levels. Statistical analysis of long bone lengths does not support the hypothesis that the individuals differ significantly from their peers in the American colonies or Britain. The prevalence of common dental pathologies observed in the sample is also consistent with those observed contemporaneous groups. Further research is recommended to gain a better understanding of the colonial group.

Introduction

This paper reports on the analysis of the skeletal remains excavated from the cemetery at St. George's Caye during the 2011 field season. The burials were analyzed to provide demographic and baseline health data for the population. A total number of eighteen individuals were excavated from nine 2x2 meter units. The area excavated included fifteen burials, 12 of which were in single, unmarked graves. Two additional burials involved commingled remains. Only Burial 1, which included a partially legible coffin plate, contained an artifact that could be used to help identify the interred individual.

Burial Locations and Inventories

In total, eighteen individuals were excavated from fifteen burials. Two additional burials were located but not excavated. The burials were assigned numbers one through seventeen based on their relative positions within the operation. Burial 1 was located at the southwestern corner of the excavation area. The remaining burials were numbered sequentially from the southwest to northeast with Burial 17 located at the most eastern-most extension. Figure 1 is a close-up schematic of the 2011 excavation units.

Osteological analysis was performed for all but one of excavated individuals, who was represented by a single fibula in commingled Burial 15. Age, sex, stature, and health were estimated via skeletal analysis, and ancestry was inferred from historical texts. Morphological and metric characteristics indicative of ancestral origin were recorded when available, but due to the poor preservation of the facial regions of the skeletons, they were very few in number. The

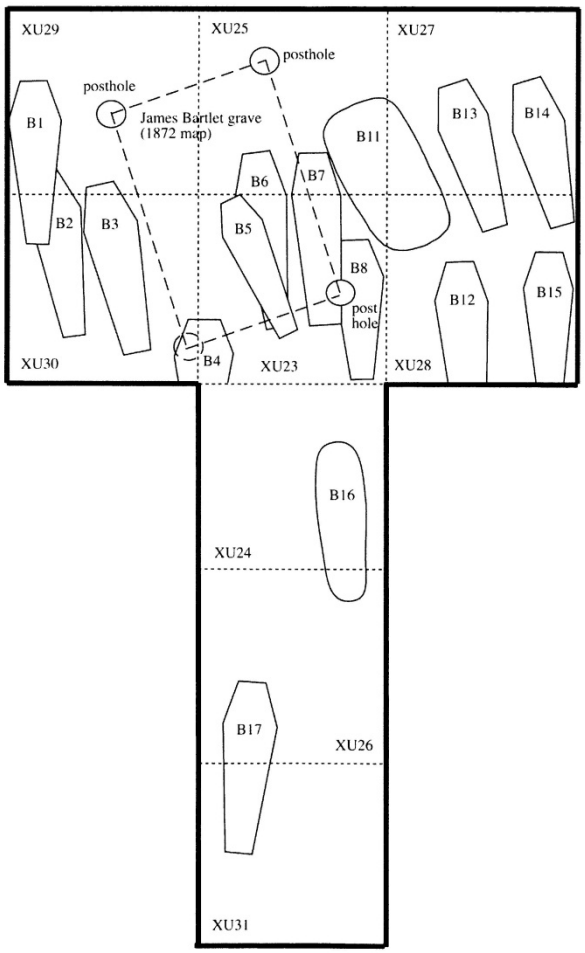

Figure 1. Schematic of the 2011 excavation.

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Burial No.	Age	Sex	Dental Pathologies	Other Pathologies	Coffins/ Burial Artifacts
	Category				
1	Young Adult	Male	Caries and hypoplasia	-	Coffin plate
2	Middle Adult	Male		-	Coffin
3	Middle to Older Adult	Male	Caries and hypoplasia	-	Coffin and Spanish Reale
5	Adult	Male	Caries	Pacchonian pits	-
6	Young to Middle Adult	Male	Caries and hypoplasia	Vertebral lipping and Schmorl's nodes	Coffin
7	Subadult	N/A	Caries	Cranial lesions	-
8	Adult	Indeterminate		-	Coffin
9	Adult	Ambiguous	Caries and hypoplasia	Abnormal suture closure, limb bowing, and periosteal infection	Faunal bone
10	Adult	Male	Caries and hypoplasia	Extensive hypoplasia	Faunal bone
11A	Adult	Male	Caries	-	Conch shells
11B	Adult	Female	Caries	-	Conch shells
13	Young to Middle Adult	Female	Caries and hypoplasia	-	Coffin
14	Subadult	N/A	Hypoplasia	-	-
15A	Middle Adult	Indeterminate	-	-	-
15B	Subadult	N/A	-	-	-
16	Young to Middle Adult	Ambiguous	Caries and hypoplasia	-	-
17	Young to Middle Adult	Male	Caries and hypoplasia	-	Coffin

Table 1. Results of osteological analysis for the 2011 St. George's Caye Archaeological Project.

results of the osteological analysis are presented in Table 1.

Preservation

Preservation of skeletal and burial materials varied widely in the cemetery with respect to the depth of burial. Sitting in the middle of a fluctuating water table, the cemetery has been subjected to periodic bouts of saturation by sea, fresh and brackish water since its inception. Excavations revealed a pattern of preservation that is reflective of the amount of time the burials remained submerged in water. The uppermost levels of the cemetery, where the water table was inconsistently present, produced poorly preserved skeletal fragments and a complete lack of organic coffin remnants. In contrast, skeletal elements were better preserved at lower depths and those burials extending deepest in the units were found with organic coffin remnants. A clear soil change in the profiles of the units likely indicated the lowest height of the water table, and materials situated beneath that depth were among the most well preserved at the site. During 2011, only the bases and partial sidewalls of coffins were recovered. The lids and walls of the coffins extending above the water table were not preserved.

Specific classes of skeletal remains also displayed different degrees of preservation. The flat bones were particularly prone to poor preservation, and those most damaged included the bones of the face, scapulae, ribs, vertebrae, sterna, innominates, and sacra. The long bones maintained the highest degree of preservation,

although the articular surfaces were frequently damaged or destroyed. Removal of burials for analysis at the lab additionally impacted the integrity of the skeletal remains. Many elements were extremely friable and fragmented upon removal. Other common issues included root damage and unintentional fracturing during excavation. Figure 2 illustrates the various degrees of preservation encountered in the burials.

Figure 1. Burials 5 through 11 illustrating the range of preservation encountered.

Dating the Cemetery

Mortuary Style

The mortuary style of the burials excavated during the 2011 field season was compared to styles popular among contemporary groups in Europe and North America. The only coffin type found in the cemetery at St. George's Caye is the generally unadorned "pinch toe" or "shoulder" coffin. These coffins are wooden and have a characteristic hexagonal in shape that tapers towards the toe. Pinch toe coffins were the primary means of burial in European and American populations until the Beautification of Death Movement of the nineteenth century (LeeDeeker 2009).

During the early to mid-nineteenth century, mortuary behavior in North America and Europe change dramatically. The Beautification of Death Movement began in the late eighteenth and early nineteenth centuries and was marked by a cultural and material shift of attitudes toward the dead. Stylish grave markers, monuments and decorative coffins became commonplace, and elaborate epitaphs to decorate tombs rapidly gained in popularity. Only one burial from the 2011 excavations exhibited any such evidence of adornment. Burial 1 included an inscribed, heart-shaped, metal coffin plate found in association with the skeletal remains. This burial may be representative of the beginning of a shift in mortuary style among the settlers on the caye.

Additionally, the burial styles found during the 2011 field season contrast with the cemetery descriptions, photographs, and the epitaph inscriptions recorded by Usher in 1907. As opposed to documenting the use of the classic pinch toe coffins, the burials described by Usher were composed of concrete, above-ground tombs that were topped with marble lids. The lids were etched with epitaphs including the identity of the individuals and often poetry or biblical verses (Usher 1907). While a few of these burials dated to the end of the eighteenth century, the majority were dated within the nineteenth century. The descriptions provided by Usher demonstrate mortuary styles on the caye that align closely with those gaining popularity during the Beautification of Death Movement. Since the burials uncovered in 2011 are stylistically less advanced than those documented in the nineteenth century, it is likely that they originated sometime in the eighteenth century.

Specific Burials

The identified graves of the Reverend John C. Mongan and James Bartlet were also used to establish a tentative date of use for the cemetery. A brick grave previously excavated in 2010 was identified as belonging to Reverend John C. Mongan, who died in 1860. The grave was located at a higher elevation than that of the burials excavated during 2011, indicating that it may be from a later date. The grave enclosure was additionally constructed out of brick and more stylistically advanced than those seen during 2011.

In 2011, another grave was located, identified, and matched to one of the epitaphs recorded by Usher in 1907. Three posts were identified in XUs 23, 25, and 29 that most likely represent the corners of a burial present on an 1872 cemetery map drawn by Rob Hume. Loose brick that is believed to be part of a tomb

was found in the sand between the posts at a depth superior to those of the 2011 burials. The placement of the three posts very closely corresponds to the two western and the northeastern corners of the burial of a man named James Bartlet. According to memorial epitaphs recorded by Usher (1907), James Bartlet was interred in 1800. His grave was also memorialized by an epitaph inscription that both identified the burial and celebrated his life's work.

The identified burials of John C. Mongan and James Bartlet both appear to postdate the 18 graves analyzed in this report. This is indicated in both their mortuary style and depth of burial. Because the grave depth and style of the 2011 burials seem to predate the previously located and described burials, the plots excavated during the 2011 season are estimated to be from the mid to late eighteenth century.

Sex and Age Distributions

Sex

More males than females were excavated from the cemetery at St George's Caye, with 47% (n=8) of the individuals in the cemetery estimated as male and 12% (n=2) estimated to be female. Of those remaining, 12% (n=2) displayed features that were not diagnostic of sex, 12% (n=2) had too few diagnostic features from which to estimate sex, and 17% (n=3) were subadults. Despite the scarcity of females in the sample, it is possible that the sex distribution observed in the cemetery at St. George's Caye is consistent with the sex distribution of the eighteenth century population living at the caye. Differential burial practices among men and women, and male-dominated migrations to colonial territories have been previously cited as mechanisms that can lead to unbalanced sex ratios in archaeological samples (Ashmore and Gellar 2005; Engerman 2000; LeeDeeker 2009). Alternatively, given that the initial excavations of the cemetery grounds only covered a very small portion of the total area, it is possible that future excavations will expose more female internments and possibly even out the sex ratio of the sample.

Age

Age ratios indicate that the population was relatively young in comparison to contemporary groups. The most common age-at-death categories found in the sample are for early and middle adults, with very few older individuals present. Where able, individuals from St. George's Caye were grouped into one or more age classes of subadult (<20 years), young adult (20-34 years), middle adult (35-49 years), and older adult (>50 years). Of the individuals assigned to a specific age group, 27% (n=3) classified as subadults, 64% (n=7) as younger to middle aged adults, and only 9% (n=1) as middle to older aged adults. Six additional individuals were estimated as adults, but were unable to be assigned to a more specific age group due to poor preservation of the necessary skeletal elements. The ages for the individuals at St. George's Caye were relatively young in comparison to the British age-at-death distributions from contemporaneous samples interred in Chelsea Old Church and St. Bride's Lower churchyards in England. Thirty-six percent and 30% of the individuals were aged as older than 46 years at their time of death in the Chelsea Old Church and St. Brides's Lower samples, respectively (Centre for Human Bioarchaeology 2011). Again, the disparity in age among the samples may be due to a number of causes varying from unbalanced migrations or small sample size.

Ancestry

Because ancestry could not be estimated skeletally for the individuals interred at St. George's Caye, ancestry for the sample was inferred from available demographic and historic texts. Initial investigations into historic records suggest that the cemetery is mainly comprised of individuals of European ancestry (Bolland 1977; Garber 2011; Setzekorn 1975; Usher 1907; Waddell 1961). However, it is known that African enslaved groups did live on and near the caye at the same time as the European settlers. Additionally, indigenous Mayan and Carib groups were living near St. George's Caye during the colonial period (Shoman 2000). Admixture between the groups was documented both during and after the period of slavery in Belize, which suggests that the presence of

individuals of African, native, or mixed descent in the cemetery could be a very real possibility.

Despite the sparse amount of biological data available to aid in ancestry estimation, indications of a diverse population have presented in some of the skeletal remains. For example, some of the individuals excavated displayed shovel-shaped incisors and complex cranial suture patterns which, although found across populations, are considered more commonly associated with Asian and Native American groups (Ortner 2003; Pindborg 1970). Additionally, a single coin was found adhered to the cranium of the individual in Burial 3. Excavations of a historic African American cemetery in Pennsylvania included burials characterized by the placement of a single coin near the head (LeeDecker 2009). This practice is considered distinctively African in origin. While the placement of the coin could be completely coincidental, it may also represent the presence of an individual of African ancestry in the cemetery or the adoption of African customs into the colonists' mortuary practices. Lastly, in the 2010 field season two culturally modified teeth were found buried in an adjacent area of the cemetery. The teeth were both medial maxillary incisors and had been culturally modified by filing on the occlusal surfaces. While the cultural practice of dental modification is not common in individuals of European ancestry, it is frequently associated with both Native American and African groups (Finucane et al. 2008).

General Health

Stature

Stature was analyzed for the sample at St. George's Caye because significant differences among the statures of biologically similar groups can indicate that health disparities exist between the populations. The total number of individuals from St. George's Caye for which stature could be estimated was twelve. Average stature for male adults (n=7) was calculated and compared to contemporaneous British and American samples. The lowest and highest values obtained for a male stature interval were 144.1 and 181.3 cm, respectively. The average stature for the male group was 165.3 cm. To analyze the height statistics of the sample, Analysis of Variance was used to test for significant differences among the British, American, and St. George's Caye samples. There were no significant differences found in the statures of the St. George's Caye group when compared to British or American samples of the same time period. Consequently, stature analyses fails to indicate that the population residing at St. George's Caye was experiencing different levels of health than those observed in contemporaneous populations.

Dental Health

The prevalence of the common dental pathologies observed in the St. George's Caye sample is also consistent with those that were observed in contemporaneous British samples. However, it should be noted that the dental statistics described for this sample report on the occurrences of particular pathologies per individual analyzed, not per tooth. As the pathologies are not reported based on their occurrence per tooth and most individuals were missing data due to postmortem loss of dentition, the results presented are more likely to underrepresent the total occurrence of the pathologies.

Of the individuals with dentition present, 64% exhibited parallel grooved striations or pits on their anterior dentition consistent with enamel hypoplasias. Another 86% of the individuals had visible caries, with the lesions ranging in size from small (<1 mm wide) to large (covering an entire side of the crown). Eighty-six percent had calculus deposits on their enamel or root surfaces. Alveolar resorption was present in 75% of the individuals and another 69% displayed visible antemortem tooth loss.

Pathological Lesions

Burial 5

The individual in Burial 5 had seven endocranial lesions on the left and right parietals. The lesions ranged from 1 to 4 mm in diameter and were roughly circular in shape. They were all located along the sagittal and coronal sutures. The defects were smooth-edged and did not extend through the exterior surface of the crania. Their morphology is consistent

Figure 3. Frontal lesion of Burial 7.

Figure 4. Lambdoidal lesion of Burial 7.

with pacchionian pits, which are generally located on the parietals and are very common across populations (Mann and Hunt 2005). While the pits have not been significantly linked to any adverse health conditions, they have been characterized as more prevalent and pronounced in older individuals.

Burial 6

Schmorl's nodes and slight vertebral lipping were visible on four of the vertebrae recovered from Burial 6. Schmorl's nodes are identified as variously shaped and sized depressions on the surfaces of vertebral bodies that are fairly common and often related to increasing age or the application of stress to the lower spine due to heavy lifting or strenuous and habitual activities (Mann and Hunt 2005; Waldron 2009). They are fairly common and are most likely to be found in the lower thoracic and lumbar vertebrae.

The presence of vertebral lipping, which is commonly associated with osteoarthritis, also occurs in the spine with advancing age or the presence of applied physical stress (Ortner 2003). Because the age of the individual in Burial 6 is estimated as a younger to middle adult, the presence of the previously described pathologies is consistent with that of defects resulting from physical stress to the lower spine.

Burial 7

There was a slight, smooth-edged depression superior to the right eye orbit on the frontal bone of the individual in Burial 7. The defect was not penetrating but was visible both endo- and ectocranially. On the ectocranial aspect, the defect was roughly circular and had an uneven, undulating surface. The endocranial view of the defect was crescent-shaped and also slightly uneven.

There was a second antemortem defect just lateral to the intersection of the sagittal and lambdoidal sutures. The lesion was circular in shape and its base was slightly pitted. The edges and base were smooth, and while it was not penetrating, the depth of the pit nearly reached the endocranial surface. The two lesions are pictured in Figures 3 and 4.

It is not clear whether or not the two defects are related to one another. The defect on the frontal has the overall appearance of a healed compression fracture while the morphology of the second defect is consistent with that of a lytic lesion. Mann and Hunt (2005) note that characteristic "pond"-like compression fractures that are often found on the skull are commonly indistinguishable from healed infectious lesions. While the frontal defect appeared to be consistent in morphology with a healed compression fracture, it could also represent a lytic lesion similar to the one found on the right parietal but at a more progressive state of healing.

Burial 9

The individual in Burial 9 displayed an unusual suture closure pattern. The sagittal suture was completely obliterated antemortem and the lambdoidal sutures were near obliteration. The areas along the previously mentioned suture lines were depressed, resulting in a pronounced bulbous appearance of the cranial vault. In contrast to the sagittal and

lambdoidal sutures, the coronal and metopic sutures remained completely open.

Normally, the cranial sutures first begin to close around bregma and their degree of closure increases with age (Aufderheide and Rodriguez-Martin 1998). The fusion of the metopic suture typically occurs in childhood, but its presence has been found in adult skeletons as well as juveniles. While it is possible that the abnormal pattern of suture closure for this individual is pathological in nature, it could simply be a result of normal human variation.

Additionally, the bones of the lower limbs were all bowed and the tibiae exhibited a classic saber-shin appearance, as shown in Figure 5. There was significant woven bone formation at the anterior sites of bowing. The femora were also thicker and heavier at the sites of bowing than the remaining areas of the shaft. The right fibula exhibited two sites of possible periosteal infection where woven and porous bone growth and remodeling was marked.

The postcranial traits were all consistent with changes seen to adult skeletons of individuals that had residual rickets as children (Brickley and Ives 2008). Additional differential diagnoses for the individual include osteomalacia, Paget's disease, Blount's disease, trauma, infection, and childhood stress.

Burial 10

The central incisors of the maxillary teeth from Burial 10 each had antemortem circular defects with what look like radiating, postmortem fractures. The edges of the defects were smooth, completely penetrated the enamel, and extended into the core of the tooth, as shown in Figure 6. The anterior and inferior halves of the incisors were thicker and whiter in color, and the lingual surfaces were covered with pitted hypoplasias. While not as common as linear or pitted variants, hypoplasias can also be expressed as "poorly-defined, chalky white of hypomineralization or honeycombed beds of cup-shaped enamel voids" (Aufderheide and Rodriguez-Martin 1998:406), similar to what is seen in Burial 10. Enamel defects like hypoplasia have been linked to various conditions like hemolytic disease of the newborn, dietary deficiency, and congenital syphilis (Aufderheide and Rodriguez-Martin

Figure 5. Bowed tibiae of Burial 9.

Figure 6. Dental defects of Burial 10.

1998). However, the most commonly acknowledged condition resulting in hypoplasia is malnutrition.

Conclusions

Dated to approximately the mid to late eighteenth century, the 2011 excavated cemetery burials represent the remains of men, women, and children. The cemetery appears to include a larger number of men than women, which could be indicative of differential burial practices, dominantly male colonial migrations, or could be a relic of a small sample size. The most common age-at-death categories found in the sample are for early and middle adults, with very few older individuals represented. Because only sparse demographic data is available for the sample, it is unclear whether or not the age and sex distributions accurately represent the individuals living on the caye during the eighteenth century.

The metric, dental, and pathological data available for the sample do not support the hypothesis that the population at St. George's Caye was experiencing different health levels than their British and American counterparts. While specific pathological indicators were highlighted, it appears that the St. George's Caye group was very similar to their contemporaries in terms of their overall health indications.

While ancestry was unable to be estimated skeletally, it is recommended that future efforts be made to understand the biological background of this colonial group. If future analyses reveal that the settlers are more racially mixed than is presently indicated, the cemetery would be an invaluable source of information as one of the few skeletal collections able to document admixture between diverse groups. Alternatively, if it is confirmed that the sample is comprised of individuals of European ancestry, the cemetery could be studied as a representative of the slave-holding upper class of the society. In either situation, the information gained from the skeletal and archaeological analysis would provide valuable insights into the division of class structure and racial dynamics in the British colonies in Belize.

Future excavation and skeletal analysis of the cemetery at St. George's will be able to increase the body of data available to researchers who wish to understand the biological and cultural histories of colonial settlers at St. George's Caye. It is recommended that this study be used to highlight possible research avenues of future projects.

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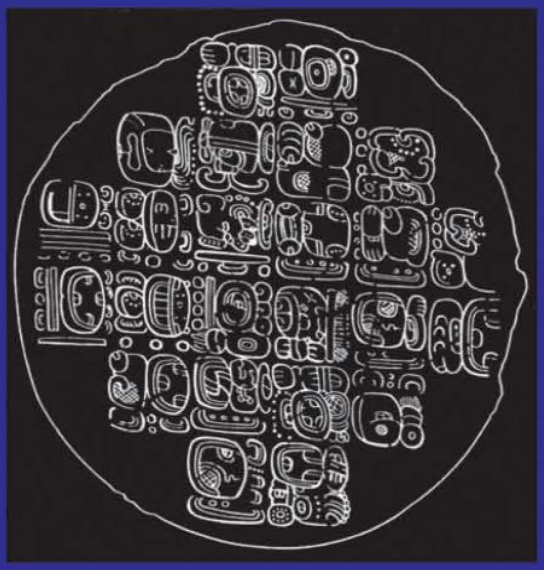

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