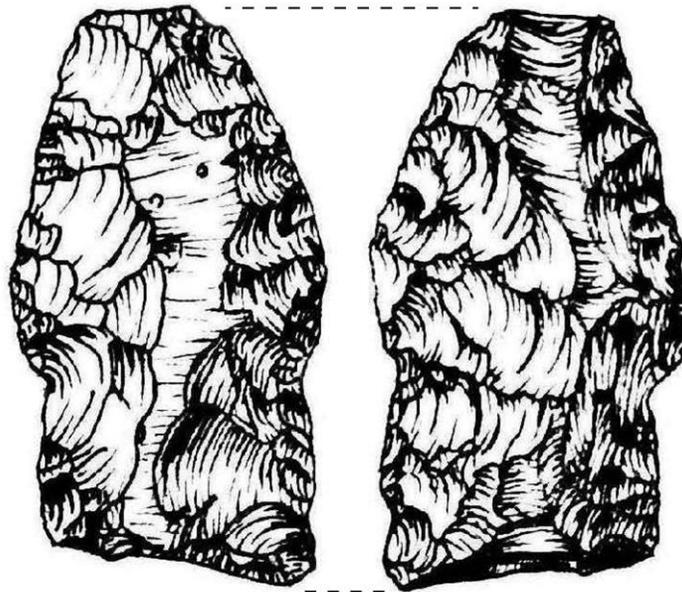


***The Belize Valley Archaeological  
Reconnaissance Project***

***A Report of the 2017 Field Season***

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**Edited by Claire E. Ebert, Julie A. Hoggarth  
& Jaime J. Awe**

**Volume 23  
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## Editors' Note

In 2017 the Belize Valley Archaeological Reconnaissance (BVAR) Project, co-directed by Dr. Jaime Awe (Northern Arizona University) and Dr. Julie Hoggarth (Baylor University) celebrated its 30<sup>th</sup> anniversary of archaeological investigations in the upper Belize River Valley. Excavations and survey conducted during the 2017 field season continued to focus on understanding the development and decline of Belize Valley socio-political complexity over more than 2,000 years, from the Preclassic to Postclassic periods (1200 BC-AD 900/1000), at the Maya centers of Cahal Pech, Baking Pot, Lower Dover, and Xunantunich.

Excavations at the site of Cahal Pech focused on documenting early residential and ceremonial contexts within the site's monumental epicenter, as well as understanding the decline of the site. Ebert (Chapter 1) placed several large exposures in Plaza B with two primary goals: (1) document the earliest contexts within the Cahal Pech epicenter and (2) sample temporally diagnostic material from stratified contexts to understand the timing and tempo of site development throughout the Preclassic period (~1200 BC-AD 300). The 2017 excavations on the west side of Plaza B exposed the largest and most elaborate Middle Preclassic building in the plaza to date, composed of a multi-tiered platform that may have served as the western structure of an eastern triadic group. Excavations in Plaza B also revealed new evidence for the role of ceremonies in the development of complexity beginning in the Middle Preclassic through the documentation of three large ceramic caches on the east, west, and northern edges of the plaza. Excavations by AFAR (Chapter 2) articulated with Ebert's units on the southwestern side of Plaza B to document continuous construction activity through the end of the Classic period at Cahal Pech. Excavations in Plaza G by Beardall (Chapter 3) exposed a massive retaining wall and several large-scale construction phases that served to expand the Cahal Pech monumental epicenter during the Middle Preclassic. Fox (Chapter 4) reports on artifact analyses from Terminal Classic ceramic deposit from Cahal Pech's Zopilote Group, which was excavated during the 2015 and 2016 field seasons. Results suggest that the deposit was likely associated with re-visitation to Cahal Pech, perhaps for the purpose of ancestor veneration after the site as depopulated around AD 850/900.

Excavations and epigraphic and laboratory analyses at Baking Pot focused on understanding social and political changes occurring at the site throughout the Classic period. Helmke and colleagues (Chapter 5) present an epigraphic analysis of a ceramic sherd collected from a high-status residential group located north of the Baking Pot epicenter. Comparisons to the three other ceramic vessels found at other major polities in Belize and Guatemala support the hypothesis that Baking Pot was under the influence of Caracol from the fourth through seventh centuries. Hoggarth (Chapter 6) discusses the results of excavations of a complex water management system, composed of over 23.5 linear km of ditches, located in the southwestern periphery of the major site of Baking Pot. Test excavations collected materials that will be used to develop a chronology for the initial construction and final use of the ditch system, and to understand its role as an adaptation to population increase and climate change during the Late Classic. Davis (Chapter 7) presents the results analyses of the artifact assemblages from five peri-abandonment deposits from Group B in Baking Pot's epicenter in order to compare the timing of their placement and their forms and functions. The presence of burials, fine polychrome ceramics, some bearing glyphic inscriptions, and specialized lithic artifacts likely indicate that the deposits

represent ceremonial activities associated with ancestor veneration and petitioning the gods that were carried out during Baking Pot's Terminal Classic period.

Research at Lower Dover continued to focus on exploring the establishment and decline Late and Terminal Classic epicenter and its relationship to the peripheral settlement. Guerra (Chapter 7) developed a test pitting program to document material evidence and chemical signatures of soils associated with marketplace activities in Lower Dover's Plaza A. While geochemical analyses of soil phosphates are ongoing, a total of 103 test pits documented the presence of several burned areas and concentrations of lithics and ceramics across Plaza A, perhaps representing concentrated use areas. Romih and colleagues (Chapter 8) initiated excavations of an extensive peri-abandonment deposit in Courtyard 4 (CT4), the southern-most courtyard of the Lower Dover palatial complex. While the 2017 excavations exposed the top of the deposit, research during the 2018 BVAR Project field season will document the entire deposit and provide a comparison to other similar deposits from Cahal Pech and Baking Pot. Continued research in the Lower Dover settlement focused household excavations to understand the developmental trajectory of the Lower Dover polity from the Preclassic through Terminal Classic periods (~900 BC-AD 900/1000). Walden and colleagues (Chapter 10) report the results of excavations at Tutu Uitz Na, an intermediate elite center, a rockshelter (RS 2), and four additional commoner settlement groups around the Lower Dover epicenter. These investigations identified a possible sacrificial deposit consisting of multiple inhumations associated with the eastern triadic shrine at Tutu Uitz Na, a lithic workshop at SG 28, and preliminary evidence that at least three commoner dwellings predate the Late Classic rise of the Lower Dover polity.

The 2017 field season investigations at Xunantunich marked the third year of the Xunantunich Archaeology and Conservation Project (XACP), the primary goals of which are to determine the factors that led to the rapid, but short-lived, development of this major Belize Valley site and to conserve several large structures within the site's epicenter. Excavations resumed at Group B (Alvarado and colleagues, Chapter 11), a Late Classic elite residential group located along the western edge of the central precinct of Xunantunich, and exposed the terminal phase of construction in addition to an extensive peri-abandonment deposit. Green and colleagues (Chapter 12) report on the completion of excavations of Burial B1-4 in the group's Structure B1, a small eastern shrine. Excavations at this structure are particularly important for understanding the Terminal Classic occupation and function of Group B within the larger Xunantunich epicentral complex. Initial skeletal analyses indicate that multiple individuals were buried just outside the doorway to Structure B1, and that at least one burial was of a high status individual based on the presence of fine ware ceramics, three chert biface blades, and a miniature jar.

The 2017 XACP work also included excavations and conservation work at several large temple structures, the Castillo, and the Xunantunich palace. Slocum and Awe (Chapter 13) describe work at Structures A9, A28, and A1. XACP excavations at Structure A9 in 2016 documented two hieroglyphic panels flanking the building's axial stairway and a royal burial within the structure. The 2017 investigations at A9 provided evidence for the reuse of stones at the building during the Terminal Classic, in addition to the presence of a low platform beneath the structure's terminal façade. Excavations of Structure A28 on the upper terrace of El Castillo exposed terminal architecture for consolidation. Investigations at Structure A1 expose portions of the lower terminal phase architecture. Exposed architectural material included two rows of facing

stones along Structure A1's southeast corner and collapsed material the building's east face, which will be targeted for conservation in the future. Watkin's and colleagues (Chapter 14) targeted Plaza A-III and the associated southern structure, Structure A13, to further understand the role of the Xunantunich palace complex within the greater ceremonial center. Excavations uncovered well the preserved architecture of Rooms 6, 7, and 8, as well as the north facing interior terrace. Researchers also recorded 14 examples of Maya graffiti etched into plaster surfaces of the room benches and other architectural features. While a complete catalog and description of each graffiti is provided in the chapter, images include *patolli* boards, a seated figure looking into a mirror, and a calendrical date. The association of later ceramic materials suggests that suggest Structure A13 may have been a later addition to the Plaza A-III complex during the Late Classic. Research during subsequent field season will aim to determine the complexes' function as a "palace" at Xunantunich.

The final chapter of the volume by Freiwald (Chapter 15) presents a comprehensive overview of stable isotope research in the Maya region, including detailed methodological guidelines. Recent research documenting the origin of a high status individual in Structure A9 at Xunantunich is used as a case study to illustrate how stable isotope bone chemistry can help archaeologists reconstruct individual lives and patterns of population movement.

The 2017 BVAR Project field season benefitted from the help of many individuals and establishments. We would like to thank Hode's Restaurant, Mana Kai Cabins, Lower Dover Field Station, and Shell Gas station among others. The owners and employees of these establishments were essential in the housing, transport, and daily lives of the BVAR Project staff and students. In addition, we would like to acknowledge the 2017 field school students, staff, and local field assistants. We graciously thank Doug Tilden for supporting the Xunantunich excavation and consolidation work, which was funded by the Tilden Family Foundation (San Francisco, CA). Other funding sources including the National Science Foundation are noted in the acknowledgments for individual chapters. Finally, we offer our thanks to Dr. John Morris and the Belize Institute of Archaeology (NICH) for permission to excavate all four sites and their continued support of BVAR Project research. Our greatest honor is to protect Belize's cultural heritage, to train the next generation of archaeologists from Belizean and abroad, and to educate students from all over the world about the importance of understanding the past.

Finally, we would like to dedicate this volume to the late Keith Solmo, who displayed unparalleled enthusiasm and dedication during his time as a student, staff member, and colleague on the BVAR Project. Keith became an integral part of the BVAR Project family and he will be greatly missed.

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*The Belize Valley Archaeological  
Reconnaissance Project*

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**A Report of the 2017 Field Season**

**Volume 23**

# PRECLASSIC PLAZA INVESTIGATIONS AT CAHAL PECH, BELIZE: RESULTS OF THE 2017 EXCAVATIONS IN PLAZA B

Claire E. Ebert  
University of Pittsburgh

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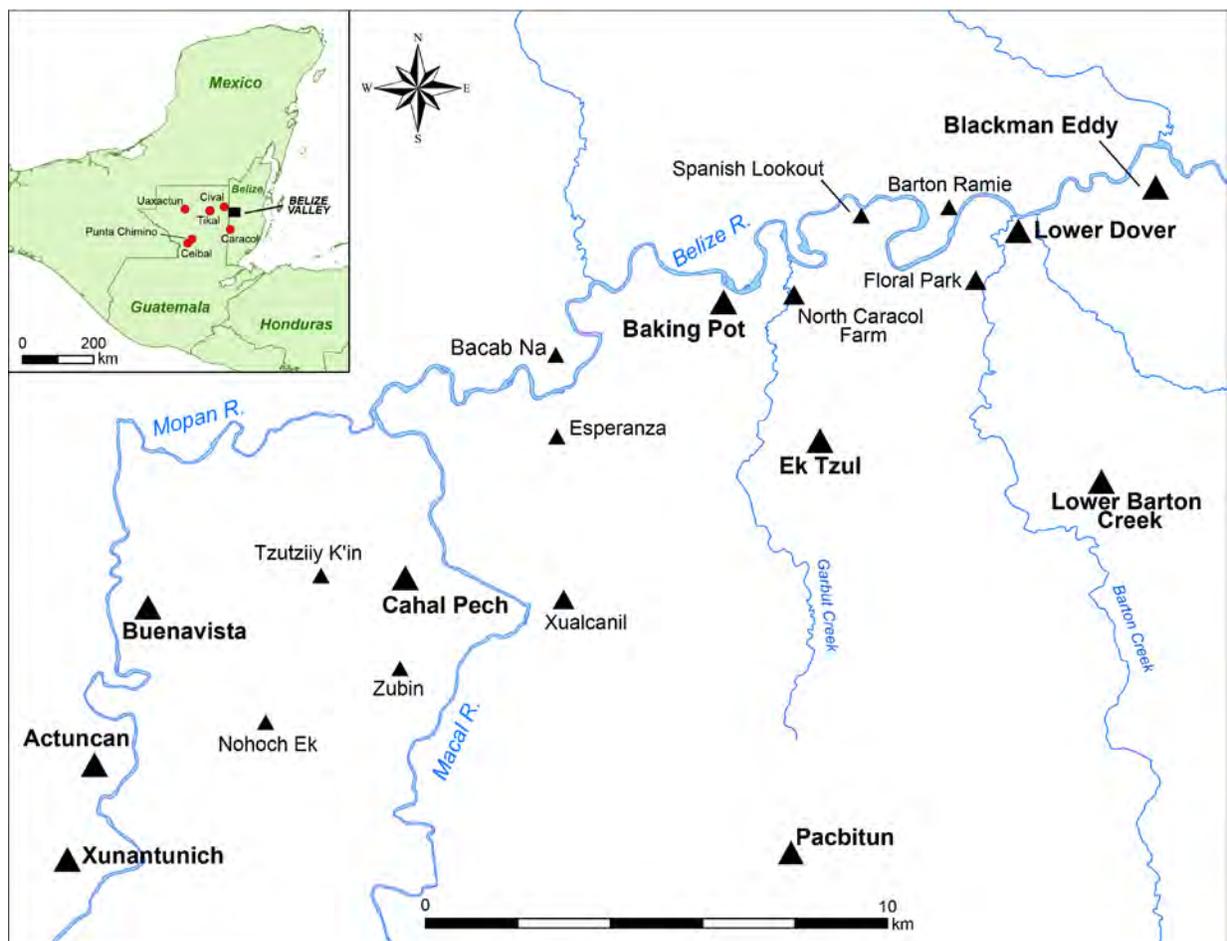
## INTRODUCTION

The Preclassic period (1200 BC-AD 300) was a critical transition for social and economic organization across the Maya lowlands (Table 1). During this time, the adoption of ceramic technology, construction programs of public architecture, and development interregional long-distance exchange systems set the stage for the development of complex society across the region. The 2017 Belize Valley Archaeological Reconnaissance (BVAR) Project excavations at the site of Cahal Pech, located in west-central Belize (Figure 1), were aimed at understanding the foundation and early growth of the Preclassic community of Cahal Pech into a major civic-ceremonial center. Investigations focused on documenting Preclassic contexts in Plaza G (see Beardall, Chapter 3), and Plaza B, the focus of this report (see also Guenter et al., Chapter 2). Plaza B is the largest open plaza in the Cahal Pech monumental epicenter, measuring approximately 50x60 m (Figure 2). The primary goal of the 2017 Plaza B investigations was to recover temporally diagnostic materials, including ceramics and organic remains and bone for AMS <sup>14</sup>C dating, to understand the timing of site establishment and expansion at Cahal Pech throughout the Preclassic (see Appendix A for <sup>14</sup>C sample list). A secondary goal of research at Plaza B was to identify stratified components below Early Preclassic contexts that might potentially date to the Archaic period. Previous excavations in Plaza B indicate that the earliest cultural levels at the site, which include evidence of domestic architecture, are located directly on top of black paleosols, which contain only a very small number of ceramic sherds with higher concentrations chert flakes and tools and freshwater shells (Ebert 2017; Ebert et al. 2017). Similar contexts have been encountered throughout the Maya lowlands (e.g., Beach et al. 2006), and may represent transitional Archaic-to-Preclassic levels.

Plaza B at Cahal Pech has been the focus of intensive archaeological research for over 30 years. During preliminary test excavations conducted between 1988 and 1992, Jaime Awe (BVAR Project Co-Director, Northern Arizona University) and his colleagues encountered some of the most extensive Preclassic contexts documented in the Maya lowlands. Stratigraphic trenches in Structure B4, located on the south side of Plaza B, produced a continuous construction sequence of Early Preclassic domestic structures superimposed by later Middle and Late Preclassic platforms and temples (Awe 1992; see also Awe and Healy 1995; Healy et al. 2004a; Ishihara-Brito et al. 2013). Based on a series of test units placed across Plaza B, David Cheetham (1996) identified the presence of at least eight small domestic buildings with Early Preclassic components. A limited program of radiocarbon dating temporally placed the Early Preclassic at Cahal Pech between 1200-900 cal BC (Awe 1992; Healy et al. 2004a).

**Table 1:** Chronological periods in calibrated radiocarbon years and associated ceramic complexes for Cahal Pech (after Awe 1992).

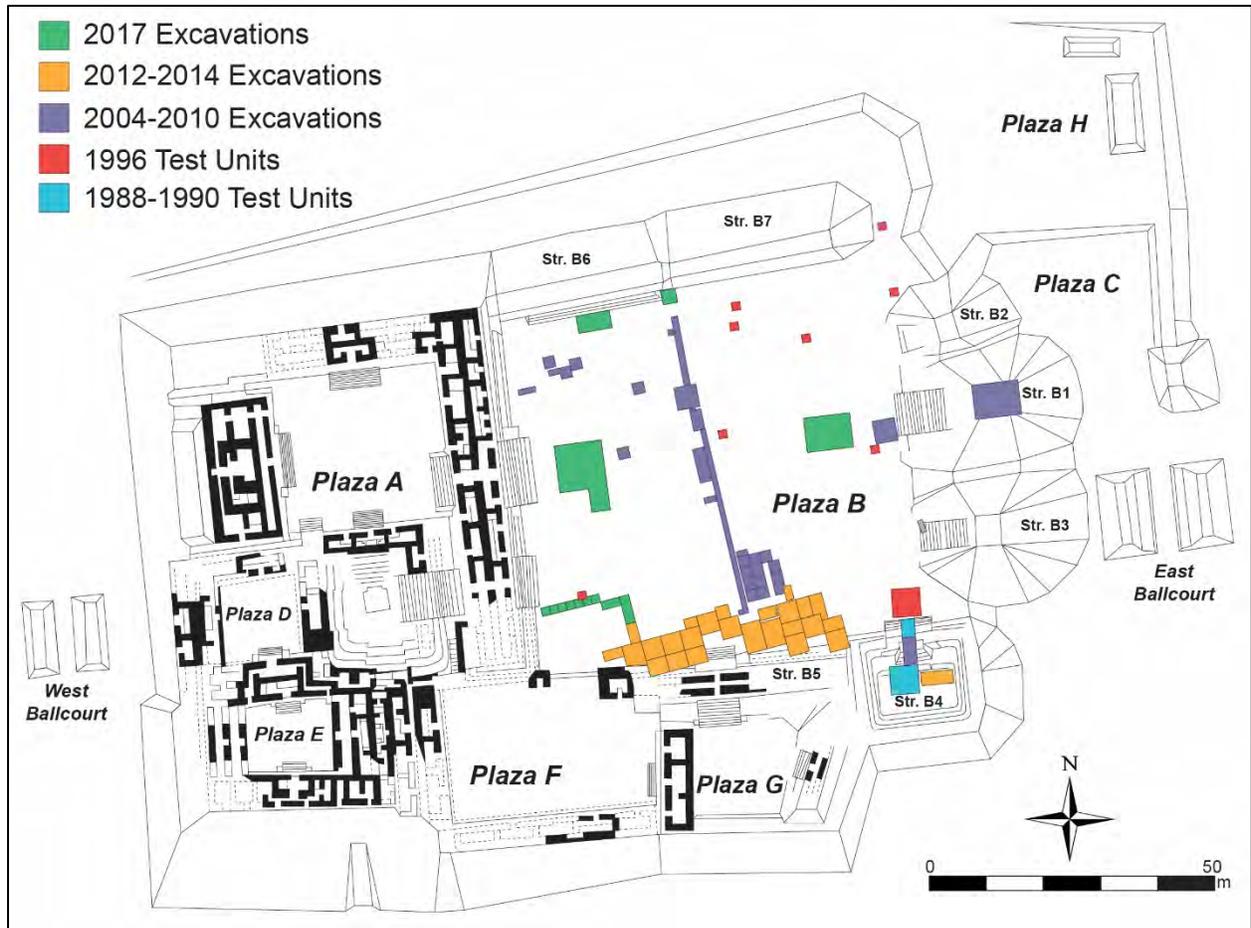
<i>Time Period</i>	<i>Ceramic Complex</i>	<i>Calibrated year BC/AD</i>
Terminal Classic	Spanish Lookout	AD 750-850/900
Late Classic	Tiger Run	AD 600-750
Early Classic	Hermitage	AD 300-600
Late Preclassic	Late Facet Xakal	AD 100-300
	Early Facet Xakal	300 BC-AD 100
Middle Preclassic	Late Facet Kanluk	750-300 BC
	Early Facet Kanluk	900-750 BC
Early Preclassic	Cunil	1200/1100-900 BC



**Figure 1:** Map of Belize Valley and Maya lowlands (inset) with major sites mentioned in text (map by Claire Ebert, 2018).

Based on materials from the initial Structure B4 excavations as well as new excavations conducted in the early 2000's (Garber and Awe 2009), Sullivan and Awe (2013) later defined the Early Preclassic Cunil ceramic complex, associated with the earliest residential settlement at the

site (see also Awe 1992; Clark and Cheetham 2002). While Cunil pottery consists primarily of utilitarian cooking and storage vessels, the assemblage also includes decorated bowls and plates with iconography connecting the Belize Valley region to ideological developments taking place at contemporaneous sites elsewhere in Mesoamerica (Garber and Awe 2009). Current data suggest little evidence for institutionalized social inequality at the earliest community at Cahal Pech. The presence of non-local exotics (e.g., jade, El Chayal obsidian, marine shell) within Cunil levels, however, suggests integration of the site into economic networks extending across the Maya lowlands (Awe 1992; Ebert 2017; Ebert and Awe 2018; Garber et al. 2004; Stemp et al. 2018).



**Figure 2:** Map of Cahal Pech site core, showing location of major Plaza B excavations (map by Claire Ebert).

Since Awe’s initial research on the earliest Preclassic developments at Cahal Pech, excavations in Plaza B have concentrated on exposing public architecture primarily dating to the Middle and Late Preclassic periods (Garber et al. 2010; Horn 2015; Peniche May 2013, 2014a, 2014b, 2016). A series of targeted test units and trenches in Plaza B have provided evidence for the development of higher status social groups at Cahal Pech beginning as early as 900 BC (Garber et al. 2010; Horn 2015; Peniche May 2013, 2014, 2016). Sherman Horn (2015) analyzed the Middle Preclassic ceramic, lithic, and shell assemblages from a 52 m north-to-south trench

excavated across Plaza B between 2004 and 2010. Analyses were aimed at documenting Preclassic economic systems in the Cahal Pech site core. He suggested that differential consumption of restricted high-value goods and exotic trade items (e.g., obsidian and jade) reflected wealth and were positively correlated with the size of residential architecture (Horn 2015).

Nancy Peniche May (2016) conducted large horizontal excavations ~186.5m<sup>2</sup> in the southern part of Plaza B between 2012-2014 for her dissertation research exploring the relationship between ritual activity, public architecture, and the development of socio-political power during the Middle Preclassic. Her excavations documented the construction of new styles of large public buildings appearing between 700-500 BC (Ebert et al. 2017), replacing small Early Preclassic domestic structures within the site core. Peniche May (2016) suggested that the construction of public buildings, including round platforms, were associated with a more socially restricted set of ritual and economic activities used by emergent elite households to create and maintain unequal socio-political relationships within the community. Much larger and more formally organized civic centers with Middle Preclassic public architecture have been documented at other sites in the Belize Valley region including Blackman Eddy, Xunantunich (Group E), Pacbitun, Actuncan, and Barton Ramie (Awe 1992; Brown et al. 2013; Garber et al. 2004; Healy et al. 2004b; Willey et al. 1965), suggesting that these developments were far ranging.

## **EXCAVATION METHODS**

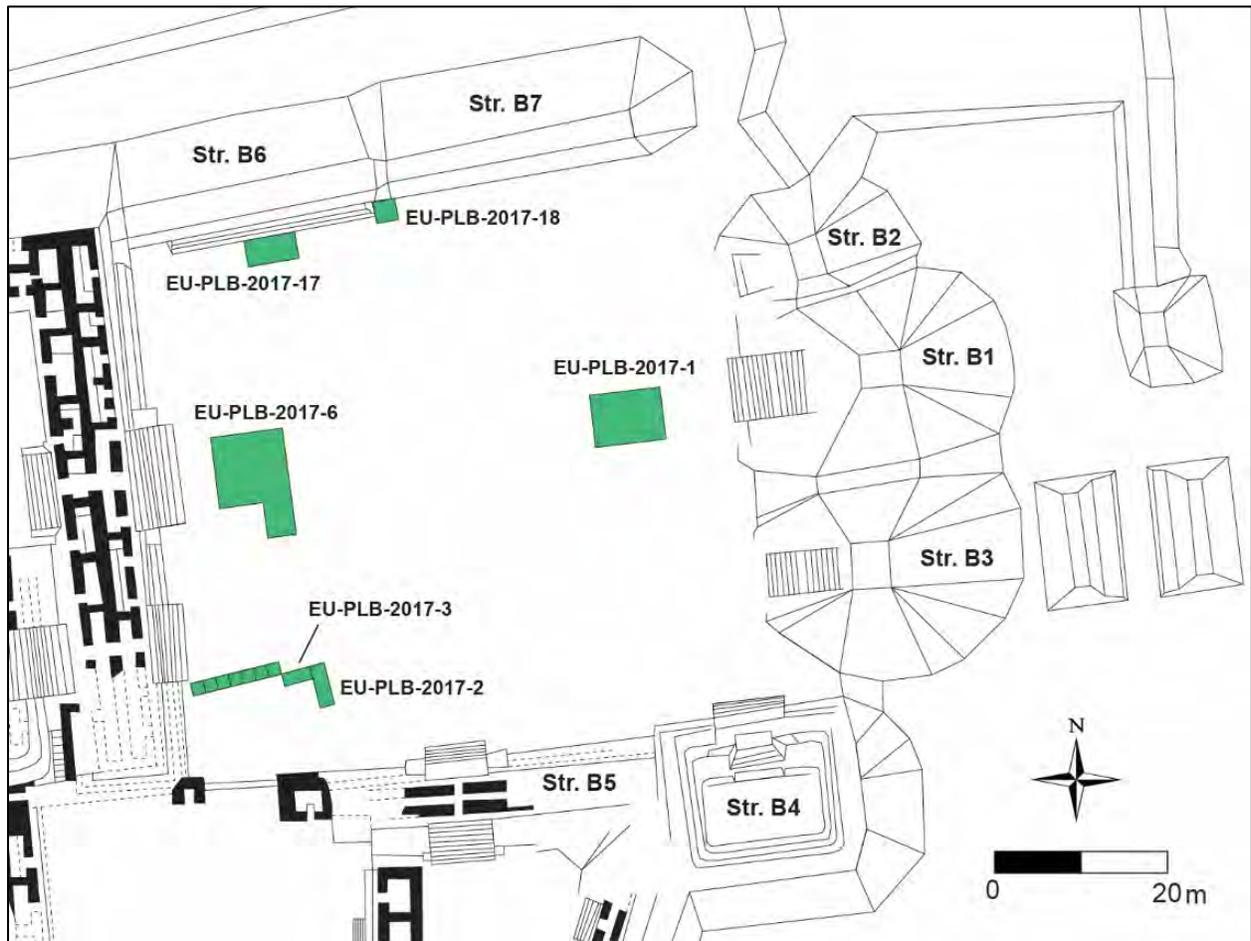
A total of 13 test units were placed in four areas across the Plaza B to exposed stratified components dating to the Preclassic period (Figure 3). Excavation unit (EU) PLB-2017-1 was located 7 m to the south of Structure B1 in the eastern side of the plaza. Nine units were placed adjacent to Peniche May's (2014, 2016) units in the southwestern corner of Plaza B in front of Structure B5. This report details the excavation results of two of those units: EU PLB-2017-2 and EU PLB-2017-3. Excavation results of EU PLB-2017-4 through EU-PLB-2017-13 are discussed by Guenter and colleagues in Chapter 2 of this volume. EU PLB-2017-16 was placed on the west side of Plaza B approximately 5 m east of Structure A2. Two units – EU-PLB-2017-17 and EU-PLB-2017-18 – were also placed along the southern façade of Structure B6, on the north side of the plaza. Excavations were conducted using both cultural and arbitrary levels. Context associations followed standards established by the BVAR Project. Artifacts were collected and separated based on unit, level, lot, and context. All matrices were screened through ¼-inch mesh. While collected artifacts are currently being formally analyzed, preliminary results are discussed throughout this chapter. Special finds recovered from excavations are listed in Appendix B.

## **EXCAVATION RESULTS**

### **Surface finds**

Cahal Pech possesses evidence for occupation and activity over a period of 3000 years, beginning during the Early Preclassic period (~1200-900 BC) and extending through the present day. While current archaeological data indicates that the monumental epicenter was largely abandoned by the Maya at the end of the Terminal Classic period (~AD 850/900; Hoggarth et al., n.d.), Cahal Pech experienced low levels of periodic activity until an archaeological reserve was established at the site in the 1990's. AMS <sup>14</sup>C dates and strontium isotope analyses from the burial

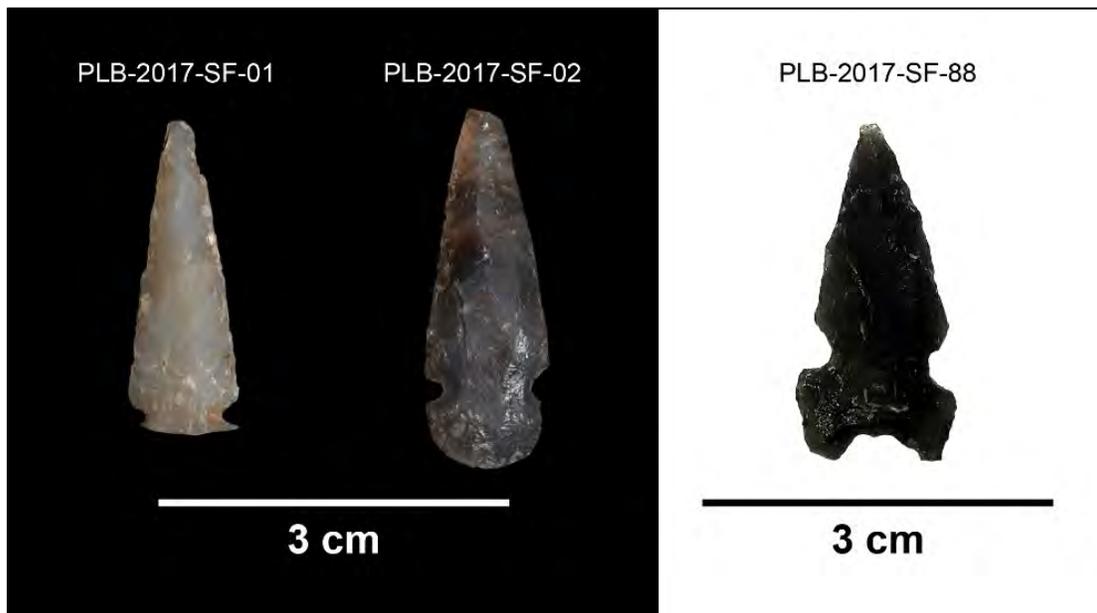
of a juvenile recovered from Plaza G suggest that the site may have been re-visited by groups from the Petén between ~AD 1650-1800 (Awe et al. 2017; Ebert and Awe 2018). Evidence for more recent activities includes the presence of United States coins and porcelain pipe fragments dating to the early 20<sup>th</sup> century. Cahal Pech was also a known campsite of the British West India Regiment much later during the early 1900's (Awe 1992: 172). Today, Cahal Pech is one of the most visited archaeological sites in Belize, and Plaza B experiences heavy foot traffic on a daily basis.



**Figure 3:** Map of Plaza B with location of 2017 BVAR Project excavations (map by Claire Ebert).

Several types of artifacts collected from surface and humic contexts at Cahal Pech during the 2017 BVAR Project field season provide additional evidence for activity at the site from the Postclassic period through the modern era. Surface clearing prior to excavations in the east, south, and west of the plaza recovered three small arrow points, two of which were made from chalcedony and one from obsidian (PLB-2017-SF-01, SF-02, and SF-88; Figure 4). Similar small points, typically measuring between 1 cm and 3 cm long, have been documented from Late Postclassic (AD 1400-1697) contexts throughout Belize Valley and elsewhere in the southern Maya lowlands, and were key components of bow-and-arrow weaponry and hunting technology (Meissner 2014; Meissner and Rice 2015). Meissner (2014) suggests that the presence of small arrow points at Cahal Pech and the nearby Belize Valley site of Baking Pot may be linked to the occupation of

western Belize by Late Postclassic Dzuluinikob Maya groups. Evidence for more recent activity at Cahal Pech includes a 20<sup>th</sup> century ceramic pipe stem recovered from the surface of EU PLB-2017-16, and several types of metal artifacts including Belize coins, bullet casings, and fragments of a metal bucket in the humus layer of EU PLB-2017-1.



**Figure 4:** Chalcedony and obsidian arrow points recovered from surface of Plaza B. Special finds numbers indicated on figure (see Appendix B).

### **EU PLB-2017-1**

EU PLB-2017-1 was a 4x6 m unit placed to run east-to-west perpendicularly to the centerline of the Structure B1 stairway. Structure B1 is the central pyramid building of a large eastern triadic group in Plaza B, which functioned as a ritual architectural complex beginning in the Middle Preclassic (Awe et al. 2017). The building is also associated with some of the most elaborate royal burials at the site, and became the focal point of the Cahal Pech epicenter during the Late Preclassic period. Intentional placement of Middle and Late Preclassic dedicatory caches aligned with the centerline of eastern architectural groups has been documented at several lowlands sites including Cival (Estrada-Belli 2011: 260) and Ceibal (Inomata et al. 2017; Triadan et al. 2017), in addition to contemporaneous centers elsewhere in Mesoamerica (e.g., La Venta, Druker et al. 1959; Chiapa de Corzo, Bachand and Lowe 2012). EU PLB-2017-1 was placed in front of the structure to investigate the presence of similar deposits in Plaza B.

Excavation of EU PLB-2017-1 recorded a total of six floors in the eastern part of the plaza, though no formal masonry architecture was encountered. After the excavation levels 1 through 2, which cleared a compact humic layer containing modern debris (e.g., plastic, metal) and exposed two poorly preserved plaster floors (Floors 1 and 2), the unit was bisected and excavated in two separate sections. EU PLB-2017-1A was a 2.5x4 m sub-unit, and encompassed the western portion of the unit and exposed Feature 2 (see below). EU PLB-2017-1B was a 2x2.7 m sub-excavation in

the eastern portion of the unit and exposed Features 1 and 3. An additional four plaster floors (Floors 3 through 6) were encountered in both excavated sections of the unit. Most floors were poorly preserved with the exception of Floor 4, which was a relatively flat plaster floor measuring approximately 5 cm thick. Diagnostic ceramics recovered from below Floor 4 included Xakal phase (Late Preclassic) types, including a Sierra Red basal flange, suggesting construction of the floor in Late Preclassic or Early Classic period.

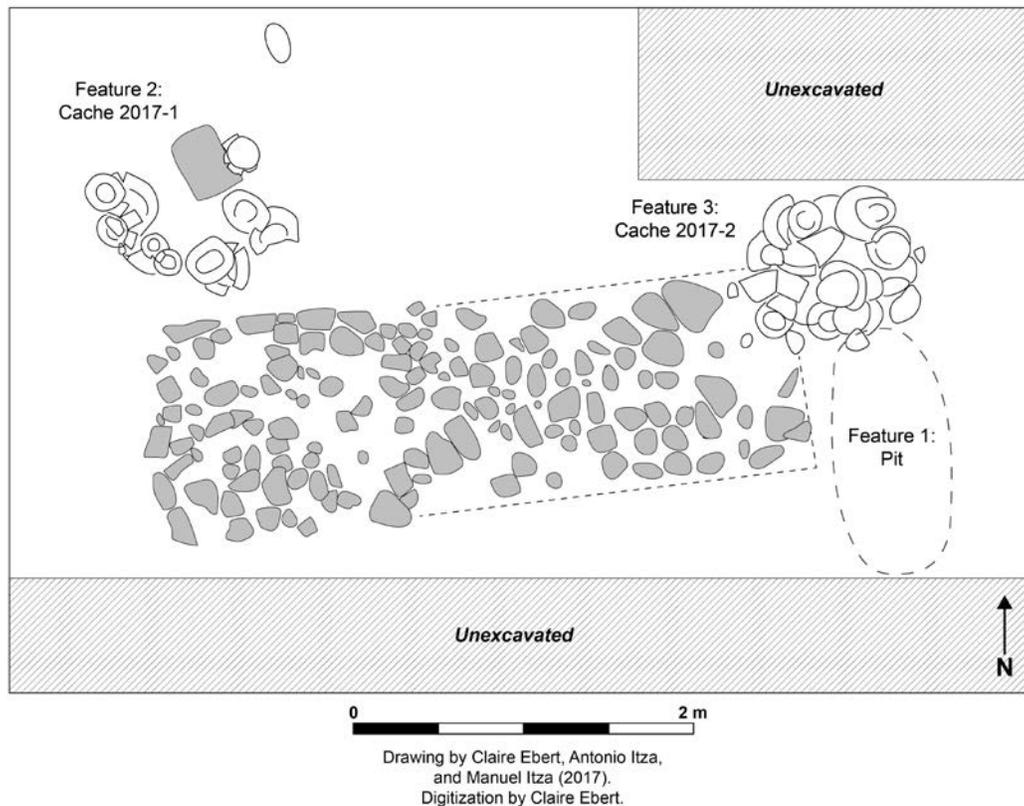
While few artifacts were recovered between Floors 3 and 6 in EU PLB-2017-1A, high frequencies of chert flakes were found below Floor 2 ( $n=214$ ) and Floor 3 ( $n=55$ ) in EU PLB-2017-1B. In this same area of the unit, Floor 5 had been intentionally cut and excavated into a pit (Feature 1) measuring approximately 1.4x0.5 m (Figure 5). Excavation of Feature 1 recovered ceramics, chert flakes, freshwater shell, jade bead fragments, modified and unmodified marine shell, and two figurine fragments. While no artifacts are believed to be *in situ*, based on the associated contexts of the pit, it is hypothesized the feature may have functioned as a cache or, based on its size and orientation, possibly cyst for a human burial. The northern end of the pit was associated with Feature 3 (Cache 2017-2, described below), additionally suggesting a ceremonial function for this feature.



**Figure 5:** Pit cut into Floor 5 (EU PLB-2017-1B, Feature 1) viewed from the south.

### Feature 2: Cache 2017-1

Excavations below Floor 6 uncovered two caches aligned with the centerline of Structure B1 (Figure 6). Cache 2017-1 was documented in EU PLB-2017-1A, and consisted of a total of 13 reconstructible and partial ceramic vessels, many of which were originally placed in lip-to-lip positions (Figure 7). While most of the vessels were unslipped, at least three had remnants of a thin red slip. The cache was placed directly on bedrock at the north western corner of a small platform (3.75x1.5 m) formed out of single course of medium-sized cobbles. Lip-to-lip vessel caches, in particular, became common beginning in the Late Preclassic across the Maya lowlands (e.g., Cahal Pech, Awe et al. 2014; Caracol, Chase and Chase 1995:95–97; Ceibal, Inomata et al. 2017; Tikal, Laporte and Fialko 1987; Punta de Chimino, Bachand 2006; Uaxactun, Ricketson and Ricketson 1937:49–68). While the form and paste of the vessels from Cache 2017-1 and Cache 2017-2 possess similarities to Hermitage phase (Early Classic) Hewlett Bank Unslipped pottery from Barton Ramie (Gifford 1976: 190-191; Fig. 108), it should be noted that similar slipped and unslipped bowls appear in lip-to-lip caches from the Preclassic through Late Classic periods in western Belize (Figure 8; Awe et al. 2014: 197; Chase and Chase 2006: 49-51). The matrix associated with Cache 2017-1 (and Cache 2017-2) vessels contained diagnostic Kanluk phase (900-300 BC) ceramics, including Savana Orange and Reforma Incised types, possibly suggesting a Middle Preclassic date for the placement of this feature. Four samples of charcoal were collected for radiocarbon dating, which will help to confirm this temporal assignment.



**Figure 6:** Plan map of EU PLB-2017-1(B) showing location of Features 1, 2, and 3, and associated cobble platform.

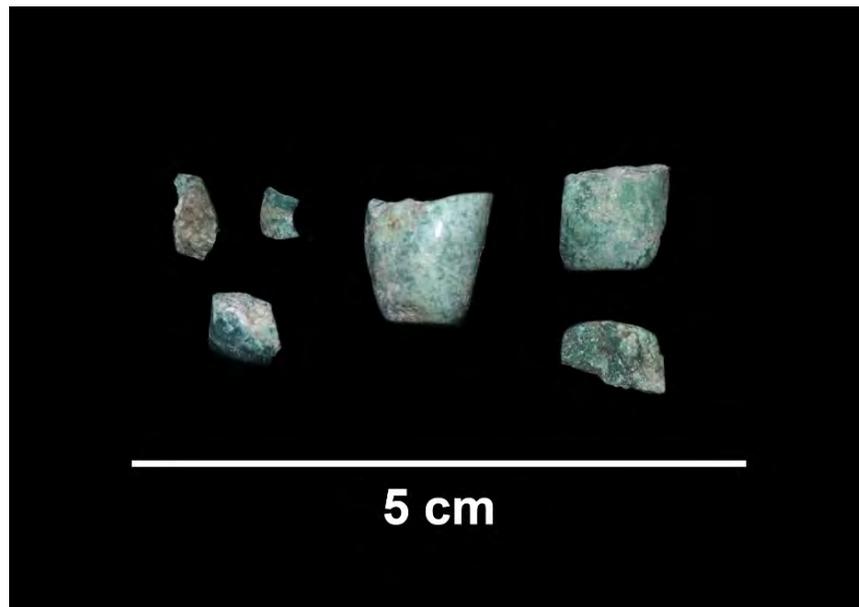


**Figure 7:** Cache 2017-1 (EU PLB-2017-1B, Feature 2) containing 13 reconstructible and partial vessels on the northwest corner of cobble platform, viewed from the west.



**Figure 8:** Photograph of Vessel #14 from Cache 2017-2, providing an example of typical lip-to-lip vessel recovered from Cache 2017-1 and Cache 2017-2 (Reconstruction by Joe Reavis).

Other artifacts associated with Cache 2017-1 include one figurine body (right torso, arm, and leg) made from a Savana Orange paste. High frequencies of freshwater shell ( $n=684$  jute, i.e., *Pachilyus* sp.) and marine shell fragments ( $n=104$ ) were also recovered from throughout the surrounding matrix. Several long bone fragments from the cache were identified as human by BVAR Project osteologist Kirsten Green (personal communication, 2017). Several polished jade bead fragments were also placed on top of the cache (Figure 9). Because the cached vessels were placed directly on top of bedrock, and subsequently covered with fill before the construction of Floor 6, it is difficult to determine if all of these artifacts were placed in this area as part of the cache. Based on the paucity of many of these artifact classes in later strata in this part of Plaza B, it is likely that most were intentionally placed contemporaneous with the placement of the cache.



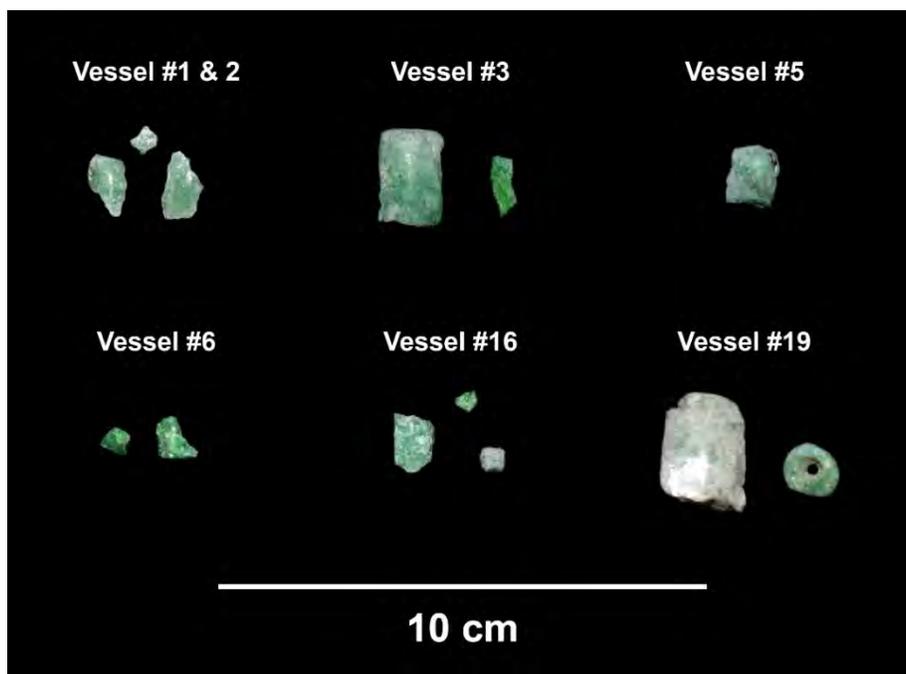
**Figure 9:** Jade bead fragments from Cache 2017-1.

### *Feature 3: Cache 2017-2*

Cache 2017-2 was documented in the sub-unit EU PLB-2017-1B. While this feature is associated with the pit cut into Floor 5 (Feature 1), located just to the north of Cache 2017-2, the cache itself was found under a sealed portion of Floor 5. The cache was composed of a total of 26 reconstructible and partial vessels, located on the northeast corner of the cobble platform (Figure 10). Similar to Cache 2017-1, many of the vessels were unslipped bowls and were placed lip-to-lip placed in two layers, and placed directly on top of bedrock. Two small Savana Orange (v. Savana) bowls were also part of the cache. Small fragments of jade beads and one complete bead were recovered from inside at least 6 of the lip-to-lip bowls, and from surrounding matrix (Figure 11).



**Figure 10:** Cache 2017-2 (Feature 3, EU PLB-2017-1), containing 26 reconstructible and partial vessels on the northeast corner of cobble platform, viewed from the north.



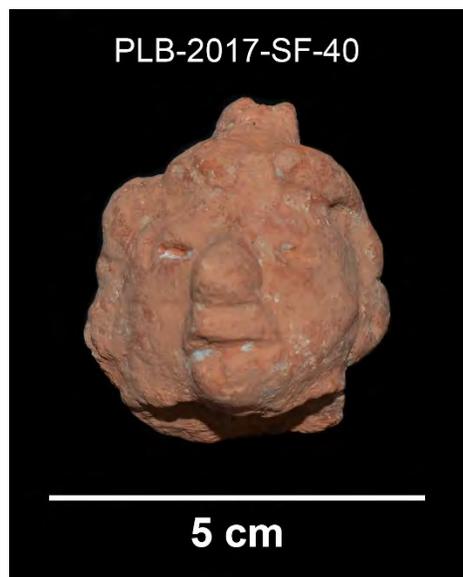
**Figure 11:** Jade beads and fragments from inside Cache 2017-2 vessels.

Other artifacts associated with the cache include a marine shell pendant, one medial fragment of an obsidian blade, freshwater shell, and fragments of unmodified marine shell. A total of 35 small chert microdrills were also recovered from the cache (Figure 12). Most of the microdrills consisted of burin spalls modified into uni-tipped or bi-tipped tools, many of which exhibit evidence for retouch (Hohmann 2002: 133; Peniche May 2016: 267). Microdrills created from burin spalls have been previously reported from Middle Preclassic contexts both within the Cahal Pech site core and peripheral settlement groups (e.g., Cas Pek and Tolok Groups) and have been identified as part of the toolkit used to produce shell crafts such as beads (Hohmann 2002; Horn 2015; Powis 1996; Peniche May 2016). Other examples of small chert artifacts include possible blade segments that were reduced using bipolar splitting, which breaks blade segments lengthwise, creating two pieces using bipolar force. Splitting removes the lateral facets of the blade and creates a flat surface and narrow cutting edges (Clark 1981), which may have been used to pry open shells. Similar bipolar percussion techniques have been documented in Early and Middle Formative lithic assemblages from Oaxaca, Guatemala, and along the Pacific Coast of Guerrero (Clark and Lee 1984; Ebert et al. 2014; Nance and Kirk 1991; Joyce et al. 1995).



**Figure 12:** Chert microdrills and bipolar artifacts from Cache 2017-2.

Excavations in EU PLB-2017-1B bisected the cobble platform associated with the caches. The platform was built directly on top of bedrock, which was located at a relatively shallow depth (~1m) below the modern plaza surface. While no evidence for plastering was present, the construction material for the platform, composed of tightly packed rounded and angular limestone cobbles, is similar to other small buildings previously encountered in Plaza B (Cheetham 1996; Garber et al. 2007, 2009:11; Horn 2015: 193-195, 263; Peniche May 2016: 191). This style of architecture, often associated with symbolic deposits at Cahal Pech, has been dated to the Kanluk ceramic phase (900-300 BC) based on ceramic associations (Horn 2015: 194; Peniche May 2016: 191) and AMS <sup>14</sup>C dates on faunal bone (Ebert 2017; Ebert et al. 2017). Preliminary ceramic analyses from the fill below the platform in EU PLB-2017-1B recovered both Kanluk and Cunil phase types in a thin (~15 cm thick) strata below the platform, tentatively placing the construction in the early Middle Preclassic period. Two charcoal samples for radiocarbon dating, including one paired charcoal-shell sample, were collected from directly on top of bedrock to date the initial construction of the cobble platform. Two figurine fragments including one head (Savana Orange paste; Figure 13) and one unidentified appendage (Jocote Orange-Brown paste) were recovered from the fill below the platform.



**Figure 13:** Figurine head from fill below cobble platform in EU PLB-2017-1.

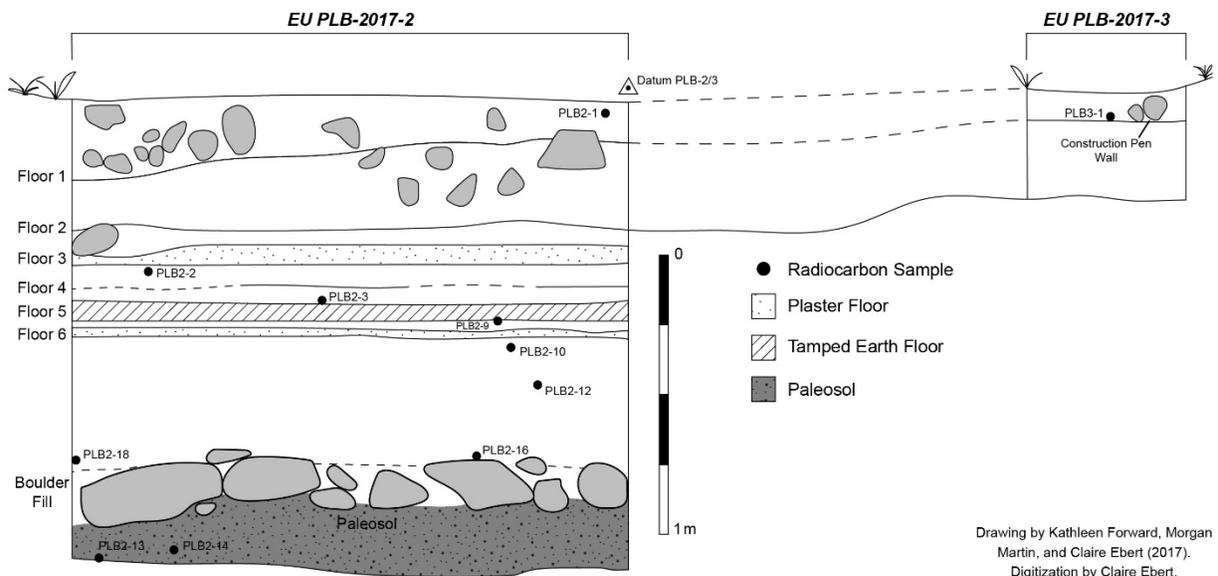
### **EU PLB-2017-2 and PLB-2017-3**

EU-PLB-2017-2 was a 4x1.5m trench placed on the south side of Plaza B, in front of Structure B5. Previous exploration in this area of the plaza by Nancy Peniche encountered a total of eight floors in addition to a rectangular platform measuring approximately 9.5x2.5 m (Plaza B/11<sup>th</sup>-B) constructed out of three courses of cut limestone blocks (Peniche May, 2014b, 2016: 180-184). The building may have served a residence for a high-status family, and is also associated with a keyhole-shaped round structure. Diagnostic ceramics associated with both buildings included Kanluk types (Jocote Orange-Brown and Savana Orange) and a small amount of Cunil sherds (Cocoyol Cream, Uck Red, and Sikiya Unslipped). Radiocarbon dating of the sequence

estimates the construction around 600 BC (Ebert 2017; Ebert et al. 2017: 223-224), however, suggesting that earlier ceramic types are likely derived from fill used for construction of the buildings.

The 2017 excavations were aligned parallel to Peniche May’s excavations (Unit CHP-PB-PU-39), extending an additional 4 m into the plaza. The goal of the excavations was to document the presence of additional architecture in the southern part of Plaza B and to recover additional material for AMS <sup>14</sup>C dating. Because previous excavations did not reach bedrock, a secondary goal was to expose the complete construction sequence for this part of the plaza. A total of 6 floors were encountered during the excavation of EU-PLB-2017-2, though no masonry architecture was documented (Figure 14).

Floors 1 and 2 were both highly eroded. Floor 1 was a thin plaster floor located approximately 10-20 cm below the modern ground surface and was only visible in the profile. While ceramic associations likely place the construction of Floor 1 during the Late Classic period, the Spanish Lookout ceramic phase, Preclassic types were also recovered from this context (e.g., Savana Orange, Sierra Red). The mixing of cultural materials and poor preservation of the floor is likely related to heavy foot traffic at Cahal Pech over the past 30 years. Floor 2 was preserved only in the western portion of EU-PLB-2017-2. Excavations exposed a low stone alignment placed on top of Floor 2 running east-to-west. An additional unit (EU PLB-2017-3) measuring 1.5x3.5 m was placed perpendicular to the west EU-PLB-2017-2 to expose the alignment, which was also partially visible on the modern ground surface (Figure 15). Additional excavations in Plaza B by AFAR (see Guenter et al., Chapter 2) exposed similar stone alignments, which likely functioned as construction pens or task units used to hold fill during the raising of the Plaza B floor in the Late Classic period (Jaime Awe, personal communication 2017).



**Figure 14:** West profiles of EU-PLB-2017-2 and EU-PLB-2017-3.

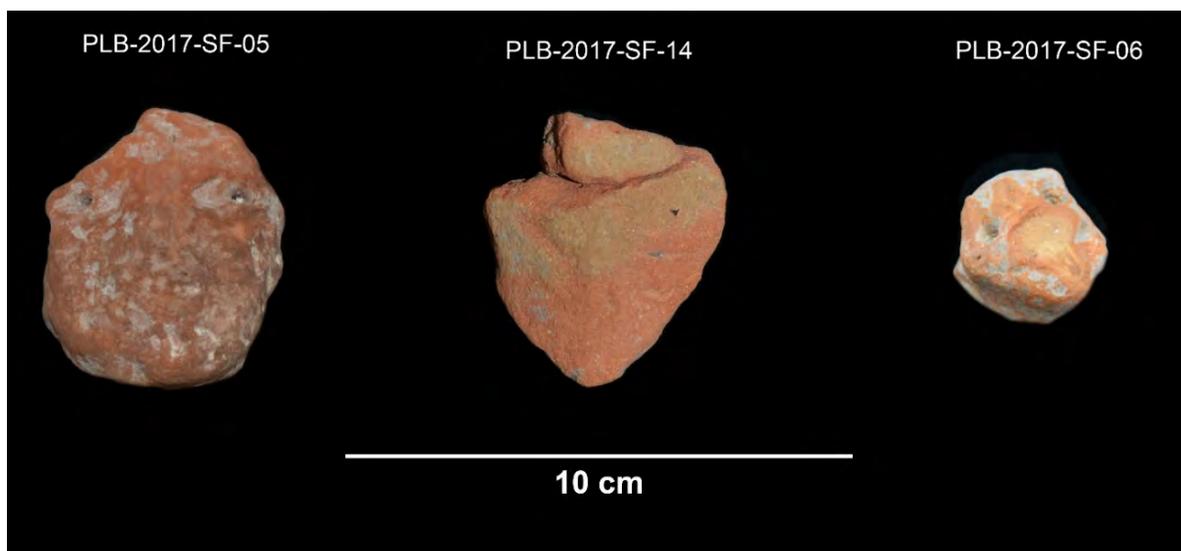


**Figure 15:** Construction pen exposed in EU PLB-2017-3.

Floor 3 through Floor 6 were likely constructed during the Middle and Late Preclassic periods based on ceramic associations. Floor 3 was a 3-5cm thick plaster floor and corresponds to Floor 5 documented in Peniche May's (2016) excavations. One figurine head was recovered from below Floor 3 (PLB-2017-SF-05; Figure 16). Floor 4 was documented in EU-PLB-2017-2, this was a very thin plaster floor that was only preserved in the west part of the unit. Excavation of fill between Floors 3 and 4 encountered very little cultural material, though small amounts of ceramics, chert, and freshwater and marine shell were recovered from these contexts. Floor 5 was a thick, compact tamped earth floor. Below this floor, higher frequencies of artifacts, including *jute* and faunal remains were recovered. Ceramics from this context include primarily Kanuluk phase types including Savana Orange and Jocote Orange-Brown, though lower frequencies of Xakal phase ceramics, including Sierra Red sherds, were also recorded. Floor 6 was a relatively well preserved plaster floor, likely constructed sometime during the Middle Preclassic period.

Evidence for Early Preclassic activity was present in contexts below Floor 6. The fill below the floor consisted of a dark compact clay containing small fragments of ceramics, many of which date to the Middle Preclassic Kanuluk ceramic phase, including Savana Orange (v. Savana and Rejolla), Reforma Incised (v. Reforma), Joventud Red, Jocote Orange-Brown, and Sayab Daub

Striated. The consistency of the matrix was similar to paleosol strata encountered elsewhere at Cahal Pech, both within the settlement and site core that has been radiocarbon dated to the end of the Middle Preclassic period (Ebert 2017; Ebert et al. 2016). In this case, the clay composing this level was likely removed from another location and placed as fill in order to level out the plaza prior to construction. The upper portion of this strata also contained higher densities of freshwater ( $n=684$ ) and marine shell ( $n=104$ ) artifacts, in addition to slate and greenstone. Two figurine fragments were also recovered from the fill below Floor 6 (PLB-2017-SF-06 and SF-14; see Figure 16). Cunil ceramics began to appear at the base of the level along with small chert flakes and a total of 30 chert microdrills and bipolar chert blade segments (Figure 17).

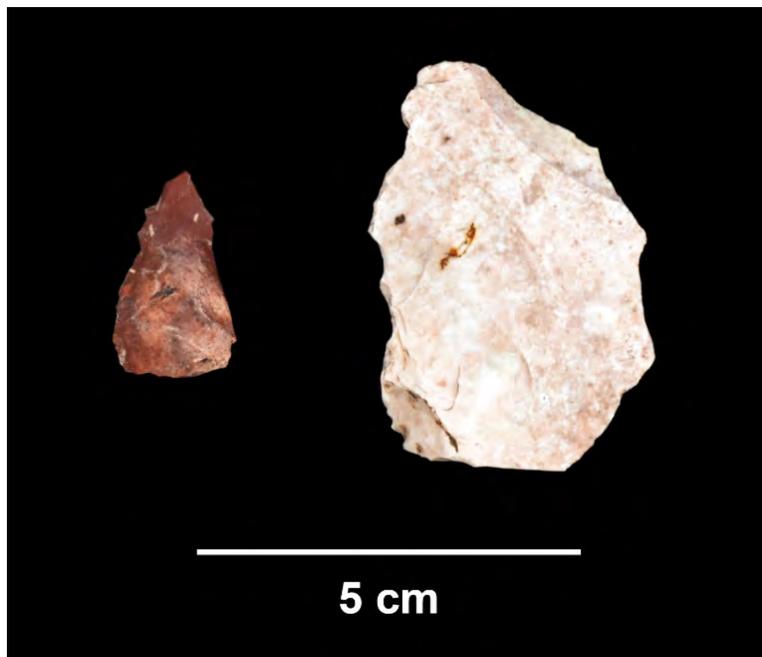


**Figure 16:** Figurine fragments from EU PLB-2017-2.

Approximately 70 cm below Floor 6, excavations encountered a layer of fill consisting of very large, rough limestone boulders measuring ~60-80 cm in diameter surrounded by dense black clay. While few artifacts (only 30 freshwater shell and 48 chert flakes) were recovered from the boulder fill, higher frequencies of Cunil sherds were documented in this context compared to superimposing strata. The placement of the boulder fill likely functioned to level Plaza B prior to habitation and construction of buildings at the site. The presence of predominately Cunil phase ceramics (Uck Red, Cocoyol Cream, Sikiya) suggests that this event occurred at least by the end of the Early Preclassic period. Beneath the boulder fill, a paleosol consisting of black clay was encountered. The paleosol also contained few artifacts, though low frequencies of Cunil sherds, freshwater shell, and chert were present. Two of the chert artifacts recovered appear to be formal tools. Differing in form and function from the Middle Preclassic microdrills, these artifacts appear to be formal tools, including a possible scraper, produced bifacial thinning of larger chert flakes (Figure 18). Similar flaked tools have been reported from Archaic period contexts across Belize (Lohse et al. 2006), suggesting that the paleosol level in EU-PLB-2017-2 may represent a possible transitional Archaic-to-Preclassic living surface. An abundance of charcoal was also presented throughout this level. Two samples were recovered for AMS  $^{14}\text{C}$  dating, which will provide a temporal assignment for this early context.



**Figure 17:** Chert microdrills and bipolar chert blades from below Floor 6 (EU PLB-2017-2).



**Figure 18:** Possible Archaic period flaked tools from paleosol (EU PLB-2017-2).

## EU PLB-2017-16

EU PLB-2017-16 was a 5x5 m unit placed to run east-to-west perpendicularly to the centerline of the Structure A2 stairway on the west side of Plaza B. A subsequent 3x2 m extension running north-to-south was placed on the southern side of the unit to expose architectural features encountered during excavations (see below). The unit was placed 5 m east of the basal stair of Structure A2 in order to avoid previous excavations in this location. In 2006, Garber and colleagues placed a 2x2 m unit (Op. 4a) approximately 9.4 m east of the Structure A2 stairway as part of the Belize Valley Archaeology Project (BVAP) investigations in Plaza B (Garber et al. 2007: 10). This unit was excavated to locate the corner of a Middle Preclassic platform (Platform B), however because the stratigraphy was different from other nearby plaza units, Garber and colleagues suggested that it was possible that the Op. 4a was actually placed inside a structure. Some of the lowest strata in this unit also encountered the summit of a cobble platform dating to the Middle Preclassic period, though the dimensions and shape could not be determined by the limited exposure (Garber et al. 2007: 12). Excavations also recovered Early Preclassic Cunil ceramics above bedrock.

The goal of the 2017 excavations at EU PLB-2017-16 was to determine if previous units were placed within architecture, identify these possible architectural features, and document the presence of possible centerline caches in the western part of Plaza B. The clearing of humus revealed Floor 1, a poorly preserved floor approximately 10 cm below modern plaza surface, associated with Late and Terminal Classic period ceramic materials (Spanish Lookout phase) and two figurine heads (Figure 19), one of which is typical of Terminal Classic style (PLB-2017-SF-60; see DeLance 2016). The fill below Floor 1 was highly compact, with some modern artifacts also recovered, suggesting that this area of Plaza B was subject to high levels of modern disturbance.



**Figure 19:** Figurine fragment from EU PLB-2017-16.



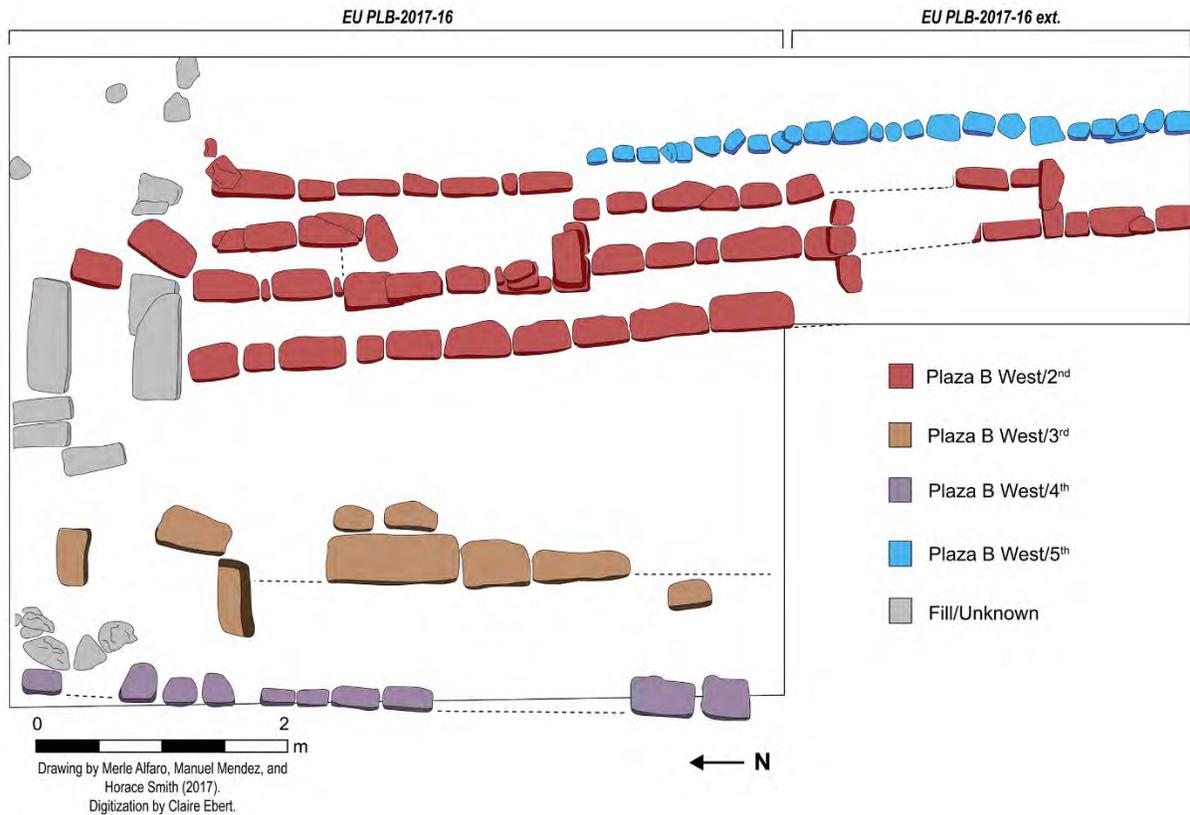
**Figure 20:** Photograph of EU-PLB-2017-16 showing exposed architecture of Plaza B West, viewed from the north.

Excavations of levels below Floor 1 revealed a complicated sequence of construction in the western side of Plaza B. Figures 20 and 21 show exposed architecture from all contiguous units. At least five major construction phases were identified:

**Plaza B West/1<sup>st</sup>:** The first phase of construction in Plaza B West consisted of a soil layer placed on top of a paleosol and bedrock. These strata were exposed in a smaller 1.3x1.5 m sub-unit, but it is likely the similar contexts are present across the western edge of Plaza B. Very few artifacts were found within the paleosol matrix, and perhaps those present have been vertically displaced from superseding levels through time. The soil above the paleosol contained high frequencies of diagnostic Middle Preclassic (Kanluk ceramic phase) sherds, in addition to faunal remains typical of Middle Preclassic contexts both in the Cahal Pech site core and peripheral settlement including parrot fish mandibles, and dog teeth (Powis et al. 1999; Welker 2015).

**Plaza B West/2<sup>nd</sup>:** During the second construction phase, a large masonry platform was built on the west side of Plaza B. Excavations exposed the western facade of the structure, which was offset from Structure A2 and was oriented  $\sim 10^\circ$  west of north. The platform was

constructed of large cut limestone blocks measuring between 40 cm and 80 cm in length. A total of four steps were present running the entire length of the exposed portion of structure (~8m), and the presence of a stair block suggests that excavations exposed the centerline of the building. Excavations did not encounter the corners of the building, however, and length of the western structure façade is currently unknown. The construction of Plaza B West/2<sup>nd</sup> is dated by the presence of transitional Cunil/Kanluk (Uck Red and Cocoyol Cream) and Kanluk ceramic materials (Savana Orange, Reforma Incised, and Jocote Orange-Brown; Awe 1992; Gifford 1976; Sullivan and Awe 2013). Subsequently, Floor 4 which was a thick (~5-7 cm) plaster floor, was placed to the west of the structure and abutted the building in the middle of its basal step. Based on current excavation data, it is likely that Floor 4 represents a remodeling or resurfacing phase of Plaza B. It appears, however that, the platform was still in use at this time because it was not completely covered over.



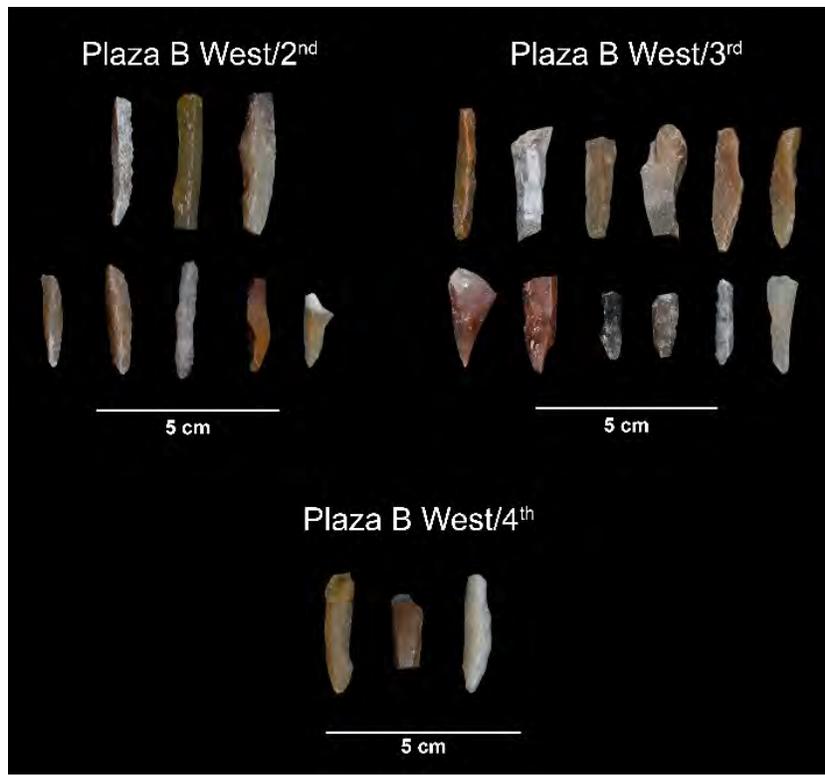
**Figure 21:** Plan map of EU PLB-2017-16 showing Plaza B West construction phases discussed in text.

**Plaza B West/3<sup>rd</sup>:** During the third phase of construction, high volumes of fill were placed to cover the Plaza B West platform. The fill included very large (>1m long) cut stone blocks (shown in gray in Figure 19), which displaced the steps of the building in the northern portion of the unit. The fill was then capped by Floor 3, a relatively thick plaster floor (~6-8 cm) that was placed level to the third step of the platform and the central stair block. The fill below Floor 3 contained Kanluk phase ceramics (Savana Orange and Reforma Incised),

freshwater shell, chert artifacts including microdrills, and marine shell debitage likely from shell bead production. Excavations also documented a wall sitting on top of Floor 3 composed of a single course of limestone blocks along the western edge of the unit. While this may represent a substantial expansion on the platform, the 2017 excavations only exposed a limited portion of the wall.

**Plaza B West/4<sup>th</sup>:** The penultimate construction phase saw a second expansion of the Plaza B West platform. At this time, the entire original structure (Plaza B West/2<sup>nd</sup>) was covered by fill, and then capped by plaster Floor 2, which was highly eroded across the entire unit. Facing stones located at the west of the unit correspond to this phase of the building. The fill below Floor 2 contained diagnostic Kanluk phase ceramics, in addition to chert microdrills ( $n=22$ ; Figure 22) and marine shell debitage. One figurine head (PLB-2017-SF-38; see Figure 19) was also recovered from this context. The ash temper of this artifact is similar to Cunil or transitional Cunil/Kanluk ceramic types (i.e., Uck Red), perhaps indicating placement of the fill during the Middle Preclassic period.

**Plaza B West/5<sup>th</sup>:** The terminal construction phase on the west side of Plaza B consisted of the placement of a low wall on top of Floor 2, located approximately 30 cm below the modern plaza surface. Differing from previous architectural styles, the wall was built of small limestone blocks more typical of the Late and Terminal Classic period (Awe 2012). Large amounts of Late to Terminal Classic ceramic material (Belize Red plates, Cayo Unslipped jars, Alexanders Unslipped jars) were also collected from this level.

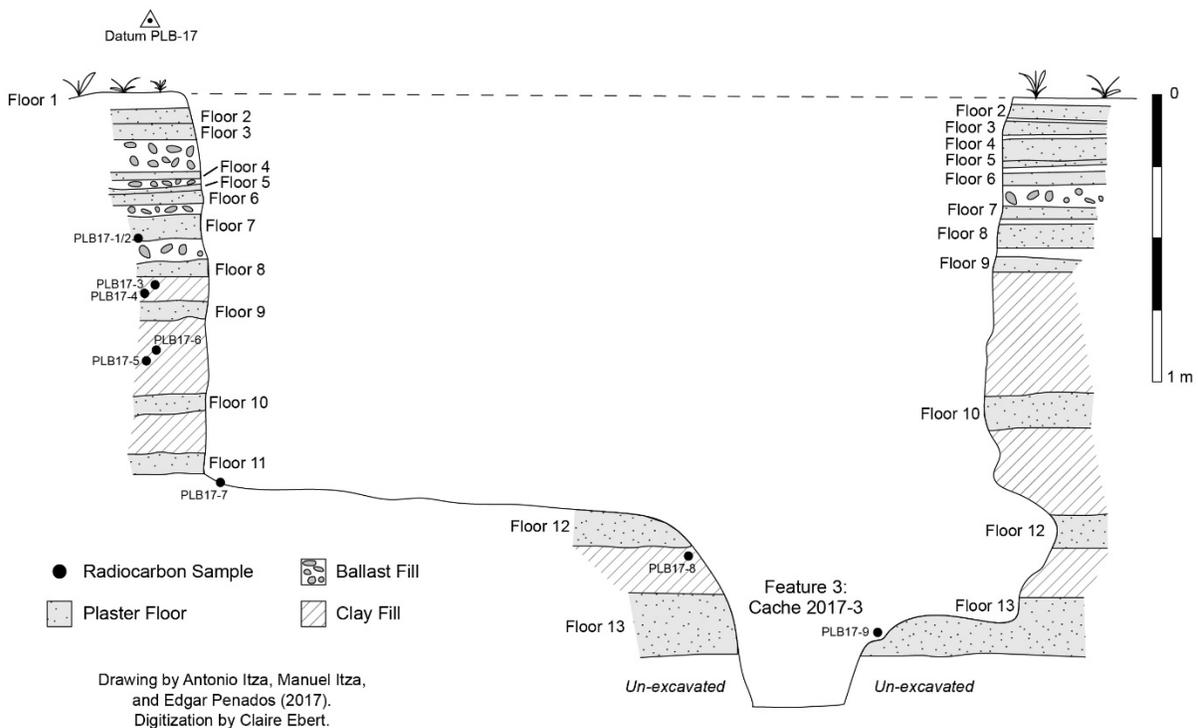


**Figure 22:** Chert microdrills and bipolar artifacts from Plaza B West. Corresponding construction phases are indicated on figure.

## EU PLB-2017-17

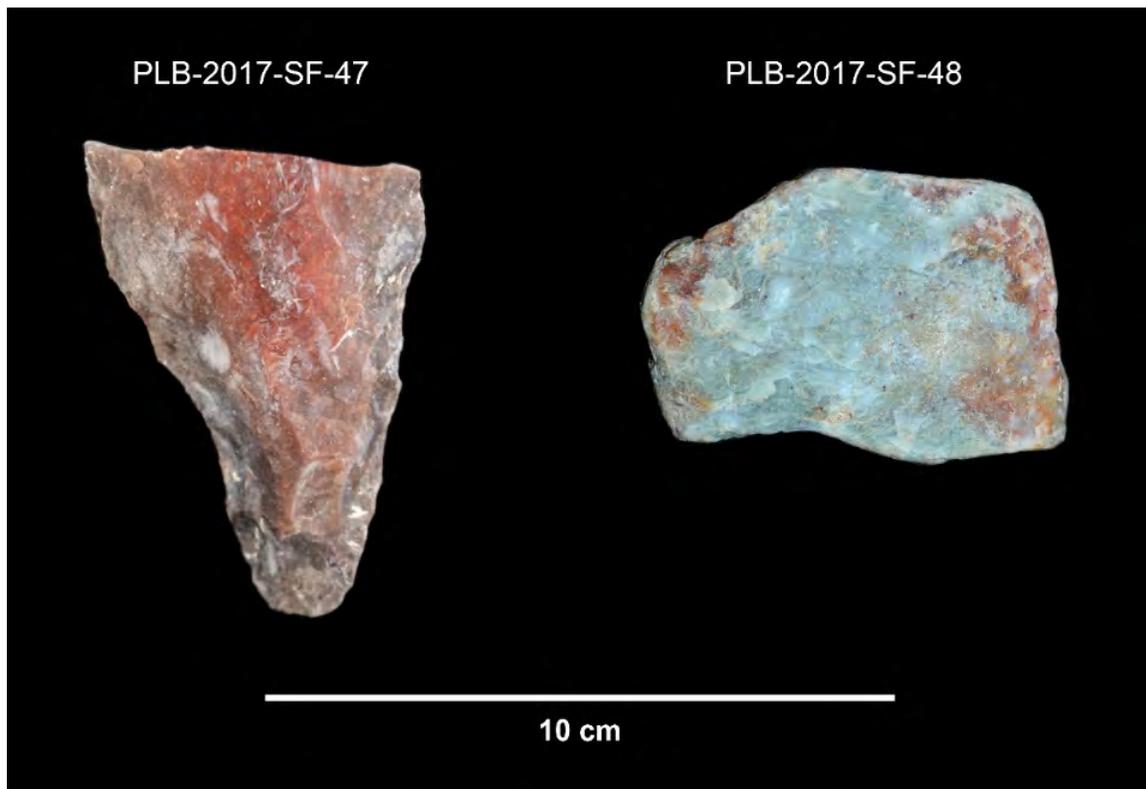
The southern façade of Structure B6, located on the north side of Plaza B, was previously excavated and consolidated by AFAR and the BVAR Project during the 2013 summer field season (Lopez-Johnson et al. 2014). These excavations removed the humus layer from in front of the structure and exposed the terminal plaza floor (Floor 1), the basal molding of the building, and an outset staircase dating to the Late to Terminal Classic period. EU PLB-2017-17 was a 2x3 m test unit placed perpendicularly to centerline of the Structure B6 outset stairway, with the goal of understanding the articulation between plaza floors and the building. A total of 13 plaster floors were recorded in this part of the plaza, many of which were interspersed by a series of fill episodes interspersed with construction floors. No architectural features were documented in this unit.

Excavation of Floors 1 through 3 exposed Classic period components in front of Structure B6. Floor 1 was previously exposed by the joint 2013 BVAR Project and AFAR excavations (Figure 23). Approximately 5-8 cm below Floor 1 (the modern plaza surface), Floors 2 and 3 were exposed. Both were plaster floors, and Floor 2 was constructed directly on top of Floor 3. While few artifacts were associated with the floors, diagnostic ceramics place construction during the Spanish Lookout phase (e.g., Belize Red, Cayo Unslipped). Excavations below Floor 3 recovered higher frequencies of artifacts, though obsidian ( $n=8$  blade fragments) was recovered in relatively high frequencies. The fill below this floor was composed of ballast and ceramics were dominated by Kanluk phase types including Savana Orange dishes and Jocote Orange-Brown jars, possibly indicating a hiatus in construction activity in this part of Plaza B during the Late Preclassic and Early Classic periods.



**Figure 23:** East profile of EU-PLB-2017-17.

Based on preliminary ceramic analyses, Floors 4 through 8 likely date to at least the Middle Preclassic period. All floors were constructed of plaster with ballast fill placed between them. Approximately 30 cm below the modern plaza surface, excavations encountered Floor 4, which was relatively well preserved and thick (~4cm). Higher frequencies of chert, slate, and freshwater shell were recovered from the fill below Floor 4. A large concentration of obsidian flakes ( $n=69$ ) was also recovered from this context. Most flakes were small (~1-2 cm in length). Floor 5, located approximately 36 cm below the modern plaza surface, was constructed directly on top of Floor 6. Artifact quantities associated with these levels were relatively low. Floor 7 was encountered approximately 60 cm below the modern plaza surface. The floor was constructed of at least four construction floors and then capped by plaster. The lower most floor composed of rounded and angular limestone cobbles, with subsequently placed floors constructed out of plaster. While the cobble construction floor is similar in form to other Preclassic period cobble floors documented elsewhere across Plaza B, a lack of associated artifacts suggest that this particular floor did not function as an occupational surface. Below Floor 7, excavations encountered a layer of fill consisting of very small, rough cobbles measuring ~10-15 cm in diameter. The upper portion of this strata contained higher densities of ceramic and chert artifacts (primarily flakes), and freshwater and marine shell artifacts. A broken biface made out of red chert (PLB-2017-SF-47) and polished greenstone plaque measuring approximately 6x4.5 cm<sup>2</sup> (PLB-2017-SF-48) were also recovered (Figure 24).



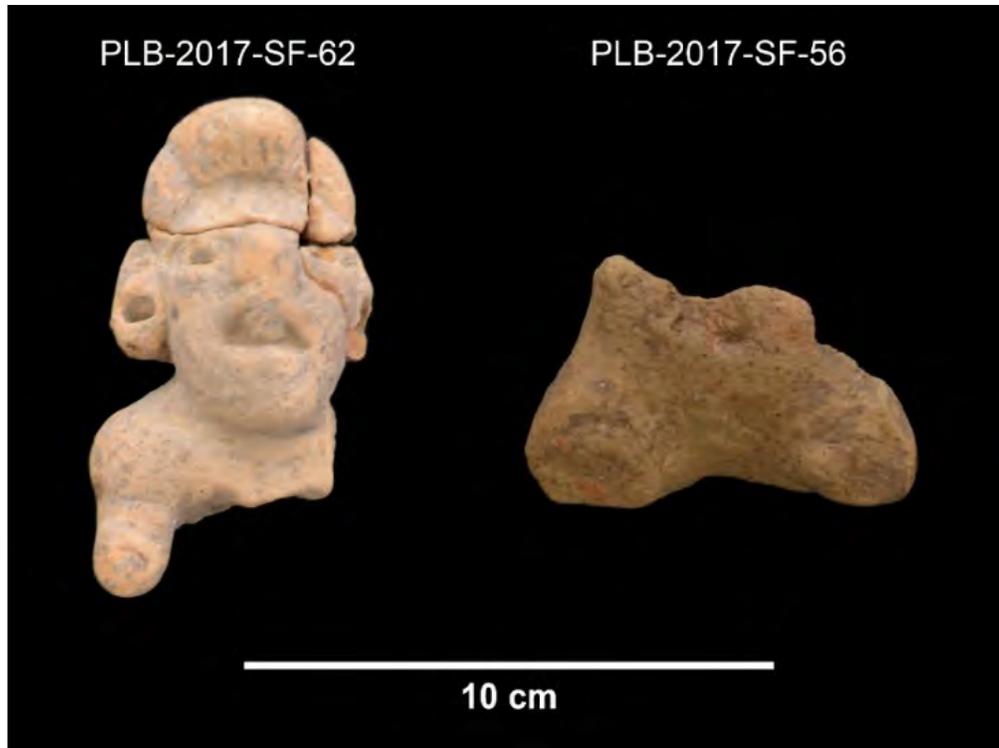
**Figure 24:** Lithic special finds from below Floor 7.

Excavations of Floors 8 through 13 documented a series of thicker plaster floors interspersed by compact clay fills. The shift in architectural style from subsequent constriction phases (thinner plaster floors with ballast fill) was also accompanied by the appearance of small quantities of Cunil ceramic materials (primarily Uck Red sherds). While Middle Preclassic Kanluk phase materials (Savana Orange and Reforma Incised dishes, Jocote Orange-Brown jars) dominate the ceramic assemblage, low frequencies of Early Preclassic ceramics. An increase in figurine fragments was also documented. Higher concentrations of figurine fragments from Middle Preclassic contexts has been documented throughout the Cahal Pech site core (Awe 1992; Peniche May 2016; see also DeLance 2016), perhaps representing locations that played prominent roles in ceremonies or ritual activities. Taken together, current evidence suggests that Floors 8 through 13 were constructed during the beginning of the Middle Preclassic period. Floor 8 was located approximately 70 cm below the modern plaza surface. Artifacts associated with this context include high frequencies of Kanluk phase ceramics, chert, slate, freshwater shell, and fragments of unmodified marine shell. One possible figurine fragment was also recovered from the fill below Floor 8 (PLB-2017-SF-49).

#### *Feature 1: Ceramic Deposit*

Floor 9 was a 6 cm thick plaster floor. Excavations below Floor 9 encountered Feature 1 approximately 90 cm below the modern plaza surface in the southwest corner of the unit. The deposit consisted of three fragmentary Savana Orange (v. Savana) dishes surrounded by freshwater shells (primarily *jute*). Five figurine fragments were also recovered, including two heads, a torso, foot, and an unidentified appendage (Figure 25). High frequencies of charcoal were also present around the deposit, suggesting intentional burning in this part of the unit. The deposit was capped by a construction floor, which was subsequently covered with clay fill prior to the placement of Floor 9. The fill above the construction floor also contained high frequencies of Savana Orange and Reforma Incised sherds.

Two figurine fragments (PLB-2017-SF-53 and SF-54), including a head and arm, as well as a mini-ocarina (PLB-2017-SF-52) were also recovered from the fill immediately above the construction floor (Figure 26). The figurine head has a naturalistic human face, with a topknot above the center of the forehead and an open mouth with teeth. The head also has ear ornaments depicted in the form of earspools. Similar forms have been documented at Structure B4 (Awe 1992; DeLance 2016) from Middle Preclassic contexts. While some figurines were made of an ashy cream paste, similar to Cocoyol Cream ceramics (Cunil phase; Peniche May et al., n.d.), this figurine head also had evidence for red slip, more similar to Uck Red ceramics dating to the Early Preclassic Cunil ceramic phase (Awe 1992: 270). The mini-ocarina was made out of a Savana Orange paste, and resembles a snail. Simple hollow whistles such as this often occur in zoomorphic shapes (Awe 1992: 263; DeLance 2016; Peniche May 2016), similar examples have not been encountered elsewhere at Cahal Pech.



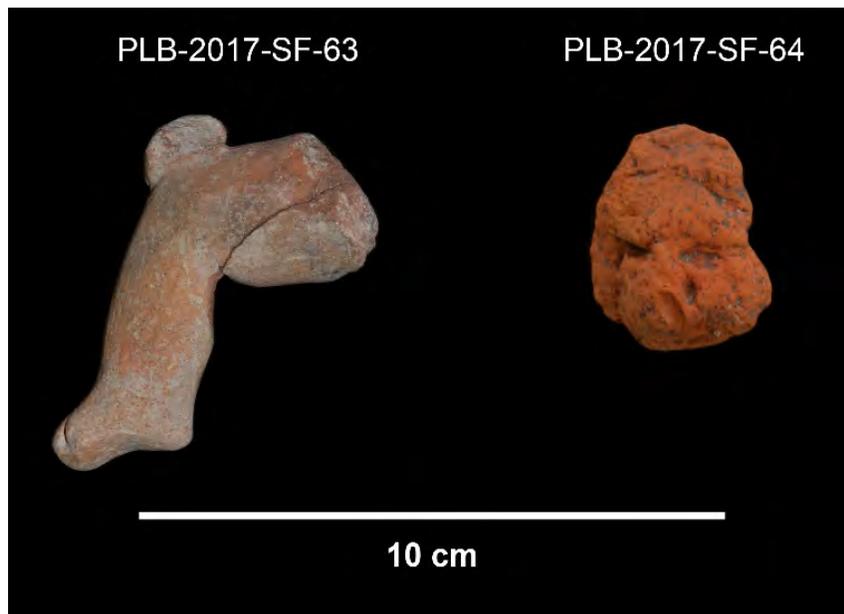
**Figure 25:** Identifiable portions figurine fragments from Ceramic Deposit 1.



**Figure 26:** Figurine fragments and mini-ocarina found on floor above Ceramic Deposit 1.

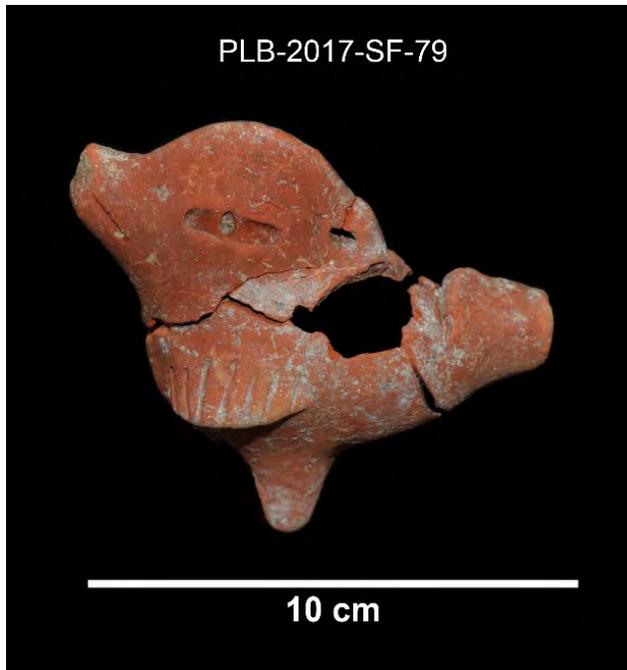
### *Feature 2: Ceramic Deposit*

A second ceramic deposit (Feature 2) was encountered during the excavation of fill between Floors 9 and 10. The deposit was documented on the northern side of the unit, directly on top of Floor 10, a 10 cm thick plaster floor located 100 cm below the ground surface. The deposit was composed of many large Jocote Orange-Brown (v. Jocote) jar sherds including handles, likely from one or two individual vessels. Similar to Feature 1, high frequencies of *jute* and charcoal were also found in associated with the deposit. Two figurine fragments were recovered from the deposit including a figurine head and body portion (Figure 27).

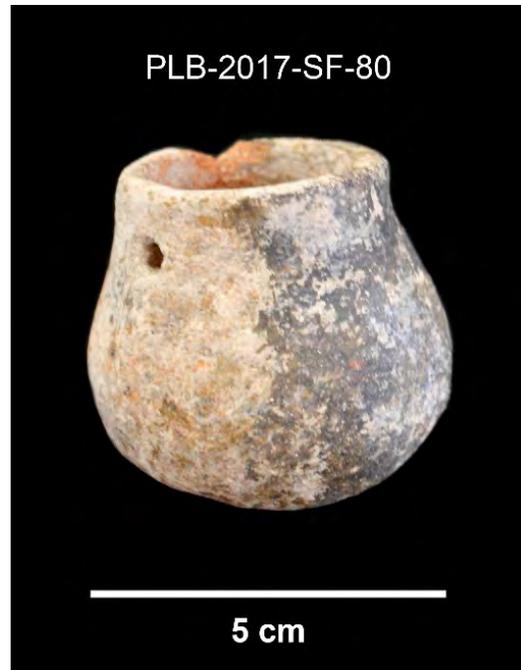


**Figure 27:** Figurine fragments from Ceramic Deposit 2.

Excavations between Floors 10 and 11 recovered additional Middle Preclassic materials including Jocote Orange-Brown jars fragments. Frequencies of freshwater shells also increased within the fill compared to subsequent strata. Other artifacts recovered from this context include a figurine, a ceramic ring, and chert microdrills. The zoomorphic figurine (PLB-2017-SF-75) resembles a monkey with a hollow pot belly, perhaps suggesting that it was part of a musical instrument. Floor 11 was a highly eroded plaster floor, and was best preserved in the northeastern corner of the unit. The fill below the floor consisted of a compact clay matrix containing high frequencies of Kanluk phase ceramics, chert, and freshwater shell (*jute* and clam, *Nephronaias ortmanni*). One large obsidian flake was also recovered from the fill, though no blades were present. Awe and Healy (1994) documented a transition from flaked obsidian to blade technology beginning in the Middle Preclassic. The lack of blades from this context might be suggestive of an early date for the deposit, though additional investigations necessary to evaluate this hypothesis. Other artifacts recovered include part of a figurine torso (PLB-2017-SF-78), a large zoomorphic ocarina in the shape of a bird (Figure 28; PLB-2017-SF-79), and an unslipped mini pot with paste resembling Jocote Orange-Brown (PLB-2017-SF-80; Figure 29).



**Figure 28:** Zoomorphic bird ocarina from below Floor 11.



**Figure 29:** Mini-pot from below Floor 11.

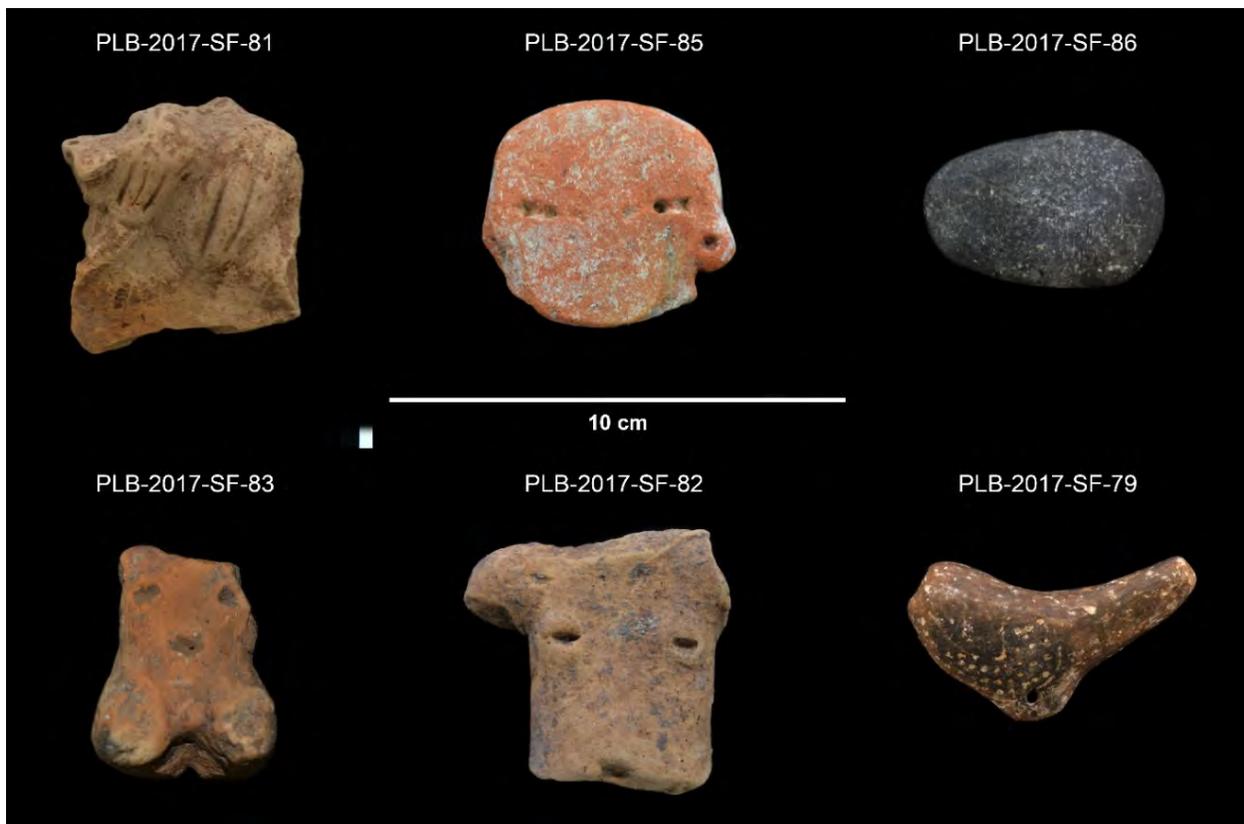


**Figure 30:** Cache 2017-3 (Feature 3, EU PLB-2017-17), containing 15 reconstructible and partial vessels, viewed from the east.

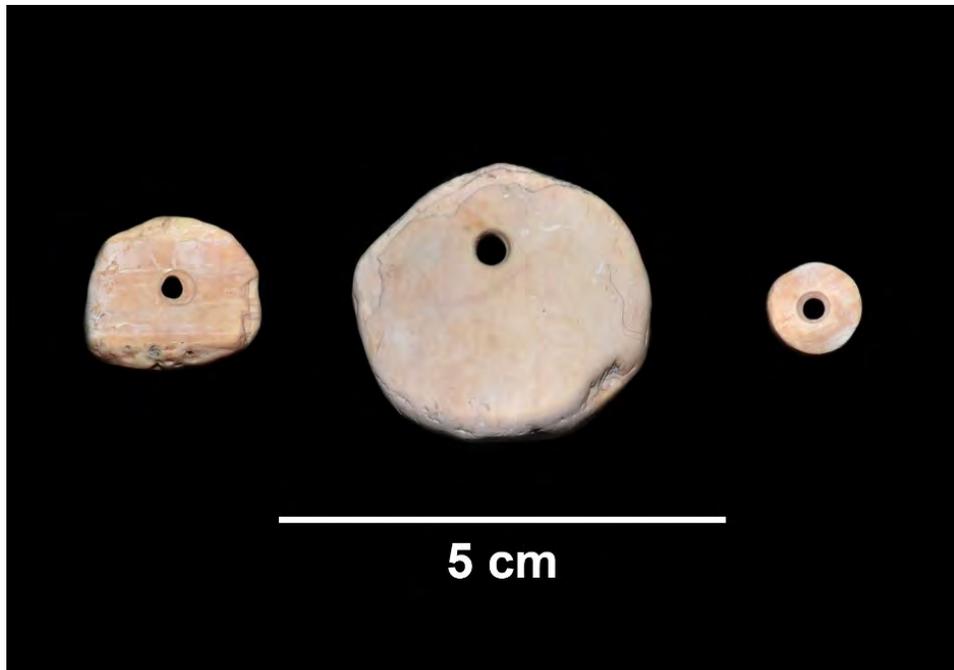
*Feature 3: Cache 2017-3*

Continued excavations through Floors 12 and 13 indicate that both plaster floors had been broken in the western portion of the unit in order to place a Cache 2017-3. The cache was composed of a total of 15 reconstructible and partial vessels including 13 large Jocote Orange-Brown (v. Jocote) jars and two Savana Orange (v. Savana) dishes (Figure 30). The vessels were arranged around two large cut limestone blocks which showed evidence of burning. Additional evidence for intentional burning associated with the cache include high frequencies of charcoal compared to surrounding areas. High frequencies of small, red *jute* were placed directly on top of the cache, which was subsequently capped by clay fill found below Floor 11.

Other ceramic artifacts associated with Cache 2017-3 include several figurine fragments, a zoomorphic ocarina in the shape of a bird, and one piece of ash tempered ceramics with applique design (Figure 31). Several shell artifacts were also associated with the cache including three marine shell beads (Figure 32) and two conch columnelas (Figure 33). One celt was recovered from the cache though its material composition is currently unknown (see Figure 31). Excavations by Inomata and colleagues (2017) at the site of Ceibal, Guatemala have documented similar Middle Preclassic caches containing greenstone celts. The caches, placed along the centerline axis of an E-Group architectural assemblage, may have played an important function in public rites associated with development of the site as an important ceremonial center. Because of time constraints, EU PLB-2017-17 was not excavated after the removal of Cache 2017-3 (Figure 34).



**Figure 31:** Ceramic and lithic objects from Cache 2017-3.



**Figure 32:** Shell beads from Cache 2017-3.



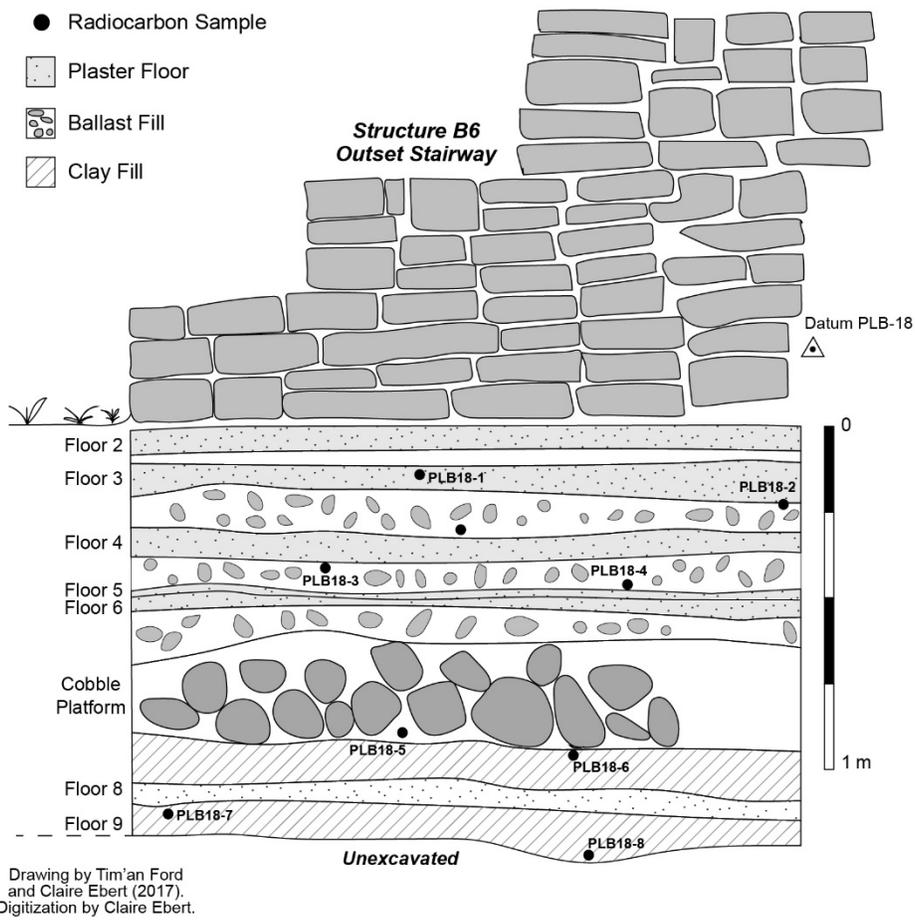
**Figure 33:** Conch columelas from Cache 2017-3.



**Figure 34:** Photograph of cut Floor 11 and 12 after removal of Cache 2017-3, viewed from the north.

### **EU PLB-2017-18**

EU PLB-2017-18 was a 2x2 m unit placed in the northeast corner of the Structure B6 outset stairway. Similar to investigations conducted elsewhere in Plaza B, the goal of excavation was to document plaza construction phases present and recover diagnostic Preclassic period materials. A total of nine floors were documented, and no architecture was encountered (Figure 35). The construction sequence in this unit corresponds closely to EU PLB-2017-17, with the exception of Floor 7. In this unit, a possible northeast corner of a cobbled platform was present at the level of Floor 7, which continued under the Structure B6 stairway (Figure 36). The building was composed of a single course of medium sized rough cobbles measuring between 20 cm and 30 cm in diameter. Associated artifacts include Kanluk phase types (Savana Orange and Reforma Incised) in addition to Xakal phase ceramic materials (two Sierra Red chocolate pot spouts). An ocarina fragment and a figurine fragment were also recovered from the level of the cobble platform. Below the platform, very low frequencies of all artifact classes were recovered, likely because the unit was not aligned with the center of any structure. Because of time constraints, the unit was not excavated below Floor 9.



**Figure 35:** West profile of EU PLB-2017-18.



**Figure 36:** Cobble platform documented in EU PLB-2017-18, viewed from the south.

## DISCUSSION AND CONCLUSIONS

Understanding the settlement and growth of Cahal Pech during Preclassic period is one of several critical research issues addressed by the BVAR Project. Excavations conducted during the 2017 field season in particular had two primary aims: (1) documenting the earliest contexts within the Cahal Pech site core at Plaza B and (2) sampling temporally diagnostic material from stratified contexts to understand the timing and tempo of site development. The results of excavations provide new information about the initial occupation at the site and the role of public architecture in community integration. Evidence for Early Preclassic activity and possible Archaic components were documented in the south and western part of Plaza B. In both these parts of the plazas, excavations encountered dense paleosol strata (and in some cases several layers of paleosol) with Cunil ceramics and possible Archaic lithic materials. Excavations at Cahal Pech in 2018 will be aimed at the recovery of organic material and faunal/human remains from strategically targeted primary, stratified deposits in the site core. A pilot program of high-resolution AMS <sup>14</sup>C dating, in addition to ceramic and zooarchaeological analyses, will be used to detect and temporally define the Archaic and Early Preclassic at Cahal Pech, and to understand the nature of the foraging-to-farming transition in the Belize Valley more broadly.

The 2017 excavations in Plaza B also revealed new evidence for the construction of large public architecture and the role of ceremonies in the development of complexity at Cahal Pech beginning in the Middle Preclassic period. Previous excavations at Cahal Pech provided limited exposures of larger Middle and Late Preclassic public structures within the site's epicenter, including low platforms constructed out of one or two courses of cut limestone blocks (see Horn 2015; Peniche May 2016). The 2017 excavations on the west side of Plaza B exposed the largest and most elaborate Middle Preclassic building in the plaza to date. The Plaza B West structure (Plaza B West/2<sup>nd</sup>) was a multi-tiered platform with at least 4 stairs lining the western central axis of the building. A similar building has been documented in the north side of Plaza A at the site of Pacbitun, located to the south of the Belize Valley. Micheletti and colleagues (2016; see also Micheletti and Powis 2015) have suggested that the large platform, which was also buried beneath superimposing Classic period plaza floors, was possibly a radial pyramid that was essential in ceremonial performance at Pacbitun during the Late Preclassic period. Evidence for burning on top of the building also indicated a symbolic function for the structure.

Based on preliminary excavations results from Cahal Pech, we hypothesize that Plaza B West/2<sup>nd</sup> may have functioned as the western structure of an eastern triadic shrine, sometimes referred to as E-Groups, which was continually modified and expanded throughout the Preclassic period. E-Group architectural assemblages have been documented from Middle Preclassic contexts sites across the Maya lowlands (Aimers and Rice 2006, Doyle 2012, 2017). In the Belize Valley, these Preclassic architectural complexes usually consist of three structures in a linear, north to south, arrangement on the eastern side of large public plazas, with range structures or pyramids sometimes located to the west (Awe et al. 2017). At Cahal Pech, intensive excavations indicate that the first construction phase of Structure B1 occurred during the Late Middle Preclassic period (late facet Kanluk ceramic phase; Awe 1992; Awe et al. 2017). The first construction phases of the northern (Structure B2) and southern (Structure B3) buildings occurred at end of the Middle or beginning of the Late Preclassic (Awe et al. 2017). Continued excavations on the west side of Plaza B are planned for the 2018 BVAR Project field season, the primary goal of which will be to

document the extent of the western façade and to determine the dimensions of Plaza B West/2<sup>nd</sup> and subsequent construction phases. Additional ceramic analysis, radiocarbon dating, and excavations within the platform itself will also be aimed at understanding the timing of construction phases of building.

The 2017 Plaza B investigations also documented three centerline caches, providing additional data on Middle Preclassic ritual deposits at Cahal Pech. Two of the caches exposed in EU PLB-2017-1 (Cache 2017-1 and Cache 2017-2) were placed along the centerline of Structure B1. The caches contained 13 and 26 vessels, respectively, placed lip-to-lip. The number of vessels is likely symbolic, perhaps reflecting a layered view of the Maya cosmos that included a heaven with 13 levels (Schele and Freidel 1990: 67). Both caches are also aligned with the central axis of the Plaza B West platform, perhaps suggesting a relationship with a Middle Preclassic E-Group architectural assemblage at the site. Cache 2017-3 was placed along the central axis of Structure B6, perhaps also indicating the significance of this part of the plaza during the Middle Preclassic period. In addition to several ceramic vessels, all caches contained figurine fragments. Piniche May and colleagues (n.d.; see also DeLance 2016; Piniche May 216) propose that beginning in the Middle Preclassic, the Cahal Pech community experienced a shift in ideology reflected in an increase in communal ceremonies related to ancestor veneration. The predominance of figurines in the caches encountered during the 2017 Plaza B excavations, in addition to other plaza excavation conducted throughout the Cahal Pech site core, suggests that they have functioned as ancestral totems. Plaza excavations from the 2017 BVAR Project field season at Cahal Pech highlights the need for future excavations in Plaza B and elsewhere at Cahal Pech. Additional documentation of stratified contexts, buried architecture, and ceremonial deposits will help to establish a more a precise and accurate chronology for settlement and the socio-political development of this important Maya center during the Preclassic period.

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## APPENDIX A: PLAZA B RADIOCARBON SAMPLE INDEX

<i>Excavation Unit</i>	<i>Lvl.</i>	<i>Lot</i>	<i>This lot is</i>	<i>Date</i>	<i>Description</i>	<i><sup>14</sup>C Sample Number</i>
PLB-2017-1	5	PLB-2017-1-6	Below Floor 5	7-Jun-17	102 cmbd, on Floor 3	PLB1-4
PLB-2017-1	5	PLB-2017-1-6	Below Floor 5	7-Jun-17	102 cmbd, on Floor 3	PLB1-5
PLB-2017-1	7	PLB-2017-1-8	Feature 2: Cache 2017-1	7-Jun-17	On bedrock, near Cache 2017-1	PLB1-6
PLB-2017-1	7	PLB-2017-1-7	Feature 2: Cache 2017-1	7-Jun-17	168 cmbd, Cache 2017-1	PLB1-7
PLB-2017-1	7	PLB-2017-1-7	Below Floor 6	8-Jun-17	127 cmbd	PLB1-9
PLB-2017-1	7	PLB-2017-1-8	Feature 2: Cache 2017-1	8-Jun-17	Inside Vessel #4	PLB1-10
PLB-2017-1	7	PLB-2017-1-7	Feature 2: Cache 2017-1	9-Jun-17	178 cmbd	PLB1-11
PLB-2017-1	7	PLB-2017-1-7	Feature 2: Cache 2017-1	9-Jun-17	Inside Vessel #9	PLB1-12
PLB-2017-1	7	PLB-2017-1-8	Feature 2: Cache 2017-1	9-Jun-17	Inside Vessel #10	PLB1-13
PLB-2017-1	7	PLB-2017-1-7	Below Floor 6	9-Jun-17	154 cmbd	PLB1-14
PLB-2017-2	1	PLB-2017-2-1	Humus	21-May-17	10 cmbd	PLB2-1
PLB-2017-2	6	PLB-2017-2-7	Below Floor 6	8-Jun-17	154 cmbd	PLB2-10
PLB-2017-2	6	PLB-2017-2-7	Below Floor 6	13-Jun-17	222 cmbd	PLB2-12
PLB-2017-2	8	PLB-2017-2-9	Paleosol	13-Jun-17	238 cmbd	PLB2-13
PLB-2017-2	--	--	West Profile	14-Jun-17	186 cmbd	PLB2-14
PLB-2017-2	--	--	West Profile	14-Jun-17	122 cmbd	PLB2-15
PLB-2017-2	--	--	South Profile	14-Jun-17	153 cmbd	PLB2-16
PLB-2017-2	--	--	South Profile	14-Jun-17	201 cmbd	PLB2-17
PLB-2017-2	--	--	West Profile	14-Jun-17	154 cmbd	PLB2-18
PLB-2017-2	3	PLB-2017-2-4	Below Floor 3	6-Jun-17	97 cmbd	PLB2-2
PLB-2017-2	4	PLB-2017-2-5	Below Floor 4	7-Jun-17	138 cmbd, on Floor 5	PLB2-6
PLB-2017-2	5	PLB-2017-2-6	Below Floor 5	7-Jun-17	130 cmbd	PLB2-9
PLB-2017-3	2	PLB-2017-3-4	Below Floor 1	5-Jun-17	60 cmbd, on Floor 2	PLB3-1
PLB-2017-16	3	PLB-2017-16-3	Below Floor 2	19-Jun-17	102 cmbd, on Floor 3	PLB16-1
PLB-2017-16	2	PLB-2017-16-3	Below Floor 2	19-Jun-17	94 cmbd	PLB16-2
PLB-2017-16	3	PLB-2017-16-3	Below Floor 3	20-Jun-17	192 cmbd in fill	PLB16-3
PLB-2017-16	3	PLB-2017-16-3	Below Floor 2	20-Jun-17	148 cmbd	PLB16-4
PLB-2017-16	4	PLB-2017-16-4	Below Floor 3	21-Jun-17	164 cmbd	PLB16-4

<i>Excavation Unit</i>	<i>Lvl.</i>	<i>Lot</i>	<i>This lot is</i>	<i>Date</i>	<i>Description</i>	<i><sup>14</sup>C Sample Number</i>
PLB-2017-16	4	PLB-2017-16-4	Below Floor 3	22-Jun-17	170 cmbd	PLB16-5
PLB-2017-16	4	PLB-2017-16-4	Below Floor 3	22-Jun-17	184 cmbd	PLB16-7
PLB-2017-16	5	PLB-2017-16-5	Below Floor 4	22-Jun-17	197 cmbd	PLB16-8
PLB-2017-16	6	PLB-2017-16-8	Below Floor 4	23-Jun-17	232 cmbd	PLB16-10
PLB-2017-16	6	PLB-2017-16-8	Below Floor 4	23-Jun-17	246 cmbd	PLB16-11
PLB-2017-16	6	PLB-2017-16-8	Below Floor 4	23-Jun-17	263 cmbd	PLB16-12
PLB-2017-16	2	PLB-2017-16-12	Below Floor 2	11-Jul-17	142 cmbd, on surface of second step	PLB16-13
PLB-2017-17	12	PLB-2017-17-12	Below ballast floor	22-Jun-17	119 cmbd	PLB17-1
PLB-2017-17	12	PLB-2017-17-12	Below ballast floor	22-Jun-17	113 cmbd	PLB17-2
PLB-2017-17	14	PLB-2017-17-14	Below Floor 12	23-Jun-17	130 cmbd	PLB17-3
PLB-2017-17	14	PLB-2017-17-14	Below Floor 12	23-Jun-17	134 cmbd	PLB17-4
PLB-2017-17	17	PLB-2017-17-18	Below Floor 15	6-Jul-17	156 cmbd	PLB17-5
PLB-2017-17	16	PLB-2017-17-16	Below Floor 14	6-Jul-17	165 cmbd	PLB17-6
PLB-2017-17	19	PLB-2017-17-21	Below Floor 17	11-Jul-17	185 cmbd	PLB17-7
PLB-2017-17	20	PLB-2017-17-22	Below Floor 18	11-Jul-17	193 cmbd	PLB17-8
PLB-2017-17	21	PLB-2017-17-24	Feature 3: Cache 2017-3	13-Jul-17	Below vessel #5	PLB17-9
PLB-2017-18	8	PLB-2017-18-8	Below Floor 7	4-Jul-17	115 cmbd	PLB18-1
PLB-2017-18	9	PLB-2017-18-9	Below Floor 8	6-Jul-17	128 cmbd	PLB18-2
PLB-2017-18	10	PLB-2017-18-10	Below Floor 9	7-Jul-17	130 cmbd	PLB18-3
PLB-2017-18	11	PLB-2017-18-11	Below cobble platform	10-Jul-17	136 cmbd	PLB18-4
PLB-2017-18	15	PLB-2017-18-15	Below Floor 13	11-Jul-17	163 cmbd	PLB18-5
PLB-2017-18	16	PLB-2017-18-16	Below Floor 14	12-Jul-17	165 cmbd	PLB18-6
PLB-2017-18	17	PLB-2017-18-17	Below Floor 15	13-Jul-17	171 cmbd	PLB18-7
PLB-2017-18	18	PLB-2017-18-18	Below Floor 16	13-Jul-17	178 cmbd	PLB18-8

**APPENDIX B: 2017 PLAZA B SPECIAL FINDS INDEX**

<i>EU</i>	<i>Lvl.</i>	<i>Lot</i>	<i>This lot is</i>	<i>Class</i>	<i>Special Find No.</i>	<i>Freq.</i>	<i>Description</i>	<i>Additional Notes</i>
PLB-2017-1	2	PLB-2017-1-2	Below Floor 1	Ch	PLB-2017-SF-01	1	Chalcedony arrow point	Late Postclassic
PLB-2017-3	1	PLB-2017-3-1	Humus	Ch	PLB-2017-SF-02	1	Chalcedony arrow point	Late Postclassic
PLB-2017-3	1	PLB-2017-3-1	Humus	Ch	PLB-2017-SF-03	1	Chert biface	
PLB-2017-3	1	PLB-2017-3-2	Above Floor 1	Ch	PLB-2017-SF-04	1	Biface fragment	
PLB-2017-2	6	PLB-2017-2-6	Below Floor 6	Ce	PLB-2017-SF-05	1	Figurine head	
PLB-2017-2	4	PLB-2017-2-4	Below Floor 3	Ce	PLB-2017-SF-06	1	Figurine head	Eyes, nose, mouth, highly weathered; Savana paste
PLB-2017-8	1	PLB-2017-8-1	Humus/collapse	Ch	PLB-2017-SF-07	1	Chert biface	
PLB-2017-8	1	PLB-2018-8-1	Humus/collapse	Ce	PLB-2017-SF-08	1	Ceramic spout	Dual spout similar to northern Belize types
PLB-2017-1	7	PLB-2017-1-7	Feature 2: Cache 2017-1	Ch	PLB-2017-SF-09	16	Chert microdrills	Includes bipolar tools
PLB-2017-1	7	PLB-2017-1-7	Feature 2: Cache 2017-1	Ce	PLB-2017-SF-10	1	Figurine body	Savana Orange paste, right leg and arm with arm resting on knee
PLB-2017-2	6	PLB-2017-2-7	Below Floor 6	Ch	PLB-2017-SF-11	8	Chert microdrills	Includes bipolar tools
PLB-2017-1	7	PLB-2017-1-8	Feature 2: Cache 2017-1	Jd	PLB-2017-SF-12	7	Jade bead frags	
PLB-2017-16	7	PLB-2017-1-8	Below Floor 6	Jd	PLB-2017-SF-13	7	Jade fragments	Includes bead polished fragments
PLB-2017-2	6	PLB-2017-2-6	Below Floor 6	Ce	PLB-2017-SF-14	1	Possible figurine fragment	Savana Orange paste
PLB-2017-2	6	PLB-2017-2-6	Below Floor 6	Ce	PLB-2017-SF-15	1	Modified sherd	

<i>EU</i>	<i>Lvl.</i>	<i>Lot</i>	<i>This lot is</i>	<i>Class</i>	<i>Special Find No.</i>	<i>Freq.</i>	<i>Description</i>	<i>Additional Notes</i>
PLB-2017-2	6	PLB-2017-2-6	Below Floor 6	Ch	PLB-2017-SF-16	23	Chert microdrills	Includes bipolar tools
PLB-2017-2	6	PLB-2017-2-6	Below Floor 6	Ce	PLB-2017-SF-17	1	Figurine fragment	Possible head (maybe and eye) but highly weathered; Savana orange paste
PLB-2017-1	6	PLB-2017-1-13	Feature 1: Floor 5 Cut	Ce	PLB-2017-SF-18	1	Figurine head (mouth)	
PLB-2017-1	6	PLB-2017-1-13	Feature 1: Floor 5 Cut	Ce	PLB-2017-SF-19	1	Figurine head	Figurine head, small face with eyes and mouth as slit
PLB-2017-1B	7	PLB-2017-1-14	Below Floor 4	Ce	PLB-2017-SF-20	1	Figurine foot	Jocote paste, with fine calcite inclusions
PLB-2017-1B	7	PLB-2017-1-14	Below Floor 6	Ce	PLB-2017-SF-21	1	Figurine fragment	Foot/leg portion
PLB-2017-2	1	PLB-2017-2-6	Below Floor 6	Ce	PLB-2017-SF-22	2	Figurine head	Zoomorphic, possibly crocodile; produced as separate component
PLB-2017-1B	6	PLB-2017-1-13	Feature 1: Floor 5 Cut	Sr	PLB-2017-SF-23	1	Polished green stone	
PLB-2017-1B	7	PLB-2017-1-14	Below Floor 6	Ch	PLB-2017-SF-24	5	Chert microdrills	Includes bipolar tools
PLB-2017-2	8	PLB-2017-12-9	Below paleosol	Ch	PLB-2017-SF-25	2	Possible Archaic artifacts	
PLB-2017-6	3	PLB-2017-6-3	Collapse	Ce	PLB-2017-SF-26	1	Figurine fragment	Savana Orange paste, leg
PLB-2017-1B	7	PLB-2017-1-14	Below Floor 6	Jd	PLB-2017-SF-27	5	Jade bead fragments	
PLB-2017-1B	7	PLB-2017-1-14	Below Floor 6	Ch	PLB-2017-SF-28	16	Chert microdrills	Includes bipolar tools
PLB-2017-1B	7	PLB-2017-1-15	Feature 3: Cache 2017-2	Jd	PLB-2017-SF-29	2	Jade fragments	Inside vessel #6
PLB-2017-17	17	PLB-2017-17-18	Below Floor 15	Ce	PLB-2017-SF-30	8	Figurine (in pieces)	Ash temper; complete head with upper body (including right arm); head dress and earspools
PLB-2017-1B	7	PLB-2017-1-15	Feature 3: Cache 2017-2	Jd	PLB-2017-SF-31	2	Jade bead fragments	Inside vessel #3

<i>EU</i>	<i>Lvl.</i>	<i>Lot</i>	<i>This lot is</i>	<i>Class</i>	<i>Special Find No.</i>	<i>Freq.</i>	<i>Description</i>	<i>Additional Notes</i>
PLB-2017-1B	7	PLB-2017-1-15	Feature 3: Cache 2017-2	Jd	PLB-2017-SF-32	3	Jade fragments	Inside vessel #16
PLB-2017-1B	7	PLB-2017-1-15	Feature 3: Cache 2017-2	Jd	PLB-2017-SF-33	3	Jade fragments	Inside vessel #1-2
PLB-2017-1B	7	PLB-2017-1-15	Feature 3: Cache 2017-2	Jd	PLB-2017-SF-34	3	Jade fragments	Inside vessel #11
PLB-2017-1B	7	PLB-2017-1-15	Feature 3: Cache 2017-2	Jd	PLB-2017-SF-35	2	Jade fragments	Inside vessel #19
PLB-2017-1B	7	PLB-2017-1-15	Feature 3: Cache 2017-2	Ch	PLB-2017-SF-36	1	Shell pendant fragment	
PLB-2017-1B	7	PLB-2017-1-15	Feature 3: Cache 2017-2	Jd	PLB-2017-SF-37	1	Jade fragments	Inside vessel #15
PLB-2017-16	3	PLB-2017-16-3	Below Floor 2	Ce	PLB-2017-SF-38	1	Figurine head	Ash temper, possible Early Preclassic
PLB-2017-16	3	PLB-2017-16-3	Below Floor 2	Ch	PLB-2017-SF-39	4	Chert microdrills	Includes bipolar tools
PLB-2017-1B	8	PLB-2017-1-16	Below platform	Ce	PLB-2017-SF-40	1	Figurine head	Savana Orange paste, some slip remaining; figure has headdress and earpool on right
PLB-2017-1B	8	PLB-2017-1-16	Below platform	Ch	PLB-2017-SF-41	2	Chert microdrills	Includes bipolar tools
PLB-2017-16	3	PLB-2017-16-3	Below Floor 2	Ch	PLB-2017-SF-42	4	Chert microdrills	Includes bipolar tools
PLB-2017-16	4	PLB-2017-16-4	Below Floor 3	Ch	PLB-2017-SF-43	4	Chert microdrills	Includes bipolar tools
PLB-2017-16	5	PLB-2017-16-6	Below Floor 4	Ch	PLB-2017-SF-44	2	Chert microdrills	Includes bipolar tools
PLB-2017-16	6	PLB-2017-16-8	Below Floor 4	Ch	PLB-2017-SF-45	1	Chert microdrills	Includes bipolar tools
PLB-2017-17	13	PLB-2017-17-13	West Profile	Ch	PLB-2017-SF-46	1	Chert microdrills	Includes bipolar tools
PLB-2017-17	13	PLB-2017-17-13	Below Floor 11	Ch	PLB-2017-SF-47	1	Biface	
PLB-2017-17	13	PLB-2017-17-13	Below Floor 11	Sr	PLB-2017-SF-48	1	Polished green stone	

<i>EU</i>	<i>Lvl.</i>	<i>Lot</i>	<i>This lot is</i>	<i>Class</i>	<i>Special Find No.</i>	<i>Freq.</i>	<i>Description</i>	<i>Additional Notes</i>
PLB-2017-17	14	PLB-2017-17-14	Below Floor 12	Ce	PLB-2017-SF-49	1	Figurine fragment	Unknown portion; Savana with red slip
PLB-2017-18	8	PLB-2017-18-7	Below Floor 7	Ch	PLB-2017-SF-50	1	Blade frag	
PLB-2017-16	1	PLB-2017-16-1	Humus	Cr	PLB-2017-SF-51	1	Pipe stem	Early 19th century, porcelain
PLB-2017-17	16	PLB-2017-17-16	Below Floor 14	Ce	PLB-2017-SF-52	1	Mini ocarina	Possible zoomorphic (snail?); Savana Orange paste
PLB-2017-17	16	PLB-2017-17-16	Below Floor 14	Ce	PLB-2017-SF-53	1	Figurine head	Ash temper with red paste (probably Uck Red)
PLB-2017-17	16	PLB-2017-17-16	Below Floor 14	Ce	PLB-2017-SF-54	1	Figurine fragment	Arm portion, Savana orange
PLB-2017-17	17	PLB-2017-17-18	Below Floor 15	Ce	PLB-2017-SF-55	3	Unknown portion of figurine	Ash temper
PLB-2017-17	17	PLB-2017-17-18	Below Floor 15	Ce	PLB-2017-SF-56	1	Figurine body	Ash temper; seated position
PLB-2017-17	17	PLB-2017-17-18	Below Floor 15	Ce	PLB-2017-SF-57	1	Figurine fragment	Foot portion; Savana Orange paste
PLB-2017-18	9	PLB-2017-18-9	Below Floor 8	Ce	PLB-2017-SF-58	1	Ocarina fragment	Ash temper; unknown forms
PLB-2017-18	9	PLB-2017-18-9	Below Floor 8	Ce	PLB-2017-SF-59	1	Figurine fragment	Unknown portion; Savana Orange paste with red slip
PLB-2017-16	1	PLB-2017-16-4	Humus/collapse	Ce	PLB-2017-SF-60	1	Figurine head	Coarse paste but typical style of Terminal Classic; head dress and earpools
PLB-2017-16	1	PLB-2017-16-4	Humus/collapse	Ce	PLB-2017-SF-61	1	Figurine head	Red paste, highly weathered, two eyes visible
PLB-2017-17	17	PLB-2017-17-18	Below Floor 15	Ce	PLB-2017-SF-62	1	Figurine head	Ash temper
PLB-2017-17	18	PLB-2017-17-20	Below Floor 16	Ce	PLB-2017-SF-63	2	Figurine fragments	Jocote Orange-Brown paste with fine calcite inclusions; left leg dangling with hand resting on knee
PLB-2017-17	18	PLB-2017-17-20	Below Floor 16	Ce	PLB-2017-SF-64	1	Figurine head	Savana Orange paste; highly weathered but can make out head dress

<i>EU</i>	<i>Lvl.</i>	<i>Lot</i>	<i>This lot is</i>	<i>Class</i>	<i>Special Find No.</i>	<i>Freq.</i>	<i>Description</i>	<i>Additional Notes</i>
PLB-2017-2	6	PLB-2017-2-7	Below Floor 6	Ce	PLB-2017-SF-65	1	Figurine arm	Savana Orange paste
PLB-2017-2	6	PLB-2017-2-7	Below Floor 6	Ce	PLB-2017-SF-66	1	Figurine arm	Sampopero Red paste, with groves along arm
PLB-2017-2	6	PLB-2017-2-7	Below Floor 6	Ce	PLB-2017-SF-67	1	Figurine nose	Jocote Orange-Brown paste
PLB-2017-2	6	PLB-2017-2-7	Below Floor 6	Ce	PLB-2017-SF-68	1	Figurine fragment	Unknown portion; white/tan ash temper paste
PLB-2017-2	6	PLB-2017-2-7	Below Floor 6	Ce	PLB-2017-SF-69	1	Figurine fragment	Unknown portion; red ash temper paste
PLB-2017-16ext	2	PLB-2017-16-7	Fill inside 1st construction	Gr	PLB-2017-SF-70	1	Possible spindle whorl	
PLB-2017-16ext2	1	PLB-2017-16-11	Humus/collapse	Ls	PLB-2017-SF-71	1	Limestone disk	
PLB-2017-17	19	PLB-2017-21	Below Floor 17	Ce	PLB-2017-SF-72	1	Figurine foot	Savana Orange paste
PLB-2017-18	11	PLB-2017-18-11	Below cobble platform	Ce	PLB-2017-SF-73	2	Figurine fragments	Ash temper, leg and body; may go together
PLB-2017-16	4	PLB-2017-16-13	Below Floor 3	Ce	PLB-2017-SF-74	1	Figurine leg	Ash temper, some red paste visible in spots
PLB-2017-17	19	PLB-2017-17-21	Below Floor 17	Ce	PLB-2017-SF-75	1	Figurine body	Head and left arm; possibly was part of ocarina
PLB-2017-17	19	PLB-2017-17-21	Below Floor 17	Ce	PLB-2017-SF-76	1	Ceramic ring	Brown glossy slip; incised on the inside
PLB-2017-17	19	PLB-2017-17-21	Below Floor 17	Ch	PLB-2017-SF-77	1	Chert microdrills	
PLB-2017-17	20	PLB-2017-17-22	Below Floor 18	Ce	PLB-2017-SF-78	1	Figurine body	Seated position, Jocote Orange-Brown paste
PLB-2017-17	20	PLB-2017-17-22	Below Floor 18	Ce	PLB-2017-SF-79	1	Ocarina	Bird shape, Savana paste (but more red) with brown slip
PLB-2017-17	20	PLB-2017-17-22	Below Floor 18	Ce	PLB-2017-SF-80	1	Mini pot	Jocote Orange-Brown style, with holes on either side to hang
PLB-2017-17	21	PLB-2017-17-24	Feature 3: Cache 2017-3	Ce	PLB-2017-SF-81	1	Applique ceramic	

<i>EU</i>	<i>Lvl.</i>	<i>Lot</i>	<i>This lot is</i>	<i>Class</i>	<i>Special Find No.</i>	<i>Freq.</i>	<i>Description</i>	<i>Additional Notes</i>
PLB-2017-17	21	PLB-2017-17-24	Feature 3: Cache 2017-3	Ce	PLB-2017-SF-82	1	Figurine body	Ash temper
PLB-2017-17	21	PLB-2017-17-24	Feature 3: Cache 2017-3	Ce	PLB-2017-SF-83	1	Figurine body	Seated position, with legs extended
PLB-2017-17	21	PLB-2017-17-24	Feature 3: Cache 2017-3	Ce	PLB-2017-SF-84	1	Figurine hand	Possibly zoomorphic; Savana Orange paste
PLB-2017-17	21	PLB-2017-17-24	Feature 3: Cache 2017-3	Ce	PLB-2017-SF-85	1	Figurine head	Flat face/head; Savana Orange paste
PLB-2017-17	21	PLB-2017-17-24	Feature 3: Cache 2017-3	Unk	PLB-2017-SF-86	1	Celt	
PLB-2017-16	3	PLB-2017-16-3	Below Floor 2	Ch	PLB-2017-SF-87	1	Biface fragment	
PLB-2017-17	3	PLB-2017-17-3	Below Floor 2	Ob	PLB-2017-SF-88	1	Obsidian arrow point	Late Postclassic

# EXCAVATIONS IN THE SW CORNER OF PLAZA B, CAHAL PECH, BELIZE

**Stanley Guenter**  
**American Foreign Academic Research**

**C. Mathew Saunders**  
**Davidson Day School**  
**American Foreign Academic Research**

**Lea Goldstein**  
**Davidson Day School**

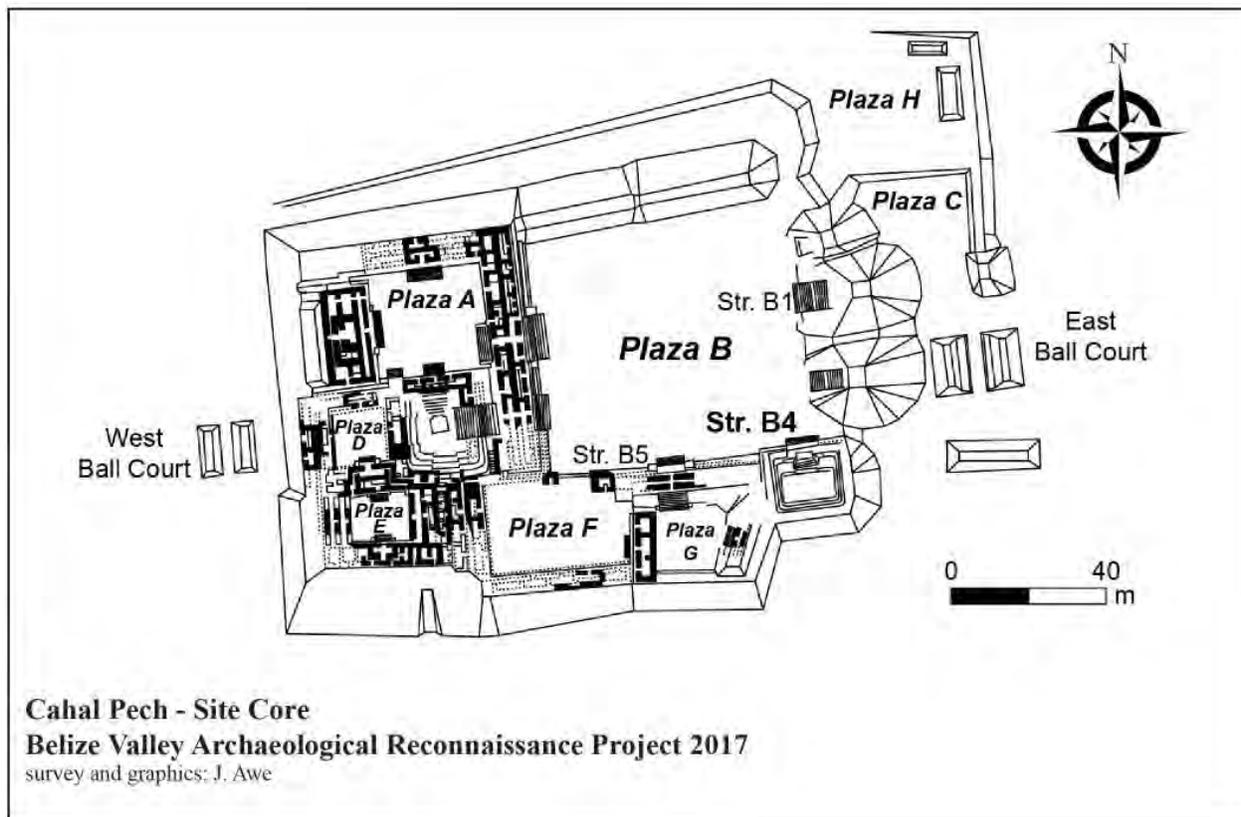
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## INTRODUCTION

This report summarizes the excavations conducted in June, 2017 by the American Foreign Academic Research (AFAR) field school project that operates in conjunction with the Belize Valley Archaeological Reconnaissance Project at Cahal Pech, Cayo District, Belize. Supervising this excavation were Jaime Awe, C. Mathew Saunders, Christy W. Pritchard, James C. Pritchard, and Stanley Guenter, with the assistance of Michael and Tiffani Thomas, Susan Dutcher, Powell Paguibitan, Abraham Guerra, and Reuben Mendez. The 2017 excavations were carried out in a single, two-week session in mid-June and consisted of excavation and examination of a line of stone blocks extending eastward into the southwest quadrant of Plaza B.

## BACKGROUND

The 2017 AFAR excavations were originally programmed to continue those carried out by AFAR in the 2016 season on the western ball court at Cahal Pech (Pritchard et al. 2017). However, due to the amount of debris in this area left by the previous hurricane season it was determined that, due to the short 2017 AFAR field season and the time necessary to remove this debris, that an alternative area at Cahal Pech for our students to excavate was necessary. In consultation with Jaime Awe and Claire Ebert we determined to investigate a line of stones that extended eastwards into Plaza B, the central plaza area of Cahal Pech (Figure 1). This plaza contains some of the earliest evidence of occupation and construction at the site but, even before excavation, it was believed that the line of stones most likely dated to one of the latest occupations at the site, either in the very late-Late Classic or Terminal Classic periods, or possibly even to the Postclassic era, all of which have been attested in this part of the site in previous excavations (Awe 1992, 2008, 2013; Awe and Campbell 1989; Ebert 2017). Small lines of stone like what appeared on the surface prior to our excavations have in other excavations proven to be from a number of different sources, including low, Terminal Classic house mounds and enigmatic Terminal Classic walls. However, another possibility, since this line of stones paralleled the walls and staircases of the structures from Plazas F and G facing north onto Plaza B, was that this line of stones represented the western edge of a low staircase, a step up that would have divided Plaza B into northern and southern sections. In order to test these possibilities and determine the age and nature of this line of stones our 2017 excavations were carried out.

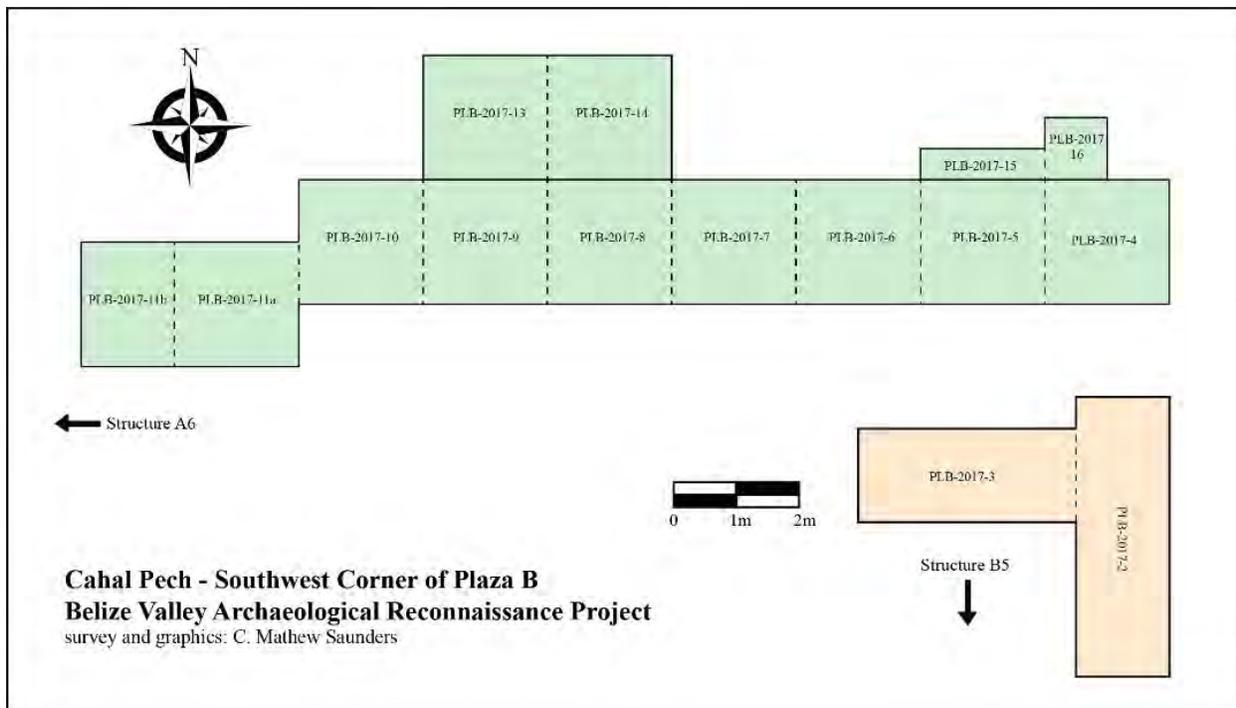


**Figure 1:** Plan view map of Cahal Pech site core.

## METHODS

Unit placement and oversight of excavations in the 2017 season was overseen by C. Mathew Saunders, Christy W. Pritchard, James C. Pritchard, and Stanley Guenter, in coordination with Claire Ebert of the BVAR Project who was conducting excavations just a few meters to the southeast. Documentation, in the form of drawings, sketches, and photography, was assisted by Michael and Tiffani Thomas of Davidson Day School. AFAR students participated in the practical work as well as in note-taking every day to gain knowledge of the field research process and to complete their field school requirements. In order to capture as much of the line of stones as possible a line of seven 2x2 m<sup>2</sup> units were placed in a line running E-W were set out, designed to be each excavated by three or four students each (Figure 2).

Units were excavated using cultural levels when possible or approximately ten centimeter arbitrary levels when cultural levels could not be determined. All matrices were screened through 1/4-inch mesh. All cultural material was collected and bagged per class and unit. All collected material was washed, sorted, counted and re-bagged for future study. Analysis of materials collected is on-going and will, hopefully, be included in future publications. Materials removed and saved for later analysis include ceramics, chert, freshwater shell, marine shell, quartzite, obsidian and one complete *mano* and *metate* found together. Documentation includes plan view photos and plan view maps for the base of each level of excavation.



**Figure 2:** Plan view including excavation units established by C. Ebert and C. M. Saunders.

## EXCAVATIONS

Seven 2 x 2 m units were placed continuously in an E-W line over the line of stones seen from the surface. These were numbered Units 04 through Unit 10, the numbering designed to continue on from the units that were then already under excavation by the team of Claire Ebert (see Chapter 1 in this volume for a summary of those excavations). The line of stones and stone blocks had its edge on the south and thus was either a stair, with treads leading upwards as one would have walked north, or a low platform, with this line of stones forming the southern edge of the structure.

Unit 04 was the easternmost of the units our team excavated this season and this unit was excavated by Kate Roberts, Elizabeth Crispino, and Zoë Chapman. More artifacts, including sherds (861), chert pieces (127), quartz pieces (167), were found in this unit than in any other, as well as a large number (8) pieces of jute shell. While a number of our other units, especially units 08 and 09, were full of far more tree roots and stones than Unit 04, it is still remarkable the number of artifacts found in this unit compared to the others, especially given that Unit 05, right next to it, produced the fewest number of artifacts of any of our main, original 2 x 2 m units. It is not certain why there were so many artifacts in this unit and no features other than a poorly preserved stucco floor at the bottom of Lot 03. This same floor was found in the rest of the units we excavated but was most poorly preserved here in Unit 04, likely because this unit was furthest into the plaza and thus away from any structures that might have provided better preservation when they eroded.

**Table 1:** Artifacts from CHP-PLB-2017-4.

<i>Artifacts by Unit</i>	<i>Total Counts</i>
<b>Lot 1</b>	<b>412</b>
Ce	340
Ch	53
Fs	6
Ob	1
Gr	1
Qz	12
<b>Lot 2</b>	<b>473</b>
Ce	310
Ch	65
Fs	1
Gr	2
Qz	95
<b>Lot 3</b>	<b>285</b>
Ce	211
Ch	10
Fs	1
Ob	2
St	1
Qz	60
<b>Grand Total</b>	<b>1170</b>

Unit 05 was located immediately west of Unit 04 and these excavations were carried out by Jack Wolter, Connor Horstman, and Chase Saine. The fewest number of artifacts in any of our original units was found here but the stucco plaza floor, found approximately 50 cm below surface, was encountered here in a state of better preservation. In comparison to Unit 04, less than half the number of chert pieces were found here and less than a sixth the number of sherds, while almost no chert pieces at all were found in this unit. If we assume that the number of artifacts is likely to be less the further one extends into the center of a plaza, away from structures, then we need to explain the much higher concentration of artifacts found in Unit 04 and, at present, no clear indication as to why that might have been is known. This is most likely to implicate Unit 04 being the oddity and we may have had some small midden forming in the Unit 04 area, off the corner of the structure whose wall we were excavating.

Unit 06 was located immediately west of Unit 05 and was excavated by Nicholas Rogers, Whit Johnson, and Morgan Scott. The second highest number of artifacts was found in this unit, with 670 sherds, 125 pieces of chert (only 2 less than Unit 04), and 5 jute shells. However, only 2 pieces of quartz were found in this unit, and, in fact, quartz was almost completely absent from almost all our units, other than Unit 04. Again, the reason for such high concentrations of quartz pieces in Unit 04, in the middle of the plaza, is uncertain.

**Table 2:** Artifacts from CHP-PLB-2017-5.

<i>Artifacts by Unit</i>	<i>Total Counts</i>
<b>Lot 1</b>	<b>20</b>
Ce	17
Ch	3
<b>Lot 2</b>	<b>14</b>
Ch	11
Fs	1
Qz	2
<b>Lot 3</b>	<b>132</b>
Ce	91
Ch	40
Fs	1
<b>Grand Total</b>	<b>166</b>

**Table 3:** Artifacts from CHP-PLB-2017-6.

<i>Artifacts by Unit</i>	<i>Total Counts</i>
<b>Lot 1</b>	<b>323</b>
Ce	257
Ch	62
Fs	1
Qz	3
<b>Lot 2</b>	<b>276</b>
Ce	225
Ch	47
Fs	2
Gr	1
Ob	1
<b>Lot 3</b>	<b>207</b>
Ce	188
Ch	16
Fs	2
Fa	1
<b>Grand Total</b>	<b>806</b>

Unit 07 was immediately west of Unit 06 and was excavated by Henry Jamison, Murphy Jones, Nick Deane, and Mark Breunig. About half the number of artifacts were found here as in Unit 06, except that this unit produced 2 obsidian pieces, the same as in Unit 04. Units 06 and 11a each produced one piece of obsidian each and no other pieces were found in any of our other units.

Unit 08 was excavated by Ivy Graves, Lea Goldstein, and Abby Myers and, along with adjacent Units 09 and 10, was most affected by tree roots, being quite near to a large tree standing in Plaza B just a meter or so to the south. Due to this the excavation here took longer and these units were terminated at a higher level than those units to the east. A higher stucco floor was found in these units and Unit 07, having been very poorly preserved or preserved not at all in the eastern units. Almost twice as many chert pieces were found in Unit 08 than in Unit 07 but the number of sherds and most other artifacts categories were very similar, other than quartz pieces, with Unit 08 producing 4, the second highest number of the original 7 units we excavated this season. While it might be tempting to suggest that the chert pieces may reflect the use of the area for processing chert tools the numbers of chert pieces are still not that large and this larger number of chert pieces is still currently unexplained.

**Table 4:** Artifacts from CHP-PLB-2017-7.

<i>Artifacts by Unit</i>	<i>Total Counts</i>
<b>Lot 1</b>	<b>303</b>
Ce	263
Ch	33
Fs	3
Gr	1
Ob	2
Qz	1
<b>Lot 2</b>	<b>26</b>
Ce	26
<b>Lot 3</b>	<b>77</b>
Ce	64
Ch	12
Gr	1
<b>Grand Total</b>	<b>406</b>

Unit 09 was layed out immediately west of Unit 08, and was excavated by Adam Ratcliff, Justin Riou, Lance Fenderson, and Steven Scherrman. As with Unit 08, this unit contained a lot more stones and tree roots than the other units and, concomitantly, fewer artifacts. The most interesting material from this excavation consisted of pieces of metal cans and rope that were clearly modern and, by the time we finished this unit, we began suspecting that this included the remains of archaeological backdirt from previous excavations. We are uncertain of when this material would have been deposited here but it did indicate that this area of the site was not as pristine as originally thought and that all of the materials we recovered might be contaminated from earlier excavations, likely from work carried out in the A Group structures and plaza more than a decade earlier. The vast majority of artifacts found in Units 07 and 08 were found in the uppermost level of these units and this could also be a feature of the contamination from the backdirt of these earlier excavations but it is interesting to note that Units 09 and 10 had more of their artifacts in their lower levels, making this interpretation somewhat less likely.

**Table 5:** Artifacts from CHP-PLB-2017-8.

<i>Artifacts by Unit</i>	<i>Total Counts</i>
<b>Lot 1</b>	<b>357</b>
Ce	273
Ch	76
Fs	4
Qz	4
<b>Lot 2</b>	<b>85</b>
Ce	67
Ch	17
Fs	1
<b>Grand Total</b>	<b>442</b>

**Table 6:** Artifacts from CHP-PLB-2017-9.

<i>Artifacts by Unit</i>	<i>Total Counts</i>
<b>Lot 1</b>	<b>80</b>
Ce	58
Ch	18
Fs	1
Trash	3
<b>Lot 2</b>	<b>165</b>
Ce	146
Ch	17
Fs	2
<b>Grand Total</b>	<b>245</b>

Unit 10 was set west of Unit 09 and was excavated by Sarah Chinundtet, Aicha Kaouss, Isabelle Burkhart, and Colby Litsey. Unit 10 had fewer stones than in Unit 09 and more artifacts, with 314 sherds, 100 pieces of chert, and 21 jute shells, the largest number of the latter artifact class from all of our units this year. The total number of artifacts was very comparable to Units 07 and, especially, 08. The lesser amount of stones in this unit means that, in addition to explaining the higher number of artifacts in Unit 01, we needed to explain the stones in Units 08 and 09. Immediately north of these two units were a number of smaller, irregularly shaped stones. These appeared to possibly be from a stone platform, one possibly built atop the wall or structure that formed the line of stones we had been investigating in the other units, and we determined to lay out more units here, as well as extend our excavations in the main line towards the west. However, while this material could be from an ancient structure the material recovered from Unit 09 made us consider that this pile of stones was part of archaeological backdirt and not part of an ancient structure or feature.

**Table 7:** Artifacts from CHP-PLB-2017-10.

<i>Artifacts by Unit</i>	<i>Total Counts</i>
<b>Lot 1</b>	<b>185</b>
Ce	114
Ch	58
Fs	12
Qz	1
<b>Lot 2</b>	<b>253</b>
Ce	200
Ch	42
Fs	9
St	2
<b>Grand Total</b>	<b>438</b>

Unit 11a was laid out west of Unit 10 but offset one meter to the south. It was excavated by the same team that had finished up Unit 10 itself. Unit 11b was set immediately west of Unit 11a and was excavated by the team from Unit 04. While Unit 11b is exactly aligned with the northern and southern edges of Unit 11a, it is only 1.5 m E-W. These units we excavated down only to the uppermost of the two floors seen in the previous excavations. While few artifacts were found in the upper lots of these two units a much large number of sherds were found in each in the lower levels – Lot 2 of Unit 11a produced more sherds than any other lot this season -, and, as these lots were much closer to the masonry of the A Group palace this could be the result of Terminal Classic refuse accumulations against the sides of these large walls of masonry. Unfortunately, due to analysis of these ceramics not having yet been carried out we cannot say much about these sherds other than that they do appear to be mostly Late or Terminal Classic in date and future analysis will hopefully be able to confirm or deny this hypothesis and date these more closely.

**Table 8:** Artifacts from CHP-PLB-2017-11a.

<i>Artifacts by Unit</i>	<i>Total Counts</i>
<b>Lot 1</b>	<b>46</b>
Ce	18
Ch	26
Qz	2
<b>Lot 2</b>	<b>608</b>
Ce	495
Ch	99
Fs	10
Ob	1
Qz	3
<b>Grand Total</b>	<b>654</b>

**Table 9:** Artifacts from CHP-PLB-2017-11b.

<i>Artifacts by Unit</i>	<i>Total Counts</i>
<b>Lot 1</b>	<b>131</b>
Ce	102
Ch	26
Fs	3
<b>Lot 2</b>	<b>456</b>
Ce	394
Ch	56
Fs	4
St	1
Qz	1
<b>Grand Total</b>	<b>587</b>

Unit 12 was a 2 x 2 m extension of Unit 08 to the north in order to examine the larger concentration of stones in this area that was visible already from the surface. Unit 12 was excavated by the same team as Unit 08 and, due to time constraints, the two lots dug here only reached a depth of 15-20 cm. Due to the small amount of material removed few artifacts were found but no pattern was evident in the arrangement of the rocks and it was ultimately concluded that these were most likely simply the remains of archaeological backdirt from previous excavations.

**Table 10:** Artifacts from CHP-PLB-2017-12.

<i>Artifacts by Unit</i>	<i>Total Counts</i>
<b>Lot 1</b>	<b>36</b>
Ce	27
Ch	7
Fs	2
<b>Lot 2</b>	<b>51</b>
Ce	42
Fs	8
Qz	1
<b>Grand Total</b>	<b>87</b>

Unit 13 was placed immediately west of Unit 12 and north of Unit 09 and was excavated by the team that had excavated the latter. This unit was dug down to about 20-25 cm, slightly more than Unit 12, and we recovered slightly more numbers of artifacts. However, as both of these appear to be units of disturbed and previously excavated material these artifacts will likely not prove overly informative of any Precolumbian activity in this immediate area of the site.

Unit 14 was placed immediately north of Unit 04 and excavated by the team that had worked on Unit 07, while Unit 15 was immediately north of Unit 05 and excavated by the team that excavated that unit. Both of these were very small units designed merely to extend our

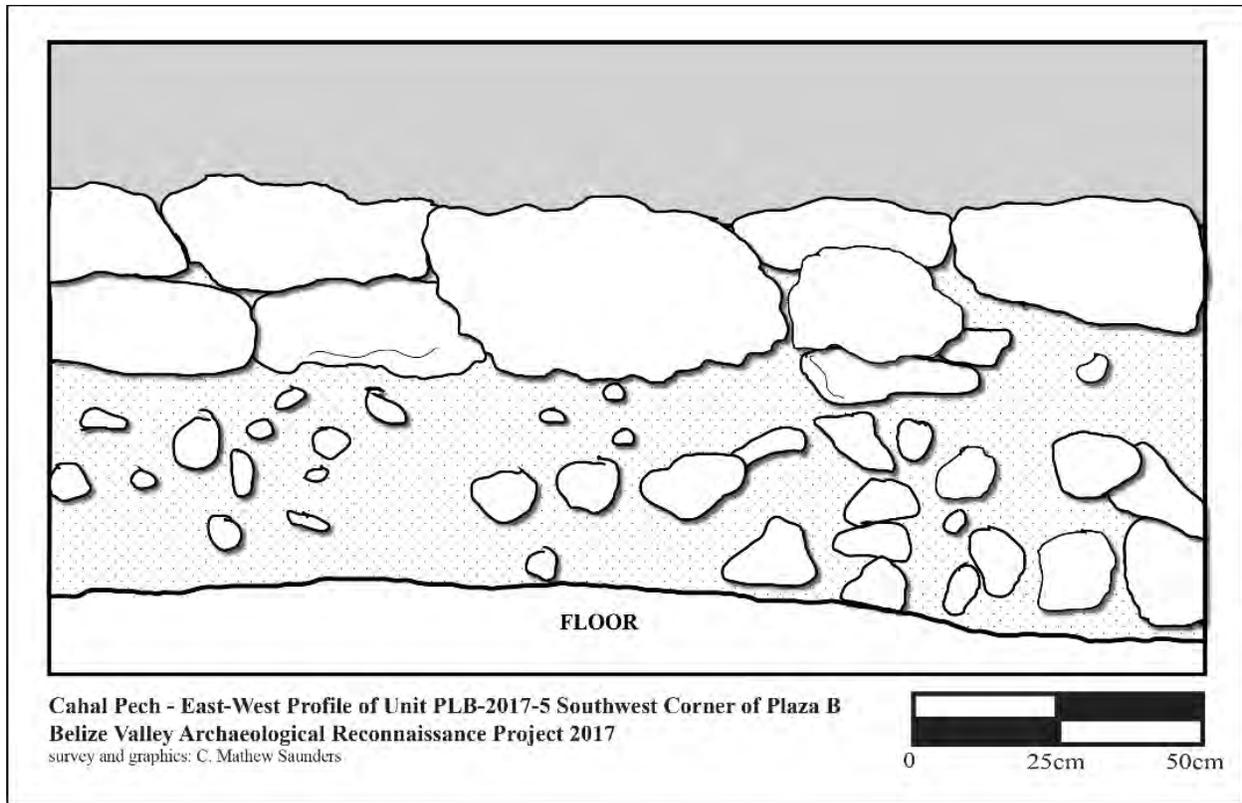
excavations northwards to encounter the line of stones we had been following in the original units. Our excavations indicated that this line of stones angled towards the NE. Very few artifacts were found in either of these units, unsurprising given how little material was removed in them. These units were also much smaller than the other units we excavated, as they were excavated at the end of our season and only designed to reach the stone wall and no further. Unit 14 was merely a 1 x 1 m<sup>2</sup> unit that extended north from the NW quadrant of Unit 04. Unit 15 extended across the entire northern face of Unit 05 but only to a distance of 0.5 m to the north. No artifacts were found in Lot 2 of Unit 14 and none at all for either of the two lots in Unit 15, though this is not surprising given how small these lots were and the fact that they mostly consisted of cleaning around the stone wall.

**Table 11:** Artifacts from CHP-PLB-2017-13.

<i>Artifacts by Unit</i>	<i>Total Counts</i>
<b>Lot 1</b>	<b>49</b>
Ce	32
Ch	8
Fs	1
Qz	2
Trash	6
<b>Lot 2</b>	<b>84</b>
Ce	59
Ch	20
Fs	3
Ob	1
Qz	1
<b>Grand Total</b>	<b>133</b>

**Table 12:** Artifacts from CHP-PLB-2017-14.

<i>Artifacts by Unit</i>	<i>Total Counts</i>
<b>Lot 1</b>	<b>22</b>
Ce	18
Ch	4
<b>Lot 2</b>	<b>0</b>
<b>Grand Total</b>	<b>22</b>



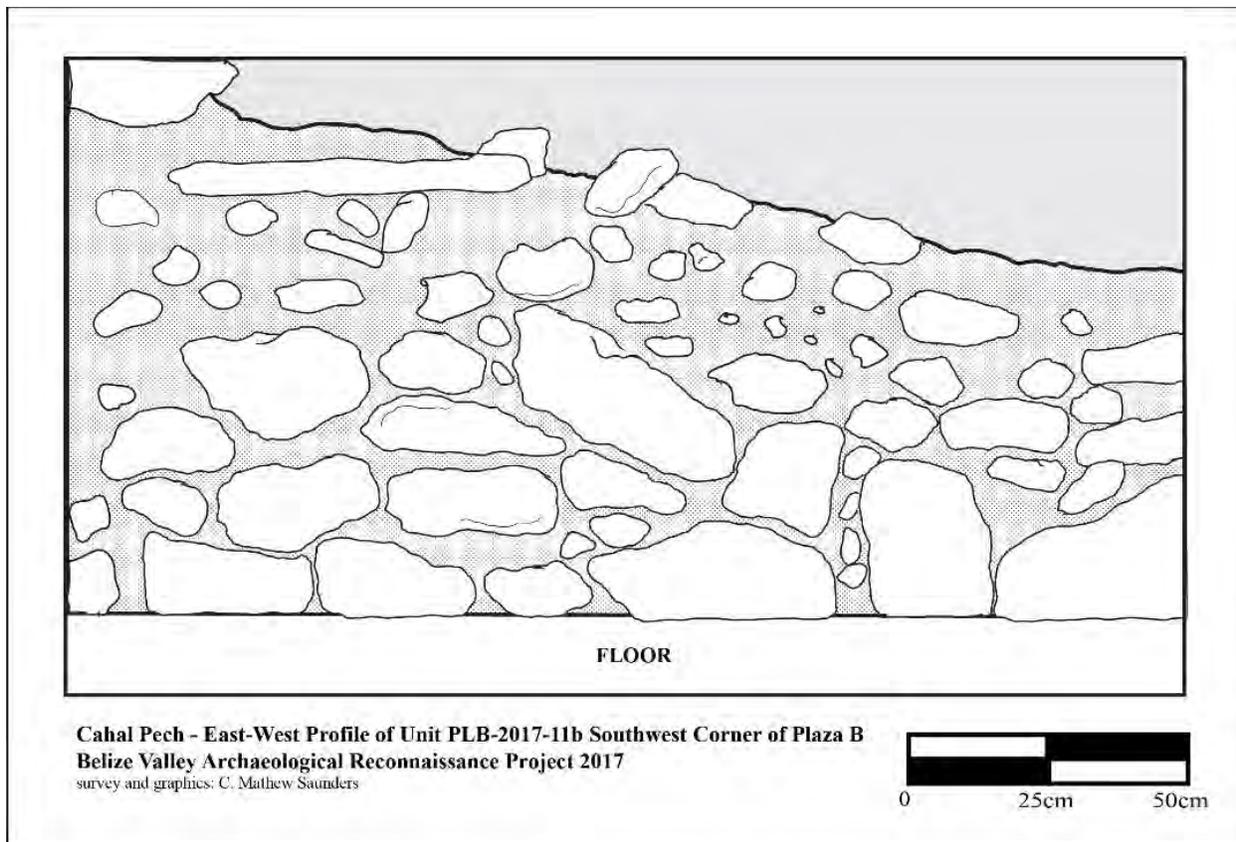
**Figure 3:** Profile view of Unit PLB-2017-5 facing north.

## CONCLUSIONS

Due to the late revision to our research plan for this season, the 2017 AFAR excavations were not groundbreaking and did not manage to continue our excavations of the western ball court as originally planned. However, we did manage to investigate the curious line of stones in the middle of the SW quadrant of Plaza B. The nature of the line of stones we excavated is still not certain but we were able to determine that the pile of stones found north of Units 08 and 09 were part of an unrecorded backpile of excavation debris from previous excavations. The line of stones (Figure 3) is clearly intentional and from an ancient feature and, given its height, is more likely a wall than a step. It is quite possible that this line of stones merely demarcates two different phases of raising the Plaza B floor, with the northern section being finished before the southern section was and, the wall would have allowed the builders to finish the northern section for use before continuing with the southern section. The western part of the wall is less clearly defined and we were not able in our brief season to identify any turns or articulations to any other structures in the vicinity and the top of the wall of stones is not as clearly defined in this area (Figure 4).

The greater number of artifacts in Unit 04 is still a curiosity. This may be a relic of previous excavation material being dumped here but the larger number of artifacts extends down through multiple lots and it seems most likely that this is due to other, though still uncertain, reasons. Our excavations from the 2017 season may not add much to our knowledge of the Precolumbian past of Cahal Pech but the line of stones we documented is curious and something not previously noted, providing indications of more complexity to the history and construction of Plaza B than

previously thought. Furthermore, our excavations this season help highlight the need to document previous excavations and how, over only a few decades, such excavations and the material discarded from those field seasons can be forgotten.



**Figure 4:** Profile view of Unit PLB-2017-11b facing north.

**Acknowledgements.** We would like to thank the 2017 AFAR field school students for their hard work this summer, as well as Dave Swezey, Barbara Nelson, and the entire board of directors of American Foreign Academic Research and Davidson Day School. We would also like to acknowledge the BVAR project for their continued collaboration with the AFAR program and field work at Cahal Pech. We especially want to thank the BVAR Project, including Drs. Jaime Awe, Julie Hoggarth, and Claire Ebert, as well as the Institute of Archaeology, including Dr. John Morris, for permitting BVAR Project research.

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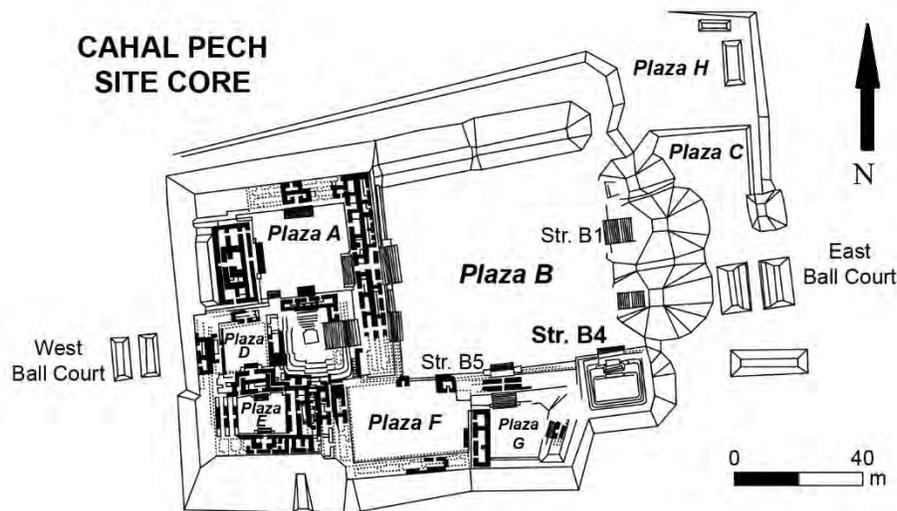
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# ALL IN ALL, IT'S JUST ANOTHER GLYPH AND A WALL: MORE TALES FROM THE G UNITS

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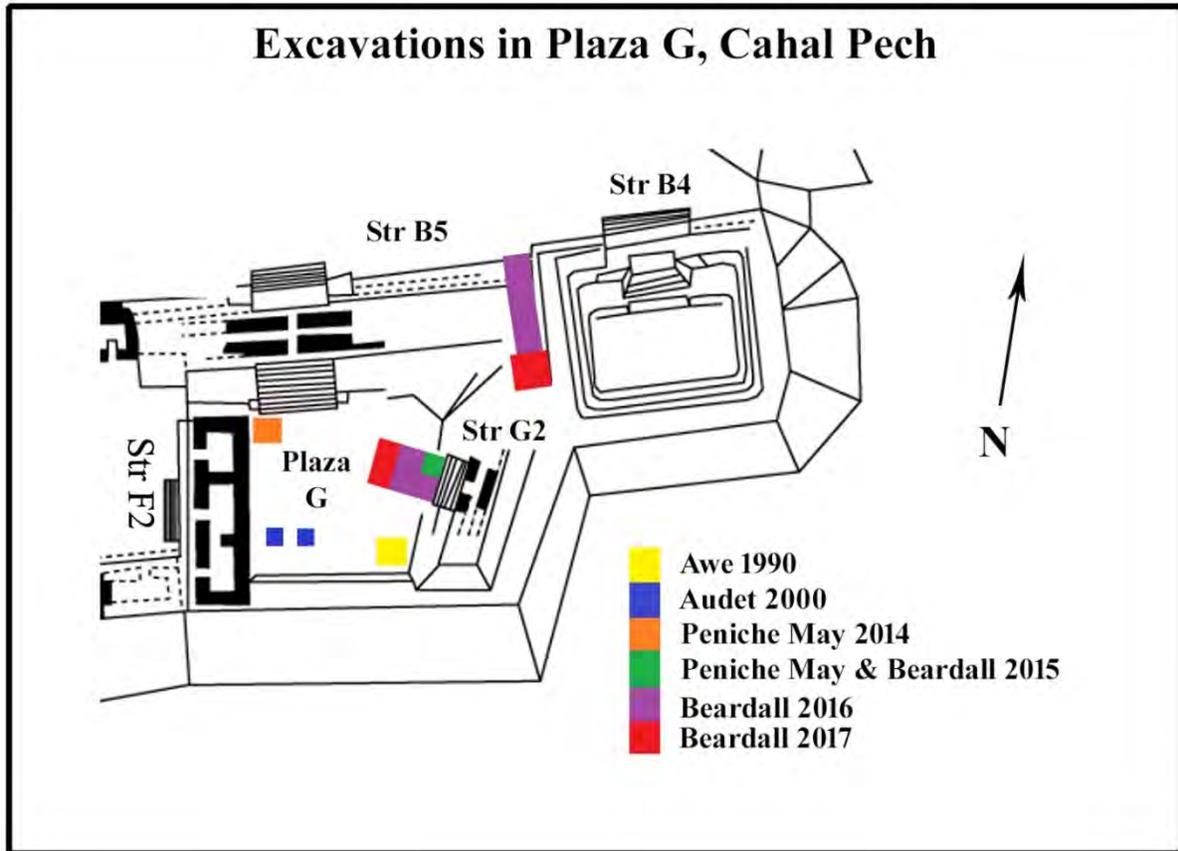
## INTRODUCTION

Cahal Pech is a medium-sized Maya center located above the modern town of San Ignacio, Belize and is situated approximately 2 km south of where the Mopan and Macal rivers meet to form the Belize River. The site core, which includes an elite acropolis, is located on a steep hill and covers approximately one hectare and is made up of seven plazas. Plaza B is the largest plaza at the site and is bordered by Structures B1, B2 and B3 on the east, B6 and B7 to the north, A2, a long-range *audiencia* to the west, and in the south by Structures B4 and B5 (Figure 1).



**Figure 1:** Map of Cahal Pech site core with major plazas labelled.

The focus of field work by the Belize Valley Archaeological Reconnaissance (BVAR) Project in 2017 was twofold. First, research focused on one unit north of Structure G2 and south of the Structures B4/B5 alley uncovered in 2016 by Beardall, and excavations were undertaken to expose more of the terminal classic architecture of Structures B5 and G2 and find out where they both meet. Second, additional units opened in Plaza G in 2016 were reopened and extended in 2017 to shed more light on a possible Middle or Late Preclassic period (900 BC-AD 300) wall that was under the plaza surface. The wall was discovered in 2016 while excavating the interior of a possible round structure. Figure 2 shows where the units were placed. The results of both 2016 and 2017 excavations are discussed in this report.



**Figure 2:** Location of previous excavations (modified after Awe et al. 2017).

## PREVIOUS EXPLORATIONS IN THE SOUTHERN SITE CORE

### Structure B5

The construction history of Structure B5 is well established. The building was first investigated by Awe and colleagues in the 1990's (1992:143-148). More recently, the Structure B5 was revised by Peniche May in 2014 following her work in 2012-13 examining Plaza B just north of building. Over 15 discrete construction phases were documented at the building, beginning first in the Late Preclassic (300 BC-AD 300). The terminal phases of construction has been dated based on relative ceramic associations to the Terminal Classic period (AD 750-850/900; Peniche May 2015).

In 2016, Beardall excavated the alleyway between Structures B4 and B5 (Beardall 2016), further elucidating construction activities taking place at Structure B5 during the Terminal Classic. The alley's surface corresponds to the basal platform Structure B5/14<sup>th</sup>, which abutted the now visible construction phase of Structure B4, B4/10<sup>th</sup>. This alleyway was filled in during the Terminal Classic period, with this closure creating a single long structure. The wall of the basal platform that was concealed by B4/10<sup>th</sup> can be seen in the northeast section of Structure B5. Excavations in 2017 were aimed at documenting the location of find southeast corner of the building where it abuts Structure G2.

## **Plaza G**

Plaza G has a complex construction history. Initial investigations in the plaza were undertaken by Awe and colleagues in 1990 (Awe and Campbell 1991). Their excavations in this area of the site core uncovered a total of five floors, with sterile soil located less than 2 meters below the modern surface of the plaza. In 2000, Carolyn Audet placed two excavation units in Plaza G during her investigations of Structure F2. She also documented five phases of construction for the plaza (Audet 2001). The units placed were near the center of the eastern staircase access of Structure F2, located at the southern end of building. This staircase provided an entry way to Plaza G. While one unit, Unit 57, revealed a cache of a laurel leaf points (Audet 2001:278), excavations were terminated after one meter. Unit 50, however, which was placed 3 meters east of the center of the rear staircase, revealed a total of construction episodes within Plaza G, including the construction of a 1.8 m tall wall (Plaza G/2<sup>nd</sup>) dating to the Middle Preclassic. The fifth construction phase (Plaza G/5<sup>th</sup>) consisted of the terminal floor of Plaza G, which was poorly preserved.

Fourteen years later, Nancy Peniche May placed a test excavation unit in Plaza G, closer to the rear of Structure B5 and the north-eastern edge of Structure F2. The goal of her excavations was understand the construction history of this courtyard. The 2x2 unit was denoted as CHP-PL-G-3 (Peniche May 2015:125). This unit was excavated to a depth of 2.42 m below the modern plaza surface, and uncovered a total of 12 plaster floors. Based on these results, she argued that the floors most likely correspond to the construction efforts of Structure B5, which would explain the difference in construction efforts between her unit, and those excavated by Awe and Audet in the southern portion of the courtyard.

## **METHODOLOGY**

### **Structures B5 and G2**

To further explore the construction sequence and formation of Structures B5 and G2, the BVAR Project team placed a single excavation unit, using the previously established orientation of Structure G2 as a guide, 9° east of magnetic north. The dimensions were 2.5 m (E-W) x 2 m (N-S) and was placed just north of Structure G2 and south of the alleyway excavated in 2016. Depth measurements for the excavations were taken from using a Datum 2016C, located 369 above the modern surface of Plaza G. The datum was established using using previous Plaza G and Structure G2 datums as reference. The levels of excavation were established based on either arbitrary or cultural characteristics. Lots were assigned by levels and cultural contexts. All matrices were screened through ¼-inch mesh. Collected artifacts were processed and counted and presented in this report.

### **Plaza G**

During the 2015 excavations of Structure G2, Peniche May and Beardall placed an excavation unit in front of the building's staircase. While discussion of part of the excavation was not included in the report, architecture was uncovered and this served as the stimulus for continued investigation in 2016 (Figure 3). The first unit opened was 1.5x1.5 m, place west of the staircase

of Structure G2 south of the unit excavated the previous year, EU G2-39. A simultaneous unit measuring 1.5x1.5 m was placed west of this same unit, PLG-5. One final unit was placed in the plaza, PLG-6, also 1.5x1.5 m, joining the two previous units making an L-shaped excavation. All units were combined into a single unit (PLG-7) when they had reached level 4. This level was designated based on cultural attributes. The datum used for this was newly established and is 138 cm above Plaza G and is called 2016A. Because of time constraints, the architecture discovered below the plaza was covered by a tarp with the aim of continued excavation the following year.

In 2017 PLG-7 was re-excavated, removing all the backdirt to reveal the tarp and the preserved level of where 2016 excavation had halted. EU G2-17, which was excavated by Peniche May and Beardall, was also re-excavated to once again expose the architecture found therein. Two further units were opened in 2017, PLG-8 and PLG-9, both 2 m (E-W) x 1.5 m (N-S). The datum 2016A was now lost as the tree it was attached to had since been removed. 2017 A was established being 50 cm above the level of Plaza G, while 2017B was placed 200 cm below 2017A, for easier measurements and access inside the unit.

The levels of excavation for Plaza G were established based on both arbitrary and cultural characteristics. Lots were assigned by levels and cultural contexts. All matrices were screened through ¼-inch mesh. Collected artifacts of both seasons were processed and counted and presented in this report.

## **EXCAVATION RESULTS**

### **Structure G2 Excavations**

Excavation Unit (EU) G2-40 was dug to a maximum depth of approximately 120 cm below ground surface. After the humic layer and architectural collapse was removed from the surface of the unit, the top stones of an architecture feature were exposed in the southern part of the unit. Continued excavations revealed that the stones were associated with a terrace, which is possibly part of the G2/8<sup>th</sup> basal platform (Peniche May and Beardall 2016). The terrace was not uniformly constructed as the western part, as exposed in the unit, had a thread of approximately 45 cm while the eastern edge is about 65 cm. The stones used on this portion were also not uniform. The terrace in this portion is about 3 courses high with smaller stones in between. They vary in size from 10-25 cm wide and between 7 and 15 cm high.

Clearing of the collapse layer in the northeastern part of the unit exposed the top course of the wall composing eastern edge of the B5/14<sup>th</sup> terrace. This wall can be seen coming out from under Structure B4 to the north. This wall was exposed in 2016, albeit from the inside, by Beardall (2016:61-62). The wall was associated with an earlier phase of Structure B4, and apart from the other side of B5/14<sup>th</sup>, an earlier version of B5 as well. By the close of the season, the southeast corner of this terrace was exposed. The top course directly under Structure B4 was the same height as can be seen emerging from the same structure to the north. As no cut stones were found at this level in a collapse context, it is likely that some of the cut stones that formed the corner were removed in antiquity for possible reuse in other areas of the site or perhaps in the closure of the alleyway and the modification of the building thereafter. What is evident from this unit is that

during the terminal classic and prior to the filling in of the alleyway, the south-eastern corner of this version of Structure B5 was flush against this northern extreme of Structure G2 (Figure 3).



**Figure 3:** View of EU G2-40 showing earlier versions of Structure B5 in relation to Structure G2.

### *Artifact Counts*

The artifact count yielded a total of 2,762 items that majority of which were ceramic artifacts (Table 1). Of the 2,147 ceramic sherds that were processed, only ~38% ( $n=819$ ) were diagnostic. A total of 50 polychrome sherds were recovered, including two depicting animals. One sherd also had an incised glyph (discussed in more detail below). A total of 86 freshwater shells were recovered. The 20 special finds included 16 modified shells (see Appendix A). The shells which are probably *Pachychilus* sp. (Stanchly, personal communication 2018) and were found within a Terminal Classic fill context. Though not discovered with much depth between them, there is no indication that these were buried specifically as a cached offering.

### *The Animals*

Amid the polychrome fragments extracted from this unit, and all as fill within Structure B5/14<sup>th</sup>, 2 fragments stuck out as being rather special. Both of them contained the image of an animal, most likely rodents (Helmke 2017, personal communication). Helmke believes that Figure 4-A is likely an opossum, but these are not animals represented often. While B is not very clear, it is evident that A was part of a repeated motif that circled the rim of the vessel, most likely a plate.

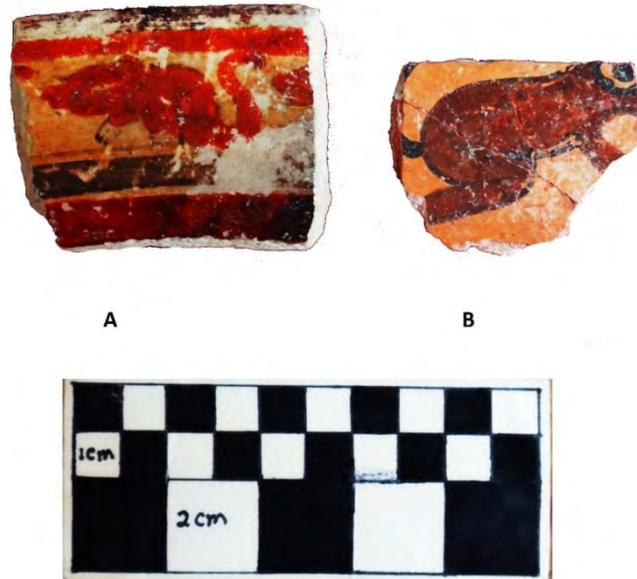
**Table 1:** Artifact count from EU G2-40.

<i>Artifact Class</i>	<i>Count</i>	<i>% of Total Assemblage</i>
Ceramic	2147	77.7
Chert	382	13.8
Freshwater Shell	86	3.1
Faunal Remains	25	1
Marine Shell	24	0.9
Daub	22	0.8
Cobble	20	0.7
Quartz	12	0.4
Obsidian	10	0.4
Special Finds	20	0.7
Charcoal	8	0.3
Granite	4	0.1
Slate	3	0.05
Unknown	3	0.05
<b>Total</b>	<b>2762</b>	<b>100</b>

### *The Glyph*

Alongside the 2 animal sherds, another special sherd found had a glyph incised on it (Figure 5). This glyph was drawn and interpreted by Dr. Christophe Helmke. The sherd is that of a red slipped bowl that was embellished with an incised design, prior to breakage. The addition of such incised decorations is type of secondary embellishment that was practiced throughout the Classic period, although it predominates in some areas during the Early Classic. Based on the form of the sherd, we can say that the incised design was applied to the interior of a well-slipped bowl. What subsists is part of a profile of a supernatural entity that faces to the left. To the right is the circular earflare and the personification head beneath it (Schele and Miller 1986:44), both of which are readily apparent. The entity was represented with a partially open mouth, one of the superior molars visible and what may be a pointed and lolling tongue protruding from the mouth. Very little subsists to enable us to identify this entity, with the exception perhaps of the sinuous serpentine form scrolling down the side of the jaw from the corner of the mouth. This is a distinctive feature of a variety of entities related to water, particularly the personification or rain and thunder, known as the Chaahk (God B; see Taube 1992:17-27). As there are many different manifestations of this deity, at times conflated with other supernatural entities (see Pallán Gayol 2009; Anderson and Helmke 2013), we are not able to provide a more detailed identification at present. Assuming that

the identification of the figure as Chaahk is correct, one might wonder as to why it was depicted with a circular earflare, rather than the more characteristic Spiny Oyster (*Spondylus* sp.) shell that he usually wears (see Schele and Miller 1986:48-49). The addition of this entity to the bowl in question may not have been motivated by any particular religious sentiment to judge from the variety of different themes applied to similarly decorated ceramics in the Maya lowlands. Interestingly, the execution of this figure is the work of an accomplished hand, well versed in Maya iconography, suggesting that this may have been undertaken by a scribal figure of the royal court.



**Figure 4:** Polychrome fragments depicting animals from EU G2-40.



**Figure 5:** An incised red ware sherd: (a) photograph by Antonio Beardall and (b) drawing by Christophe Helmke.

## Plaza G Excavations

In 2015, Peniche May and Beardall placed excavation units on Structure G2 to learn more about the construction history, and in doing so placed a unit at the base of the staircase located on the western side of the structure. After 20 cm in EU-G2-17, an alignment was discovered running north-to-south. This alignment faced east (Figure 6) and was composed of rough cut stones. Additional excavations were placed in this part of Plaza G during the 2016 BVAR field season to expose more of this feature and test the hypothesis that it may be associated with a possible Preclassic period round structure.



**Figure 6:** EU G2-17 showing architecture in Plaza G.

Opening a unit south of the EU-G2-17 allowed for further exposure of the alignment. Given the location of the ‘round’ structure in relation of its proximity to Structure G2, clearing and properly measuring in front of the facing side proved challenging. What we learned from the exposed architecture, however, is that it is at least three courses high. The alignment was also constructed from uneven and roughly cut limestone blocks and measures approximately 25-30 cm high. This structure, at least in the area of excavation, was covered by the terminal floor of Plaza G, where Structure G2 now stands. This structure was built on another plaster floor, Floor 2 (Figure 7).

Exposing the circumference of the structure would be a large undertaking for the limited time, so excavations focused on the area west of the structure. Early misconceptions were that we were in front of the ‘round’ structure but Jorge Can, conservator for the Institute of Archaeology, pointed out we were actually inside it. Previous excavations of round structures, particularly at Cahal Pech, have yielded construction dates in the Middle Preclassic (900-300 BC) in addition to burials and in around the structure, such as those found by Powis at the Tolok group of Cahal Pech in 1993 (Powis 1994). While the burials post-dated the building of the structure itself, their discovery along with those found in another round structure at the Tolok Group, Structure 15 (2 burials), and those of Structure 2-2<sup>nd</sup> at the Zotz group of Cahal Pech (18 burials) (Aimers, Awe and Powis 2000), gave indication of the possibility in finding something similar in the Plaza G round structure. Villareal (2014) and her 2012 excavations of the eastern ballcourt at Chaal Pech also exposed a round structure. While there were no burials documented in these excavations, a cache was found ritually interred next to the platform.

The construction history in this section of Plaza G is very different than that documented by Peniche May in 2014, resembling the more limited construction phases observed Awe and Audet in 1990 and 2000, respectively. What was clear from the 2016 and 2017 excavations that Floor 1, poorly preserved and only visible under Structure G2, represents the terminal phase of plaza construction and was built when the ‘round’ structure was buried. The round structure was built on top of Floor 2, which was elevated 25-30 cm above Floor 3.

Floor 3 was laid directly above the retaining wall and constructions pens and was more or less constantly level across the unit. Floor 3 is associated with a masonry wall located under the round structure aligned E-W (PLG 2017/2<sup>nd</sup>). The 2016 excavations exposed a large part of the upper portion of this wall and indicated that many of the cut stones used in its construction were extracted in antiquity prior to being buried by Floor 3. At the time, it was believed this wall belonged to an earlier structure buried in Plaza G. The 2017 excavations revisited this wall, with units placed to extend the exposure of it and work continuing to expose bedrock in the area where the 2016 excavations ended. It was during the 2017 excavations this feature was identified by Awe (personal communication, 2017) as a retaining wall, built for earlier stability of the plaza and even identifying the crude construction pens visible in the east and west of the unit (Figure 8). Any similarities to Awe and Audet’s excavations ended with Floor 4, which may not be a true floor but rather the top of compacted marl that was laid on Floor 5. Floor 4 sloped downward east-to-west, from being directly under Floor 3 to 55 cm below but ended abruptly as can be seen in Figure 7.

In 2017, the unit (which were collectively dubbed “Noah’s Ark” because of the amount of floodwater inside after storm and the animals caught therein, including 3 snakes) measured 5 m east-to-west and 3 m north-to-south. The unit was excavated to bedrock in front of the wall to a depth between 2.57 m to 2.89 m below the modern plaza surface. The wall was built approximately 50 cm above bedrock on top of a layer of fill. The bedrock sloped downward in the eastern part of “Noah’s Ark” and this reflected the height of the retaining wall in this section. At the eastern end of the unit the wall is 1.6 m tall and consisted of nine courses of cut stones, while in the western end the wall was 1.4 m tall with only six courses. While this wall is shorter than the one documented in Audet’s excavation (Audet 2001:277) and at a steeper angle, the size of the stones used were identical, with some exceeding 20 cm high by 30 cm wide. This wall was labelled PLG 2017/2<sup>nd</sup>.

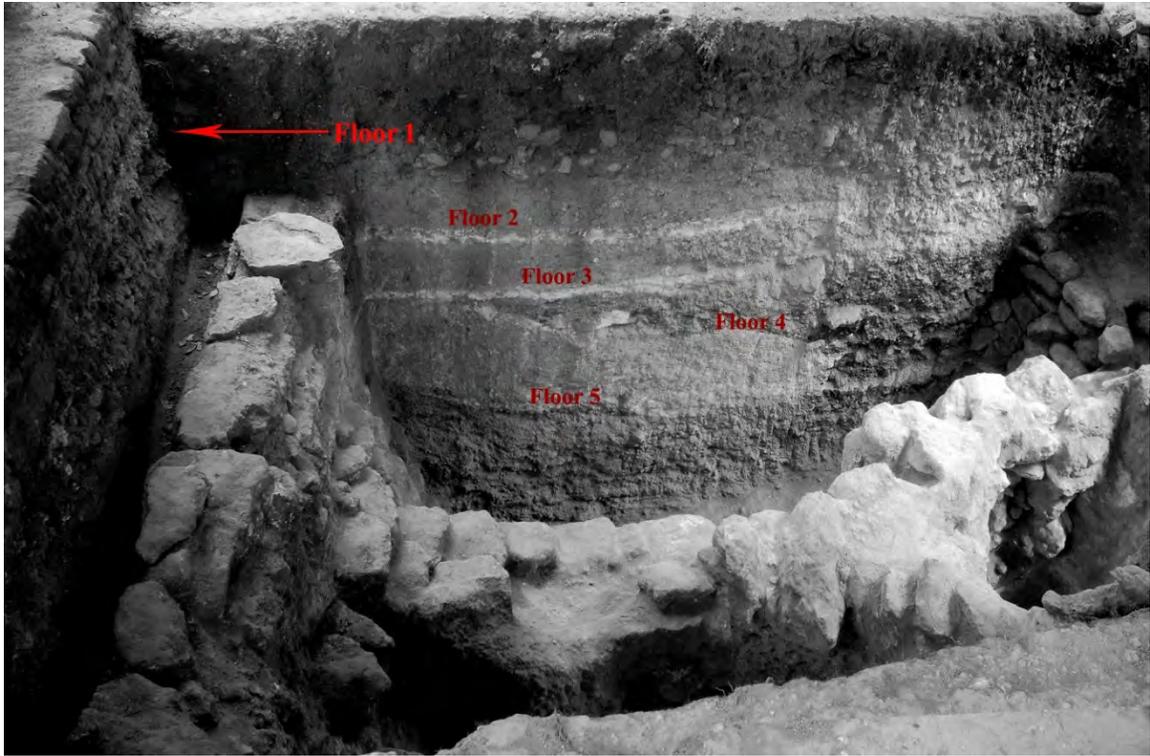


Figure 7: Southern wall of unit showing floors.

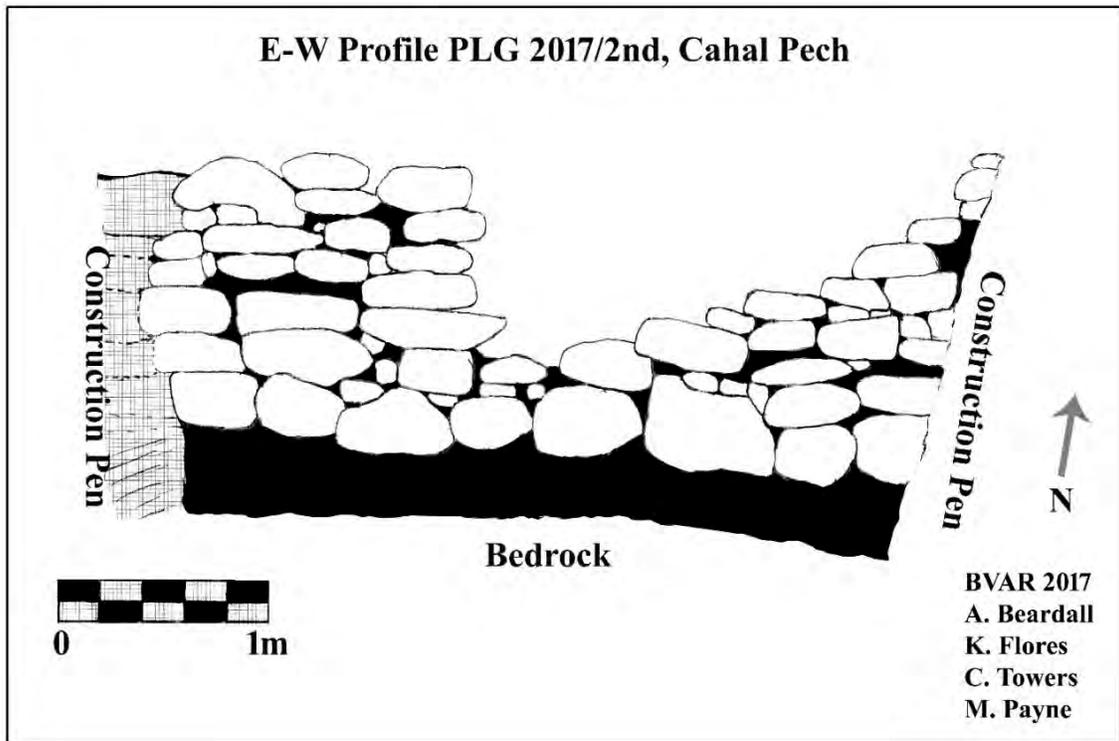
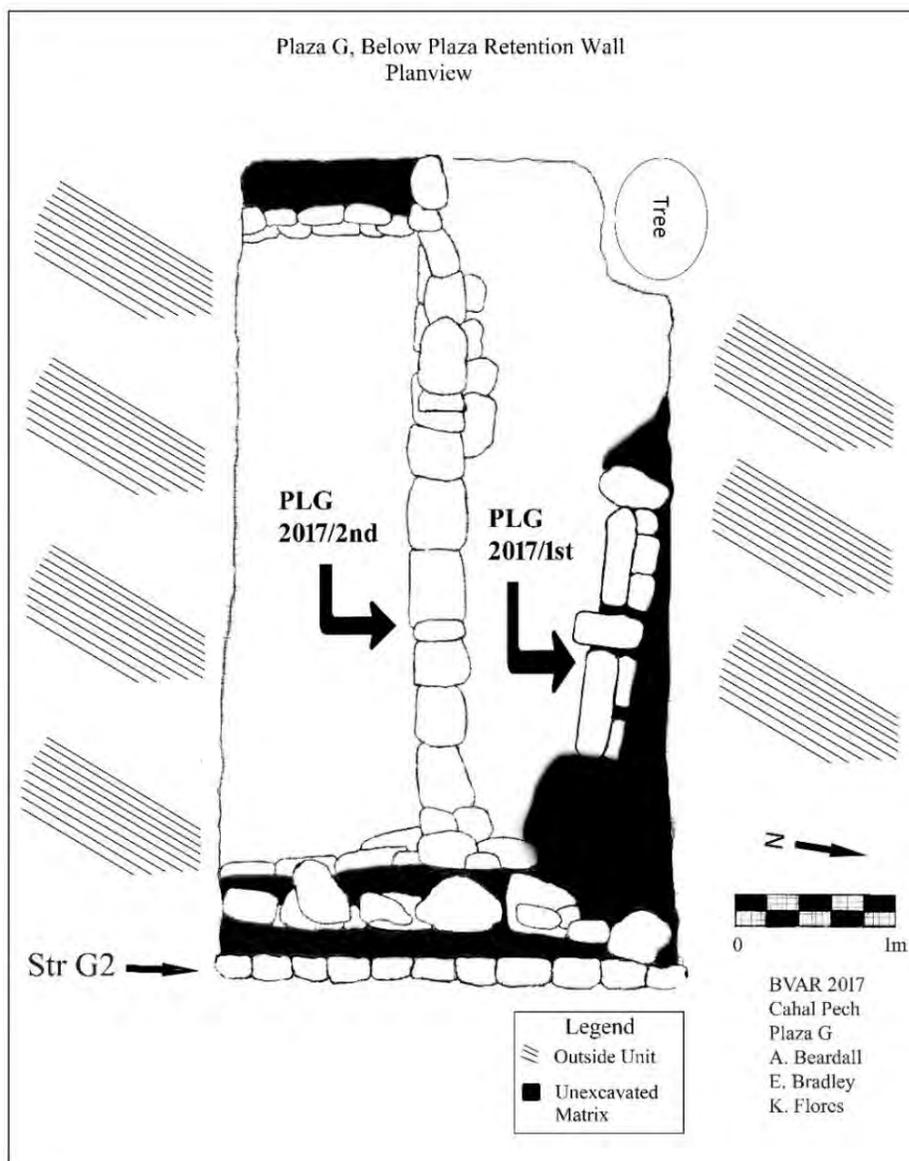


Figure 8: East-West profile of PLG 2017/2<sup>nd</sup>.



**Figure 9:** Plan view of 2017 excavation in Plaza G.

Excavations of a sub-unit behind the wall exposed the earliest construing phase in the unit (PLG 2017/1<sup>st</sup>), which consisted of a low wall, a single course high measuring approximately 15-20 cm high. Limited exposure of this feature indicates that wall was aligned east-west at a different angle from PLG 2017/2<sup>nd</sup>. There were remnants of plaster on the wall, which may have functioned as a low platform. This hypothesis could not be examined further due to the size of the unit and time constraint.

PLG 2017/1<sup>st</sup> is similar to two construction episodes previously identified in Plaza G. Audet recorded her discovery of a similar low wall (G-Plaza/1<sup>st</sup>) in Unit 50 during the 2000 excavations (Audet 2001:277). G-Plaza/1<sup>st</sup> was 3.4 m below plaza level, about half a meter deeper than PLG 2017/1<sup>st</sup> but roughly the same height and alignment. She placed that construction during

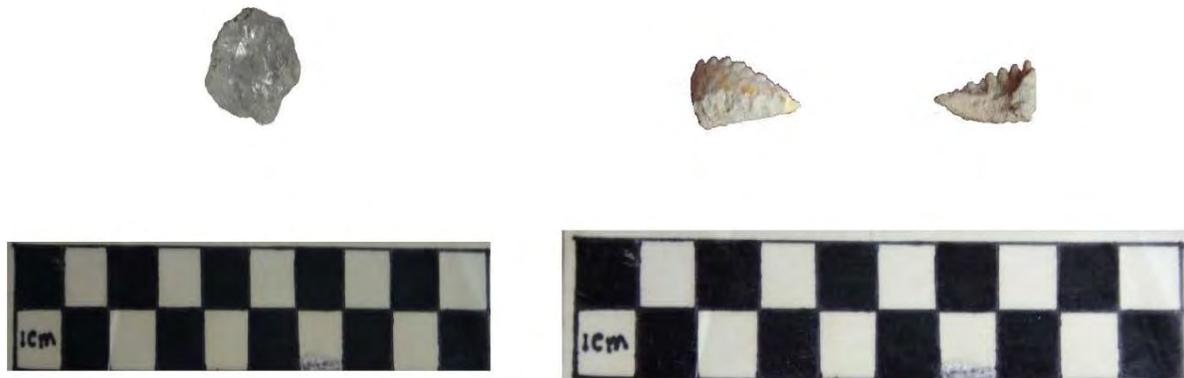
the Middle Preclassic. In 2015, Peniche May and Beardall also encountered a similar feature in a unit placed almost in the center of Structure G2. This unit, EU G2-22, was dug to a considerable depth and an alignment of cut stones was found. This was two courses high, with an east-west alignment, but was also bisected by a perpendicular wall (Peniche May and Beardall 2016:32). This alignment could possibly be the same as PLG 2017/1<sup>st</sup> as they are at similar depths, could very possibly line up, and also are made up of stones of similar size. Time constraints did not allow for further excavations of EU G2-22 after the documentation of this feature, but it is possible it is more than a single course. Peniche May placed this construction at least by the Late Preclassic based on ceramics found in context. Future analysis of the ceramics found in context with PLG 2017/1<sup>st</sup> may shed light on an approximate time, and results of that shall come later on.

The Plaza G excavations yielded a total of 8387 artifacts (Table 2), ceramics being the largest portion at 70%. Of the ceramic artifacts recovered, only 31% were diagnostic. Chert was the second largest at 17% and freshwater shells at 9.4%. Of the 114 pieces of quartz recovered during the 2016 and 2017 excavations, one fragment was beautifully translucent (Figure 10a). Another highlight, though tiny, was a single mandible found (Figure 10b). Gavin Wisner and Dr. Chrissina Burke (personal communication, 2018) both identified it a parrotfish mandible, and Dr. Claire Ebert indicated mentioned (personal communication, 2018) that the remains of parrotfish have been found in a Preclassic contexts across excavation in Plaza B at Cahal Pech.

The special finds in Plaza G included mostly stone tool fragments. Two figurine fragments were found (Appendix A). Both of these were recovered under Floor 3, inside the construction fill in front of the wall. This is not uncommon, as most Preclassic figurines found at Cahal Pech come from a construction fill context (DeLance 2016:187). A small effigy of a bat head was found in the construction fill above Floor 3.

**Table 2:** Artifact count from Plaza G 2016 and 2017 excavations.

<i>Artifact Class</i>	<i>Count</i>	<i>% of Total Assemblage</i>
Ceramic	5849	70
Chert	1462	17.4
Freshwater Shell	795	9.4
Faunal Remains	30	0.4
Human Remains	5	0.03
Marine Shell	26	0.3
Daub	2	0.02
Cobble	9	0.1
Quartz	114	1.3
Obsidian	28	0.3
Special Finds	17	0.2
Charcoal	22	0.3
Granite	21	0.2
Slate	5	0.03
Unknown	2	0.02
<b>Total</b>	<b>8387</b>	<b>100</b>



**Figure 10:** Quartz (left) and parrotfish mandible (right) from 2017 Plaza G excavations.

## DISCUSSION AND CONCLUSIONS

The construction history of both Structure B5 (Peniche May 2015) and Structure G2 (Peniche May and Beardall 2016) are well understood. The 2017 excavation placed between both structures have shed more light on the form of the buildings during the Terminal Classic period, prior to the infilling of the alleyway between Structures B4 and B5. The most puzzling aspect of this excavation was the discovery of the 16 modified shells found in front of the B5/14<sup>th</sup> terrace. The likes of these shells have never been seen before by other archaeologists, including those who specialize in faunal remains. These will have to be examined further and that analysis will be published at a later date.

The excavations in Plaza G over the past two years, 2016 and 2017, revealed that the construction history is more complicated. The four times this plaza has been examined as such, 1990, 2000, 2014, and 2016/2017, only twice have the results been similar. While Awe's 1990 excavations exposed five plaster floors, he encountered sterile soil less than two meters below the plaza surface. Both Audet and Beardall in 2000 and 2016/2017, respectively, encountered five possible construction phases, each finding both a retaining wall more than a meter high, but also a low construction of approximately 15 cm. All of these, however, are far from the multiple floors found by Peniche May in 2014 (12 total), however this is likely attributed to the proximity of that unit to Structure B5.

In 2016, a wall was discovered while excavating inside a supposed round platform buried in Plaza G. If this feature is indeed part of a round platform, it places the wall discovered under it as early as the Middle Preclassic period (900-300 BC) when the round platforms were constructed at Cahal Pecha and other sites across the Belize Valley. Plaza G was constructed later than Plaza B, which is likely why Peniche May's excavations yielded 12 floors over just the maximum of five found by Awe, Audet, and Beardall. In the expansion of the city, levelling of the plazas were undertaken by the placing of retaining walls and constructions pens, to help hold together the newly expanded plazas. In the case of PLG 2017/2<sup>nd</sup>, it was built most likely as the site was expanded

south behind Structure B5, with further expansions taking place not long after, resulting the wall discovered by Audet in 2000. The wall she discovered is higher as it is likely the bedrock dips further in that section of the city, thus needing more wall to keep the plaza as level and intact as possible. Further investigations of the 'round' structure as well as the wall are required to shed more light on this time during the evolution of Cahal Pech as a growing city during the Preclassic and later periods. Plaza G is yet to reveal all her secrets as so far its construction history is showing to be quite complex.

**Acknowledgments.** Firstly, thanks go to Dr Jaime Awe for allowing me chance to once again be a part of the Belize Valley Archaeological Reconnaissance and helping me have a greater appreciation for the beauty of retaining walls. My gratitude also extends to Dr John Morris, Director for the Institute of Archaeology for allowing me to keep building my field skills. Dr. Christophe Helmke was very instrumental in assisting me and his expertise gave so much more colour to my work. The girls from Galen University, Julia, Nadiene, Kaycee and Yasmini, thank you for your dedication in the work and making me realize the education achieved in this project is never wasted. Luis C. and Luis S, Krystal, Cole, Elijah, Jorge Lozano, Shane and Michael, thanks for your hard work taking the dirt out and back in again, and Monty Payne for helping me with the madness of it all. Gavin Wisner, Dr. Chrissina Burke, Norbert Stanchley, thanks for making me see the excitement in shells and parrotfish, and Dr. Claire Ebert, for being a voice of reason and reassurance. And lastly, to Jorge "Steaky" Can, for popping up on site just when I had a question he had the answer for.

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**APPENDIX A: 2017 PLAZA G SPECIAL FINDS**

**G2 40**



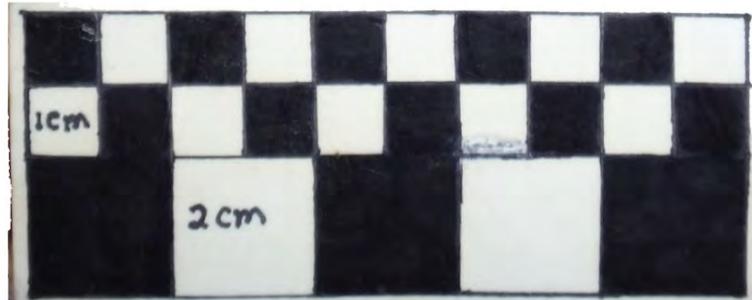
**Stone Tool**



**Stone Tool**



**Modified Shell**



**PLAZA G**



**Bat head effigy**



**Figurine Fragment**



**Stone tool fragments**



**Chert Drill Fragments**



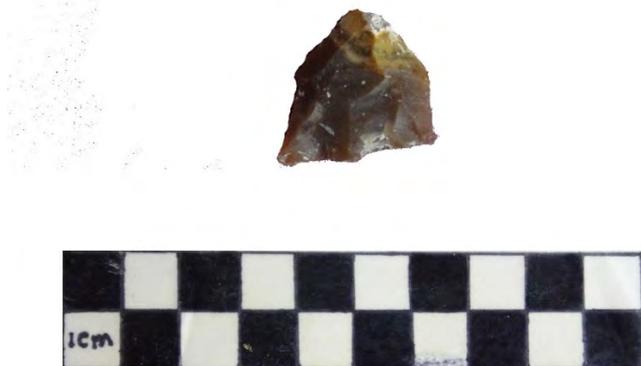
**Stone Tool Fragments**



**Ceramic Vessel Leg?**



**Scraper?**



**Possible Point**



***Incensario* Fragment**



**Figurine Fragment**

# THE MATERIAL CORRELATES OF ANCESTOR WORSHIP: CERAMIC AND LITHIC ANALYSES OF A TERMINAL DEPOSIT AT CAHAL PECH'S ZOPILOTE GROUP

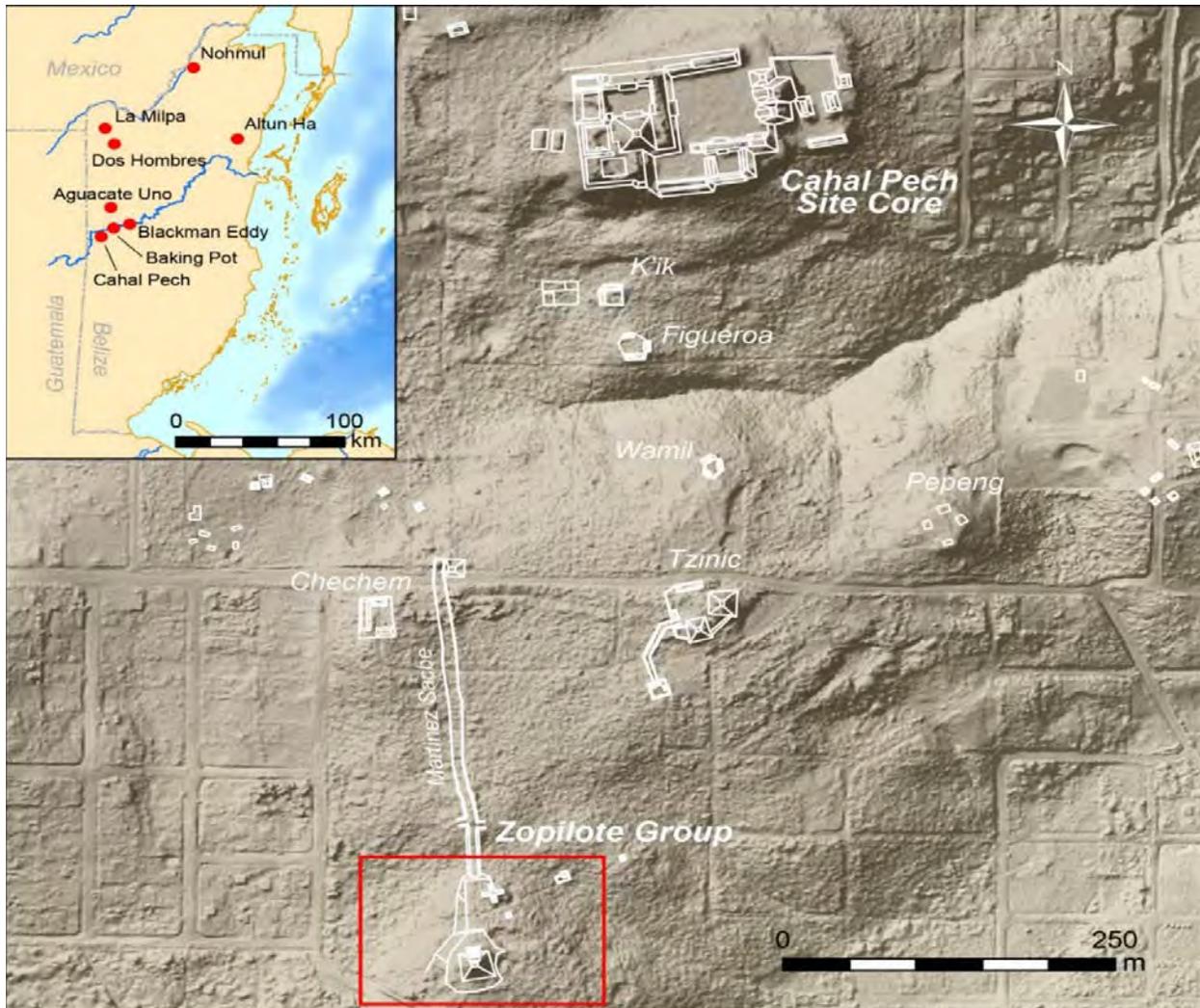
Steve Fox  
Northern Arizona University

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## INTRODUCTION

The research goals for the 2017 field season Belize Valley Archaeological Reconnaissance (BVAR) Project sought to understand the form and function of a large terminal deposit found on the southwestern face of Structure 2 at Cahal Pech's Zopilote Group. The Zopilote Group is classified as a terminus group and is located approximately 0.75 km south of the Cahal Pech civic-ceremonial core, in the Belize River Valley (Figure 1; Cheetham et al. 1993; Cheetham et al. 1994; Cheetham et al. 2004; Ebert and Fox 2016; Fox and Awe 2017). A terminus group is defined as an architectural assemblage, usually serving a non-domestic function, which is connected to an adjacent ceremonial center via manufactured causeways, or *sacbeob* in Yucatec Maya (Cheetham 2004; Shaw 2008). The Zopilote Group is composed of five structures, two of which surround a large plaza where the Martinez Sacbe terminates (Cheetham et al. 1992; Ferguson et al. 1994). Previous research suggests that the Martinez Sacbe was constructed during the Late Preclassic period (300 BC-AD 300) and extend ~280 meters north from the Zopilote Group platform towards the Cahal Pech core (Cheetham et al. 1993; Ebert and Fox 2016). Structure 1 is an 11.5 meter tall temple located on the southern portion of the group's platform, which was initially constructed during the Middle Preclassic period (900-300 BC). Excavations conducted at Structure 1 in the early 1990's by Cheetham and colleagues discovered two burials beneath the building's terminal staircase containing elite sumptuary goods and evidence of human sacrifice.

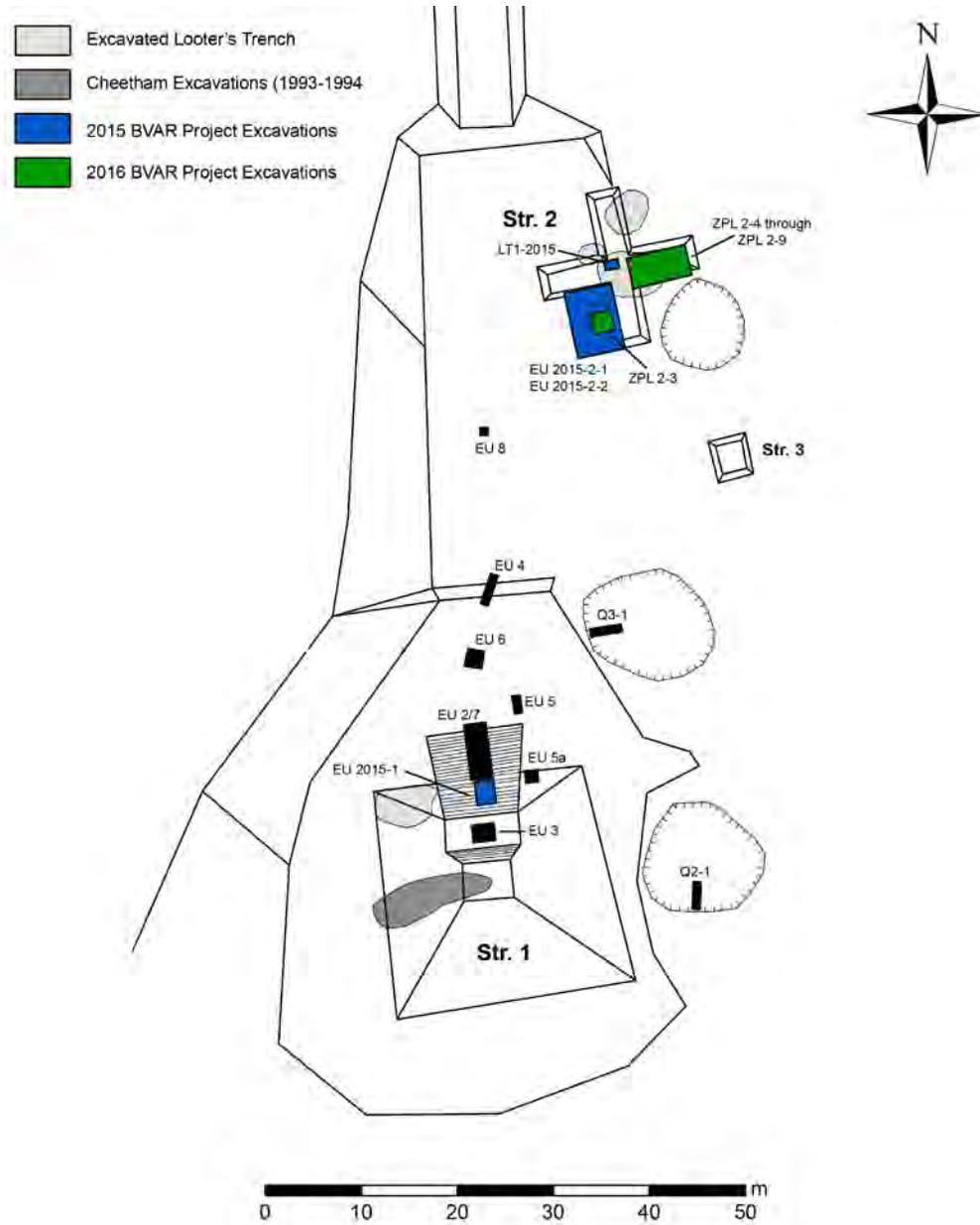
During the 2015 and 2016 field seasons, BVAR Project excavations continued at the Zopilote Group focusing on Structure 1 and Structure 2 (Figure 2; Ebert and Fox 2016; Fox and Awe 2017; Ebert 2017). Excavations aimed to refine the occupational history of the Structure 1 through AMS <sup>14</sup>C dating of stratified construction phases. Cheetham and colleagues (1993; Cheetham 2004) documented a total of ten construction phases during initial excavations conducted during the 1992 field season (Figure 2). The earliest of these construction phases (ZPL-1 1<sup>st</sup>-ZPL-1 3<sup>rd</sup>) were found in association with Kankluk (900-300 BC) and Xakal (300 BC-AD 300) ceramic materials (Cheetham et al. 1994; Ebert and Fox 2016). Earlier materials, including Cunil (~1200-1000/900 BC) and transitional Cunil/Kankluk ceramics, were recovered above the paleosol layer during the 2015 excavations and may reflect the initial residential occupation of site (Sullivan and Awe 2013; Ebert and Fox 2016). A total of six carbon samples recovered from Structure 1 were selected for AMS dating during the 2015 field season.



**Figure 1:** Map illustrating the location of the Zopilote Group relation to the Cahal Pech site core and peripheral settlement groups. Inset shows location of Cahal Pech and other major sites located in Belize (map by Claire Ebert, 2016).

Excavations on Structure 2 at the Zopilote Group sought to analyze the form and function of the building in relation to the rest of the group. Structure 2 is thought to be cruciform in shape, and excavations from both the 2015 and 2016 field season indicate that it was built in a single construction episode during the Late Classic period (AD 600-900). In 2015, a large, informal unit was placed on the southwestern face of Structure 2 and was used to remove the humic layer to expose any intact architecture features and in situ artifactual materials. A large wall was uncovered, oriented approximately to the east, abutting into the center of the structure (Figure 3). This feature coincides with the assumption that Structure 2 was, in fact, cruciform in shape. Furthermore, excavations revealed a large terminal deposit that sat atop the terminal floor of Structure 2 (Figure 4). Terminal deposits are large, surficial artifact deposits, consisting of mostly ceramic materials, which have been recovered in the corners of plazas, in front of staircases, and in the doorways of public architecture (Ebert and Fox 2016). These deposits are associated with the Terminal Classic period (AD 600-900) and may be correlated to the final use of a structure. Current hypothesis

regarding the cultural behaviors that terminal deposits reflect are domestic middens, de facto refuse, dedication/termination rituals, desecration rituals, feasting event, or remnants of ancestor worship (Awe 2012; Blackmore 2007; Chase and Chase 2007; Ebert and Fox 2016; Fox and Awe 2017; Hoggarth et al. 2016; Houk 2000; Lonaker et al. 2017; Pagliaro et al. 2003; Stanton et al. 2008). After the terminal deposit was photographed and removed, researchers observed there was evidence that the terminal deposit continued into southern baulk of the excavation unit. This observation directed excavations during the 2016 field season, seeking to recover and document the extent of the terminal deposit.



**Figure 2:** Map of the Zopilote Group showing BVAR Project excavations from 1993-1994 and 2015-2016 (map by Claire Ebert, modified from Ebert and Fox 2016: Fig. 10).



**Figure 3:** Photograph of the informal unit placed on the western face of Structure. Notice the intact wall feature that runs into the center of the structure (photograph by Claire Ebert, 2015).



**Figure 4:** Photo of terminal deposit found during the 2015 field season. Notice the wall that runs atop the deposit with artifacts eroding out of the side (Photograph by Steve Fox, 2015).

Laboratory analysis during the 2017 field season sought to analyze the complete artifact assemblage recovered from the deposit during the 2015 and 2016 field seasons. Laboratory analysis focused exclusively on ceramic and lithic artifacts as there was no evidence of human, faunal, or marine shell artifacts found in the deposit. Ceramic analysis was conducted using the type-variety method established for the Belize River Valley (Gifford 1976). Furthermore, modal analysis was also performed to investigate the types of vessel forms that were found in the deposit that may give insight into types of cultural behaviors the terminal deposit found at the Zopilote Group may represent (Gifford 1976). In total, 36,662 ceramic sherds were recovered from the deposit, 2,575 of which exhibit diagnostic attributes accounting for 7% of the entire deposit. Ceramic analysis evaluated 100% of diagnostic ceramics using the type-variety method and modal analysis to investigate what types of cultural behaviors the ceramic types and forms can be attributed to.

Lithic analysis was performed using a three-stage process. Lithics were first categorized as cores, tools, and flakes. These categories were further refined based on surface characteristics. Cores were subcategorized into uni-directional, multi-directional, and core fragments. Formal tools were subcategorized using the functional approach based on the most commonly found tools recovered from Maya area. These tools include projectile points, bifaces, adzes, *manos*, *metates*, and scrapers. Finally, lithics classified as flakes were sub-categorized using the triple cortex typology and technological approach (after Andrefsky 2005). The triple cortex typology classifies flakes into the categories of primary, secondary, or tertiary depending of the amount of cortex present on the exterior surface. Once these flakes were categorized, the technological approach was attempted (mostly on tertiary flakes and debitage) to gauge the level of production these flakes represent. These categories are biface thinning flakes, bipolar flakes, retouched scraper flakes, blades, and notching flakes (after Adrefsky 2005). However, it should be noted that few lithic flakes and debitage could be analyzed using the technological approach. In total, 367 chert fragments were analyzed with 230 showing evidence of human modification accounting for 62% of the total sample. The following sections describe a detailed account of excavations and laboratory results of the Zopilote Group performed by Belize Valley Archaeological Reconnaissance project (BVAR).

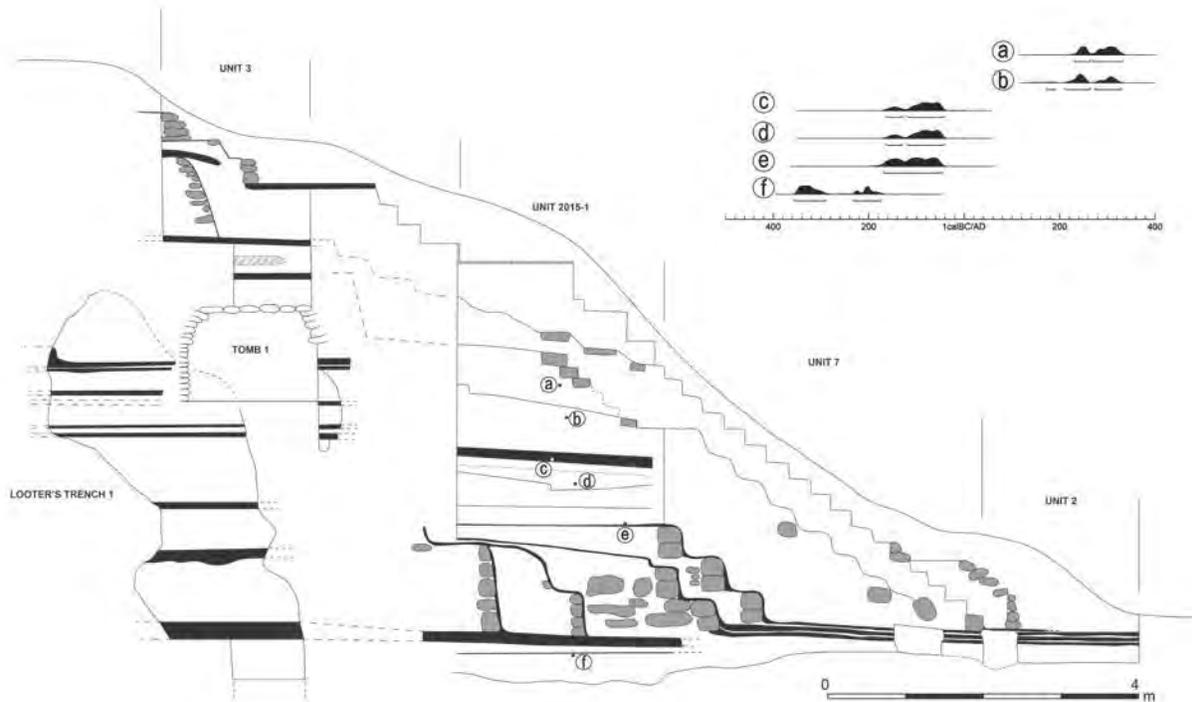
## **PREVIOUS EXCAVATIONS AT THE ZOPILOTE GROUP**

This section gives a detailed account of the excavations performed by the BVAR project at the Zopilote Group for over the past two decades. Excavations were supervised by Cheetham (Cheetham et al. 1993; Cheetham et al. 1994), Ebert, and Fox (Ebert and Fox 2016; Ebert 2017; Fox and Awe 2017) with the assistance of BVAR Project field students and local Belizean field crew.

### **Results of Excavations during the 1992 and 1993 Field Seasons**

Excavations at the Zopilote Group in the early 1990's was conducted by Cheetham and colleagues who focused on analyzing the occupational history of Structure 1 at Zopilote (Cheetham et al. 1993; Cheetham et al. 1994). Structure 1 is an 11.5 meter tall temple where excavations revealed ten super imposed construction phases (Figure 5). The earliest of these phases (ZPL-1 1<sup>st</sup> – ZPL-1 3<sup>rd</sup>) contained evidence of Kankluk (900-350 BC) and Xakal (350BC-AD 350) ceramic

phases yielding a relative date associated with the Middle Preclassic period (Cheetham et al. 1993; Ebert and Fox 2016). Two excavation units were placed on the northern axial staircase of Structure 1 where two vaulted tombs were uncovered (Cheetham et al. 1993; Cheetham et al. 1994). Tomb 1 was dug beneath floors 3 and 4 and contained seven unplastered vault beams used for support (Cheetham et al. 1993). Two burials in primary and secondary context were discovered. Individual 1 was in extended position with the head oriented towards the south. Individual 2 consisted of a head placed on a dish with an inverted vessel covering it and was placed at the feet of the primary burial. Both individuals were thought to be young adult males.



**Figure 5:** Profile of Zopilote Structure 1, showing 11 superimposed construction phases. Radiocarbon samples collected from Unit 2015-1 are lettered a-f and correspond to calibrated date ranges in upper right corner (Ebert and Fox 2016: Fig. 11).

Tomb 1 contained numerous amounts of elite sumptuary goods. These artifacts include a jade human effigy pendant, two jade beads, a stingray spine, two *Spondylus* shell earflares, a disc shaped shell, fresh-water shell, two small stone balls, a stone bead, and multi-colored stucco veneer fragments (Cheetham et al. 1993). Additionally, Tomb 1 also contained nine pottery vessels, two of which are Dos Arroyos Orange (Vessel #1) and Saxche Orange (Vessel #2) polychrome types. Cheetham and colleagues (1993) state that the iconography on the interior of Vessel #1 displays three individuals carrying a deer, stylized serpent/jaguar, and a species of waterfowl. The iconography on Vessel #2 depicts five individuals dressed in elaborate feathered and animal skin costumes on the exterior of the vessel (Figure 6). All five of these individuals wield shields and spears or axes. The rest of the ceramic assemblage includes Minana Red basal ridge dish, a Balanza Black vase, and three Pucte Brown vessels consisting of a small bowl, a pedestal-*tecomate*, and a pitcher (Cheetham et al. 1993).



**Figure 6:** Image of the iconographic depictions of Vessel #2 found in Tomb #1 at the Zopilote Group. Has been suggested as depicting a military procession (Cheetham et al. 1993: Fig. 7).

Tomb 2 was found during the 1993 field season under the north facing axial staircase by Cheetham and colleagues (1994). Aptly nicknamed the “Stelae Chamber”, Tomb 2 contained two fragments of a Late Preclassic stela (Stela 9) in association with extensive evidence of human sacrifice (Figure 7; Cheetham et al 1994; Awe et al. 2009). The remains of at least two infants and remnants of a still-born were found in association with a circular depression on top of the stela that may have acted as a receptacle for offerings (Cheetham et al. 1994; Awe et al. 2009). Awe and colleagues (2009) assert the stela fragments were placed upright within the chamber with approximately 200 small, hemispherical bowls encircling the monument. Furthermore, approximately 225 human phalanges were found in association with the bowls were also recovered. Finally, at the base of stela 45 mandibular incisors and other human remains were also discovered.



**Figure 7:** Profile drawing of the “Stela Chamber” found at Structure 1 at Zopilote. Stela 9 sits in a vaulted chamber packed with matrix with a significant amount of human sacrifice found within the chamber (Awe et al. 2009: Fig. 5).

The iconography of Stela 9 depicts an individual in the maw of a composite creature depicting jaguar and serpent imagery (Awe et al. 2009). The individual's arms are flexed and the hands are oriented in a manner associated with "scattering" iconography. Stela 9's iconography, size, and execution have been attributed to Late Preclassic prototypes (Awe et al. 2009). Awe and colleagues (2009) assert the iconographic depiction of an individual in the maw of creature exhibiting jaguar and serpent imagery may be associated with the concept of *way*, or animal co-spirits, associated with shamanism. "The concept of animal companion spirits that accompany the human soul is deeply connected to the shamanistic roots of Maya – and Mesoamerican – religion" (Awe et al. 2009: 185). Awe and colleagues (2009) also suggest Stela 9 could be depicting an important ancestor within the maw of the earth. The iconographic evidence, the extensive amount of human sacrifice, and a circular receptacle for offerings on top of the stela suggests Tomb 2 may have ritual significance attributed to this feature.

### **Results of Excavations during 2015 and 2016 Field Season**

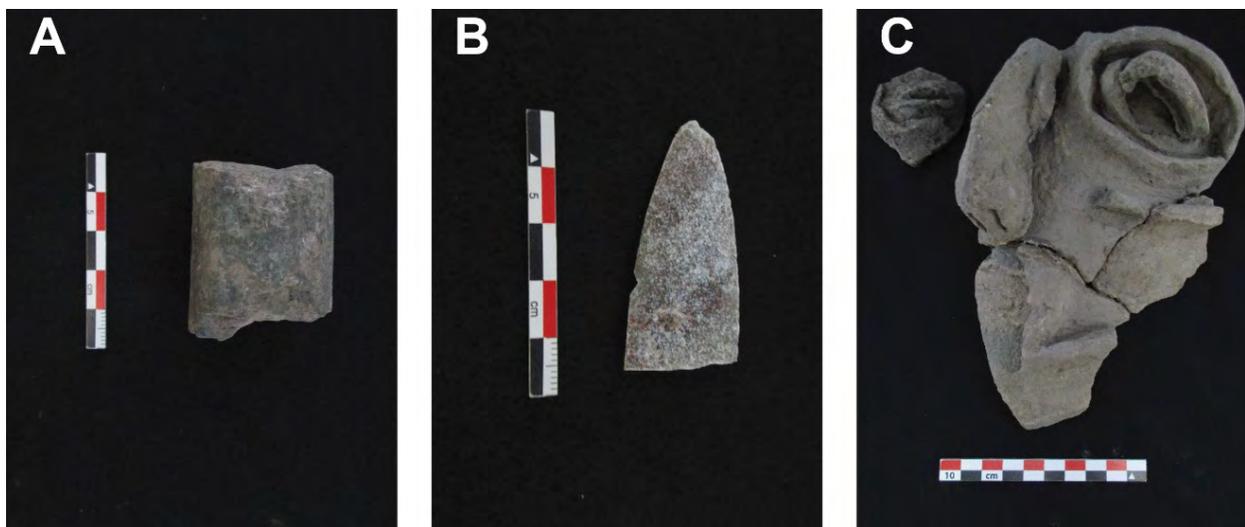
The 2015 field season sought to refine the occupational history of Structure 1 through AMS dating in addition to assessing the form and function of Structure 2. Ebert and Fox (2016) place a 2x2 meter unit abutting the southern baulk of a unit placed by Cheetham and colleagues (1994) in the early 1990's. The purpose of this unit was to recover samples for radiometric dates associated with corresponding construction phases. A total of six carbon samples were selected for dating. The earliest sample was found below Floor 1b (ZPL-1 1<sup>st</sup>) yielded a two-sigma date of 355-175 cal BC (UCIAMS-164873) (Ebert and Fox 2016). The date range retrieved from the sample indicates the construction of the temple platforms began during the Late Preclassic period. Three other samples taken from ZPL-1 5<sup>th</sup> through ZPL-1 7<sup>th</sup> strata yielded dates between 170-40 cal BC (UCIAMS-164878, UCIAMS-164875, UCIAMS-164874) indicating the temple platforms were being rapidly constructed in the Late Preclassic period (Ebert and Fox 2016). Finally, two samples were taken from ZPL-1 8<sup>th</sup> giving a date range of AD 170-330 (UCIAMS-164877) and cal AD 30-335 (UCIAMS-164876) respectively (Ebert and Fox 2016). These samples indicate that the largest building episode took place during the beginning of the Early Classic period. This phase of construction correlates with building projects within the Cahal Pech civic-ceremonial center where buildings and plaza were being built or remodeled.

Excavations also took place on the southwestern face of Structure 2 at the Zopilote Group during the 2015 field season. The focus of these excavations was to assess the form and function of Structure 2. An informal unit sought to remove the humic layer to reveal any intact architectural features in addition to recovering any cultural materials left in situ. Upon removal of the humic layer, a wall oriented approximately northeast abutted into the center of the structure. This wall met another circular wall feature that, as the circular wall progressed to right, began to deteriorate. The intact architectural features found on the southwestern face of Structure 2 gives weight to the assumption that the structure was cruciform in shape. Yet, due to the extensive amount of looting that occurred on the structure the actual architectural form may not be assessable.

After the removal of the humic layer, a large terminal deposit was discovered that spanned the entire length of the unit and continued into the southern baulk. "Terminal deposits are characteristically large surficial deposits located in the corners of plazas, in front of stairs, and in the doorways of public architecture and date to the final use of the structure" (Ebert and Fox 2016:

97). Current hypotheses regarding the cultural behaviors that led to the formation of terminal deposits are domestic middens, de facto refuse, dedication/termination rituals, discretion rituals, ritual feasting, and acts of ancestor worship. The terminal deposit found at the Zopilote Group consisted of mostly utilitarian ceramics largely from the Spanish Lookout ceramic phase that Gifford (1976) postulates is associated with the latter part of the Late Classic era. Some of the special finds found within the deposit include a fragment of a slate wrench, a chert projectile, and fragments of pedregal modeled *incensario* depicting the Jaguar God of the Underworld (Figure 9). The Jaguar God of the Underworld is associated with fire and the male dynastic line (Taube 1992). *Incensarios* were used in ritual burning of incense and fire offerings which may account for the high levels of carbon observable within the matrix layer of the terminal deposit.

It should be noted that once the terminal deposit was uncovered, a low-lying wall was found transgressing the surface of the deposit. The wall was one to two courses thick and likely was used to delineate private space (Ebert and Fox 2016). There also was a circular-like niche feature that adorned the core of the structure (Figure 10). This niche-like feature could have been used to house ritual paraphernalia, such as *incensarios*, or have been used for the placement of offerings as ceramic sherds were found within this feature.



**Figure 9:** Photos of the special finds found during the 2015 field season: (A) slate wrench fragment, (B) Chert projectile point fragments, and (C) fragments of a Pedregal Modeled *incensario* vessel (photographs by Claire Ebert, 2016).



**Figure 10:** Photograph of the circular niche feature found at Structure 2 at Zopilote.



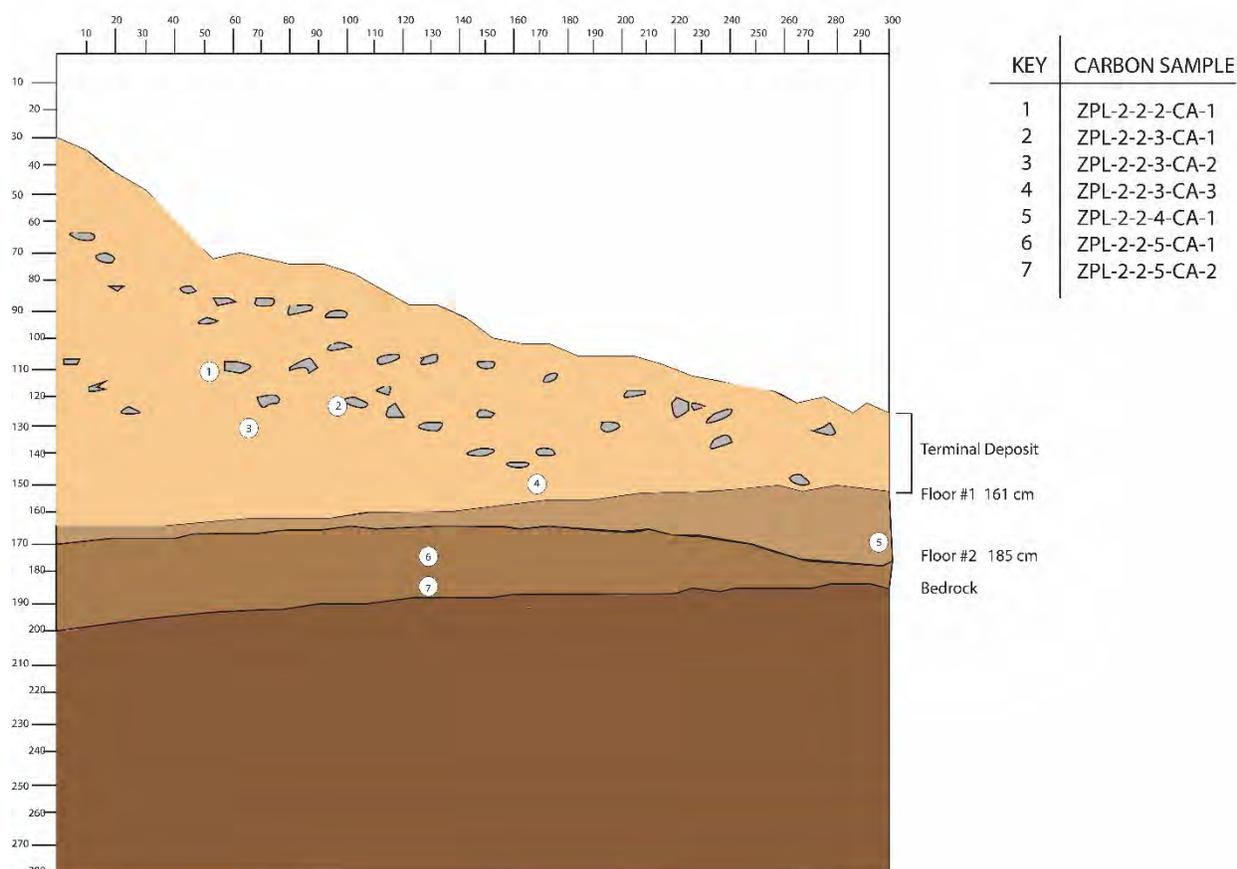
**Figure 11:** Photograph of terminal deposit found during the 2016 field season. There is evidence of collapsed stones oriented into a circular fashion yet it's hard to assess whether this is a cultural feature or just collapse.

The 2016 field season investigated the extent of the terminal deposit as there is evidence the deposit continued into the southern baulk of the previous year's excavation unit. A 2x3 m unit was placed adjacent to the previous year's unit. After the humic layer was removed, the deposit was revealed and seemed to be in a thicker concentration than what was discovered the previous year (Figure 11). A large amount of utilitarian ceramics and chert artifacts were recovered. Furthermore, once the deposit was removed and excavations penetrated two floors, a total of seven carbon samples were recovered (Fox and Awe 2017). Four of these samples were recovered from the deposit, one in between Floor 1 and 2, and two more samples recovered just above bedrock. Future radiocarbon dating of these samples will give insight into the relative time frame it took for the deposit to develop in addition to giving an absolute date from when Structure 2 was first erected. Figures 12 and 13 show the southern baulk of the unit where upon further investigation one can see matrix layers separating artifact layers indicating that the terminal deposit likely formed over multiple periods rather than a single episode.



**Figure 12:** Photograph of the southern baulk of ZPL-2-2. There is evidence of matrix layers separating various artifact layers indicating the deposit likely formed during multiple episodes.

## Profile of ZPL-2-2 with Carbon Samples found In Situ.



**Figure 13:** Profile drawing of the southern baulk of the excavation unit. Notice there seems to be separation between various artifact layers indicating the deposit likely formed during multiple episodes.

A 1x3 m extension unit was placed next to the aforementioned excavation unit as there was evidence the deposit continued into the baulk of the excavation unit (Figure 14). Once the humic layer was removed, the deposit was vertically photographed in 15 cm increments to document the formation of the deposit that later can be used in photogrammetry. This unit represented the thickest concentration of artifacts found thus far which could give insights into the depositional processes of how the deposit formed. The cultural activities may have been concentrated in this area and either cultural or environmental factors, such as bioturbation, may have caused the deposit to eventually be spread over the entire area. Excavations were halted after the deposit was removed due to time restraints and the need to process the artifacts for laboratory analysis that would be conducted during the 2017 field season.



**Figure 14:** Photograph of ZPL-2-3-3. This level is where the terminal deposit began to become discovered.

## **2017 LABORATORY ANALYSES AND RESULTS**

Laboratory analysis during the 2017 BVAR field season focused specifically on ceramic and lithic classification, in addition to evaluating any special finds that were discovered within the terminal deposit's context. Laboratory analysis facilitated the refinement of initial artifact inventories taken from previous excavations, in addition to solidifying the actual diagnostic artifact counts from their original projection.

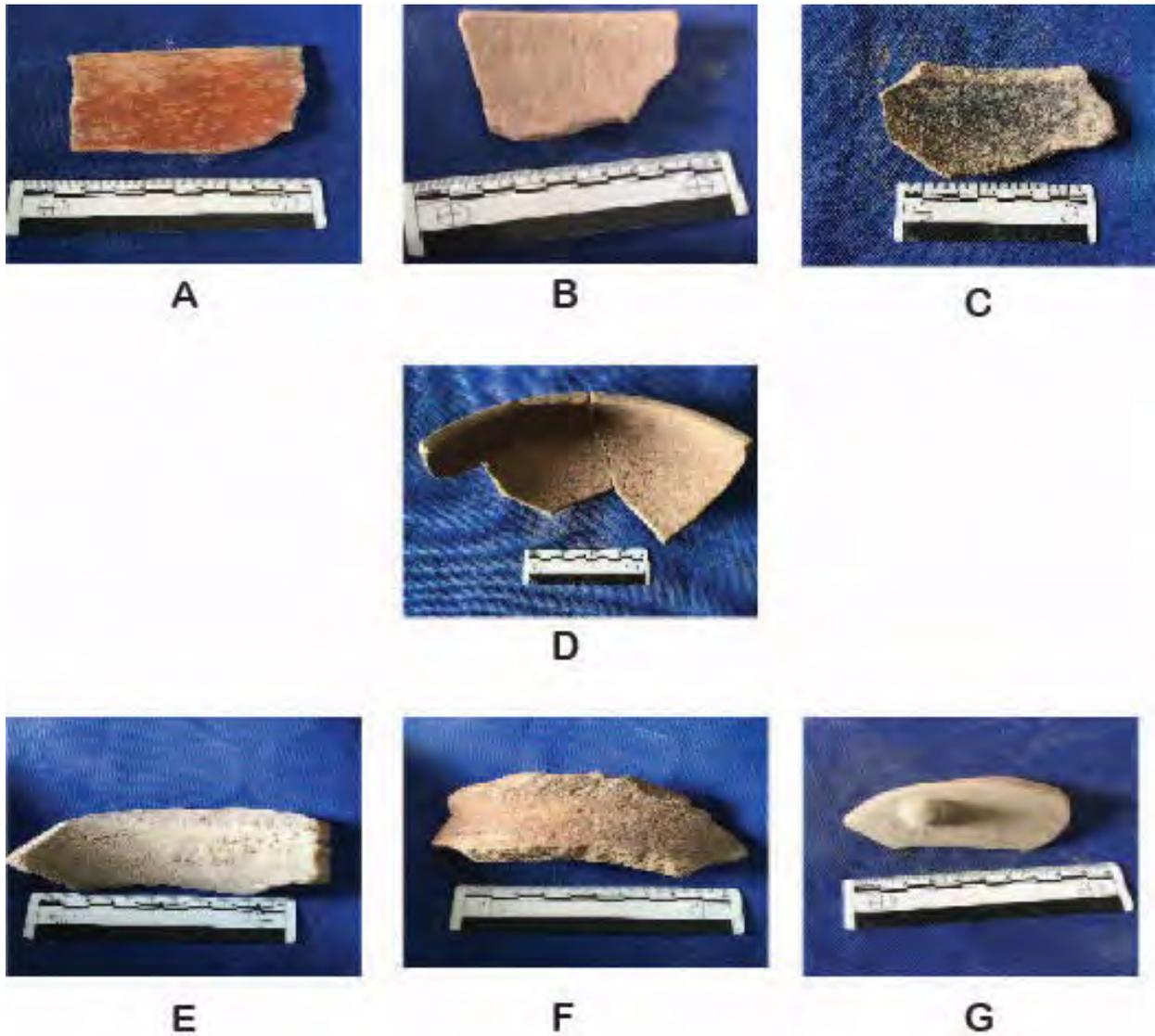
### **Ceramic Analysis**

Ceramic analysis was conducted using the type-variety method established for the Belize River Valley (Gifford 1976) and Cahal Pech (Awe 1992). Sherds were first sorted based on the day they were removed from the deposit, and placed into categories based on surface attributes, paste composition, and rim or vessel form to facilitate refitting. The Spanish Lookout phase at Cahal Pech (~AD 600-850/900) contains two primary temper types, calcite and volcanic ash, that were critical in placing these sherds into initial categories classified as wares. In total, 36,662 ceramic sherds were recovered, 4,139 of which were originally classified as diagnostic. A 100% sample of all diagnostic sherds were analyzed and due to the level of decomposition present on the sherd's surface, a total of 2,575 were confirmed to be diagnostic accounting for 7% of the total deposit. Table 1 illustrates the types of ceramics represented within the deposit. Almost all ceramic types correspond to the Spanish Lookout phase with a few from earlier ceramic complexes. The conclusion is that ceramics from these earlier phases were likely due to construction fill from other structures that became intermixed within the deposit.

**Table 1:** Frequency of ceramic types found within the Zopilote Structure 2 deposit. Refitted sherds were counted only once. Percentages rounded to the nearest and may not equal 100%.

<i>Ceramic Phase</i>	<i>Date Range</i>	<i>Type</i>	<i>Variety</i>	<i>Frequency</i>	<i>Percent</i>
Spanish Lookout	AD 700-900	Garbutt Creek Red	Garbutt Creek Variety	641	24.9%
		Belize Red	Belize Variety	615	23.9%
		Mount Maloney Black	Mount Maloney Variety	465	18.1%
		Dolphin Head Red	Dolphin Head Variety	290	11.3%
		Cayo Unsipped	Cayo Variety	142	5.5%
		Benque Viejo Polychrome	Variety Unspecified	140	5.4%
		Alexanders Unslipped	Alexanders Variety	125	4.9%
		McRae Impressed	McRae Variety	28	1.1%
		Roaring Creek Red	Roaring Creek Variety	27	1.1%
		Platon Puntated-incised	Platon Variety	21	0.8%
		Chunhuitz Orange	Variety Unspecified	18	0.7%
		Rubber Camp Brown	Rubber Camp Variety	5	0.2%
		Vaca Falls Red	Vaca Falls Variety	4	0.2%
		Xunantunich Black-on-orange	Variety Unspecified	4	0.2%
		Gallinero Fluted	Gallinero Variety	2	0.1%
		Palmar Orange Polychrome	Variety Unspecified	1	>0.1%
		Alexanders Unslipped	Croja Variety	1	>0.1%
		Humes Bank Unsipped	Humes Bank Variety	1	>0.1%
		Pedregal Modeled		1	>0.1%
		Canoa Incised		1	>0.1%
Tiger Run	AD 600-700	Mountain Pine Red	Mountain Pine Variety	2	0.1%
		San Pedro Impressed		1	>0.1%
Hermitage	AD 300-600	Balanza Black	Balanza Variety	1	>0.1%
Jenny Creek	900-300 BC	Savana Orange	Savana Variety	8	0.3%
		Jocote Orange-brown	Jocote Variety	3	0.1%
		Tecomate		1	>0.1%
		"Special"		18	0.7%
		Unknown Jars		9	0.4%
<b>TOTAL</b>				<b>2575</b>	<b>100%</b>

The most common ceramic types found within the deposit are Dolphin Head Red, Garbutt Creek Red, Mount Maloney Black, and Belize Red ceramic types. Whereas Garbutt Creek Red and Mount Maloney Black are mostly representative of bowls, other vessel forms were identified for Dolphin Head Red and Belize Red (Figure 15).



**Figure 15:** Photos of the most represented sherds in the deposit. A) Dolphin Head Red. B) Garbutt Creek Red. C) Mount Maloney Black. D) Belize Red. E) Cayo Unslipped. F) Alexander Unslipped. G) Benque Viejo Polychrome.

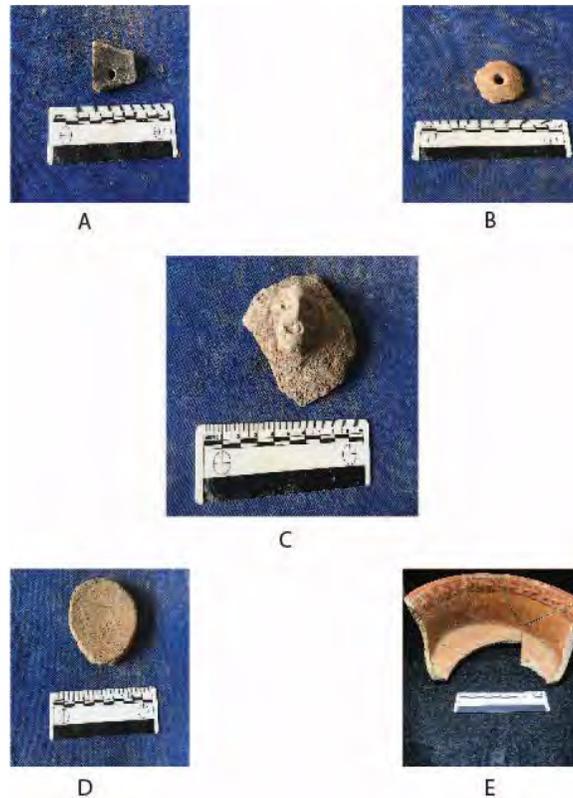
The application of modal analysis determined the majority of vessel forms found within the terminal deposit at Zopilote correspond to bowls, accounting for 60% of the assemblage. Table 2 illustrates the frequency of vessel forms found within the deposit. This is interesting as the archaeological correlates representing various aspects of human behaviors can be assessed through the ceramic forms found within the deposit. A domestic midden would have little artifactual

patterning whereas an event, such as ritual feast, would have relatively equal proportions of cooking and serving vessels in addition to a significant proportion of elite wares (Stanton et al. 2008; Hoggarth 2016). However, a complete lack of faunal remains, the presence of a pedregal modeled incensario vessel fragment, and a high proportion of ceramic bowls indicates the aforementioned scenarios do not account for the terminal deposit found at Zopilote. Bowls can be used as receptacles for offerings and in correlation with *incensario* vessel fragments in addition to a high proportion of ash found within the matrix encasing the deposit, rituals incorporating burned offerings were likely being performed. Furthermore, the terminal deposit is within the vicinity of two elite burials containing ritual paraphernalia and evidence of human sacrifice in correlation with the Late Classic period. Therefore, the conclusion can be drawn that the artifactual material and context of the terminal deposit may correlate with acts of ancestor worship performed by the ancient Maya after the collapse of Cahal Pech during the Terminal Classic period (AD750-850/900).

Excavations during the 2016 field season also produced some special finds that were recovered during laboratory analysis (Figure 16). Figure 16A and 16B represent sherds that may have been terminated due to the presence of a “kill hole” that penetrates the sherds surface. The ritual killing of objects symbolizes the release of that objects spiritual energy, or *ch’ul* (Taube 2004). These holes also can be associated with an effort to repair a vessel yet the other pieces that could have been fitted together were not discovered. Figure 16B also could represent a spindle whorl modified from an existing sherd due to the sherd’s circular shape. Figure 16C exhibits an anthropomorphic face adorning the side of a vessel. This artifact shares some similarities with Lacandon god pots found in Chiapas that served a receptacle for food offerings the gods would ritually feed from (McGee 1990). This artifact in correlation with the *incensario* vessel found in 2015 gives weight to the assumption that this terminal deposit is ritual in nature. Figure 16D has two associated functions. The first is that this ceramic disc are used to cover the orifices of jars. The second function is that a local Belizean informant told me that even today they used ceramics for forming pottery vessels. Finally, Figure 16E is a Xunantunich Black on Orange bowl that represents the most intact vessel found thus that could have been used as a receptacle for offerings.

**Table 2:** Proportion of vessel forms found Zopilote Structure 2 deposit. Vessel form could be determined in some cases where type could not. Percentages rounded to the nearest and may not equal 100%.

<i>Vessel Form</i>	<i>Frequency</i>	<i>Percentage of Assemblage</i>
Bowl	1552	59.3%
Dish	447	17.1%
Jar	441	16.9%
Plate	174	6.7%
Vase	2	0.1%
<i>Incensario</i>	1	>0.1%
<b>Total</b>	<b>2617</b>	<b>100%</b>



**Figure 16:** Photos of special finds found during the 2016 field season: (A) Sherd exhibiting a possible kill hole, (B) spindle whorl, (C) anthropomorphic face adorning the side of a vessel, (D) ceramic disk, and (E) Xunantunich Black-on-Orange polychrome bowl.

### Lithic Analysis

A second goal of laboratory analyses was to investigate the types of lithic technologies present within the deposit. Lithic tools were assessed through the examination of surface characteristics of chert artifacts to understand their function. Lithic analysis was conducted using a three stage model based on the functional method and the triple cortex typology (after Andrefsky 2005). The first stage of analysis consists of separating cores from tools, flakes, and debitage. Cores were then further separated by surface characteristics associated with multi-directional and uni-directional flaking, and by core fragments. Multi-directional cores exhibit flake scars knapped from numerous angles, whereas uni-directional cores exhibit flake scars in one uniform direction. Core fragments including chert nodules that represent a core but the angles of flake scarring cannot be assessed.

Tool categories were based on the most commonly found lithic tools in Mesoamerica. Functional categories based on the most commonly found lithic tools in the Maya area include bifaces, projectile points, *manos* and *metates* (i.e., ground stone tools), scrapers, and adzes. However, these categories were used as a baseline for analysis since all categories were not represented within the deposit.

Chert flakes were refined using the Triple Cortex typology. The Triple Cortex typology categorizes lithic artifacts according to the amount of cortex present on the distal surface of an artifact. Lithic artifacts with over 50% of the exterior surface exhibiting cortex were categorized as primary flakes. Those with less than 50% cortex were labeled as secondary flakes and those with no identifiable cortex on the outer surface were classified as tertiary. Tertiary flakes are thought to be associated with higher stages of production whereas primary flakes are associated with beginning stages of flint knapping.

Finally, debitage was categorized using the technological approach and placed into the categories of bifacial thinning flakes, bipolar flakes, blades, and other production byproducts in order to identify the level of lithic production some artifacts may have gone through prior to their deposition within the terminal deposit. Bifacial thinning flakes are associated with detached flake fragments associated with biface production, and are defined as, “curved longitudinal cross-sections, extremely acute lateral and distal edge angles, feathered flake terminations, narrow faceted striking platforms, a lip, little or no cortex, and a small flattened or diffused bulb of force” (Andrefsky 2005). Bipolar flakes are produced through direct percussion on an artifact placed on an anvil type device that causes the flake to exhibit fractures from both areas of applied force (Andrefsky 2005). Finally, blades are categorized not according to their proposed function, but rather by dimensions. Any flake that is twice as long as it is wide was classified as a blade. However, there was very few instances of debitage recovered from the deposit and this could be due to either a lack of production refuse being placed in the context of the deposit or sampling biases.

The complete lithic assemblage ( $n=564$ ) recovered from the terminal deposit was analyzed according to the aforementioned criteria (Table 3; Figure 19). If there was no noticeable evidence of surface manipulation, this material was classified as unmodified, and no additional analyses were conducted on the artifact. Approximately 40% ( $n=230$ ) of chert artifacts possessed evidence of human modification.

**Table 3.** Frequencies of lithic types found within the deposit. Percentages rounded to the nearest and may not equal 100%.

<i>Lithic Categories</i>	<i>Frequency</i>	<i>Percent</i>
<i>Cores</i>	46	20.0%
Multi-directional Cores	20	8.7%
Uni-directional Cores	19	8.3%
Core Fragments	7	3.0%
<i>Flakes</i>	186	80.9%
Secondary Flake	69	30.0%
Primary Flake	61	26.5%
Tertiary Flake	35	15.2%
<i>Tools and Production Byproducts</i>	19	8.3%
Blades	17	7.4%
Projectile Points	1	0.4%
Biface Thinning Flakes	1	0.4%
<b>Total</b>	<b>230</b>	<b>100%</b>

Most of the lithic material recovered from the terminal deposit exhibited little or no human modification, with the assemblage dominated by of primary and secondary flakes (i.e., debitage), and unmodified chert nodules (82% of the lithic assemblage). Only two formal tools were recovered from the deposit, including a chert point and fragment of a slate wrench (Fig. 3a-b). These patterns suggest may be the result of sampling bias, introduced by disturbance from looting at the site that may have mixed contexts, or that high frequencies of debitage represent remnants of ritual activities that were not concerned with utilizing highly manufactured lithic material. Iconographic evidence suggest that chert is often associated with thunder and from a phenomenological viewpoint, and the striking of chert flakes from a core would produce sparks and the smell of burning reminiscent of lightning strikes (Stone and Zender 2011). In the context of a multi-century drought documented by paleoclimate records from across the lowlands during the Terminal Classic period (Kennett et al. 2012; Medina-Elizalde et al. 2010), the aim of rituals associated with chert flakes might have to bringing rain.

## DISCUSSION AND CONCLUSIONS

The ceramic and lithic assemblages analyzed from the terminal deposit located at Structure 2 in the Zopilote Group sheds light on the types of activities carried out at this location. However, these cultural behaviors can only be ascertained through contextual analysis of the deposit in relation to the entire site. While the recovery of Cunil phase (1200/1000-900 cal BC) ceramics and domestic refuse at the lowermost levels of excavations in Structure A-1 at the Zopilote Groups, indicates early domestic activity at the site, larger scale construction of small temple platforms first begins during the Late Preclassic (~355-175 cal BC; Ebert and Fox 2016; Ebert et al. 2017). The ritual significance of the group likely developed during this time, when Stela 9, which depicts an individual within the maw of a composite jaguar-serpent creature, was originally placed at the base of Structure 1 (Cheetham et al. 1993; Awe et al. 2009). Awe and colleagues (2009) argue that the iconography of Stela 9 is associated with the concept of *way*, or animal co-spirit, which has been linked to shamanistic activities in the epigraphic record (Stuart 2005). The presence of several Late Classic period burials, all of which were associated with elite individuals, additionally indicates the ritual importance of the Zopilote Group to people living at Cahal Pech. In addition to an elaborate tomb burial of a high status male (Tomb 1), a second burial was also placed in Late Classic period architecture above the “stela chamber” containing Stela 9. Because Stela 9 was likely commissioned during the Late Preclassic period, coinciding with massive building episodes at Zopilote and the Cahal Pech elite epicenter, I argue that Zopilote functioned as an important ritual location at Cahal Pech by at least the Late Preclassic period (Awe 1992; Cheetham 2004; Ebert and Fox 2016; Ebert 2017). Additionally, interment of the burials at Structure 1 on the center line of the building’s the northern staircase may have been used to replicate the concept of *axis mundi*. In this context, Structure 1 functioned as the sacred mountain that often symbolizes the paradise where the ancestors are thought to reside (Taube 2004). The stela chamber occupying a lower position beneath the northern staircase may be associated with the underworld, or *Xibalba*, whereas the higher positioning of the Tomb 1 may symbolically link this elite individual with the dynastic lineage of Cahal Pech through directional placement based on Maya cosmology.

The question becomes what is the association between the activities carried out at Structure 1 with the placement of the terminal deposit at Structure 2? Examination of the stratigraphy of the southern baulk of unit ZPL-2-2-(1-5) excavated in 2016 showed alternating layers of matrix and

artifacts, indicating that the deposit was not created during a single depositional episode but rather through several periods of activity through time. Ceramic analysis indicated that most of the wares present in the deposit were utilitarian types dating to the Spanish Lookout phase, and do not reflect elite sumptuary goods. High frequencies of Mount Maloney Black, Garbutt Creek Red, and Belize Red types with distinct paste compositions suggests local production and consumption of ceramic vessels. None of the ceramics evaluated during analysis show any affiliation with Petén style wares (Gifford 1976), also suggesting most of the ceramic types were likely locally produced rather than imported. The quantity of utilitarian wares, the varying paste composition, and the lack of imported wares suggests that the terminal deposit likely occurred due to activities carried out by commoners inhabiting the hinterlands surrounding Cahal Pech after the collapse of the site during the Terminal Classic period.

The ceramic forms present in the deposit also illustrate what types of activities that may have been performed at the Zopilote Group. Approximately 60% of the ceramic assemblage excavated from the deposit consisted of bowls. This can be compared to a typical refuse midden, which would contain little artifactual patterning ascertainable by archaeologists, or to a feasting context, which would contain relatively equal proportions of serving and cooking vessels with higher probability of decorated fine wares. Desecration rituals would contain defaced elite paraphernalia and architectural features with high probability of burning evident within the matrix layers. The high proportion of bowls, the lack of elite paraphernalia, and the deposit's location in the proximity of two elite burials dismisses the three aforementioned hypotheses concerning the cultural behaviors the terminal deposit could represent at the Zopilote Group.

Two other factors provide critical insight into what types of activities were conducted Structure 2. First, there is evidence of burning within the matrix layers of the deposit. Secondly, fragments of a Pedregal modeled *incensario* vessel depicting the Jaguar God of the Underworld that was also recovered from the deposit during the 2015 excavations (Ebert and Fox 2016). The Jaguar God of the Underworld is the dualistic manifestation of the sun god *K'inich Ahau* who is embodied with regeneration properties, an association with the male dynastic line, and fire ceremonies (Taube 1992). The idea of regeneration of the soul is a pan-Mesoamerican religious concept associated with the sun and maize cultivation. The *incensario* vessel found in the terminal deposit at the Zopilote Group may have been used to burn offerings to appease the ancestors. The bowls found within the deposit may also represent receptacles that contained offerings. These offerings, in addition to fire rituals, may have included foodstuffs and pilgrimage tokens such as the unmodified, primary, and secondary chert fragments taken from the deposit. Conversely, the high ratio of primary and secondary flakes could be from the Maya striking a chert core to produce a spark to ignite a fuel source for fire rituals. If Structure 1 is viewed as a symbolic mountain where the ancestors reside, then positioning of Structure 2 next to the termination of the Martinez Sacbe could serve as a location where fire ceremonies and food offerings were placed. The local Maya may have been honoring ancestors associated with the dynastic founding of Cahal Pech after the site's collapse during the Terminal Classic period. Conclusively, with the commission of Stela 9 during the Preclassic period in correlation with Terminal Classic ritual activity found at Structure 2, the Zopilote Group likely functioned first as an elite ritual center sanctioned by the 'state' that eventually declined with the abandonment of Cahal Pech. However, the site's ritual significance likely was embedded within the social memory of the inhabitants remaining within the hinterland

areas causing them to continually revisit Zopilote to pay homage to their ancient beginnings during times of great social and environmental stresses characteristic of the Terminal Classic period.

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## COMMENTS ON A GLYPHIC SHERD FROM BAKING POT, BELIZE

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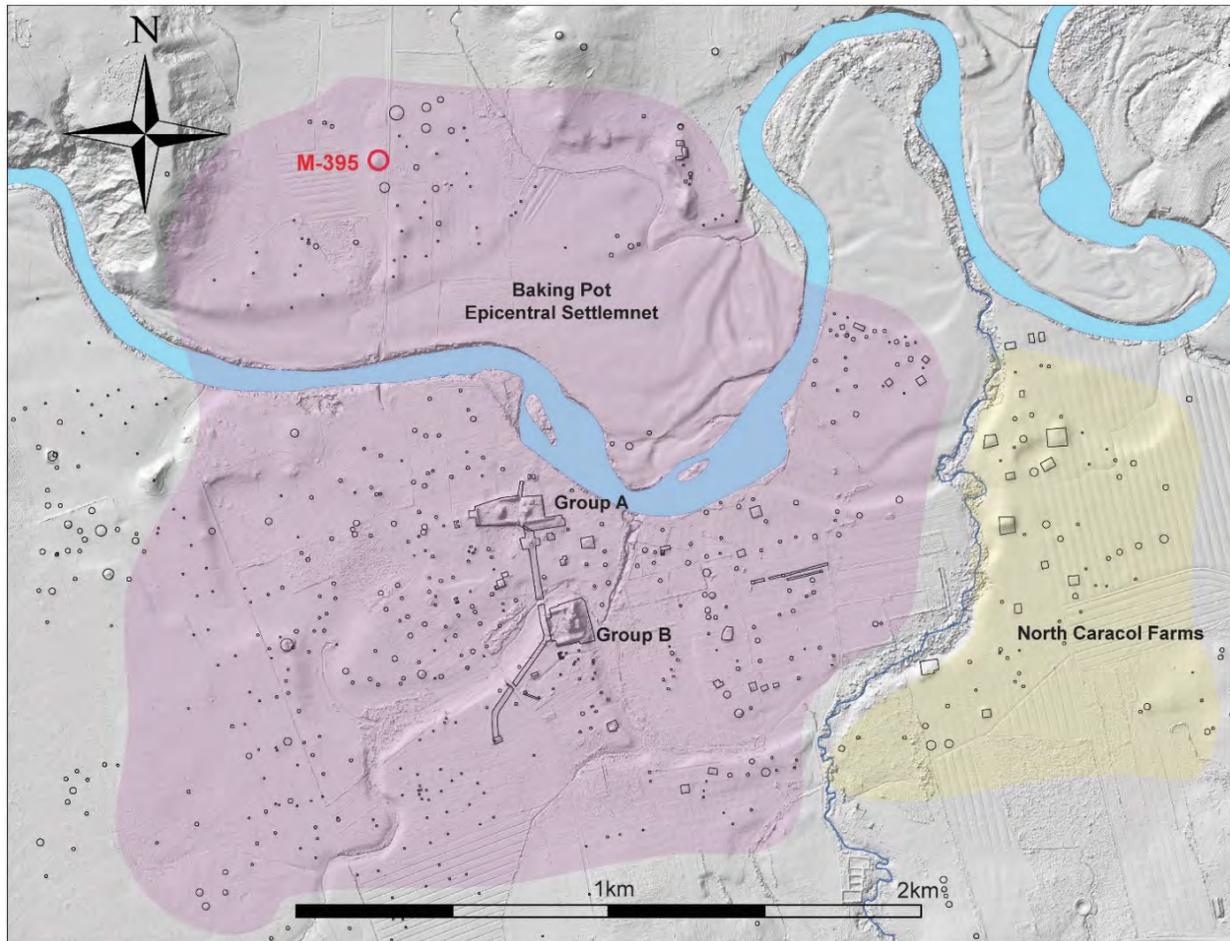
This report presents an epigraphic analysis of a ceramic sherd found as part of surface collection and pedestrian surveys of the northern reaches of the epicentral settlement of Baking Pot, to the north of the Belize River. This sherd may preserve a reference to the dynastic title of Caracol kings. Here we introduce the context of this find and compare this specimen to the three other ceramic vessels, known to date, that make reference to the Caracol dynastic title. As a means of comparison, we provide the analysis of the specimen found at Baking Pot and conclude with a few comments concerning the ramifications of this find.

### BACKGROUND AND CONTEXT OF DISCOVERY

Settlement surveys of the epicentral and peripheral areas around the monumental center of Baking Pot were conducted from 2007 through 2009 (Hoggarth 2009; Hoggarth et al. 2008; Jobbová 2009), focused on mapping house mounds and other features across the landscape. Survey in 2007 focused on mapping settlement clusters within the epicentral settlement of Baking Pot (Figure 1). This area has been subject to modern agricultural activity and plowing for many years, and although large mounds are visible on the surface, they have been substantially modified and reduced from their original dimensions. Annual plowing brings new artifacts to the surface and survey during the 2007 season was strategically planned to map the areas after they had been plowed and before crops reached heights that would disable the detection of the mounds and associated artifact scatters.

In June and of July 2007, survey was focused in the epicentral and peripheral settlement areas around Baking Pot, recording the dimensions and heights of mounds, as well as collecting a sample of surface materials to determine chronological longevity of occupation in the area. This research builds upon James Conlon's survey of the site (Conlon and Ehret 1999, 2000). During surface collections and survey in the northern settlement cluster, an eroded ceramic sherd bearing a glyphic text along its rim was identified at M-395, located 1.6 km north of the monumental epicenter (Figure 1). The approximate dimensions of M-395 were 62 x 58 m, with a height of 3.75 m. Also included in this lot were ceramic sherds, faunal material, lithics, and shell. Apart from the eroded sherd bearing the glyphic text, a perforated marine shell pendant, and a fragmentary limestone mace (with possible glyphic text) were also recovered at M-395 (see Hoggarth et al. 2008:171-172, Fig. 9). In addition,

two eccentrics were found at neighboring mounds. In general, the area clusters around larger house mounds, exhibiting evidence of material wealth and higher status.



**Figure 1:** Map of Baking Pot and the epicentral settlement area, showing the location of M-395 where the glyphic sherd was recovered through surface collections (map by Claire Ebert and Julie Hoggarth).

## THE CARACOL DYNASTIC TITLE ON CERAMIC VESSELS

The workshops attached to royal courts during the Classic period are characterized by differing outputs, depending on the various reigns and periods. In addition, certain royal courts distinguish themselves greatly in terms of the ceramic production in comparison to others. For instance, the ceramic workshops of Naranjo have the distinction of producing a broad array of unique polychromatic serving vessels, especially during the reign of the Middle Classic king *Ajasaaj Chan K'inich* (also known as “Aj Wosal”) (r. AD 546-615+) and during the Late Classic reign of the 38<sup>th</sup> king, *K'ahk' Tiliw Chan Chaahk* (r. AD 693-728+) (see Martin and Grube 2008:71-72, 75-77). The ceramics produced during their reigns were predominantly made for the consumption of the king and the local court, and yet these vessels have been found at several allied sites in the eastern central lowlands, attesting to the importance of gifting as a means of cementing alliances between different

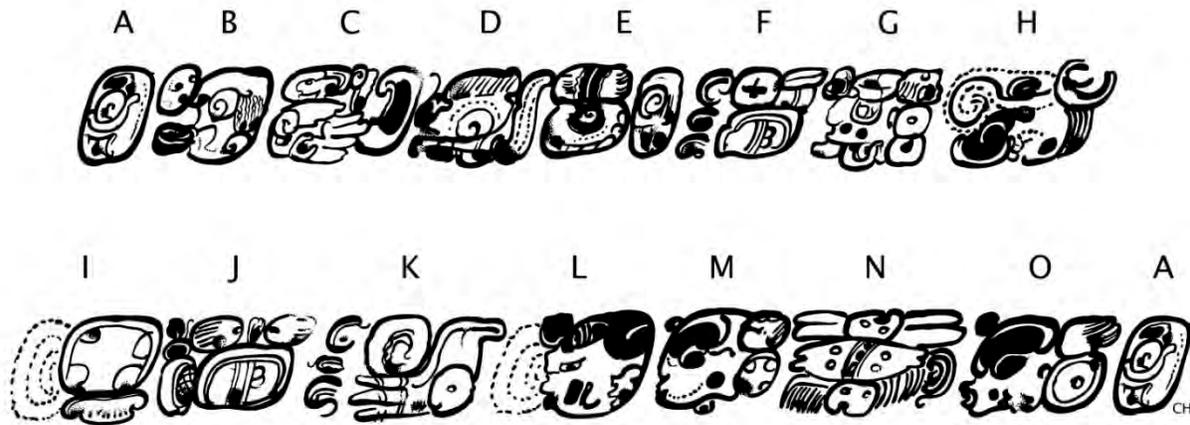
sites (see Tokovinine 2016). Such alliances were made to foster the ties of vassalage, to promote bonds between courts by the dint of martial alliances and in the wake of martial actions. In stark contrast is the court of Caracol that always had a meagre output of decorated pottery with few locally produced ceramics ever bearing any glyphic texts at all (Houston 1987:97). This means that the ceramic assemblages from different sites and courts form rather disparate assemblages, which can only be compared to with great difficulty.

Before 2001, no ceramic vessel was known to carry the dynastic title of the kings of Caracol. When this vessel appeared in a private collection, it was photographed in roll-out by Justin Kerr and inventoried as K8342 in the *Maya Vase Database* (Figure 2; Kerr 2017). Unfortunately, the original provenience of this vessel remains unknown, but it was certainly produced at Caracol. This vessel is an orange-polychrome bowl bearing the name of *Yajawte' K'inich II*, the late sixth century ruler of Caracol (r. AD 553-593+), and father to K'an II (Martin and Grube 2000:88-90). The bowl is decorated with an iconographic program that continues to stimulate discussion and remains opaque in its symbolism. To the left is a gopher (Genus: *Orthogeomys*) with the characteristic glyph for *k'an* 'yellow' on its cheek. It is seated within a square enclosure (possibly a pen) and holds a circular element in one of its paws. The remainder of the scene is dominated by a supernatural avian figure, undoubtedly the great celestial bird known to specialists as the Principal Bird Deity (Bardawil 1976; Nielsen and Helmke 2015). In addition to its characteristic regalia, the great bird also has a headdress made of knotted jaguar pelt and an upturned and squared nose embellished with a bow, a feature of the supernatural entity known as the Square Nosed Beastie. Protruding from its maw is an elongated straw-like form (possibly a type of proboscis)—darting past a stylized insect—that is pointed to a large element that is usually referred to in iconographic circles as “Casper” on account of its superficial similarity to the animated cartoon character. Based on the juxtaposition of the various elements one might conclude that this represents a type of flower, which the Principal Bird Deity is tapping for its nectar. Analysis of the iconography and epigraphy of the texts of Palenque suggest that the “Casper” element may represent the elongated lips or proboscis of a supernatural entity with traits of an insect such as a bee (see Stemp et al. 2012:118, Fig. 5). The “Casper” element may thereby serve as a *pars pro toto* sign, designating the same larger entity. As such, it may be honey, rather than nectar, that the great bird is attempting to tap in this mythological scene.



**Figure 2:** Roll-out of the orange-polychrome bowl bearing the name of *Yajawte' K'inich II* (photograph by Justin Kerr).

The text along the rim (Figure 3) provides an abbreviated Primary Standard Sequence (A1-E1), a type of dedicatory clause or incantation that brought the ceramic vessel into being and sanctioned it for proper, societal, use (see MacLeod and Reents-Budet 1994; Stuart 2005). This is followed by the statement of ownership, naming *Yajawte' K'inich* II (F1-J1). Interestingly, based on the precise phrasing of the surface treatment section, which reads *utz'ibaal Yajawte' K'inich*, 'it is the (painted) decoration of *Yajawte' K'inich*', it may well be that the text on the bowl is from the very hand of the king. An abbreviated parentage expression follows (K1-O1), wherein the very first part of the mother's name is recorded (known as Lady K'al K'inich), and omitting the name of the father, due to lack of space.



**Figure 3:** Drawing of the glyphic text adorning the orange-polychrome bowl bearing the name of *Yajawte' K'inich* II (drawing by Christophe Helmke).

The title borne by *Yajawte' K'inich* is the dynastic title of Caracol, which is here written as **K'UH-K'AN-na-tu-ma-ki**, to be read as *k'uh[ul] k'a[h]ntumaak*, or 'divine *K'ahntumaak*'. While this title is usually referred to as an "Emblem Glyph", since it does not involve nor close with the title *ajaw*, 'king', it is usually considered as one of a set of "Problematic Emblem Glyphs" (see Houston 1986). With increasing knowledge about titles, we are now beginning to realize that, in addition to Emblem Glyphs, there is another class of titles, which are described as "dynastic titles". These are now known for La Sufricaya and Holmul (*Chak Tok Wayaab*) as well as for Cahal Pech (*K'an Hix ... w*), among others (Awe and Zender 2016:160-163; Tokovinine 2013:99). In light of this, it could well be that the title seen at Caracol is now better described as one such dynastic title. The earliest attested usage of this title dates to at least as early as AD 554<sup>1</sup> (on Stela

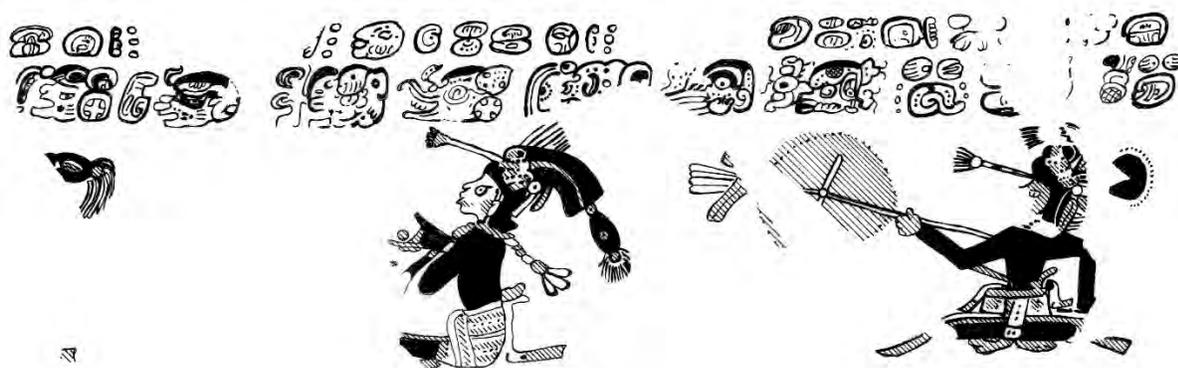
<sup>1</sup> An earlier example may be found on Stela 13 (dedicated in AD 514), although the relevant section of the titular clause is eroded. In addition, the titular clause indicates that *Yajawte' K'inich* I, the then ruling king, was styled as *Uxwitz Ajaw*, or 'Caracol King' (B14). The same title may be represented on the earlier Stela 20 (AD 400) and the later Stela 16 (C9; dedicated in AD 534), raised during the reign of K'an I. Thus, based on extant evidence the Caracol dynastic title may be an innovation made during the reign of *Yajawte' K'inich* II.

14: C9), whereas the latest example dates to as late as AD 859 (on Stela 10: B5). In the three centuries during which the kings of Caracol were styled with this title, it witnessed several variant spellings. That presented on the bowl is rather standard for the relatively early incidence as the first (and possibly earliest) attested example on a ceramic vessel.

Whereas the transliterations of this title are in and of themselves relatively straightforward, the transcription, or reading is considerably more difficult. Possible transliterations include *k'antumaak* ~ *k'ahntumaak*, the analysis and morphemic segmentations of which, are thorny and open to debate. The initial segment *k'an* ~ *k'ahn* may be the part that is most readily segmented and invariably serves as a type of qualifier to that which follows. If *k'an*, it can be the adjective 'yellow' (and by extension 'ripe'); if *k'ahn*, it may refer to any kind of flattened armature, or base. In the latter instance, the term *k'ahn* occurs frequently as part of the pairing *k'ahn-tuun*, lit. 'seat-stone', a composite term used to designate certain thrones (e.g., Palenque), panels (e.g. the Emiliano Zapata panel), or hieroglyphic stairs (e.g., Dos Pilas). As such, the term is used in reference to monumental constructions involving flat slabs of stone or large flattened surfaces. This may be the case here also in the dynastic title. The same or similar usage may also be seen in the toponym of Ucanal that was known as *k'ahnwitznal* in antiquity. Here the toponym refers to a 'mountainous' (*witz*) 'place' (*-nal*) and the initial *k'ahn* probably designates the local physiographic feature, from which the site takes its name, as a flattened mountain, or mesa, descriptively as a 'seat-mountain' or 'flattened mountain'.

In earlier analyses of the title, researchers have been tempted to segment the final segment as *-maak*, allegedly involving a term of Yucatekan substratum for 'man, person'. As such, the dynastic title would serve to form a type of ethnonym, designating a group according to its endonymic designation as 'K'antu person', or likewise (Helmke and Kettunen 2004; Martin and Grube 2000:87). Since it is clear that the language of Caracol is the eastern Ch'olan prestige dialect of Classic Mayan (see Houston et al. 2000; Lacadena and Wichmann 2002), it is unlikely that a Yucatekan lexical item should appear in the texts. As such, it seems more plausible that together the title should be segmented as *k'ahn-tum-aak*, involving a (verbal?) root *tum*, followed by what appears to be a rare suffix. Alternatively, we may be seeing a phonetic spelling for a polymorphemic form such as */k'ahn-tuun-maak/*, which is partly syncopated by the apposition of /n/+m/. Together this compound may refer to a flattened physiographic or monumental feature that is analogously referred to as a 'seat' of some kind.

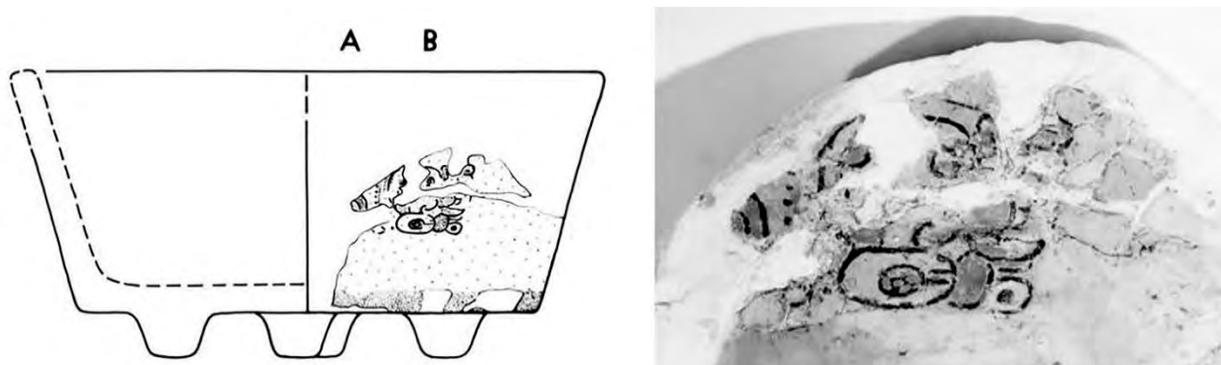
Despite the doubt that still shrouds a proper understanding of the Caracol dynastic title, during the course of the 2007 field season of archaeological investigations at Caracol, another specimen bearing part of the same dynastic title was encountered. The specimen in question is a fragmented Saxche Orange-polychrome bowl, found within the core of Str. I2, a small pyramidal structure within an epicentral group at Caracol (Chase and Chase 2008:Fig. 20) (Figure 4). Based on the type-variety as well as stylistic features of the bowl it can be dated to between the sixth and seventh centuries. This is to say that the bowl can be dated to sometime during the reigns of *Yajawte' K'inich* II and *K'an* II (see Martin and Grube 2000:88-93). The bowl is decorated on its exterior by a series of four seated individuals wearing items of dress and waving circular feather fans that identify them as members of the royal court. Across the rim is a bold red-painted band bearing small pseudoglyphic elements, painted in black. Directly below this band is a larger and more accomplished glyphic text.



**Figure 4:** Drawing of the imagery and glyphic text adorning the Saxche Orange-polychrome bowl found in the core of Str. I2 at Caracol (after Chase and Chase 2008:Fig. 20).

Some of the stylistic and calligraphic features complicate the reading of this text, as does partial preservation. Nonetheless, it is apparent that this text records a Primary Standard Sequence, including the dedicatory segment at the start (including the verb *t'abaay* 'to raise, lift, or dedicate') and a reference to the intended contents *yutal* 'fruity' (see MacLeod and Reents-Budet 1994; Stuart 2005). The last three partly preserved glyphs of the text provide part of the nomino-titular section that once recorded the names and titles of the vessel's original owner. The name may be suppressed and instead only titles appear to be listed. The first is qualified by what may be the cardinal direction *noho'l* 'south' (written **no-NOH**). This is used adjectivally to modify a particular title that is now missing in the following glyph block. The second title is only preserved in part, but clearly records **tu-ma-ki** in its final portion, making it clear that the Caracol dynastic title was also recorded on this bowl, designating its original owner as a member of the royal household.

It was the following year, in 2008, that Simon Martin identified the third vessel to bear the same dynastic title (Martin 2008). The little tetrapod is a fragmentary stucco-coated bowl that once bore a series of painted glyphs on its lid and its exterior (Moholy-Nagy 2005:Fig. 227). On the lid it bears the name of its original owner, a woman, and relates that it is *yuk'ib ta chih*, or 'her drinking implement for *pulque*'—the alcoholic beverage made from the fermented sap of the agave plant.

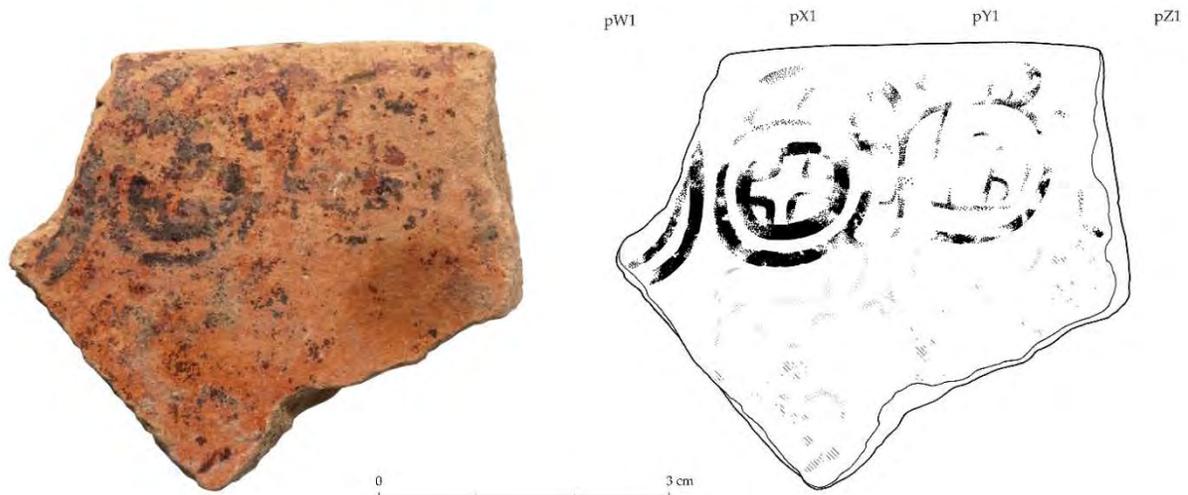


**Figure 5:** Fragmentary stucco-coated tetrapod vessel bearing the Caracol dynastic title, found in Tomb 195 at Tikal (after Moholy-Nagy 2005: Fig. 227).

On the exterior of the bowl, only the very end of the text subsists, which records the title written **K'UH-K'AN-tu-ma-ki**, for *k'uh[ul] k'a[h]ntumaak*, 'divine *K'ahntumaak*' (Figure 5). Most startlingly of all, the vessel in question was found at Tikal, in Burial 195, usually identified as the final resting place of the king known as Animal Skull. Although the regnal dates of this Tikal king are poorly known, he is said to have been the 22<sup>nd</sup> ruler of the dynasty and to have ruled around AD 593 (Martin and Grube 2000:40)—making him a later contemporary of *Yajawte' K'inich*. From extant evidence, the tomb containing this vessel may have been dedicated and sealed around AD 613, well within the reign of Knot Ajaw, the son and successor of *Yajawte' K'inich* (Martin 2008). Whereas several scenarios can be invoked to account for the inclusion of this vessel within a tomb at Tikal, it does speak of an initial period of close contacts and rapport between the two dynasties, before the eventual denouement that saw these sites pitted against one another in martial actions in AD 562—the famed battle that would see the fall of Tikal and the onslaught of the hiatus (see Martin and Grube 2000:39, 89-90).

### THE BAKING POT SPECIMEN

Accompanying these three ceramic vessels is a fourth specimen. This was found as part of surface collections in the northern continuum of epicentral Baking Pot, as outlined at the onset. The sherd in question is rather eroded and is a rim sherd of an orange-polychrome bowl. Aside from the weathered orange background are a series of bold glyphs painted in strong black paint, as well as faint decorative elements rendered in more diluted brown-black paint as well as traces of red paint. Together these features identify this specimen as a Saxche Orange-polychrome bowl, as defined in the local ceramic typology (Gifford 1976:205-208). This makes this bowl identical to the previous bowl-shaped specimens in terms of form and type-variety. The decorative elements on the Baking Pot sherd are unclear, but some of the most salient features of the glyphic text subsist (Figure 6).



**Figure 6:** The ceramic sherd from Str. M-395, showing part of the eroded glyphic text along the rim as well as faint decorative elements on the exterior, below (photograph and drawing by Christophe Helmke).

Parts of four glyphs subsist, and as is typical of ceramic texts, certain compounds are split over larger groupings than might be seen on monuments. Only the two medial segments are at all discernable (pX1-pY1), which can be transliterated as **#-K'AN-tu?-#-ki**. Together this provides a match with the Caracol dynastic title, and much as the example seen on the little stucco-coated tetrapod found at Tikal may include the logogram **K'AN**, without the typical phonetic complement **-na**. This is usually always present in all contexts in Classic Maya writing, with the exception of the Caracol dynastic title where the occurrence of the phonetic complement is entirely optional, especially in the earlier texts. As such, the absence of the phonetic complement with this logogram actually supports the identification of the Caracol dynastic title. To the right of the **K'AN** logogram is, we presume, the faded outlines of a **tu** syllabogram. The final **ki** grapheme is the same allograph as that seen on the tetrapod vessel found at Tikal, although rendered in a more squat and squared fashion, topped by what was probably the right half of the **ma** syllabogram. Together this supports the identification of this title on this ceramic sherd.

As a sherd of a Saxche Orange-polychrome bowl, it is possible to assign a rough dating to this specimen of c. AD 550-650, based on the inclusion of that type to the Tiger Run ceramic complex. This would make the specimen found at Baking Pot, contemporary with the reigns of both *Yajawte' K'inich* II and that of his son K'an II (r. AD 618-658). The presence of this ceramic specimen at Baking Pot thereby speaks of a period of Caracol influence, if not dominance, which lasted until the middle of the seventh century. Whether the specimen in question was gifted to rulers of Baking Pot by *Yajawte' K'inich* II or K'an II and thereafter made its way through lesser social echelons until it was finally discarded at its final place of usage, will remain unknown. Yet, this follows on evidence for earlier contact and influence, such as the finger bowl caches found at Baking Pot in the masonry altar of M-190, the southern causeway terminus (see Helmke and Awe 2008:84-85). In addition, the earliest inscribed ceramics found at Baking Pot also include parts of the preferred regnal names of Caracol rulers, indicating a strong and shared pattern of onomastic precedence (Colas et al. 2002; Helmke and Awe 2008:85-86). Taken together, this evidence suggests that Baking Pot was under the influence of Caracol for much of the Early Classic, apparently from the fourth until the middle of the seventh century. The socio-political picture at Baking Pot, and the Belize Valley generally, shifted greatly with the ascendancy of Naranjo during the regency of Lady Six Sky (c. AD 682-693), and most forcefully during the reign of her son, *K'ahk' Tiliw Chan Chaahk*. From that point onwards the sites of the upper Belize River Valley were firmly under the influence of Naranjo, a pattern of fealty that appears to have been maintained unbroken until the Terminal Classic, with the abandonment of later sites in the second half of the ninth century (see Helmke and Awe 2008; Helmke et al. 2010).

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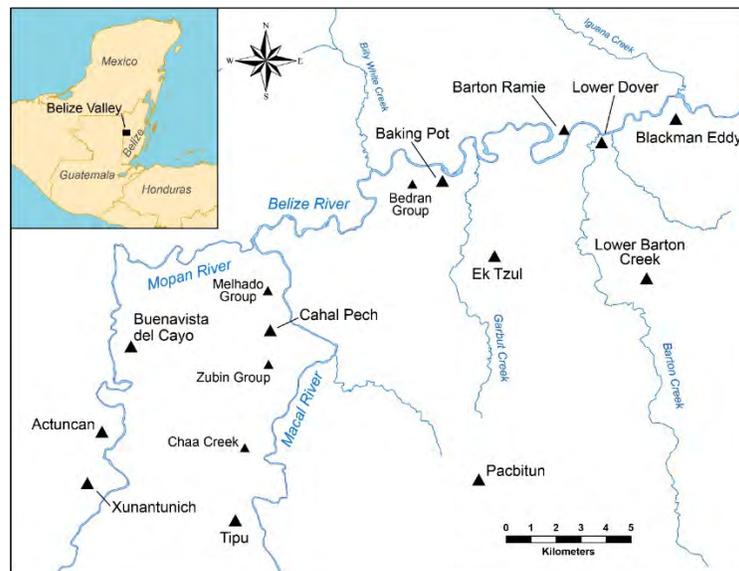
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## PRELIMINARY EXCAVATIONS IN THE DITCHED FIELD COMPLEX IN THE WESTERN PERIPHERY OF BAKING POT

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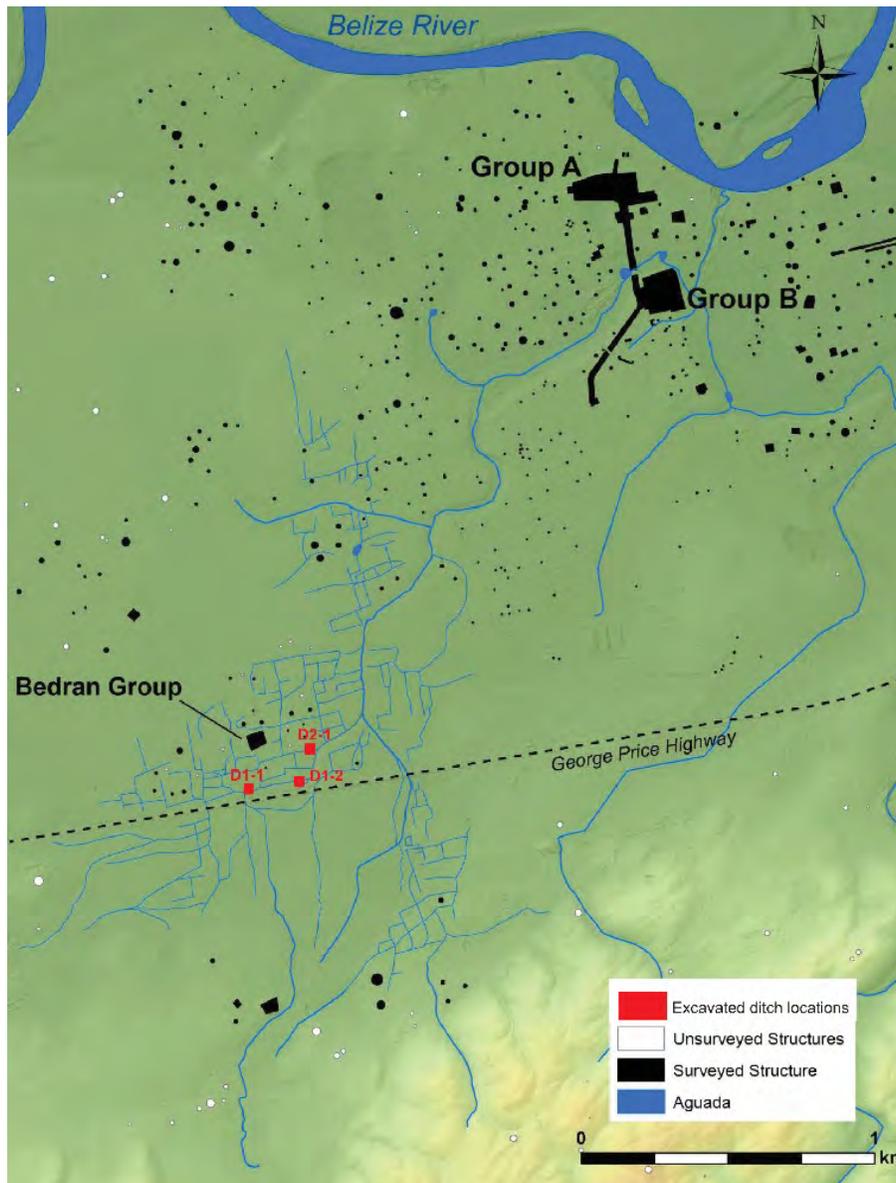
Remote sensing, aerial photography, and excavations and surface collection around the Bedran Group in the western periphery of Baking Pot (Figure 1) have noted an extensive system of ditches that were used to manage water within a complex agricultural system during the Classic period (AD 250-900; Conlon and Awe 1995; Conlon and Powis 2004; Ebert et al. 2016; Kirke 1980). This area is topographically flat and often floods during the rainy season (Figure 2). Therefore, drainage appears to be an important aspect of the ditched field system, with water draining downhill towards the north during the rainy season, into the series of *aguadas* around Group B of the ceremonial center of Baking Pot. The ditch features were initially identified by Kirke (1980), whose analysis of aerial photography of the region identified a lattice system of ditches that were compared to vegetation patterns. He classified three major ditch types, with narrow ditches (Type A) ranging to larger features (Type B) and those that more closely resembled natural or modified creeks (Type C) that spanned several meters across (Kirke 1980:282). Survey and mapping of the ditches around the Bedran Group was conducted in 1994 by the BVAR Project (Conlon and Awe 1995; Conlon and Powis 2004). Small test excavations into the ditches identified Late Classic ceramics, although the exact chronology for the initial construction and final use of the ditched field complex remains unknown (Conlon and Awe 1995). Spatial analysis of LiDAR (light detection and ranging) data by Ebert and colleagues (2016) revealed that the ditched field complex was much larger than previously known, with the results of ground-truthing documenting a system that consists of ~23.5 linear km of ditches.



**Figure 1:** Map of the Belize River Valley with the location of Baking Pot (map by Claire Ebert, 2018).

## EXCAVATION RESULTS

Excavations in 2017 were commenced in the ditched fields around the Bedran Group in the western periphery of the site of Baking Pot (Figures 1 and 2). Three excavation units were placed in two distinct ditches. The first two units (E.U. D1-1 and D1-2) were placed in a Type B ditch south of the Bedran Group. The third unit (E.U. D2-1) was placed in a Type B ditch south of the Bedran Group, approximately 6 m from its meeting with the large Type C ditch that likely was a modified natural feature during Classic times (Figure 2). Matrix samples were collected from the upper embankment portion of the ditches in 10 cm levels for future investigations of soil geochemistry and paleobotanical analysis in all excavations.



**Figure 2:** Map of Baking Pot showing the ditched field complex located in the southwestern periphery of the site (modified from Ebert et al. 2016:Fig.2).

E.U. D1-1 was excavated to a depth of 140 cm from modern surface level and revealed two distinct matrix levels. The upper matrix was characterized by dark grey brown loam clay (10YR/4/1) with the uppermost levels including roots and other organic material typical of the humic layer. At approximately 50 cm below surface (in the southeastern corner of the unit), the matrix transitioned to yellow-brown loam clay (10YR/5/6) (Figure 3). This level sloped downward in depth to the modern water level of the ditch to the north of the unit. Excavations were ceased at 140 cm below the surface, as this depth exceeded the depth of the modern water level and captured the downward slope of the side of the ditch.



**Figure 3:** E.U. D1-1 near the Bedran Group at Baking Pot.

Excavation unit D1-2 was excavated to 120 cm in depth from the surface level and revealed the same two matrix levels as identified in the first unit. Upper soil matrix was characterized by organic and humic materials and also dark grey brown in color (10YR/4/1). The transition between the upper and lower levels was more mixed than in the first unit, with mottled dark grey and yellow-brown (10YR/5/6) loam clays persisting for approximately 15 cm across the unit. Below the same yellow-brown loam clay of the original ditch were identified, with the downward slope of the original ditch captured in the western profile (Figure 4). One section of this level, about midway down in the unit on the northern end, was a section of matrix characterized by a mix of orange and red clays. This matrix type is more characteristic of the northern soils around Baking Pot, as well as those near the airstrip to the east of the ditched fields. However, this section was limited in its extent.

Excavation unit D2-1 consisted of a lower ditch embankment than the others excavated. Despite the shallow nature of this ditch, excavations were able to capture the downward slope of the original ditch in the western profile for the unit (Figure 5). The two distinct matrix layers, characterized by the same dark grey brown (10YR/4/1) and yellow brown (10YR/5/6) soils, were also identified in excavations of this ditch. Excavations ceased at 140cm below surface level.



**Figure 4:** Excavation unit D1-2 near the Bedran Group at Baking Pot.



**Figure 5:** Excavation unit D2-1 near the Bedran Group at Baking Pot.

## CONCLUSIONS

Excavations in the ditched field complex at Baking Pot were initiated in 2017 in order to collect preliminary samples for dating and paleobotanical analysis. Three units were excavated to

depths approximately 80-150 cm below the surface. Samples were exported to Baylor University for soil geochemical characterization. Future paleobotanical research will build upon these initial results. While no major results are apparent at the current time, we can discuss the general nature of the ditched field complex. Excavations revealed that most of the embankments for the ditches were fairly low to the ground, measuring less than 150 cm in height. In some cases, such as E.U. D2-1, the embankment was very low and soil changes suggest deeper indentations on the upper portion of the ancient embankment that may have been related to agricultural practices. No artifacts were recovered from the soil sample collections within the embankments themselves. No samples were collected from the middle of the ditch which held water and would have been the likely location to recover dateable material, due to weather and rainy conditions which left the ditches full of water. Overall, despite the preliminary nature of this research, it provides important information for which to build upon in future investigations.

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# LABORATORY METHODS AND ANALYSES FOR PERI-ABANDONMENT DEPOSITS IN BAKING POT'S GROUP B

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## INTRODUCTION

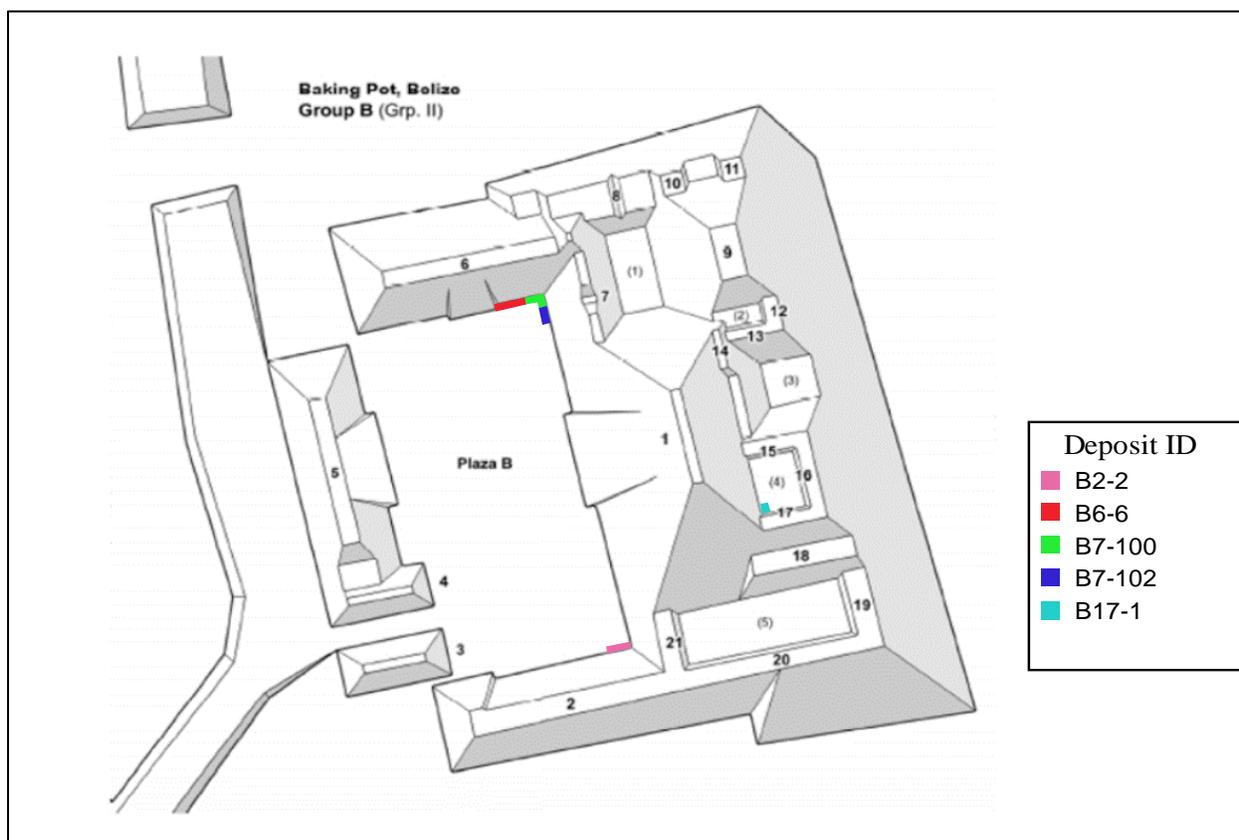
During the 2017 field season of the Belize Valley Archaeological Reconnaissance (BVAR) Project, I conducted laboratory analyses on the artifact assemblages from five peri-abandonment deposits from Baking Pot's Group B. Archaeologists report such deposits throughout the Maya lowlands that date to the end of the Late to Terminal Classic periods (AD 700-900/1000) and generally agree that their presence signifies the final activities in a site core. The exact nature of these activities remains heavily debated. Researchers hypothesize that deposits may represent *de facto* refuse (Chase and Chase 2004; Inomata et al. 2002), feasting (Sagebiel and Haines 2017), primary or transposed middens (Clayton et al. 2005), termination rituals (Garber et al. 1998; Guderjan 2004; Stanton et al. 2008), squatter refuse (Harrison 1999; O'Mansky and Dunning 2004), or post-abandonment rituals (Awe 2012, 2017).

The primary goal of artifact analyses from peri-abandonment deposits from Baking Pot's ceremonial site core is to compare assemblages between deposits to better understand both their form and their functions. With the help of AMS <sup>14</sup>C dates from the deposits and the following synthesis of the artifact analyses, the final goal of this study is to form a complete picture of the final moments of the Classic period in the site core at Baking Pot. This study is situated within the larger context of the BVAR Project's assessment of the demographic and societal collapse that occurred during the Terminal Classic period across the Belize Valley. Additionally, the results from these analyses will inform upon the behaviors of people when faced with societal turmoil and will be expanded upon in future research (see Davis 2018; Hoggarth et al. 2018).

## BACKGROUND AND RESEARCH QUESTIONS

The presence of large deposits of artifacts that date to the terminal occupation of sites has led to important questions amongst scholars in the Maya lowlands. These deposits contain an array of artifacts including decorated and non-decorated pottery including censers, lithic materials, jade, pyrite, faunal remains, human burials, and various other artifacts. Because of the variability identified across contexts, numerous interpretations have been presented to provide explanations for the types of behavior that contributed to their formation. Awe (2012) notes a pattern to peri-abandonment deposits primarily being found in the corner of courtyards and plazas, flanking stairways, and along alleyways (also see Mock 1998). Thereafter, the BVAR Project instituted a directive to excavate in these areas to locate and identify peri-abandonment deposits in the Belize Valley. Beginning in 2013, using Awe's spatial pattern, researchers began a strategic excavation program to identify peri-abandonment deposits at the site of Baking Pot (Hoggarth et al. 2016). The first deposit was located in Courtyard 4 against structure B17 during the 2013 field season

(Figure 1; Hoggarth et al. 2014). Further excavations conducted in 2015 located two additional deposits in Plaza B, one in the northeastern corner designated B7-100, and another in the southeastern corner designated B2-2 (Hoggarth et al. 2016). Additionally, during the 2016 field season, two more deposits were located. Both of these deposits were located in the northeastern corner of Plaza B, one, designated B6-6, was located just west of deposit B7-100, and the other, designated B7-102, was located just south of deposit B7-100 (Lonaker et al. 2017b). The following analyses of the artifactual assemblages of these five peri-abandonment deposits was conducted during the field season of 2017 and will shed light on the final moments of Baking Pot's site core during the Terminal Classic.



**Figure 1:** Map of Baking Pot Group B showing the location of currently known peri-abandonment deposits (adapted from Helmke 2008:Fig. 1).

Analyses of the artifact assemblages from Group B peri-abandonment deposits were conducted to address three primary questions:

1. What do the peri-abandonment events at Baking Pot tell us about the behavior of the Terminal Classic Maya during a period of site abandonment and societal collapse? This question deals with the site specific abandonment processes in Baking Pot's Group B. Previous research throughout the Maya lowlands has exhibited a vast array of abandonment behaviors, and by focusing on the site core, BVAR Project can begin to understand how

the Maya at Baking Pot were reacting to the environmental, political, and demographic upheavals of the Terminal Classic.

2. How do artifact assemblages, and their associated contexts, from each deposit at Baking Pot fit into the previous hypotheses posited for peri-abandonment deposits, or do they represent a different type of behavior altogether? We use data from excavations in Group B to evaluate previously posited hypotheses for peri-abandonment deposits by looking at the material correlates associated with the individual hypotheses. Hoggarth et al. (2018) proposes a list of material correlates that are associated with these hypotheses, and Davis (2018) compares the materials discussed below to that list. Through this research BVAR Project hopes to narrow down the types of behavior being expressed during the Terminal Classic which directly influences the interpretation of Question 1.
3. What was the nature of abandonment at the site of Baking Pot, and when during the Terminal Classic period did abandonment occur? How does the chronology for deposits relate to political and demographic collapse across the Belize Valley?

The research presented here is part of an ongoing study which analyzes the nature and timing of abandonment within the site core of Baking Pot (Hoggarth et al. 2014, 2016; Lonaker et al. 2017b). Understanding the form and timing of abandonment at Baking Pot will allow researchers to situate the site's chronology within the greater Belize Valley region and in the broader Maya lowlands.

## **CERAMIC ANALYSES**

### **Type/Variety Analyses**

To gather data regarding the relative chronology associated with the deposits at Baking Pot, a type/variety analysis was conducted on all diagnostic ceramic sherds from the deposits located in Units B6-6, B7-100, B7-102, and B2-2. Hoggarth and colleagues (2014) previously conducted ceramic analyses for the fifth deposit, from Unit B17-1. Their results are also considered in this study. Type/variety analyses were conducted following Gifford's (1976) analyses of the ceramic sherds and vessels at the site of Barton Ramie, which is located roughly 10 km east-northeast of Baking Pot.

For the purpose of this study the term 'diagnostic sherd' refers to any rim sherd, polychrome sherd, or any sherd with markers such as flutes, punctations, or additions. Due to the nature of type/variety analyses, analysis of both body sherds and rim sherds of decorated and polychrome vessels and only rim sherds of plain ware vessels can potentially bias results. To overcome this issue, the proportional analyses of both types of vessels (polychrome and plain ware) are considered separately. For the breakdown of non-decorated diagnostic pottery see Table 1, and for the breakdown of decorated pottery see Table 2.

**Table 1:** Frequency of all non-decorated ceramics analyzed from peri-abandonment deposits from Baking Pot Group B.

<i>Deposit</i>	<i>Type/Variety</i>	<i>Frequency</i>
<b>B6-6</b>	Unknown	226
	Achote Black	7
	Alexanders Unslipped: Alexanders Variety	17
	Alexanders Unslipped: Croja Variety	9
	Belize Red	86
	Cayo Unslipped: Buff Variety	1
	Cayo Unslipped: Cayo Variety	219
	Chunhuitz Orange	2
	Daylight Orange: Darknight Variety	16
	Dolphin Head Red	44
	Garbutt Creek: Garbutt Creek Variety	77
	Garbutt Creek: Paslow Variety	5
	Macal Orange Red	3
	Meditation Black	2
	Molino Black	1
	Mount Maloney Black	54
	Mountain Pine Red	7
	Roaring Creek Red	17
	Rubber Camp Brown	10
	Vaca Falls Red	42
Yalbac Smudged-Brown	1	
<b>B7-100</b>	Unknown	37
	Alexanders Unslipped: Alexanders Variety	14
	Alexanders Unslipped: Croja Variety	8
	Belize Red	14
	Cayo Unslipped: Cayo Variety	178
	Chunhuitz Orange	4
	Dolphin Head Red	31
	Garbutt Creek: Garbutt Creek Variety	15
	Garbutt Creek: Paslow Variety	2
	Mount Maloney Black	40
	Mountain Pine Red	3
	Rubber Camp Brown	4
	Vaca Falls Red	10
Yalbac Smudged-Brown	5	
<b>B7-102</b>	Unknown	25
	Belize Red	6
	Cayo Unslipped: Cayo Variety	74
	Dolphin Head Red	15
	Garbutt Creek: Garbutt Creek Variety	29
	Mount Maloney Black	13
	Mountain Pine Red	6
	Rubber Camp Brown	1
Vaca Falls Red	4	

**Table 1, continued:** Frequency of all non-decorated ceramics analyzed from peri-abandonment deposits from Baking Pot Group B.

<i>Deposit</i>	<i>Type/Variety</i>	<i>Frequency</i>
<b>B2-2</b>	Unknown	1
	Alexanders Unslipped: Alexanders Variety	4
	Alexanders Unslipped: Croja Variety	1
	Belize Red	9
	Cayo Unslipped: Cayo Variety	47
	Dolphin Head Red	4
	Garbutt Creek: Garbutt Creek Variety	17
	Mount Maloney Black	9
	Vaca Falls Red	8
Yalbac Smudged-Brown	2	
<b>B17-1</b>	Unknown	262
	Achote Black	1
	Alexanders Unslipped: Alexanders Variety	30
	Alexanders Unslipped: Croja Variety	13
	Belize Red	152
	Cayo Unslipped: Cayo Variety	154
	Daylight Orange: Darknight Variety	1
	Dolphin Head Red	44
	Garbutt Creek: Garbutt Creek Variety	61
	Garbutt Creek: Unspecified Variety	1
	Meditation Black	1
	Mount Maloney Black	47
	Mountain Pine Red	2
	Roaring Creek Red	8
	Rubber Camp Brown	20
	Vaca Falls Red	17
Yalbac Smudged-Brown	1	

**Table 2:** Frequency of decorated ceramics analyzed from peri-abandonment deposits at Baking Pot Group B.

<i>Deposit</i>	<i>Type/Variety</i>	<i>Frequency</i>
<b>B7-100</b>	Unknown	10
	"Squash Pot"	1
	Benque Viejo Polychrome	6
	Cabrito Cream	142
	Canoa Incised	1
	Chinos Black on White	1
	Cubeta Incised	2
	McRae Impressed	2
	Palmar Orange	6
	Platon Punctated-Incised	6
	Puhui-Zibal Composite	20
	Torres Incised	3
	Xunantunich Black-on-Orange	24

**Table 2, continued:** Frequency of decorated ceramics analyzed from peri-abandonment deposits at Baking Pot Group B.

<i>Deposit</i>	<i>Type/Variety</i>	<i>Frequency</i>
<b>B7-102</b>	Unknown	9
	Benque Viejo Polychrome	5
	Cabrigo Cream	70
	McRae Impressed	1
	Palmar Orange	52
	Platon Punctated-Incised	1
	Puhui-Zibal Composite	14
	Xunantunich Black-on-Orange	11
<b>B2-2</b>	Unknown	52
	Cabrigo Cream	95
	Duck Run Incised	1
	Palmar Orange	14
	Platon Punctated-Incised	3
	Puhui-Zibal Composite	5
<b>B17-1</b>	Unknown	35
	Benque Viejo Polychrome	7
	Cabrigo Cream	94
	McRae Impressed	2
	Palmar Orange	13
	Platon Punctated-Incised	8
	Puhui-Zibal Composite	30
	White Cliff Striated	1

\*\*“Squash Pot” refers to an un-typed gourd shaped pot similar to three found at the site of Altun Ha in northern Belize (Pendergast 1990: Figure 106n).

## Form Analysis

To further address the second research question, which was concerned with the function of peri-abandonment deposits, the pottery assemblages were then broken down into form in order to determine the proportion of serving, storage, and ritual vessels. For the proportional breakdown of all analyzed pottery forms see Table 3.

One particular polychrome vessel was too exceptional to type, and this was largely owing to the vessel’s form (Figure 2). One researcher called the vessel a platformed pyroform (James Aimers, personal communication 2017) and another researcher believes that the vessel belongs in the Cabrigo Cream group (Christophe Helmke, personal communication 2017). The vessel has a rounded base, then vertically exhibits a hollow platform which then juts out into four panels alternating between red and black color, finally coming back together to form a rounded rim. Imagery on this vessel may represent the Maya cosmology, with a tripartite vertical axis, and the middle level is horizontally quadripartite representing the four corners of earth present in Maya mythology.

**Table 3:** Proportions of all diagnostic ceramic by form, rounded to the nearest tenth. Totals may not equal 100%.

<i>Deposit</i>	<i>Form</i>	<i>Proportion of Deposit</i>	<i>99% CI</i>
<b>B6-6</b>	Unknown	17.8%	2.5%
	Bowl	25.1%	2.9%
	Dish	15.3%	2.4%
	Drum	0.3%	0.4%
	Jar	34.5%	3.1%
	Plate	0.1%	0.2%
	Pyroform	1.1%	0.7%
	Spout	0.1%	0.2%
	Vase	5.6%	1.5%
<b>B7-100</b>	Unknown	6.9%	2.5%
	Bowl	19.8%	4.0%
	Dish	8.7%	2.8%
	Jar	60.8%	4.9%
	Vase	3.7%	1.9%
<b>B7-102</b>	Unknown	13.9%	4.8%
	Bowl	20.3%	5.5%
	Dish	9.4%	4.0%
	Jar	45.5%	6.9%
	Vase	10.9%	4.3%
<b>B2-2</b>	Unknown	1.7%	2.4%
	Bowl	20.7%	7.4%
	Dish	20.7%	7.4%
	Jar	50.0%	9.1%
	Pyroform	0.9%	1.7%
	Vase	6.0%	4.3%
<b>B17-1</b>	Unknown	28.1%	2.8%
	Bowl	23.3%	2.7%
	Censer	0.1%	0.2%
	Dish	11.3%	2.0%
	Jar	23.8%	2.7%
	Olla	0.5%	0.4%
	Plate	0.1%	0.2%
	Tecomate	0.2%	0.3%
	Vase	12.5%	2.1%



**Figure 2:** Possible Cabrito Cream group platformed pyroform vessel from deposit in Unit B6-6.

### Iconographic and Epigraphic Analyses

Christophe Helmke performed the iconographic and epigraphic analyses on the ceramic materials from the Group B deposits. Apart from one vessel, the Komkom Vase, discovered in 2015 in Unit B7-100, no vessels examined in this study depict formal hieroglyphic writing. Deciphering the hieroglyphic text on the Komkom Vase revealed a long count date of AD 812, providing a *terminus post quem* for that particular deposit (Helmke et al. 2017). The majority of the polychrome vessels are Cabrito Cream with the typical Holmul Dancer iconography (Figure 3), and several Cabrito Cream vessels possess cormorant iconography, which often symbolizes a creature that is capable of existing in both the upper and lower worlds (Figure 4). One mostly intact Cabrito Cream vessel depicts two seated maize god images spreading seeds, one side of which has a modified cranium suggesting some form of transformation (Figure 5). Another mostly complete Cabrito Cream vessel containing more black pigments than the rest shows a *mijin*, or ‘son-of-the-father’, symbol, which likely represents a seed because it is germinating (Figure 6). The detail and line work within a Cabrito Cream vessel is indicative of the vessel origin. Researchers argue that most Cabrito Cream vessels with intricate line work come from either the site of Holmul or Naranjo, while many of the less intricate Cabrito Cream vessels are likely imitations being locally made in the Belize Valley (Reents-Budet 1994). One Benque Viejo polychrome vessel depicts a monstrous shark with red lines emanating from the creature, reminiscent of the story of the Hero Twins spearing a monstrous shark in Xibalba.



**Figure 3:** Cabrito Cream polychrome sherds with Holmul Dancer iconography. The vessel on the left and the sherd on the top right are likely from the Belize Valley based on stylistic characteristics, while the sherd on the bottom right is likely from Guatemala.

Additionally, reconstruction of the polychrome vessels, as well as Puhui-Zibal Composite type vessels, was conducted to ascertain the extent of vessel breakage. For instance, using the provenience information provided from excavating using sub-lots (See Lonaker et al. 2017a for a description of this method), we can determine if a vessel was placed in one area, and was later broken by natural taphonomic processes, or if a vessel was shattered prior to deposition and scattered throughout the deposit. These vessel reconstructions were only conducted on the deposits from Units B6-6, B7-100, and B7-102 because the polychrome sherds from Unit B17-1 were not available and those from Unit B2-2 were too heavily degraded to type, much less reconstruct.



**Figure 4:** Cabrito Cream vessels with cormorant iconography. The cormorant on the right vessel has a water symbol above its head potentially symbolizing the ability for the cormorant to exist both in the upperworld and the underworld.



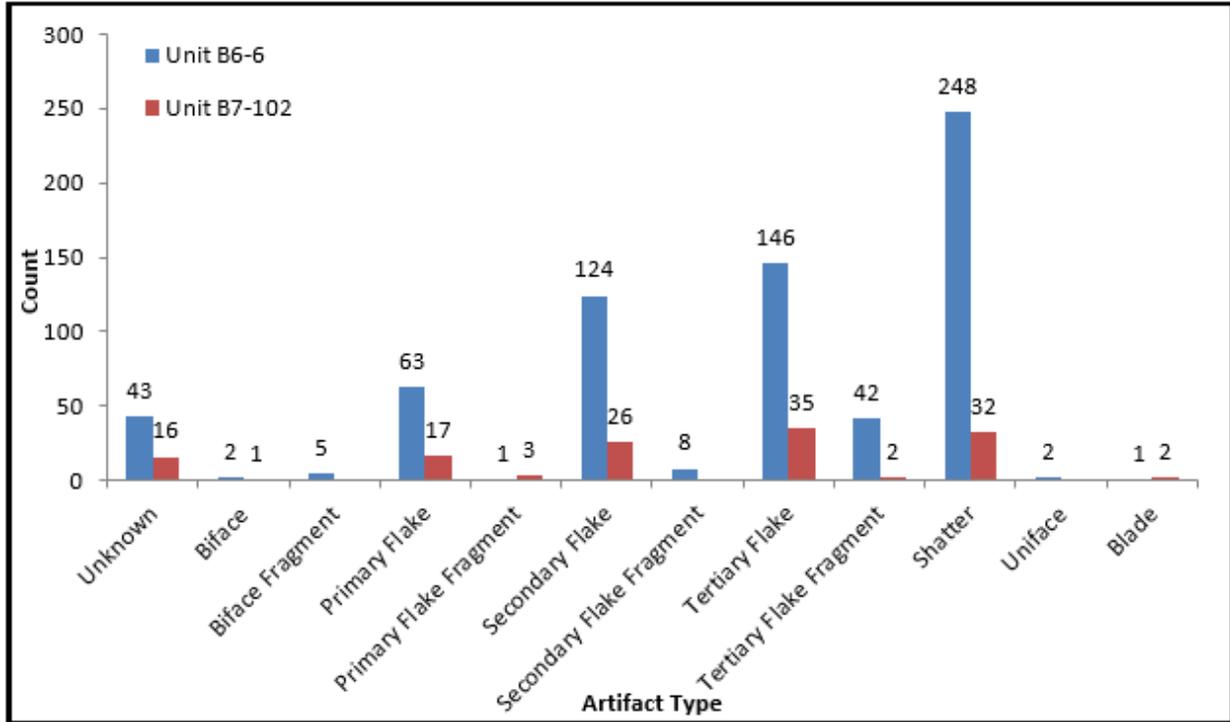
**Figure 5:** Cabrito Cream vessel with Maize God iconography. This figure shows two sides of the same vessel. On one side the head of the Maize God is more prominent and he is spreading seeds suggesting some form of transformation.



**Figure 6:** Cabrito Cream vessel with *mijin* (i.e., son-of-the-father relationship) iconography. This vessel displays a type of germinating seed imagery.

## LITHIC ANALYSIS

The lithic assemblages for Units B6-6 and B7-102 were analyzed in the summer of 2017, and the lithic analysis for the other three deposits is still ongoing with the exception of the lithic special finds. For the following analysis some terms must be defined. In this analysis a primary flake is classified as such when the dorsal surface of the flake contains 100% cortex, a secondary flake contains 1-99% cortex, and a tertiary flake contains 0% cortex. For this study, a blade is considered any tertiary flake that is twice as long as its maximum width. For the breakdown of lithic artifact types from units B6-6 and B7-102 see Figure 7. Dr. James Stemp examined the bifacial lithic artifacts from these two deposits. All of the bifaces are typical late classic projectile points with the exception of one chisel (James Stemp, personal communication 2017). Only chert and quartzite artifacts are represented in the present analyses. Technological analysis and geochemical sourcing of the obsidian artifacts is still ongoing (see Table 4 for counts).



**Figure 7:** Count of chert and quartzite lithic artifacts recovered from the peri-abandonment deposits in Units B6-6 and B7-102.

**Table 4:** Count of obsidian artifacts from the peri-abandonment deposits in Group B.

Deposit	Count
B6-6	43
B7-100	5
B7-102	8
B17-1	43
B2-2	3

## DISCUSSION AND CONCLUSIONS

What then do the smashed vessels, the censers, the burials, and the lithic debitage, tell us about the nature of the Terminal Classic period, and what do these assemblages tell us about the behavior of the peoples in the face of overpopulation, drought, and a breakdown of society? Ceramic form analyses indicate a dominance of jars in all depositional contexts, except for Unit B17-1, which contains a higher proportions of bowls. This difference could be because B17-1 is located in a more private courtyard, though other key differences between this deposit and the others in Plaza B, namely the presence of burials, censers, and localized burning. All of the deposits in Plaza B contain burials with no evidence for burning, yet the deposit located in unit B17-1 does not contain a burial and Hoggarth et al. (2014) suggests that some kind of burning event is tied to this depositional context, as no evidence for burning was identified outside of the deposit or other locations in the royal palace complex. Evidence for the use of censers is also present in unit B17-1, yet no censers were found in the Plaza B deposits. The presence of burning likely indicates a

different type of activity than is represented by the deposits in Plaza B. Additionally, the deposits in Plaza B contain a notably higher number of Cayo Unslipped jars than any other pottery type or form, but deposit B17-1 contains a similar number of Cayo Unslipped jars and Belize Red dishes.

The lithic analyses conducted for the Unit B6-6 and B7-102 deposits show similar patterns of lithic usage, though B6-6 contains a higher overall frequency of lithic materials. The majority of the lithic material present in the deposits is shatter followed by tertiary, secondary, and primary flakes. This pattern, combined with the similarities in ceramic and faunal materials (Burke et al. 2017) suggests that at least these two deposits likely represent similar activities. Additionally, almost all of the projectile points recovered from B6-6 and B7-102, as well as B17-1 (Hoggarth et al. 2014), were broken. The presence of broken anthropomorphic and zoomorphic figurines and ocarinas is noted in all of the deposits in question. The shattering of pottery and the breaking of projectile points, figurines, and ocarinas is indicative of releasing the spirit of the objects. For the deposits in Plaza B, this breaking and scattering behavior may represent ideas associated with the dead since the deposits contain burials. Once again, since B17-1 contains no burials, but evidences burning, the breaking and scattering of objects could represent a different activity. Davis (2018) suggests that both ethnographic and archaeological data support the notion that these deposits represent ritual activities associated with ancestor veneration and petitioning the gods.

These results are preliminary, but once forthcoming AMS  $^{14}\text{C}$  dates are published and a full synthesis of the data from Baking Pot's peri-abandonment deposits is complete, a larger picture will be painted. Once again, these analyses are merely a step in a larger study to infer the behavior of the Maya at Baking Pot during the Terminal Classic period, and that study is only a portion of the larger regional study of the Terminal Classic currently being conducted by the BVAR Project in the Belize Valley.

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# PRELIMINARY RESULTS OF THE TEST PITTING PROGRAM IN PLAZA A AT LOWER DOVER, BELIZE

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## INTRODUCTION

In 2017, the Belize Valley Archaeological Reconnaissance (BVAR) Project initiated a test pitting program in Plaza A of the Lower Dover monumental epicenter to understand the function of the space during the Classic Period (AD 200-900/1000). The results of on previous excavations in Plaza A, the largest plaza at Lower Dover, suggest that this location may have served as a marketplace. This idea was built on the identification of one small rectangular structure in the plaza, similar to other low-lying structures found at ancient market spaces (Guerra and Collins 2016:224-239, Dahlin et al. 2007:364-365), as well as abundant lithic material at the north east corner of the plaza (Guerra and Romih 2017:121-135).

To systematically examine the rest of the plaza for similar archaeological materials, I developed a test pitting program to evaluate possible material evidence, architecture, artifacts and chemical signatures, for the existence of likely market activities in Plaza A. The test pitting program had two primary goals. The first was to collect soil samples for phosphate and trace metal analyses resulting from ancient activities including food preparation and crafting activities. The second goal was the recovery of micro- and macro-artifacts that may have been related to marketplace activities (e.g., lithic debitage associated with tool production). This report presents the methods and preliminary results of the test pitting program carried out during the 2017 field season. Laboratory analyses of soil samples are ongoing and will be reported in future publications.

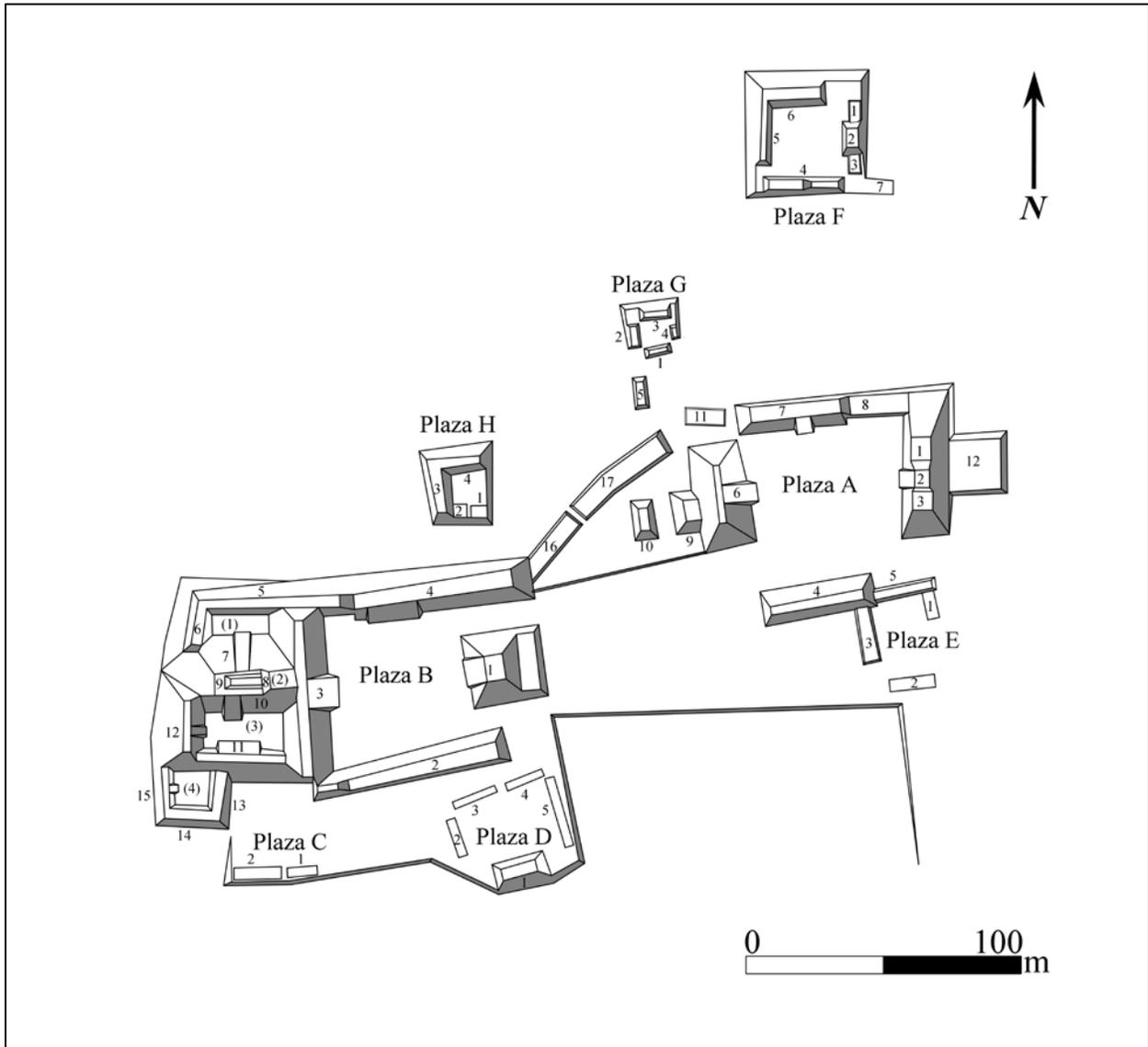
## SITE LOCATION & SETTING

The major center of Lower Dover is located on the southern bank the Belize River, approximately 15.4 km downriver of modern-day town of San Ignacio. In relation to other large regional Belize Valley polities, Lower Dover lies approximately 6.6 km east of Baking Pot and 3 km west of Blackman Eddy, the two nearest major centers (Figure 1). To the south is the small major center of Lower Barton Creek, which is roughly 5.9 km distant. Intermediate minor centers associated with Lower Dover include Floral Park. 1.6 km to the southwest and Barton Ramie directly across the river to the north (Guerra and Awe 2017). The site's settlement area extends to foothills of the Maya Mountains located south of the site core. A total of 141 settlement groups, including several small, formal *plazuelas* have been recorded in this area based on analyses of lidar (light detection and ranging) remote sensing data and pedestrian survey (Ebert et al. 2016; Guerra 2011; Petrozza 2015; Walden et al. 2017:195). Peripheral settlements are located primarily in areas with higher elevations, with much found mounds recorded in the flatter plain between the foothills and the site core. It is possible that this area may have served as farm land to the ancient community.

The Lower Dover monumental epicenter covers approximately 3.0 hectares and is located on the property of William and Madeline Reynolds at the southwestern edge of Unitedville Village, in the Cayo District. The site is bordered on the north by the Belize River, on the east by Lower Barton Creek, and on the west by the Upper Barton Creek (Guerra and Morton 2012; Guerra 2011). The site is composed of two large central plazas – Plaza A and Plaza B – of roughly similar dimension (~3200 square m; Figure 2). Plaza A to the east is the largest open plaza at Lower Dover, and is bordered by 12 structures with an attached ballcourt to the west and a single low lying structure to the northwest. Plaza B to west contains 17 structures most of which are on the west and form four restricted access courtyards that likely functioned as an elite palace complex. The two plazas are connected by a small, low-lying wall no more than four courses high (Guerra and Arksey 2012). Three formal patio groups are located to the north (Plazas F, G and H) and three informal groups to the south (Plazas C, D and E). A total of 52 structures composing the site core have been identified thus far.



**Figure 1:** Map with the location of Lower Dover in the Belize River Valley (modified from Helmke et al. 2016).



**Figure 2:** Map of the Lower Dover monumental epicenter.

## PREVIOUS RESEARCH

Archaeological investigations have been conducted at sites surrounding Lower Dover as far back as the 1920's (Ricketson 1929), including Floral Park (Willey et al. 1956), Blackman Eddy (Driver and Garber 2004), and Barton Ramie (Willey et al. 1956; Gifford et al. 1976). In 2010, the BVAR Project initiated archaeological research at Lower Dover to understand the relationships between Lower Dover and other regional polities (Guerra and Awe 2017). Preliminary research focused on mapping the monumental epicenter, with subsequent excavations and analyses aimed at developing a site chronology. Direct dating of human remains indicates that the site was occupied initially as late as AD 650 (Guerra et al. 2015; Guerra and Awe 2017). The site subsequently experienced continuous and rapid growth extending into the Terminal Classic.

Excavations in Plazas A and G identified at least two distinct phases of construction dating to the latter part of the Late Classic period (AD 600-750; Guerra and Arksey 2012: 108-120). The 2012 and 2013 excavations at Plaza F indicated that the area was built and used in the Late Classic, with an abandonment in the Terminal Classic (AD 750-900/100) and a partial reoccupation in the early Postclassic (AD 900/1000-1200; Guerra et al. 2013, 2014). Wölfel and colleagues (2010) recovered one Paxcaman Red scroll foot (New Town ceramic complex) on the surface of Plaza F, indicating possible activity during the early Postclassic. The 2014 excavations were focused on determining the chronology and construction sequence of the structures in Plaza C, E and M of the site core. Excavations indicated that the buildings in these plazas were constructed during the Spanish Lookout phase (AD 750-850) in a single construction phase.

Investigations first began in Plaza A in 2010. Plaza A lies to the east of the monumental epicenter at Lower Dover, and is one of the two largest groups at the site with an area of ~3200 square meters (25m x 30m). The main plaza is framed by 4 long range structures with the eastern structure being the tallest at 10.6 m (Guerra and Awe 2017). Three small low-lying structures were also recorded, one at the southeast corner, another one to the northwest of the plaza and one in the center of the plaza. Just to the west of the main plaza, attached to the back of Structure A6, are two structures of similar dimensions that are the site's ballcourt. This group forms the easternmost visible boundary of the site complex.

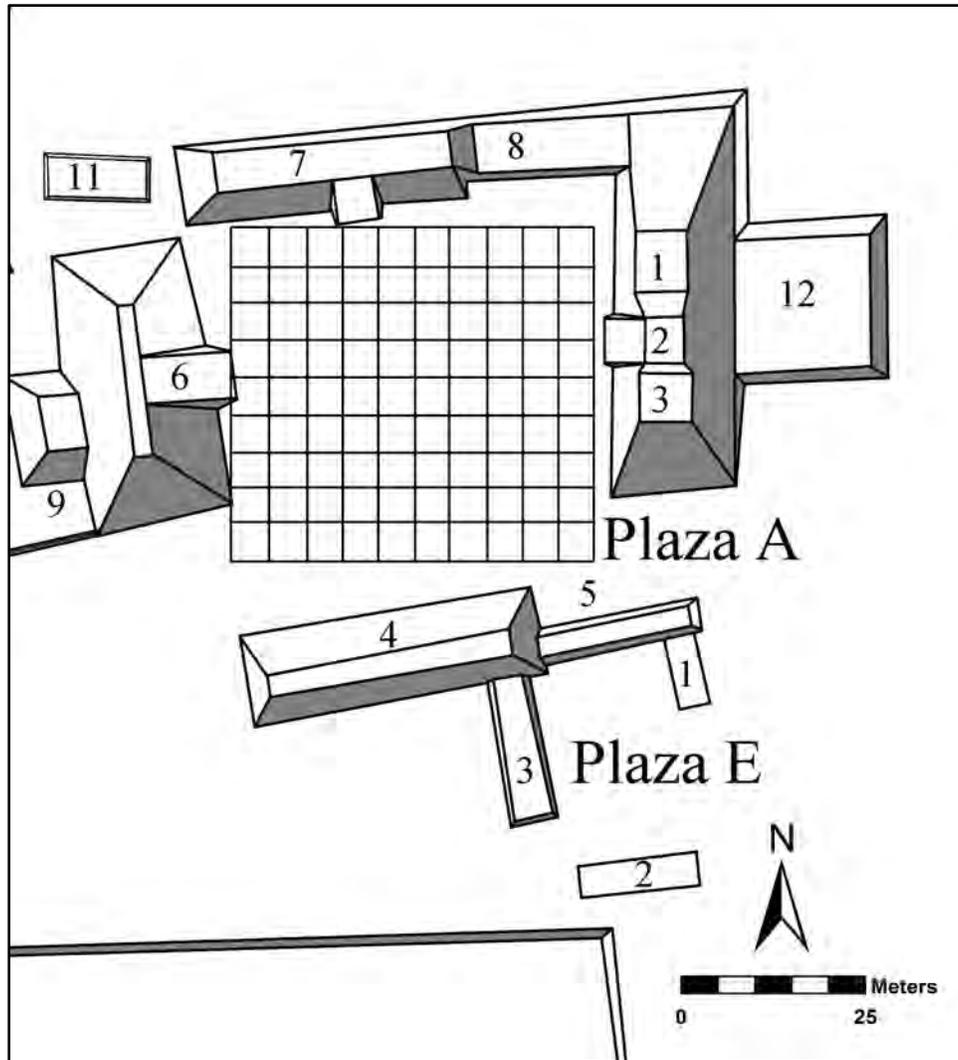
During the initial investigation of the 2010 field season, a 4x4 m test unit was excavated into Structure A2. Excavations identified three possible construction phases, though the placement of dried laid boulder fill inhibited excavation to bedrock (Wilkinson and Hude 2011:7-14). In 2015, three units placed at the base of Structure A2 revealed three consecutive floors and exposed the terminal architecture of the building including a staircase leading to the structure summit. A single 1x2 m unit placed at the northeast corner of Plaza A revealed the terminal floor and three terraces on the A1 Platform (Guerra and Romih 2017:118-119). Lastly, a 4x4 m test pit placed in the center of the plaza exposed a single course low-lying platform built in a single construction episode. This small structure may have functioned as a small shrine similar to others found at the large Classic Period center of Lubaantun in southern Belize and other Classic Period centers in northern Yucatán (Guerra and Collins 2016:224-239).

## **METHODS**

The 2017 field season a test pitting program was focused in Plaza A in order to collect soil samples for (1) the identification of cultural materials related to market activity in the plaza and (2) organic chemical residue analyses particularly, phosphate, associated with the decomposition of organic materials and the physical burning of material associated with food preparation and hearths. This latter method is adopted from Terry and colleagues' work at the site of Piedras Negras, Guatemala (Terry et al. 2000). Terry and colleagues used soil chemical profiles, specifically Phosphate (P) concentration, as a proxy for anthropogenically modified soils. The resulting profiles indicated that higher phosphate levels were more often than not associated with ancient human activity such as middens, food preparation and areas where produce were kept/sold.

To systematically collect soil samples for analyses, a grid of 5x5 m squares was established across Plaza A (Figure 3). The grid was established using a 50 m fiberglass tape and a Brunton

pocket transit. Baselines were placed at 5 m intervals running along a east-west axis starting at the center of structure A2 and moving north and south from this line, respectively. A series of east-to-west transects were drawn across the plaza and test pits were excavated initially at 10 m apart and then at 5 m apart (Figure 4). Each test pit was first excavated by removing 10 cm of humus where possible, and then excavating to the remaining matrix of the terminal plaza floor (Figure 5). The average excavated depth of each test unit was ~17.5 cm below the present day ground surface, with areas closer to structures and the center of the plaza having an average depth of ~20.5 cm. The contents of this latter level was collected and bagged for floatation.



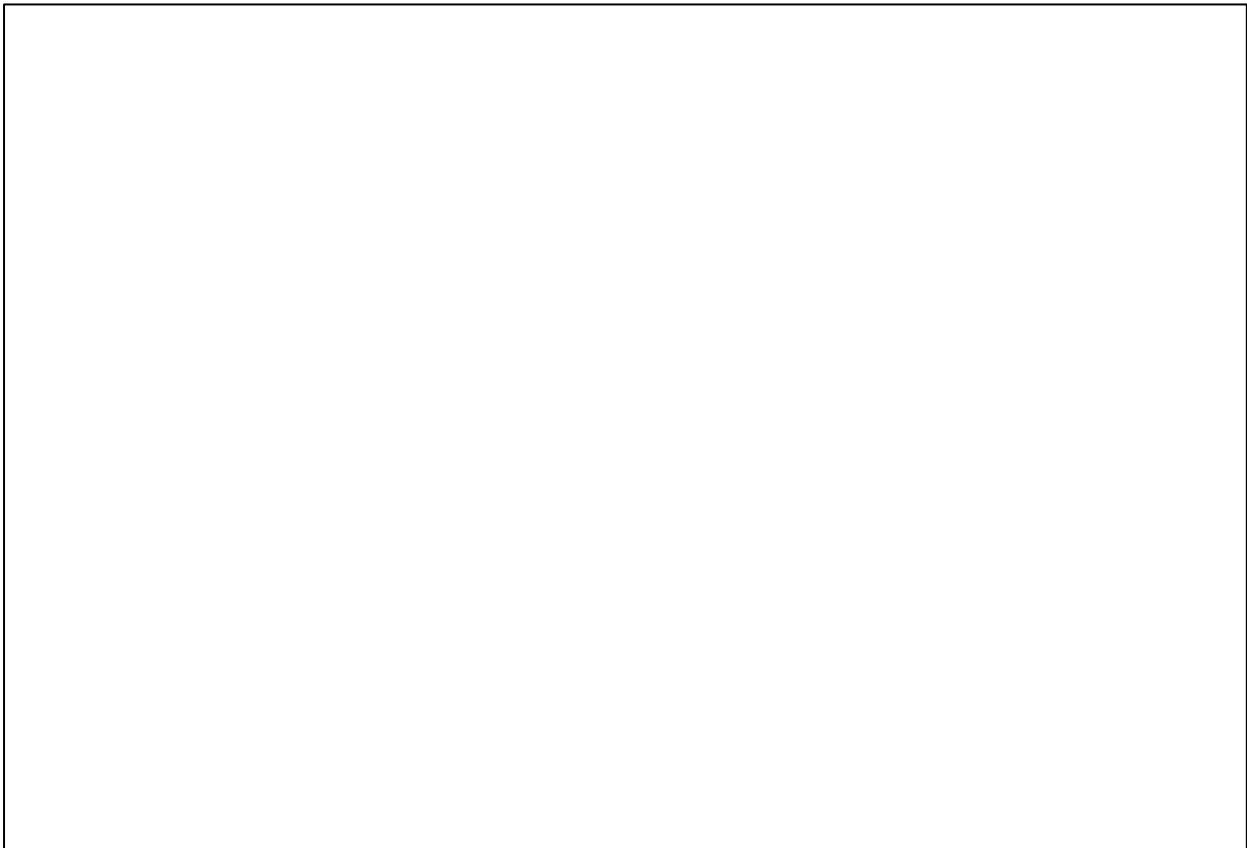
**Figure 3:** Map of Plaza A at Lower Dover showing the 5 m gridlines.

### TEST PITTING RESULTS

A total of 107 test pits measuring approximately 30x30 cm were excavated along the east west grid lines from the east to the west (Figure 4; see Appendix A). Of the 107 proposed units, four were unexcavated due to the heavy overburden of backfill from the 2016 field season and

previously excavated areas in the center of the plaza. These are Unit PLA-101, 140, 145 and 165. For each unit a sample of ~2 L or more of matrix was collected for floatation and a smaller sample ~90 g was collected for chemical residue analyses. Initial floatation of the collected samples was performed by the decanting method and proved difficult given the clay composition of these samples. Each sample was soaked overnight in baking soda (sodium bicarbonate) in order to break up the clay matrix. Due to this lengthy process, only a few samples were floated in the field season. The other samples were completed in December 2017, using a modified semi-automated floatation machine (Figure 6). All heavy and light fractions of these samples were exported for analyses.

A total of 20 samples were floated during the 2017 summer field season and the others were floated in December of 2017 ( $n=83$ ) and exported to the University of New Mexico to complete the analyses. Of the 20 floated samples floated, no artifacts were recovered. However, all units possessed ample evidence of burned limestone probably resulting from a fire on the plaza floor. All 90g soil samples ( $n=103$ ) were exported in January 2018 for chemical residue analyses, particularly phosphates. These analyses will be conducted at the Environmental Archaeology Laboratory facilities at UNM.



**Figure 4:** Map of Plaza A at Lower Dover showing the location and test pit numbers excavated in 2017.



**Figure 5:** Photos of two test pits, PLA-100 (left) and PLA-143 (right), excavated in Plaza A at Lower Dover in 2017.

## CONCLUSIONS

While the analyses of the floated samples are still ongoing a few patterns were noted. First, 22 floated samples had evidence of burned limestone fragments. These smaller fragments of burnt limestone may indicate spotty fires along the ancient floor surface or may be part of small burnt limestone inclusion in the floor. However, because of the scale of the units it is difficult to determine without further horizontal exposures. Several units showed evidence of stone tool manufacture either in the form of broken and unfinished chert tools as well as evidence of pressure flaking debitage. A total of 62 Units contained artifacts including 29 units with Ceramics, 2 with partial lithic tool, 26 with some lithic debitage and 44 with secondary (reduction) lithic flakes. No architectural feature was identified during the excavations of these test units. The analyses of all heavy fractions and soil chemistry will be completed at UNM and will be reported in the 2018 BVAR Project field report.

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**APPENDIX A: 2017 PLAZA A UNITS EXCAVATED AND SAMPLES COLLECTED**

<i>Unit number</i>	<i>Depth from present ground surface (cm)</i>	<i>Excavated</i>	<i>Floatation sample collected</i>	<i>Organic residue sample collected</i>
PLA-100	18	YES	YES	YES
PLA-102	16	YES	YES	YES
PLA-103	17	YES	YES	YES
PLA-104	20	YES	YES	YES
PLA-105	25	YES	YES	YES
PLA-106	21	YES	YES	YES
PLA-107	15	YES	YES	YES
PLA-108	22	YES	YES	YES
PLA-109	17	YES	YES	YES
PLA-110	18	YES	YES	YES
PLA-111	23	YES	YES	YES
PLA-112	22	YES	YES	YES
PLA-113	16	YES	YES	YES
PLA-114	18	YES	YES	YES
PLA-115	25	YES	YES	YES
PLA-116	20	YES	YES	YES
PLA-117	16	YES	YES	YES
PLA-118	18	YES	YES	YES
PLA-119	15	YES	YES	YES
PLA-120	14	YES	YES	YES
PLA-121	14	YES	YES	YES
PLA-122	16	YES	YES	YES
PLA-123	16	YES	YES	YES
PLA-124	18	YES	YES	YES
PLA-125	16	YES	YES	YES
PLA-126	25	YES	YES	YES
PLA-127	25	YES	YES	YES
PLA-128	16	YES	YES	YES
PLA-129	17	YES	YES	YES
PLA-130	20	YES	YES	YES
PLA-131	18	YES	YES	YES
PLA-132	16	YES	YES	YES
PLA-133	13	YES	YES	YES
PLA-134	22	YES	YES	YES
PLA-135	12	YES	YES	YES
PLA-136	22	YES	YES	YES
PLA-137	16	YES	YES	YES
PLA-138	20	YES	YES	YES

<i>Unit number</i>	<i>Depth from present ground surface (cm)</i>	<i>Excavated</i>	<i>Floatation sample collected</i>	<i>Organic residue sample collected</i>
PLA-139	19	YES	YES	YES
PLA-141	14	YES	YES	YES
PLA-142	12	YES	YES	YES
PLA-143	24	YES	YES	YES
PLA-144	13	YES	YES	YES
PLA-146	16	YES	YES	YES
PLA-147	12	YES	YES	YES
PLA-148	14	YES	YES	YES
PLA-149	12	YES	YES	YES
PLA-150	14	YES	YES	YES
PLA-151	13	YES	YES	YES
PLA-152	16	YES	YES	YES
PLA-153	19	YES	YES	YES
PLA-154	15	YES	YES	YES
PLA-155	18	YES	YES	YES
PLA-156	22	YES	YES	YES
PLA-157	22	YES	YES	YES
PLA-158	14	YES	YES	YES
PLA-159	20	YES	YES	YES
PLA-160	22	YES	YES	YES
PLA-161	21	YES	YES	YES
PLA-162	19	YES	YES	YES
PLA-163	15	YES	YES	YES
PLA-164	13	YES	YES	YES
PLA-166	20	YES	YES	YES
PLA-167	19	YES	YES	YES
PLA-168	16	YES	YES	YES
PLA-169	15	YES	YES	YES
PLA-170	16	YES	YES	YES
PLA-171	20	YES	YES	YES
PLA-172	15	YES	YES	YES
PLA-173	16	YES	YES	YES
PLA-174	20	YES	YES	YES
PLA-175	16	YES	YES	YES
PLA-176	15	YES	YES	YES
PLA-177	20	YES	YES	YES
PLA-178	29	YES	YES	YES
PLA-179	16	YES	YES	YES
PLA-180	16	YES	YES	YES
PLA-181	12	YES	YES	YES
PLA-182	16	YES	YES	YES

<i>Unit number</i>	<i>Depth from present ground surface (cm)</i>	<i>Excavated</i>	<i>Floatation sample collected</i>	<i>Organic residue sample collected</i>
PLA-183	30	YES	YES	YES
PLA-184	20	YES	YES	YES
PLA-185	17	YES	YES	YES
PLA-186	16	YES	YES	YES
PLA-187	19	YES	YES	YES
PLA-188	13	YES	YES	YES
PLA-189	12	YES	YES	YES
PLA-190	13	YES	YES	YES
PLA-191	14	YES	YES	YES
PLA-192	18	YES	YES	YES
PLA-193	15	YES	YES	YES
PLA-194	18	YES	YES	YES
PLA-195	16	YES	YES	YES
PLA-196	19	YES	YES	YES
PLA-197	15	YES	YES	YES
PLA-198	16	YES	YES	YES
PLA-199	16	YES	YES	YES
PLA-200	15	YES	YES	YES
PLA-201	12	YES	YES	YES
PLA-202	15	YES	YES	YES
PLA-203	16	YES	YES	YES
PLA-204	15	YES	YES	YES
PLA-205	18	YES	YES	YES
PLA-206	17	YES	YES	YES

# THE 2017 EXCAVATIONS AT COURTYARD 4 OF THE LOWER DOVER PALATIAL COMPLEX

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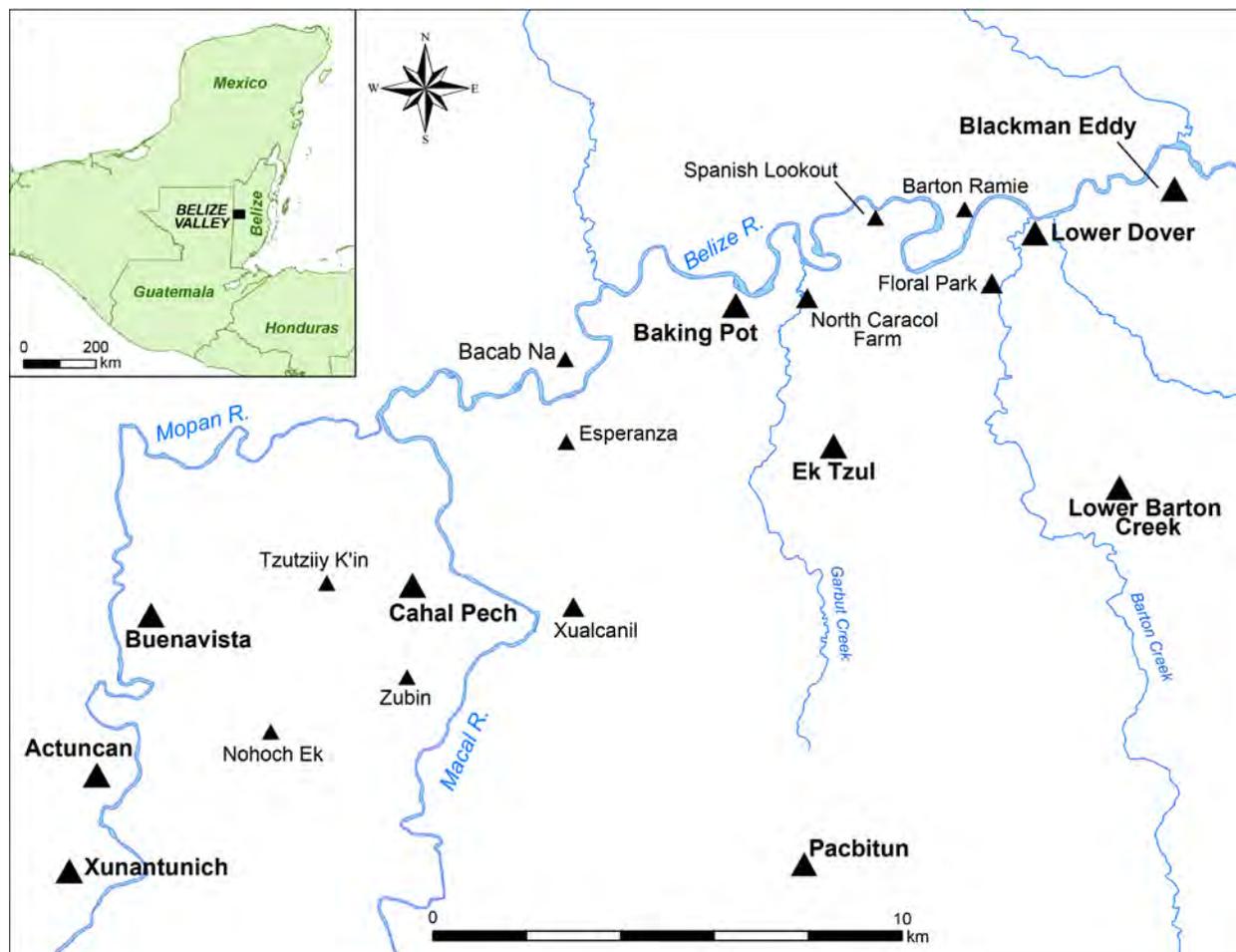
## INTRODUCTION

The site of Lower Dover is located on the grounds of Lower Dover Field Station owned by William and Madeline Reynolds in Unitedville Village, Cayo District, Belize. The Lower Dover site core sits on a limestone bluff just south of the Belize River, and is geographically bounded by Lower Barton Creek to the east and Upper Barton Creek to the west (Guerra 2011; Guerra and Awe 2017). The minor center of Barton Ramie lies just north of the Lower Dover site core across the Belize River. As shown in Figure 1, the major centers of Baking Pot and Blackman Eddy are located 5 km to the west and 2.5 km to the east of Lower Dover, respectively (Guerra and Arksey 2012).

Research during the 2017 field season of the Belize Valley Archaeological Reconnaissance (BVAR) Project was focused on excavating and documenting a large on-floor ceramic deposit, referred to as peri-abandonment deposits (Lonaker et al. 2017), in Courtyard 4 (CT4) within the Lower Dover site core, the southern-most courtyard of the palatial complex. Peri-abandonment floor deposits appear to vary in content across the Belize Valley (Awe 2012; Hoggarth et al. 2016; Lonaker et al. 2017) and the Maya lowlands generally (Adams 1990; Stanton et al. 2008), but are usually located in corners of courtyards and plazas, in front of stairs, and in the doorways of public architecture and contain large quantities of densely packed, intentionally smashed pottery, shell, lithics, as well as ritually charged items (Mock 1998). At Lower Dover, peri-abandonment deposits have previously been identified as ‘sheet deposits’ containing vast quantities of ceramics dating to the Terminal Classic Period (AD 750-900/100), along with chert fragments and partial bifaces, shell bead, faunal remains, jute shells, obsidian blade fragments, jade, ocarina fragments, and spindle whorls (Guerra et al. 2013, 2014; Guerra and Romih 2017).

Beginning in 2012, the BVAR Project began to investigate ‘peri-abandonment’ deposits at the regional scale due to the diverse and varied identification of these types of on-floor deposits (Awe 2012; Hoggarth et al. 2016; see also Lonaker et al. 2017). To address concerns over the nature and function of peri-abandonment floor deposits found across the Belize Valley region,

excavations at Lower Dover concentrated on the northern side of Courtyard 4 as the presence of a possible deposit was noted there during 2013 excavations (Figure 2; Guerra et al. 2014). The on-floor feature stretched across the front of the staircase on the southern side of Courtyard 4 and in some areas even over the first step. The deposit contained several ocarina and figurine fragments, along with broken and whole bifaces, *incensario* fragments, polished quartz, and worked faunal remains (Guerra 2014). This report describes the 2017 excavations of the peri-abandonment deposit in Courtyard 4 and provides the results of preliminary artifact analyses.

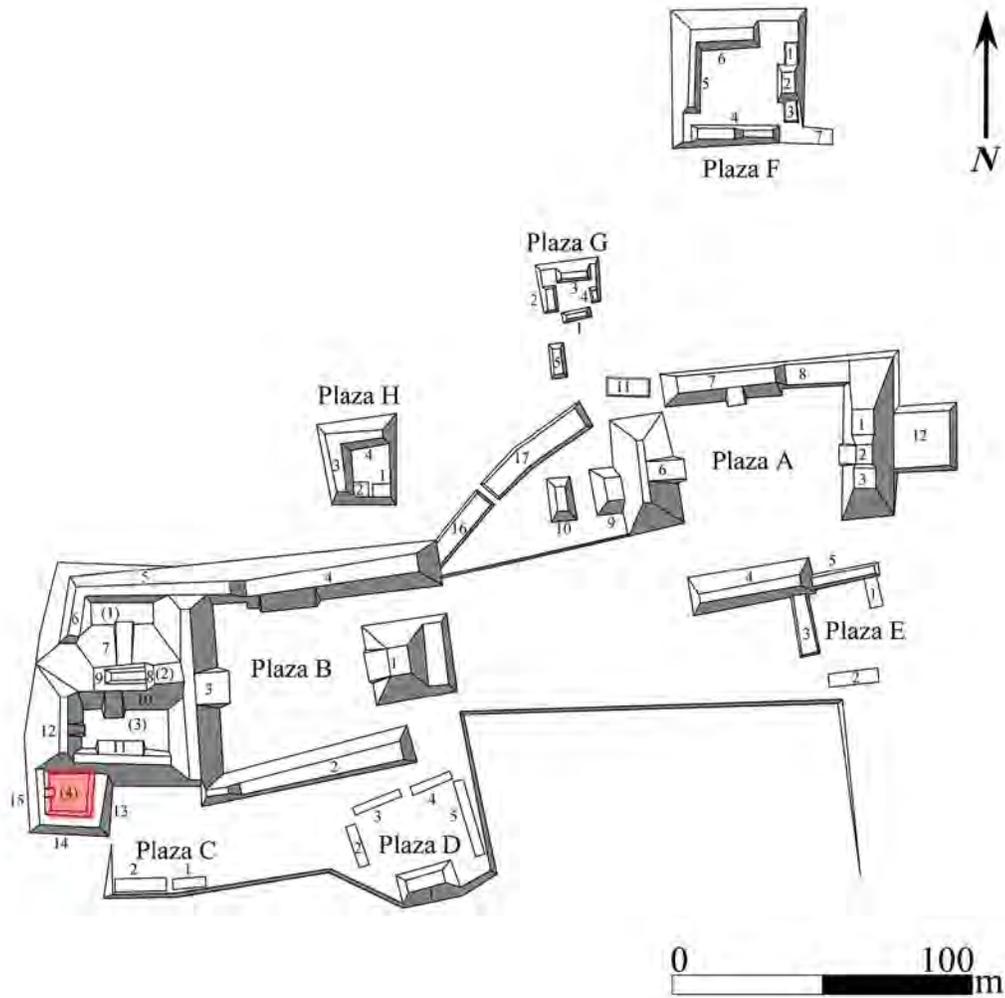


**Figure 1:** Map of Archaeological Sites in Upper Belize Valley, Cayo District, Belize (map by Claire Ebert, 2018).

## BACKGROUND

The Terminal Classic Period has plagued Maya archaeology with querulous debate because of the massive social, religious, and political changes (Demarest et al. 2004; Guderjan 2005; Stanton et al. 2008; Webster et al. 1998). Some have viewed the Terminal Classic as a cultural horizon “characterized as ‘spatial continuum represented by the wide distribution’ of recognizable artifacts, styles, or practices, defined most saliently by ‘it’s relatively limited time dimension and its significant geographic spread,’” (Phillips and Willey 1953:625). The identification and analysis

of peri-abandonment deposits most often, but not exclusively, found in elite contexts may provide an avenue to investigate the Terminal Classic period as a distinct cultural horizon. Because deposits are indicators of the final activities in elite contexts, they can provide important contextual information about the timing of the political collapse and the abandonment of monumental centers.



**Figure 2:** A site plan of the Lower Dover site core where the red box represents the 2017 excavation area.

Archaeologists working at Maya centers throughout Belize have proposed differing interpretations of the function of peri-abandonment or otherwise known as problematic deposits. Over 60 years ago, Sir J. Eric S. Thompson proposed the “squatter theory” based on evidence of the use of structures in a ruin after the site’s abandonment. He suggested that on-floor deposits found in elite plazas were evidence of the lavish, or careless living of squatters who simply

disposed of their trash wherever they pleased (Thompson 1954). However, there is no ethnographic evidence to suggest such behavior among ancient Maya peoples, however most ethnographic work has not focused on descriptions of abandoned domestic structures. Ethnographic evidence from the Maya highlands does suggest however, that discard behavior is ruled by three main factors: (1) economy of effort, (2) potential value of refuse, and (3) potential hindrance by refuse (Stanton et al. 2008:230). Therefore, it is unlikely that squatters created dumps adjacent to their living spaces, and that they would have disposed of valued goods such as complete chert bifaces, shell beads, and jade.

Until relatively recently, Thompson's squatter model went unchallenged. More recent interpretations of peri-abandonment deposits include domestic refuse or "ceremonial trash generated from termination rituals" (Stanton et al. 2008:227). In their extensive examination of the ethnographic literature on discard disposal in contemporary Maya communities, Stanton and colleagues (2008:230) also suggest that Maya houses and public spaces such as courtyards and plazas were kept very clean and were routinely swept. It is therefore, just as unlikely that 'peri-abandonment' deposits are piles of domestic refuse. Both ethno-archaeological and archaeological data from the study of abandonment processes however, suggest that site maintenance may be put off if a relocation is planned, therefore "the process of anticipated abandonment results in accumulation of refuse in areas that would normally be kept clean in pre-abandonment contexts. If there is anticipated return, objects may be cached," (Stanton et al. 2008:233). Thus, it is possible that some of the extensive deposits in the Maya lowlands could be explained by these impromptu dumping sites, however most peri-abandonment deposits date to a time after site abandonment (Awe 2012).

Still, other scholars have suggested that these deposits, which often contain evidence of burning, show signs of rapid abandonment of sites (Chase and Chase 2004) sometimes associated with conflict such as that seen at the site of Aguateca (Inomata 2003; Stanton et al. 2008). The assumption of this model is that people were forced to flee quickly from the site because of warfare or epidemics, which they dumped all that they could not carry. These types of deposits have also been termed "de facto refuse," meaning the artifacts have not strayed far from their original contexts if people simply picked up and left (Chase and Chase 2004). However, this is often not the case, as these types of deposits tend to contain large amounts of faunal remains, mixed in with burnt material, ceramics, obsidian, and chert tools. There is no logical explanation for these items being kept in a pile on the floor in front of someone's home that would prevent access to the structure while the site was still occupied. Thus, it is unlikely that these deposits are evidence of rapid abandonment of sites, unless there is some other evidence to suggest warfare or an epidemic. Individual elite centers responded differently to the collapse of 'classic Maya' society during the Terminal Classic however, and each center likely experienced different stresses which caused some to wither, and other to rise in power during the Postclassic period (1000 AD-1521 AD) (Demarest et al. 2004). Archaeologists must recognize then, that 'peri-abandonment' deposits within and between ceremonial centers formed in unique, but identifiable ways. While some deposits may certainly suggest evidence of warfare such as those associated with human remains that evidence death by combat (need good example to cite), the majority of 'peri-abandonment' deposits are too large and systematic in placement to have been a viable option for ancient peoples to orchestrate under while under assault.

One of the main problems with examining these deposits as refuse disposal is that the “ethnoarchaeological contexts we have, have been very different from the archaeological contexts of the deposits in question,” (Stanton et al. 2008:234). The deposits are found in elite civic areas such as palaces, and temples, whereas all of the ethnoarchaeological data is focused almost exclusively on domestic refuse. However, the ritual nature of these rich floor assemblages was acknowledged by Robert Wauchope in 1948, and William Coe in 1959, but it was not until the 1990’s that Mayan archaeologists began to accept ritual termination of structures as a possible alternative model (Stanton et al. 2008:235). Ethnographic accounts of Maya communities indicate that the ancient Maya conceptualized the world around them as entirely animate, meaning that dead ancestors, objects and landscapes had a spirit, or life, and that these supernatural forces could be manipulated by living people, so that all ritual behavior revolved around this base (Stanton et al. 2008:235). Structure animation through “consecration rituals” is perhaps best exemplified by (Vogt 1998) where chickens were sacrificed and consumed, their heads removed and buried facing the cardinal directions (cited in Stanton et al. 2008:235). By contrast, there are also termination rituals which de-charge, or kill, the structure, and often involve the burning of copal incense for purification, prayers or chants, and offerings (Stanton et al. 2008:236).

We argue that peri-abandonment deposits in the Belize Valley are associated with rituals performed during pilgrimage and ancestor veneration rites by post-abandonment Maya populations (Awe 2012). These pilgrimages to sacred sites have been documented archaeologically, particularly in the case of La Milpa, Belize where several lines of evidence indicate that people visited the site to perform rituals after its abandonment (Hammond and Bobo 1994). The first of these lines of evidence is the resetting of fallen stelae--first documented by Pollock at the site of Cobá at which the base of the stela seemed to have been broken off and reworked “suggest[ing] that the stela was set up in its present position by a later people than the actual sculptors, perhaps as a venerable object rather than a contemporaneous record (Pollock 1929: 328-9). However, this also suggests that people who visited the site also recognized the stela as symbols of power from their ancestors. While knowledge of the written text on the stela themselves was lost, they still functioned as shrines because of their ritual significance. Furthermore, *incensario* fragments, dating to the 15<sup>th</sup> or 16<sup>th</sup> century, were also found at the base of Stela 12 at La Milpa, suggesting that someone regularly visited there because of the association of incense with purification in Mayan rituals (Hammond and Bobo 1994:27).

The issue of interpretation becomes most apparent when examining the form of peri-abandonment deposits, which superficially appear very similar. As always, the context and content of individual deposits must be closely scrutinized to grasp the full picture of the ancient past, but crucial to that understanding are the assumptions we make in theoretical models. At the site of Altun Ha, Pendergast, attributed a relatively small deposit containing 2,000 sherds to refuse from squatters after abandonment (Pendergast 1998). More extensive deposits have been documented in the Belize Valley by the BVAR Project. For example, a peri-abandonment deposit containing over 50,000 sherds has been excavated at the Zopilote Group, a terminal-sacbe group associated with monument epicenter of the site of Cahal Pech (Ebert and Fox 2015; Fox and Awe 2017; Fox, this volume). A similar deposit was reported at the site of Blue Creek, in northern Belize, where feasting refuse was placed on the floor of a ceremonial building (Structure 3) when the structure was abandoned. Researchers from Blue Creek suggest that these deposits “resemble middens in composition but are ritual in context, as they are often located at the centerline of monumental,

ceremonial architecture,” (Guderjan 2005:119). Guderjan goes on to suggest that the deposit found at Structure 3 is clearly a termination ritual deposit as evidence by intentional smashing and layering of ceramics. The pattern is also evident at larger centers across the Maya region. At the large site of Copan, Honduras the edges of two elite courtyards, group 8N-11, and 9N-8, were described as littered with domestic refuse right before site abandonment (Webster et al. 1998). The northern Yucatán site of Yaxuna also exemplifies this pattern in its northern most acropolis. Termination rituals were performed on Str. 6F-4 whereby a bed of ash was laid on the plaza floor and covered with a deposit containing “whole and fragmented ceramic vessels, faunal remains, obsidian blades, and a chert biface,” (Suhler et al. 2004:465). At structure 6F-68 more deposits containing smashed household goods were found lining entire walls of rooms, and along the face of the structure, however the researchers describe them as evidence of feasting, prior to the termination of the structure (Suhler et al. 2004:475).

Lower Dover’s temporal and spatial location make it an excellent site to examine these contentious floor deposits. The small number of building phases with associated architecture at the site has led archaeologists to believe that Lower Dover was rapidly constructed during the Late Classic Period (Guerra and Awe 2017), and therefore a temporally ideal space for finding such deposits. Furthermore, based on existing evidence most structures at Lower Dover were abandoned during the Terminal Classic period, though there is some limited evidence for Postclassic activity, making it contextually an excellent site for examining these controversial floor assemblages.

## **METHODS**

The 2017 field season saw the excavation of the southern base of Structure B13 through access on the northern end of Courtyard 4. Since 2013 excavation revealed a “sheet-like” peri-abandonment deposit on the southern end of the courtyard, we decided to excavate a large horizontal exposure on the northern side of the plaza, where it abuts Structure B13. The specific methodology used to excavate the northern side of CT4 were the general BVAR Project Excavation guidelines outlined in the Supervisor Manual (Hoggarth and Awe 2017). Excavations of the Courtyard 4 ‘peri-abandonment’ deposit however, were carried out according to methods outlined by Lonaker and colleagues utilizing a microstratigraphic approach and a 1m by 1m subplot system (2017). The horizontal excavation of the northern side of CT4 was first divided into a grid system of 2x2 m units (Figure 3) and was reconstructed from the previous grid used in 2013. The middle four units were excavated in 2013 by Rafael A. Guerra and colleagues and are therefore designated as backfill on Figure 4.

The deposit itself was not located until the last week of the excavation season because of backfill removal, therefore only the first layer was able to be excavated and documented. The first layer of the deposit was excavated in discrete layers, with soil samples taken for floatation. All matrix will be sifted through 1/8<sup>th</sup> inch screens, as opposed to the standard 1/4<sup>th</sup> inch screen, since the presence of very small fine artifacts is greatly associated with these types of deposits such as bone, beads, and mosaic pieces. The first layer of the deposit was also to be mapped in both plan and profile views. These methods will be employed for completing excavations of the deposit during the 2018 BVAR Project field season.



**Figure 3:** Photograph of the deposit feature discovered in CT4 during the 2017 field season.

1 meter	E.U. CT4-8	E.U. CT4-1	E.U. CT4-2	E.U. CT4-5	
	E.U. CT4-3	2013 BACKFILL	2013 BACKFILL	E.U. CT4-4	
2 meters	E.U. CT4-7	2013 BACKFILL	2013 BACKFILL	E.U. CT4-6	
	2 meters				

**Figure 4:** Unit grid system for the 2017 Courtyard 4 excavations.

## Photography

The beginning of every unit, and at the change of every lot and level are documented photographically as per general BVAR excavation procedures. When deposits are discovered, the photographic evidence becomes even more crucial because the photographs can be used to create 3-D models. For this project, the deposit itself was and will be extensively photographed at each layer of sediment removal and per subplot. These photographs in addition to drawn maps will be used to compile plan view maps of each micro layer in the deposit itself.

## Floatation

Each layer of the deposit located is screened through ¼ inch mesh and a sample soil taken from the sifted matrix, which will be floated for light and heavy fraction. Heavy fraction can contain very small artifacts such lithic debitage, whereas the light fraction is collected for later paleobotanical analyses. Through the collection of floated samples, I hope to find evidence of seeds as well. Since the deposit was located late in the field season only the first layer was excavated this past 2017 field season. Therefore, the floatation method was not utilized this year, but samples were taken from the first layer of the deposit for processing next field season in 2018.

## RESULTS

A total of nine units were opened during this field seasons excavations in Courtyard 4, in search of similar floor assemblages to those described in the literature, for a more complete understanding of the behavior and cultural process that led to their formation. Several interesting finds were discovered in the course of these investigations that have provided important information about the architectural aspects of Courtyard 4, the form and possible function of peri-abandonment deposits in this part of the Lower Dover site core, and possibly the life of craftsmen in the site core.



**Figure 5:** Panoramic view of excavated units after they were closed at the end of the field season.

## Architecture

Based on survey of Courtyard 4 and the surrounding structures, we assumed that we were excavating at the base of Structure B13. However, excavation of Unit CT4-5, and extension A of that unit, revealed that the wall of Structure B1 directly abutted another wall, suggesting a structure was built as an extension of an earlier building (Figure 5 and Figure 6). This required a change in the numbering of buildings on the sitemap (See Figure 2 for up-to-date site core numbering system). This later structure was designated as Structure B11, whereas the structure on western side was designated Structure B12. The break between the two walls represents a rounded corner of Structure B12, indicating that it was built at an earlier time than the attached Structure B11 to the east.



**Figure 6:** Photograph showing Units CT4-1, 4, 5 excavated to the level of the plaza floor. Note the rounded corner and the adjoining wall of Structure B11. The exposed ceramics and cut stones in the photograph represent the last layer of collapse during the 2017 excavations.

While most of the middle portion of the wall of Structure B12 had collapsed, the east part of the wall was relatively well preserved and was conserved in September of 2017 through funding provided by the Friends of Lower Dover Foundation (Figure 12). The plaza floor in Courtyard 4

was also well preserved where we were able to finish excavating to floor level (Units CT4-3,6,7) however at the end of the season we put tarps down and partially backfilled it to protect it from deterioration as best as possible. The floor became more deteriorated towards the middle of the plaza where collapse was not present to prevent water from reaching the plastered floor. Charcoal samples were obtained from the last collapse level whose matrix consisted of a compact daub-like layer across several units (CT4-2, 4, 5, and 6) on the eastern side of excavations this field season. These samples along with those to be collected this upcoming field season will be analyzed in 2018-2019 for radiocarbon dates to better understand when the courtyard was abandoned as a residence and when the deposit event occurred as well.

High frequencies of daub were documented during the Courtyard 4 excavations compared to other locations in the Lower Dover site core, suggesting that there was likely a perishable structure on top of Structure B13. Burning was also noted on some of the larger daub specimens which still held impressions of the beams and poles they were attached to. Further analysis of the daub collection is necessary to make any conclusive statements as to the significance of the high quantities here in proportion to other excavations in the site core.



**Figure 7:** Photograph of the large pieces of daub discovered during 2017 CT4 excavations. Note the impressions left by the posts the daub was attached to.

### **Preliminary Artifact Analyses**

Because excavations of the peri-abandonment deposit in Courtyard 4 are ongoing, only preliminary artifact analyses have been conducted. Preliminary ceramic analyses documented only Late and Terminal Classic types (Spanish Lookout phase). Of significance were several sherds from Pabellon molded-carved vessels (Figure 7 and Figure 8). The sherds likely rolled down from the top of Structure B13, as similar vases were also recovered from collapse and humus levels at

the eastern base of the structure in previous excavations. Several *incensario* fragments were also recovered from the 2017 excavations. A variety of other special ceramic finds were discovered during the excavations of Courtyard 4 including a figurine, two spindle whorls, and flute and ocarina fragments (see Appendix A). One spindle whorl was carved out of limestone, indicating that perhaps different weighed spindle whorls may have been important to spinning fabrics.



**Figure 8:** Examples of molded-carved ceramics recovered from 2017 Courtyard 4 excavations. Several types of molded-carved ceramics are present within the assemblage from the northern side of CT4 and will be analyzed during the next field season.



**Figure 9:** Other examples of molded-carved ceramic sherds. Note that the bottom right sherd still has some red paint.



**Figure 10:** Spindle whorl, figurine and musical instrument fragments uncovered in the collapse of the southern wall of Structure B13 (See Appendix A). Note that SF #18, and SF # 27 were ash tempered and did not preserve well.

## Lithics

Lithic artifacts recovered from the 2017 excavations in Courtyard 4 include high frequencies of complete and fragmentary chert bifaces, many of which appear to be in different stages of production (Figure 10). Also, of note, is a modified river cobble that judging from the drilled holes was likely a pendant or adornment (SF #12). Several fragments of obsidian blades were also present in the assemblage and were exported for geochemical sourcing analyses. Lastly, a granite grooved stone (SF #1), which likely served as a multi-purpose weight to which rope could be tied, was also collected during excavations.



**Figure 11:** Lithic special finds found in the collapse of the southern wall of Structure B13. Note that the bifaces are in varied states of production, and some were likely abandoned after experimentation had gone wrong (SF #19). No analysis has been conducted on the lithics as yet, and we are uncertain whether the grooved line on SF #12 is naturally caused or modified by a person—the holes however appear drilled based on initial observations.

## Faunal Analysis

Faunal remains recovered from Courtyard 4 were limited, though continued excavations will likely recover additional specimens. Many of the remains could not be identified to taxonomic category; however, element identification was successful often to size class and taxonomic classes and/or orders (Table 1). Breakage and root etching were the primary natural taphonomic damage

occurring on many of the remains. Cultural modifications were identified on some of the marine and freshwater shells recovered from the excavations. These included drilled holes in a freshwater clam (*Nephronaias* sp.), an olive shell tinkler (*Oliva reticularis*), and a Spondylus bar-shaped pendant with drilled holes on each end (Figure 11).

Mammals present in the assemblage were mainly identified as artiodactyls. The tip of an antler was identified to *Artiodactyla*, even-toed ungulates, but could not be differentiated between white-tailed deer and brocket deer. White-tailed deer (*Odocoileus virginianus*) elements identified include three first and two second phalanges, one right maxillary molar, and the epiphysis of a vertebrae centrum. One right shaft of a calcaneus closely following *Mazama* sp. was also identified. Outside of the Artiodactyls, a left dentary closely following one of the many opossums found in Belize was identified. A left humerus from a large American Opossum (Genus: *Didelphis*) was also present. Two fragments from a left tibia identified to closely following large cats (Family: *Felidae*) was also identified. Indeterminate large mammal elements identified were primarily long bone fragments. One phalanx and two long bone fragments were attributed to medium-large sized mammals (e.g., white-tailed deer, brocket, tapir, jaguar, and cougar). One right tibia shaft fragment and two long bone fragments were identified to medium sized mammals (e.g., opossum, armadillo, paca, skunk, coati, and peccary). Two species of jute were present, including 18 *Pachychilus indiorum* and three *Pachychilus glaphyrus*. Fifteen of these jutes were missing their distal ends from either being lobbed off or natural causes. Two complete and two fragments of apple snail shells (*Pomacea flagellata*) were identified. Excavators also collected complete and fragmentary land snail shells from *Orthalicus princeps*, which is the largest land snail in Belize. These are often misidentified as freshwater shells due to their thickness and size.

**Table 1:** Faunal remains recovered from 2017 Lower Dover Courtyard 4 Excavations.

<i>Taxonomic Category</i>	<i>NISP</i>	<i>% NISP for Structure</i>
<i>Pachychilus indiorum</i>	18	26.09%
<i>Pachychilus glaphyrus</i>	3	4.35%
<i>Pomacea flagellata</i>	4	5.80%
<i>Oliva reticularis</i>	1	1.45%
<i>Orthalicus princeps</i>	7	10.14%
<i>Nephronaias</i> sp.	2	2.90%
<i>Spondylus</i> sp.	1	1.45%
INDT Marine Shell	1	1.45%
<i>Odocoileus virginianus</i>	6	8.70%
cf. <i>Odocoileus virginianus</i>	1	1.45%
cf. <i>Mazama</i> sp.	1	1.45%
<i>Artiodactyla</i> (antler)	1	1.45%
<i>Didelphis</i> sp.	1	1.45%
cf. <i>Didelphimorphia</i>	1	1.45%
cf. <i>Felidae</i> (Large)	2	2.90%
Indeterminate Large Mammalia	13	18.84%
Indeterminate Medium-Large Mammalia	3	4.35%
Indeterminate Medium Mammalia	3	4.35%
<b>Total</b>	<b>69</b>	<b>100%</b>



**Figure 12:** Faunal special finds from 2017 CT4 excavations at the southern base of Structure B13. The tinkler (SF #4), and the *Oliva* sp. shell (SF # 7) were likely worn as adornment on clothing. The *Spondylus* sp. bar (SF # 20) on the right was likely part of a necklace made of jade beads like the one found in Plaza H Burial 2.

## DISCUSSION AND CONCLUSIONS

While the 2017 excavations of Courtyard 4 yielded little in terms of our larger questions about these contentious peri-abandonment deposits, preliminary results provide us with a clearer understanding of the construction history, function, and use of Courtyard 4, as well as the site core of Lower Dover itself. Excavations documented at least two phases of construction, which may serve to indicate that the site was not built as rapidly as previously thought. It is also possible that it served as an extended royal family residence and that those members participated in craftsmanship. The continuation of excavations in Courtyard 4 during the 2018 field season will serve to further elucidate information about the function of space during its occupation and perhaps through the floor deposit, the courtyards uses after the site core is abandoned as a living space.

The deposits themselves are unique and often distinct from one another within and between sites across the Belize River Valley. Therefore, further study of them would enable us to determine whether there are different types of ritual deposits like this and the varied ways in which they are presented. Through a regional approach we might begin to understand how ‘peri-abandonment’ deposits might be more appropriately identified and interpreted. This research is also more broadly significant to BVAR’s special focus on regional research because through individual study at a variety of site in the Belize Valley we can begin to search for regional patterns. Moreover, this clear expression of the continuation of Maya culture and religious practice defies the general public’s opinion of the Maya being largely gone. If we can understand these deposits, perhaps we can use this information to reinvigorate local interest in Maya heritage and culture to thereby stem the tide of artifact trafficking and encourage the development of local tourism and cultural heritage management.



**Figure 13:** Photograph of the conservation work conducted after the close of the 2017 field season through the gracious funding of the Friends of Lower Dover Foundation, and the continued support and protection of the site by the Reynolds family. Note that a drain was discovered during the conservation process close to where the later Structure B11 was attached. If the construction of Structure B11 served to close of CT3 then the hole likely served as a necessary means to drain water from the higher elevated CT3.

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**APPENDIX A: SPECIAL FIND INVENTORY**

<i>E.U.</i>	<i>Lvl.</i>	<i>Lot #</i>	<i>Lot Designation</i>	<i>Class</i>	<i>Bag (x of n)</i>	<i>Freq.</i>	<i>Notes</i>	<i>Photos</i>
CT4-0	0	CT4-0-0	Backfill	CH	2 of 2	1	Grooved Stone SF#1	341-348
CT4-1	1	CT4-1-1	Humus and Collapse	CE	6 of 6	11	Molded Carved SF#2	610-613
CT4-1	1	CT4-1-1	Humus and Collapse	CE	6 of 6	1	Molded Carved SF#3	349-356
CT4-2	1	CT4-2-1	Humus and Collapse	SH	5 of 5	2	Tinkler SF#4	0786-0788
CT4-2	1	CT4-2-1	Humus and Collapse	CH	8 of 9	1	Biface SF#5	357-363
CT4-2	1	CT4-2-1	Humus and Collapse	CH	9 of 9	1	Biface Frag. SF#6	364-371
CT4-2	1	CT4-2-1	Humus and Collapse	SH	5 of 5	1	Pendant SF #7	0783,0785
CT4-3	1	CT4-3-1	Humus and Collapse	CE	7 of 9	6	Molded Carved SF#8	614-619
CT4-3	1	CT4-3-1	Humus and Collapse	CH	8 of 9	1	Biface Frag. SF#9	372-384
CT4-3	1	CT4-3-1	Humus and Collapse	CB	9 of 9	1	Modified River Cobble SF#10	620-626
CT4-3	1	CT4-3-1	Humus and Collapse	CE	5 of 6	3	Molded Carved SF#11	627-631
CT4-3	1	CT4-3-1	Humus and Collapse	CH	6 of 6	1	Biface SF#12	632-642
CT4-5	1	CT4-5-1	Humus and Collapse	CH	7 of 8	1	Biface SF#13	643-649
CT4-5	1	CT4-5-1	Humus and Collapse	CH	8 of 8	1	Biface SF#14	650-655
CT4-4	1	CT4-4-1	Humus and Collapse	CE	7 of 8	1	Flute Fragment SF#15	656-662
CT4-4	1	CT4-4-1	Humus and Collapse	CH	8 of 8	1	Biface SF #16	663-670
CT4-4	1	CT4-4-1	Humus and Collapse	CE	9 of 12	1	Figurine Frag. SF#17	671-683
CT4-4	1	CT4-4-1	Humus and Collapse	CE	10 of 12	1	Figurine Frag. SF#18	684-690
CT4-4	1	CT4-4-1	Humus and Collapse	CH	11 of 12	1	Biface Frag. SF #19	691-698
CT4-4	1	CT4-4-1	Humus and Collapse	SH	12 of 12	1	Pendant SF#20	8046-8049
CT4-6	1	CT4-6-1	Humus and Collapse	CH	7 of 7	1	Biface-Projectile Point SF#21	699-707
CT4-4	1A	CT4-4-1A	Collapse	CH	9 of 9	1	Biface SF#22	708-715
CT4-3	1A	CT4-3-1A	Collapse	CE	6 of 6	1	Ocarina Frag. MP SF#23	716-726
CT4-8	1	CT4-8-1	Humus and Collapse	CE	6 of 6	4	Molded Carved SF #24	727-731
CT4-6	1A	CT4-6-1A	Collapse	CH	4 of 4	1	Biface SF #25	732-738
CT4-4	1B	CT4-4-1B	Collapse	LM	4 of 4	1	Spindle Whorl SF #26	739-748

**SETTLEMENT EXCAVATIONS IN THE LOWER DOVER HINTERLAND:  
RESULTS OF THE 2017 FIELD SEASON**

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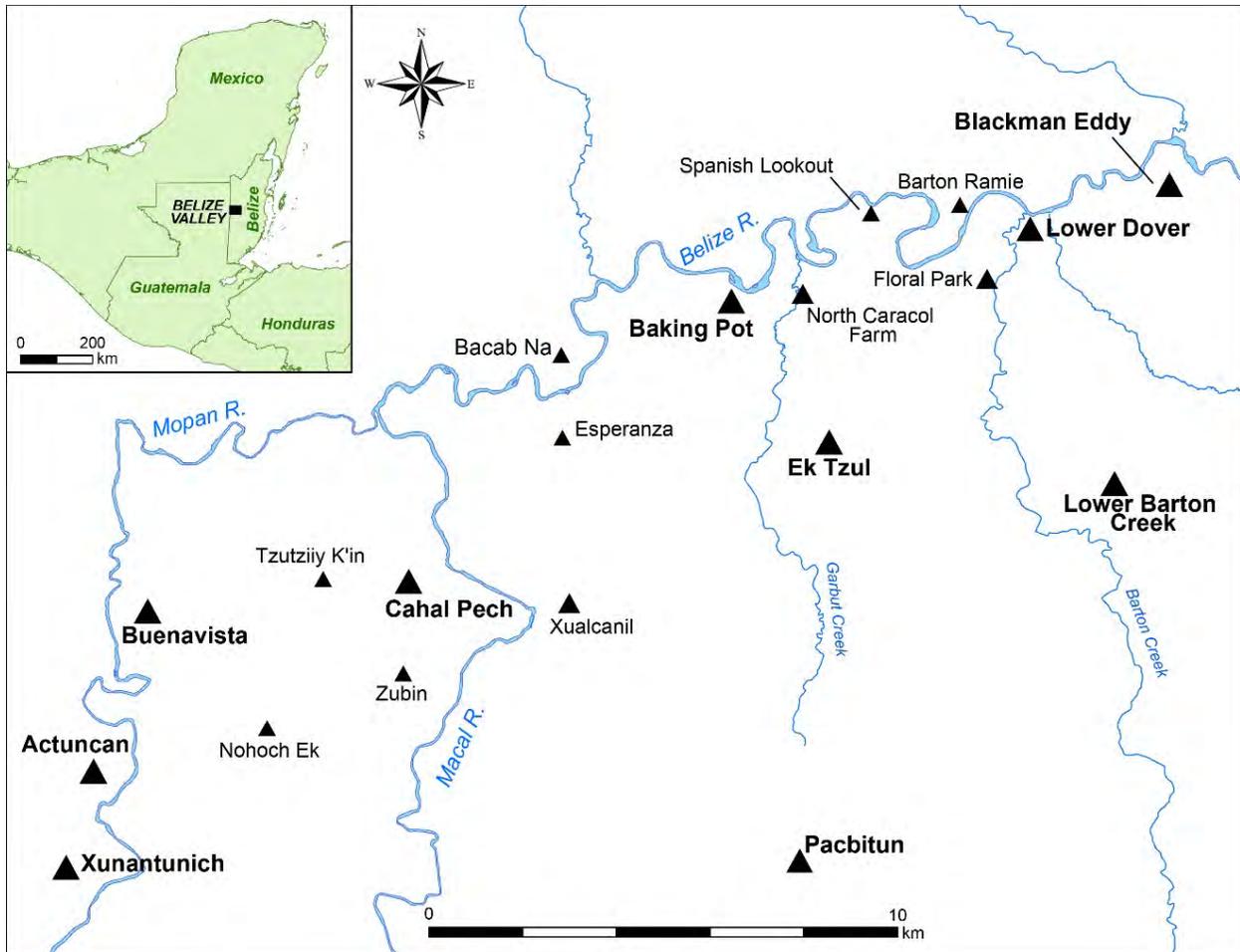
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**INTRODUCTION**

The summer of 2017 saw continuing research on the Tutu Uitz Na neighborhood, located to the south of the political center of Lower Dover (Walden et al. 2017; Figure 1). Excavations targeted the Tutu Uitz Na intermediate elite center (SG 1), a rockshelter (RS 2) and four additional commoner settlement groups (SGs). The sample of commoner households included two high status commoner patio groups (SG 3 and SG 51), and two low status commoner patio groups (SG 28 and SG 11; Figure 1). The sampling strategy was designed to understand the ways in which people of varying social statuses were affected by, and reacted to the emergence of Lower Dover as a regional polity during the Late Classic Period (AD 500-750; Guerra 2011; Guerra and Awe 2017; Helmke and Awe 2012; Walden et al. 2017). The 2017 settlement excavations built upon previous survey and preliminary test excavations carried out in the Lower Dover settlement during the 2016 field season of the Belize Valley Archaeological Reconnaissance (BVAR) Project. Investigation during the 2017 BVAR Project field season identified a possible sacrificial deposit consisting of multiple inhumations (atop Structure E2, the eastern triadic shrine at Tutu Uitz Na), a lithic workshop (SG 28, Structure N2), and preliminary evidence that at least three commoner dwellings predate the Late Classic rise of Lower Dover.



**Figure 1:** Map of Maya centers in the upper Belize River Valley (map by Claire Ebert, 2018).

The 2017 excavations in the Lower Dover periphery were conducted to address two primary questions:

1. How did the political power of Tutu Uitz Na, and the wealth and status of surrounding commoner households, wax and wane throughout the developmental trajectory of the neighborhood and the Lower Dover polity? Previous settlement excavations and ceramic evidence indicate initial settlement of some households and neighborhoods surrounding the Lower Dover monumental epicenter may have occurred as early as the Middle Preclassic period (900-300 BC; Table 1). The presence of relatively large and elaborate domestic and ceremonial architecture at Tutu Uitz Na (Walden et al. 2017), in addition to BR-180/168 (Willey et al. 1965) and Floral Park (Driver and Garber 2004), reflects the sociopolitical status of their residents. The 2017 settlement excavations also focused on smaller, less elaborate residential settlements to understand the ways in which the rise of Lower Dover affected commoners, and their integration into the ascendant Lower Dover polity. Reconstruction of household wealth and status based on assemblages and architectural data allows us to chart diachronic trends in status and wealth throughout the occupational history of each residential group.

2. How did the roles and activities of the intermediate elite at Tutu Uitz Na and surrounding households change through the developmental trajectory and, in particular, the emergence of Lower Dover? The quantification and comparison of the relative amount, quality, and diversity of artifacts related to economic and ceremonial activities provides a window into what households were doing.

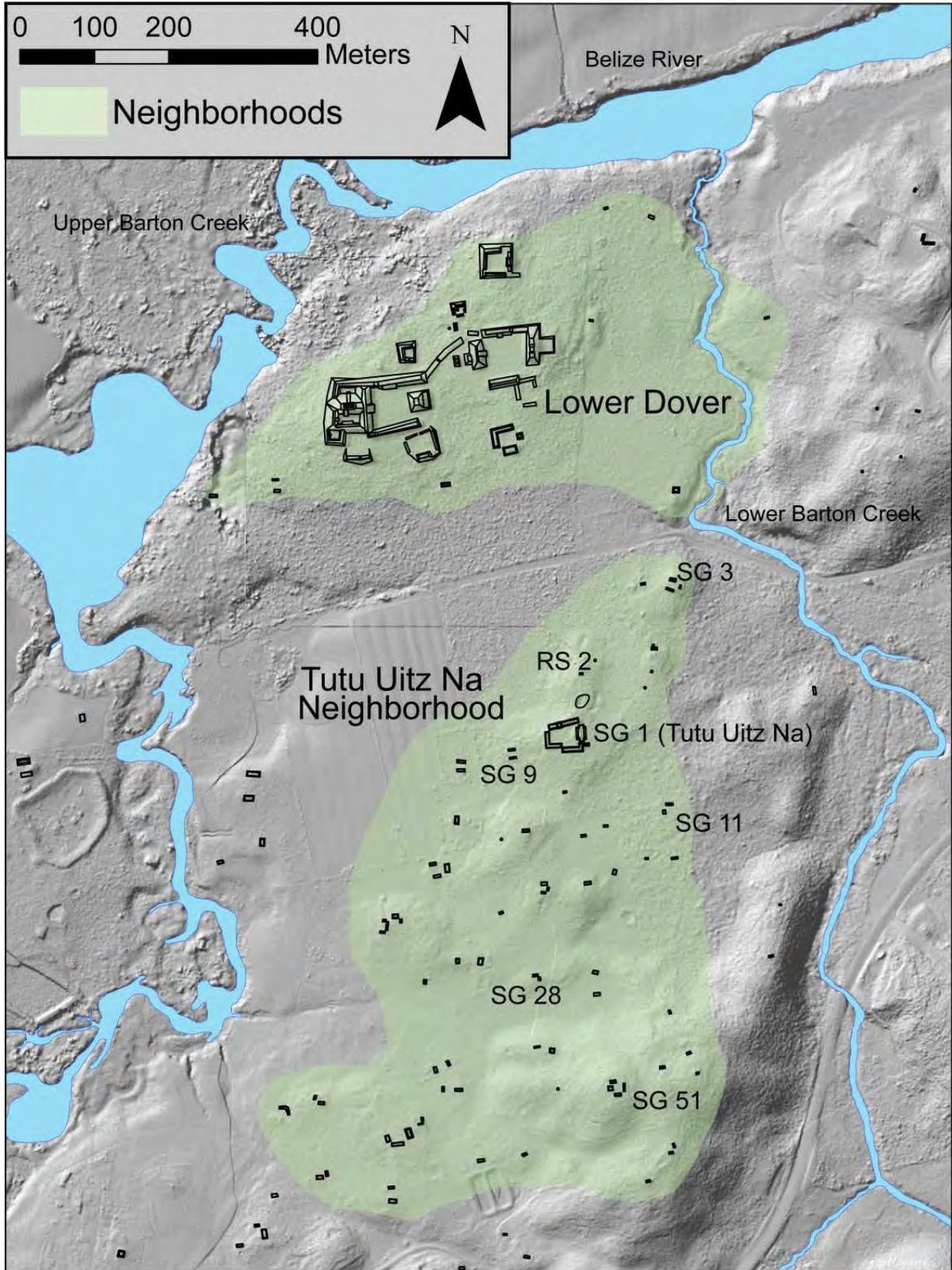
**Table 1:** Relative time periods of occupation for aspects of the Lower Dover Polity.

<i>Time Period</i>	<i>Date Range (cal yr BC/AD)</i>	<i>Lower Dover</i>	<i>Tutu Uitz Na</i>	<i>BR-180/168</i>	<i>Floral Park</i>
Terminal Classic	AD 750-900/1000	Active	Active	Active	Active
Late Classic	AD 500-750	Active	Active	Active	Active
Early Classic	AD 300-500	Active?	Active	Active	Active?
Late Preclassic	300 BC-AD 300	Inactive	Active	Active	Active
Middle Preclassic	900-300 BC	Inactive	Active	Active	Active

## PREVIOUS SETTLEMENT EXCAVATION AT TUTU UITZ NA

Tutu Uitz Na was first recorded by Wölfel and colleagues (2010:20-21) as Lower Dover, Plaza F. It was later revisited by BVAR Project researchers Petrozza and Biggie (2015:29) and renamed Group 1. It was subsequently renamed SG 1 in the 2016 survey for consistency with other settlement groups (see Walden et al. 2017). The moniker Tutu Uitz Na (roughly translating to “snail sacred mountain house” in Yucatec Mayan) originated from the sizeable deposit of freshwater snail called *jute* or *tutu* in Mayan (*Pachilyus glaphyrus/Pachilyus indiorum*) documented beneath the plaza, and from the compound’s hilltop location (Petrozza 2015:44). Tutu Uitz Na is a large intermediate elite plaza group located 500m southeast of the Lower Dover civic-ceremonial center. Tutu Uitz Na functioned as an elite residence and a ceremonial center and appeared on the landscape during the Middle Preclassic. The group fits into regional settlement typologies as a large plazuela or ‘medium minor center’ (see; Walden et al. 2017, n.d.), and is larger than Bedran, a satellite of the Baking Pot polity (Conlon and Moore 2003), but smaller than minor centers near Cahal Pech, like Nohoch Ek and Zubin (Coe and Coe 1956:171; Iannone 2003). The Tutu Uitz Na intermediate elite center has a sizeable plaza (703m<sup>2</sup>) and a three meter high eastern triadic shrine (Awe et al. 2017; Walden et al. 2017).

The Tutu Uitz Na neighborhood was surveyed in 2016. The neighborhood surrounds the Tutu Uitz Na intermediate elite center, and extends to the south of Lower Dover (Walden et al. 2017). Neighborhoods were defined using an array of spatial analyses. The Tutu Uitz Na neighborhood covered a rough area of 3.5km<sup>2</sup> and included 46 settlement groups. Tutu Uitz Na had a relatively high population density of 108 people per km<sup>2</sup> in the Late Classic period. A stratified random sample of households was selected for excavation. Initial test excavations were conducted at the Tutu Uitz Na center (SG 1) in 2016, and at the Pechna Group (SG 9), a smaller commoner house group located near Tutu Uitz Na.



**Figure 2:** Map of the southern Lower Dover settlement showing the location of the Tutu Uitz Na neighborhood and the Lower Dover monumental epicenter. Excavated settlement groups are also marked.

## THE 2017 EXCAVATION METHODS

A total of seven units were excavated during the 2017 BVAR Project field season in order to answer the research questions outlined above. Two were placed in lower status commoner groups (SG 11 and 28), two in higher status commoner groups (SG 3 and 51), one in a rockshelter (RS 2-1), and two on the eastern triadic shrine at the Tutu Uitz Na intermediate elite group (SG 1; Figure 2). Units excavated in architecture were comprised of centerline axial trenches which ran perpendicular to the structure. This excavation strategy allows greater scope for hitting burials and ritual caches which were often interred in the center of ancient Maya households (Welsh 1988), in addition to providing the greatest understanding of the construction sequence within a structure. Lot numbers were assigned to different contexts in the order they were exposed archaeologically. The first lot number was consistently designated to the ground surface regardless of whether artifacts were present as this practice can provide valuable data for survey archaeologists who primarily deal with surface deposits. Excavation units were recorded using a two-digit number, the first designating the settlement group number, and the second number designating the numerical order of excavations; for instance E.U. 1-4 is located on SG 1 and is the fourth excavation unit placed in this group. Each excavation unit was dug using cultural or natural stratigraphy and excavated to either bedrock, where possible, or sterile matrix. Artifacts recovered from units excavated in 2017 are listed in Appendix A. Appendix B displays a selection of the special finds recovered in 2017.

## THE 2017 SETTLEMENT EXCAVATION RESULTS

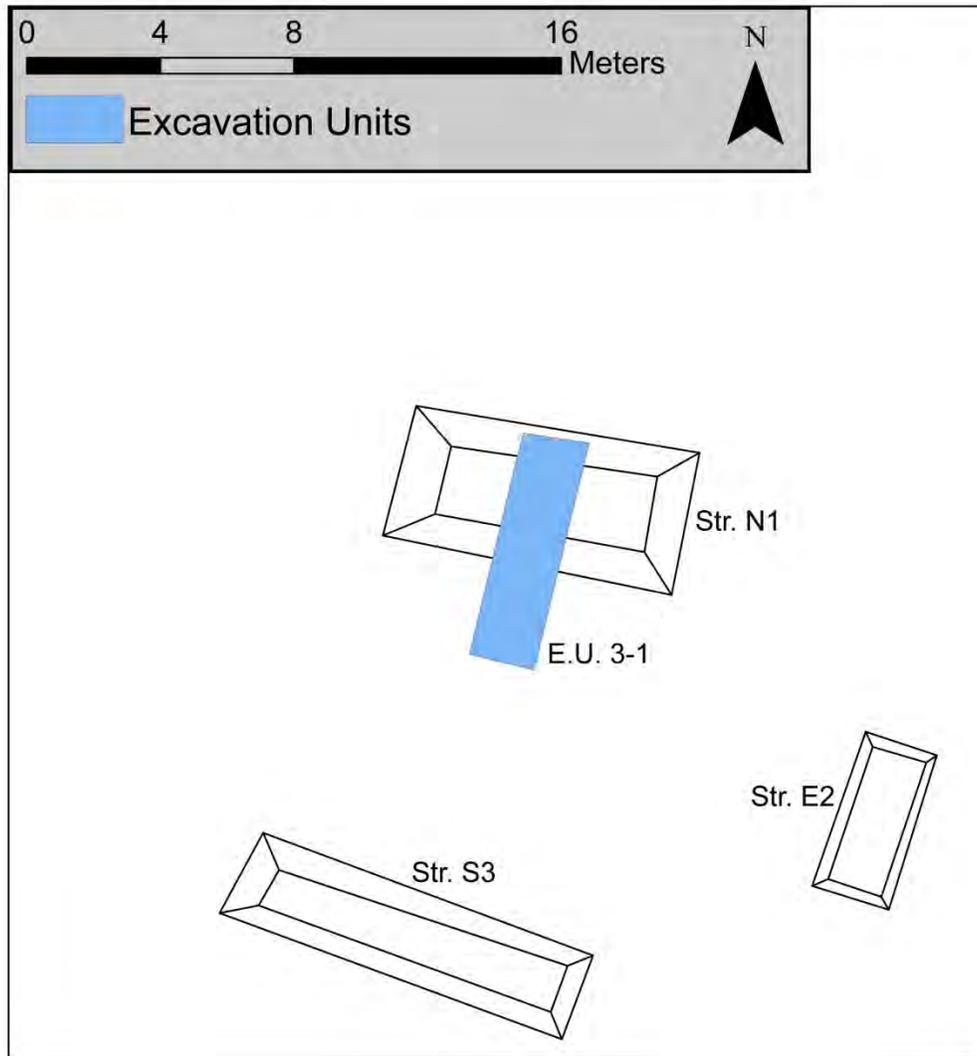
### Excavation Unit SG 3-1

Mamna (SG 3) is a high status commoner patio group located on a hilltop, 400m from the Lower Dover civic-ceremonial center and 250m from Tutu Uitz Na. The group was first surveyed in 2016, and is composed of three structures, the largest being the northern structure which is 1.20m above ground surface (2.20m above bedrock; Walden et al. 2017). A single 2x5m axial trench was placed through the centerline of the northern structure (SG 3, Structure N1). This unit was later bisected and extended into a 2x6.5m trench because of the presence of burials. The group was named Mamna, or 'house of the elder' due to the presence of an elderly individual buried within the northern patio. Excavations revealed the group to have a long construction history beginning by at least the Late Preclassic, possibly the late Middle Preclassic. Elevations for this unit were taken from SG3-Datum 1.

#### *SG 3-N1 1st*

Structure N1 was initially built as a small residential platform during the Late Preclassic, although roughly 30% of the ceramic assemblage constituted Middle Preclassic sherds. The first construction event at Structure N1, and likely across the SG 3 group, involved the leveling of the bedrock across the hill top (Figure 4), followed by the construction of a low wall against the northern baulk of the unit (Wall 1). Wall 1 was composed of a single course stone alignment of large roughhewn boulders (Figure 5). Wall 1 may form part of a crypt wall, however, time and safety constraints prohibited additional excavation to address this hypothesis. The portion of Wall

1 present in the unit was removed to expose the northern unit baulk, but no ceramics or other temporally diagnostic materials were recovered from this context (Lot 3-1-25).

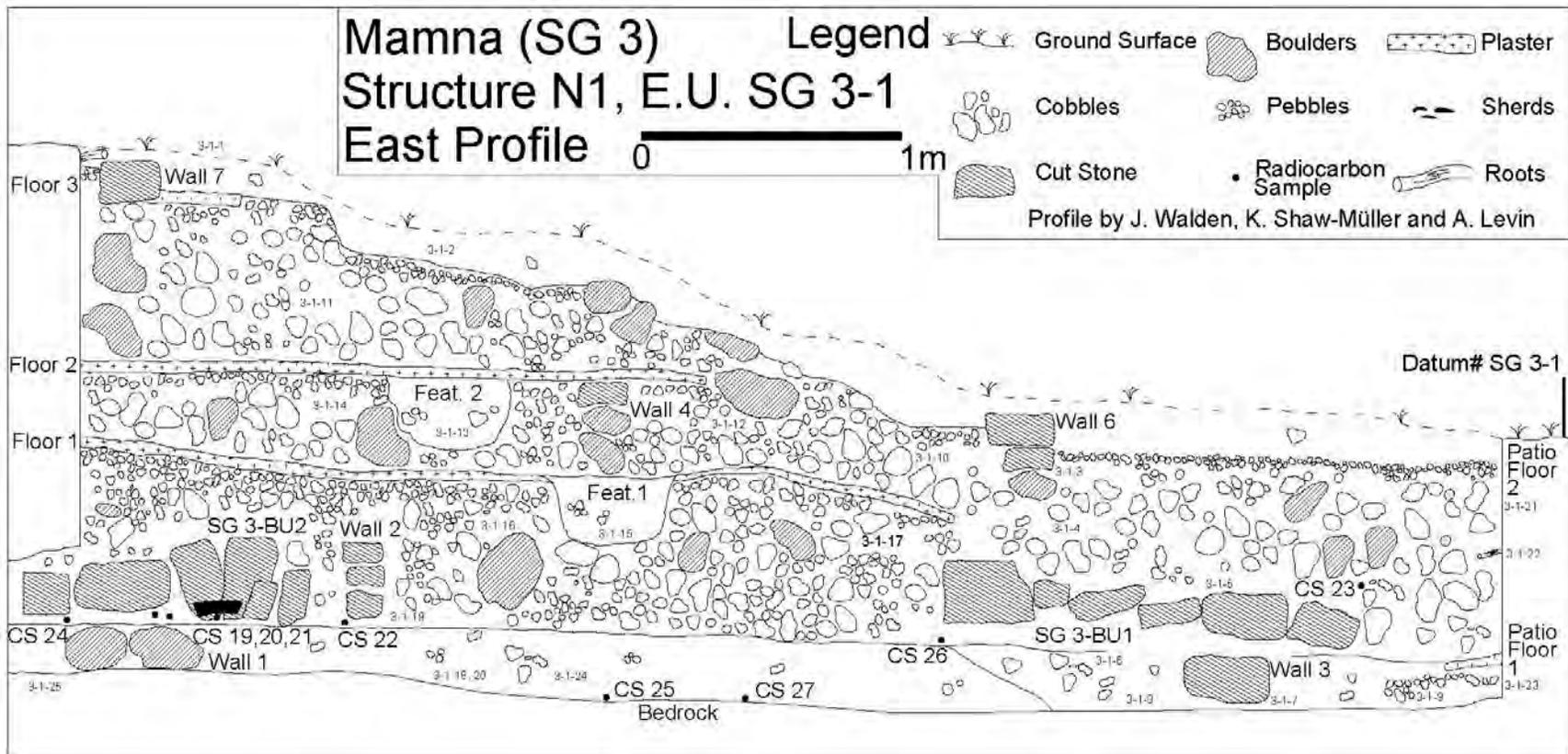


**Figure 3:** Map of the SG 3 showing location of E.U. SG 3-1.

Following the placement of Wall 1, a 20cm layer of light brown marl and *jute* was laid across the structure area (10YR 7/2). The marl contained high frequencies of Jenney Creek phase ceramics (900-300 BC), including Reforma Incised and Sampoperro Red types, and likely functioned as a foundation for the later construction of Wall 2. Two radiocarbon samples (CS# 25 and 27) were collected from this layer. Wall 2 was built on top of the marl fill, and formed the front wall of the structure, facing the patio. Wall 2 rose to an approximate height of 30cm above the level of the contemporaneous patio (Patio Floor 1; Figure 6). One radiocarbon sample (CS# 22) was collected from Wall 2. No intact plaster floor was found overlaying Wall 2, as would be expected. Instead, it was likely that any floor present was removed as part of the subsequent construction phase, when Burial 2 (SG 3-BU2) was placed within the structure.



**Figure 4:** Wall 1 at rear of E.U. 3-1



**Figure 5:** Profile of SG 3-N1 (E.U. SG 3-1), with locations of important architectural features and radiocarbon samples indicated.



**Figure 6:** Wall 2 at rear of E.U. 3-1.

### *SG 3-N1 2<sup>nd</sup>*

Following the construction of Structure N1 1<sup>st</sup>, a burial (SG 3-BU2) was interred inside the structure behind Wall 2 (Figures 7 and 8). The burial may have been interred contemporaneously with the construction of Wall 2, or interred later when the possible plaster floor running above Wall 2 was removed. The burial comprised a crypt interment, with several large rough capstones measuring approximately 30x40cm placed over the body (Welsh 1988). Interred with the individual were two Late Preclassic ceramic vessels placed next to the head, including a Sierra Red bowl, which was crushed when the capstones were placed, and a complete Polvero Black/Sierra Red bowl (See Appendix B). Skeletal analysis was performed, showing the individual to be a male of approximately 30 to 55 years of age at death. Age at death was estimated based on antemortem loss of the left second and third mandibular molar with complete remodeling of the alveolar bone, moderate enamel attrition (wear) on most teeth with heavy wear on the maxillary right first molar and the mandibular left first molar, and the presence of osteophytes and porosity on the end plate of the only body from a lumbar vertebra. The individual was oriented with the cranium to the south and the feet to the north. The body was extended and prone (face down). Both arms are slightly flexed at the elbows such that the hands were resting in the pelvic region and the legs were fully extended. The human remains were sampled for AMS dating and four radiocarbon

samples were taken from below the remains (CS #19, 20, 21, 24). While the burial was associated with Late Preclassic ceramic types (Sierra Red and Polvero Black) the position of the individual with the head to the south is characteristic of later Early and Late Classic burial patterns in the Lower Dover polity and the broader Belize Valley (Hoggarth et al., n.d.; Welsh 1988:53).



**Figure 7:** SG 3-BU2 with capstones removed.

### *SG 3-N1 3<sup>rd</sup>*

The next construction phase saw Wall 3 constructed running east/west across the patio (Figure 9). This was a single course of large cut boulders running at the same angle as Wall 1, but at a different angle to later construction phases. It is unclear how this construction event articulates with those preceding it because the context was so badly disturbed, presumably when SG 3-BU1 was placed above it. If Wall 3 was the front of a structure it contained no fill suggestive of its orientation; both sides of the wall shared the same fill, a dense loam clay (7.5 YR 4/3). In theory, Patio Floor 1 ran up to and abutted Wall 3 or even overlaid it and ran up to the Wall 2. This was, however, far from clear due to the significant remodeling evident on Structure N1. This context contained only Jenney Creek and Barton Creek ceramic types, suggesting construction during the Late Preclassic or the beginning of the Early Classic. The fill from this context also included high frequencies of *jute* ( $n=11,014$ ), suggesting that the patio area of SG 3 had a similar ritual function to the *jute* deposit beneath the plaza of SG 1 (Walden and Biggie 2017).

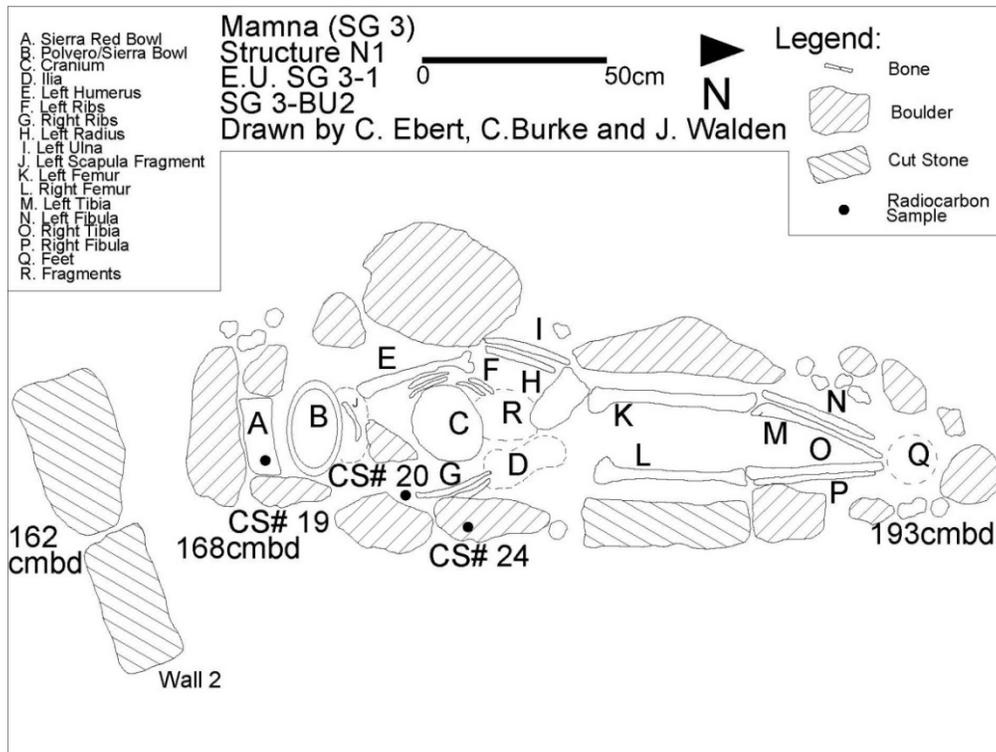


Figure 8: Plan of SG 3-BU2.



Figure 9: Patio Floor 1 with Wall 3 exposed.



**Figure 10:** Floor 1 running across unit. Feature 1 is present on the right side of the unit.

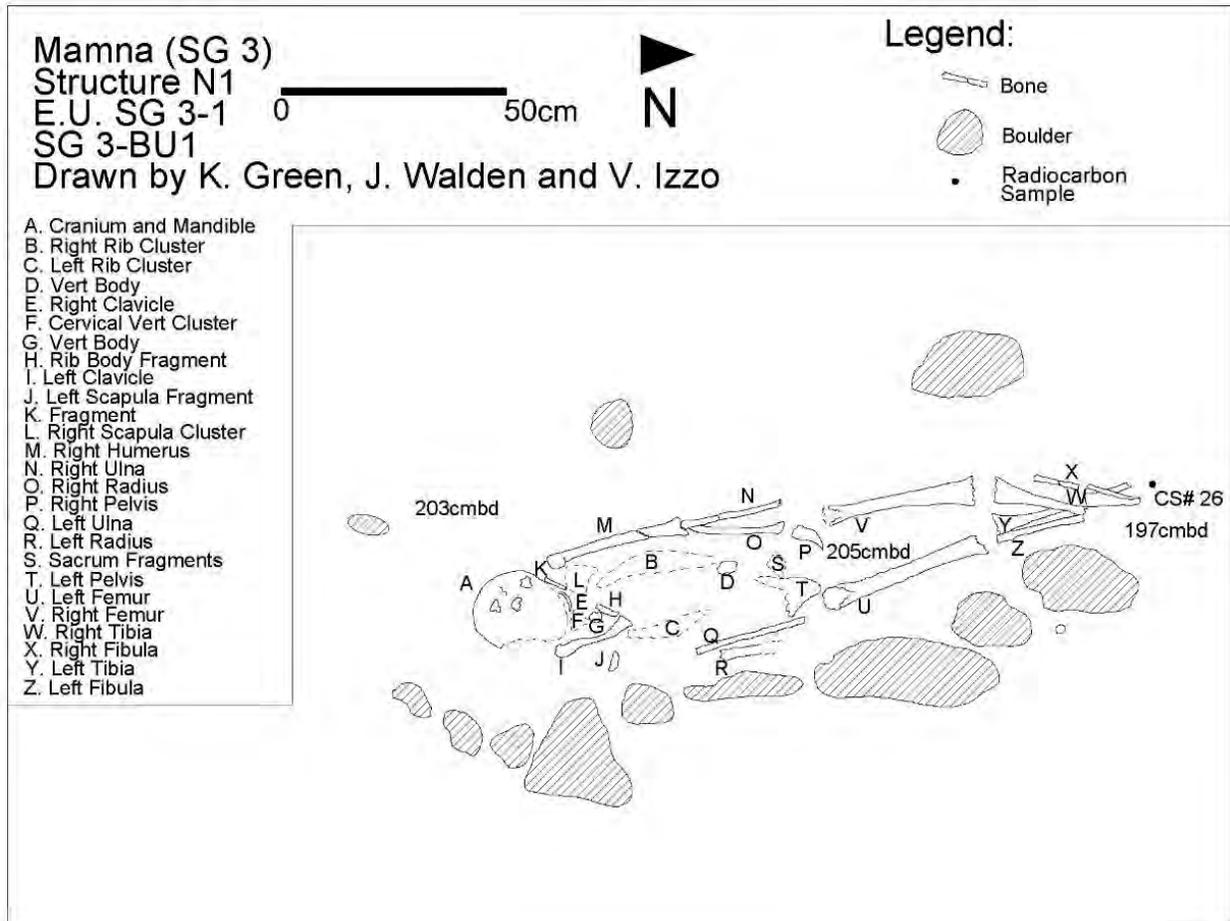
#### *SG 3-N1 4<sup>th</sup>*

The fourth phase of construction at Structure N1 involved a sizeable expansion of the building, including the expansion of the front wall. While much of the wall was not present because of a later intrusive burial, it likely ran ~2 m in front of Wall 2, roughly below the terminal front wall of the structure (Wall 6). The platform's height was increased by approximately 30cm at its northern side (on top of the previous construction) and 70cm in the southern portion of the unit. Floor 1, a 20cm thick plaster floor, was placed on top of Wall 2. The fill below Floor 1 included dense concentrations of the small cobbles characteristic of Preclassic and Early Classic construction elsewhere in the Lower Dover settlement (Walden et al. 2017:256). Materials from this context were collected as Lot 3-1-16, and ceramics included Jenney Creek, Barton Creek, and Floral Park types, suggesting a construction at the end of the Late Preclassic or beginning of the Early Classic.

#### *SG 3-N1 5<sup>th</sup>*

The fifth construction phase was composed of two contemporaneous events, the placement of Burial SG 3-BU1 and the excavation of Feature 1 into Floor 1. These events probably occurred in succession (Figures 11 and 12). First, an elderly male individual was interred in a well-built crypt in the patio at the southern edge of the house platform. The head was oriented to the south,

and the burial was covered by several large (~20-30 cm) capstones. The majority of diagnostic sherds recovered from the fill associated with the burial dated to the Late Preclassic (Barton Creek ceramic phase). An additional radiocarbon sample (CS# 26) was also collected from inside the crypt wall at the feet of the individual. AMS <sup>14</sup>C dating of bone collagen from Burial SG 3-BU1 places the interment between 15 cal BC-cal AD 85 (PSUAMS-3366), consistent with relative temporal assignments from ceramics.



**Figure 11:** Plan of SG 3-BU1.

The male sex of the individual was identified by a robust glabella and brow ridges, marked supraceutical/mastoidal crest, strong gonial angle, projecting and square mental eminence, and narrow greater sciatic notch. Several features support the determination of old age including a closed coronal suture, which was obliterated in areas, severe dental attrition with nearly all enamel worn away from each tooth recovered, and advanced arthritic changes throughout the body. Large interproximal and pulp caries were also present in all teeth recovered. Cementosis on the roots is present on the maxillary dentition recovered. Periodontal disease on the mandible is evident by extreme alveolar resorption and activity. Interesting dental pattern may suggest habitual use of dentition for some activity. Arthritic changes are evident on the fragments recovered of the cervical vertebra including compressed vertebral bodies and marginal lipping. Evidence for old age is also

present on the humerus at the trochlea and epicondyles, and on the ulna at the radial notch. Evidence of musculoskeletal markers include: strong gluteal tuberosity, linea aspera, attachment sites for the pectoral muscle on the humerus and clavicle, deltoid tuberosity, costal tuberosity, and pronator ridge. Despite his age and probable importance, no grave goods were evident in the burial.

The second construction event in SG 3-N1 5<sup>th</sup> was the placement of Feature 1. Feature 1 (3-1-15) was a 30 cm pit cut into Floor 1 (Figure 10). The pit contained a compact grey/beige matrix (10YR 5/2) and a small number of sherds (no diagnostics), chert, and freshwater shell. We hypothesize that this feature may have functioned as an offering pit, which was later emptied of its contents in prehistory or perhaps contained biodegradable offerings, effectively representing the residue of a house dedication ceremony (Vogt 2004:32-33). Conversely the pit could also result from more prosaic, quotidian behavior.



**Figure 12: SG3-BU1.**

SG 3-N1 6<sup>th</sup>

The sixth construction phase involved the construction of Wall 4 and Floor 2 on top of the pre-existing structure (Figure 13). During this expansion, the building rose in height approximately 30cm above the previous edifice. This fill (Lot 3-1-14) contained primarily Late Preclassic and Early Classic sherds, providing a *terminus ante quem* of the Early Classic for this construction phase. In addition to ceramic sherds, the lot contained chert, obsidian, freshwater shell, and a ceramic figurine (SF# 112). The cobble fill included marl and comprised a compact grey matrix (7.5YR 6/1). It is highly likely that Patio Floor 2 was constructed at this time. Patio Floor 2 likely ran horizontally across to the front of the structure, however there is no way of definitively ascertaining this, as the front of the structure was so radically altered during the Late Classic period. The ballast and fill beneath Patio Floor 1 (Lots 3-1-3 and 3-1-4) contained an array of sherds representative of the Late Preclassic through Late Classic periods, suggesting regular modifications to the building.



**Figure 13:** Floor 2 and Wall 3.

### *SG 3-N1 7<sup>th</sup>*

Following the construction of Wall 4 and Floor 2, Floor 2 was extended to the front of the structure. This happened after the construction of SG 3-N1 6<sup>th</sup>, as the floor was extended over Wall 4. It is unclear where this floor terminated, and it is likely that a front wall was present which was subsequently removed during the extensive Late Classic remodeling of the structure in Phase 8 (Figure 18). Construction from this phase (Lot 3-1-12) involved a dense cobble fill in a compact light brown loam-clay matrix (10YR 6/2). The fill associated with this construction episode is clearly earlier, containing primarily Late Preclassic types such as Sierra Red. This event raised the front of the structure approximately 40cm higher, making the structure 120cm above bedrock.

### *SG 3-N1 8<sup>th</sup> (Penultimate)*

SG 3-N1 8<sup>th</sup> involved the excavation of Feature 2, a small pit cut into Floor 2 (Figure 14). Materials from Feature 2 were collected as Lot 3-1-13, and included diagnostic Preclassic and Early Classic ceramics, including one Ixcario Orange Polychrome sherd, chert, and freshwater shell. The pit was approximately 40cm deep and 30cm wide. This second pit was remarkably similar to Feature 1, and alike to previous pits found in residential contexts in the Lower Dover settlement (see Walden and Biggie 2017). Again, this feature may represent a dedicatory offering associated with the next construction phase, or could have resulted from more quotidian activities. The pit was either emptied or contained only biodegradable offerings. The fill was similar to Feature 1 and was a compact grey/beige matrix (10YR 5/2).

### *SG 3-N1 9<sup>th</sup> (Terminal)*

During the following construction phase, Structure N1 was completely remodeled, with all the earlier architecture essentially encased within the structure (Figures 15 and 16). A new front wall was constructed (Wall 6) which consisted of three courses of cut limestone blocks, two of which rose 30cm above Patio Floor 2. We hypothesize that the structure likely had four tiers (the uppermost being behind Wall 7, Floor 3 being the second highest, a third highest in the middle of the structure, and a lower one behind Wall 6). This arrangement is somewhat visible in the profile, although bioturbation potentially destroyed a middle wall. At the top of the structure Wall 7 represents a single tier alignment of cut stones. These might represent the foundations of the front wall of a pole and thatch superstructure, but their unusual location in the center of the building probably means they were the foundation of an internal feature. Ceramics from this latest construction phase (collected in Lots 3-1-10 and 3-1-11) primarily consisted of Late Classic types, like Cayo Unslipped, Vaca Falls, Belize Red and Garbutt Creek. The construction style in the final construction phase comprises a mix of larger loose boulders, in contrast to the smaller, denser fill used in preceding periods. This pattern has been noted across the Tutu Uitz Na neighborhood (Walden and Biggie 2017). The humic layer above this predominantly contained Late Classic ceramics, like Vaca Falls and Cayo Unslipped, domestic items such as three chert bifaces, and a spindle whorl, in addition to a speleothem, which was potentially removed from a cave for domestic ritual (Brady et al. 1997). A notable find was a large obsidian biface (SF#36) lying on the terminal patio floor (Patio Floor 1; see Appendix B). The presence of such a sizeable obsidian artifact on a Late Classic surface is noteworthy because most households only had access to obsidian blades by the Late Classic and not the sizeable cores needed to make a biface (James

Stemp, personal communication, 2017). Furthermore, the poor level of workmanship evident on the biface indicates it was not worked by a specialist (John Whittaker personal communication, 2017).



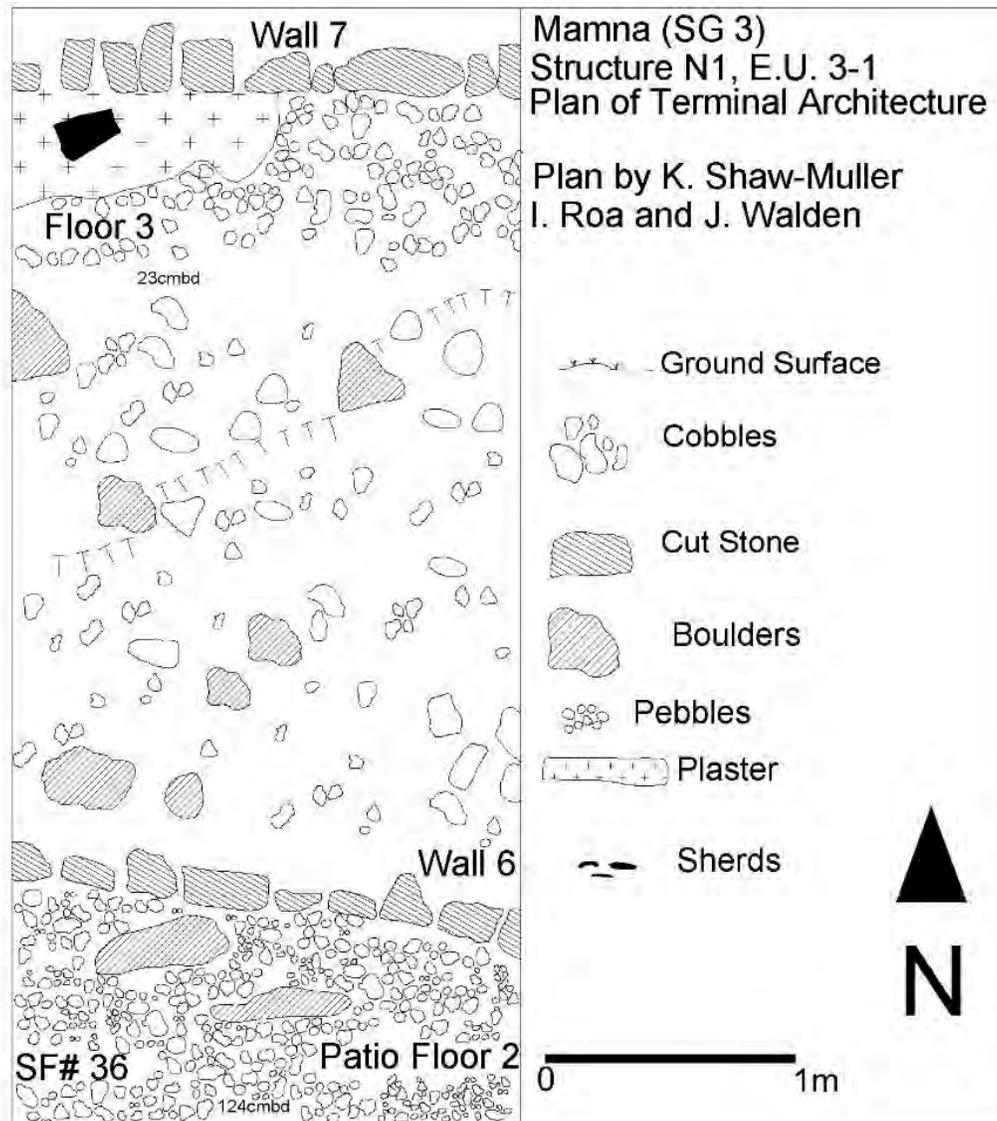
**Figure 14:** Floor 2 (extended).



**Figure 15:** Patio Floor 2 and Wall 6.



**Figure 16:** Terminal construction phase.



**Figure 17:** Plan of terminal architecture.

*SG 3-N1 10<sup>th</sup> (Post-abandonment Occupation)*

Above the terminal floor of the structure we found an assortment of flat lying sherds in association with a single Paxcaman Red Postclassic scroll foot (Figure 18). It is unclear what taphonomic factors resulted in the placement of this small deposit, just centimeters above the terminal architecture. It is now known that this part of the Belize Valley was depopulated during the Early Postclassic and such evidence of Postclassic re-visitation probably reflects new groups entering the region in the Late Postclassic (Hoggarth et al. 2014). The deposit encountered on SG 3, represents meager evidence for Postclassic activity, and probably reflects Postclassic re-visitation rather than Postclassic residential occupation. The nature of this re-visitation is unclear, but it seems possible that larger abandoned households located in prominent positions, like SG 3, might become either the focus of ritual activity, or simply objects of curiosity, following abandonment.



**Figure 18:** Possible post-abandonment deposit.

### *Summary of SG 3 Str. N1 Excavations*

SG 3 had a long construction history and was probably founded as a small residential settlement during the Late Preclassic, perhaps as early as the Middle Preclassic, based on the substantial amount of Jenney Creek ceramics. Interestingly, the high densities of *jute* below the Preclassic patio floor suggests the commoner residents were emulating the local elite construction style present at SG 1, located just 250m away (Walden and Biggie 2017). It would seem, that in terms of construction volume, the household went through at least eight building phases leading up to the rise of Lower Dover during the Late Classic. The Late Classic saw extensive remodeling of Structure N1. Similar large-scale Late Classic construction is evident at the Tutu Uitz Na intermediate elite center and many other high-status commoner households in the Belize Valley, such as M-184, M-90, M-100 and M-101 at Baking Pot (Hoggarth 2012). These elaborate multicomponent construction episodes in the Lower Dover periphery suggest that local high status commoners were prospering prior to the rise of Lower Dover and continued to do so after its florescence. In terms of activities, Structure N1 contains an overtly standard domestic assemblage: we find utilitarian bifaces for agriculture, storage and serving vessels, and *mano* and *metate* fragments (Douglass 2002; Lohse and Valdez 2004). In addition to this, are *incensario* fragments, figurines, musical instruments and speleothems, which in conjunction with the burials and possible offering pits point to the types of domestic ritual common in Maya household contexts (Lohse 2007; Plunket 2002). The large obsidian biface (SF# 36) was somewhat surprising and indicates that this Late Classic household had access to large nodules of the material, either from trade contacts (possibly through Lower Dover), or from early construction contexts.

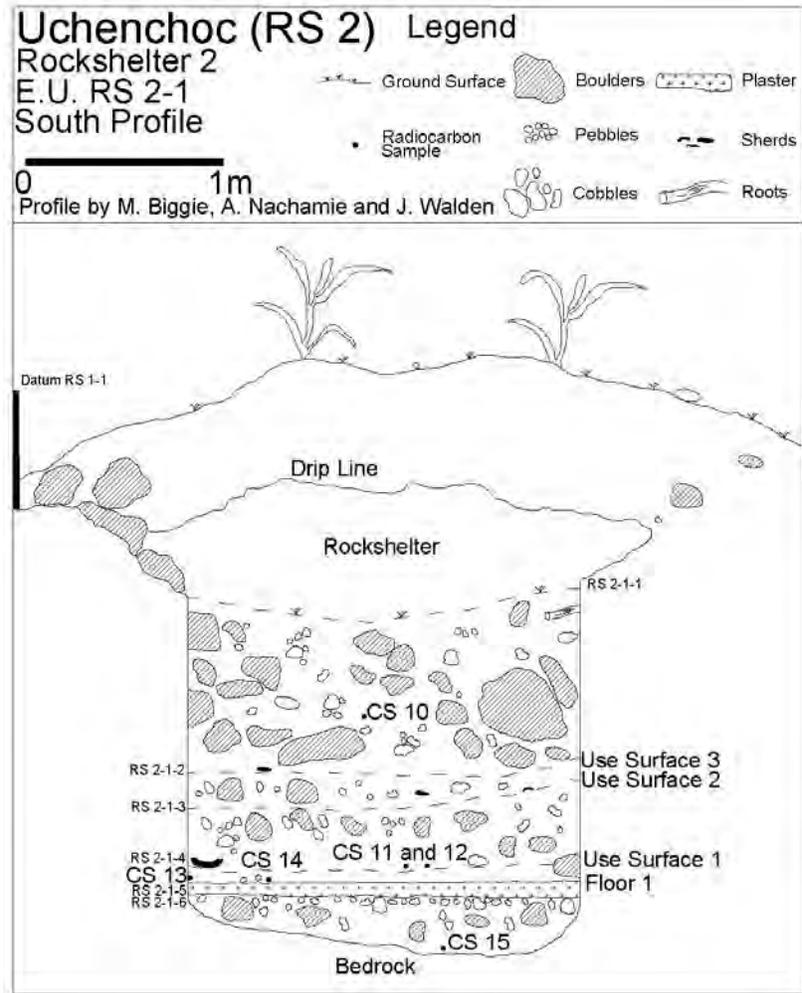
## Excavation Unit RS 2-1

Rockshelter 2 (Uchenchoc or RS 2) is located 80 meters due north of Tutu Uitz Na, and was documented during the 2016 Lower Dover survey. Scholars have long noted the sacred chthonic nature of caves and rockshelters in ancient Mesoamerica (Brady 1989; Brady and Prufer 2005; Moyes et al. 2009). Excavation was undertaken following the recovery of Late Classic ceramic sherds inside the rockshelter, suggesting a possible ritual usage (Walden et al. 2017). Excavations in RS 2 revealed changing intermediate elite ritual practices as the Lower Dover ceremonial center rose.

The rockshelter is approximately 3m wide and extends back 5m on the east side and 3m on the west. Spall and sediment deposits leave an opening just high enough to crawl through, enlarging to approximately 1.5m of ceiling clearance to the rear eastern portion of the shelter. The limestone walls and ceiling are highly fragile and prone to collapse. Given that RS 2 lies in close vicinity to SG 1, it is possible that the rockshelter served as some form of ritual shrine to the intermediate elite residents of SG 1. A 1x2m unit was placed running east-to-west just outside of the drip zone of the rockshelter. A 1m extension was placed to the north of the unit, but was later closed because of time constraints and the density of the spall layer on the surface of the unit. Elevations were recorded from datum RS2-Datum 1.



**Figure 19:** Photo showing position of E.U. RS 2-1 (taken above rockshelter entrance).



**Figure 20:** Profile of Rockshelter 2.

### RS2-1 1<sup>st</sup>

During the Late Preclassic Period, the Maya began actively using RS2. The initial phase of usage saw the placement of ballast, consisting of rockshelter spall, large stones, and soil placed atop uneven bedrock. Subsequently, a 12cm thick plaster floor was laid down on top of the fill (Figures 20 and 21). Floor 2 ran across the entire unit, extending into the baulk on all sides, suggesting that it likely spans the entirety of the rockshelter. It was found to be surprisingly level and well preserved, the latter possibly owing to the deposition of 10cm of dense medium brown matrix on top of the floor (7.5YR 3/2), which was later buried beneath layers of spall ceiling collapse. Late Preclassic Barton Creek ceramics, chert, and freshwater shell were collected from the ballast fill below Floor 1 (Lot 2-1-6). A sample of the plaster was also collected for future evaluation, and a radiocarbon sample recovered from the lower ballast (CS #15 at 266cmbd) might date the earliest occupation. Few artifacts were found on the surface of Floor 1, except for a scatter of Barton Creek and Hermitage bowl sherds, dating the use of the surface (Lot 2-1-5) between the Late Preclassic and Early Classic periods. *Jute*, chert, and two small fragments of charcoal (CS #13 and 14), which we believe to be *in situ*, were also collected from the surface of Floor 1.



**Figure 21:** Floor 1.

*RS2-1 2<sup>nd</sup>*

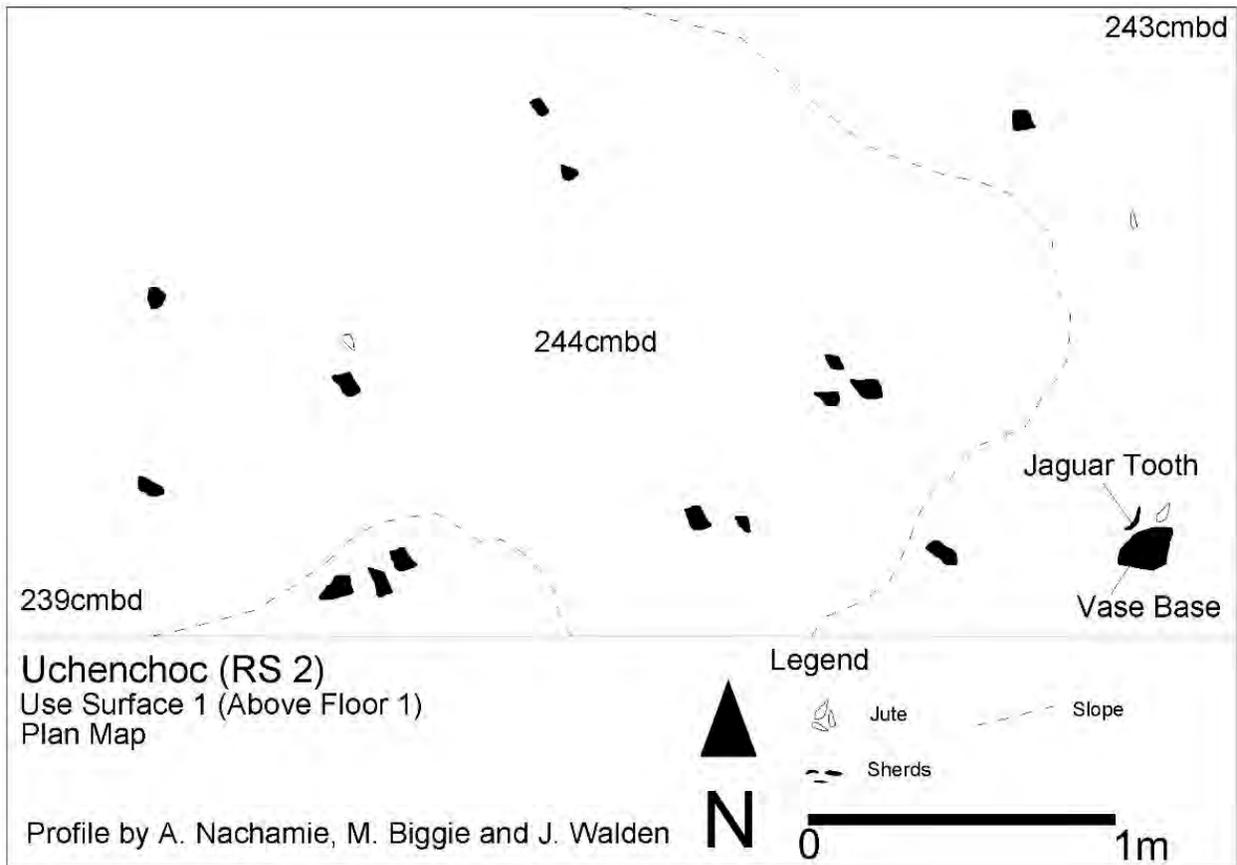
A 10cm thick layer of compact matrix consisting of crushed limestone particulate was subsequently placed on top of Floor 1 (Figures 22-25). It is unclear whether the presence of this layer should be attributed to natural or anthropogenic causes, but the density of the soil, accompanied by a lens of flat lying sherds and charcoal (CS #11 and 12) indicates that the surface of this layer, designated Use Surface 1, functioned as a floor. The recovery of an overturned red slipped vase ring base in the south-eastern corner of the unit, beneath which lay a jaguar tooth (SF #53) and a naturally colored *jute* (which may have been selected due to its color), provides evidence for possible ritual use of RS2 in this phase. Ceramics collected from Use Surface 1 range from the Barton Creek to Hermitage ceramic phases (Lot 2-1-4), indicating a Late Preclassic to Early Classic time frame for the second phase of occupation.



**Figure 22:** Vase ring base fragment on Use Surface 1.



**Figure 23:** Upturned vase ring base fragment showing *jute* and tooth.



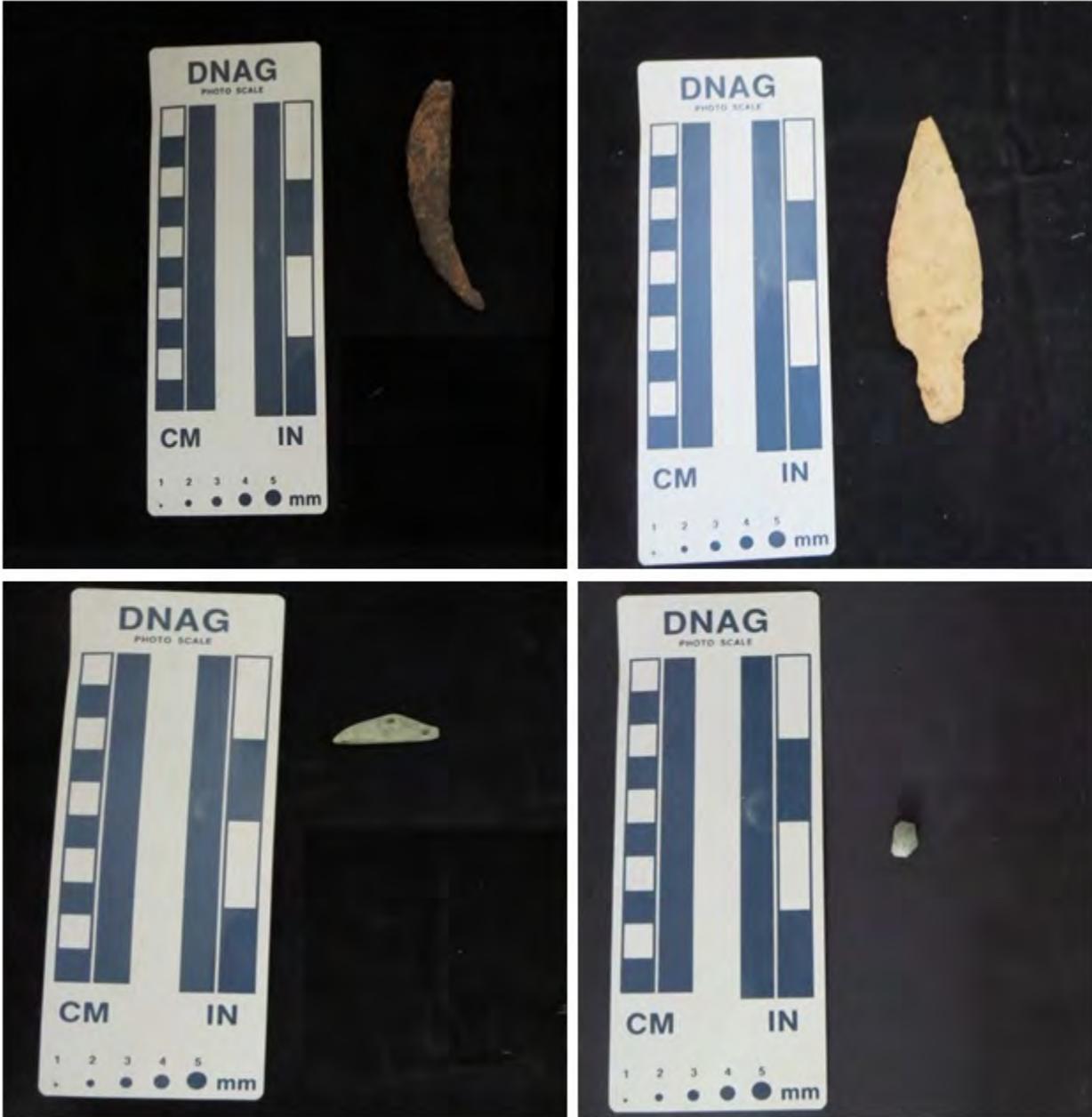
**Figure 24:** Plan of Use Surface 1.



**Figure 25:** Use Surface 1.

*RS2-1 3<sup>rd</sup>*

Use Surface 1 was covered with a 30cm layer of spall and possible anthropogenic fill. Directly on top of this was Use Surface 2, which contained a thin layer of flat lying ceramic sherds, a Cayo Unslipped censer prong, high frequencies of fine charcoal and ash, and a conch fragment (Figure 25 and 26). This surface likely dates to the Late Classic period, based on the presence of Spanish Lookout and Tiger Run ceramics. Subsequently we think that activities involving *incensarios* were likely performed in the rockshelter during the Late Classic. Chert debitage, two chert biface fragments, freshwater shell, faunal remains, two obsidian blade fragments, and a jade bead (SF #51) were also present in this context.



**Figure 26:** Selection of Special Finds from Rockshelter 2 (From top left: SF#39 Jaguar Tooth, SF#40 Stemmed Thin Biface, SF#46 Jade Pendant, SF#51 Jade Bead.



**Figure 27: Use Surface 2.**



**Figure 28: Use Surface 3.**

#### *RS2-1 4<sup>th</sup>*

A 10cm layer of soil mixed with limestone spall and cobbles covered Use Surface 2 (Figure 27). Atop this layer was Use Surface 3, evident based on a matrix change from dark brown/black to a light golden brown (10YR 3/3), and a flat lying sherd. This surface dates to the Late Classic period based on a mix of Spanish Lookout and Tiger Run ceramics. Chert debitage, *jute* and conch fragments were also recovered (Lot 2-1-3). Overall, this was the most unconvincing use surface present in the stratigraphic sequence due to the small number of artifacts associated with the surface.

#### *RS2-1 5<sup>th</sup> (Terminal Activity)*

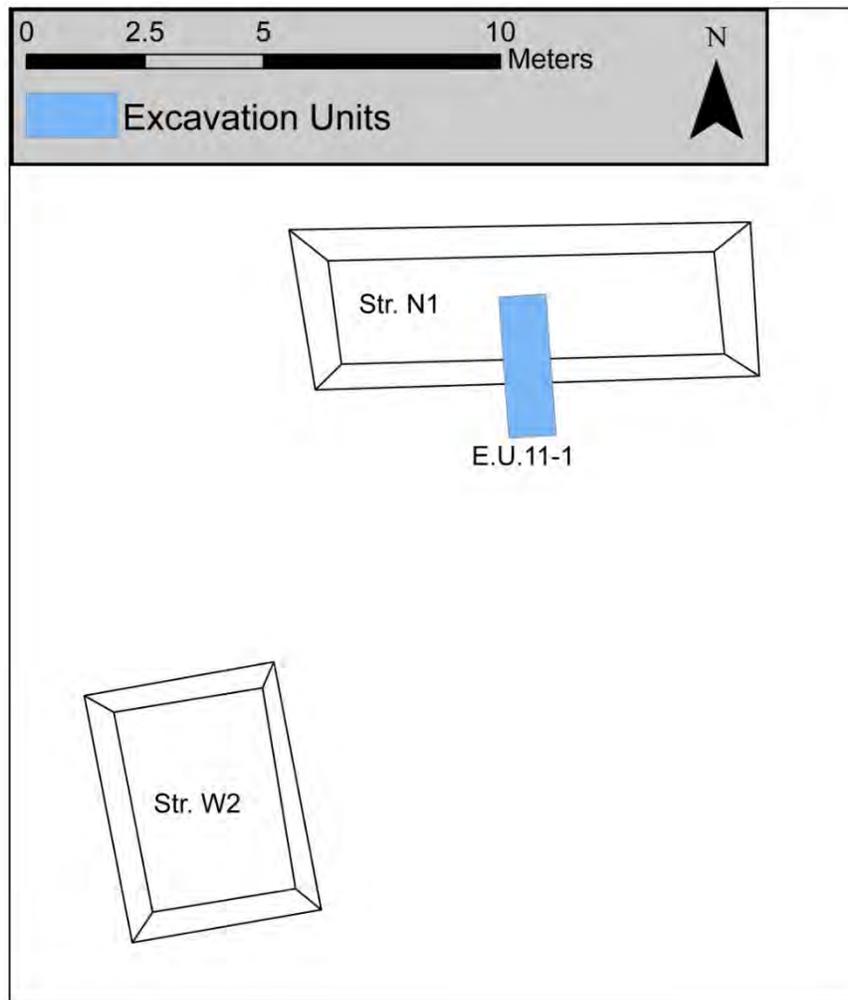
The terminal phase of activity at RS2 occurred during the Late Classic, and is evident by the presence of Spanish Lookout phase ceramics including Belize Red, Mountain Pine Red, and Cayo Unslipped types. Other artifacts include a jade pendant (SF #46), two thin chert bifaces (SF #40, 45), two borers, a worked flake, and two obsidian blades, as well as chert debitage (Lot 2-1-2). A radiocarbon sample (CS #10), human teeth, and numerous faunal remains, including a jaguar tooth (SF #39), were also collected in this lot (Figures 26 and 28).

#### *Summary of RS 2 Excavations*

As expected, the rockshelter assemblage indicated a ritual function throughout the trajectory. The well-constructed plaster floor (Floor 1) in conjunction with the assemblage suggests that the area was a formalized space for ceremonial activity in the Late Preclassic/Early Classic. Unlike larger Maya ritual cave sites, the presence of plaster floors is uncommon in rockshelters (e.g., Moyes et al. 2012; see Romih et al. 2017 for a description of RS 1 at Lower Dover). As Lower Dover rose in the Late Classic, it is possible that use of the rockshelter became less formalized (the plaster floor was either covered over, or not re-laid in later phases). The consequent Late Classic activity surfaces comprise tamped earth surfaces which probably formed the natural floor of the rockshelter at any given period. The recovery of a jade bead and a jade pendant in Late Classic contexts suggest that the sacred importance of the rockshelter did not decline over time, but was less formalized, becoming a place to deposit high value offerings (also including marine shell and jaguar teeth). Based on the scarcity of these materials among commoner households at Lower Dover, we argue the intermediate elite occupants of the adjacent Tutu Uitz Na (SG 1) group were the likeliest candidates to be using the rockshelter. The sizeable amounts of both marine and freshwater shell (including 1466 *jute*), likely correspond to the emic belief that caves were related to the watery underworld (Halperin et al. 2003, Healy et al. 1990; Moyes et al. 2009). Ceramics from the rockshelter assemblage show a general shift from bowls during initial phases of occupation to jars towards during the terminal phase. This prevalence of jars, capable of storing water, may relate to the Late Classic ritual drought complex often attributed to caves (Moyes et al. 2009). In terms of faunal remains, it is likely that the remains collected were placed intentionally in the rockshelter by humans, along with other artifacts present due to the nature of the species and body parts present.

### Excavation Unit SG 11-1

SG 11, also known as the Acbalamna Group, is a double mound patio group located in a depression 150m southeast of Tutu Uitz Na. The low-lying location, diminutive mound height and presence of Late Classic ceramics on the surface initially led us to assume that SG 11 was a Late Classic lower status commoner residence (Figure 26). The low elevation of the group creates swampy, undesirable conditions through the rainy season, transforming the area into a *bajo*. The excavators experienced this firsthand, encountering turtles on at least one occasion, hence the Mayan name (*Ahk*: Turtle). Consequently, we hypothesized that the group was settled no earlier than the Late Classic, much like another small house group nearby, SG 9 (Pechna). Structure N1, was selected for excavation as it is the largest structure on the group (70cm above patio). A 1x3m axial trench was placed running north-to-south perpendicular to Structure N1 at SG 11. Despite the house-group's small size, and apparently undesirable location, we recovered evidence suggesting that SG 11 was inhabited before the Late Classic, and despite its small size was relatively affluent in terms of the domestic assemblage. Elevations for this unit were taken from datum SG11-Datum 1.



**Figure 29:** Plan showing the position of E.U. SG 11-1.

SG 11-N1 1<sup>st</sup>

Given its location in a seasonally inundated depression, Acbalamna's northern structure was built on top of the paleosol, a layer of clay-rich sediment, which extended as much as 1m below the modern-day ground surface to a heavily eroded layer of breccia bedrock (Figure 26). This matrix was a dark brown heavy clay (10YR 4/4). The first construction phase was clearly defined by a plaster floor (Floor 1), the southern end of which had been heavily replastered. This was laid on top of a thin bed of limestone pebble ballast (Figures 30, 31 and 32). It is unclear how far above the clay strata this floor rose, because its southern extension ended abruptly 20cm below where Patio Floor 1 was discovered in later phases. This floor was likely built directly on the dense paleosol layer. Excavations reveal that Floor 1 experienced re-plastering and remodeling throughout its use, perhaps because of frequent flooding and water damage. Two radiocarbon samples (CS# 17 and 18) were retrieved from the beneath Floor 1. Diagnostic ceramics from SG 11-N1 1<sup>st</sup> were limited ( $n=4$ ), dating to the Late Preclassic and Early Classic, corroborating the more conclusive Early Classic temporal assignment to SG 11-N1 2<sup>nd</sup>. Five pieces of freshwater shell, one obsidian blade fragment, and 28 pieces of chert were also recovered and collected as Lots 11-1-10 and 11.

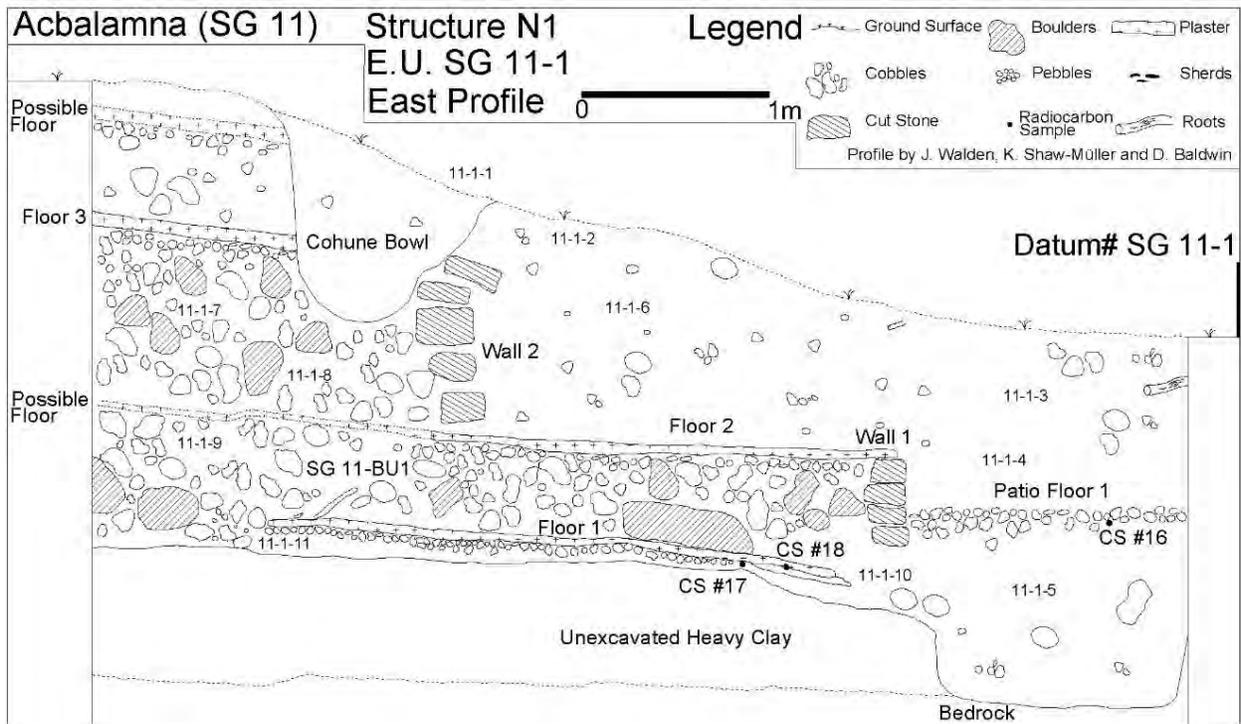
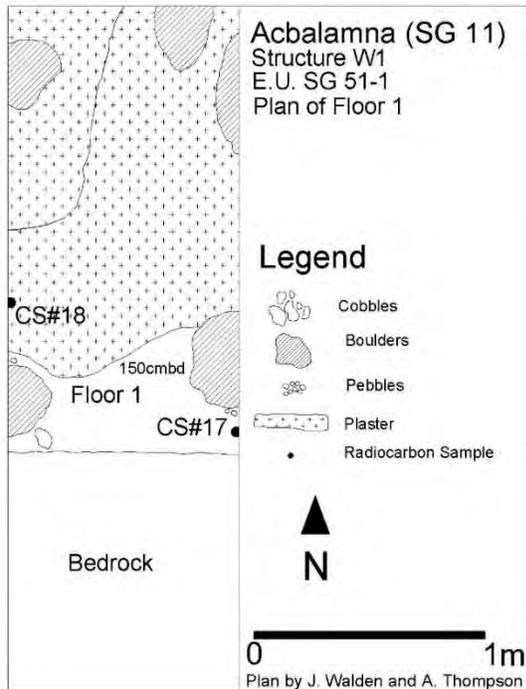


Figure 30: Profile of E.U. SG 11-1.



**Figure 31:** Plan of Floor 1.

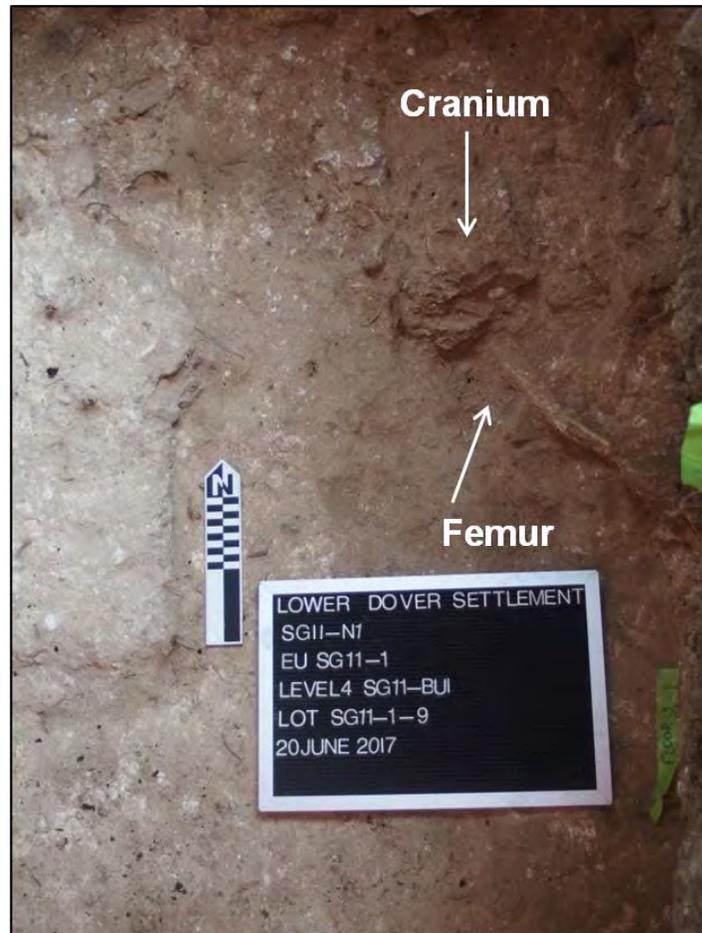


**Figure 32:** Floor 1.

### *SG 11-N1 2<sup>nd</sup>*

The second phase of construction at Structure N1 began with the placement of a secondary burial (SG 11-BU1) at the base of the structure, on top of the northern portion of Floor 1 (Figure 33). Skeletal preservation was very poor and the body was disarticulated, with recovered remains consisting mainly of large cranial and femoral fragments. Cranial fragments, including flakes and dentition, were located to the northwest of the femoral shaft. The integrity of the femoral shaft was slightly better, but ultimately we were unable to assess whether the proximal or distal end was running beneath the cranium or into the east wall of the unit. Smaller bones were not present, likely reflecting a secondary burial context. The stature of the individual was unable to be determined due to the lack of integrity of the remains and the fact that maximum length of the element was unable to be determined *in situ*. The burial was encased in a hard, plaster-saturated matrix (the color was very light yellow/brown: 10YR 8/4). We believe this matrix was a product of large quantities of plaster dumped on top of saturated eroding limestone boulder fill.

The recovered dentition possessed minimal wear facets indicating a young adult, aged >25yrs. The following teeth expressed minimal dentin exposure: left maxillary canine, right mandibular lateral incisor, and left mandibular canine. The lateral and central incisors expressed shoveling. Interesting to note is a deep groove or band occurring around the crown on the following dentition: right and left maxillary premolar 1 or 2, right maxillary 2<sup>nd</sup> molar, left maxillary canine, left maxillary 1<sup>st</sup> molar, left mandibular canine. This could be similar to enamel hypoplasia, where a time of high stress during development of these adult teeth causes stasis in the growth pattern for that period of time (Wright 1997). Other pathology includes very few carious lesions. The occlusal surfaces of the left maxillary premolar 1 or 2 and the right mandibular molar exhibit carious lesions in the form of pits.

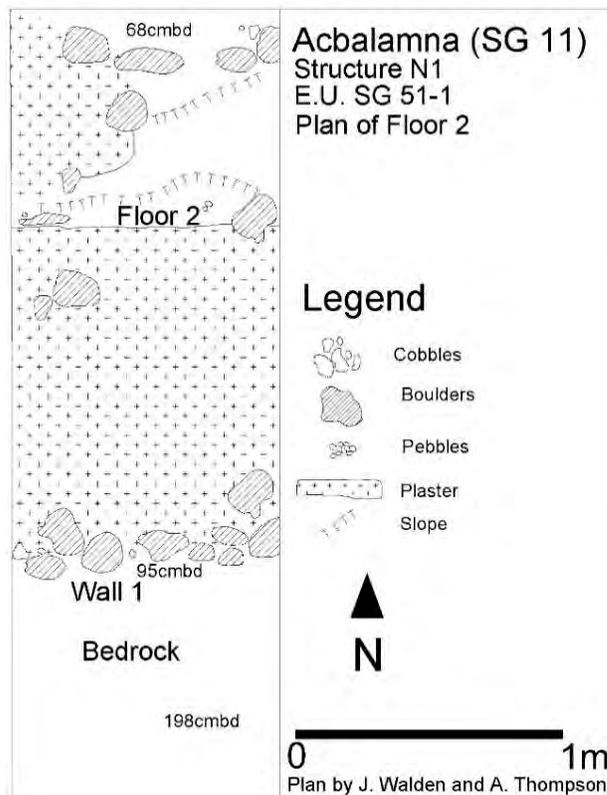


**Figure 33:** SG 11-BU1.

Following the placement of SG 11-BU1, a large platform and patio floor (Patio Floor 1) were constructed on Structure N1 (Figure 34 and 35). The main elements of which comprised a front wall (Wall 1), and a plaster floor running on top of the wall (Floor 2; Lot 11-1-9). Floor 2 rose 50cm above Floor 1, and stepped 15cm down to Patio Floor 1. The step was also defined by two courses of limestone cobbles that formed Wall 1. Perhaps for structural purposes, there were two more courses to this facing wall below the surface of Patio Floor 1. It is hypothesized that Floor 2 originally ran across the unit from the northern baulk and formed the house platform, but was removed in the subsequent phase when Wall 2 was constructed. Floor 2 was most exemplary of the resources put into this phase: although it was eroded, the river and limestone cobble fill beneath it was permeated by degraded plaster, making for an almost cement-like texture in parts and a light brown matrix (10YR 6/4). Put simply, a far larger than average amount of plaster was used to face these floors, especially relative to other commoner house groups. It is possible that some of this plaster was in fact limestone which had degraded due to moist conditions from the surrounding bajo. Cultural materials consisted primarily of domestic refuse including 32 chert flakes, 34 freshwater shells, and 37 ceramic sherds. The diagnostic sherds consisted of Jenney Creek-Barton Creek types such as Jocote Orange Brown and Sierra Red wares, suggesting a late Middle Preclassic-Late Classic founding of the group. A radiocarbon sample (CS #16) was taken from under Patio Floor 1.



**Figure 34:** Floor 2 and Wall 1.



**Figure 35:** Plan of Floor 2.

*SG 11-N1 3<sup>rd</sup> (Penultimate)*

Floor 3 and Wall 2 formed the penultimate construction phase on Structure N1. The top of Floor 3 raised the structure ~50cm above the preceding phase (overall height of 90cm). During the 3<sup>rd</sup> phase the structure effectively had 2 tiers, the uppermost of which comprised Floor 3 and Wall 2 (this phase), while the lower tier constituted the previous construction phase (Floor 2; Figures 30 and 36). The majority of ceramics evident in the fill of this construction phase were Late Classic types such as Dolphin Head Red and Belize Red, with earlier types present such as Sierra Red, Hillbank and four Ixcario Orange polychrome sherds. Alongside these, other artifacts recovered included 176 pieces of chert and 23 freshwater shells.

*SG 11-N1 4<sup>th</sup> (Terminal)*

The final construction phase at Structure N1 lacked clear architecture due to heavy bioturbation and erosion. The only likely architectural features of this phase were the ballast of a possible floor some centimeters below the ground surface in the unit's northern third (Figure 30). If this did represent a floor then the structure would have been raised ~30cm higher than the previous phase (a total overall structure height of 2m above the heavy clay paleosol). Materials from SG 11-N1 4<sup>th</sup> were collected in Lots 11-1-1, 11-1-2, 11-1-3, 11-1-4 and 11-1-6. The assemblage includes a chert biface fragment, a *mano* fragment, 927 ceramic sherds, 254 chert flakes, 83 freshwater shells and two obsidian blade fragments.



**Figure 36:** Floor 3 and Wall 2.

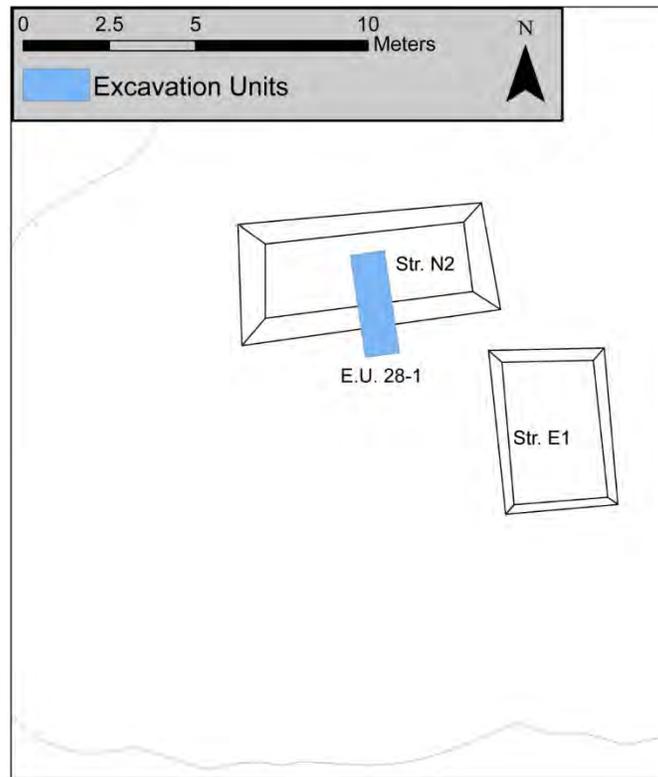
The household had access to high-quality ceramics, as evidenced by several polychrome sherds, mainly of the Dos Arroyos and Actuncan groups. These fine ceramics were found intermixed with Spanish Lookout phase sherds, namely of the Cayo Unslipped and Belize Red types. This mixing of different complexes within a single context could in part be explained by bioturbation, especially in the lots surrounding Wall 1 (where two cohune palms grew). Though it is clear Phase 3 could not have been built before the Late Classic, it is more likely the phase was built with midden material rich in Early Classic sherds. Furthermore, it bears mentioning that the presence of Early Classic polychromes compared to a lack of Late Classic fine ceramics (e.g., Molded-Carved) might indicate an Early Classic patron-client relationship which disintegrated by the Late Classic (LeCount 1999). 40 tiny human bone fragments were discovered in this lot, largely from the screen. It is unclear whether these were from SG 11-BU1 and were bioturbated to the surface, although this is unlikely considering the dense plaster floors in between.

### *Summary of SG 11 Structure N1 Excavations*

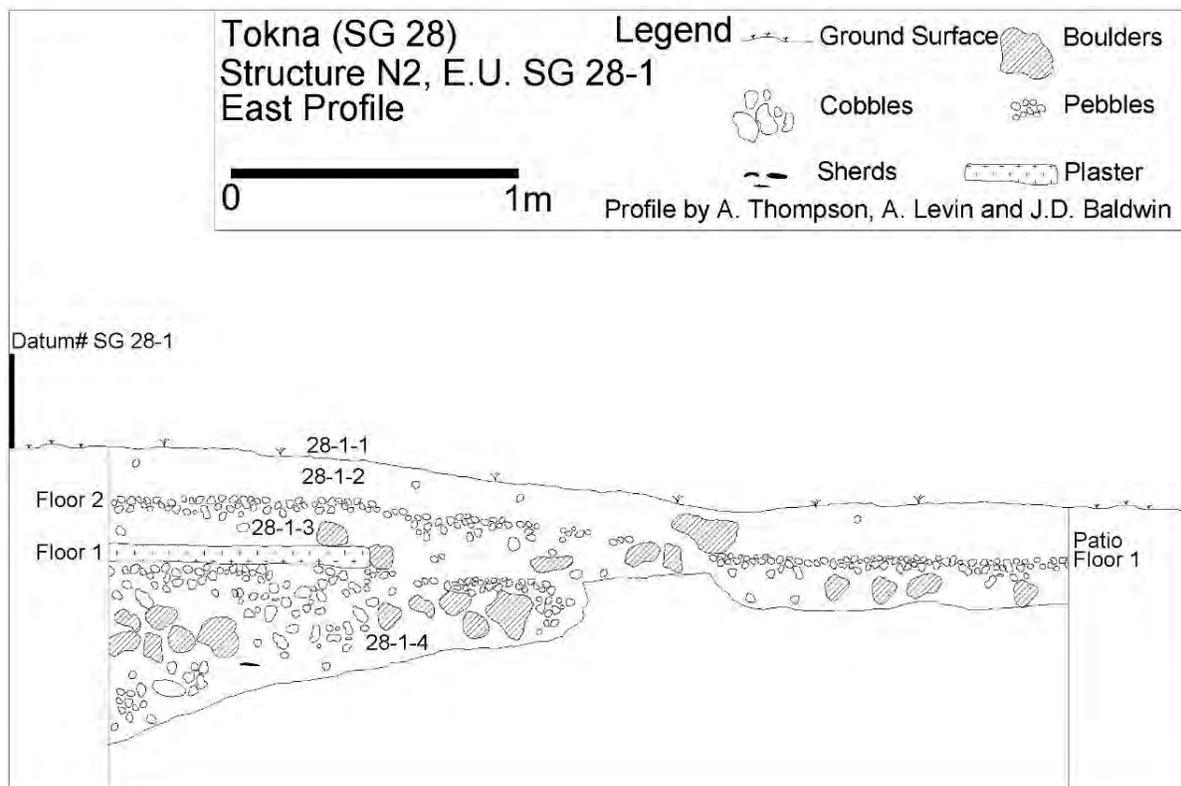
The investigations of Structure N1 show that SG 11 was initially founded in the Late Preclassic or Early Classic, and was occupied through the Late Classic period. The first phase of construction at the site was small-scale, with the second and third construction phases being far more substantial. The secondary burial (SG11-BU1) interred during SG 11-N1 2<sup>nd</sup> may be associated with the erection of these larger platforms. Increased architectural investment and high frequencies of polychrome ceramics during the Early-Late Classic phases suggests residents had greater access to such materials at this time. The Late Classic structural fill was predominantly river cobbles, whereas the preceding phases predominantly used limestone fill. This might be because river cobbles were easier to source than limestone due to the relative lack of exposed bedrock in the immediate, vicinity of SG 11, which was just 400m from Lower Barton Creek. SG 11 seems to reflect a lower status group who were socially mobile. The first construction phase is meager, but subsequent phases exhibit access to cut stone and quality construction materials. How this is related to the deposition of SG 11-BU1 can only be speculated; potentially a different family moved to the site and brought their ancestor with them (Barnhart 2002). This affluence increases over time, evident in access to high quality Early Classic ceramics, possibly through patron-client relations with the Tutu Uitz Na group, but then diminishes somewhat in the Late Classic. In terms of activities the household possessed the types of artifacts (bifaces, *manos*, and utilitarian ceramics) generally attributable to a domestic function.

#### **Excavation Unit 28-1**

SG 28 (the Tokna Group) is located in the Tutu Uitz Na neighborhood (approximately 400m from SG 1). The group consists of two mounds, of which Structure N2 is the largest in volume, and Structure E1 is the largest in height (Figure 37). SG 28 was chosen for excavations due to the large amounts of chert debitage documented during survey (Walden et al. 2017). Further the small size of the structure suggested a shorter occupation span, helping us understand commoner occupations during the Late Classic period. A 1x3m axial trench running north-to-south was placed on Structure N2 at SG 28, perpendicular to the structure. Elevations for the unit were taken from Datum# SG28-1, which was placed on the north-west corner of the unit, 50cm above the modern ground surface.



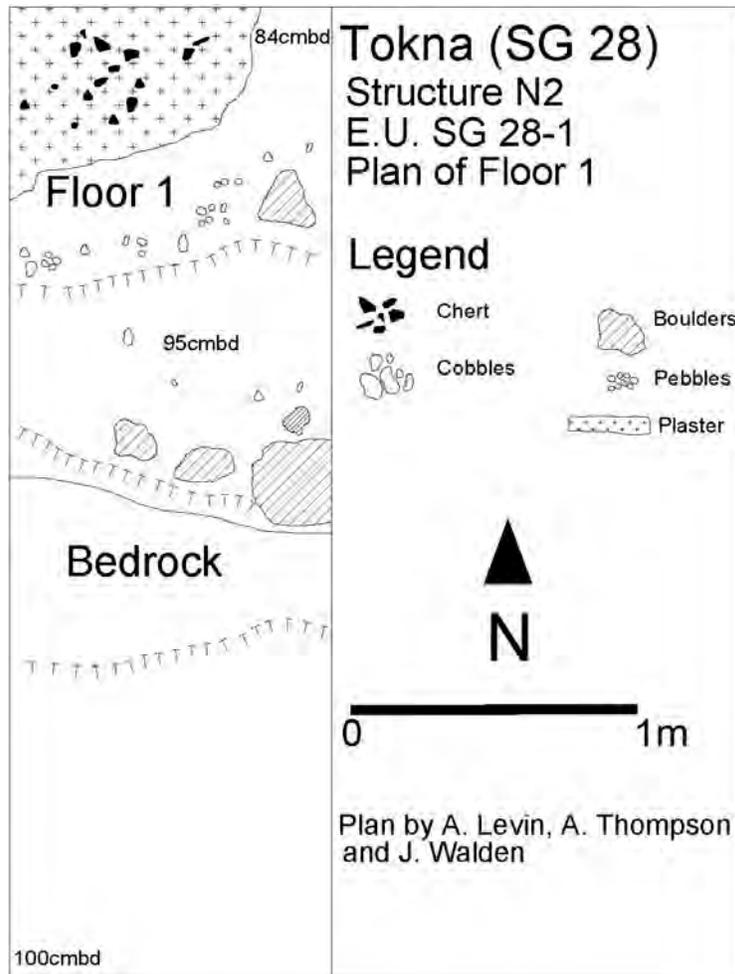
**Figure 37:** Plan showing position of E.U. SG 28-1.



**Figure 38:** Profile of E.U. SG 28-1.

SG 28-N2 1<sup>st</sup>

The first construction phase of Structure N2 consisted of the placement of a plaster floor (Floor 1) atop a layer of ballast and dry core fill, which was, in turn, placed on top of bedrock (Figures 38, 39, 40 and 41). The floor was only visible on the northwestern part of the unit. The general fill comprised a light golden brown clay (7.5 YR 4/3). The layer of ballast fill beneath Floor 1 was approximately 30cm deep, and consisted mostly of loose cobbles. Immediately above bedrock was a shallower layer of fill mixed with soil of a pinkish grey color (7.5YR 6/2). Artifacts found in this layer consisted of chert debitage, ceramics, fresh water shell, quartz, and petrified wood (these were collected as Lot 28-1-4). Bedrock was found throughout the unit below the layer of fill under Floor 1, which was higher than this first construction phase. Subsequently the ballast underlying Patio Floor 1 was probably repurposed from an early floor which abutted the first construction phase of the structure, but was later reused. Ceramics recovered from this construction phase included Late Preclassic (Barton Creek) and Early Classic (Hermitage) types like Aguila Orange, Quintal Unslipped and Polvero Black, providing a *terminus post quem* of the Early Classic. The first construction phase of Structure N2, therefore, predates the rise of the Lower Dover polity.



**Figure 39:** Plan of Floor 1.



**Figure 40:** Floor 1 with artifacts.



**Figure 41:** Floor 1 throughout unit.

## SG 28-N2 2<sup>nd</sup>

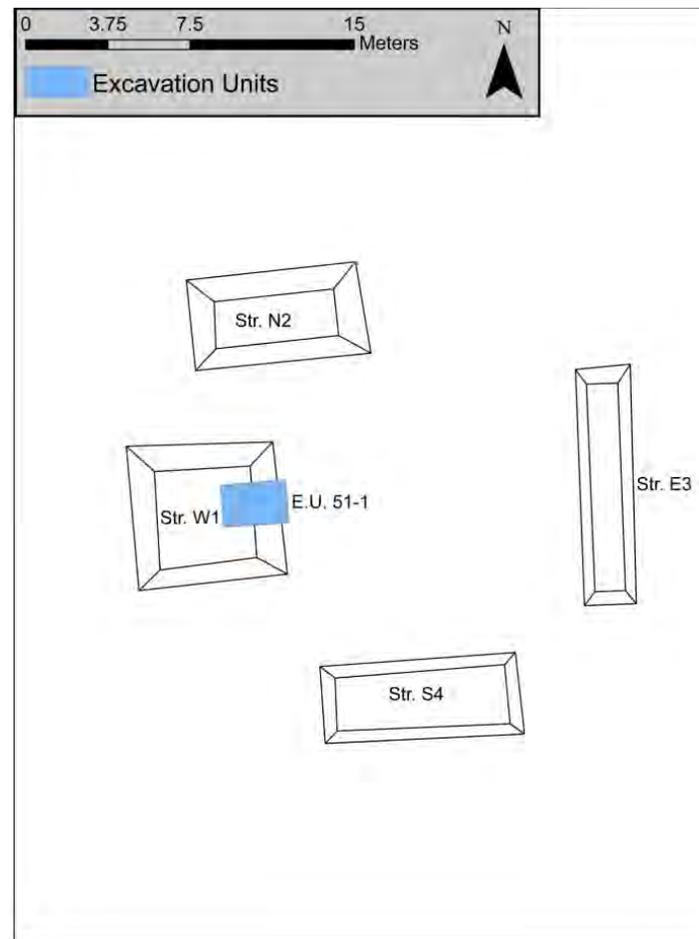
The second construction phase at Structure N2 saw the deposition of a cobble and a dark brown (10 YR 3/1) fill over Floor 1. The fill was then capped by the terminal structure floor (Floor 2), which was highly degraded. Floor 2 was identified on the profile of the unit by a change in the color of the soil throughout the unit, and the presence of ballast in the profile (Figures 38 and 42). The architectural fill of phase SG 28-N2 2<sup>nd</sup> contained a single biface, a single chisel, 567 borers, 133 chert blades, two obsidian blades, 44 chert cores, and 1715 pieces of chert debitage. These artifacts were collected in Lots 28-1-1, 28-1-2 and 28-1-3. The assemblage of SG 28-N2 2<sup>nd</sup>, contained vastly higher proportions of lithic debitage and tools than other domestic contexts in the Lower Dover settlement, likely indicating lithic tool production, or other craft activities which would require such tools. Apart from the large amount of chert tools and debitage, other artifacts found in this construction phase included 15 freshwater shells, two pieces of marine shell, a spindle whorl, and a shell tinkler. Ceramics found were confined to Late Classic types, like Dolphin Head, and Cayo Unslipped. This construction phase, therefore, occurred during or after the rise of Lower Dover.



**Figure 42:** Floor 2.

### Summary of SG 28 Structure N2 Excavations

The excavations at SG 28 reveal that Structure N2 was constructed in two phases, the first likely dating to the Preclassic/Early Classic and the second to the Late Classic. The structure did not possess major architectural components with the exception of the two floors. The presence of the lithics in the second construction phase may indicate that the structure was not occupied as a household, but was perhaps used as a workshop. This is corroborated by a lack of many items generally associated with domestic contexts like *manos* and *metates* and utilitarian ceramics. The presence of such high proportions of chert tools suggests the Late Classic period structure may have been a workshop for production of other items (Braswell 2010; Vandebosch et al. 2010; Whittaker et al. 2009). This assumption may be further validated by the lower frequencies of ceramics found in the unit compared to others that were excavated in the Lower Dover settlement. Whether it be a workshop or a commoner residence with an adjoining workshop, we can be fairly certain the site was of low status due to a lack of any wealth items. That said the group certainly displays occupational longevity, suggestive of some degree of success. The presence of lithic tools on the second construction phase may indicate that production started after the rise of the polity, perhaps related to economic developments associated with the establishment of the Lower Dover polity.



**Figure 43:** Map showing the position of E.U. SG 51-1.

## Excavation Unit 51-1

SG 51 was named Ikilna (roughly translating to “windy house” in Yucatec Mayan) because of the heavy winds buffeting the hilltop locale (Figure 43). The house group is composed of four structures arranged around a central patio. Because of the group’s commanding position on the most prominent hill in the Tutu Uitz Na neighborhood, (450m south of Tutu Uitz Na), we hypothesized that it was a high status commoner residence. In that regard, it was selected in part to test whether increased viewshed was correlated with household success, and whether its significant distance from Tutu Uitz Na and especially Lower Dover affected its economic wellbeing. The results of excavation suggested that SG 51 was not nearly as affluent or well-established as we initially hypothesized.

The western mound, Structure W1, is the largest in the group of four mounds at SG 51, measuring 1.4m in height, and is “L” shaped, with a projection pointing eastward on its northern side. We were uncertain whether this form resulted from the original construction layout, or post-abandonment taphonomic processes, which included the use of the house group as a training area for the British military some decades ago, leaving several pits in the house group. A 2x3m unit was placed running east-to-west perpendicular to Structure W1. The unit was excavated at its full width only through its terminal phase (SG 51-W1 4<sup>th</sup>), and then bisected by a 1m trench running along its northern side through to bedrock. Elevations for this unit were taken from SG51-Datum 1.

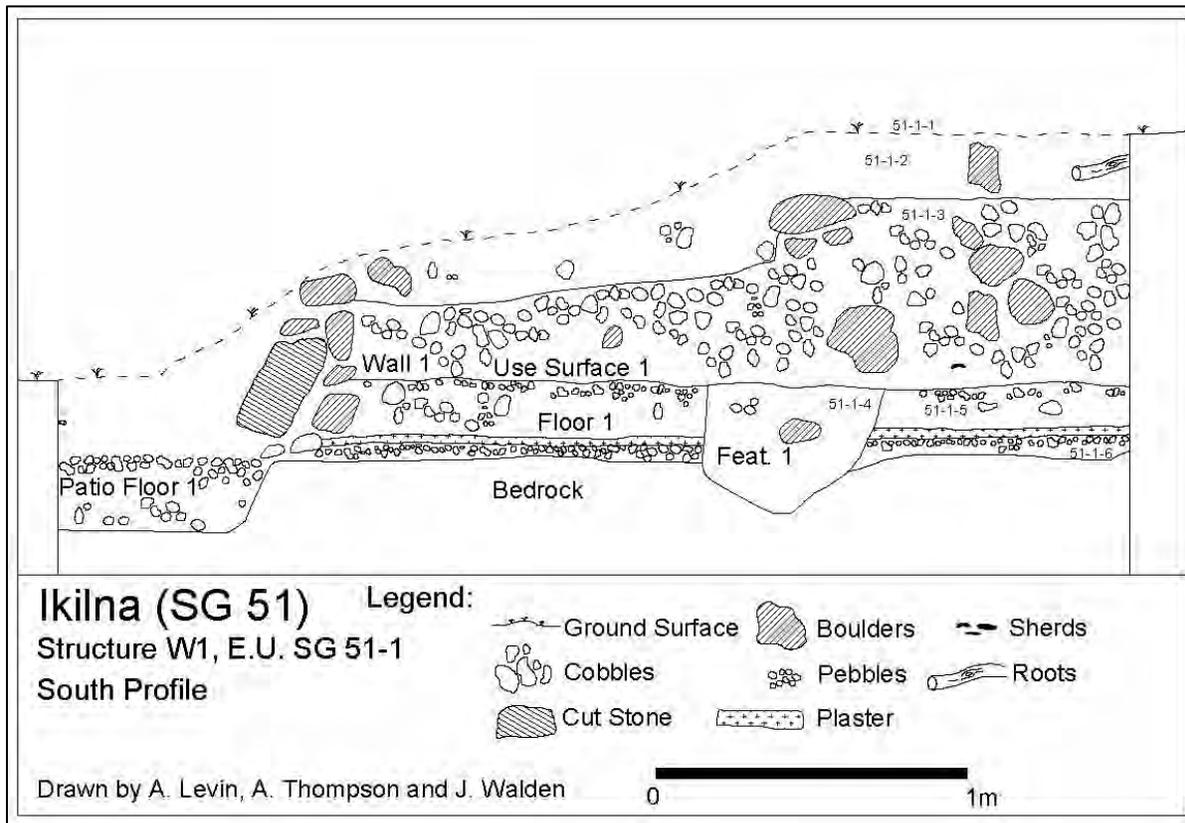


Figure 44: E.U. SG 51-1 Profile.

### *SG 51-W1 1<sup>st</sup>*

The earliest construction phase of SG 51-W1 saw the erection of a 20cm platform directly upon cleared bedrock, with the eastern edge of the building faced with one course of limestone boulders. The fill consisted of limestone cobbles and dense brown matrix, covered by a lighter matrix characteristic of decayed plaster, representing Floor 1 (Figures 44 and 45). This floor was further distinguished by an apparent use surface of several flat-lying sherds on its western end. While diagnostic ceramics from this phase were limited ( $n=11$ ), these comprised Late Classic, Spanish Lookout types like Belize Red and Vaca Falls (Lot 51-1-6). This phase also included a 15cm thick layer of matrix interspersed with small limestone ballast covering the bedrock in front of Wall 1. This surface was designated Patio Floor 1.



**Figure 45:** Floor 1 and Wall 1.

### *SG 51-W1 2<sup>nd</sup>*

This second phase at Structure W1, saw the construction of a higher platform on top of Floor 1, which was capped with Use Surface 1 (Figure 46). Use Surface 1 was placed on top of a layer of ballast fill, and probably was either a tamped earth floor or a plaster floor which completely eroded. This construction episode was associated with Late Classic ceramics, including Belize Red. Materials from this context included 41 pieces of chert and 18 sherds, these were collected as Lot 51-1-5.



**Figure 46:** Use Surface 1.

*SG 51-W1 3<sup>rd</sup> (Feature 1)*

The third construction phase at Structure W1 saw the excavation of Feature 1 into Use Surface 1. Feature 1 was a round pit measuring 20 x 30cm, and was noted for its browner matrix color (10YR 3/2) and apparent indentation in the floor's surface. The feature was dug into Floor 1, penetrating 20cm through the platform to bedrock (Figure 47). This pit only contained an obsidian blade fragment and seven *jute*. The pit was excavated as Lot 51-1-4. It is possible that the pit represented a dedicatory offering associated with the next construction phase and held biodegradable offerings, or was emptied of significant artifacts before the next construction phase, although this remains speculative (Vogt 2004). The dark matrix color could indeed corroborate that organic material was placed in the pit, blackening the soil through decay. Despite the lack of diagnostics, we are confident that this was likely a Late Classic construction phase.



**Figure 47:** Feature 1.

#### *SG 51-W1 4<sup>th</sup> (Penultimate)*

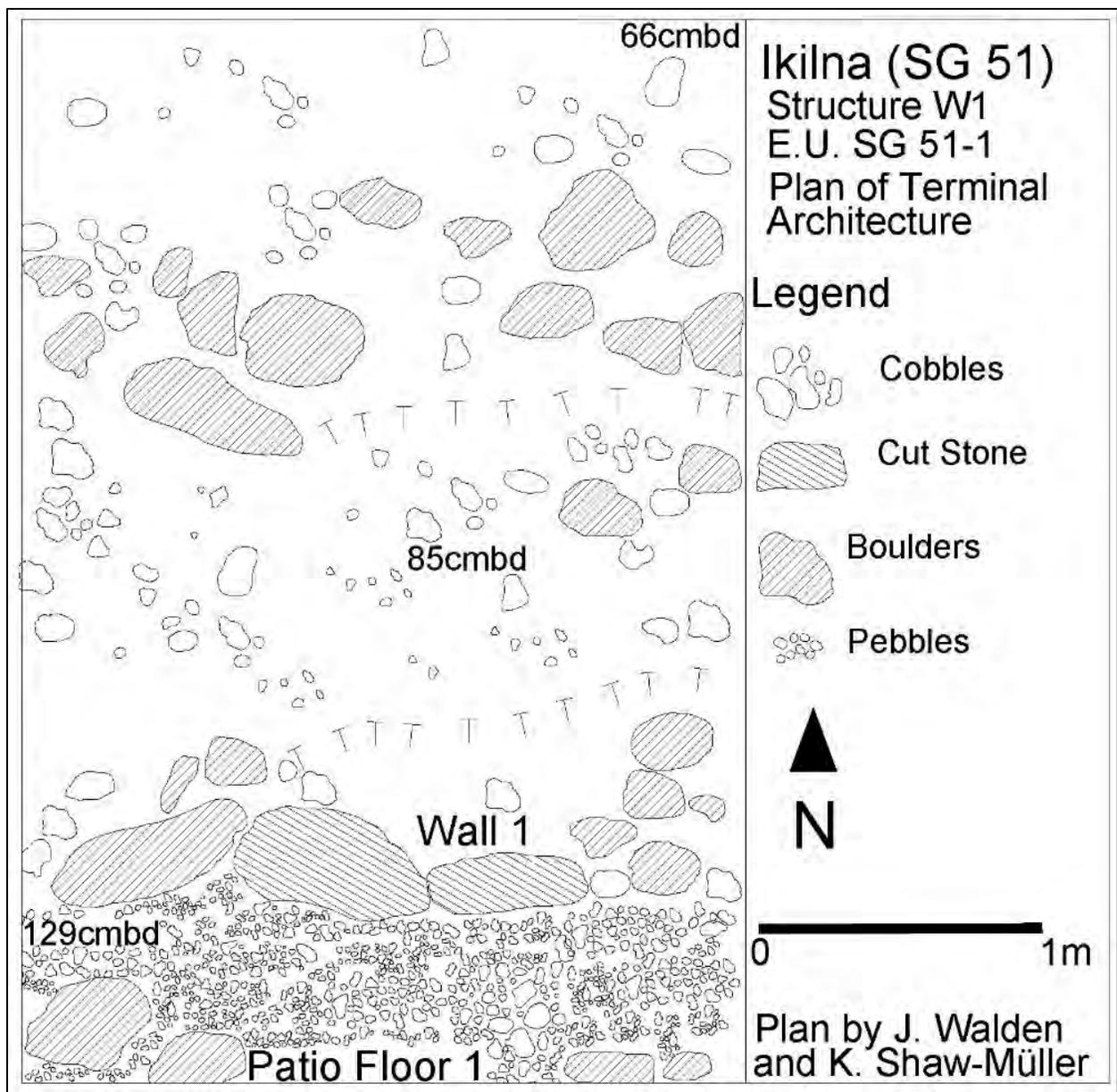
Use Surface 1 was then covered by the structure's penultimate construction phase. Consisting primarily of a limestone pebble and brown matrix fill, this construction episode was approximately 20cm thick at the eastern end of the unit (up against Wall 1) and thicker (50cm) at the western unit baulk (Figures 44, 48 and 49). This phase was filled with high frequencies of Spanish Lookout complex diagnostic sherds, namely the Belize and Cayo types, with a high preponderance of jar and bowl rims commonly found in domestic assemblages. In that regard, other finds typical of such a context were present, including 41 chert flakes, and 85 freshwater shells. These materials were collected as Lots 51-1-1, 51-1-2 and 51-1-3. Fewer *jute* (n=286) were recovered from this phase compared to house groups located at lower elevations in the settlement cluster. A speleothem fragment (SF#101) was unearthed, which possibly held some type of ritual significance (Brady 1997). It also bears mentioning that there was a large amount of limestone boulders and cobbles in the western portion of the unit. Our current hypothesis is that these boulders formed a step, as corroborated by its facing boulders and pebbles that may have acted as ballast behind the step. Steps such as this are common features of Classic period Maya houses throughout the Belize Valley (Walden and Biggie 2017).



**Figure 48:** Penultimate construction phase.

*SG 51-W1 5<sup>th</sup> (Terminal)*

The terminal phase of construction at Structure W1 consisted of a very thin (10cm) living surface. While no formal plaster floor was present, the context was replete with cultural material, indicating habitation. The high levels of modern post-abandonment activity, namely military training decades ago and cow pasturing through to the present, would have caused enough erosion to significantly deteriorate the uppermost level of the building. The phase contained a wide diversity of Spanish Lookout diagnostic ceramics, as well as a piece of petrified wood (SF#107), Olivella tinklers (SF#98) and a chert biface fragment (SF#97). The biface fragment especially indicates continued habitation of the structure, in that it was likely broken through use (not ceremonially broken, which typically results in a clean break and close association between fragments), while the Olivella tinklers are more suggestive of ceremonial activity and a limited degree of affluence for the building's occupants. This phase also included material from the matrix in front of Wall 1, just above Patio Floor 1.



**Figure 49:** Penultimate architecture.

*Summary of SG 51 Structure W1 Excavations*

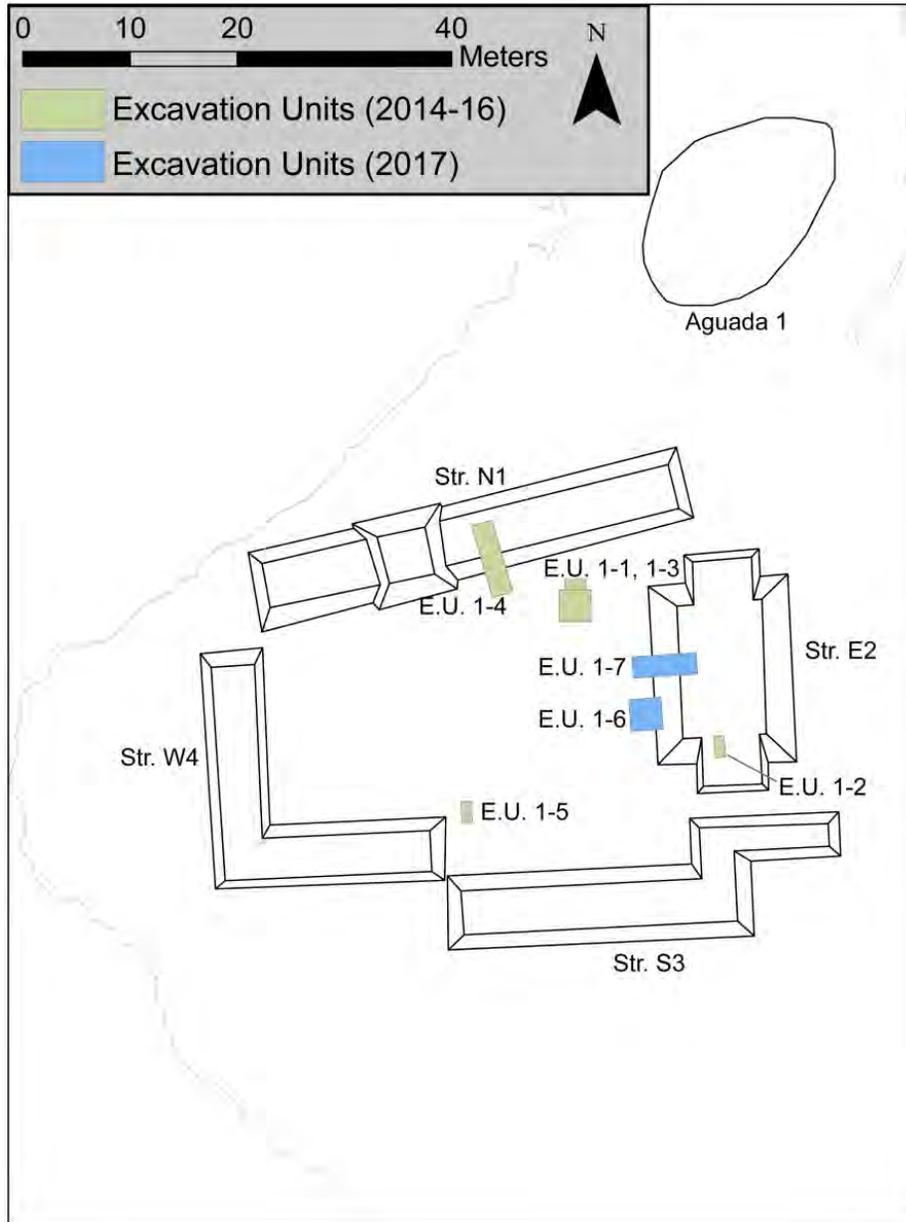
Excavations at Structure W1 indicate that the Ikilna group (SG 51) was constructed in the Late Classic period, though it remains unclear how early in this period the structure was first erected. Though the structure was inhabited long enough to merit a second rather significant construction phase that apparently included basic tiered architecture, it was certainly not settled as early as we expected, despite it occupying the most commanding position in the Tutu Uitz Na neighborhood. Evidence suggesting a high status for the groups' residents is not plentiful, aside from the two *Olivella* shell beads that were imported from the coast. Apart from some large boulders which were used to form Wall 1, the construction materials and the lack of skilled labor

that went into assembling the structure (SE51-W1 3<sup>rd</sup>), further corroborates the seemingly low status of the SG51 inhabitants. Evidence yielded from this structure suggests instead that there is not a strong correlation between viewshed/elevation, affluence, and longevity of habitation. That this house group was only established in the Late Classic would further suggest a correlation with Lower Dover's rise, and a limited connection to Tutu Uitz Na's trajectory. Because nearly 1km of hilly terrain separates this house group from Lower Dover, the likeliest causal relation between the polity's rise and the foundation of Ikilna could simply be a general attraction of new inhabitants to the area during the Late Classic. Settlement in increasingly marginal zones, such the area around Ikilna, may reflect population expansion across the Belize Valley during the Late Classic. Indeed, as the excavators' experience and the house-group's namesake suggest, the wind alone may have discouraged most (especially well-established) families from settling the hill, though the presence of tree cover in prehistory may have altered wind intensity. Regardless, excavations have shown that Ikilna was far from being a leading household of the Southern Cluster, despite initial hypotheses to the contrary.

### **Excavation Unit SG 1-6**

Tutu Uitz Na has four structures, the highest being the northern range structure (Structure N1), measuring over 3m high. The eastern structure (Structure E2) in the group measures just under 3m in height and appears to have been modified into a small eastern triadic shrine at some point (see Walden et al. 2017). Structures S3 and W4 are smaller buildings, both around 80cm high. Wölfel et al. (2010:23-26) mapped the group and profiled a looter's trench on Structure N1, revealing four exposed plaster floors. Following this, Petrozza and Biggie (2015) placed two units on the group. The first, E.U. 1-1, was a 2x2m unit which was later reduced to a 1x2m unit, and was located in the north-west corner of the plaza. The second, E.U. 1-2 was a 2x1.5m unit placed perpendicular to the southern looter's trench in Structure E2, with salvage excavations aimed at documenting a burial present in the baulk of the looter's trench. BVAR Project excavations in 2016 in the groups' plaza and northern structure revealed that Tutu Uitz Na, like the centers of Barton Ramie and Floral Park, was occupied at least as early as the Middle Preclassic (900-300 BC; Garber et al. 2004:28; Gifford 1976:23), pre-dating the rise of Lower Dover by over 1000 years (Petrozza and Biggie 2015:36; Walden et al. 2017). The presence of a high volume of Late Classic (AD 500-750) ceramics indicates that Tutu Uitz Na was active throughout the local trajectory and was occupied contemporaneously with the Lower Dover political center (Figure 2).

Excavation Unit 1-6 was a 3x3m unit placed on the western face of Structure E2 extending into the east side of the group's central plaza, just to the west of excavation Unit 1-2 excavated by BVAR Project members Petrozza and Biggie (2015; Figure 50). The goal of this excavation was to expose the central staircase of the eastern triadic structure at SG 1. Because of time constraints, the unit was first reduced to a 3x1.5m unit and then reduced a second time to a 1x1m unit in order to investigate the earliest construction phase and *jute* deposit (Lot SG1-6-4). After revealing the anticipated staircase, our goal was to trench the structure in order to find any caches, burials, or other centerline features associated with the building, and to develop a chronology from the construction of the building. However, the majority of material discovered was from heavily disturbed matrix deposited on the front of the structure by looting activity. A second unit, Unit SG1-7 (described below), was placed to the north in order to document undisturbed stratigraphic contexts on the structure. Elevations were taken from SG 1-Datum 6.



**Figure 50:** Map of excavation locations on SG 1 (Tutu Uitz Na).

*SG 1 Eastern Plaza 1<sup>st</sup>*

This first construction event in the eastern plaza involved clearing the natural topsoil down to bedrock and depositing vast quantities of *jute* (Lot SG1-6-4; Figure 51 and 47), an event documented elsewhere in plaza excavations at the group (Petrozza and Biggie 2015; Walden and Biggie 2017). This *jute* deposit was found intermixed with compact matrix (10 YR 3/2) containing small pebbles. Additionally, chert and ceramics were found within the *jute* deposit. The chert found in this lot consisted of 12 pieces of debitage, and a single chert core. The ceramics date the deposit to the Middle Preclassic, and include diagnostic Jenny Creek complex ceramics including Jocote Orange Brown jars.



**Figure 51:** *Jute* deposit.

### *SG 1 Eastern Plaza 2<sup>nd</sup>*

Based on earlier investigations in the plaza at SG 1, we expected to find ballast and the remains of a floor directly on top of the *jute* deposit (Petrozza and Biggie 2015; Walden and Biggie 2017). However, where we expected to find such floor remnants, there was instead a rocky dark-brown/black layer (10 YR 2/1; Figure 48). This lot (SG1-6-3) was investigated after bisecting the original unit along its north-south axis, creating a 3x1.5m unit (Figure 52). The ceramic materials from this context mostly consisted of Late Classic sherds from the Spanish Lookout complex, including Achote Black, Belize Red, Cayo Unslipped, Garbutt Creek, Yaha Creek Cream, Rubber Camp Brown, Vaca Falls, Jaguarundi Brown, Dolphin Head, Mountain Pine Red, and Mount Maloney Black types (Gifford 1976). This lot also contained a small Late Preclassic and Early Classic component, the former being represented by the discovery of Hillbank and Sierra Red sherds, with the latter represented by Dos Arroyos Polychrome sherds (Gifford 1976). Chert artifacts in this lot included eleven flakes, three flake tools, nine cores, and a biface fragment (SF #74). Other artifact classes found in this lot include freshwater shell, marine shell, faunal remains, and a shell bead (SF #78).



**Figure 52:** Dark humic layer/looter's backdirt.

### *Post-abandonment Disturbance*

Unfortunately, in the recent past Structure E2 experienced extensive looting and evidently much of the backdirt from two looting pits located on top of the structure was thrown into the area of our excavation unit. This looting event is represented by Lot SG1-6-2. The matrix was a dark-brown humus (10 YR 3/3) that contained a large amount of construction fill and cap stones from the looted structure. A large number of ceramics were recovered, but they represent mixed materials dating from the Middle Preclassic through to the Terminal Classic periods. This mixed context is attributed to the indiscriminate deposition of matrix, which also included human bone fragments, from the interior of the structure by the looter's. The presence of the aforementioned capstones and large amounts of human remains found in this lot speak to the wealth of the information lost as a result of the looting, and suggest that at least one formal burial may have been placed in this location. We also uncovered one obsidian blade fragment, *jute*, quartz, a *metate* fragment (SF #72), and two bifaces (SF #71 and #111). Additionally, a single *tecomate* sherd and a biface (SF #69) were collected from the surface of the unit (Lot SG1-6-1).

### *Summary of SG 1 Eastern Plaza Excavation*

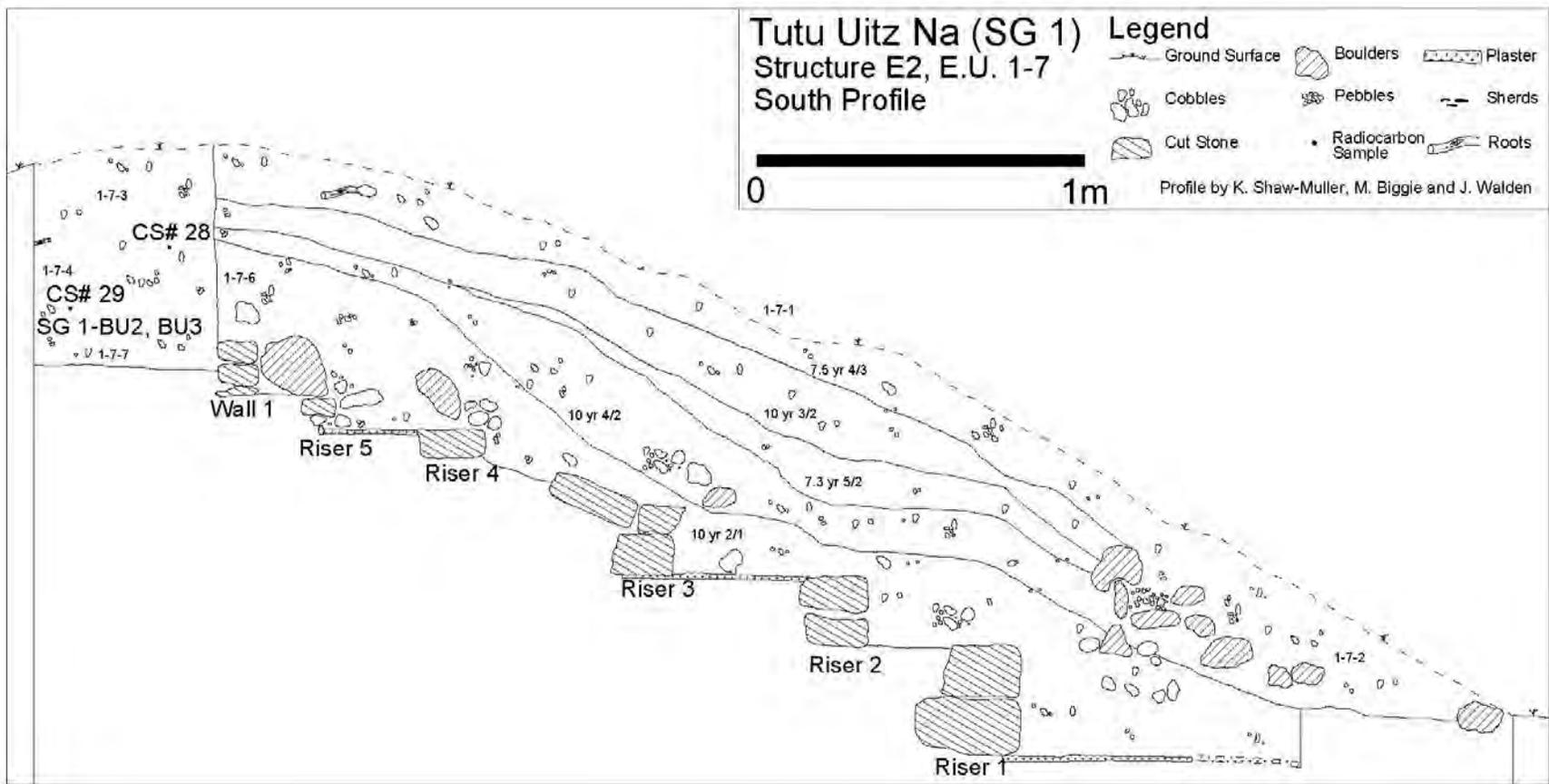
The findings from E.U. SG1-6 corroborate earlier findings in this settlement group made by Petrozza and Biggie (2015) and by Walden and Biggie (2017). Our excavation further shows that SG 1 was founded during the Middle Preclassic, with occupation continuing well into the Late Classic when it was finally abandoned during the Terminal Classic period. The findings of this excavation also show that the *jute* deposit exists in the eastern part of the plaza and provides further evidence that the deposit exists beneath the entire plaza. The significance of the vast quantities of *jute* shells placed in the plaza is something that we can only speculate on. One hypothesis is that the placement of the *jute* along with shells from other freshwater and marine species created a representation of the primordial sea from Maya mythology. Furthermore, because the plaza is bounded on four sides, it may have served as a representation of the Maya world with its four cardinal directions (Ashmore 1992). In this way, the layout of SG 1 may intentionally draw upon emic concepts about sacred space from Maya cosmology. What is more problematic is explaining the absence of the expected ballast and floor on top of the *jute* deposit, as was found by Petrozza and Biggie (2015) and Walden and Biggie (2017) in other parts of the plaza. While the lot on top of the *jute* level (Lot SG1-6-3) contains a small Late Preclassic and Early Classic component ( $n=5$ ), the ceramic material from this lot mostly dates to the Late Classic. Thus, it seems likely that the ballast and original floor were removed during the Late Classic period.

#### **Excavation Unit SG1-7**

E.U. SG1-7 was placed 2m north of E.U. SG1-6, in an attempt to avoid the looter's trench and expose the stairway architecture of structure E2. A 2x3m unit was opened running east-to-west. The unit was subsequently later expanded on the east side, giving a final dimension of 2x6m. Measurements were taken using Datums #SG1-4 and SG1-4A.

#### *SG 1 Structure E2 Terminal Architecture*

The base of Structure E2 was cleared to the *jute* deposit, which appears to cover the bedrock throughout the plaza (Figure 53; Walden and Biggie 2017). This layer was followed eastward to expose the terminal phase architecture of Structure E2. E.U. SG 1-7 excavations revealed an outset staircase with a 50cm average run (i.e., tread) and an average rise of 30cm. A total of 5 risers were uncovered leading eastward towards the structure's summit. The steps consisted of cut limestone blocks fronting dry-laid fill. There was only evidence of plastering remaining on steps 3 and 5. The architecture above Step 5 was missing, partially due to the intrusion of the looter's trench on the southeast edge of the unit, but also possibly because of post-abandonment intrusion by the Maya. The soil above Step 5 had been excavated and redeposited, leaving a mix of artifacts interspersed throughout. The assemblage included ceramics, chert, *jute*, obsidian, worked shell, jade and greenstone, worked faunal bone, and human teeth and bone fragments. The top of this structure was overlain with a complex series of burials (Figures 55-58). Overall the stratigraphy on this part of the unit was the source of substantial confusion.



**Figure 53:** Profile of SG 1 Structure E2.

The structure and fill of Step 5 had been displaced to make room for an intrusive burial, Burial SG1-BU3. This contained the remains of an adult female individual. The burial was potentially placed either on the floor, or in the top of the ballast of the terminal construction episode. The individual had been interred face down, with the head to the north (Figures 57 and 58). The upper legs were straight, with lower legs flexed with feet over the *ox coxae*. The feet seem bound to the waist as they rested upon the buttocks in a somewhat unnatural position, potentially mirroring depictions of captives in Classic Maya iconography with their arms and legs bound. The arms also appear to have been bound, the shoulders were raised and scapulae vertical, arms straight alongside the body with right hand tight to leg, palm inward. Though skeletally intact, poor preservation caused bones to crumble upon removal. An overturned intact bowl was located on the same level near the eastern baulk, but at enough distance that it did not appear to be associated with this individual. Analysis of this burial is still ongoing.

Above Burial SG1-BU3 was a second burial, SG1-BU2. The individual was male, in their early 20's (as indicated by pelvic notch) and was at least 188cm tall (6 feet; Figures 55 and 56). This individual was not particularly muscular, as muscle attachments were not robust. The individual was buried face down, head to the south, hands beneath pelvis, with palms towards the body. The legs were likely bound, as the upper legs were straight, but the lower legs were bent so that the feet were near the *ox coxae*. The hand placement also indicated possible binding. The upper half of the individual's body was missing, having been in the "looter's trench" area, with radius and ulna cleanly cut and nothing above the first couple lumbar vertebrae. The bones were in a very good state of preservation. A mandible fragment was found by the left hip. We will need to determine if it is from the same individual. North of Burial 2 was an assortment of bones, including metacarpals, metatarsals, a radius, an adult male tibia and the mandible of a small child (1-2 years). Bone pins and pin fragments located near the east baulk possibly indicate that these remains are from a secondary burial, perhaps a bundle of some sort. It is undetermined whether these individuals were buried during a single event, but the radiocarbon date ranges from bone collagen of these individuals overlap temporally. SG 1-BU3 dates to cal AD 770-890. Individual 1 in SG 1-BU2 dates to cal AD 765-885 and Individual 2 in SG 1-BU2 dates to cal AD 775-885. Although the vastly different states of bone preservation and the layer of soil separating the bodies could possibly indicate two separate events. While the burials were interred in an eastern triadic shrine, which formed the basis of ancestor veneration, it seems that these burials might not reflect veneration at Tutu Uitz Na during the Terminal Classic (McAnany 2013; Pagliaro et al. 2003). Materials from this terminal activity layer on Str. E2 were collected as Lots 1-7-4, 1-7-6, 1-7-7 and 1-7-8.



**Figure 54:** Terminal architecture.

*SG 1 Structure E2 Post-abandonment Occupation*

At some point in antiquity the entire structure had been covered in humic soil. This dark soil, approximately 30cm deep, started directly above the *jute* layer in the plaza (Figure 54 and 59). As in unit SG1-6, there was no evidence of plaza floor between the *jute* and the humic soil. The humic layer rose with each step, continuing undisturbed even past step 5. This means the humic layer was laid sometime after the intrusive burials SG1-B2 and SG1-B3. Items found in this humic layer include wood, charcoal, and a burnt cohune nut. These were collected in Lots 1-7-1, 1-7-2, 1-7-3 and 1-7-4. Atop this humic layer was a layer of lighter, drier soil filled with rocks and

pebbles, limestone chunks and ceramic sherds. A pile of capstones was found in this layer at the base of the structure. This layer was striated, as if soil/fill from different areas had successively covered the structure. Atop all of this was 20cm of modern humic layer. The existence of the buried humic layer raises some intriguing possibilities:

1. Structure E2 was left undisturbed and naturally buried in humic soil in antiquity. The structure was then subjected to post-abandonment use and looting, becoming the repository of 60cm of rubble and fill. Afterwards the structure was left to gather a 20cm covering of humic soil. A problem with this theory is that such a deposition pattern is not seen anywhere else in the area. Structure N1 did not have a dark humic layer directly atop the structure. The plaza excavations had no humic layer directly atop the *jute* layer. If a natural occurrence, it is oddly localized.
2. Structure E2 was ritually buried. At some point post-abandonment, the structure was ritually covered with a layer of topsoil. This begs the question as to where such a large amount of soil originated, and whether there is evidence of such an occurrence anywhere else in the region.



**Figure 55:** SG1-BU2.

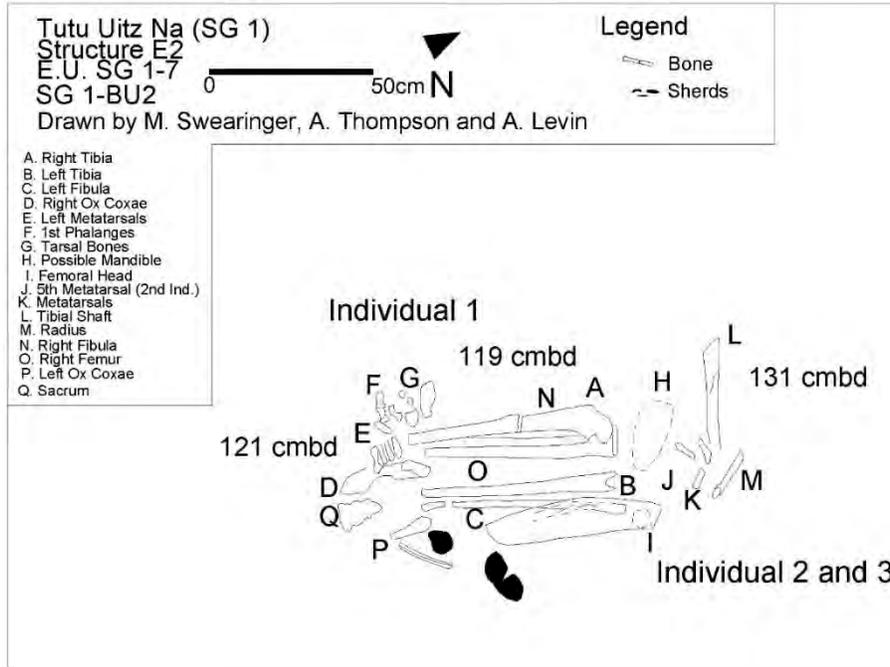


Figure 56: Plan of SG 1-BU2.

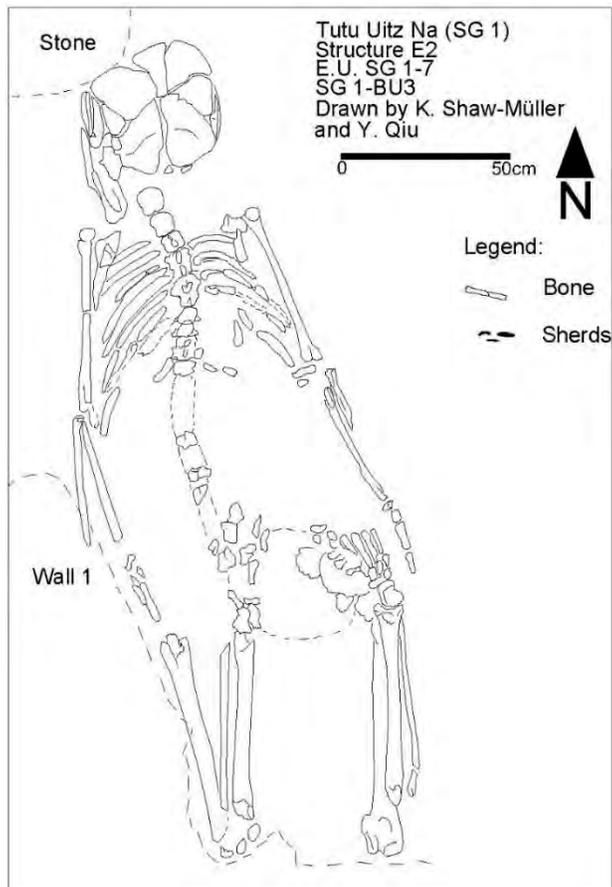
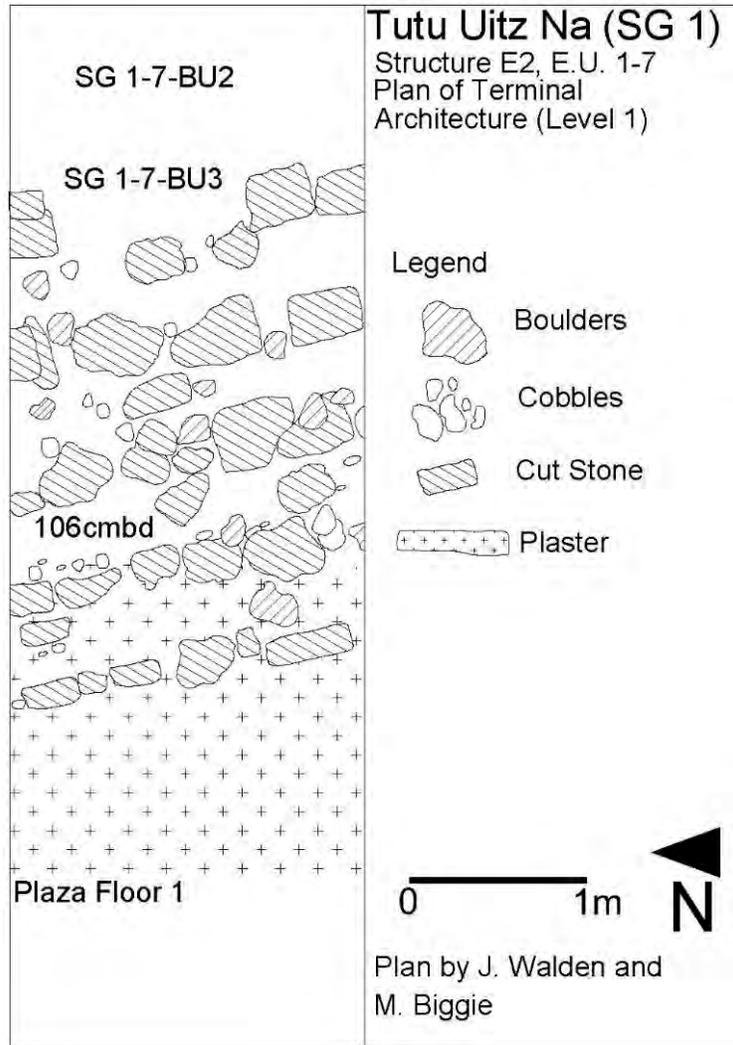


Figure 57: Plan of SG1-BU3.



**Figure 58:** SG1-BU3.



**Figure 59:** SG 1-7 Plan.

### *Summary of Structure E2 Excavations*

The most notable discovery at Tutu Uitz Na this season was the discovery of the burials, SG1-BU2 and SG1-BU3, located on top of the Structure E2 terminal architecture. The placement of the feet over the buttocks and wrists by the sides seems highly indicative of binding and the position face down on the floor potentially indicates sacrifice. The position of both skeletons is reminiscent of iconographic representations of captives lying face down with legs and arms bound (Marcus 1993:146; Figure 60). The fact that this event occurred at the end of the construction sequence at SG 1 suggests that the group was no longer in use after their deposition. That said skeletal analysis of the remains is ongoing and currently there is no evidence these individuals were “killed”, although this will often leave little bioarchaeological trace. An alternative explanation involving the position of the legs is that the ligaments were cut so that the lower leg would fall flat on top of the upper leg. The reasons as to why this would be done are unclear. Nonetheless a similar burial position has been noted at the Lower Dover palace in a Terminal Classic context (Watkins et al. 2017:155).



**Figure 60:** Tikal Altar 8 (Image courtesy of FAMSI).

## DISCUSSION AND CONCLUSIONS

The excavations conducted provide preliminary data to answer the questions outlined. In terms of wealth and status the development of Lower Dover does not seem to have had a major impact on many of the commoner families living in its immediate vicinity. Neither does it appear to have had a drastic impact on the intermediate elite resident at Tutu Uitz Na. Late Classic construction at the different contexts seems to continue at relatively the same tempo. In terms of assemblages, our conclusions are particularly tentative as statistical manipulation is required to explore the patterns evident in the proportions of artifacts. It would seem though that following the emergence of Lower Dover, most of the population did not see their wealth and status drastically reduced or improved, potentially showing a lack of integration into the polity (Awe et al. 2014). In terms of activities most of the households carried on, much as expected. The development of the chert workshop at SG 28 is probably the most noteworthy change in the Late Classic period.

The 2017 excavations in the Lower Dover settlement provide information about the relationships between the different settlement groups and between the hinterland and Lower Dover monumental epicenter. Excavations and artifact analyses indicate that many of the larger households in the Tutu Uitz Na neighborhood were established surprisingly early. Relative ceramic dates indicate that SG 11, SG 3, SG 28 and SG 1 all possess Late Preclassic components. This chronology will be further refined through the AMS dating of organic remains (i.e., charcoal) and bone. Rigorous statistical analysis of household assemblages will later be conducted to provide additional information about the relationships between households and how the neighborhood and the intermediate elite at SG1 changed as Lower Dover emerged.

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The methods, outcomes, and conclusions of the ongoing research will be presented in full in the resulting dissertation, which will be available for open access online via the University of Pittsburgh library (<http://d-scholarship.pitt.edu>).

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**APPENDIX A: 2018 LOWER DOVER SETTLEMENT ARTIFACT INVENTORY**

<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>Notes</i>
LWD	N/A	Surface	N/A	Surface Collection	Gr	1	Mano SF#59
RS2	RS2-1	1	RS2-1-2	Humus and Spall	Ca	1	Radiocarbon Sample #10
RS2	RS2-1	1	RS2-1-2	Humus and spall	Ce	40/168	
RS2	RS2-1	1	RS2-1-2	Humus and spall	Ch	101	
RS2	RS2-1	1	RS2-1-2	Humus and spall	Ch	1/1	SF#37 Biface
RS2	RS2-1	1	RS2-1-2	Humus and spall	Ch	1	SF# 40 Lenticular Biface
RS2	RS2-1	1	RS2-1-2	Humus and Spall	Ch	1	SF#45 Broken Biface
RS2	RS2-1	1	RS2-1-2	Humus and spall	Fa	7	
RS2	RS2-1	1	RS2-1-2	Humus and spall	Fa	1	SF# 39 Tooth
RS2	RS2-1	1	RS2-1-2	Humus and spall	Fs	N/A	
RS2	RS2-1	1	RS2-1-2	Humus and spall	Hr	1	SF# 38 Teeth
RS2	RS2-1	1	RS2-1-2	Humus and Spall	Jd	1	SF#46 Jade Pendant
RS2	RS2-1	1	RS2-1-2	Humus and spall	Ms	1	
RS2	RS2-1	1	RS2-1-2	Humus and spall	Ob	2	
RS2	RS2-1	2	RS2-1-3	Collapse and Spall	Ce	5/11	
RS2	RS2-1	2	RS2-1-3	Collapse and Spall	Ch	7	
RS2	RS2-1	2	RS2-1-3	Collapse and Spall	Fs	N/A	
RS2	RS2-1	2	RS2-1-3	Collapse and Spall	Ms	1	
RS2	RS2-1	3	RS2-1-4	Possible Cave Floor	Ca	1	Radiocarbon Sample #11
RS2	RS2-1	3	RS2-1-4	Possible Cave Floor	Ca	1	Radiocarbon Sample #12
RS2	RS2-1	3	RS2-1-4	Possible Cave Floor	Ce	91/291	
RS2	RS2-1	3	RS2-1-4	Possible Cave Floor	Ch	90	
RS2	RS2-1	3	RS2-1-4	Possible Cave Floor	Fa	16	
RS2	RS2-1	3	RS2-1-4	Possible Cave Floor	Fa	1	SF#53 Animal tooth

<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>Notes</i>
RS2	RS2-1	3	RS2-1-4	Possible Cave Floor	Fs	N/A	
RS2	RS2-1	3	RS2-1-4	Possible Cave Floor	Jd	1	SF#51 Jade Bead
RS2	RS2-1	3	RS2-1-4	Possible Cave Floor	Ob	5	
RS2	RS2-1	4	RS2-1-5	Artifacts on Floor 1	Ca	1	CS#13
RS2	RS2-1	4	RS2-1-5	Artifacts on Floor 1	Ca	1	CS#14
RS2	RS2-1	4	RS2-1-5	Artifacts on Floor 1	Ce	6/26	
RS2	RS2-1	4	RS2-1-5	Artifacts on Floor 1	Ch	6	
RS2	RS2-1	4	RS2-1-5	Artifacts on Floor 1	Fs	N/A	
RS2	RS2-1	4	RS2-1-5	Artifacts on Floor 1	Ms	1	
RS2	RS2-1	4	RS2-1-5	Artifacts on Floor 1	Mx	1	
RS2	RS2-1	5	RS2-1-6	Plaster Floor 1, and Ballast Beneath	Ca	1	CS#15
RS2	RS2-1	5	RS2-1-6	Plaster Floor 1, and Ballast Beneath	Ce	6/21	
RS2	RS2-1	5	RS2-1-6	Plaster Floor 1, and Ballast Beneath	Ch	6	
RS2	RS2-1	5	RS2-1-6	Plaster Floor 1, and Ballast Beneath	Fs	N/A	
RS2	RS2-1	5	RS2-1-6	Plaster Floor 1, and Ballast Beneath	Pl	1	
SG11-N1	SG11-1	5	SG11-1-10	Beneath Floor3	Ca	1	CS# 17
SG11-N1	SG11-1	5	SG11-1-10	Beneath Floor3	Ca	1	CS#18
SG11-N1	SG11-1	5	SG11-1-10	Beneath Floor3	Ce	1/24	
SG11-N1	SG11-1	5	SG11-1-10	Beneath Floor3	Ch	11	
SG11-N1	SG11-1	5	SG11-1-10	Beneath Floor3	Fs	N/A	
SG11-N1	SG11-1	5	SG11-1-10	Beneath Floor3	Hr	n/a	
SG11-N1	SG11-1	5	SG11-1-10	Beneath Floor3	Ob	1	
SG11-N1	SG11-1	6	SG11-1-11	Beneath Floor3	Ce	5/20	
SG11-N1	SG11-1	6	SG11-1-11	Beneath Floor3	Ch	17	
SG11-N1	SG11-1	6	SG11-1-11	Beneath Floor3	Fs	N/A	
SG11-N1	SG11-1	6	SG11-1-11	Beneath Floor3	Hr	n/a	
SG11-N1	SG11-1	1	SG11-1-2	Humus and Collapse	Ce	100/514	

<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>Notes</i>
SG11-N1	SG11-1	1	SG11-1-2	Humus and Collapse	Ch	158	
SG11-N1	SG11-1	1	SG11-1-2	Humus and Collapse	Ch	1	SF#49 Chert Biface fragment
SG11-N1	SG11-1	1	SG11-1-2	Humus and Collapse	Db	5	
SG11-N1	SG11-1	1	SG11-1-2	Humus and Collapse	Fa	2	
SG11-N1	SG11-1	1	SG11-1-2	Humus and collapse	Fs	N/A	
SG11-N1	SG11-1	1	SG11-1-2	Humus and Collapse	Gr	1	SF# 50 Mano Fragment
SG11-N1	SG11-1	1	SG11-1-2	Humus and Collapse	Hr	n/a	
SG11-N1	SG11-1	1	SG11-1-2	Humus and Collapse	Ob	1	
SG11-N1	SG11-1	2	SG11-1-3	Ballast and Fill	Ce	6/20	
SG11-N1	SG11-1	2	SG11-1-3	Ballast and Fill	Ch	10	
SG11-N1	SG11-1	2	SG11-1-3	Ballast and Fill	Fs	N/A	
SG11-N1	SG11-1	3	SG11-1-4	Patio Fill	Ce	54/264	
SG11-N1	SG11-1	3	SG11-1-4	Patio Fill	Ch	43	
SG11-N1	SG11-1	3	SG11-1-4	Patio Fill	Fs	N/A	
SG11-N1	SG11-1	4	SG11-1-5	Patio Floor 1 and Ballast Beneath	Ca	1	CS#16
SG11-N1	SG11-1	4	SG11-1-5	Patio Floor 1 and Ballast Beneath	Ce	47/70	
SG11-N1	SG11-1	4	SG11-1-5	Patio Floor 1 and Ballast Beneath	Ch	15	
SG11-N1	SG11-1	4	SG11-1-5	Patio Floor 1 and Ballast Beneath	Fs	N/A	
SG 11-N1	SG11-1	2	SG11-1-6	Fill Behind Wall 1	Ce	1	Figurine Lab SF 114
SG11-N1	SG11-1	2	SG11-1-6	Fill Behind Wall 1	Ce	18/58	
SG11-N1	SG11-1	2	SG11-1-6	Fill Behind Wall 1	Ch	27	
SG11-N1	SG11-1	2	SG11-1-6	Fill Behind Wall 1	Fs	N/A	
SG11-N1	SG11-1	2	SG11-1-6	Fill Behind Wall 1	Ob	1	
SG11-N1	SG11-1	3	SG11-1-7	Fill Behind Wall 2	Ce	14/59	
SG11-N1	SG11-1	3	SG11-1-7	Fill Behind Wall 2	Ch	47	
SG11-N1	SG11-1	3	SG11-1-7	Fill Behind Wall 2	Fs	N/A	
SG11-N1	SG11-1	3	SG11-1-7	Fill Behind Wall 2	Wd	1	SF#54

<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>Notes</i>
SG11-N1	SG11-1	4	SG11-1-8	Fill Behind Wall 2/Under Floor 2	Ce	50/212	
SG11-N1	SG11-1	4	SG11-1-8	Fill Behind Wall 2/Under Floor 2	Ch	128	
SG11-N1	SG11-1	4	SG11-1-8	Fill Behind Wall 2/Under Floor 2	Fs	N/A	
SG11-N1	SG11-1	4	SG11-1-8	Fill Behind Wall 2/Under Floor 2	Hr	n/a	
SG11-N1	SG11-1	4	SG11-1-9	SG11-BU 1	Ce	12/37	
SG11-N1	SG11-1	4	SG11-1-9	SG11-BU 1	Ch	32	
SG11-N1	SG11-1	4	SG11-1-9	SG11-BU 1	Fs	N/A	
SG11-N1	SG11-1	4	SG11-1-9	SG11-BU 1	Hr	n/a	
SG1-E2	SG1-6	Surface	SG1-6-1	Surface	Ce	1/1	
SG1-E2	SG1-6	Surface	SG1-6-1	Surface	Ch	1	SF#69 Biface
SG1-E2	SG1-6	1	SG1-6-2	Humus and Looter's Backfill	Ce	278/814	
SG1-E2	SG1-6	1	SG1-6-2	Humus and Looter's Backfill	Ch	136	
SG1-E2	SG1-6	1	SG1-6-2	Humus and Looter's Backfill	Ch	1	SF# 71 Biface
SG1-E2	SG1-6	1	SG1-6-2	Humus and Looter's Backfill	Ch	1	SF# 111 Lab SF
SG1-E2	SG1-6	1	SG1-6-2	Humus and Looter's Backfill	Fs	N/A	
SG1-E2	SG1-6	1	SG1-6-2	Humus and Looter's Backfill	Gr	1	SF#72 Metate fragment
SG1-E2	SG1-6	1	SG1-6-2	Humus and Looter's Backfill	Hr	n/a	
SG1-E2	SG1-6	1	SG1-6-2	Humus and Looter's Backfill	Ob	1	
SG1-E2	SG1-6	1	SG1-6-2	Humus and Looter's Backfill	Qz	1	
SG1-E2	SG1-6	2	SG1-6-3	Humic	Ce	76/319	
SG1-E2	SG1-6	2	SG1-6-3	Humic	Ch	66	
SG1-E2	SG1-6	2	SG1-6-3	Humic	Ch	1	SF#74 Biface fragment
SG1-E2	SG1-6	2	SG1-6-3	Humic	Fa	1	
SG1-E2	SG1-6	2	SG1-6-3	Humic	Fs	N/A	
SG1-E2	SG1-6	2	SG1-6-3	Humic	Ms	5	
SG1-E2	SG1-6	2	SG1-6-3	Humic	Sh	1	SF#78 Shell bead
SG1-E2	SG1-6	3	SG1-6-4	<i>Jute</i> deposit	Ce	11/54	

<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>Notes</i>
SG1-E2	SG1-6	3	SG1-6-4	<i>Jute</i> deposit	Ch	52	
SG1-E2	SG1-6	3	SG1-6-4	<i>Jute</i> deposit	Fs	N/A	
SG1-E2	SG1-7	1	SG1-7-2	Humus and Looter's Backfill	Ce	191/665	
SG1-E2	SG1-7	1	SG1-7-2	Humus and Looter's Backfill	Ch	109	
SG1-E2	SG1-7	1	SG1-7-2	Humus and Looter's Backfill	Ch	1	SF#77 Biface fragment
SG1-E2	SG1-7	1	SG1-7-2	Humus and Looter's Backfill	Ch	1	SF#80 Biface frag
SG1-E2	SG1-7	1	SG1-7-2	Humus and Looter's Backfill	Ch	1	SF#84 Biface frag
SG1-E2	SG1-7	1	SG1-7-2	Humus and Looter's Backfill	Fa	7	
SG1-E2	SG1-7	1	SG1-7-2	Humus and Looter's Backfill	Fs	N/A	
SG1-E2	SG1-7	1	SG1-7-2	Humus and Looter's Backfill	Gr	1	SF#85 Mano frag
SG1-E2	SG1-7	1	SG1-7-2	Humus and Looter's Backfill	Hr	n/a	
SG1-E2	SG1-7	1	SG1-7-2	Humus and Looter's Backfill	Ls	1	SF#79 Worked Limestone
SG1-E2	SG1-7	1	SG1-7-3	Humus and Looter's Backfill	Ce	336/905	
SG1-E2	SG1-7	1	SG1-7-3	Humus and Looter's Backfill	Ce	1	SF#86 Ceramic pestle
SG1-E2	SG1-7	1	SG1-7-3	Humus and Looter's Backfill	Ch	491	
SG1-E2	SG1-7	1	SG1-7-3	Humus and Looter's Backfill	Fa	1	SF#91 worked bone
SG1-E2	SG1-7	1	SG1-7-3	Humus and Looter's Backfill	Fa	1	SF#88 worked bone
SG1-E2	SG1-7	1	SG1-7-3	Humus and Looter's Backfill	Fs	N/A	
SG 1-E2	SG 1-7	1	SG1-7-3	Humus and Looter's Backfill	Hr	2	Human crania
SG1-E2	SG1-7	1	SG1-7-3	Humus and Looter's Backfill	Hr	n/a	
SG1-E2	SG1-7	1	SG1-7-3	Humus and Looter's Backfill	Jd	1	SF#83 Jade bead
SG1-E2	SG1-7	1	SG1-7-3	Humus and Looter's Backfill	Jd	1	SF#87 Jade bead
SG1-E2	SG1-7	1	SG1-7-3	Humus and Looter's Backfill	Jd	1	SF#89 Jade bead
SG1-E2	SG1-7	1	SG1-7-3	Humus and Looter's Backfill	Ls	1	SF#93 Grooved stone
SG1-E2	SG1-7	1	SG1-7-3	Humus and Looter's Backfill	Ob	6	
SG1-E2	SG1-7	1	SG1-7-3	Humus and Looter's Backfill	Sh	1	SF#90 Worked shell
SG1-E2	SG1-7	1	SG1-7-3	Humus and Looter's Backfill	Sp	1	SF#94 Speleothem

<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>Notes</i>
SG1-E2	SG1-7	1	SG1-7-4	SG1-BU2	Ca	1	CS#29
SG1-E2	SG1-7	1	SG1-7-4	SG1-BU2	Ce	36/140	
SG1-E2	SG1-7	1	SG1-7-4	SG1-BU2	Ce	9/17	Vessel 1 at feet
SG1-E2	SG1-7	1	SG1-7-4	SG1-BU2	Ce	5/15	Vessel 2 at feet
SG1-E2	SG1-7	1	SG1-7-4	SG1-BU2	Ch	41	
SG1-E2	SG1-7	1	SG1-7-4	SG1-BU2	Fs	N/A	
SG1-E2	SG1-7	1	SG1-7-4	SG1-BU2	Hr	N/A	
SG1-E2	SG1-7	1	SG1-7-4	SG1-BU2	Hr	1	SF#100 worked bone pin
SG1-E2	SG1-7	1	SG1-7-4	SG1-BU2	Hr	4	SF#102 worked bone pin
SG1-E2	SG1-7	1	SG1-7-4	SG1-BU2	Hr	1	Bone needle SF#105
SG1-E2	SG1-7	1	SG1-7-4	SG1-BU2	Hr	1	Bone needle SF#104
SG1-E2	SG1-7	1	SG1-7-4	SG1-BU2	Hr	1	Bone awl SF#106
SG1-E2	SG1-7	1	SG1-7-4	SG1-BU2	Ms	4	
SG1-E2	SG1-7	1	SG1-7-4	SG1-BU2	Mx	3	
SG1-E2	SG1-7	1	SG1-7-4	SG1-BU2	Qz	5	
SG1-E2	SG1-7	1	SG1-7-5	Looter's Trench Fill	Ce	2/12	
SG1-E2	SG1-7	1	SG1-7-5	Looter's Trench Fill	Ch	11	
SG1-E2	SG1-7	1	SG1-7-5	Looter's Trench Fill	Fs	N/A	
SG1-E2	SG1-7	1	SG1-7-5	Looter's Trench Fill	Hr	N/A	
SG1-E2	SG1-7	1	SG1-7-6	Humus and Collapse Behind Wall 2	Ca	1	CS#28
SG1-E2	SG1-7	1	SG1-7-6	Humus and Collapse Behind Wall 2	Ce	174/802	
SG1-E2	SG1-7	1	SG1-7-6	Humus and Collapse Behind Wall 2	Ch	411	
SG1-E2	SG1-7	1	SG1-7-6	Humus and Collapse Behind Wall 2	Ch	1	SF#99 Chert Biface (not a special find)
SG1-E2	SG1-7	1	SG1-7-6	Humus and Collapse Behind Wall 2	Ch	1	SF#109
SG1-E2	SG1-7	1	SG1-7-6	Humus and Collapse Behind Wall 2	Fs	N/A	
SG1-E2	SG1-7	1	SG1-7-6	Humus and Collapse Behind Wall 2	Hr	N/A	
SG1-E2	SG1-7	1	SG1-7-6	Humus and Collapse Behind Wall 2	Ms	1	

<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>Notes</i>
SG1-E2	SG1-7	1	SG1-7-6	Humus and Collapse Behind Wall 2	Ob	5	
SG1-E2	SG1-7	1	SG1-7-6	Humus and Collapse Behind Wall 2	Wd	1	
SG1-E2	SG3-1	2	SG1-7-7	SG1-BU2	Ce	3/18	
SG1-E2	SG3-1	2	SG1-7-7	SG1-BU2	Ch	16	
SG1-E2	SG3-1	2	SG1-7-7	SG1-BU2	Fs	N/A	
SG1-E2	SG3-1	2	SG1-7-7	SG1-BU2	Hr	n/a	
SG1-E2	SG3-1	2	SG1-7-7	SG1-BU2	Mx	1	
SG1-E2	SG1-7	2	SG1-7-8	Ballast Below Terminal Floor	Ce	36	Complete vessel SF#110(not photographed)
SG1-E2	SG1-7	2	SG1-7-8	Ballast Below Terminal Floor	Mx	1	
SG28-N2	SG28-1	Surface	SG28-1-1	Surface	Ch	2	
SG28-N2	SG28-1	1	SG28-1-2	Humus and Collapse	Ce	18/68	
SG28-N2	SG28-1	1	SG28-1-2	Humus and Collapse	Ch	156	
SG28-N2	SG28-1	1	SG28-1-2	Humus and Collapse	Ch	1	SF#70 Biface frag
SG28-N2	SG28-1	1	SG28-1-2	Humus and Collapse	Fs	N/A	
SG28-N2	SG28-1	1	SG28-1-2	Humus and Collapse	Ob	2	
SG28-N2	SG28-1	2	SG28-1-3	Architectural Fill	Ce	7/30	
SG28-N2	SG28-1	2	SG28-1-3	Architectural Fill	Ce	1	SF#75 Spindle Whorl
SG28-N2	SG28-1	2	SG28-1-3	Architectural Fill	Ch	2519	
SG28-N2	SG28-1	2	SG28-1-3	Architectural Fill	Ch	1	SF# 63 Biface
SG28-N2	SG28-1	2	SG28-1-3	Architectural Fill	Fs	N/A	
SG28-N2	SG28-1	2	SG28-1-3	Architectural Fill	Ms	2	
SG28-N2	SG28-1	2	SG28-1-3	Architectural Fill	Sh	1	Lab SF# 115 Tinkler
SG28-N2	SG28-1	2	SG28-1-3	Artifacts on Floor 2	Ce	1	
SG28-N2	SG28-1	2	SG28-1-3	Artifacts on Floor 2	Ch	98	
SG28-N2	SG28-1	2	SG28-1-3	Artifacts on Floor 2	Fs	N/A	
SG28-N2	SG28-1	3	SG28-1-4	Fill Under Floor 2	Ce	18/98	
SG28-N2	SG28-1	3	SG28-1-4	Fill Under Floor 2	Ch	357	

<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>Notes</i>
SG28-N2	SG28-1	3	SG28-1-4	Fill Under Floor 2	Fs	N/A	
SG28-N2	SG28-1	3	SG28-1-4	Fill Under Floor 2	Qz	2	
SG28-N2	SG28-1	3	SG28-1-4	Fill Under Floor 2	Wd	1	SF#76 Petrified wood
SG3-N1	SG3-1	Surface	SG3-1-1	Surface	Ce	1/1	
SG3-N1	SG3-1	1	SG3-1-2	Humus and Collapse	Ce	317/1917	
SG3-N1	SG3-1	1	SG3-1-2	Humus and Collapse	Ce	1	SF# 42 Spindle Whorl
SG3-N1	SG3-1	1	SG3-1-2	Humus and Collapse	Ch	595	
SG3-N1	SG3-1	1	SG3-1-2	Humus and Collapse	Ch	1/1	SF#33 Biface Fragment
SG3-N1	SG3-1	1	SG3-1-2	Humus and Collapse	Ch	1/1	SF#34 Biface Fragment
SG3-N1	SG3-1	1	SG3-1-2	Humus and Collapse	Ch	1/1	SF#35 Biface Fragment
SG3-N1	SG3-1	1	SG3-1-2	Humus and Collapse	Ch	1	SF#47 (Chert biface fragment)
SG3-N1	SG3-1	1	SG3-1-2	Humus and Collapse	Db	2	
SG3-N1	SG3-1	1	SG3-1-2	Humus and Collapse	Fa	1	
SG3-N1	SG3-1	1	SG3-1-2	Humus and Collapse	Fa	1	SF# 41 Tooth Pendant
SG3-N1	SG3-1	1	SG3-1-2	Humus and Collapse	Fs	N/A	
SG3-N1	SG3-1	1	SG3-1-2	Humus and Collapse	Ob	5	
SG3-N1	SG3-1	1	SG3-1-2	Humus and Collapse	Ob	1/1	SF# 36 Biface
SG3-N1	SG3-1	1	SG3-1-2	Humus and Collapse	Qz	4	
SG3-N1	SG3-1	2	SG3-1-2	Humus and Collapse	Sp	1	SF# 66 Speleothem
SG3-N1	SG3-1	2	SG3-1-3	Patio Floor 1 and Ballast Beneath	Ce	68/217	
SG3-N1	SG3-1	2	SG3-1-3	Patio Floor 1 and Ballast Beneath	Ch	113	
SG3-N1	SG3-1	2	SG3-1-3	Patio Floor 1 and Ballast Beneath	Ch	1	Biface fragment SF#52
SG3-N1	SG3-1	2	SG3-1-3	Patio Floor 1 and Ballast Beneath	Fs	N/A	
SG3-N1	SG3-1	2	SG3-1-3	Patio Floor 1 and Ballast Beneath	Gr	1	Mano SF#48
SG3-N1	SG3-1	2	SG3-1-3	Patio Floor 1 and Ballast Beneath	Ob	2	
SG3-N1	SG3-1	2	SG3-1-3	Patio Floor 1 and Ballast Beneath	Qz	1	
SG3-N1	SG3-1	3	SG3-1-4	Fill Below Patio Floor 1 Ballast	Ce	118/257	

<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>Notes</i>
SG3-N1	SG3-1	3	SG3-1-4	Fill Below Patio Floor 1 Ballast	Ce	1	SF#44 POT DISK
SG3-N1	SG3-1	3	SG3-1-4	Fill Below Patio Floor 1 Ballast	Ch	98	
SG3-N1	SG3-1	3	SG3-1-4	Fill Below Patio Floor 1 Ballast	Fa	2	
SG3-N1	SG3-1	3	SG3-1-4	Fill Below Patio Floor 1 Ballast	Fs	N/A	
SG3-N1	SG3-1	3	SG3-1-4	Fill Below Patio Floor 1 Ballast	Gr	1	Metate SF#43
SG3-N1	SG3-1	3	SG3-1-4	Fill Below Patio Floor 1 Ballast	Ob	2	
SG3-N1	SG3-1	3	SG3-1-4	Fill Below Patio Floor 1 Ballast	Qz	1	
SG3-N1	SG3-1	4	SG3-1-5	SG3-BU1	Ce	14/19	
SG3-N1	SG3-1	4	SG3-1-5	SG3-BU1	Ch	26	
SG3-N1	SG3-1	4	SG3-1-5	SG3-BU1	Fs	N/A	
SG3-N1	SG3-1	4	SG3-1-5	SG3-BU1	Hr	N/A	
SG3-N1	SG3-1	5	SG3-1-5	SG3-BU1	Mx	1	Matrix from head
SG3-N1	SG3-1	5	SG3-1-5	SG3-BU1	Mx	1	Matrix from abdomen
SG3-N1	SG3-1	5	SG3-1-5	SG3-BU1	Mx	1	Matrix from the feet
SG3-N1	SG3-1	5	SG3-1-6	Fill beneath SG3-BU1	Ce	115/233	
SG3-N1	SG3-1	5	SG3-1-6	Fill beneath SG3-BU1	Ch	61	
SG3-N1	SG3-1	5	SG3-1-6	Fill beneath SG3-BU1	Fs	N/A	
SG3-N1	SG3-1	5	SG3-1-6	Fill beneath SG3-BU1	Gr	1	
SG3-N1	SG3-1	4	SG3-1-6	Fill beneath SG3-BU1	Hr	N/A	
SG3-N1	SG3-1	5	SG3-1-6	Fill beneath SG3-BU1	Hr	N/A	
SG3-N1	SG3-1	5	SG3-1-6	Fill beneath SG3-BU1	Ob	1	
SG3-N1	SG3-1	5	SG3-1-7	Fill Inside Wall 3	Ce	0/5	
SG3-N1	SG3-1	5	SG3-1-7	Fill Inside Wall 3	Ch	26	
SG3-N1	SG3-1	5	SG3-1-7	Fill Inside Wall 3	Fs	N/A	
SG3-N1	SG3-1	6	SG3-1-8	Behind Wall 3	Ce	9/55	
SG3-N1	SG3-1	6	SG3-1-8	Behind Wall 3	Ch	31	
SG3-N1	SG3-1	6	SG3-1-8	Behind Wall 3	Fs	N/A	

<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>Notes</i>
SG3-N1	SG3-1	6	SG3-1-8	Artifacts on Patio Floor 2	Ce	2/8	
SG3-N1	SG3-1	6	SG3-1-8	Artifacts on Patio Floor 2	Fa	2	
SG3-N1	SG3-1	6	SG3-1-8	Artifacts on Patio Floor 2	Fs	N/A	
SG3-N1	SG3-1	7	SG3-1-9	Patio Floor 1 and Ballast Beneath	Ce	12/25	
SG3-N1	SG3-1	7	SG3-1-9	Patio Floor 1 and Ballast Beneath	Ch	12	
SG3-N1	SG3-1	7	SG3-1-9	Patio Floor 1 and Ballast Beneath	Fs	N/A	
SG3-N1	SG3-1	7	SG3-1-9	Patio Floor 1 and Ballast Beneath	Ob	1	
SG3-N1	SG3-1	2	SG3-1-10	Fill Behind Wall 2	Ce	55/208	
SG3-N1	SG3-1	2	SG3-1-10	Fill Behind Wall 2	Ch	68	
SG3-N1	SG3-1	2	SG3-1-10	Fill Behind Wall 2	Ch	1	SF# 56 Biface frag
SG3-N1	SG3-1	2	SG3-1-10	Fill Behind Wall 2	Ch	1	Sf# 57 arrowhead
SG3-N1	SG3-1	2	SG3-1-10	Fill Behind Wall 2	Fa	4	
SG3-N1	SG3-1	2	SG3-1-10	Fill Behind Wall 2	Fs	N/A	
SG3-N1	SG3-1	2	SG3-1-10	Fill Behind Wall 2	Gr	1	SF#58 metate frag
SG3-N1	SG3-1	2	SG3-1-10	Fill Behind Wall 2	Ob	1	
SG3-N1	SG3-1	2	SG3-1-11	Collapse and Fill	Ce	232/483	
SG3-N1	SG3-1	2	SG3-1-11	Collapse and Fill	Ch	150	
SG3-N1	SG3-1	2	SG3-1-11	Collapse and Fill	Ch	1	Sf#60 biface fragment
SG3-N1	SG3-1	2	SG3-1-11	Collapse and Fill	Fs	N/A	
SG3-N1	SG3-1	2	SG3-1-11	Collapse and Fill	Ob	3	
SG3-N1	SG3-1	3	SG3-1-12	Fill Beneath Floor 3	Ce	36/131	
SG3-N1	SG3-1	3	SG3-1-12	Fill Beneath Floor 3	Ch	56	
SG3-N1	SG3-1	3	SG3-1-12	Fill Beneath Floor 3	Fa	1	
SG3-N1	SG3-1	3	SG3-1-12	Fill Beneath Floor 3	Fs	N/A	
SG3-N1	SG3-1	3	SG3-1-12	Fill Beneath Floor 3	Ms	1	
SG3-N1	SG3-1	3	SG3-1-12	Fill Beneath Floor 3	Ob	1	
SG3-N1	SG3-1	3	SG3-1-13	Feature 1 Below Floor 3	Ce	29/126	

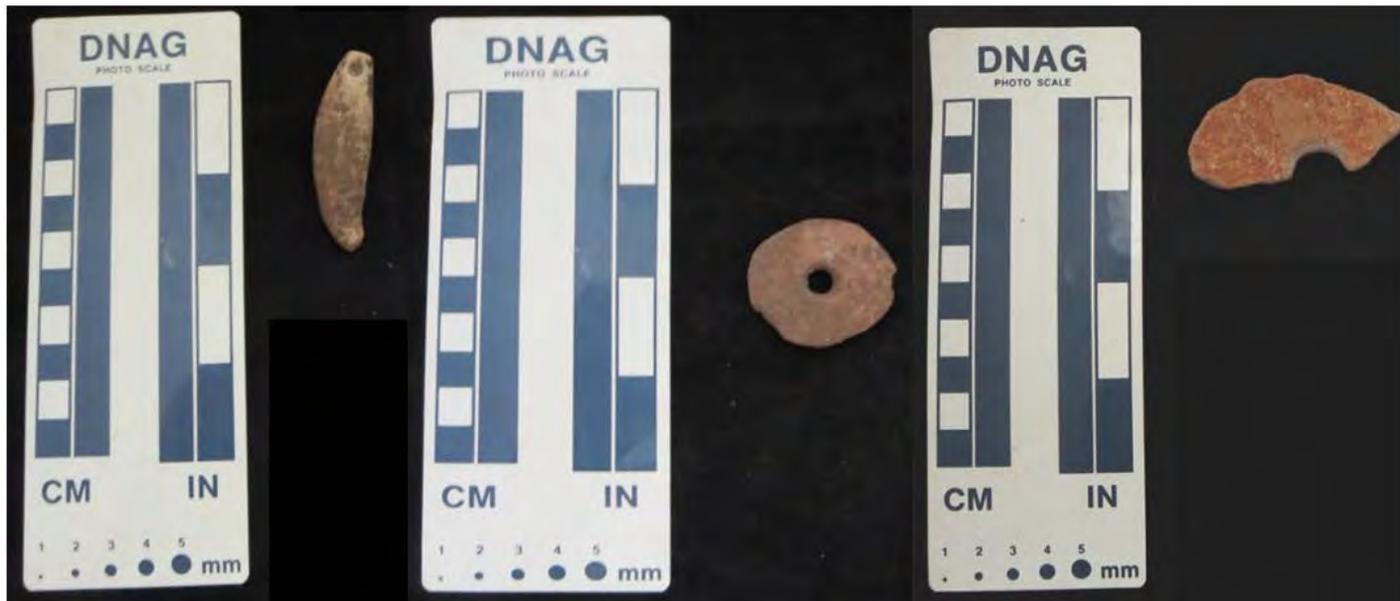
<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>Notes</i>
SG3-N1	SG3-1	3	SG3-1-13	Feature 1 Below Floor 3	Ch	38	
SG3-N1	SG3-1	3	SG3-1-13	Feature 1 Below Floor 3	Fs	N/A	
SG 3-N1	SG 3-1		SG3-1-14	Fill Behind Wall 4	Ce	1	Figurine Lab SF 112
SG3-N1	SG3-1	3	SG3-1-14	Fill Behind Wall 4	Ce	417/1326	
SG3-N1	SG3-1	3	SG3-1-14	Fill Behind Wall 4	Ch	138	
SG3-N1	SG3-1	3	SG3-1-14	Fill Behind Wall 4	Ch	1	SF#61 Chert Biface
SG3-N1	SG3-1	3	SG3-1-14	Fill Behind Wall 4	Fs	N/A	
SG3-N1	SG3-1	3	SG3-1-14	Fill Behind Wall 4	Ob	1	
SG3-N1	SG3-1	4	SG3-1-15	Feature 2	Ce	0/4	
SG3-N1	SG3-1	4	SG3-1-15	Feature 2	Ch	2	
SG3-N1	SG3-1	4	SG3-1-15	Feature 2	Fs	N/A	
SG3-N1	SG3-1	4	SG3-1-15	Feature 2	Mx	1	
SG3-N1	SG3-1	4	SG3-1-16	Fill Below Floor 4	Bs	1	SF# 62
SG3-N1	SG3-1	4	SG3-1-16	Fill Below Floor 4	Ce	180/568	
SG3-N1	SG3-1	4	SG3-1-16	Fill Below Floor 4	Ch	137	
SG3-N1	SG3-1	5	SG3-1-16	Fill Below Floor 4	Fs	N/A	
SG3-N1	SG3-1	4	SG3-1-16	Fill Below Floor 4	Gr	1	
SG3-N1	SG3-1	4	SG3-1-16	Fill Below Floor 4	Ob	1	
SG3-N1	SG3-1	4	SG3-1-17	Feet of Burial SG 3-BU1	Ca	1	CS# 26
SG3-N1	SG3-1	4	SG3-1-17	Feet of Burial SG 3-BU1	Ce	22/82	
SG3-N1	SG3-1	4	SG3-1-17	Feet of Burial SG 3-BU1	Ch	25	
SG3-N1	SG3-1	4	SG3-1-17	Feet of Burial SG 3-BU1	Fs	N/A	
SG3-N1	SG3-1	4	SG3-1-17	Feet of Burial SG 3-BU1	Hr	n/a	Feet Bones
SG3-N1	SG3-1	4	SG3-1-17	Feet of Burial SG 3-BU1	Ob	1	
SG3-N1	SG3-1	5	SG3-1-18	SG3-BU2	Ca	1	CS#19
SG3-N1	SG3-1	5	SG3-1-18	SG3-BU2	Ca	1	CS#20
SG3-N1	SG3-1	5	SG3-1-18	SG3-BU2	Ca	1	CS#21

<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>Notes</i>
SG3-N1	SG3-1	5	SG3-1-18	SG3-BU2	Ca	1	CS#24
SG3-N1	SG3-1	5	SG3-1-18	SG3-BU2	Ce	4/34	
SG3-N1	SG3-1	5	SG3-1-18	SG3-BU2	Ch	21	
SG3-N1	SG3-1	5	SG3-1-18	SG3-BU2	Fs	N/A	
SG3-N1	SG3-1	5	SG3-1-18	SG3-BU2	Hr	N/A	
SG3-N1	SG3-1	5	SG3-1-18	SG3-BU2	Mx	1	
SG3-N1	SG3-1	5	SG3-1-18	SG3-BU2	Mx	1	
SG3-N1	SG3-1	5	SG3-1-19	Lowermost Fill in Front of Wall 5	Ce	15/75	
SG3-N1	SG3-1	5	SG3-1-19	Lowermost Fill in Front of Wall 5	Ch	42	
SG3-N1	SG3-1	5	SG3-1-19	Lowermost Fill in Front of Wall 5	Fs	N/A	
SG3-N1	SG3-1	6	SG3-1-20	Fill Behind Wall 5	Ca	1	CS#22 on bedrock
SG3-N1	SG3-1	6	SG3-1-20	Fill Behind Wall 5	Ce	11/40	
SG3-N1	SG3-1	6	SG3-1-20	Fill Behind Wall 5	Ch	42	
SG3-N1	SG3-1	6	SG3-1-20	Fill Behind Wall 5	Db	1	
SG3-N1	SG3-1	6	SG3-1-20	Fill Behind Wall 5	Fs	N/A	
SG3-N1	SG3-1	6	SG3-1-20	Fill Behind Wall 5	Gr	1	
SG3-N1	SG3-1	4	SG3-1-21	Fill Below Patio Floor 1	Ce	22/40	
SG3-N1	SG3-1	4	SG3-1-21	Fill Below Patio Floor 1	Ch	24	
SG3-N1	SG3-1	4	SG3-1-21	Fill Below Patio Floor 1	Fs	N/A	
SG3-N1	SG3-1	6	SG3-1-22	<i>Jute</i> Deposit below Patio Floor 1	Ca	1	CS#23
SG3-N1	SG3-1	6	SG3-1-22	<i>Jute</i> Deposit below Patio Floor 1	Ce	14/34	
SG3-N1	SG3-1	6	SG3-1-22	<i>Jute</i> Deposit below Patio Floor 1	Ch	21	
SG3-N1	SG3-1	6	SG3-1-22	<i>Jute</i> Deposit below Patio Floor 1	Fs	N/A	
SG3-N1	SG3-1	6	SG3-1-22	<i>Jute</i> Deposit below Patio Floor 1	Ob	2	
SG3-N1	SG3-1	6	SG3-1-22	<i>Jute</i> Deposit below Patio Floor 1	Sl	1	
SG3-N1	SG3-1	6	SG3-1-23	<i>Jute</i> Deposit below Patio Floor 2	Ce	4/9	
SG3-N1	SG3-1	6	SG3-1-23	<i>Jute</i> Deposit below Patio Floor 2	Ch	17	

<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>Notes</i>
SG3-N1	SG3-1	6	SG3-1-23	<i>Jute</i> Deposit below Patio Floor 2	Fs	N/A	
SG3-N1	SG3-1	5	SG3-1-24	Fill Above Bedrock	Ca	1	CS#25
SG3-N1	SG3-1	5	SG3-1-24	Fill Above Bedrock	Ca	1	CS#27
SG3-N1	SG3-1	5	SG3-1-24	Fill Above Bedrock	Ce	13/33	
SG3-N1	SG3-1	5	SG3-1-24	Fill Above Bedrock	Ch	119	
SG3-N1	SG3-1	5	SG3-1-24	Fill Above Bedrock	Db	1	
SG3-N1	SG3-1	5	SG3-1-24	Fill Above Bedrock	Fa	1	
SG3-N1	SG3-1	5	SG3-1-24	Fill Above Bedrock	Fs	N/A	
SG3-N1	SG3-1	5	SG3-1-24	Fill Above Bedrock	Hr	N/A	
SG3-N1	SG3-1	5	SG3-1-24	Fill Above Bedrock	Ms	2	
SG3-N1	SG3-1	5	SG3-1-24	Fill Above Bedrock	Sh	1	
SG3-N1	SG3-1	5	SG3-1-24	Fill/marl above bedrock	Sh	1/1	SF# 103 Lab SF. Shell Bead
SG3-N1	SG3-1	7	SG3-1-25	Behind Wall 6	Fs	N/A	
SG3-N1	SG3-1	7	SG3-1-25	Behind Wall 6	Qz	1	
SG51-W1	SG51-1	Surface	SG51-1-1	Surface	Ob	1	
SG51-W1	SG51-1	1	SG51-1-2	Humus and Collapse	Ce	53/313	
SG51-W1	SG51-1	1	SG51-1-2	Humus and Collapse	Ch	116	
SG51-W1	SG51-1	1	SG51-1-2	Humus and Collapse	Ch	1	SF# 96 Biface
SG51-W1	SG51-1	1	SG51-1-2	Humus and Collapse	Ch	1	SF# 97 Biface
SG51-W1	SG51-1	1	SG51-1-2	Humus and Collapse	Db	1	
SG51-W1	SG51-1	1	SG51-1-2	Humus and Collapse	Fs	N/A	
SG51-W1	SG51-1	1	SG51-1-2	Humus and Collapse	Fs	88	
SG51-W1	SG51-1	1	SG51-1-2	Humus and Collapse	Gr	1	SF#98 Metate
SG51-W1	SG51-1	1	SG51-1-2	Humus and Collapse	Ob	2	
SG51-W1	SG51-1	1	SG51-1-2	Humus and Collapse	Sh	1	
SG51-W1	SG51-1	1	SG51-1-2	Humus and Collapse	St	1	
SG51-W1	SG51-1	1	SG51-1-2	Humus and Collapse	Wd	1/1	SF#107 Petrified Wood

<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>Notes</i>
SG51-W1	SG51-1	2	SG51-1-3	Terminal Architecture Fill	Ce	161/626	
SG51-W1	SG51-1	2	SG51-1-3	Terminal Architecture Fill	Ch	116	
SG51-W1	SG51-1	2	SG51-1-3	Terminal Architecture Fill	Db	1	
SG51-W1	SG51-1	2	SG51-1-3	Terminal Architecture Fill	Fs	N/A	
SG51-W1	SG51-1	2	SG51-1-3	Terminal Architecture Fill	Fs	N/A	
SG51-W1	SG51-1	2	SG51-1-3	Terminal Architecture Fill	Ob	1	
SG51-W1	SG51-1	2	SG51-1-3	Terminal Architecture Fill	Sp	1	SF#101 Speleothem
SG51-W1	SG51-1	3	SG51-1-4	Feature 1	Ce	7/32	
SG51-W1	SG51-1	3	SG51-1-4	Feature 1	Ch	7	
SG51-W1	SG51-1	3	SG51-1-4	Feature 1	Fs	N/A	
SG51-W1	SG51-1	3	SG51-1-4	Feature 1	Mx	1	
SG51-W1	SG51-1	3	SG51-1-4	Feature 1	Ob	2	
SG51-W1	SG51-1	4	SG51-1-5	Fill beneath use surface 1	Ce	3/18	
SG51-W1	SG51-1	4	SG51-1-5	Fill beneath use surface 1	Ch	41	
SG51-W1	SG51-1	4	SG51-1-5	Fill beneath use surface 1	Fs	N/A	
SG51-W1	SG51-1	5	SG51-1-6	Fill beneath floor 1	Ce	6/27	
SG51-W1	SG51-1	5	SG51-1-6	Fill beneath floor 1	Ch	28	
SG51-W1	SG51-1	5	SG51-1-6	Fill beneath floor 1	Fs	N/A	
SG51-W1	SG51-1	5	SG51-1-6	Fill beneath floor 1	Ob	2	

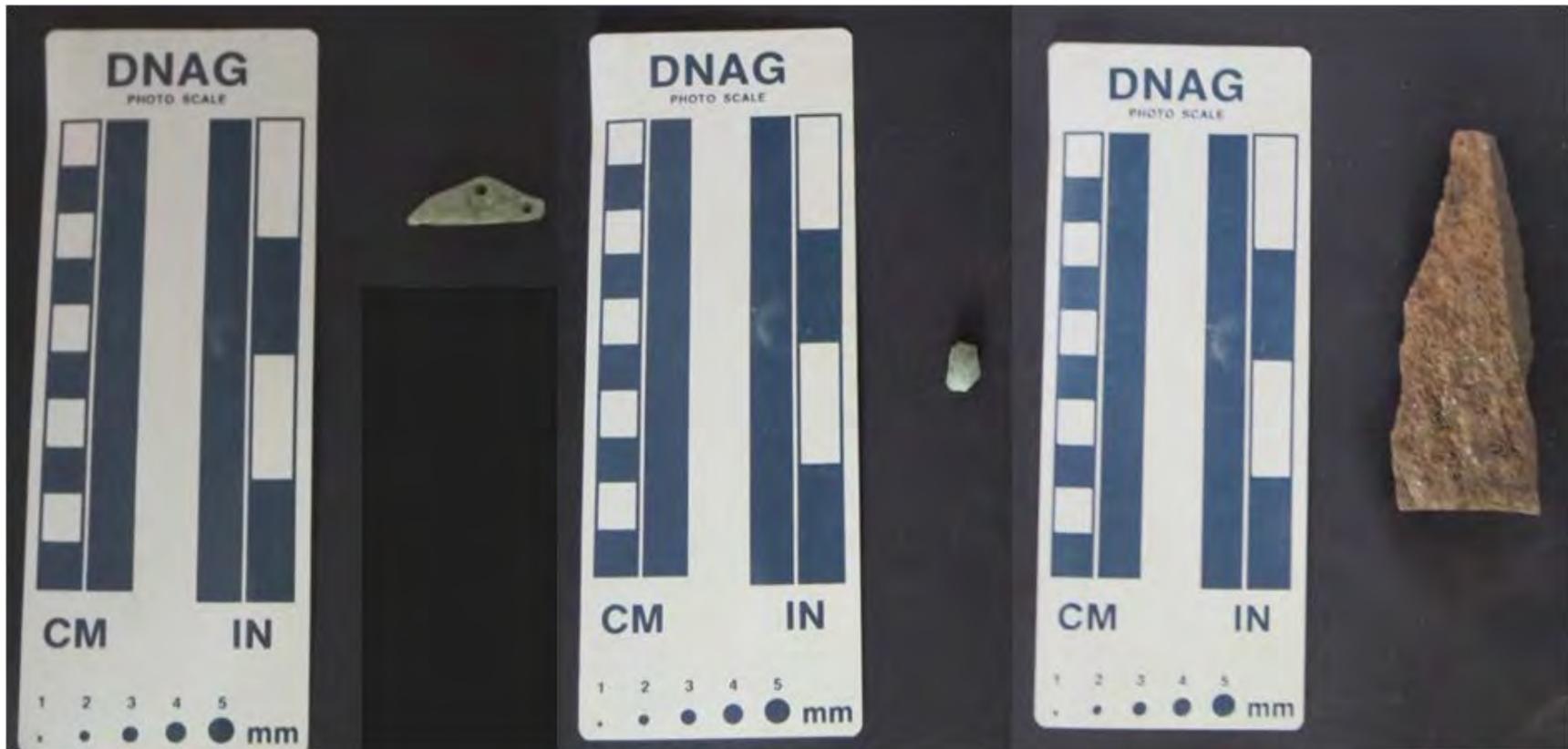
**APPENDIX B: 2018 LOWER DOVER SETTLEMENT SPECIAL FINDS**



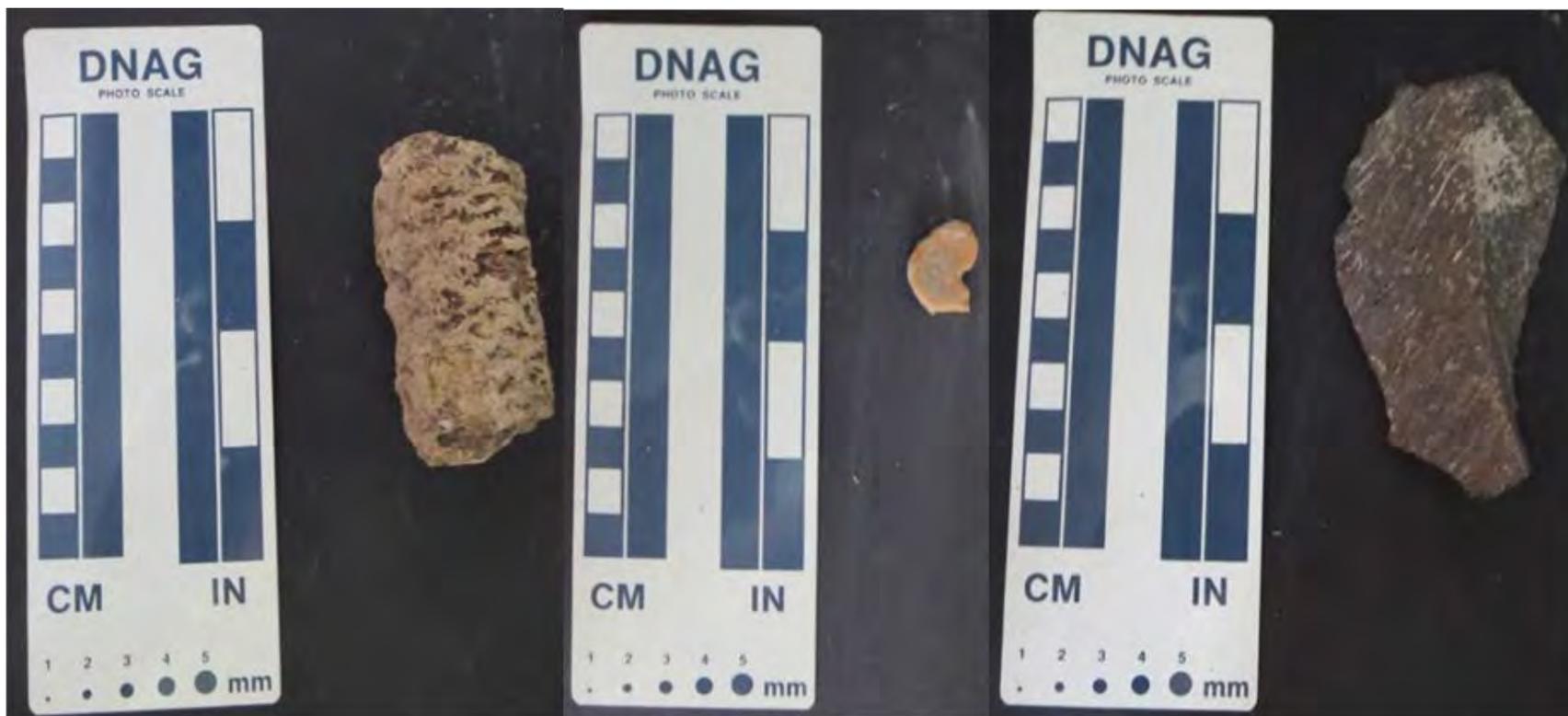
SF#41 Worked faunal tooth.

SF#42 Spindle whorl.

SF#44 Pot disk.



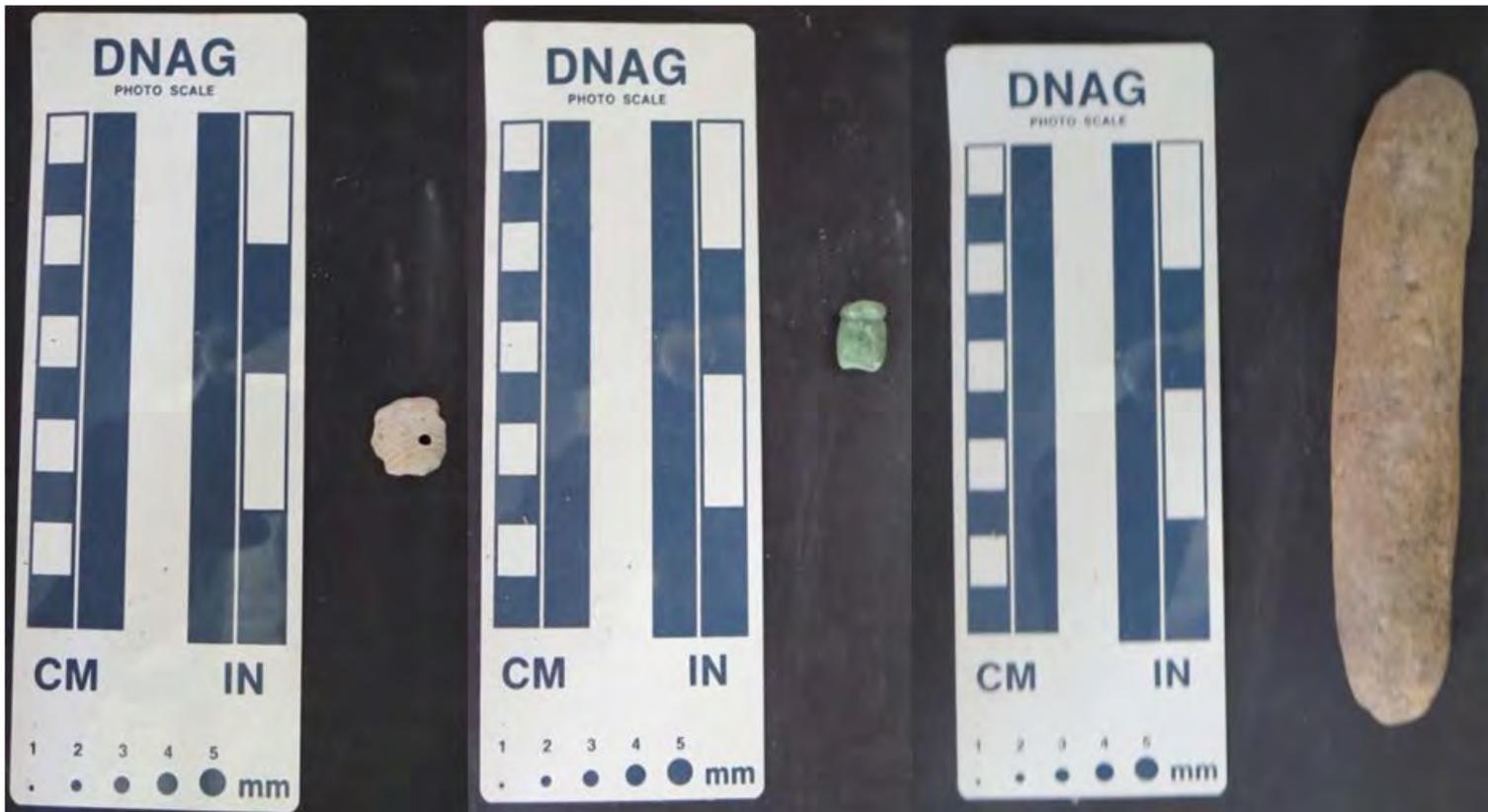
SF#46 Worked jade.                      SF#51 Jade bead.                      SF#54 Petrified wood.



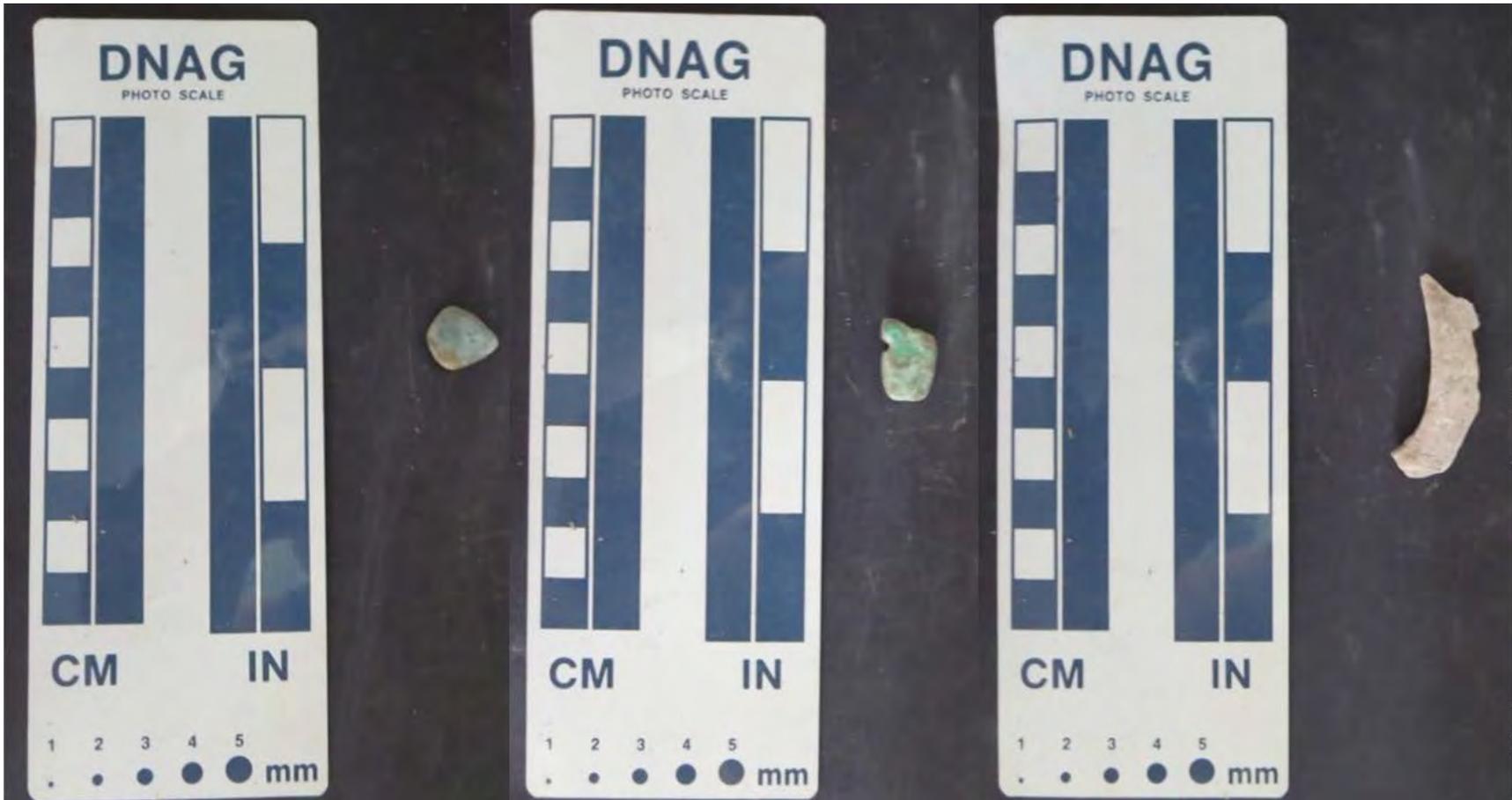
SF#66 Speleothem.

SF#75 Spindle whorl.

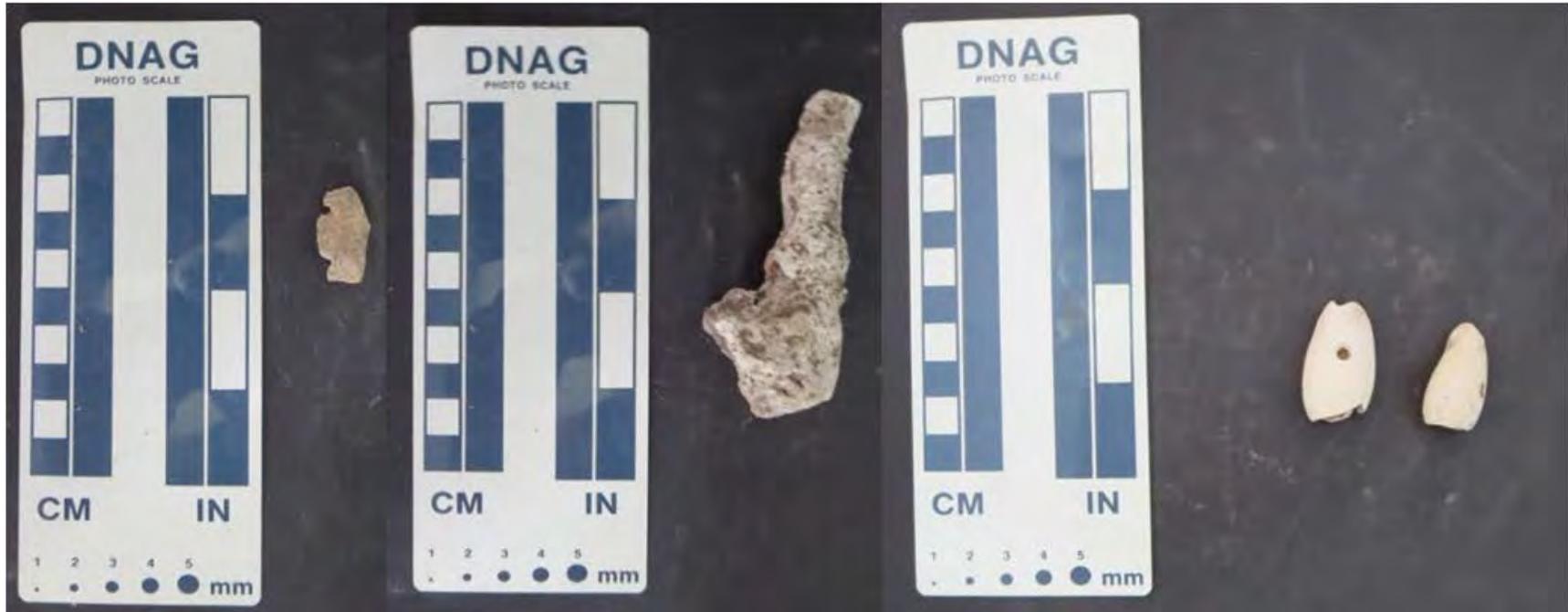
SF#76 Petrified wood.



SF#78 Shell bead.                      SF#83 Jade bead.                      SF#86 Ceramic pestle.



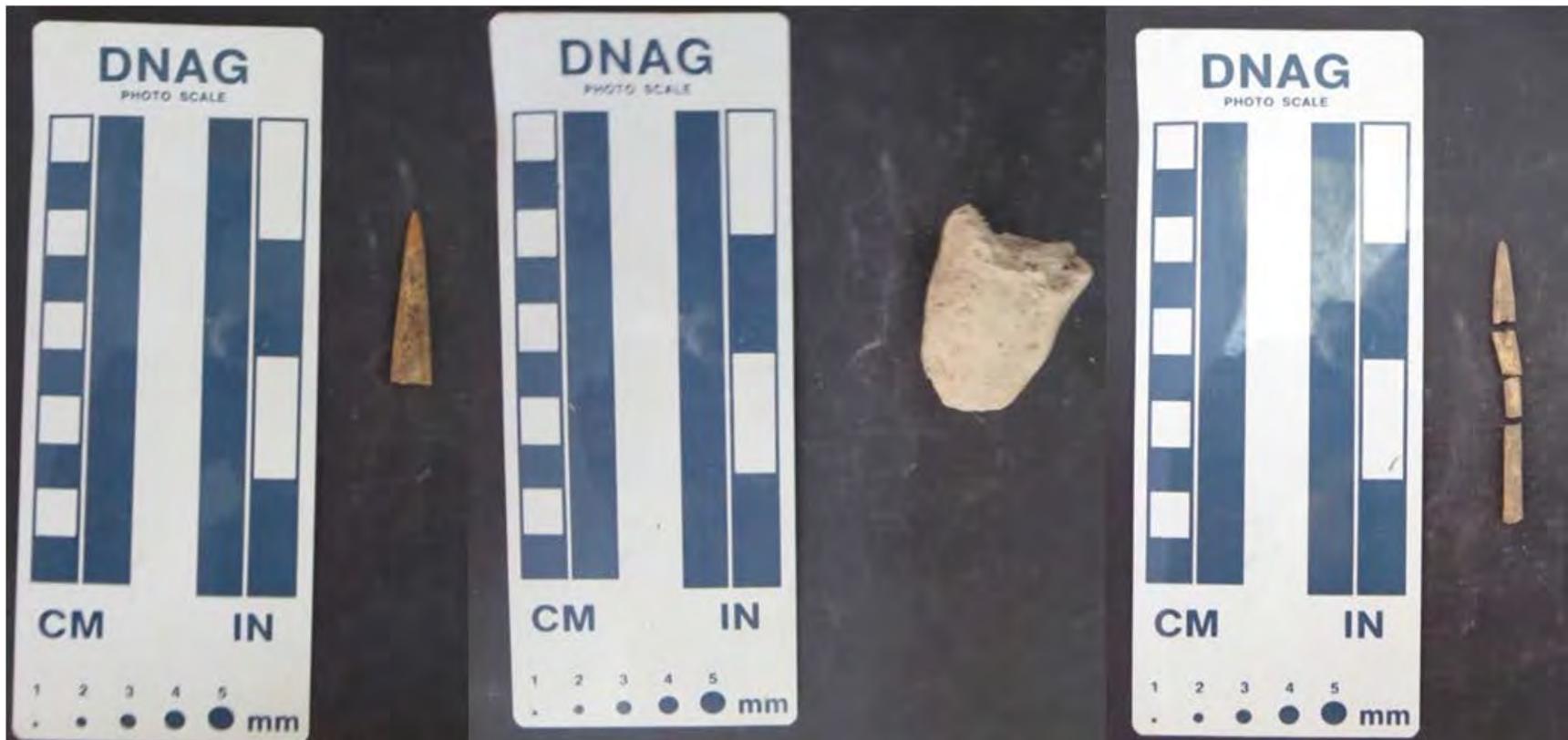
SF#87 Jade bead.                      SF#89 Jade bead.                      SF#90 Worked shell.



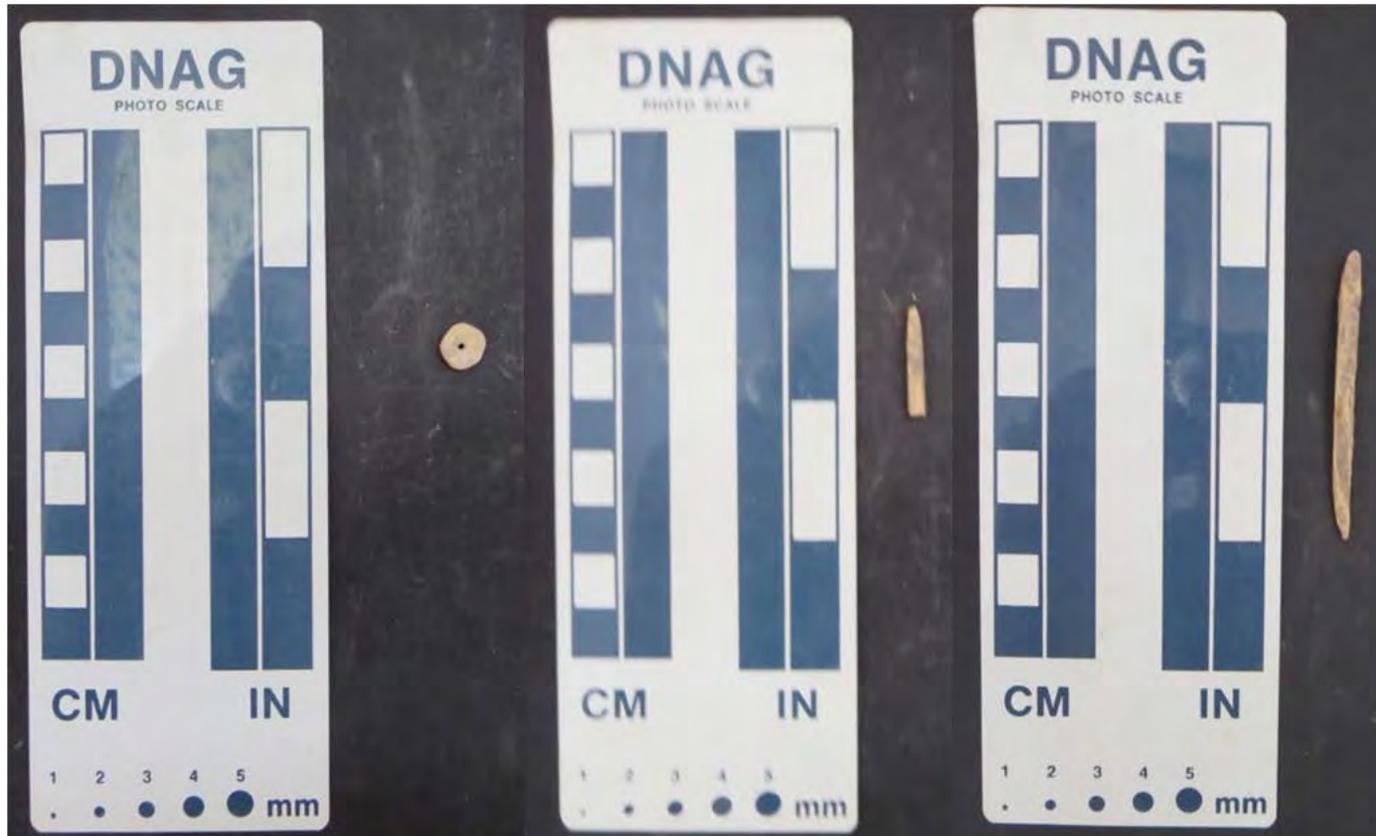
SF#91 Worked faunal bone.

SF#94 Speleothem.

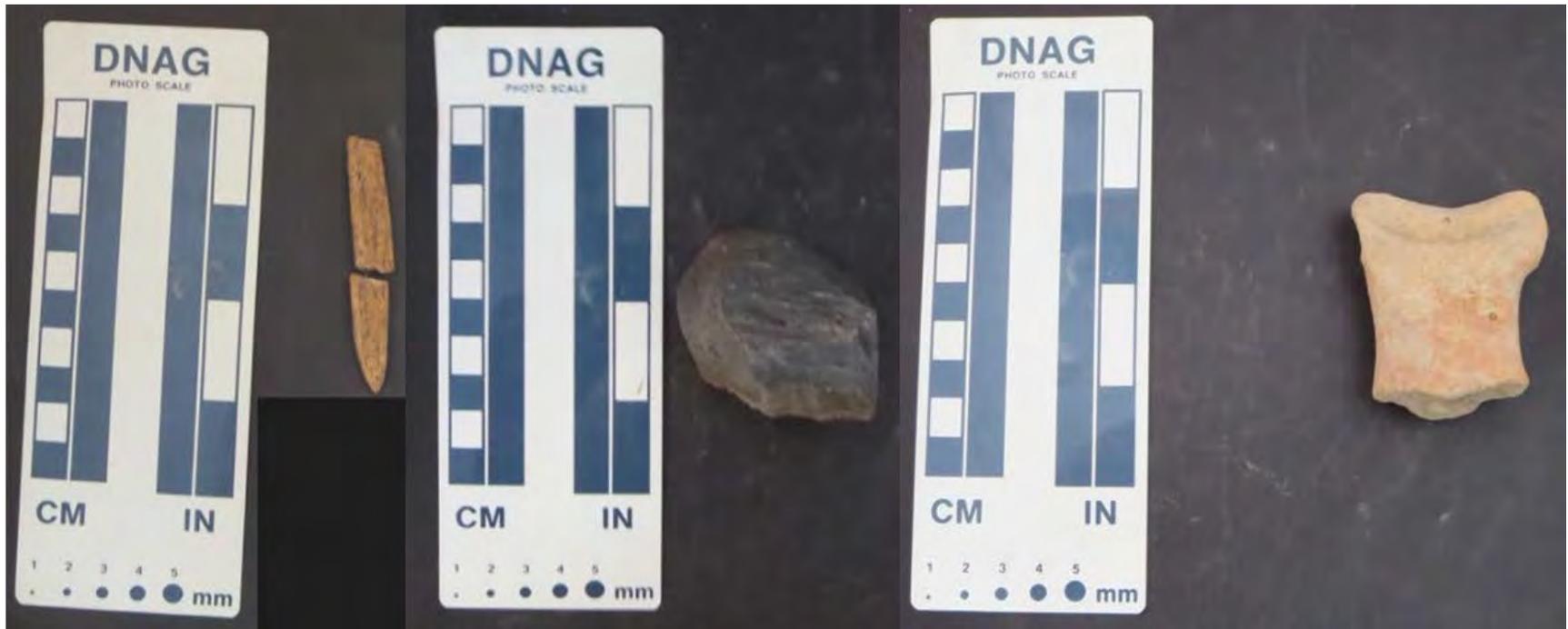
SF#98 Worked shell.



SF#100 Worked human bone. SF#101 Speleothem. SF#102 Human bone needle.



SF#103 Worked shell bead. SF#104 Human bone needle. SF#105 Human bone needle.



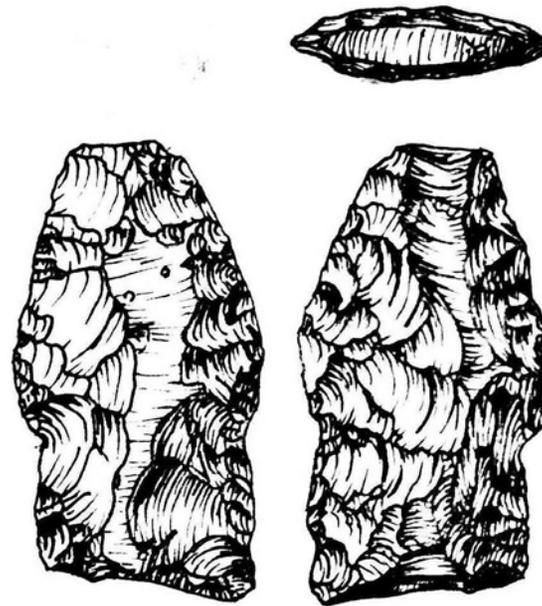
SF#106 Worked human bone. SF#107 Petrified wood. SF#112 Figurine fragment.



SF#113 Worked river clam.      SF#114 Figurine fragment.      SF#115 Worked shell.

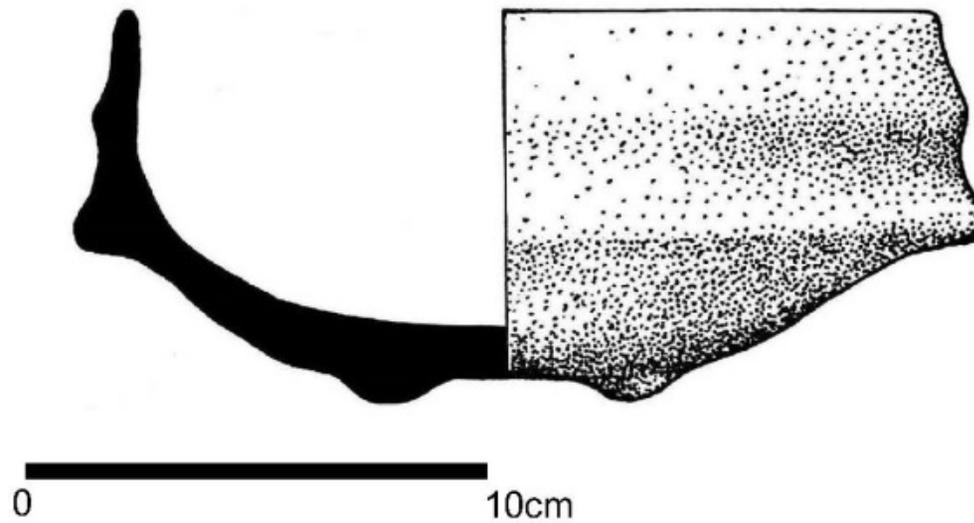
SF# 36, Obsidian Biface  
SG 3, Structure N1  
Drawn by K. Shaw-Müller

0 4cm



Obsidian Biface from Patio Floor 2 (SG 3).

Sierra/Polvero Bowl  
E.U SG 3-1, SG 3-BU2  
Drawn by K. Shaw-Müller



Polvero/Sierra Bowl from SG 3-BU2.

APPENDIX C: EAST PROFILE OF PECH NA S9-S1

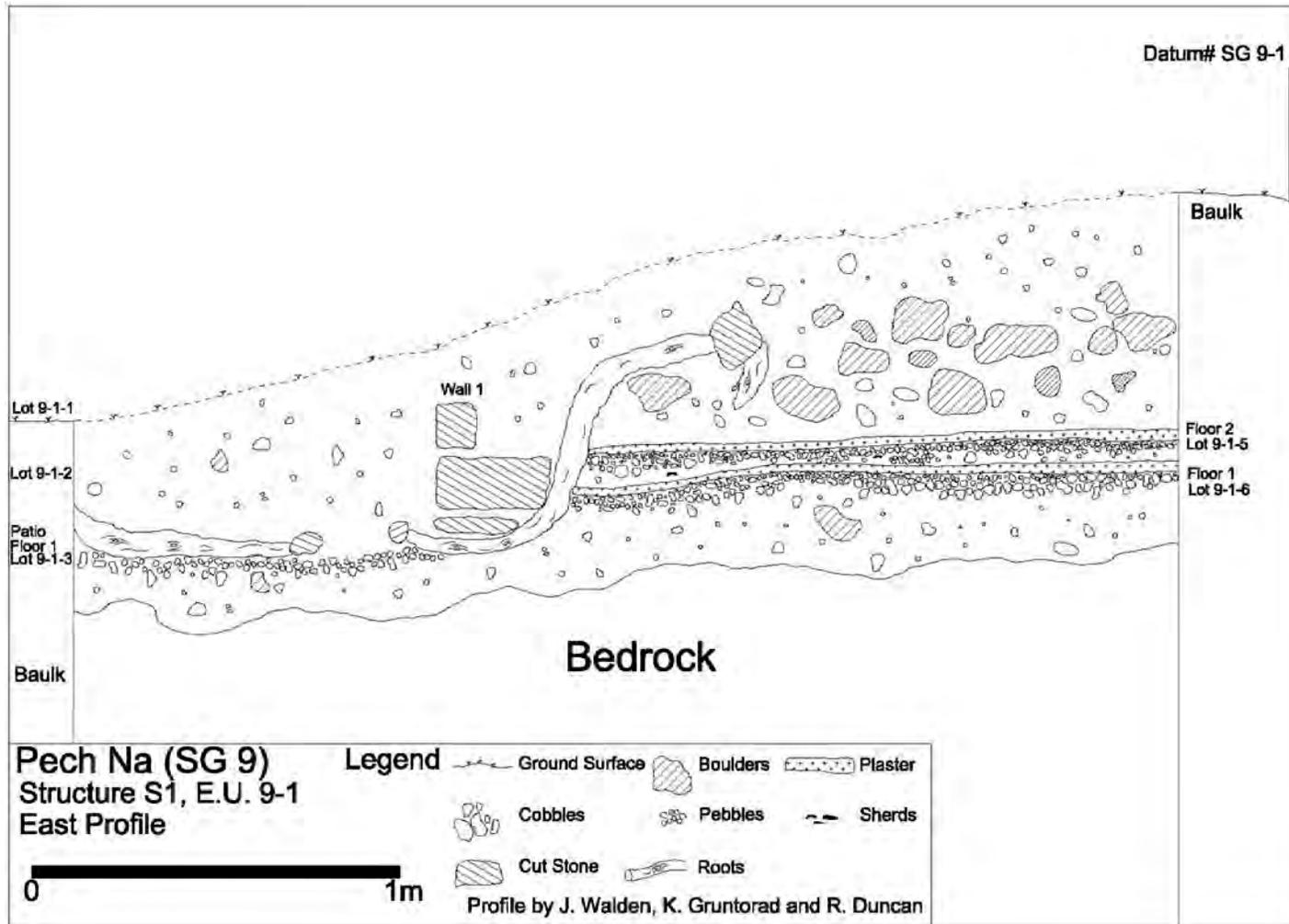


Figure omitted from 2016 BVAR Project progress report (Walden et al. 2017).

# **AN ELITE RESIDENTIAL GROUP AND PERI-ABANDONMENT DEPOSITS: RESULTS FROM THE 2017 EXCAVATIONS OF GROUP B, XUNANTUNICH**

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## **INTRODUCTION AND RESEARCH GOALS**

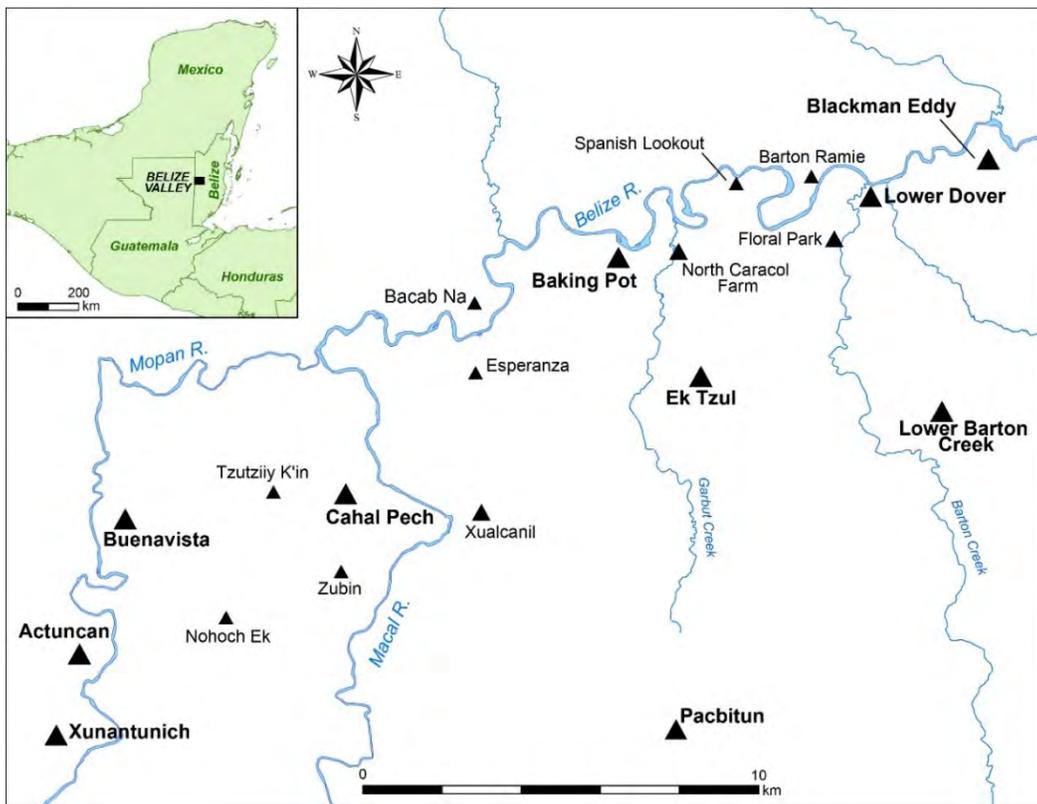
In the summer of 2017 excavations continued at Group B, an elite residential group located along the western edge of the central precinct of the Late Classic polity of (AD 600-900) Xunantunich. These excavations are part of the multi-year Xunantunich Archaeological and Conservation Project (XACP), which began in Summer 2015 with the goals of (1) conserving several large structures within the site's central precinct for the purposes of enhancing the tourism potential of the park, (2) documenting final phases of occupation at this late center, and (3) determining the factors that led to the rapid, but short-lived, development of this major Belize Valley site.

Previous excavations of Group B documented an extensive Terminal Classic (AD 750-900) component, making this location ideal for further investigation (Etheridge 1995; Pendergast and Graham 1981; Thompson 1942). In 2016, XACP and the Belize Valley Archaeological (BVAR) Project excavations began in Group B to define the extent of the residential group, and gain further insight into the previously noted Terminal Classic occupation in the area. While previous excavations identified high concentrations of artifacts in this part of the site, it still came as a surprise when multiple, dense artifact concentrations composed of Late-Terminal ceramic sherds, ceramic figurines, lithic tools (chert and obsidian), shell, and faunal and human remains were encountered throughout Group B overlaying the terminal plaster floor, but below collapsed architecture. Dense Terminal Classic artifact concentrations have been documented throughout the Maya Lowlands, and in recent years, the BVAR Project has also encountered an increasing number

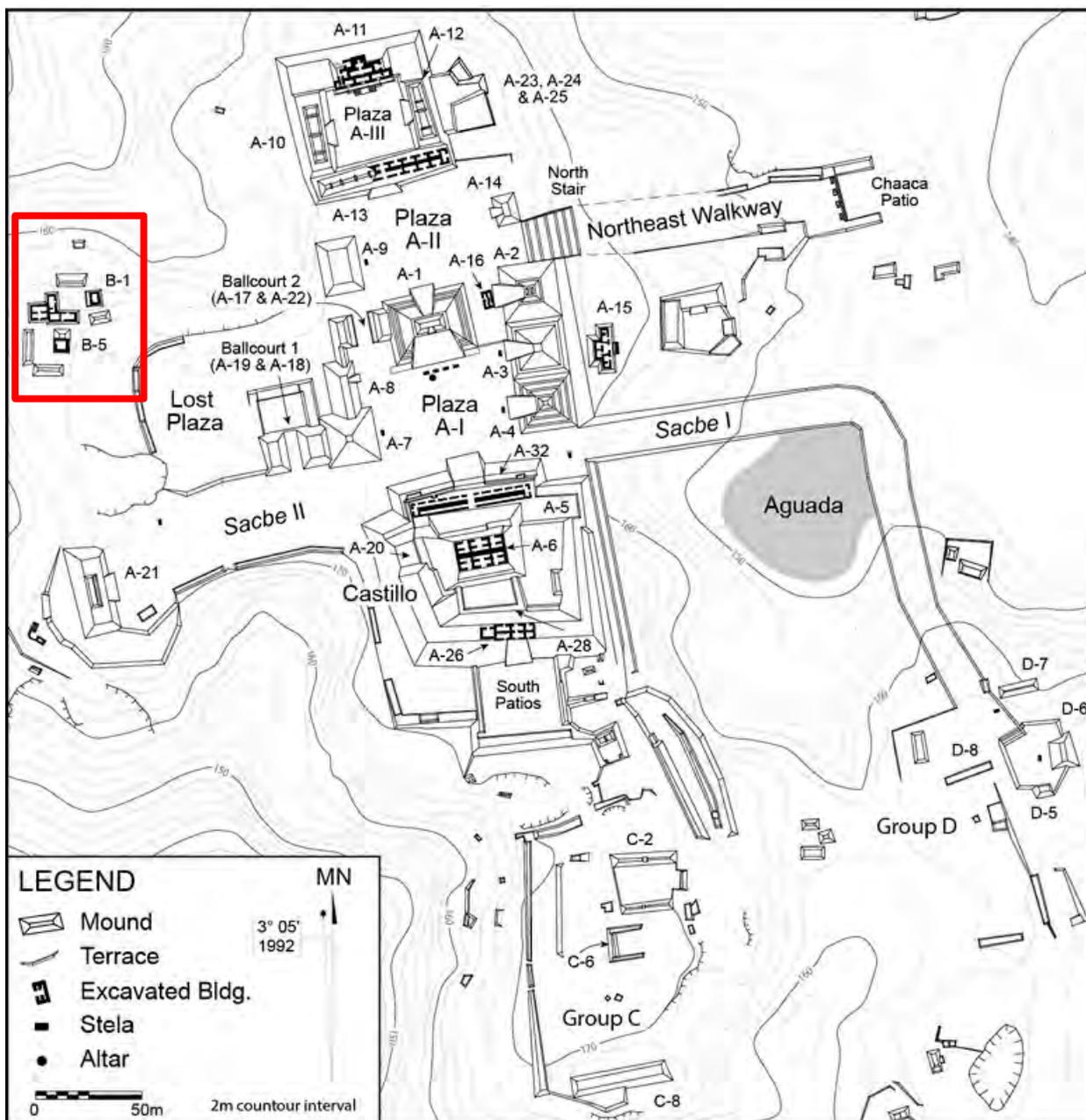
of these deposits at the sites of Xunantunich, Baking Pot, and Cahal Pech. This Late-Terminal Classic activity, termed “peri-abandonment deposits”, have become a focus of BVAR Project research (Hoggarth et al. 2016, 2018). The project defines peri-abandonment deposits as materials indicative of ritual activities conducted by returning populations, occurring above a thin lens of matrix over terminal floors, and located in front of stairs, and in the corners of courtyards or plazas (Awe 2012; Hoggarth et al. 2016; see also Lonaker et al. 2017). Research at Group B will increase understanding of these deposits at the site, and supplement the broader BVAR Project goal of examining the function of peri-abandonment deposits at a regional level.

In 2017, field excavations continued to investigate this Late Classic behavior by defining the central courtyard, as well as exposing the terminal architecture of Structures B-1, B-2, B-3, and B-4. In addition, excavations were completed for Burial B1-4 that began during the 2016 field season and are reported in the 2017 osteological report (see Green et al., Chapter 12). The report herein discusses the preliminary results of these excavations and provides new data pertaining to the final activities at the polity of Xunantunich between AD 750-900.

It is important to note that although units were labeled as belonging to Courtyard 1, in addition to all artifact logs and documentation of these units, additional excavations completed in 2016 have led us to believe this area should instead be identified as a *plazuela*, or patio group. Multiple access points were revealed in this primary residential space. As excavators can now estimate the area’s approximate size, this would point to a partially restricted, family-oriented *plazuela*.



**Figure 1:** Map of the upper Belize River Valley (map by Claire Ebert, 2018).



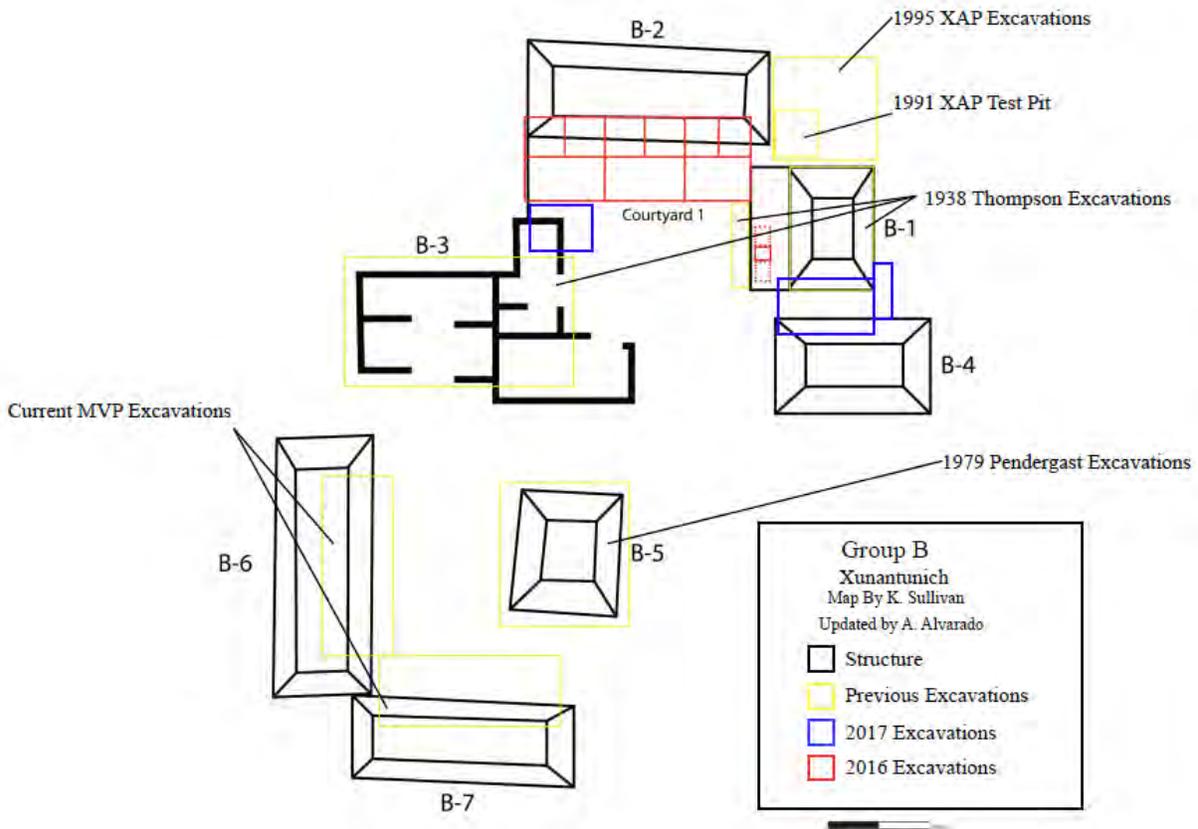
**Figure 2:** Map of the site core of Xunantunich, with Group B identified in red (after LeCount and Yaeger 2010:Fig. 1.3).

## PREVIOUS RESEARCH

The site of Xunantunich has been extensively excavated since the turn of the 19<sup>th</sup> century with three previous investigations focusing specifically on Group B, including Thompson (1942), Pendergast and Graham (1981), and Xunantunich Archaeological (XAP) Project (Etheridge 1995). In addition, during the 2016 and 2017 field seasons the BVAR Project continued excavations in Group B as a part of the XACP (Zanotto and Awe 2017).

Group B is an elite Late Classic residential group consisting of seven structures. The group is located approximately 150 m west of Xunantunich's Plaza A indicating the residents of this group had strong ties to the apical elite in the central plaza and that the group's residents were likely members of an intermediate elite or noble class. In addition to the proximity to the civic-ceremonial center, this hypothesis is supported by the presence of masonry architecture, and high quantities of wealth items goods such as polychromes and jade. Five burials have also been recovered from Group B, many of which were interred with some amount of grave goods. While these burials were not as elaborate as those found within the main plaza, the presence of *incensarios* and chert blades within the Group B burials suggests some amount of additional investment.

The results of previous excavations yielded extensive evidence for a Terminal Classic occupation and a high frequency of artifacts overlaying architectural collapse. This may indicate several phases of abandonment and reoccupation, and a ritual component to these deposition episodes. Excavations during the 2016 field season by BVAR Project and XACP focused on continuing to reveal architecture and exposing the peri-abandonment deposits to identify construction chronology related to abandonment and possible reoccupation (Sullivan et al. 2017).



**Figure 3:** Map of Group B excavation units and structures exposed from BVAR excavations (adapted and updated from Sullivan et al. 2017:383, Fig. 3).

## METHODS

The 2017 Group B excavations focused on exposing the extent of the artifact concentrations in the courtyard and near Structures B-1 and B-4. A secondary goal of excavations was revealing the terminal orientation and extent of the structures for conservations purposes. The objective of much of the BVAR Project's current research is understanding the synchronous patterns of material concentrations across major civic-ceremonial centers of this era. The broader research questions specific to Group B aim to develop a chronological sequence of construction, occupation, and abandonment, along with any reoccupation to the area in the Late Postclassic (after AD 1250).

To prioritize the *in situ* exposure of peri-abandonment deposits, units were excavated by cultural levels along the periphery of Courtyard 1. Initial units were opened to extend the 2016 excavations units, in order to complete exhuming Burial B1-4, and to expose the courtyard clusters flanking the south side of B-2. Excavations were later expanded to investigate the courtyard's southwestern corner, and Structures B-1 and B-4 in the southeast part of the group. Units were typically aligned with the exposed architecture, or strategically placed to confirm maps with previous orientation approximations (Figure 3). Unit size was irregular for this reason. When opening tent units in a new area, humic or previous backfill layers were first removed, which contained sparse artifacts, in order to reach the level of terminal phase activity at a given location. At Group B, as with many peri-abandonment activities, high density artifact clustering is typically associated with clear cultural levels such as floors. If clusters were encountered, careful pedestaling was employed to display their breadth, allowing for the mapping and measuring of the interaction between clusters and subsequent floors. Units were usually excavated to uncover at least two sequential stratigraphic layers. In several eastern structural units and one courtyard unit (GB-C1-5), excavations closed after undulating bedrock was reached at a relatively shallow depth confirming there were no additional phases of occupation or deposition beyond this level.

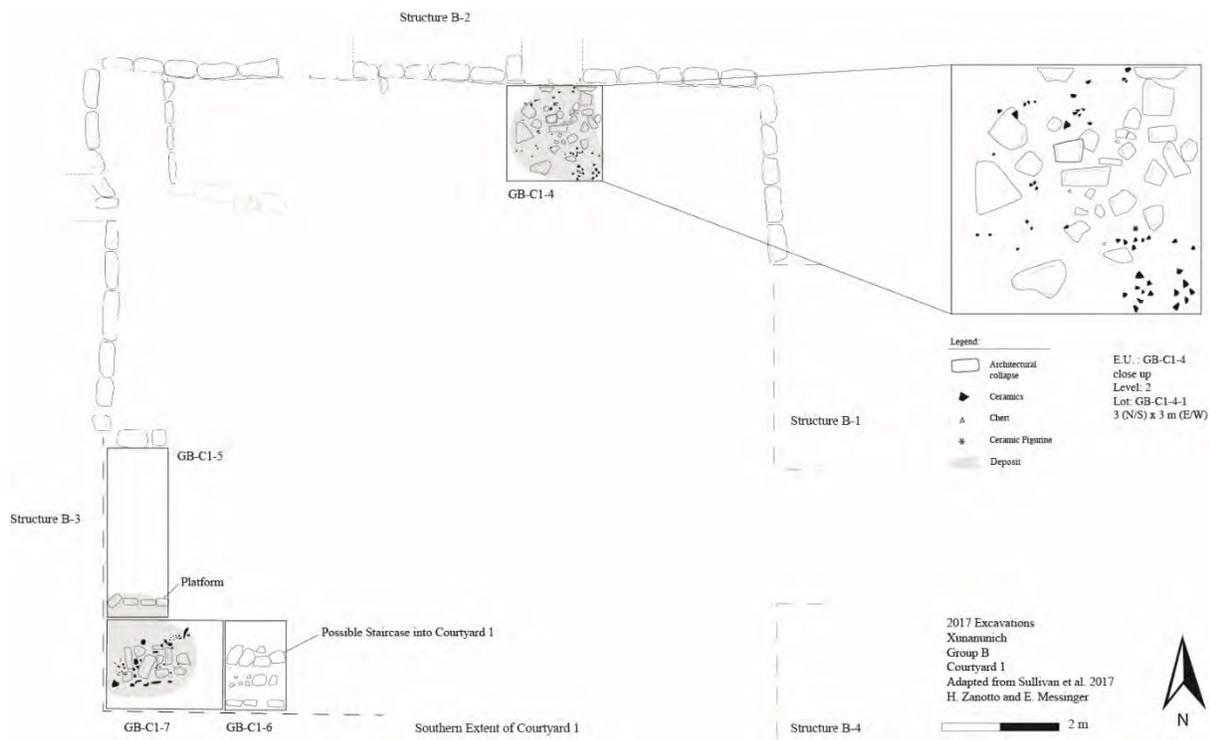
As in previous years, the results presented in this report are preliminary. A complete analysis of the artifacts will be finalized during the first session of the 2018 field season, following processing and documentation. Ceramic analysis will be conducted using Gifford's (1976) and LeCount's ceramic typologies. Faunal materials were initially cleaned (dry-brushed) in-field by project zooarchaeologists before export to Northern Arizona University Department of Anthropology Faunal Analysis Lab for a full analysis that will be completed in 2018. Lithic analysis will be performed in-field following Andrefsky's (1998) lithic analysis techniques. Lithics will be classified according to material and type and then examined macroscopically for use-wear.

## EXCAVATION RESULTS

### Courtyard Units

During the 2016 field season, a large and densely compact artifact concentration was uncovered flanking the southern façade of Structure B2 in the Group B courtyard. This concentration primarily consisted of Late-Terminal Classic sherds (e.g., Belize Red, Cayo Unslipped), however, it also included pieces of pyrite, slate, an *incensario* fragment, a bark beater, chert flakes, and *mano* and *metate* fragments (Sullivan et al. 2017). Because of both poor weather

conditions and time constraints, excavations for this deposit were closed until the 2017 field season. Excavations in June 2017 continued by fully exposing and excavating peri-abandonment deposits along the southern face of Structure B2 (Figure 4). Additionally, units on the southeastern corner of the courtyard near Structure B-3 were opened with the objective of exposing the courtyard's southern extent (Figure 4).



**Figure 4:** Plan of Group B, with courtyard units outlined.

### GB-C1-4

In order to continue exposing the peri-abandonment deposit along the southern wall of Structure B-2, excavations continued in June 2017 with a 3x3 m excavation unit placed directly to the south of the easternmost collapsed doorway of Structure B2. The unit was opened to expose the floor and reveal the extent of the deposit using cultural stratigraphy. The lot was disrupted by flooding in the GB-2016 field season, and had large pieces of collapse from the Structure B-2 doorway. Excavators employed careful pedestaling to reveal the horizontal concentration of artifacts across the unit, and to determine the corresponding temporal sequence between the deposit and the collapse event.

Upon pedestaling to the fullest possible extent, artifacts were uncovered both underneath and sitting on top of collapse, and a partial floor was exposed in the northwest quadrant. The condition of ceramics and position of artifacts related to the collapse could indicate a taphonomic event where the Structure B-2 doorway fell on top of waterlogged limestone plaster, causing the weakened floor to collapse and artifacts to scatter (Figure 5). The large limestone doorway

crumbling onto the deposit could have resulted in the inconsistent sequence of events where artifacts appear on either side of the limestone rubble. Otherwise, the stratigraphy could be a record of multiple ceremonial phases, or at least two phases of abandonment and subsequent reoccupation.



**Figure 5:** Group B Deposit 2 Exposed. Artifact deposits overlaying architectural collapse.

Initial survey of ceramics indicate this cluster consists of utilitarian ceramic types dating to the Terminal Classic, predominantly Belize Red, and often larger refits based on their in situ proximity. This behavior indicates ceramic vessels were brought whole and smashed at or shortly after abandonment, which is consistent with trends in peri-abandonment deposits. The unit contained a single ceramic special find: a non-utilitarian anthropomorphic figurine fragment (Figures 6, 7, 8, and 9). The lithic assemblage included small obsidian blades (1.5-3 cm), and chert, cobble, and granite special finds. Chert is the secondary artifact class, found frequently in larger flakes and cores, and interspersed with smashed ceramics and freshwater *jute* shell.



**Figure 6:** Group B Deposit 2 Exposed. Ceramic concentration with special find.



**Figure 7:** Anthropomorphic figurine fragment amongst the predominantly utilitarian GB-C1-4 assemblage.

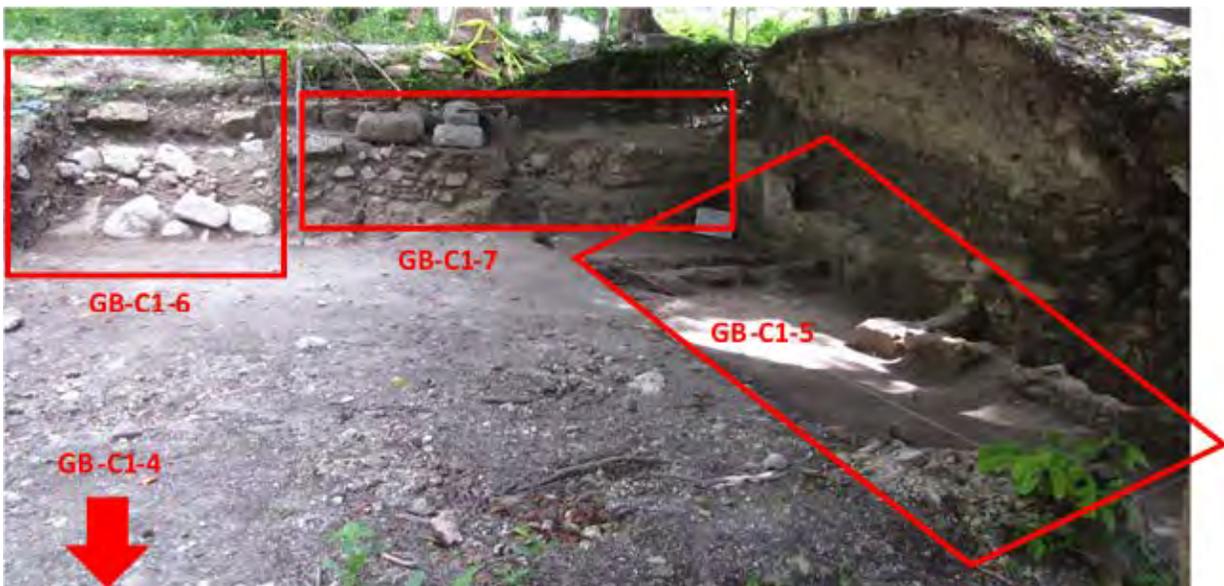
Excavations of the unit concluded when the frequency of artifacts waned a couple weeks into the season, and excavation efforts were refocused to the south of the courtyard. Based on regional characteristics of peri-abandonment deposits, the team was confident this artifact concentration pattern would be mirrored on this southern side of the courtyard, where there was more to learn about the architectural layout as well. Three units (GB-C1-5, GB-C1-6, and GB-C1-7) were opened at the estimated southern border of the courtyard and northern edge of Structure B-3 to determine perimeter orientation and continue to reveal terminal activity.



**Figure 8:** Group B Deposit 2 Exposed. Ceramic concentration below architectural collapse.



**Figure 9:** Group B Deposit 2 Exposed. Ceramic concentration below architectural collapse.



**Figure 10:** Group B-Courtyard 1 units in the southwest corner of the Courtyard and interior northwestern perimeter of Structure B-3.

## GB-C1-5

With the goal of locating the southern corner of Courtyard 1, excavators opened GB-C1-5, a 5 m (N-S) by 4 m (E-W) unit at the approximate southwestern extent, based on the alignment from the revealed wall of Structure B-3 (Figure 10). Initial excavations encountered humus and collapse containing low frequencies of artifacts, which were later revealed to be backfill from Thompson's 1938 excavations. The unit's western baulk was formed by the present architecture and backfill, which displayed obvious stratigraphic layers (Figure 10 and 11). This architecture seemed to mirror the low walls discovered to the northwest in 2016, and horizontal excavation exposed ceramic clusters radiating from the unit's southern baulk.

By mid-June, excavators began to encounter clustered artifacts in the southern side of the unit, including ceramics, chert, freshwater shell, groundstone (*mano* fragments), and granite. Work stopped for the final week of June due to flooding, and the July session centered around the two step-like features, the southern E-W Feature 1 Platform, and N-S Feature 2 Platform to the northwest. The team began by pedestaling to reveal and document the extent of the cluster on top of Feature 1. This is where the most intact portion of Floor 1 was reached; although it was partial, this was the best preserved floor seen in the courtyard to date.

As the team excavated by cultural levels, poorly preserved or disrupted floors were a consistent pattern of this Terminal Classic construction phase. It is clear clustered levels of artifacts were associated with the cultural levels of this floor and the partial floor in GB-C1-4. To determine how direct the interaction, pedestaling was employed to expose the extent of the floor and the concentration above. Once the deposit-level above Floor 1 was bagged, the floor was excavated and the types and frequency of artifacts decreased dramatically; excavations of this feature concluded with the discovery of Floor 2.

Feature 2: Platform was excavated down to bedrock in order to rule out any ritual component occurring within the step, as it was unclear what architectural purpose it served. This may have been an access point to the courtyard level from Structure B-3. Artifact frequency was low, typical of fill, and likely unrelated to the ritual behavior to the south, above Feature 1: Platform. Artifact classes in this unit were very similar to the assemblage to the north, in GB-C1-4. The clustered artifacts were predominantly ceramics and chert, relatively low levels of freshwater shell, and only one instance of faunal remains, in addition to granite pieces, obsidian, daub, and slate. There was a more varied and frequent lithic aggregation within these courtyard units than with faunal, shell, or ceramics. Although ceramics remain the most ubiquitous class, variety was limited to fairly utilitarian types, characteristic of the Terminal Classic. Larger sherds were common, as were areas of obvious refits where vessels were brought whole and smashed. The type of lithics may have been utilitarian initially, and later repurposed for this ritual use. For example, there was a high ratio of chert cores and larger flakes to debitage, indicating the lithics were not associated with tool production at this location. Although not to the level of the ritual activity and grave goods in the site core, the expansive concentrations within Group B may reflect the affluence and status of its occupants. Analysis of these artifact classes and frequencies may not only help the hypothesis these are intentional deposits, but it will also increase understanding of how elite residential peri-abandonment deposits could vary from those found in monumental elite spaces.



**Figure 11:** GB-C1-5 feature 1 deposit exposed, above floor 1 and the cut stones bordering feature 1 platform are visible. Deposit visible within the southern baulk, at the GB-C1-7 northern perimeter.

### **GB-C1-6**

This lot was briefly opened in mid-June with the continued aim of exposing the courtyard's southern extent, and outlining Structure B-3 (Figure 12). Excavators hoped to determine whether the floor uncovered in adjacent GB-C1-5 was present across the courtyard. Artifact classes at these levels included ceramics, chert, freshwater shell, granite and slate, and an incidental fragment of human humerus, not associated with a burial. Excavators also revealed a feature resembling a staircase, perhaps one of the multiple access points into the courtyard. The architectural function is speculative, as this may also be a collapse event from the neighboring Structure B-3. The unit was closed when floor was reached, level to the adjacent segment in GB-C1-5.



**Figure 12:** GB-C1-6. Possible staircase entering into Courtyard 1.

### **GB-C1-7**

The unit GB-C1-7 was opened, 3 m (E-W) by 3.8 m (N-S), to remove Thompson's backfill and reveal architecture below once it was evident GB-C1-5 did not encompass the southern courtyard perimeter. Excavations began in early June and continued through the end of the field season, similar to GB-C1-5, becoming the predominant focus of the courtyard excavations due to extensive peri-abandonment deposits across the unit. Excavations were interrupted in the 4th week of June due to flooding on the Mopan River, and the BVAR Project team returned to GB-C1-7 in the July session (Figure 13). At this time, the unit was approximately 50 centimeters higher than adjacent GB-C1-5, and leveling resulted in the discovery of a wall, running east to west, located approximately 100 cm into the unit from its northern side. This wall became the recognized southern perimeter between the Courtyard and Structure B-3. As regional data indicates, structure's peripheries and corners tend to be a point of convergence for peri-abandonment deposits.

As hypothesized, July excavations revealed extensive artifact concentrations similar to unit GB-C1-4, connecting to the Feature 1 deposit/platform level in GB-C1-5. Increasing artifact density appeared to correlate with proximity to the southwest corner. Leveling to the depth of GB-C1-5 revealed a row of proportioned stones running north-to-south bisecting the unit. Artifacts in

levels 2 and 3 were pedestaled and categorized as two separate deposits (Feature 1 and Feature 2 Deposits), as the bisecting feature divided them. Artifact classes at these levels include ceramics, chert, freshwater shell and faunal remains, obsidian, four carbon samples, a granite hammerstone (or “Thompson’s ball”), slate, and a cobble. As pedestaling continued, it was revealed the bisecting feature was sitting on top of artifacts, likely collapse from Structure B-3 fallen in linear alignment, giving it the appearance of an architectural feature. Once the collapse was removed, it was became clear that the two deposits connected. For continuity, artifacts continued to be collected and documented within separate lots.

Artifact removal resulted in the discovery of an intact Floor 1 below the Feature 1 deposit, revealing a contiguous cultural level with adjoining GB-C1-5. In order to explore the interaction between the deposit and Floor 1, the Feature 1 deposit was left intact and a baulk was created 50 centimeters out from the wall on the west end of the unit to create a profile view map of the deposit stratigraphy (Figure 16). Excavators were able to document a lens between deposit and Floor 1 by creating this baulk and carefully pedestaling. The lens, an average of 2 centimeters thick (Figure 13 and 14), may indicate Group B was abandoned, the floor was left to collect matrix, and then reoccupied when the artifacts were deposited.

Excavation also cleared out an element of the southern courtyard wall, which at first appeared to be a doorway on the western side of the bisecting collapse in the Feature 1 deposit. The team worked to clear some of the largest diagnostic ceramic sherds from this divot in the wall during the final days of excavation. It was determined the doorway was carved bedrock instead of a discrete architectural feature; it appears the bedrock was incorporated into the masonry construction (southern courtyard wall) above. Approximately one third of the exposed courtyard wall was comprised of this carved bedrock.



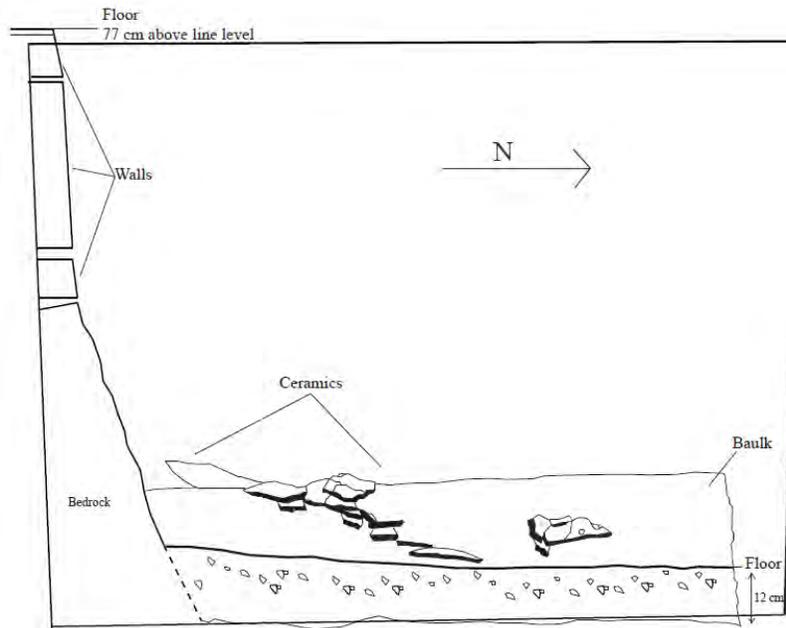
**Figure 13:** GB-C1-7. Feature 2 deposit on the left, Feature 1: Deposit on the far right. Pedestaling revealed the two deposits were connected, continued underneath the bisecting row of stones.



**Figure 14:** GB-C1-7. Lens between Feature 1: Deposit and Floor 1 exposed.



**Figure 15:** GB-C1-7. More lens exposed with tape measure for scale between ceramics in segmented section of Feature 1: Deposit and Floor 1. This indicates some time may have elapsed between abandonment and reoccupation; the floor was not bare prior to the deposition of these ceramics. Rattler foot visible in upper left-hand corner.



**Figure 16:** Profile view map of segment 50cm out from the west wall in Feature 1: Deposit. Drawing not to scale (Profile drawn by Merle Alfaro and K. Tappan, digitized by A. Alvarado).

### **Structure B1 Units**

During the 2016 field season a cluster of ceramics was discovered flanking the southern facade of structure B-1. To investigate the concentration of the cluster, units were placed along the outside wall of structure B-1: B1-South-1, the eastern unit, and B1-South-2, the western unit (See Figure 28 for sketch map of B1-South and B-4 units).

#### *B1-South-1*

B1-South-1 was a 2 m (N-S) by m meter (E-W) unit with a cluster of ceramics and chert in the northwest corner of the unit (labeled Cluster 1). As excavation continued two more ceramic clusters were discovered: one in the northwest corner (labeled Cluster 2) and another centered in the southern edge of the unit (labeled Cluster 3). All artifacts uncovered were collected from the unit and excavation continued to define the depth and breadth of the ceramic clusters. Further excavation uncovered three additional clusters: Cluster 5 connected Cluster 1 and 3 together while Cluster 4 merged with Cluster 1. As the unit was taken down it was noted that all clusters blended together. Once past the clusters bedrock was encountered and the unit ended.

#### *B1-South-2*

B1-South-2 was an irregularly shaped unit placed west of B1-South-1. Almost immediately two human femora, one left and one right, were encountered. Excavations continued but did not yield dense concentrations of artifacts as seen in other B1-South units. Bedrock was encountered and the unit was closed.

### *B1-South-3*

A 2.8 m by 3.5 m unit (B1-South-3) was placed on the east side of B1-South-1 to define the orientation of Structure B-4, south of Structure B-1. Near the surface, several collapsed cut stones were encountered and removed and two clusters containing ceramics, fauna, and chert were discovered in the northwest and northeast corners of the unit. Upon this discovery, the unit was extended back towards the southern wall of Structure B-1 (new N-S measurement 5 m). Two more clusters of mixed fauna, ceramics, chert, and smaller limestone or cobble fill were discovered, with some special finds throughout: Cluster 3 (NE corner) and Cluster 4 (NW corner), connecting to Cluster 1 and Cluster 4, respectively. As excavation continued it was noted that all cluster blended together. Because of the intense concentration of artifacts, the clusters were then labeled as Feature 1: Deposit (Figure 17) in excavation logs.

After all artifacts from the deposit were pulled, a sterile lens was encountered and the lot was changed. Moving past the sterile lens, another deposit was discovered, labeled Feature 2: Deposit, composed of the same artifact types previously mentioned. Moving past Feature 2 deposit, a rock alignment composed of five cut facing stones was encountered in the middle of the unit, after which another sterile lens was encountered. Moving further down in the unit, a smaller deposit, Feature 3: Deposit was discovered in the northeastern corner of the unit followed by another, albeit thinner, sterile lens. Bedrock was encountered beneath the sterile lens and the unit was closed (Figure 18).

### *B1-South-Drain*

A small drain was found in the Northwest corner of excavation unit B1-South (Figures 19 and 20). The drain measured approximately 28 cm N-S and 18 cm vertically, no elevations were taken for this unit because of the small workspace and were ultimately unnecessary. Few artifacts were recovered from the drain: a marine shell *adorno* (similar to one found in the B1-South unit), small ceramic sherds in front of the drain (too small to be collected), and two small chert flakes, all of which were found on the northern side of the drain and appeared to have washed in. Excavation was halted once two large limestone rocks were found within the drain at approximately 40 cm deep.



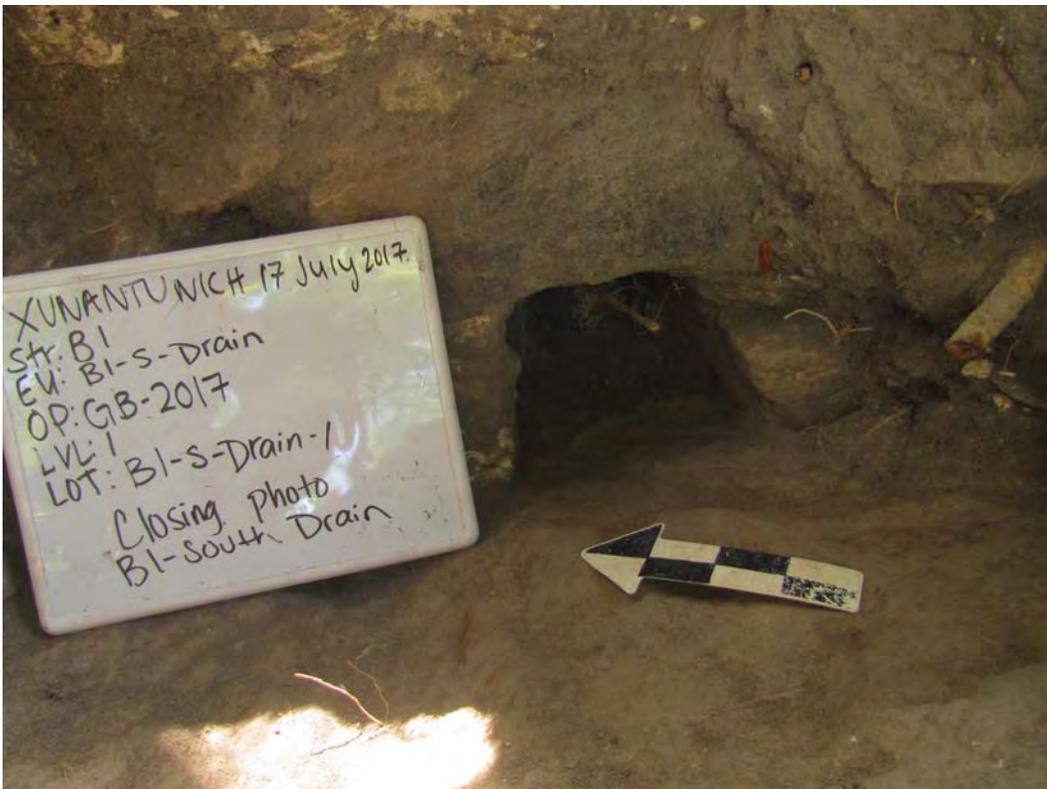
**Figure 17:** Photo of B1-South-3 excavation unit with Feature 1 exposed.



**Figure 18:** Closing photo of B1-South-3 excavation unit with floor exposed.



**Figure 19:** Opening photo of B1-South-Drain excavation unit.



**Figure 20:** Closing Photo of B1-South-Drain excavation unit.

## Structure B4 Units

As one of the goals of the 2017 field season was to locate and expose Structure B-4 (Figure 21), four units were placed in the approximate location of the structure: B4-1 and B4-2 directly south of B1-South-3 (see map), and B4-3 and B4-4.

### B4-1 & B4-2

B4-1 and B4-2 were approximately 4.34 m (N-S) by 2.23 m (E-W). After removing the collapse, which was focused in the B4-2 unit, a double cut stone masonry wall was encountered in the middle of both units. Excavating around the wall revealed a bench (Figure 21), with a step (Figure 22) leading up in unit B4-1 and a pit feature in B4-2 (labeled B4-2a, see below). Further excavation focused on uncovering the rest of the bench and exposing the northern wall of Structure B-4, which was hit at the end of the B4-1 & B4-2 units. Once the bench and wall were completely exposed the units were closed. Limited artifacts were yielded from the B4-1 & B4-2 units beyond those labeled as special finds.



**Figure 21:** Opening photo of B4 units with collapse exposed.



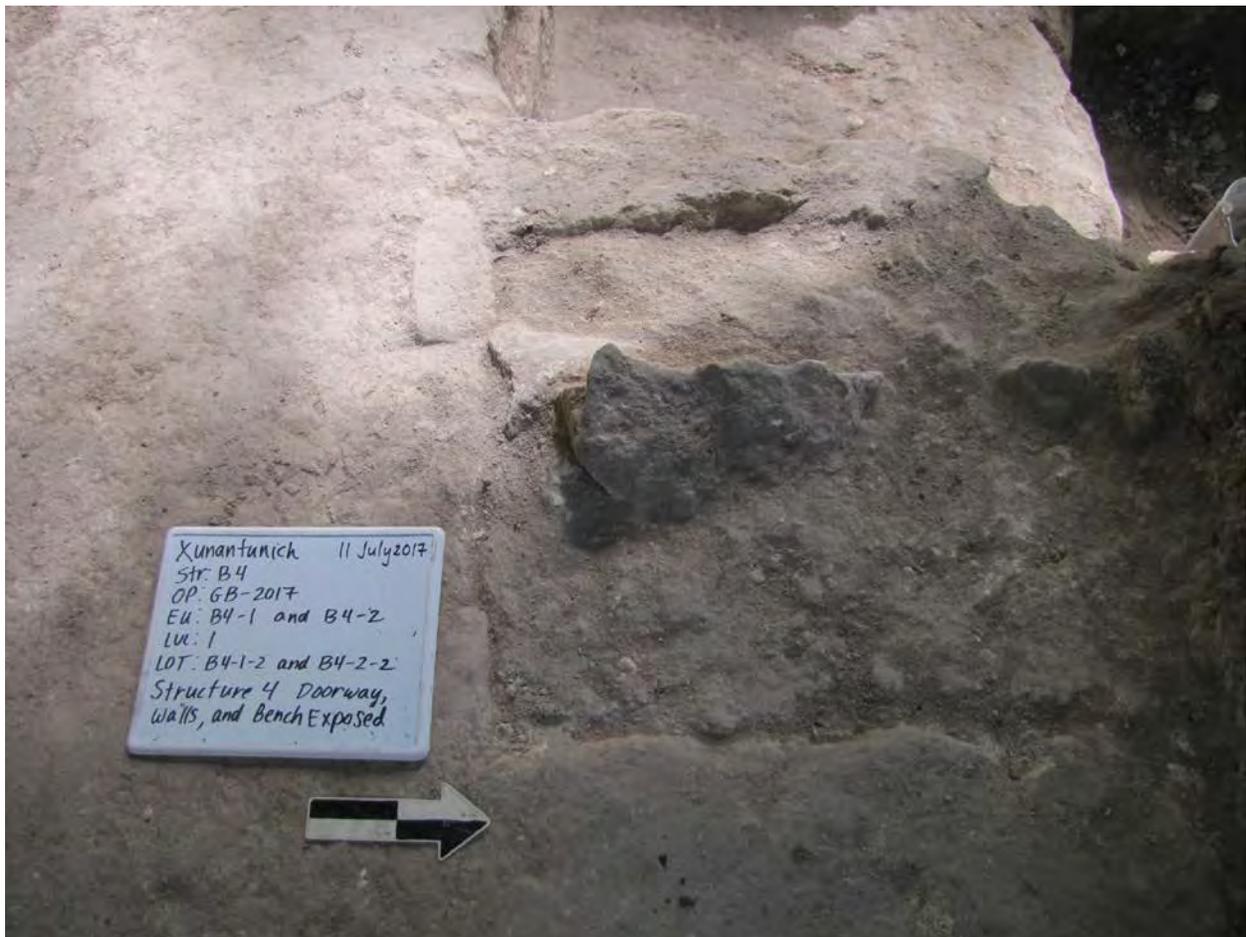
**Figure 22:** Photo of B4-1 and B4-2 units with bench exposed. Note the outline of B4-2a in the right corner.



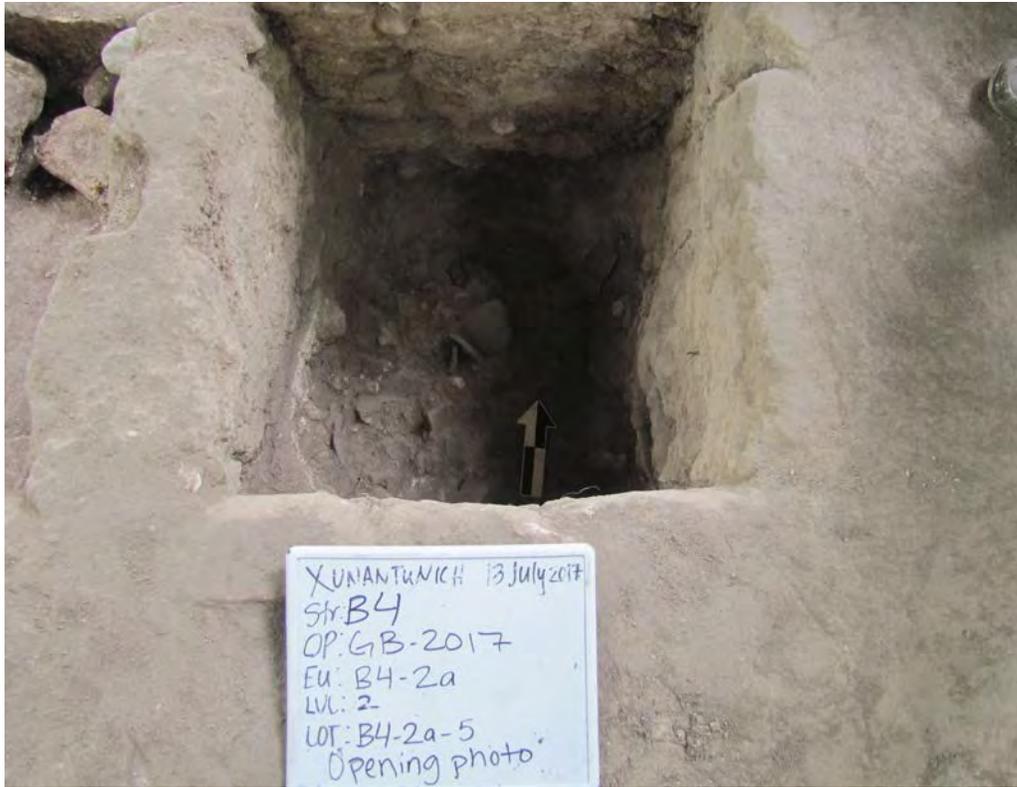
**Figure 23:** Photo of B4-1 unit, step exposed.

## B4-2a

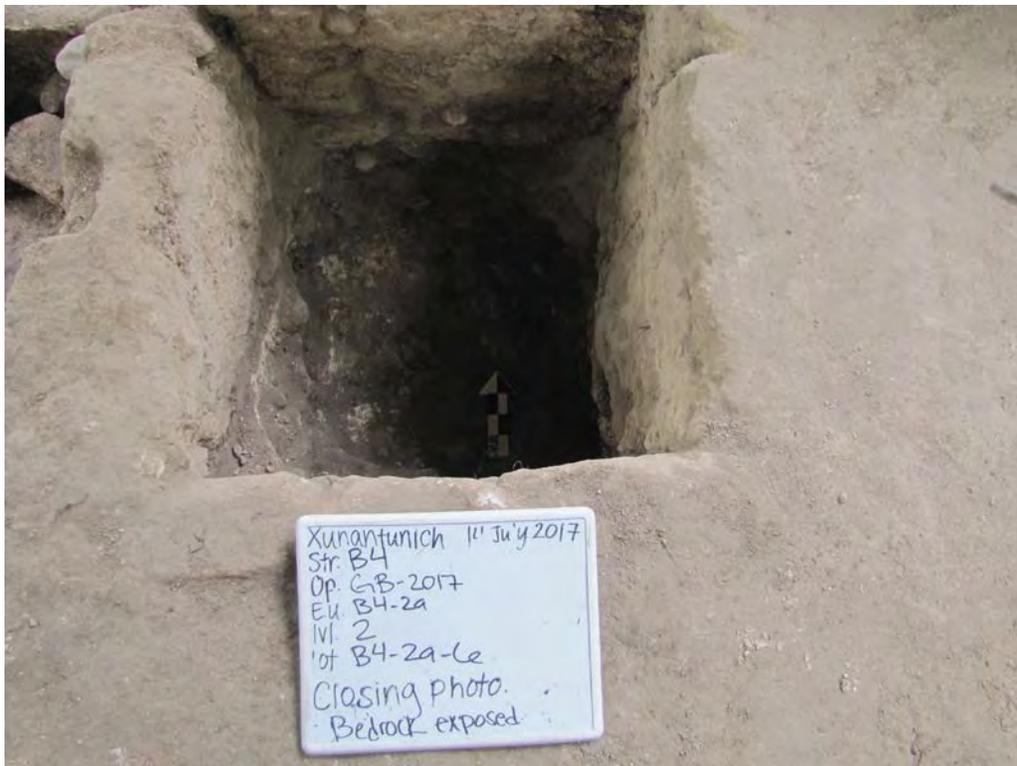
A small hole/pit measuring 83.5 cm N-S by 76 cm E-W was discovered in unit B4-2 (Figure 24). The pit was originally thought to be a cut in the bench, which runs in an east-to-west orientation across units B4-1 and B4-2. Upon further investigation it was discovered the bench was L-shaped, the plaster floor was cut through, and a wall addition was placed to enclose the pit. Once the top layer of the loose fill was removed, a layer of small ceramic and chert pieces were noted approximately 54.3 cm below datum. Once removed, a deposit layer composed of shattered ceramic vessels and chert flakes was found (Figure 25). Upon reaching the cut-floor level the bulk of the deposit ended. A chert biface was discovered in the northwest corner, a round-worked chert stone was discovered in the southwest corner, and a round-worked limestone rock was discovered in the southeast corner of the unit. Past the level of the cut-floor, only minimal amounts of ceramic sherds and chert debitage were found, and bedrock was reached at approximately 23 cm below the deposit and approximately 88.5 cm from the top of the pit (Figure 26).



**Figure 24:** Opening photo of B4-2a (pit outline exposed).



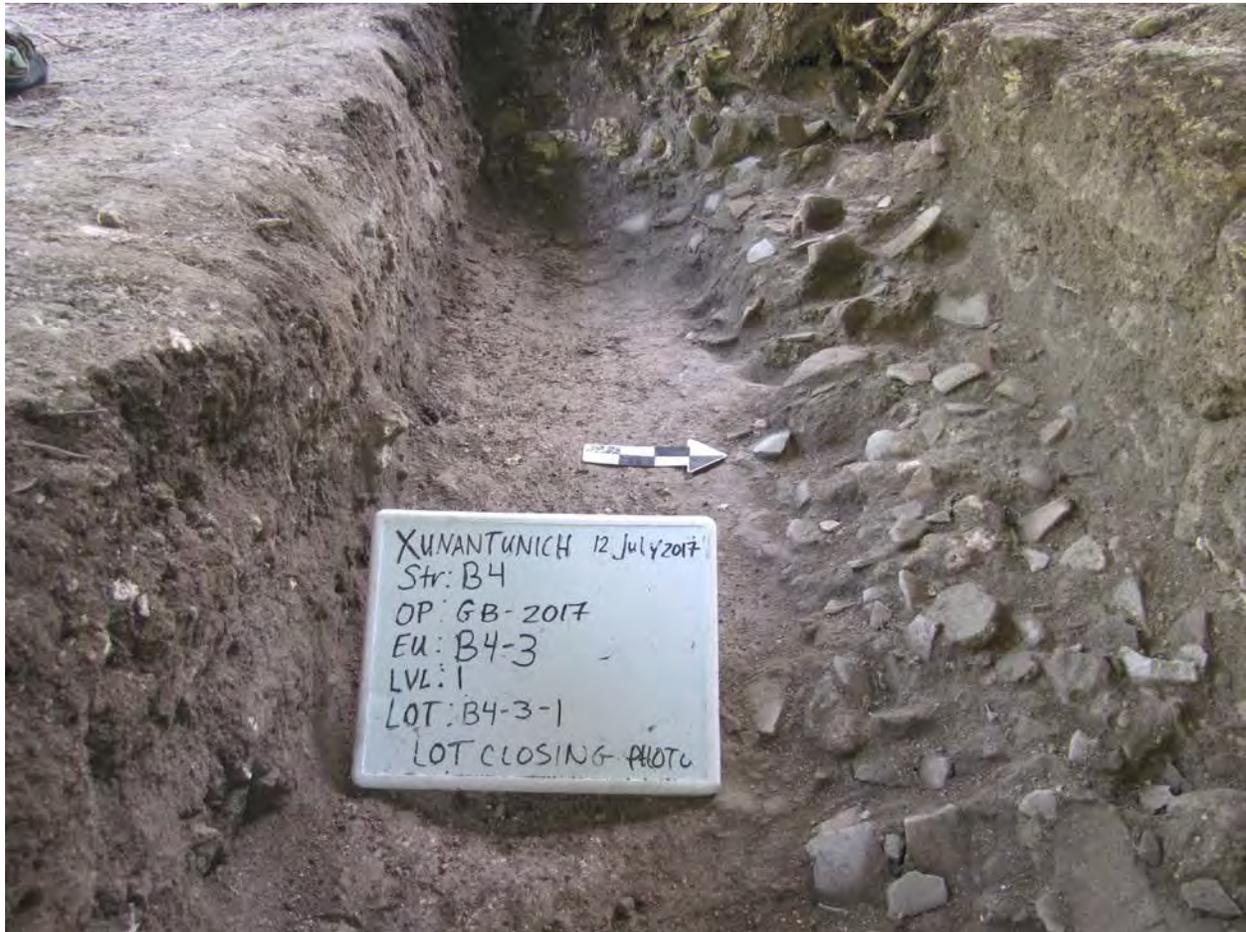
**Figure 25:** Photo of deposit in B4-2a.



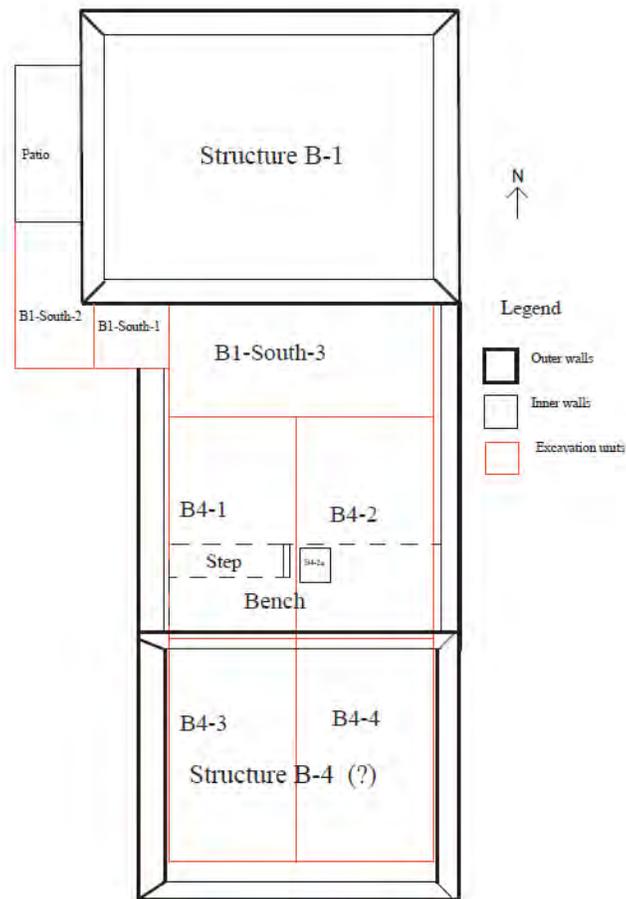
**Figure 26:** Closing photo of B4-2a (bedrock exposed).

## B4-3 & B4-4

B4-3 & B4-4 were approximately 3 m (N-S) by 2 m (E-W), see exact measurements below. These units were started to investigate the architecture of Structure B-4 and picked up on the southern side of the northern wall of Structure B-4. Excavations revealed a dense concentration of artifacts, labeled Feature 1: Deposit, which was composed primarily of ceramic sherds and faunal remains, with the ceramics found within the northwest corner of B4-3 belonging to several very large vessels (Figure 27). Below the Feature 1: Deposit a sterile layer was encountered. Beneath the sterile layer another dense concentration of artifacts was discovered, labeled Feature 2: Deposit. Once this deposit was removed, a small sterile layer of dirt was noted above the bedrock. Upon cleaning the unit for the closing unit photo, a carved drain was discovered in the northern section of the unit. Additionally, a small rounded platform was discovered in the southeast corner of B4-4. Because of time constraints only the northern half of the original units were excavated.



**Figure 27:** Photo of B4-3 and B4-4 units exposed with Feature 1 exposed.



**Figure 28:** Sketch of Structure B-1 and Structure B-4 denoting excavation units. Note that the diagram is not to scale and the orientation of Structure B-4 is approximate.

## DISCUSSION AND CONCLUSIONS

The 2017 field excavations of Group B recovered multiple dense artifact concentrations overlaying collapsed architecture. While these deposits were primarily composed of Terminal-Classic ceramics, additional artifacts were recovered such as ceramic figurines, lithic tools and debitage, as well as faunal and human remains. Similar deposits have been noted in previous excavations throughout Xunantunich along the façade of El Castillo (Structure A-6), within Structure A-15, and in the alley between Structures A-3 and A-4 and with Group B (Audet 2006; Awe 2008; Sullivan et al. 2017). In addition, these deposits have been documented across the Belize Valley at the sites of Baking Pot (Hoggarth et al 2014; Hoggarth et al. 2016, 2018), Cahal Pech (Audet 2006; Awe et al. 2009, 2017; Zanotto and Awe 2017) and Lower Dover (Watkins et al. 2017).

In the archaeological literature, these deposits have generated multiple interpretations including trash middens, rapid site abandonment (Chase and Chase 2000:67; Inomata 2002),

deseccration, and warfare (Suhler and Friedel 2003) and have been referred to as “problematic deposits” and “de facto refuse” (Webb and Hirth 2003). However, Awe (2012) suggests that these deposits may reflect rituals conducted at the end of a sites occupation as a type of ritual closure or may have occupied post abandonment by individuals returning as a part of ancestral veneration. In recent years BVAR Project has begun to refer to these concentrations as ‘peri-abandonment deposits’ and have aimed their research efforts at understanding the nature of this prehistoric behavior (Hoggarth et al. 2016, 2018).

Several trends characteristic of peri-abandonment deposits are visible throughout the dense artifact clusters at Group B at the site of Xunantunich. This includes the almost predictable locations of these concentrations, found to increase in corners and along perimeters of structures and courtyards. Across Group B, deposits are also found within or around drain systems. The types of artifacts found in peri-abandonment deposits are not standard across sites, but they do contain artifacts whose classes and functions imply value and intentionality. These items at Group B had utilitarian or ceremonial purpose, and their high frequencies and deposition in set patterns are not arbitrary.

It is notable the large concentrations of artifacts believed to be peri-abandonment deposits at Group B are typically on or directly above floors. The clear lens seen within deposits, such as GB-C1-7, could indicate the site is abandoned and later reoccupied sometime during the Postclassic period. Several of these floors are poorly preserved and interrupted beneath deposit levels, but this group did not see any evidence of intrusive behavior. As future research focuses on developing a construction and occupation chronology, excavators will continue to look for taphonomic indicators of bio- or geoturbation. Continuous flooding during the 2016 field seasons may also have eroded partially exposed levels.

Previous excavation at Group B as part of the 1995 Xunantunich Archaeological Project (XAP), recorded two features carved out bedrock along the eastern wall of Group B (Structure B-1), in addition to a carved bedrock corner of the courtyard to the northeast between Structures B-1 and B-2 (Etheridge 1995). Based on the similar bedrock element in GB-C1-7 to the southwest, the earliest construction phase at Group B may have incorporated the natural geologic features as a foundation for masonry. While the exact nature of these deposit remains elusive excavations at Group B continue to examine this behavior.

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## APPENDIX A: 2017 XUNANTUNICH GROUP B EXCAVATION UNIT INFORMATION

<i>Excavation Unit</i>	<i>Unit Size (N-S x E-W)</i>	<i>Lvl.</i>	<i>Lot</i>	<i>Lot Description</i>
B1-Clearing		1	B1-Clearing-1-1	
B1-Room			B1-Room	
B1-Doorway			B1-Doorway-1	
B1-Doorway			B1-Doorway-2	
B1-1-Burials				
B1-South-1	1 m x 2 m	1	B1-South-1-1	Humus
B1-South-2		1	B1-South-2-1	humus, Cluster 1 exposed
B1-South-2		1	B1-South-2-2	Humus
B1-South-2		2	B1-South-2-3	Floor 1 ballast
B1-South-3	2 m x 5 m	1	B1-South-3-1	Humus/collapse
B1-South-3	2.8 m x 3.4 m	1	B1-South-3-2	Humus w/ Feature 1: Deposit
B1-South-3	2.8 m x 3.4 m	2	B1-South-3-3	Below Floor 1
B1-South-3	2.8 m x 3.4 m?	3	B1-South-3-4	Humus below Feature 1
B1-South-3	2 m x 5 m	4	B1-South-3-5	Feature 2: Deposit
B1-South-Drain	28 cm x 18 cm	1	B1-5-Drain-1	Feature 1: Drain
B4-1	4.34m x 2.23 m	1	B4-1-1	Humus, collapse, overburden
B4-1		1	B4-1-2	Humus, collapse Structure B4
B4-2	4.34 m x 2.23 m	1	B4-2-1	Humus, collapse, overburden
B4-2	4.34 m x 2.23m	1	B4-2-2	Humus, collapse Structure B4
B4-1a	1m x 1m	1	B4-1a-1	Feature 1 Step
B4-2a	83.5 cm x 76 cm	1	B4-2a-1	Feature 1
B4-2a	83.5 cm x 76 cm	2	B4-2a-2	Feature 1
B4-2a	83.5cm x 76 cm	2	B4-2a-3	Feature 1 addition
B4-2a	83.5 cm x 76 cm	2	B4-2a-4	Feature 1 addition
B4-2a	83.5 cm x 76 cm	2	B4-2a-5	Feature 1 addition
B4-2a	83.5 cm x 76 cm	2	B4-2a-6	Feature 1 addition

<i>Excavation Unit</i>	<i>Unit Size (N-S x E-W)</i>	<i>Lvl.</i>	<i>Lot</i>	<i>Lot Description</i>
B4-3	3.16 m x 2.21 m	1	B4-3-1	Humus and overburden
B4-3	3.16 m x 2.21 m	1	B4-3-2	Feature 1: Deposit
B4-3	3.16 m x 2.21 m	2	B4-3-3	Humus below Feature 1
B4-3	3.16 m x 2.21 m	2	B4-3-4	Feature 2: Deposit
B4-3	3.16 m x 2.21 m	3	B4-3-5	Humus layer below feature 2
B4-3	3.16 m x 2.21 m	3	B4-3-5	Humus layer below feature 2
B4-1	4.34 m x 2.23 m	1	B4-1-1	Collapse, humus, overburden
B4-1		1	B4-1-2	Humus and collapse
B4-2	4.34 m x 2.23 m	1	B4-2-1	Humus, collapse, overburden
B4-2	4.34 m x 2.23 m	1	B4-2-2	Humus and collapse from Structure B4
B4-1a	1 m x 1m	1	B4-1a-1	Feature 1 step
B4-2a	83.5 cm x 76cm	1	B4-2a-1	Feature 1 addition
B4-2a	83.5 cm x 76 cm	2	B4-2a-2	Feature 1 addition
B4-2a	83.5 cm x 76 cm	2	B4-2a-3	Feature 1 addition
B4-2a	83.5 cm x 76 cm	2	B4-2a-4	Feature 1 addition
B4-2a	83.5 cm x 76 cm	2	B4-2a-5	Feature 1 addition
B4-2a	83.5 cm x 76 cm	2	B4-2a-6	Feature 1 addition
B4-3	3.16 m x 2.21 m	1	B4-3-1	Humus overburden
B4-3	3.16 m x 2.21 m	1	B4-3-2	Feature 1: Deposit
B4-3	3.16 m x 2.21 m	1	B4-3-2	Feature 1: Deposit
B4-3	3.16 m x 2.21 m	2	B4-3-3	Humus below Feature 1
B4-3	3.16 m x 2.21 m	2	B4-3-4	Feature 2: Deposit
B4-3	3.16 m x 2.21 m	3	B4-3-5	Humus below Feature 2: Deposit
B4-4	2.90 m x 2.39 m	1	B4-4-1	Humus and overburden
B4-4	2.90 m x 2.39 m	1	B4-4-2	Feature 1: Deposit
B4-4	2.90 m x 2.39 m	2	B4-4-3	Humus below Feature 1: Deposit
B4-4	2.90 m x 2.39 m	2	B4-4-4	Feature 2: Deposit
B4-4	2.90 m x 2.39 m	2	B4-4-5	Floor 1 - small patio or platform, plastered

<i>Excavation Unit</i>	<i>Unit Size (N-S x E-W)</i>	<i>Lvl.</i>	<i>Lot</i>	<i>Lot Description</i>
B4-4	2.90 m x 2.39m	2	B4-4-6	Feature 3: Deposit
B4-5	8 m x 3 m	1	B4-5-1	Humus, collapse
B4-5	8 m x 3 m	2	B4-5-2	Humus, collapse
B4-6	2 mx 2 m	1	B4-5-1	Humus
B4-6-Ext-E	2 m x 1 m	1	B4-6-Ext-E-1	Humus, collapse, cultural feature (wall uncovered)
GB-C1-4	3 m x 3 m	2	GB-C1-4-1	Humus, collapse, ceramic deposit *excavations continued from 2016
GB-C1-5	5 m x 4 m	1	GB-C1-5-1	Humus and collapse
GB-C1-5	5 m x 2 m	2	GB-C1-5-2	Humus, deposit
GB-C1-5	5 m x 2 m	3	GB-C1-5-3	Feature 1: Deposit and Floor 1
GB-C1-5	5 m x 4 m	2	GB-C1-5-4	Collapse and Feature 2: Platform
GB-C1-5-5	5 m x 4 m	3	GB-C1-5-5	Humus, collapse, architectural feature
GB-C1-6	3 m x 2 m	1	GB-C1-6-1	Humus, collapse, backfill
GB-C1-6	3 m x 2 m	2	GB-C1-6-2	Humus
GB-C1-7	3 m x 3.8 m	1	GB-C1-7-1	Backdirt, collapse

**THE 2017 XUNANTUNICH STRUCTURE B1 EXCAVATION:  
THE COMPLETION OF THE BONE SOUP EXCAVATION OF BURIAL B1-4.**

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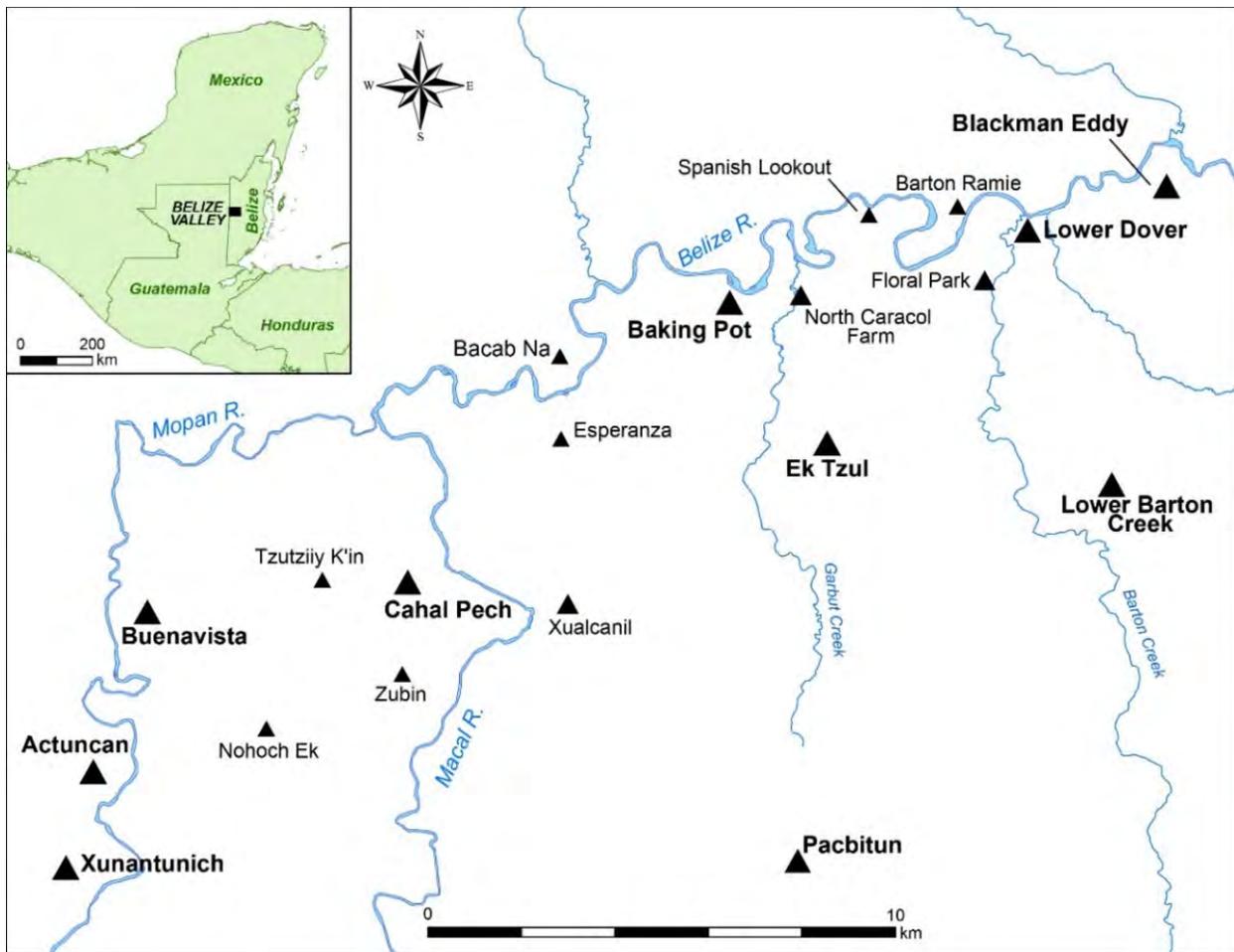
**Jaime J. Awe**  
**Northern Arizona University**

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## **INTRODUCTION**

In the summer of 2017 the Belize Valley Archaeological Reconnaissance (BVAR) Project continued excavations at the site of Xunantunich, located in the upper Belize River Valley (Figure 1). These excavations were part of an ongoing, multi-year collaboration between the Belize Institute of Archaeology, the Xunantunich Archaeology and Conservation Project (XACP), the BVAR Project, and Dr.'s Jason Yaeger and M. Kathryn Brown of the University of Texas, San Antonio (UTSA). The overall goal of investigations at the site are to understand the development of the Late and Terminal Classic (~AD 500-900/1000) civic-ceremonial center of Xunantunich, as well as to conserve structures for the expansion of the tourism potential of this site (Zanotto and Awe 2017). This report focuses on the completion of the excavation of Structure B1 in Group B (Figure 2), located in the northeastern Courtyard 1 at Xunantunich. Structure B1 is the small Eastern Shrine for this portion of the site. Excavations at this structure are important for understanding the Terminal Classic occupation in this area and the function of Group B within the larger Xunantunich complex.

Initial investigations at Group B focused on the excavation of Unit B1-1 by Sullivan and colleagues during the 2016 field season, during which time Burial B1-4 was encountered (Sullivan et al. 2017). Because of time constraints and the complexity of the burial within the unit, completions of the excavations was postponed and resumed during the 2017 field season. This report describes the completion of the excavation of Unit B1-1 by the BVAR Project and field school between May 29<sup>th</sup> through June 6<sup>th</sup>, 2017. Skeletal inventory and analysis of Burial B1-4 is ongoing, and will be reported in future publications.



**Figure 1:** Map of Belize River Valley archaeological sites, showing location Xunantunich (map by Claire Ebert, 2018).

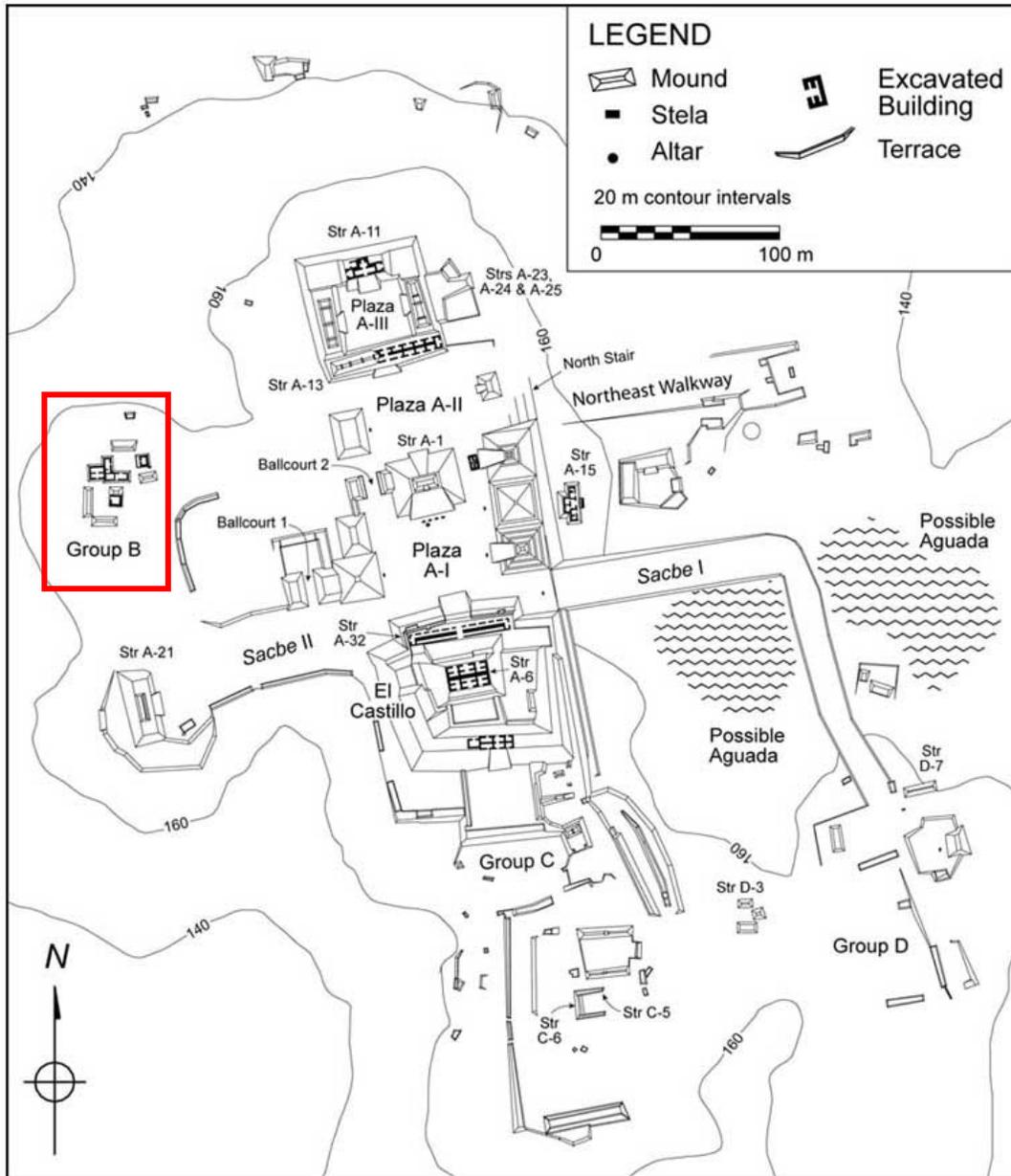
### The 2016 Excavations

Initial excavations in Unit B1-1 consisted of a 1x1 m unit placed on the platform of Structure B1 to investigate the construction sequence of this building (Figure 3). After the removal of the overlying humic layer, a cist burial was encountered that housed comingled human remains, with minimum number of individuals is 3 based on the presence of three dens (C2 vertebrae). These comingled remains were identified as Burial Bu-B1-4 and the remains were mapped and excavated in three sublevels.

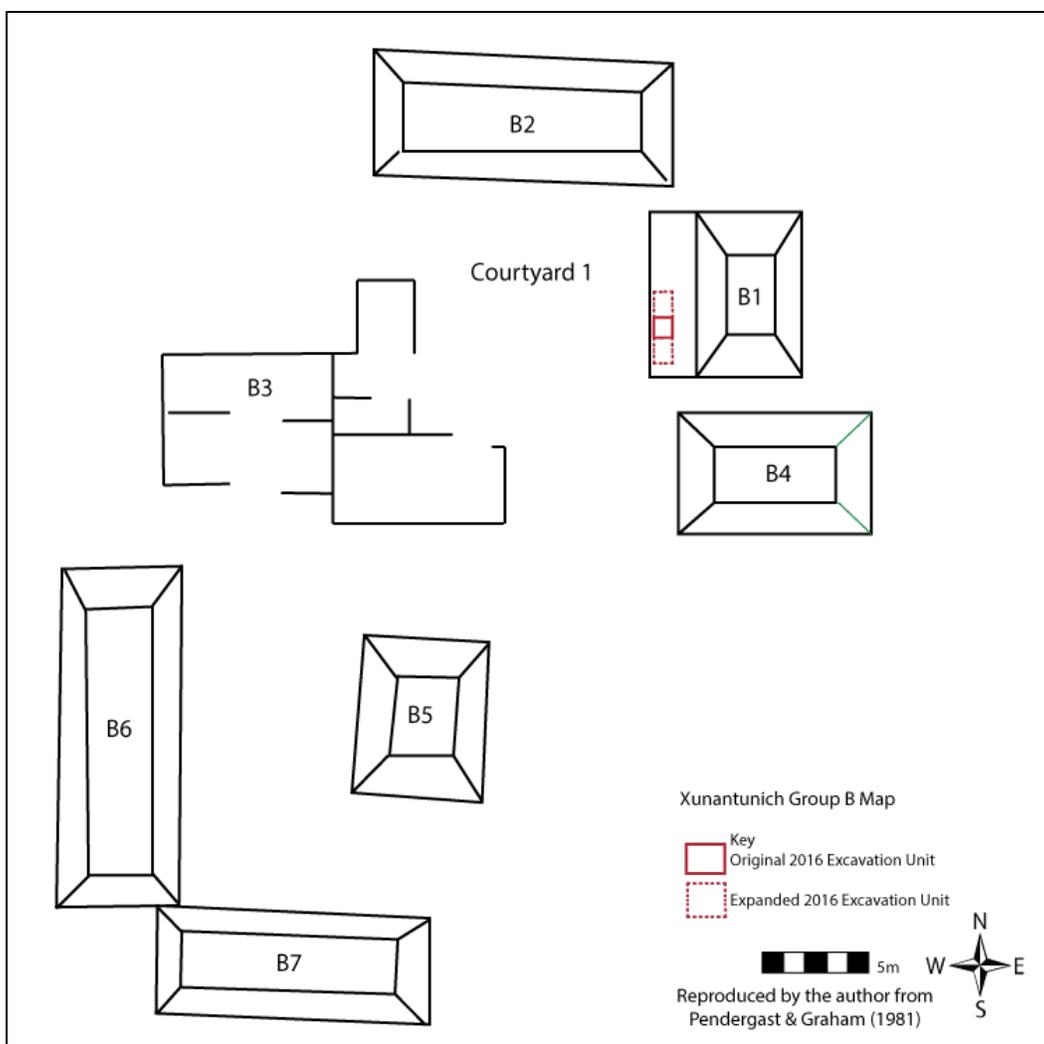
In order to completely expose the human remains, the unit was expanded by 50 cm on both the north and south sides of the unit, creating a 2 meter (north-to-south) by 1 meter (east-to-west) unit. Excavations then followed the general cist outline that was initially identified in level 2. The unit was cut in half length-wise (east-to-west), creating an approximately 2 m by 50 cm unit (Figure 3). This would become problematic during the 2017 excavations when additional human remains were found within west wall. Excavation were halted at the end of the 2016 field season at level 3. Unit B1-1 and Burial B1-4 were covered in order to protect the remains so the project could complete excavations the following year (2017).

## The 2017 Excavations

On May 30<sup>th</sup>, 2017 excavations were resumed on Unit B1-1. Table 1 provides lot numbers associated with the removal of discrete elements and artifacts of Burial B1-4. Lot B1-1-5 with the removal of the rib cluster that was exposed at the end of 2016, as well as the vertebrae cluster, and bone bead cluster (Figure 4). After removal of the human remains and artifacts, excavation continued as Lot B1-1-5 to the north and south ends of the cluster in order to level out the unit. This portion of the unit is 2 meters x 50cm.



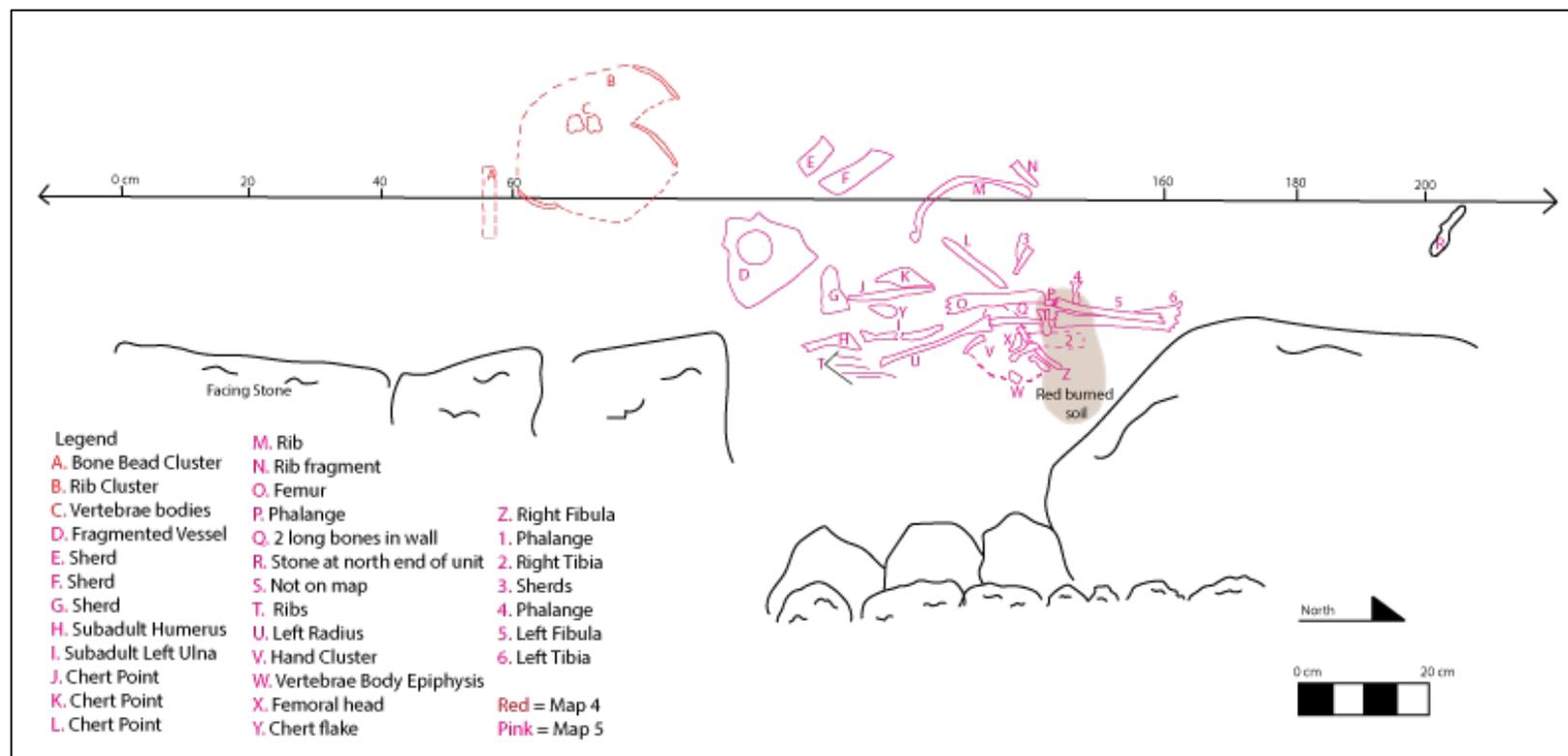
**Figure 2:** Map of Xunantunich archaeological site with Group B in red square (adapted from LeCount and Yaeger 2010:Fig. 2.1).



**Figure 3:** Map of Group B with the 2016 excavation unit and expansion in red (after Sullivan et al. 2017:Fig. 3).

Almost immediately under the rib and vertebrae cluster large pot sherds and three chert points were encountered. These artifacts were pedestaled, mapped (Figure 4) and photographed (Figure 5). During the pedestaling of the artifacts, it was discovered that several artifacts were extending into the East wall and human remains were also seen within the wall. At this point it was determined to leave the artifacts and human remains in situ while the East portion of the unit, that was left unexcavated during 2016, was removed as Lot B1-1-6.

On June 1<sup>st</sup>, 2017, Lot B1-1-5 area and artifacts were covered while the main bulk of Lot B1-1-6 was removed (Figure 6). A perforated shell with associated beads was found stuck to the underside of a limestone block during the removal of the B1-1-6 baulk (Figure 7). Dr. Chrissina Burke and her students identified the large perforated shell as marine shell, possibly *Mercenaria campechiensis* species (Chrissina Burke, personal communication). The smaller shell beads were only able to be identified as marine shell. Further analysis is need in order to confirm species identification and potential function of the artifacts.



**Figure 4:** XUN Burial B1-4 combination of hand drawn maps #4 & #5.



**Figure 5:** Photo of chert blades, pottery, and human remains *in situ* (Lot B1-1-5).



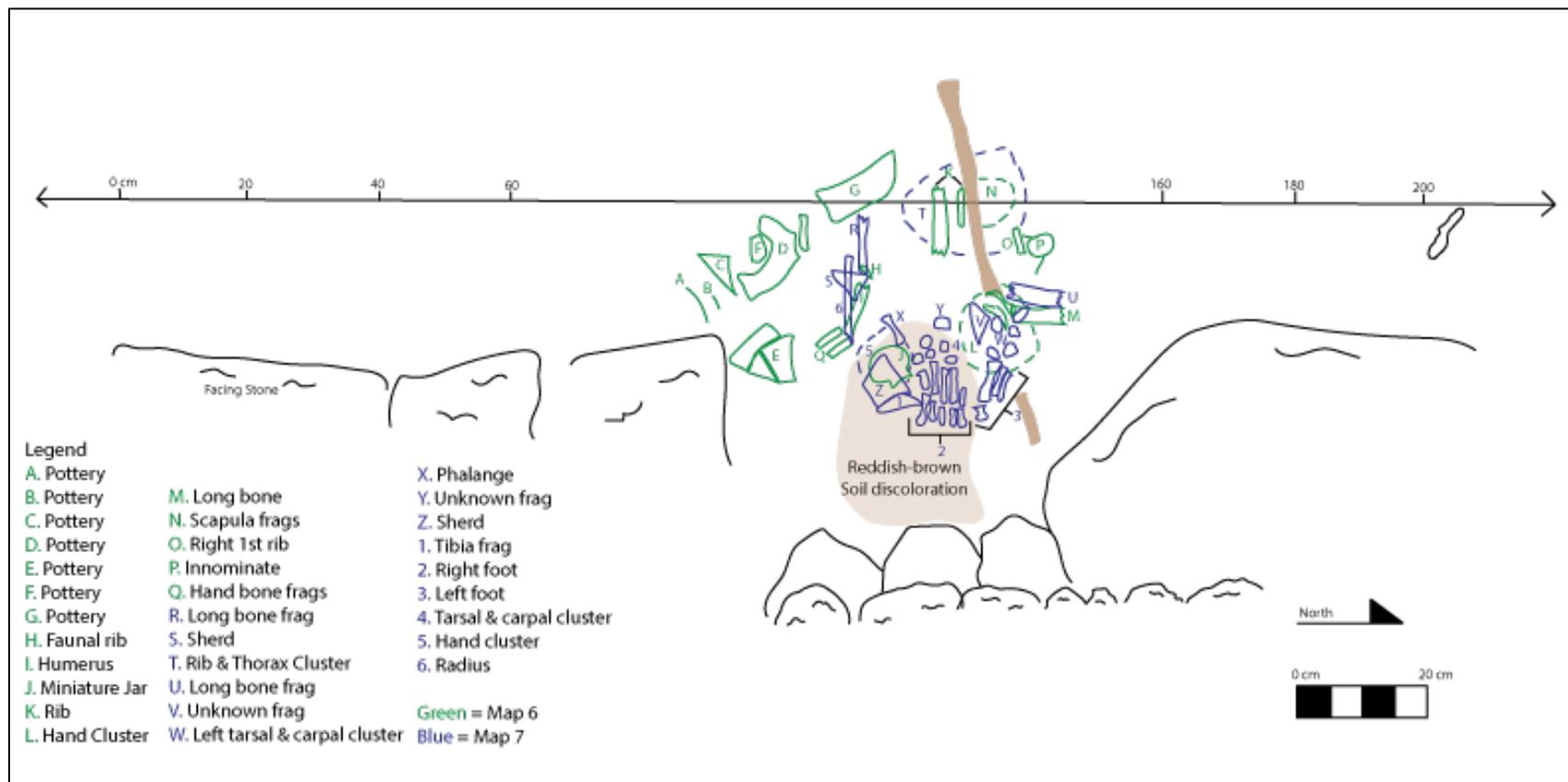
**Figure 6:** Taking down the east baulk to Lot B1-1-6.



**Figure 7:** Perforated shell pendant and beads (photograph by Claire Ebert, 2018).

Human remains, which were previously identified in the wall, were also encountered in this lot a few centimeters down. These skeletal elements were pedestaled, mapped (Figure 8), photographed, and removed as Lot B1-1-6 (Figure 9). Just below, if not right under the bones, we encountered a large stone. Several of the skeletal elements were laid directly on top of the stone while some had a thin layer of dirt between them and the stone. It should be noted that several of the skeletal elements recovered in this section on or above the large stone were from a subadult. More human remains were encountered in the north-east corner of lot B1-1-6, pedestaled, mapped, and removed. At this point in the excavation, tree roots from a large tree located at the north end of the unit began to disturb the remains and artifacts in the northern end of the unit, both lots B1-1-5 and B1-1-6. The tree, however, was not removed because it would likely undermine the integrity of what was left of the structure.

By June 2<sup>nd</sup>, 2017, Lot B1-1-6 had reached the same depth as Lot B1-1-5. At this point, the cache of blades and pottery was removed as lot B1-1-5 (Figure 9). Any additional human remains and artifacts found in the screen during this day were labeled as Lot B1-1-5/6 because determination of dirt from a specific lot was impossible during the cleaning process. The cache was removed, and the entire unit was leveled. The cache contained three large oval chert biface blades approximately 5.5-6.5 cm in width and 14-16 cm in length (Figure 10).



**Figure 8:** XUN Burial B1-4 combination of hand drawn maps #6 & #7.



**Figure 9:** Close up of cache with chert blades, pottery, and human remains.



**Figure 10:** Three large oval chert bifaces (Photograph by Claire Ebert, 2018).



**Figure 11:** Articulated feet pointed east found below miniature jar.



**Figure 12:** Miniature jar (Photograph by Claire Ebert, 2018).

More remains and artifacts were encountered and pedestaled which were now considered Lot B1-1-7 (Figure 8). These consist of human remains, including articulated feet (Figure 11), and a miniature jar (Figure 12). The articulated feet were located just north of a large stone and west of the stone doorway. The miniature jar is a plain ware unslipped jar with a flared rim (Dr. John Douglas, personal communication). Further ceramic analysis will need to be done to identify temper and paste information as well as potential function. A soil sample was collected from around the miniature jar because of the presence of distinct reddish-brown matrix in this part of the unit (Figure 8). Once the remains and artifacts were removed on June 6<sup>th</sup>, 2017, a final clean of the floor was done. The floor did not contain any further human remains and the unit was considered completed at this point.

## CONCLUSIONS

At the completion of the excavation of the “bone soup” burial, XUN Burial B1-4, the unit was considered sterile and closed although bedrock was not hit at this time. The completion of a full skeletal analysis will give us a better idea of the type of burial and give context to Structure B1. Our current results indicate that multiple individuals were buried just outside the doorway to Structure B1, and that at least one burial was of a high status individual based on the presence of ceramics, three chert biface blades, and the miniature jar. It is impossible to say which remains belonged to the high-status burial, or if all the burials were high status. It is also impossible, without a complete skeletal analysis in conjunction with the interpretation of the excavation, to say whether or not these individuals constitute a multiple burial or reused grave. It is likely that these individuals represent one family based solely on their location and the fact that they are all interred in the same grave. Continued research on this burial will likely add a unique story to the site of Xunantunich and its Group B structures.

**Acknowledgements.** We would like to acknowledge the 2017 BVAR Project staff members, especially Hannah Zanotto, for providing guidance and extra paperwork when needed. We would also like to thank Jorge “Tlico” Can and Eduardo Cunil for their hard work and encouragement during this process, as well as the other BVAR Project workmen who work tirelessly to make our projects run smooth. Finally, we would like to thank Dr. John Morris and the staff at the Belize Institute of Archaeology for allowing us to continue to work and do research at Xunantunich with the BVAR Project. Financial support for this research was provided by the Tilden Family Foundation (San Francisco, California).

**Table 1:** Lot inventory for Burial B1-4.

<i>Area</i>	<i>Operation</i>	<i>Unit</i>	<i>Lot Number</i>	<i>Lot Description</i>	<i>Excavation Dates</i>	<i>Context</i>	<i>Location in Unit</i>	<i>Class</i>	<i>Description</i>
Str. B1	GB-2017	B1-1	B1-1-5	Burial B1-4	May 30-June 1	Cache/Burial B1-4	Western portion	Chert	3 chert blades
Str. B1	GB-2017	B1-1	B1-1-5	Burial B1-4	May 30-June 1	Cache/Burial B1-4	Western portion	Ceramics	Various pottery sherds
Str. B1	GB-2017	B1-1	B1-1-5	Burial B1-4	May 30-June 1	Cache/Burial B1-4	Western portion	Human Remains	Various skeletal elements
Str. B1	GB-2017	B1-1	B1-1-5	Burial B1-4	June 1-2	Burial B1-4	Eastern portion	Marine Shell	Shell beads
Str. B1	GB-2017	B1-1	B1-1-6	Burial B1-4	June 1-2	Burial B1-4	Eastern portion	Marine Shell	Worked shell pendant
Str. B1	GB-2017	B1-1	B1-1-6	Burial B1-4	June 1-2	Burial B1-4	Eastern portion	Ceramics	Various pottery sherds
Str. B1	GB-2017	B1-1	B1-1-6	Burial B1-4	June 1-2	Burial B1-4	Eastern portion	Human Remains	Various skeletal elements
Str. B1	GB-2017	B1-1	B1-1-5/6	Burial B1-4	May 31-June 2	Mixed matrix from screening		Ceramics	Various pottery sherds
Str. B1	GB-2017	B1-1	B1-1-5/6	Burial B1-4	May 31-June 2	Mixed matrix from screening		Human Remains	Various skeletal elements
Str. B1	GB-2017	B1-1	B1-1-7	Burial B1-4	June 5-6	Burial B1-4	Unit	Ceramic	Miniature jar
Str. B1	GB-2017	B1-1	B1-1-7	Burial B1-4	June 5-6	Burial B1-4	Unit	Human Remains	Various skeletal elements

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# THE 2017 INVESTIGATIONS OF STRUCTURES A9, A28, & A1 AT XUNANTUNICH, BELIZE

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## INTRODUCTION

In this report, we describe excavations and conservation work conducted at Structures A9, A28, and A1 at Xunantunich by the Belize Valley Archaeological Reconnaissance (BVAR) Project during the 2017 field season. This work was carried out as part of the Xunantunich Archaeology and Conservation Project (XACP), which operates under the auspices of BVAR and has been conducting research and conservation at the Xunantunich site core since 2015. For a more detailed description of the XACP's objectives and past work, please refer to Zanotto and Awe (2017). The primary objectives during the 2017 field season excavations of Structures A9, A28, and A1 continue to support the overall goals of XACP. These goals include (1) preserving the architecture of the three structures to enhance tourism potential of the site, (2) increasing understanding of the final phases of occupation of Late Classic Xunantunich, and (3) elucidating factors that contributed to the late, rapid development of the site.

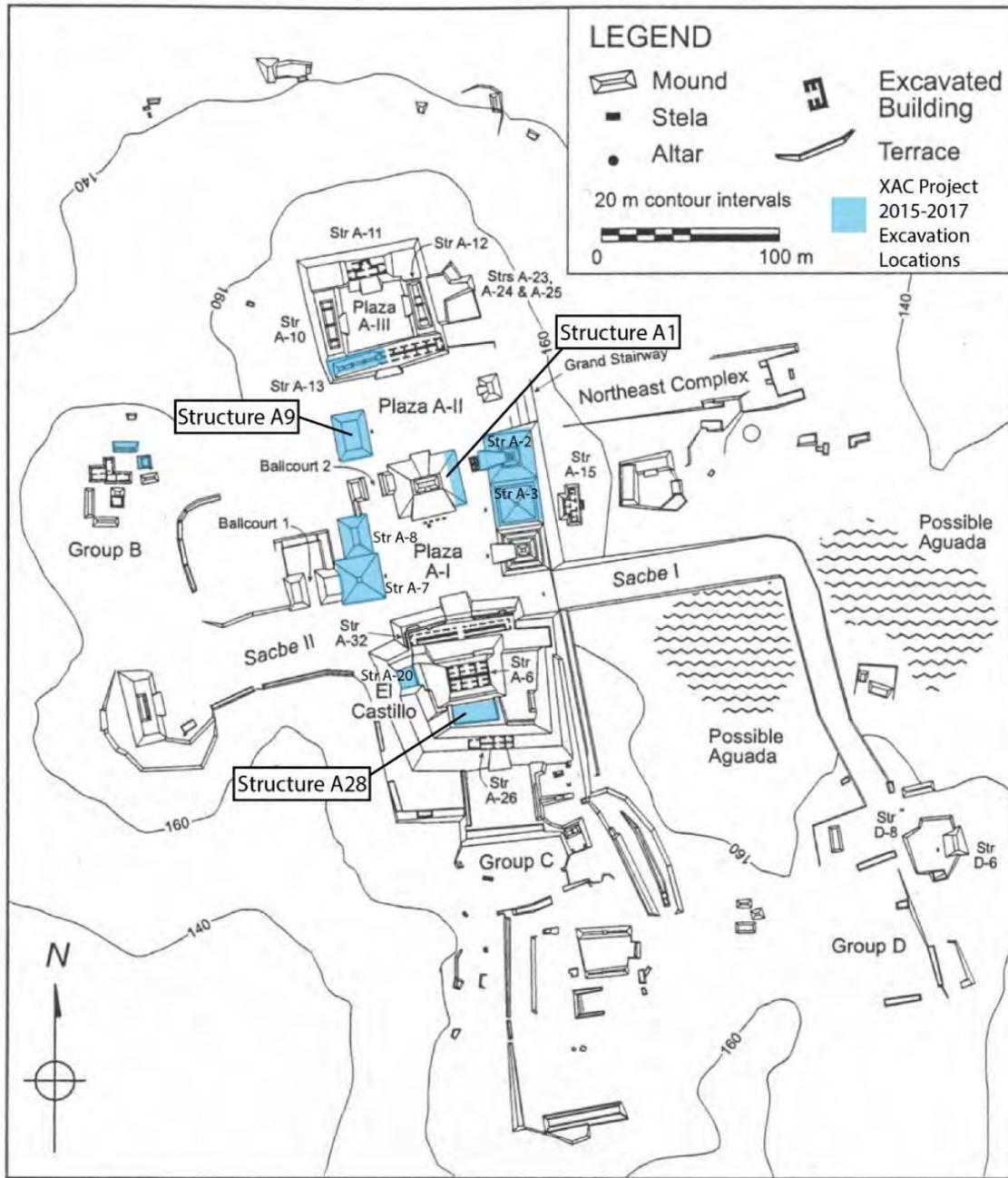
## EXCAVATIONS AND CONSERVATION OF STRUCTURE A9

Structure A9, located toward the north end of the Xunantunich civic-ceremonial epicenter on the western edge of Plaza AII, is a pyramidal structure measuring approximately 10 m in height and 25 m wide at its base (Figure 1). The objectives of investigations at A9 during the 2017 field season were to complete conservation of the building's east face and explore levels below the terminal floor of Plaza AII to increase understanding of earlier plaza floor construction sequences. The 2017 investigation of Structure A9 provides additional information that contributes to understanding Xunantunich's earlier development and Terminal Classic period occupation.

### Structure A9 Background

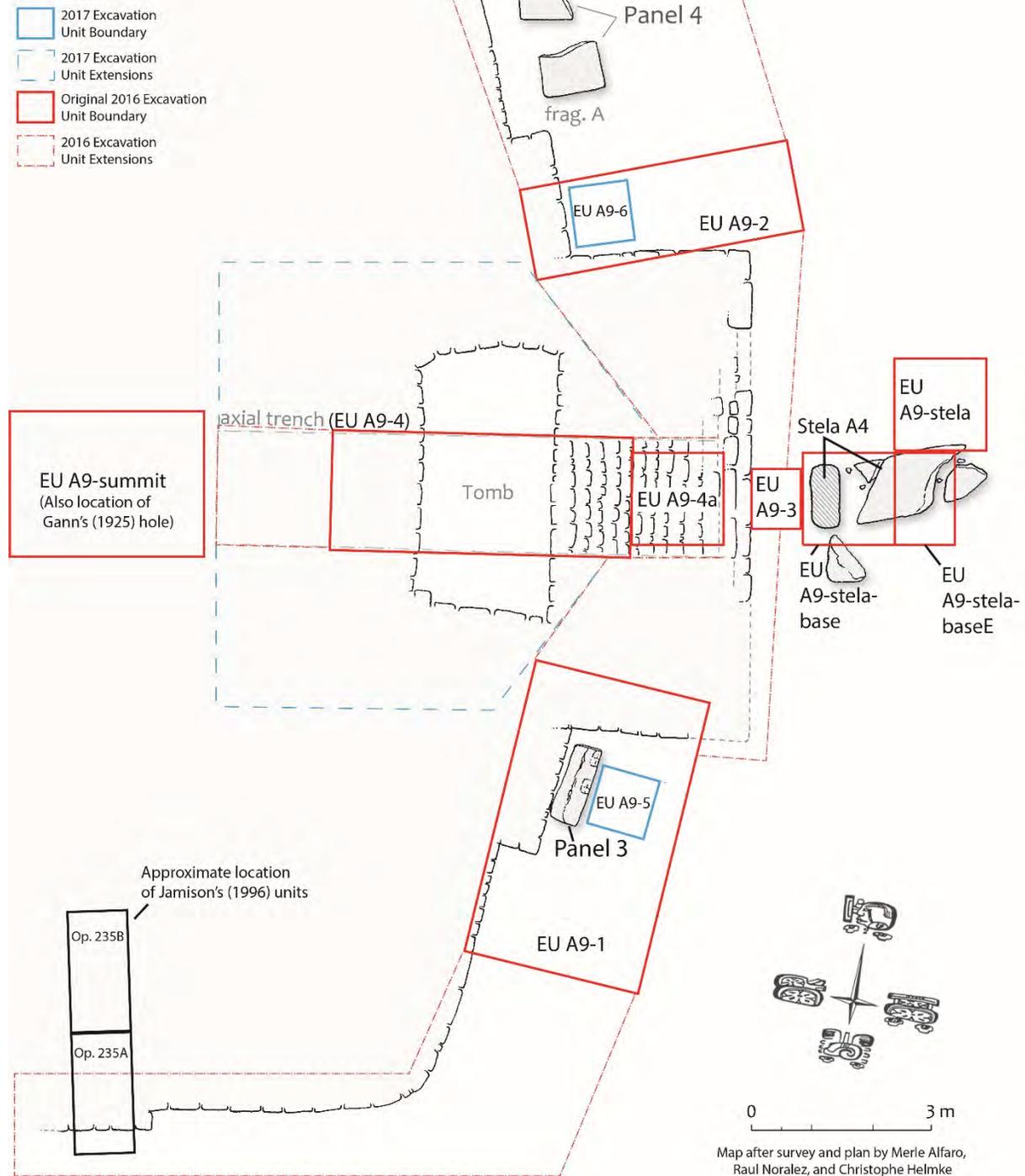
Prior to the XACP excavations in 2016 (Tilden, Slocum et al. 2017), two previous researchers performed minimally invasive investigations at A9. The first was Thomas Gann (1925) who located an intrusive burial at the summit of the structure. Based on Gann's (1925) description, the burial contained high status grave goods, such as jadeite, but was not enclosed in a tomb. Tilden and colleagues (2017b) note the burial Gann recovered may have been similar to Terminal Classic period (AD 750-900/1000) burials found at other Belize Valley sites such as Cahal Pech.

The second researcher to investigate Structure A9 was Thomas R. Jamison (1996) with the Xunantunich Archaeological Project (XAP). Jamison placed two units (Ops. 235A and 235B) on the south face of A9 and noted a modification to the structure's south face (Figure 2). According to Jamison (2010), this modification may have occurred at the same time as modifications to Ballcourt 2, which is located to the south of A9, and post-dates A9's original construction. The XACP 2016 excavations on the south face of A9 (Tilden et al. 2017b:323) confirmed the presence of this later modification.



**Figure 1:** Xunantunich site map indicating location of XACP excavations (after Yaeger 2005).

# Xunantunich Structure A9 Planview



**Figure 2:** Structure A9 planview indicating previous and 2017 excavation unit locations.

XACP began intensive excavations of Structure A9 in 2016 with three primary goals. First, XACP wanted to conserve the structure to enhance the overall visitor experience upon entering Plaza AII, the main entryway to the site core (Tilden et al. 2017b:316-317). Second, the XACP investigation sought to determine if A9 was built in only one or two construction phases, in a similar manner to other structures in the Xunantunich site core. Third, the investigation served to continue the search for evidence of a relationship between Xunantunich and Naranjo, another major Maya center located 13 km to the west in the Petén region of Guatemala. This third objective stemmed from an argument by previous archaeologists working at the site (Freiwald et al. 2014; LeCount and Yaeger 2010) that Xunantunich's late, rapid rise to prominence may have been due to its relationship with Naranjo.

The 2016 excavations resulted in several unanticipated discoveries. Horizontal excavations at the base of A9 (see Figure 2, EU A9-1 and EU A9-2) exposed two hieroglyphic panels flanking the building's axial stairway. Helmke and Awe (2016a, 2016b) concluded that these panels were placed at Xunantunich shortly after Naranjo's defeat of Caracol in AD 680, and were likely war booty provided in exchange for Xunantunich's assistance to Naranjo in the victory over Caracol. Vertical excavations unearthed two caches of eccentric lithics, one at the base of an uncarved collapsed stela (EU A9-stela-base) and another below the plaza floor just in front of the first step of the axial stairway (EU A9-3; see Sullivan 2017; Tilden et al. 2017b). Finally, a burial in a large tomb was discovered below the axial stairway, approximately midway up the structure (Tilden et al. 2017a). The tomb contained the remains of one male individual, 37 whole ceramic vessels, 1 partial ceramic vessel, 13 obsidian blades, 6 jadeite beads, two bone hairpins, a shell ring, plus faunal remains including deer and jaguar. Hieroglyphic dates from two of the ceramic vessels in the tomb and radiocarbon dates from the human remains coincide with the defeat of Caracol by Naranjo in AD 680 and link the individual in the tomb to this military event (Awe et al. 2017; Slocum et al. 2017; Tilden et al. 2017a). The hieroglyphic and radiocarbon dates also place the primary construction of A9 in the early part of the Hats' Chaak phase (AD 670-780).

### **Structure A9 East Face Excavations**

The main goal of the 2017 field season was to complete conservation of the east face of Structure A9. The tomb, located just beneath the east face of A9, was conserved during the fall of 2016. To complete the remaining east face conservation work, the axial trench (EU A9-4) was extended horizontally to the north and south across the east face of A9 to expose the terminal phase construction, and EU A9-2 was extended to the north to continue exposure of the lower north terrace and corner north of the axial stairway (see Figure 2). The excavated material was not screened from these unit extensions, but artifacts were collected during excavation.

#### *EU A9-4 (Axial Trench) Extension*

The horizontal clearing of the east face of Structure A9 exposed the axial construction steps, which extended over two-thirds of the way up the building. Conservators located a portion of the construction wall of the second terrace and used this portion of wall as a guide to complete conservation of the second terrace's construction wall (Figure 3). Based on observations of the size and angle of the structure, A9 likely was composed of three terraces. Artifacts recovered during horizontal clearing include ceramics, chert, obsidian, granite (a ground stone *metate*

fragment), and freshwater snail. Two special finds located during excavation just north of the axial trench include one side-notched projectile point, diagnostic of the Terminal Classic period, and a head fragment of an anthropomorphic effigy vessel (Appendix A, Figure 14).

### *EU A9-2 Extension*

Excavation unit A9-2 was started in 2016 as a 1.5 m (N/S) by 4.5 m (E/W) unit placed just to the north of the axial stairway shortly after the discovery of Panel 3 to locate architecture at the base of A9 and explore for another inscribed panel (Tilden et al. 2017b: 322). Panel 4 was located when EU A9-2 was extended an additional 3 m to the north. In 2017, EU A9-2 was extended 3 more meters to the north to expose the remaining terminal phase architecture at the base of A9's east face including the wall of the first terrace and the structure's northeast corner. Unlike A9's extremely well-preserved southeast terrace wall and corner, the lower terrace wall north of the axial stair and the northeast corner of the structure were not intact, and only the lowest course of stones from the northeast terrace wall and corner remained (Figure 4). The absence of the stones from the northeast base of A9 may be the result of the stones being robbed by the Maya in antiquity for other building purposes.



**Figure 3:** Structure A9 post-conservation.



**Figure 4:** Structure A9's northeast base, view facing south. Excavations at A9's northeast base exposed the lowest terrace wall with missing facing stones.

### **Structure A9 Plaza Floor Excavations**

The second objective of the Structure A9 excavations was to enhance understanding of cultural activity prior to the terminal phase construction of A9. To pursue this objective, two new excavation units (EU A9-5 and EU A9-6) were placed on either side of the axial stairway in front of the stair-side outsets (see Figure 2). In 2016, XACP excavations uncovered two earlier plaster floors below the terminal plaza floor in front of the base of the axial stairway. The first of these earlier floors (Floor 3) is located 10 cm below the floor which Structure A9 sets upon (Floor 2), and the second earlier floor (Floor 4) is located 35 cm below Floor 3 (Figure 5: Tilden et al. 2017b:324). Excavation units A9-5 and A9-6 were placed to determine if the previously recovered Floors 3 and 4 extended elsewhere across the plaza. Additionally, the placement of EU A9-5 and EU A9-6 at the base of the stair-side outsets allowed exploration for dedicatory caches, which are often found flanking axial stairways of pyramidal structures in the Belize Valley. The matrix from all lots and levels of EU A9-5 and EU A9-6 was screened through ¼ inch wire mesh, and all artifacts were collected.

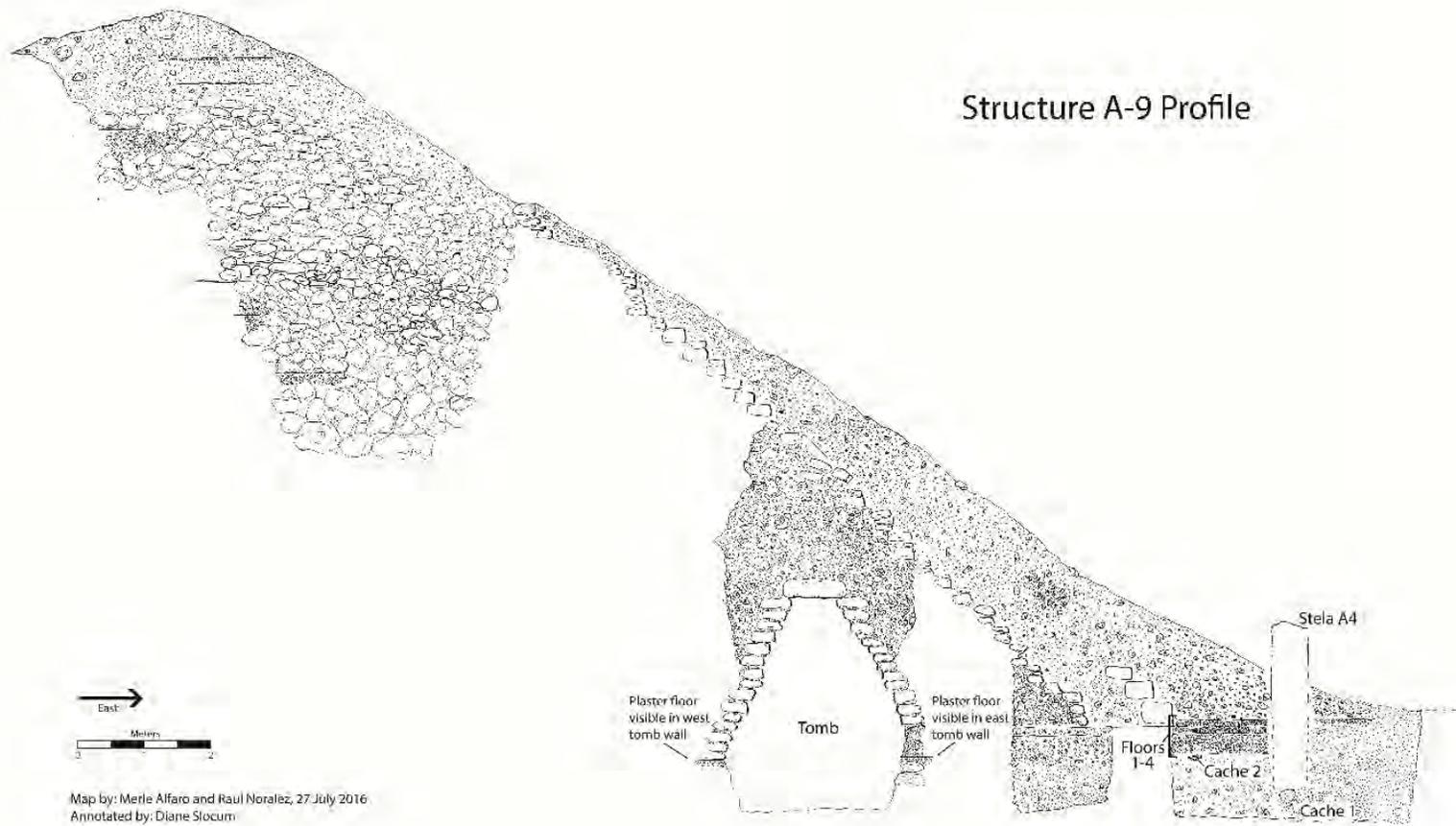
### *EU A9-5*

The 1 m by 1 m excavation unit (EU A9-5) was placed to the south of the axial stairway, just north of the stair-side outset and east of Panel 3, which was leaning against the southeast stair-side outset (see Figure 2). As Panel 3 rests angled slightly outward to the southeast, the excavation unit was angled to parallel Panel 3. The unit was placed directly on the plaza floor, as the humus and collapse from the structure had been cleared away in 2016 during the exposure of Panel 3 and surrounding architecture.

This unit exposed four plaster floors below the terminal plaza floor and ultimately extended down 258 cm to bedrock (Figure 6). Floor 1 lips up to the edge of A9 and likely would have lipped up to the edge of Panel 3. Panel 3 rests on the surface of Floor 2, the floor Structure A9 rests upon. Floor 1 is a re-plastering of Floor 2 and was in poor condition and highly eroded within the unit but was present just to the south of the unit. About 40 cm below Floor 2 is Floor 3. The matrix between Floors 2 and 3 is composed of ballast and fill, and artifacts collected from between Floors 2 and 3 include ceramics and chert. Floor 3 is a re-plastering of Floor 4, which is located just below Floor 3. Some portions of the plaster of Floor 3 appear to have been burnt and may be evidence of a ritual burning practice in antiquity. Below Floor 4 the matrix is a dark brown loam, and artifacts collected include ceramics, chert, and 22 jute shells (*Pachychilus* sp.). The rather high frequency of jute per unit area at this level is similar to that observed in EU A9-4, which was placed to explore below the axial construction steps in 2016 (Tilden et al. 2017b:324), and may serve as evidence for Preclassic occupation or simply be part of the fill material used to build up the plaza. Jamison (1992) and Zeleznik (1993) also observed large quantities of jute (*Pachychilus glaphus*) in a darker soil horizon during plaza floor excavations to the north and south of Structure A1, and it is possible this level below Floor 4 in EU A9-5 correlates to the levels with large quantities of jute observed in the 1990s. Fifty centimeters below Floor 4 is a 30-cm-thick layer of compact white marl that was placed in antiquity to build up and level the plaza floor. Artifacts were no longer present in the unit below the compact marl. Beneath the compact marl was a culturally sterile dark brown, highly compact paleosol layer that extends 50 cm to bedrock. The bedrock was just soft enough to chip away with a heavy pick, and to confirm we had indeed reached bedrock, we extended the unit an additional 30 cm into the bedrock.

### *EU A9-6*

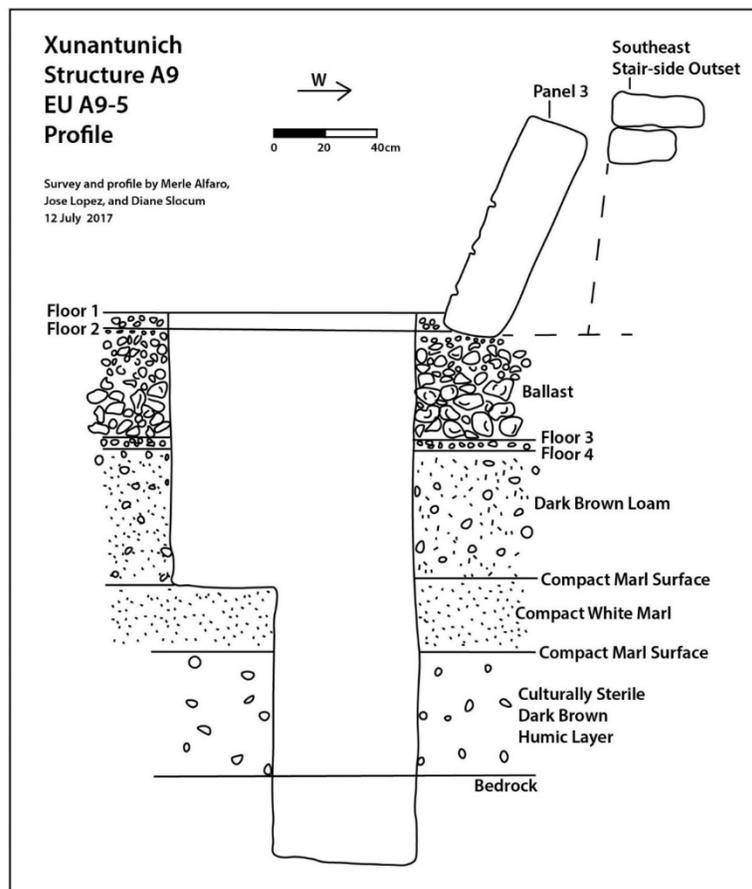
Another 1 m by 1 m excavation unit (EU A9-6) was placed to the north of the axial stairway and just east of the stair-side outset. The unit was placed directly on the terminal plaza floor, like EU A9-5, as humus and collapse had been removed in 2016 to expose architectural elements at the base of A9.



**Figure 5:** Structure A9 profile.

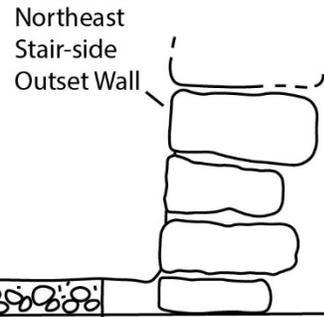
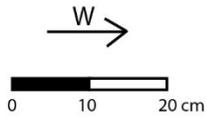
This unit extended 136 cm below the terminal plaza floor and ended at bedrock (Figure 7). In EU A9-6, we exposed Floor 1, which lips up to the edge of the structure and rests just on top of Floor 2. Floor 1 was highly eroded from the in-progress conservation work and was only present on the west edge of the unit against the stair-side outset. Floor 2, which Structure A9 rests upon, showed significant evidence for being burned in antiquity. We then exposed three more plaster floors (Floors 3-5). Floor 3 was in good condition and located 17 cm below Floor 2. Floor 4 was located 11 cm below Floor 3 and was in fair condition. Floor 5 was in poor condition and was exposed 7 cm below Floor 4. Floor 4 may be a resurfacing of Floor 5. In this unit, Floors 4 and 5 are at approximately the same level (35-40 cm below the terminal plaza floor level) as Floors 3 and 4 of EU A9-5, and likely are part of the same construction event.

The matrix below Floor 5 is a dark brown loam, and artifacts collected at this level include ceramics, chert, 1 freshwater shell, and 1 unworked piece of slate. Approximately 46 centimeters below Floor 5 is a compact marl surface placed in antiquity to level the plaza. Below this compact marl surface, no other artifacts were identified within the unit. Approximately 30 cm below the compact marl surface and 20 cm above bedrock we exposed another compact marl layer that also likely was placed by the ancient Maya to level the plaza surface just above bedrock.

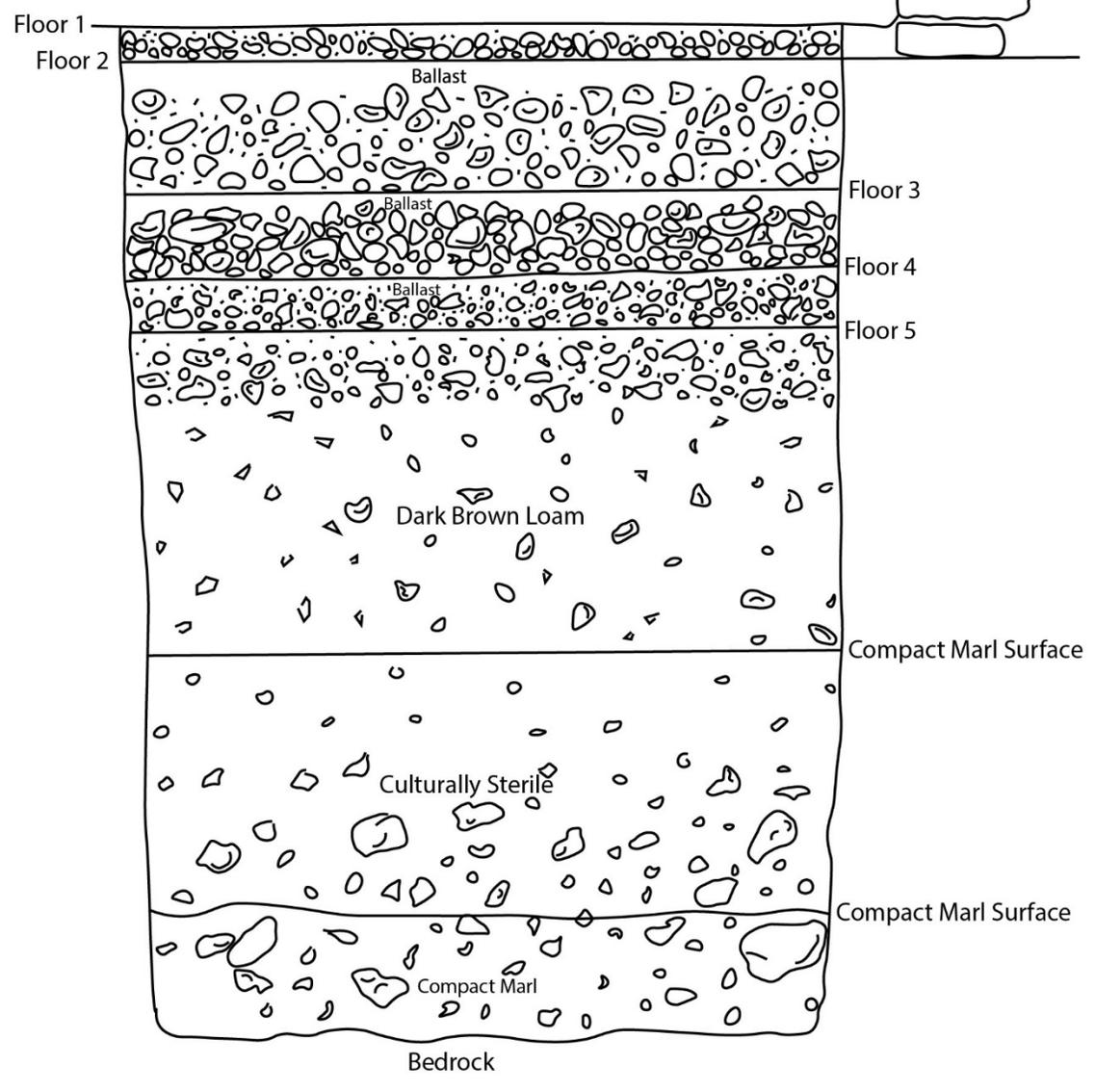


**Figure 6:** EU A9-5 profile.

**Xunantunich  
Structure A9  
EU A9-6  
Profile**



Survey and profile by  
Merle Alfaro and Diane Slocum  
18 July 2017



**Figure 7:** EU A9-6 profile.

## **Structure A9 Discussion**

The 2017 investigations of Structure A9 shed light on time periods after and before A9's main construction during the early Hats' Chaak (AD 670-780) (Tilden et al. 2017a, 2017b). First, the stones missing from the northeast portion of A9 were likely removed by the ancient Maya sometime during the Terminal Classic period (AD 750-900/1000). We suggest that Panel 4, which was found lying face-down on the plaza floor at the base of the first terrace just north of the stair-side outset (Tilden et al. 2017b:322), may have been knocked down during the removal of the terrace wall. Presumably, Panel 4 originally stood leaning against the north stair-side outset in a similar manner to Panel 3, which was recovered in 2016 leaning against the south stair-side outset. It is still unclear whether or not Panel 4 broke prior to or during this removal nor is it certain whether the removal of Panel 4 was a ritual termination of the monument. Regardless, the missing stones and evidence for movement of the monument provide additional support for continued cultural activity at Xunantunich after its Late Classic florescence. Terminal Classic activities such as the reuse of stones have been observed at several other structures in the Xunantunich site core (Awe et al. 2009; Slocum and Awe 2017).

Second, the two vertical excavations (EU A9-5 and EU A9-6) beneath the plaza floor enhance understanding of Structure A9's construction prior to the Hats' Chaak phase. In both units, we found evidence of an earlier re-plastered plaza floor (Floors 3 and 4 in EU A9-5 and Floors 4 and 5 in EU A9-6) approximately 35-40 cm below the terminal plaza floor. This earlier re-plastered plaza floor may indicate that at least one structure may be present beneath A9's terminal phase construction. A plaster floor at a comparable level was exposed in 2016 within EU A9-4 and within the tomb (see Figure 5). If present, this earlier structure would have been a low platform located west of the location of the tomb. Such low platforms typically supported a thatch structure. We further surmise the structure would have been a low platform because Tilden and colleagues (2017b:326) found no evidence for an earlier structure during the previous field season within the deep excavation unit placed at the summit of A9. Finally, EU A9-5 and EU A9-6 exposed evidence for the extensive amount of work necessary to create the foundation of Plaza AII in antiquity. The contrast in overall depth of the two units illustrates the unevenness of the bedrock on the hilltop, and the thick layers of compact marl demonstrate the necessary techniques to create a level surface for subsequent construction of structures. The lack of artifacts below the compact marl layer may indicate little human use of the area prior to the building of Plaza AII.

## **EXCAVATIONS AND CONSERVATION OF STRUCTURE A28 ON EL CASTILLO**

Structure A28, nicknamed the "Piscina," is located on the Upper Terrace of El Castillo above and to the north of Structure A26 and just south of and below Structure A6 (see Figure 1). A28 consists of platforms that surround a sunken plaza with stairways on the east and west ends of the structure that allowed for access in and out of the plaza area. The structure dates to the Hats' Chaak (AD 670-780) and Tsak' (AD 780-890) ceramic phases (Leventhal 2010; McCurdy 2016). Objectives for the 2017 field season were to (1) conserve the architecture exposed during the 2016 field season for tourism development and (2) excavate into the plaza floor to explore for dedicatory offerings or earlier architectural phases.

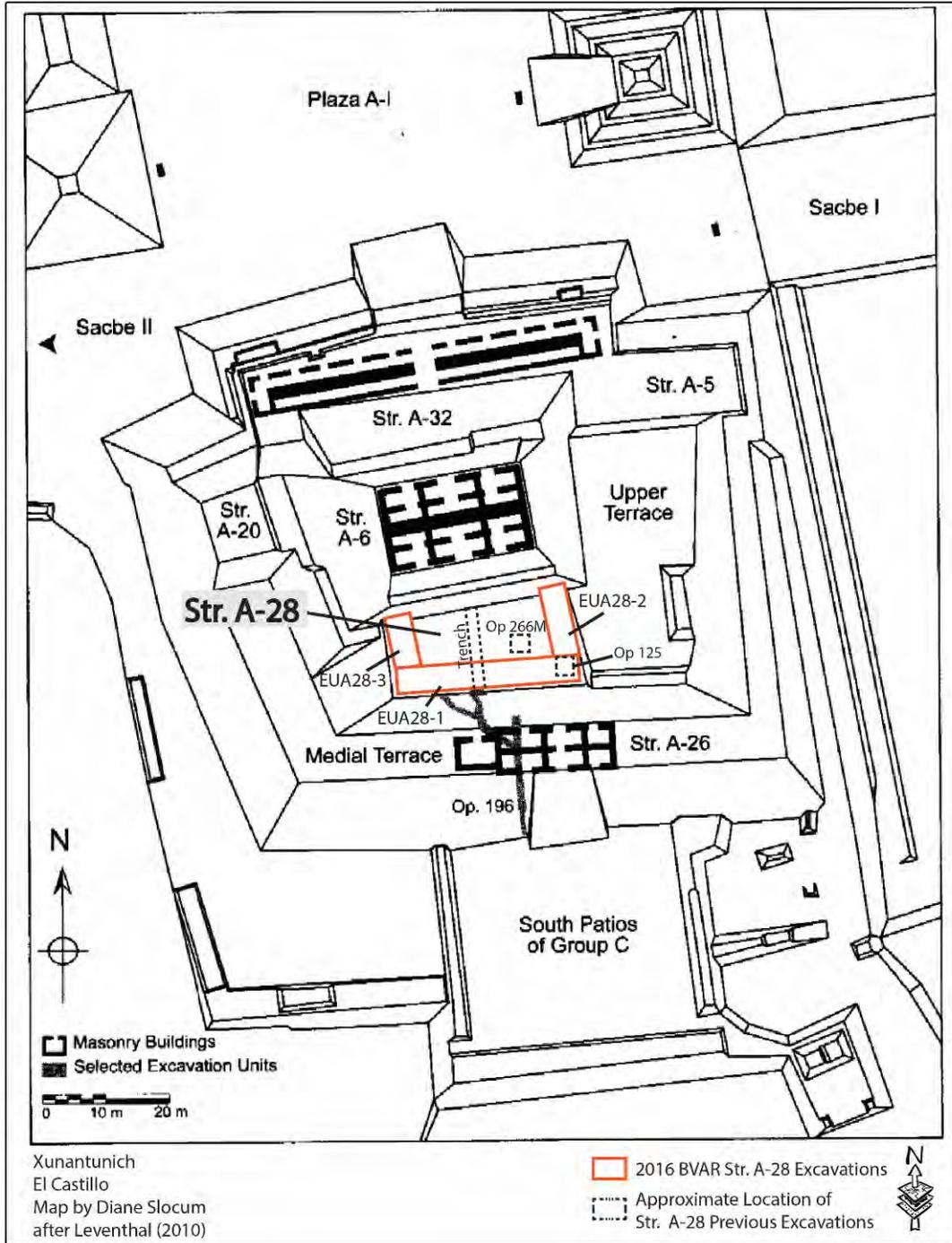
## **Structure A28 Background**

XACP began excavation of Structure A28 in 2016 with the primary goals of clarifying the architectural details of the structure and conserving the structure to enhance tourism (Slocum and Awe 2017). The 2016 XACP excavations included three perpendicular trenches (Figure 8) placed to expose the architecture surrounding the plaza area. These excavations exposed two parallel walls approximately 70 cm apart (the southernmost 1m high and the other 40 cm high) running along the southern edge of the plaza (Figure 9). The 2016 excavations also exposed low walls (50-60 cm high) on the east, west, and north edges of the plaza. The remains of a 4-m-wide stairway were located on the west edge of the plaza, and only a few stones from what was likely a similarly-sized stairway were located on the eastern edge of the plaza. Prior to the XACP excavations, XAP had placed test units (Op. 125) in the southeast corner of A28 (Robin 1994) and a trench and a deep test unit (Op. 266M) in the central plaza (Hays 1997). Suggestions of the structure's function vary. Hays (1997) argues A28 may have been a feasting area, and McCurdy (2016:353), who created computer reconstructions of A28 as part of her dissertation research, suggests A28 was a water retention area. Though the interpretation of the exact function of the structure remains debatable, the XACP 2016 excavations verified the architectural form of the structure suggested by previous researchers.

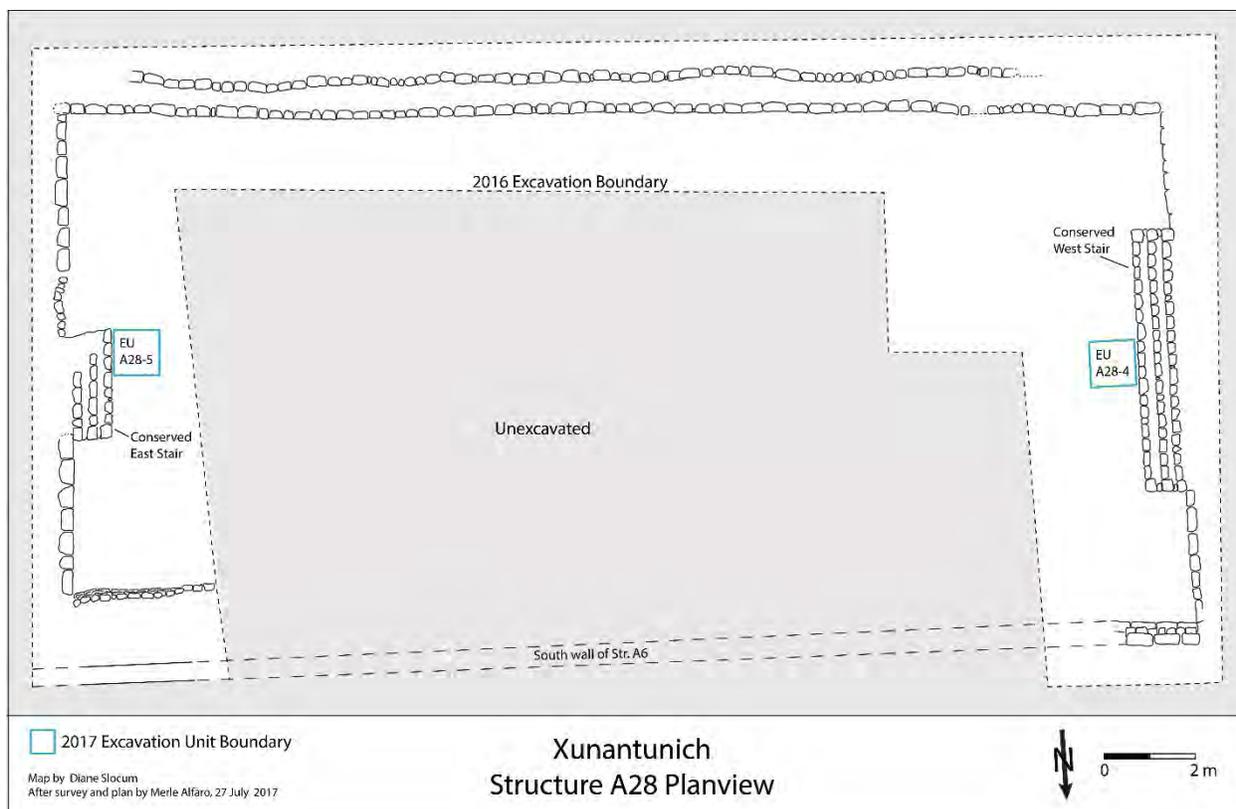
## **Structure A28 Methodology and Excavations**

During the 2017 field season XACP conserved the architecture exposed during the 2016 field season. Because only a few stones of the east stairway had been found, the conservators built a stairway on the east end of the structure to facilitate movement of tourist traffic into the plaza area (see Figure 9). The central section of the northernmost southern wall, which had been removed for placement of a PVC pipe in the 1990s (Slocum and Awe 2017:307), was also reconstructed to direct movement of foot traffic.

In 2017, two new excavation units (EU A28-4 and EU A28-5) were placed at the centerline of each stairway to search for dedicatory offerings and increase understanding of the construction sequence below the plaza floor (see Figure 9). Dedicatory offerings are commonly found along the centerline of stairways and structures at Xunantunich (Jamison 2010; Sullivan 2017), and our objective was to determine if this pattern of axial caches or burials was reflected at Structure A28. Because of time constraints, each unit was stopped at approximately 1 m deep. All excavated matrix was screened through ¼ inch wire mesh, and all artifacts were collected.



**Figure 8:** El Castillo planview indicating previous Structure A28 excavation units.



**Figure 9:** Structure A28 plan.

### *EU A28-4*

We placed EU A28-4, a 1 m by 1 m unit, at the centerline and in front of the base of A28's west stairway (see Figure 9). The unit began at plaza floor level and extended 95 cm deep (Figure 10). In this unit, we exposed two plaster floors (Floor 1 and Floor 2). Floor 1 was located just 2 cm beneath the bottom step of the stairway and is a re-plastering of Floor 2, which is located just beneath it. Floor 1 was heavily burnt in the southwestern edge of the unit alongside the bottom step of the stairway. Below Floor 2 we encountered a layer of compact marl mixed with chunks of chalky, white limestone that served as ballast. Below the ballast we exposed two perpendicular construction pen walls, one running E-W in the southern third of the unit that formed a corner with another running N-S just west of the center of the unit (Figure 11). Because we had obtained our basic objective and time constraints, we halted the excavations prior to reaching the bottom of the construction pen. No deposits were located. Artifacts recovered from EU A28-4 include a small number of ceramics and chert, one freshwater shell, and one obsidian blade fragment.

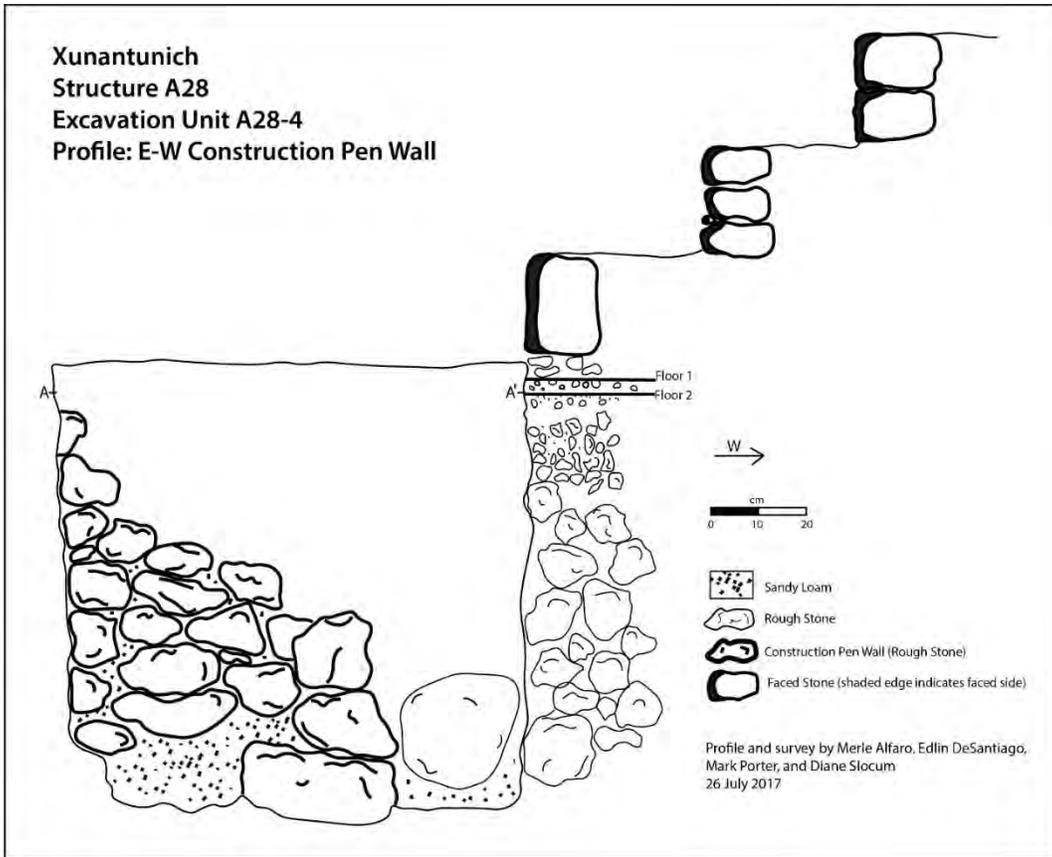


Figure 10: EU A28-4 profile.

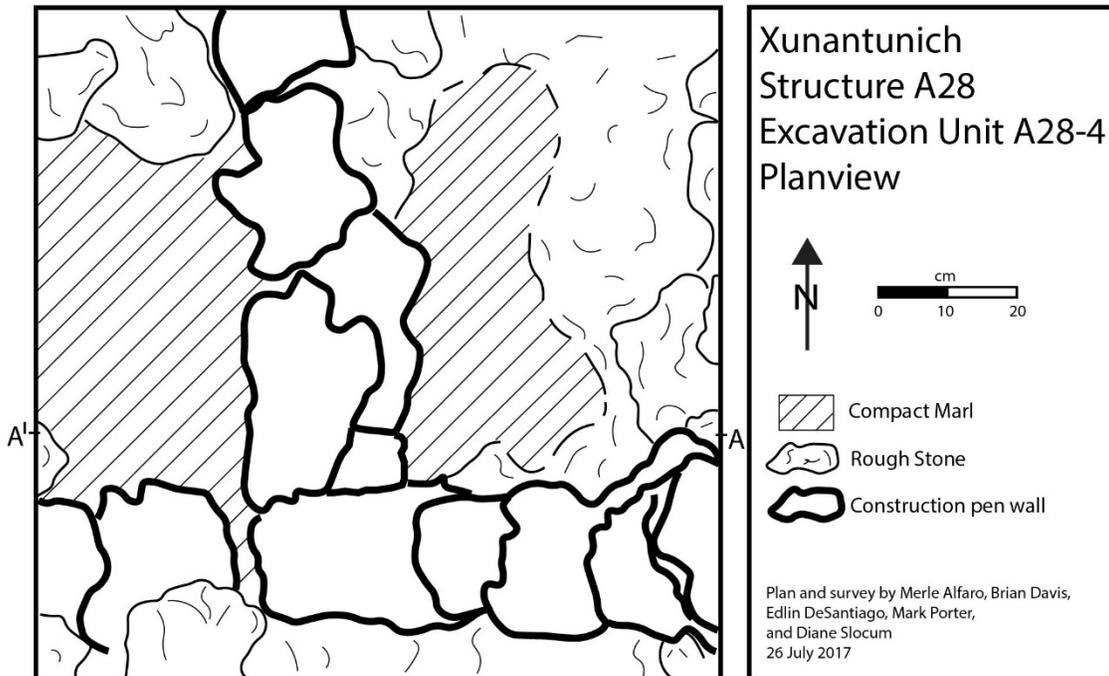


Figure 11: EU A28-4 plan.

EU A28-5

We placed a second 1 m by 1 m unit (EU A28-5) at the centerline and in front of the base of the east stairway (Figure 12). In this unit we exposed one plaster floor (Floor 1) in fair condition just below the lowest step of the stairway. Below Floor 1 was a layer of ballast composed of a brown, sandy clay loam and many limestone cobbles. Approximately 25 cm below Floor 1 and below the ballast, the matrix consisted of a medium compact, sandy clay loam with many large (40 cm diameter) boulders. At about 60 cm below plaza floor level, we encountered a layer of more highly compact marl fill. The compact marl layer continued, becoming increasingly more compact within the unit as we reached a depth of approximately 1 m. Excavations were halted at 1 m below the surface because our basic objective had been met. No deposits were located. Artifacts recovered from EU A28-5 include a small number of ceramics and chert, 1 obsidian blade fragment, and 2 parts of a ceramic figurine fragment designated as a special find (Appendix A, Figure 15).

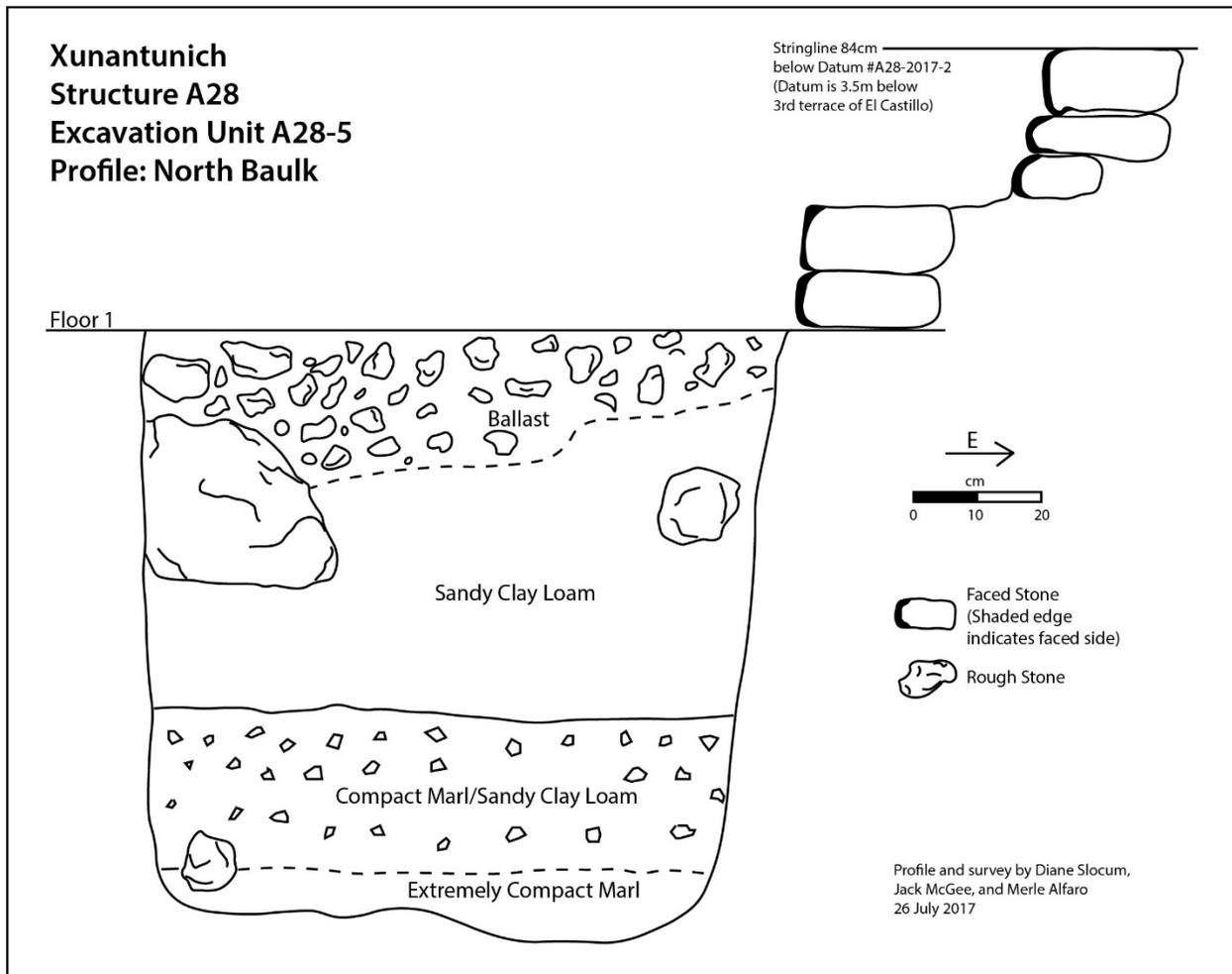


Figure 12: EU A28-5 profile.

## **Structure A28 Discussion**

While we did not encounter any deposits in EU A28-4 or EU A28-5, we did gain a better understanding of the construction of A28's plaza floor. Each unit exhibited slightly different architectural features and matrix characteristics demonstrating possible variation in building techniques across the plaza floor. First, in EU A28-4 we located two floors, the uppermost a re-plastering event of the Floor 2, whereas in EU A28-5 we located only one floor. It is possible, however, that either the re-plastering of the floor on the east side of the plaza had simply worn away or that no re-plastering took place on the east side of the plaza. Second, the ballast on either side of the plaza below the plaza floor was composed of different material. In EU A28-5, the ballast was similar to that identified immediately beneath the floors of Plaza AII in the vicinity of Structure A9 (a mixture of sandy clay loam and limestone cobbles). In EU A28-4, the ballast was most similar to the compact marl (below the ballast and fill) placed to level the bedrock for construction of Plaza AII. Third, excavations revealed no construction pen walls in EU A28-5 like those identified in EU A28-6. However, the excavation unit may have been positioned within a construction pen, as construction pens can be varying widths and depths.

Finally, in a reexamination of the overall architectural layout of A28 during conservation, we observed that the low (50 cm tall) E-W wall located in the northeast corner of Structure A28 and approximately 1.5 m south of Structure A6 is only present on the east side of the structure (see Figure 9). In 2016, we recorded a portion of the low northern wall in the west trench and assumed that it was a continuation of the low E-W wall recovered in the east trench (Slocum and Awe 2016:310). However, the wall segment exposed in the west trench is only the lower portion of the south facing wall of Structure A6, and its upper portion likely collapsed or the stones were repurposed in antiquity. Interestingly, the additional wall segment identified on the east side of A28 is also on the same side as the east stairway, which was found missing the majority of its stones. While the occurrence of the missing stones and low wall may be coincidental, the wall and missing steps suggest remodeling on the east end of the plaza that did not occur on the west end.

## **PRELIMINARY EXCAVATIONS AT STRUCTURE A1**

In the 2017 field season, XACP began excavations of Structure A1, a large pyramidal structure that divides Plazas A1 and AII (see Figure 1). The XACP excavations focused on clearing collapsed debris from the lower east face of A1 for the purposes of improving tourist access from Plaza AII to A1 during peak visitation periods and to search for possible monuments buried by collapsed debris.

In the 1990s, XAP had conducted excavation and conservation work at Structure A1. Thomas R. Jamison (1992) placed numerous 1 m by 2 m and 2 m by 2 m units on both the north and south faces of A1, as well as units in the surrounding plaza floors, and observed that modifications to A1 had been restricted to the south rather than north side of the structure. Scott Zeleznik (1993) also placed numerous units about the structure to clear the terminal phase architecture for consolidation purposes. Zeleznik concluded A1 was built during the latter half of the Late Classic in one construction phase and continued to be used and modified into the Terminal Classic period, likely functioning as a space for enactment of public rituals. XAP completed consolidation of A1 in 1995.

The XACP excavations placed one approximately 3-m-wide trench that extended the entire length of Structure A1 to expose portions of the lower terminal phase architecture. Exposed architectural material included two rows of facing stones along A1's southeast corner and collapse material from A1's east face (Figure 13). The excavations yielded a low concentration of artifacts including ceramics, chert, and slate. At the end of the field season, the excavations were stopped at about 40-50 cm above plaza floor level and will be continued in the 2018 field season.



**Figure 13:** The east face of Structure A1 prior to excavation (left) and post-excavation (right).

## **FUTURE RESEARCH DIRECTIONS**

The XACP will continue work at Xunantunich during the 2018 field season. Because of the project's emphasis on architectural conservation for tourism development, much of the research will be aimed at shedding light on the final phases of occupation at the site. While the XACP has no plans for further excavation at Structures A9 and A28 during the 2018 field season, there are several future research opportunities at these structures.

Conservation of the east face of Structure A9 was completed in the fall of 2017. This included the consolidation of A9's lowest terrace, part of the second terrace, the axial stairway, stabilization of the opening at the level of the tomb capstones to allow visitors to view the interior tomb architecture. Conservators also produced replicas of Panels 3 and 4 discovered during the 2016 field season. The replicas are to be placed in front of A9's stair-side outsets near where the originals were discovered. The original panels will be placed in the Xunantunich museum. Though there are no immediate plans for additional excavation at Structure A9, the XACP may explore beneath the stair block, which is west of the tomb capstones and east of the summit of the structure. The stair block is a common location on pyramidal structures to find burials or caches, and deep vertical exploration may also provide another opportunity to identify an earlier structure beneath the terminal phase.

The XACP is completing conservation at A28. Conservators removed the fill in the unexcavated plaza area at Structure A28 (see Figure 9) following the field season in the fall of 2017. An object of note found during the removal of collapsed debris in the central area of the

plaza floor was an uncarved stone panel measuring approximately 45 cm wide and 10 cm thick. Conservation will continue at A28 to improve the appearance of the south side of El Castillo and facilitate the flow of tourist traffic. Future conservation and research possibilities may include excavating around the exterior of the plaza area to better define architectural elements.

Research and conservation will continue in 2018 at Structure A1. Research goals include improving understanding of A1's terminal construction phase and use. Excavation along the east face of the structure will seek to identify any terminal deposits or architectural construction in the plaza area that may be indicative of Terminal Classic use. The XACP will also initiate excavations on the west face of A1, which articulates with the east half of Ballcourt 2. Defining architectural elements of Ballcourt 2 will allow for a comparison of Ballcourt 2 with Xunantunich's Ballcourt 1, as well as comparisons with ballcourts in the Belize Valley.

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## APPENDIX A: SPECIAL FINDS

<i>Structure</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>Artifact Description</i>
A9	A9-4	1	A9-4-1	Collapse	Chert	1	Side-notched projectile point, diagnostic of Terminal Classic period
A9	A9-4	1	A9-4-1	Collapse	Ceramic	1	Fragment of head of anthropomorphic effigy vessel
A28	A28-5	4	A28-5-2	Fill below Floor 1	Ceramic	2	Fragments of figurine



**Figure 14:** Structure A9 special finds. Side-notched projectile point (left) and anthropomorphic effigy vessel fragment (right).



**Figure 15:** Two adjoining ceramic figurine fragments from Structure A28 (EU A28-5).

**CLASSIC MAYA PALACES AND THEIR ROLES WITHIN THE GREATER  
CEREMONIAL CENTER:  
RESULTS FROM THE 2017 FIELD SEASON XUNANTUNICH, BELIZE**

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## **INTRODUCTION**

This report focuses on the excavations conducted by the Belize Valley Archaeological Reconnaissance (BVAR) Project during the 2017 field season at the Xunantunich epicenter as a part of the 3<sup>rd</sup> seasons in Xunantunich Archaeological Conservation Project (XACP), Operation A13-2017 and PLA3-2017. Plaza A-III and the encompassing structures have been recognized as the residence of the apical elite at Xunantunich, Belize. Investigations from the 2017 field season targeted Plaza A-III and the associated southern structure, A13 to further understand the role of this complex within the greater ceremonial center. This research was collaborative in nature and concluded with the conservation of Structure A-13 for tourist development and the public.

## **BACKGROUND**

The major center of Xunantunich became a prominent figure within the region around AD 600-670 during the Samal Phase. Xunantunich achieved political sovereign during the Late-Terminal Classic period (AD 750-900), a time when many other Maya polities were already in decline or political collapse (Figure 1; LeCount et al. 2002:41; NICH 2015; Yaeger 2005:5). The Classic Maya collapse, a still highly debated topic, denoted the culmination of dynastic ruler ship, a shift in cosmological worldview, and the demographic abandonment of many political centers (Culbert 1973; Shaw 2003). Events leading up to the collapse and the ways in which various polities responded to growing social tension (Demarest 1996), ecological degradation (Deevey et al. 1979), and drought (Hoggarth 2017; Kennett et al. 2012) have been of great interest to both scholars and the general public. Xunantunich provides a unique opportunity to examine a polity that endured longer than its peers, providing insight on how the apical elite of an ancient Maya polity continued attempting to legitimize their power and mediate risk in the face of socio-political disaster (Zanotto et al. 2016; see also Walden 2017).

## PREVIOUS EXCAVATIONS AT PLAZA A-III

Prior to excavations conducted by XACP, 1924 explorer Thomas Gann spearheaded archaeological investigations in Plaza A-III at Xunantunich (Figure 2; Gann 1925). Twenty-five years later, Euan MacKie would continue to explore the area, excavating Structures A-11 and A-15 in 1959 and 1960 (MacKie 1960, 1985). The Belize Department of Archaeology would continue MacKie's research throughout the 1980's which allowed the Xunantunich Archaeological Project to (XAP) to develop and continue investigating the palace during the 1990's (Harrison 1996; Jamison and Wolff 1994; Yaeger 1997). In 2002 and 2003 the Belize government implemented the Tourism Development Project (TDP), under the direction of Jaime Awe, to conserve the ceremonial center of Xunantunich for tourism purposes. Additionally, during the 2003 field season Jason Yeager investigated both Structure A-11 and the northern gallery on the eastern half of Structure A-13 (Yaeger 2005).

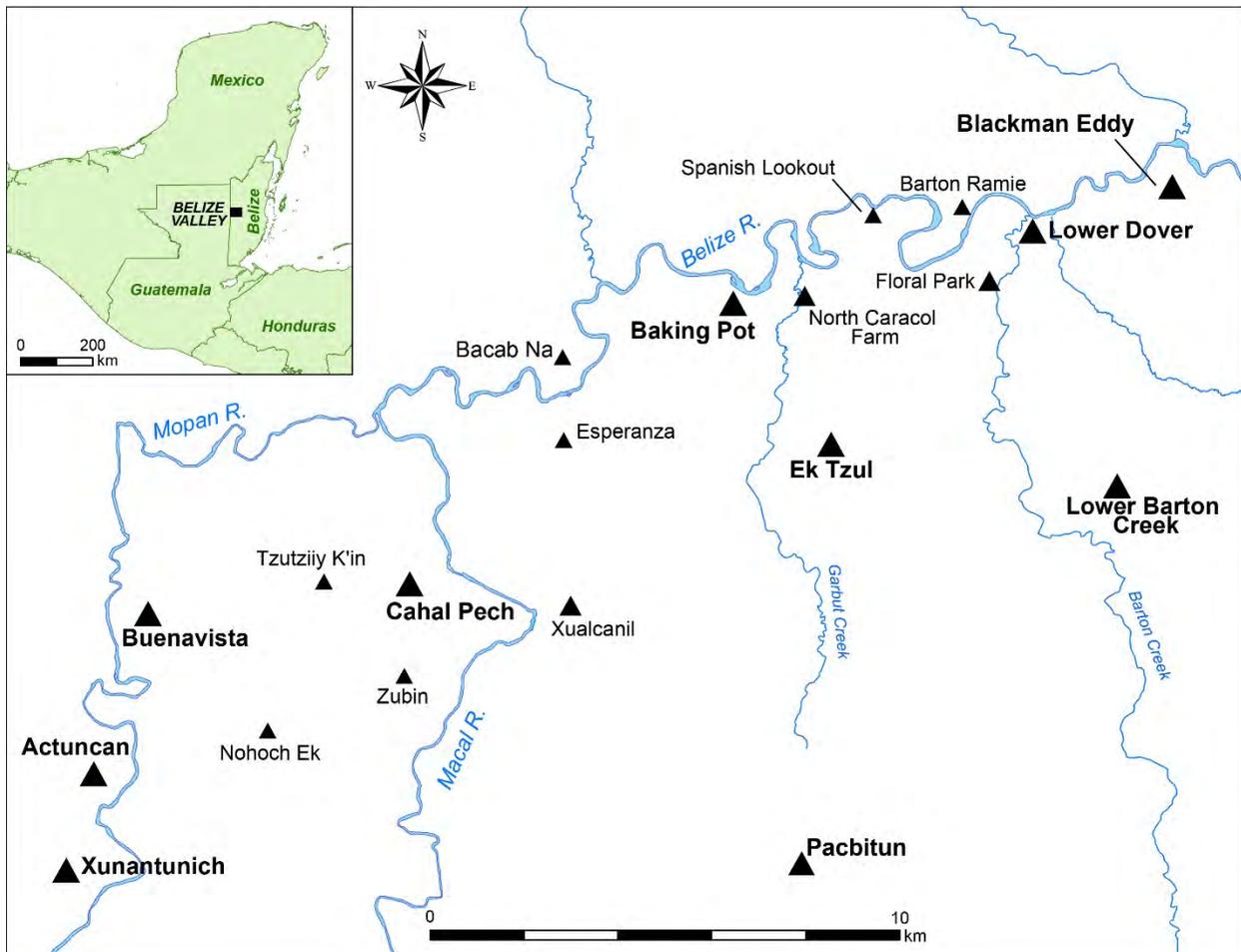


Figure 1: Map of the Belize River Valley (map by Claire Ebert, 2018).

## RESEARCH QUESTIONS

Investigations from the 2017 field season aimed to address the following questions through implementation of both horizontal and vertical excavation methods, as well as artifact and architectural analysis. These questions readdress some of the previous research done in the plaza to better understand the relationship between elite behavior and elite space.

1. Is Plaza A-III the residence of the ruling family during the occupation of Xunantunich or is it a space designated for lower ranking elite officials?
2. What is the chronological occupation of Plaza A-III, was it abandoned in the Hats Chak phases as previously suggested?
3. How can the functionality of this space point towards the greater behavioral patterns of the Maya upper echelon?

Research questions for the 2017 field season targeted the topic of behavioral patterns of the ruling dynasty of Xunantunich by conducting archaeological excavations in Plaza A-III. Plaza A-III and its associated structures are the northern most compound within the ceremonial center of Xunantunich. The Plaza A-III complex has been hypothesized to be the place of residence for the apical elite of the Xunantunich polity by the scholarly community based on architectural features and material assemblages recovered from excavations (Yaeger 2005). In 2017, both the BVAR Project and XACP decided to peruse investigations of Structure A-13's western half as it is the merging point of both public and private space within the complex. Investigating these points of converged perspectives are important for understanding the self-reflective view of the apical elites in comparison to the commoner point of view on elite's and their private space. These investigations will elucidate the structural functions of A-13, as previous documentation of the excavations on the eastern section are unavailable (Yaeger 2005). Investigations in Plaza A-III aimed to provide a chronological comparative for architectural development within the overall complex.

## METHODS

To address these research questions, the Xunantunich Archaeological Conservation project, in association with the BVAR Project, focused on excavating the western south-facing gallery of structure A-13 and the center point of Plaza A-III. Excavations on Structure A-13 aimed to uncover the assumed gallery of rooms that would mirror the eastern side of the structure, which was excavated by Yeager (2005).

For every excavation unit and lot, opening and closing elevations were recorded using the unit's corresponding datum. Additionally, opening and closing photos were taken for each lot to document progress, features, and the stratigraphy variance of each unit. Matrix consistencies were documented on each lot form, a Munsell matrix chart was not used. Both natural and cultural changes in stratigraphy were observed and used as indicators for changes in lots.

All artifacts were recorded during excavation and analyzed after removal. After each bag of artifacts were logged into the artifact inventory, they were washed according to the BVAR Project laboratory procedures and placed out to dry. Once dry, total frequencies per bag were

recorded and all artifacts were stored for future research or analysis. All diagnostic ceramics from the 2017 excavations in Plaza A-III and Structure A-13 were typed according to the ceramic type-variety created by James C. Gifford (1967). Further, all diagnostic lithic materials were analyzed by Anaïs Levin and are included in the artifact analysis section below. All obsidian and carbon samples were exported to Pennsylvania State University for further analysis.

### **Structure A-13**

As previously stated, 2017 excavations focused on the exposure of Rooms 6, 7, and 8 of Structure A-13. Three excavation units were opened to investigate these rooms, each room consisting of one large unit for uniformity. All units aligned to architecture, each roughly measuring 5.5 m N-S by 7 m E-W. Three datum were used for elevation documentation, each corresponding to a single unit and room. Prior to excavation, beginning elevations were recorded to measure the surface distance to any important feature found during excavations. Additionally, beginning photos were taken to display the progress of these investigations.

Once all three rooms were excavated in their entirety, two vertical units were opened in Room 6 to investigate the construction phases of Structure A-13. Room 6 was chosen for these excavations because of the damage cause to the bench during the collapse of the building, as well as the lack of graffiti on the bench surface. These conditions provided us with the opportunity to investigate the internal contents of the bench without further damaging the architecture.

Both units were aligned to architecture and explored the internal contents of the bench in Room 6. A 1.5 by 1 m unit was placed on the surface of the western section of the bench. This unit consists of three lots; A13-1-5, A13-1-8, and A13-1-9. Each lot indicates a change in cultural material, in this case, the discovery of a floor. The second unit designated to investigate the bench was placed on the central axis, at the convergence of the room floor and the rise to the bench and measured 1x1 meters (see Appendix A).

### **Plaza A-III**

Excavations of the central axis point in Plaza A-III (E.U. PLA3-1) aimed to identify any cultural or natural features. Additionally, plaza excavations focused on further solidifying our understanding of Structure A-13's construction phases and chronology. The investigators decided to place the plaza unit on the central axis of the plaza for a better chance at discovering earlier architectural forms as the Classic Maya often constructed platforms in the center of plazas (Christie 2003). The central axis of Plaza A-III was measured using two open reel measuring tape placed at the edge of each structure to create a cross within the plaza. The Plaza measured 32.40 m N-S by 31.20 m E-W. A 2 by 2 m unit was opened with the central axis positioned in the middle of the unit (see Appendix A). Material recovered from the Structure A-13 and Plaza A-III excavations are further discussed below.

Additional excavations in Plaza A-III focused on locating the stair that leads into the plaza. To carry out these investigations, two units were opened along the northern facing terrace of Structure A13 (PLA3-2, PLA3-2a). These exploratory excavations were implemented to better understand the structural layout of the internal plaza.

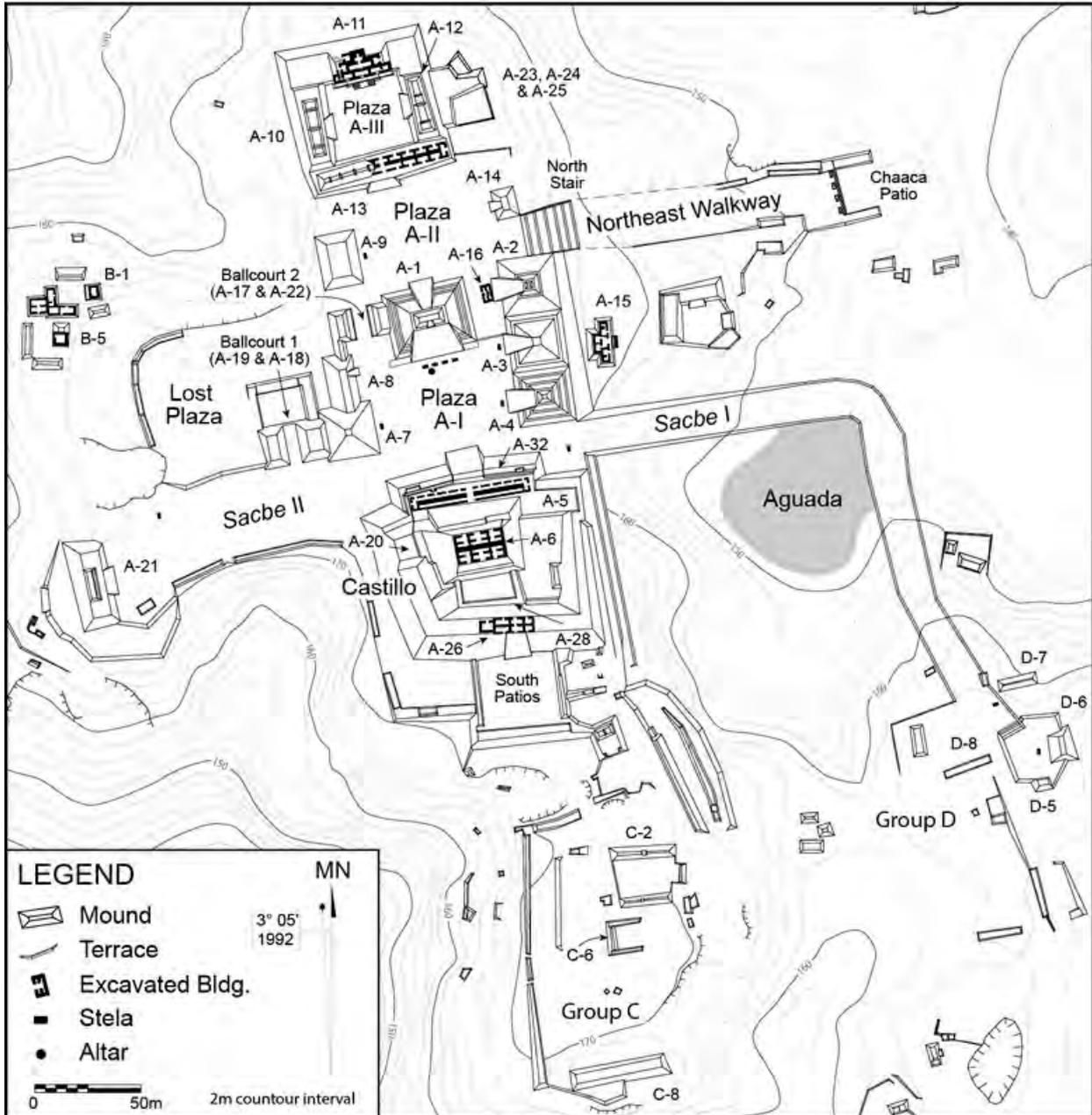


Figure 2: Map of Xunantunich (LeCount and Yaeger 2010).

## EXCAVATION RESULTS

### Burial A13-2017-001

Burial A13-2017-001 was recovered in lot A13-2-3 on the 6<sup>th</sup> of June, 2017 by the author and BVAR Project osteologist Kirsten Green-Mink, who also performed a standard osteological analysis on the remains. The following information is provided as courtesy of Green-Mink. The individual was discovered while excavating through collapsed architecture and architectural fill. The individual is believed to have been found in primary context and was found in the wall fill

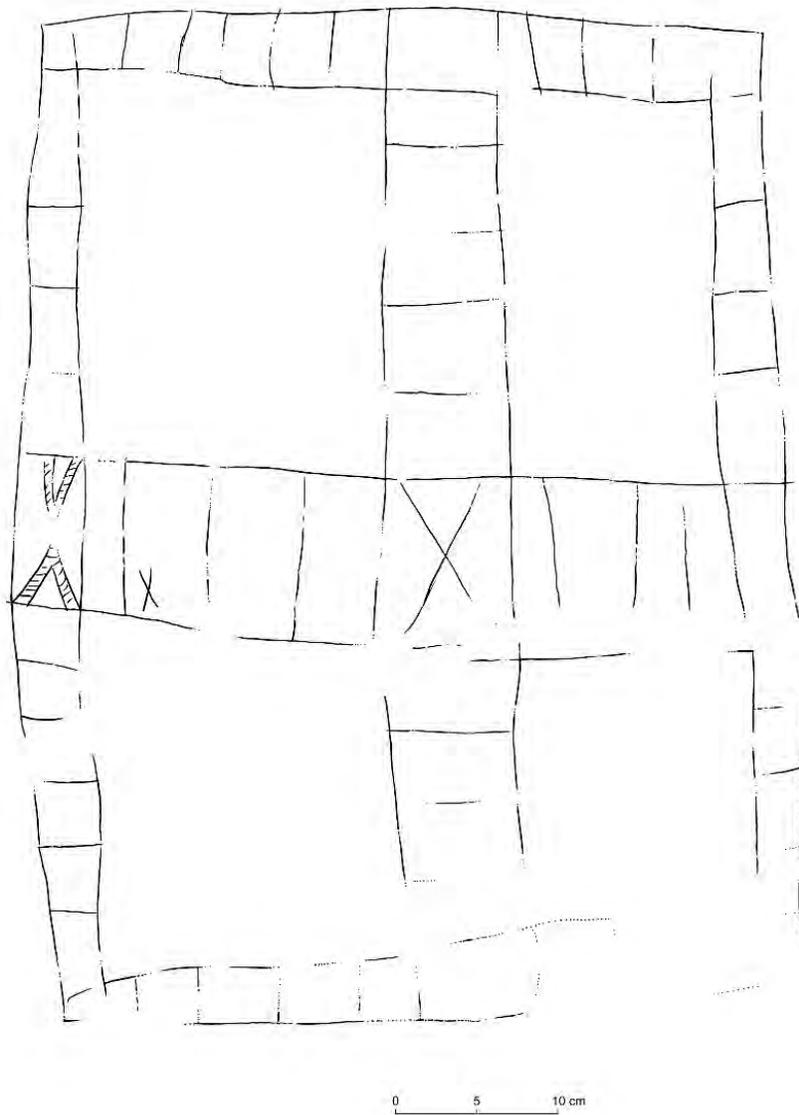
between Room 6 and Room 7 in Structure A13. The preservation was poor due to the limestone dust and fill material that caused severe degradation to the cortical bone. The age of adult is based on the size and completeness of the femora and tibiae, which are full grown. The sex was determined based on the small, gracile long bone shaft fragments, including the mostly complete femora, right humerus, 4<sup>th</sup> metatarsal, and the left ulna fragments.

The individual consisted of both right and left femora, tibiae, and fibulae in articulation and flexed at the knee. The legs were oriented north south with the knees towards the north. No other skeletal fragments were found in articulation. Several cranial fragments, including the petrous portion of the right temporal bone, were found near the proximal femur. The remains of the left humerus, ulna, and a left 4<sup>th</sup> metatarsal do suggest that at one point a complete individual was interred at this location. Unfortunately, this individual is less than 50% complete and due to the poor preservation, no pathology or trauma could be assessed and no measurements were taken (see Appendix A).

### **Graffiti**

During the 2017 investigations of Structure A-13, excavations uncovered well the preserved architecture of Rooms 6, 7, and 8, as well as the north facing interior terrace. Incised into these plaster surfaces, 14 graffiti remained preserved. Most of the graffiti found was etched into the surface of the room benches, while only two were discovered on other architectural features, one on the interior wall of Room 8 and the other on the terrace surface. The graffiti was documented upon discovery and recorded at night using raking light photography by Tia B. Watkins and Christophe Helmke (University of Copenhagen). Field sketches were made and measurements taken to secure the location of each graffito. Using edited, orthorectified and scaled photographs each of the graffito were drawn by Christophe Helmke. Subsequent efforts, towards the end of the season, saw Jorge Can (Institute of Archaeology, Belize) and J. Britt Davis (Northern Arizona University) taking additional photographs and measurements. All graffiti were mapped and illustrated by Christophe Helmke.

A catalog and description of each graffito is provided at the end of this report (see Appendix B). We will content ourselves with providing some general remarks here. By far the most common motif is that of the *patolli* board. Partial, and apparently unfinished, *patolli* boards were documented in Room 6 (Graffito 6-1) and Room 8 (Graffito 8-1), whereas complete boards were identified in Room 7 (Graffito 7-1) and on the terrace along the doorway to Room 13 (Graffito 13-1). Given the prevalence of such *patolli* boards it is clear that there is an affinity between these and the persons making use of Structure A13. Multiple functions have been proposed for *patolli* boards, ranging from the purely religious and divinatory to their use in games and gambling (Walden and Voorhies in press). Based on their number and the contexts in which these are found in Structure A13 (usually in corners and partly out of sight from the doorway), we suspect that these *patolli* were used as pastimes and that the persons making use of this structure, were evidently quite fond of this game—assuming that these were rendered and used as expedient means of entertainment (see Walden and Voorhies 2017).



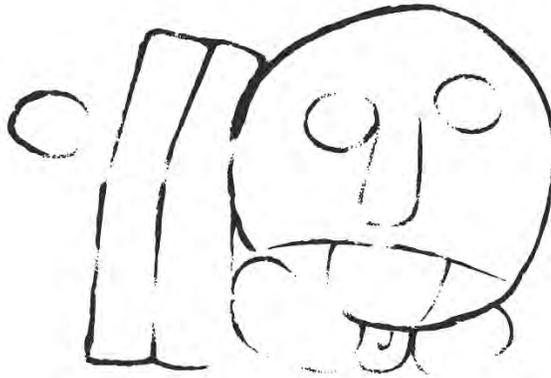
**Figure 3:** Graffito 1 of Room 7, representing a complete *patolli* board (drawing by Christophe Helmke).

In addition to these *patolli* boards, graffiti of Structure A13 is strongly figurative, emphasizing the human forms and subjects. These include an elderly male figure with a large headdress (Graffito 7-2), a seated scribal figure (perhaps an *ajk'uhu'n*, lit. 'worshipper', see Zender 2004), apparently gazing into a mirror as part of scrying ritual (Graffito 7-4), warrior figures brandishing a spear (Graffito 7-6) and another striding figure holding a shorter *atlatl* dart (Graffito 7-8), and finally a standing figure in an unclear scene (Graffito 8-3). These representations may duplicate some of the events and scenes that unfolded outside of the doors of these rooms, thinking of the warrior figures and the elderly figure with the headdress. The seated scribal figure evidently suggests something else, as though this may have been one of the functions of these rooms, or perhaps represents a sketch by one who was literate, given the detail and accomplished line.



**Figure 4:** Seated male figure representing a sacerdotal figure gazing into a mirror, Graffito 7-4 (drawing by Christophe Helmke).

The remaining graffiti can be described as indistinct forms, unclear etchings (Graffiti 7-3, 7-5, 8-2), forming patterns and forms, partly geometric and resist coherent description and interpretation. In contrast to these is the glyphic notation rendered near the middle of the bench of Room 7 (Graffito 7-7) that records a calendrical date. This is clearly the date **11-AJAW**, presumably read as *buluch [ta k'in] ajaw* in the Classic Period (i.e. '11 on the day Ajaw'). Assuming that this is an abridged k'atun Period-Ending date, meaning that this records a date in the Long Count that commemorates and "even" k'atun ending, then this can only be anchored to the dates 9.5.0.0.0 and 9.18.0.0.0, for the entirety of the Classic period. Of these, the first is much too early, but the latter is more plausible since it can be correlated to the 11<sup>th</sup> of October AD 790, in the Gregorian proleptic calendar, using the 584285 correlation coefficient. This date thereby gives us not only a *post quem* date for the construction of Structure A13, but also provides us with framework for the time frame during which these rooms were in use. As such, much of the graffiti in these rooms is contemporary with their primary usage.



**Figure 5:** The Calendrical date 11-Ajaw etched into the middle of the bench of Room 7, Graffito 7-7 (drawing by Christophe Helmke).

Interestingly, we can also say something about the manner in which these graffiti were etched into the architectural surfaces. Not all graffiti can be used to say something about the posture and body position adopted while realizing the incisions, but in some cases the orientation of a given motif provides an indication. This is particularly the case with Graffiti 7-2, 7-4, 7-7 and 7-8. In these examples, the base of the design is best viewed from within the room, as though the person who had incised these sat on the bench and looked outwards. Thus for G7-2 the orientation or line of sight (measured as an azimuth that runs vertically through the axis of the drawing) is  $180^\circ$  (south), whereas that of G7-4 is  $141^\circ$  (southeast), G7-7 is  $161^\circ$  (south), and G7-8 is  $257^\circ$  (west). We can thereby conclude that the person(s) incising these graffiti must have sat near the middle of the bench, in the best illuminated portion of the room and that these designs were etched without impeding or blocking the access of natural daylight. Assuming that these were produced during the primary phases of the structure's use, as seems to be the case, we can see that the very center of the bench was the primary activity area of the users of the rooms, the darker recesses being left to secondary activities, including the playing of *patolli*, partly away from prying eyes.

Considering that some graffiti overlap one another, it seems clear that there are multiple phases in the use and application of these designs with the rooms. This is also made clear by the varying quality of the graffiti, some rendered by more capable hands, whereas others are much more rudimentary. The presence also of a calendrical record as well as the depiction of what may be a scribal figure, both lend weight to the idea that literate individuals used these rooms, during the primary phase of usage, in the Late Classic. This has important implications for our understanding of the functions of individual rooms, but also for the greater function of *audiencia* structures as a whole.

### **Plaza A-III**

Investigations of Plaza A-III corroborated with previous research conducted in the area. Excavations (PLA3-1) recorded two construction phases, one terminal and one penultimate. These phases were in the form of plaster floors (Floor 1 and Floor 2). Floor 1 is the terminal, or final,

construction floor of the plaza, measuring roughly 10 cm below the humic layer. Excavations penetrated through Floor 1 to investigate materials used for fill below Floor 1 as well as to locate any earlier architectural features. Floor 2 was uncovered 30 cm below Floor 1 and was in poor condition due to the type of fill used to stabilize Floor 1. Excavations through Floor 2 revealed no further cultural features and reach bedrock 60 cm below Floor 2. The bedrock was heavily eroded appearing soft and powder like.

Excavation unit PLA3-2 reached the terminal construction phase of both the plaza floor as well as the northern terrace of Structure A-13. Additionally, excavations in this area of the plaza achieved the locating of the entry stair. Heavily damaged from collapse, the stair consists of two steps. Prior to these excavations, the plaza stair had not been explored, since we were able to locate the stair, this architectural feature can be contributed to the plaza map.

### **Artifact Analysis**

As previously stated, all obsidian artifacts and radiocarbon samples were exported for further laboratory analysis to the University of Pittsburgh. Results from these analyses are ongoing and will be reported on upon analysis completion. Ceramic analysis was conducted by Tia B. Watkins and Rosamund Fitzmaurice using the type-variety for the Belize Valley (Gifford 1967; see Appendix C). Lithic analysis was conducted by Anaïs Levin.

#### *Structure A-13*

Few artifacts were recovered from Structure A-13 throughout the 2017 field season. Those that were recovered consist of small ceramic sherd, chert, groundstone, and obsidian. Notably, the lack of material remains in all rooms (6, 7, and 8) suggests the rooms were swept clean prior to abandonment or contained minimal items to begin with. All ceramics from the Structure A-13 excavations correlate to the Spanish Lookout phase (AD 700-900). The seriation results align with the occupation chronology of the site, Late/Terminal Classic.

#### *Plaza A-III*

Comparably, few artifacts were recorded for the PLA3-2 excavations. Those documented were ceramic, chert, and slate materials. Notably, the slate found in unit PLA3-2 was a large slab that had gone through a fire event, which left the slate in brittle condition, breaking upon discovery. In contrast to Structure A-13 and excavations of the terrace, many artifacts were recovered from the PLA3-1 excavations, likely because this unit investigated vertically rather than horizontally.

Ceramic analysis for the PLA3-1 excavations was essential to solidify our understanding of the architectural development at Xunantunich and the transition from public to private space. Opening excavations recorded ceramics from the Spanish lookout phase, which is expected as these were the last materials left at the site before abandonment in the latter half of the ninth century. Further excavations investigated beneath the terminal plaza floor (Floor 1) and revealed a slight variance in chronology when compared to the materials found above the floor, displaying a small presence of the Barton Creek ceramic phase which correlates to the Late Preclassic period

(300-100 BC) (Table 1). Ceramics recovered from beneath Floor 2 (PLA1-3) exhibit larger quantities of Preclassic materials in addition to materials dating to the Late/Terminal Classic.

The seriation sequence recorded for the central plaza of Plaza A-III provides insight on the occupation chronology of the Plaza A-III area. The abundance of Preclassic ceramic sherds beneath Floor 2 points towards an early occupation in that area, also noted by Yaeger (2005). More precise dating may be achieved through future research in the area using Radiocarbon dating.

Lithic materials also displayed variance in tool type as excavations penetrated through the plaza floors. The lithic assemblage about Floor 1 (PLA3-1-1) was minimal and consisted primarily of debitage. Similarly, lithic materials beneath Floor 1 (PLA3-1-2) were minimal, although some core fragments were present along with debitage, one bifacial tool, and one flake tool. In contrast, the quantity of lithic materials spiked when investigating beneath Floor 2 (PLA3-1-3). Lot PLA3-1-3 recovered 113 lithic specimen, the largest quantity of all three lots. Similarly to both upper lots, the assemblage beneath Floor 2 contained more debitage and cores than bifacial or flake tools.

The lithic analysis has provided a lens into the construction methods used to build up Plaza A-III. During the initial construction of Plaza-AIII, the Maya would have needed to level the area by filling ditches and uneven planes as the bedrock in this area undulates frequently. Additionally, the decrease in lithic materials throughout the upper fill may suggest a shift away from lithic production in the immediate area as time progresses and the early Plaza A-III complex develops into a place of administration.

## CONCLUSIONS

The 2017 field season yielded much information about Plaza A-III and associated Structure A-13. Excavations in Plaza A-III confirmed a two-construction component to the plaza. Materials recovered from the PLA3-III provided information about the compounds occupational chronology through ceramic seriation. The association of early ceramic materials with the earlier construction phases provides a relative date for the earlier occupation of the complex. The presence of early ceramic types in the plaza compared to the lack of early ceramics found in Structure A-13's vertical units suggest A13 may have been a later addition to the Plaza A-III complex. In agreeance with Yaeger (2005:20), the structural layout and location of structure A-13 suggests the building would have served administrative purposes. The addition of Structure A-13 during the Late Classic period would have been necessary for administrative peoples to increase their privacy as Xunantunich became more politically involved.

The presence of the graffiti throughout Structure A-13 shifts function interpretation away from an apical elite residence, towards being the integrating point between lay peoples and either spiritual leaders (Haviland and Haviland 1995), or administrative persons. The probability of Structure A-13 serving as a meeting place between commoner and elite administrative peoples seems logical when considering architectural layout and material assemblages primarily utilitarian). This also may suggest other structures in the plaza to have served private administrative functions, or residential space for elite officials.

The 2017 excavations provided additional evidence towards understanding the compounds past inhabitants. Further research is needed to gain full understanding of the compounds inhabitants and the intended functions of the structures. The 2018 field season will aim to address these inquiries further in hopes to determine the complexes' function as a "palace".

**Acknowledgments.** The senior author would like to acknowledge many individuals and associations that make this research possible, including the directors and assistant directors of the BVAR Project – Dr. Jaime Awe, Dr. Julie Hoggarth, Dr. Claire Ebert, and Dr. Chrissina Burke – for supporting these investigations and inspiring the persistence of ethical archaeological research. Additionally, we would like to thank both the National Institute of Culture and History and the Institute of Archaeology, Belize including all staff members and local Belizeans for their collaboration, dedication, and tenacity for protecting and preserving their cultural history. Special thanks go to Jorge Can for being a wonderful mentor and teacher and for being extremely patient. Thanks is also extended to the Can family for their generosity, hospitality, and for taking time out of their day to provide our students and supervisors with lunch. To Dr. Shawn Morton many thanks also for assistance in documenting the graffiti. A great many thanks is given to Doug Tilden and the Tilden Family Foundation (San Francisco, CA). This research would not be possible without you, we thank you for your dedication to preserve cultural heritage and your passion to spread human-kindness beyond borders.

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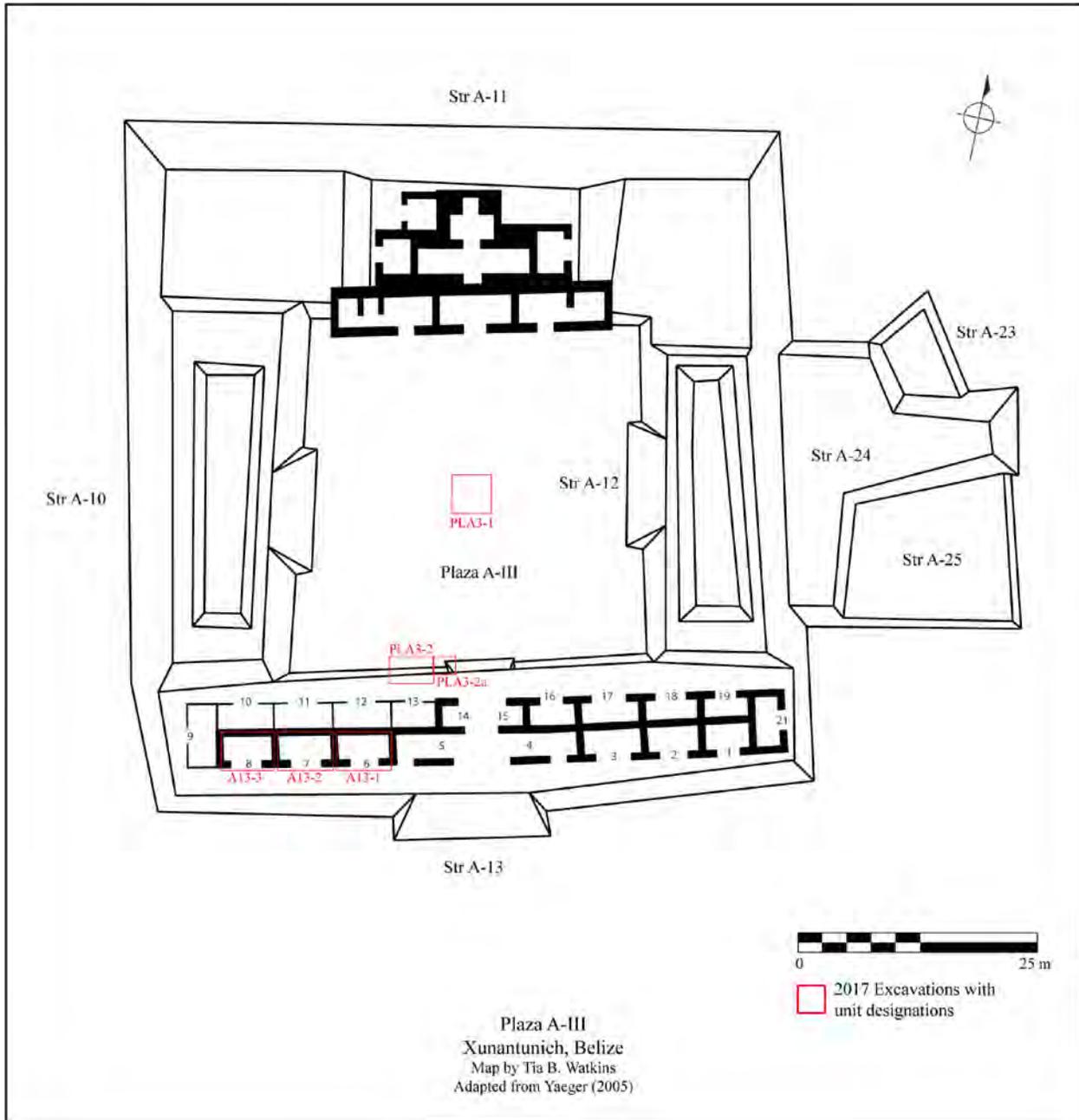
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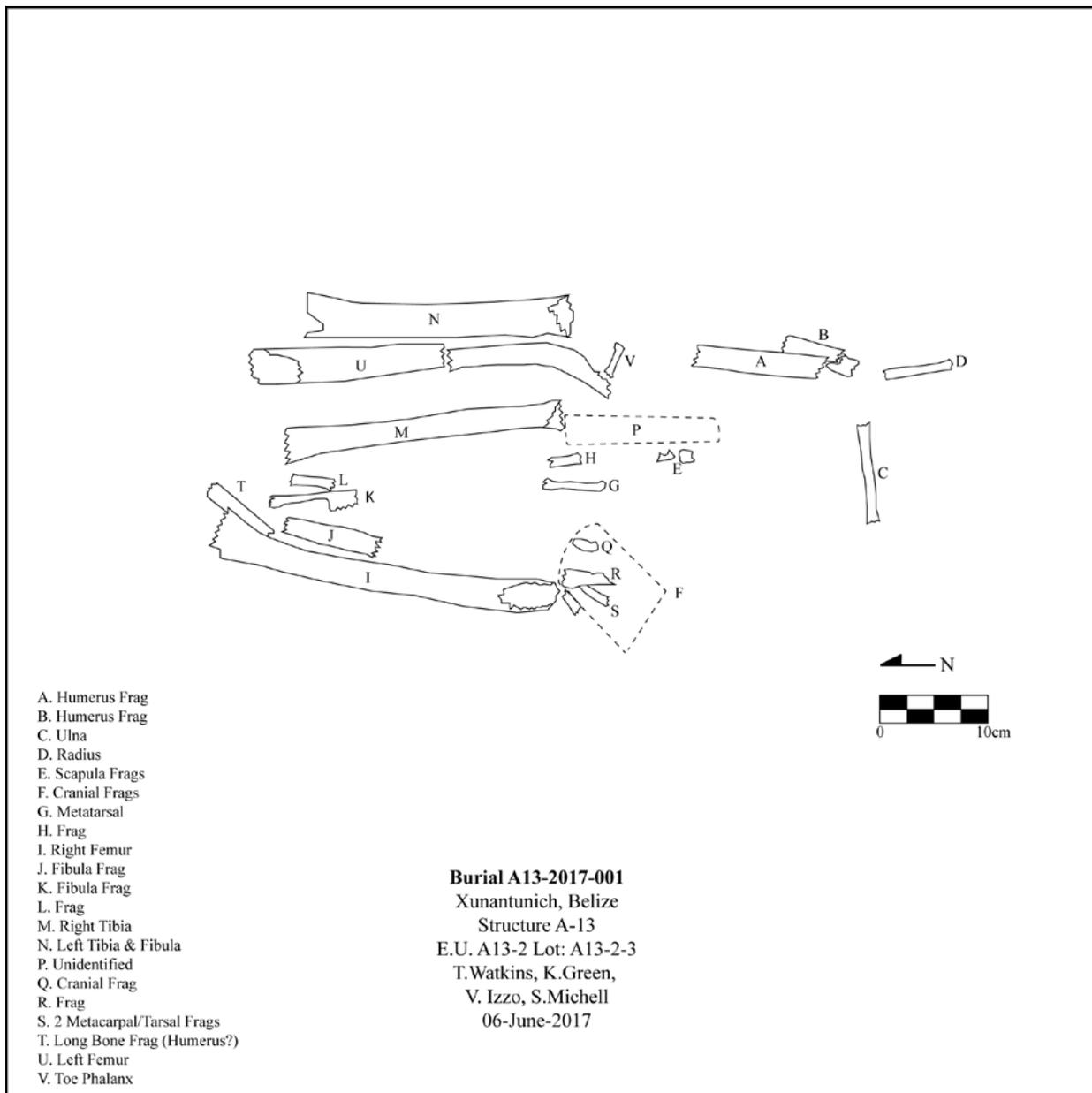
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**APPENDIX A:  
ADDITIONAL FIGURES NOT INCLUDED IN TEXT**



**Figure 6:** Plan of Plaza A-III with unit designations for the 2017 field season.



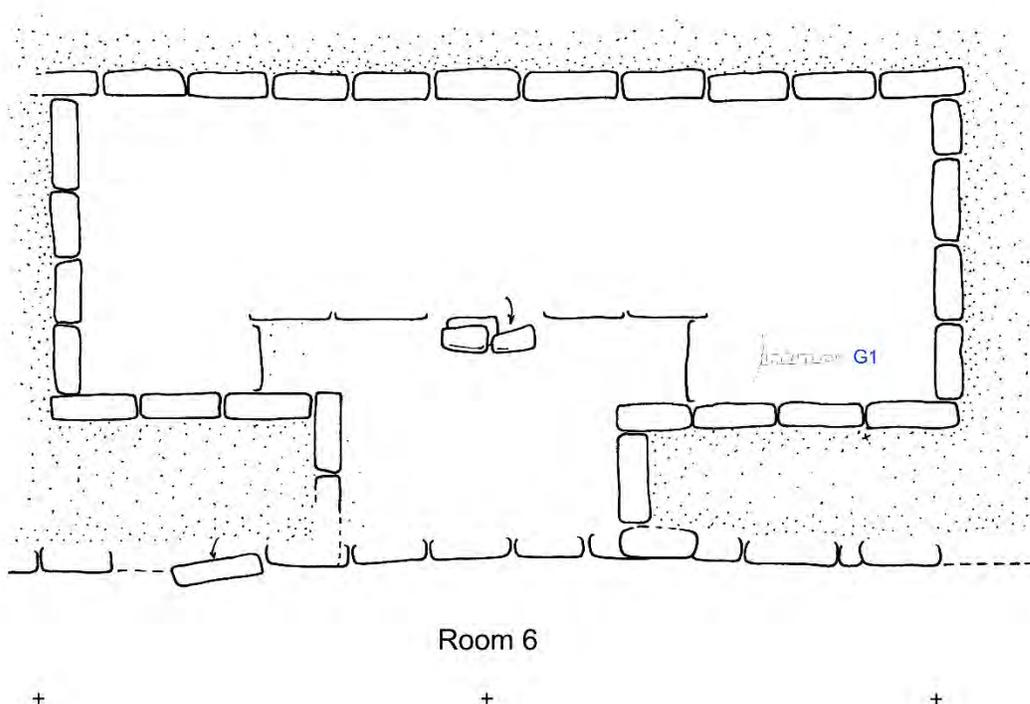
**Figure 7:** Plan of Burial A13-2017-001 (within collapse on the eastern side of Room 7).

## APPENDIX B: A CATALOG OF THE GRAFFITI OF STRUCTURE A13, WEST

By Christophe Helmke

Below each graffito exposed and recorded in Structure A13 during the 2017 season is described in terms of visual features and where possible, cursory interpretations are given for the iconographic and/or epigraphic features.

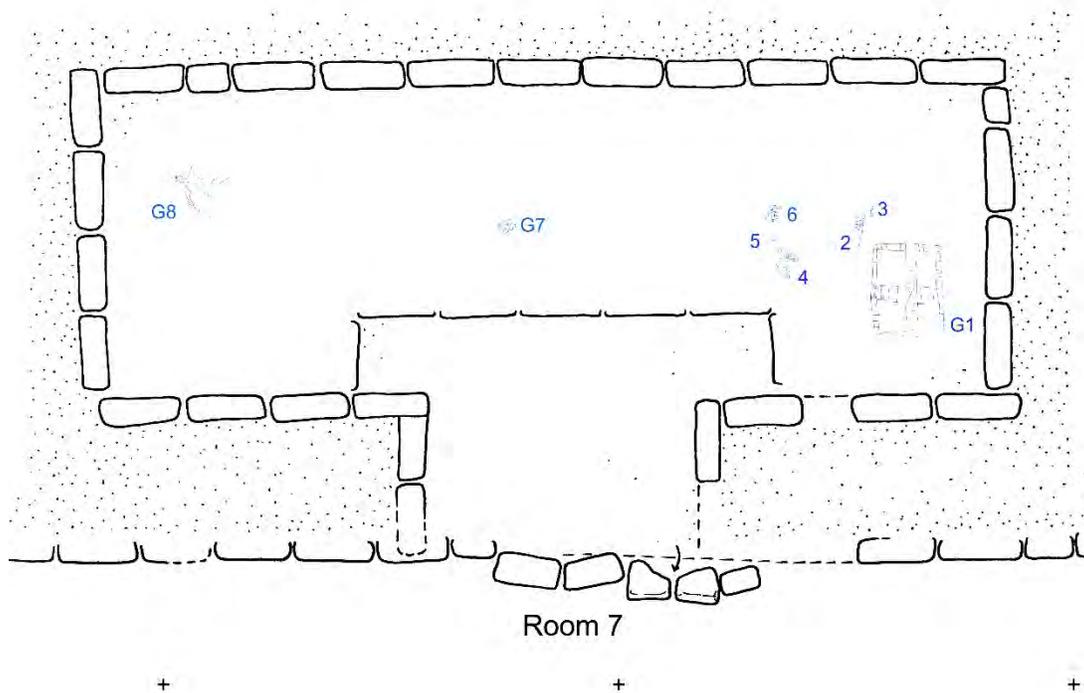
### Room 6



**Figure 8:** Plan of Room 6 showing the location of graffiti (plan by Christophe Helmke, based on surveys by Merle Alfaro, Tia Watkins and Christophe Helmke).

Graffito 1: The only graffito documented in Room 6 was found on the top of the bench surface in the southeastern corner of the room. Despite careful scrutiny, there is no indication that any other surface of the bench had ever been modified by the addition of such incised designs. What subsists at present of Graffito 1 can best be described as a ladder form that is oriented east-west, and composed of 15 squares, one of which (off-center) is marked with an X-shaped incision. On the basis of these features it is possible that this is part of a *patolli* board (see Walden and Voorhies in pres). Based on present evidence it appears as though this graffito was never completed, rather than the plaster surface having suffered erosion leading to its present appearance. Why such a *patolli* board should have been initiated and aborted remains unknown.

## Room 7



**Figure 9:** Plan of Room 7 showing the location of graffiti (plan by Christophe Helmke, based on surveys by Merle Alfaro, Tia Watkins and Christophe Helmke).

Graffito 1: Much like the graffiti in Room 6, in Room 7 the southeastern corner exhibits a complete *patolli* board. This *patolli* board is complete and appears to have been functional since it exhibits all the requisite playing fields, including a square frame, two intersecting bands in the middle (also marked by an X-shaped) and interestingly a large hatched X-shaped form at the middle leftmost field, suggesting that this may be a start point in the game. A smaller x marking is also present to the left. In all each column and row contains between 11 and 13 fields, disposed more or less regularly.

Graffito 2: This appears to represent the schematic profile of an aged male figure with a large pointed headdress. Thin lines emanating from the back of the head suggest long hair. The uppermost portion of the torso is also hinted out in broad outlined strokes.

Graffito 3: An indistinct and roughly serpentine form, although it is too schematic to make any conclusive interpretation.

Graffito 4: This represents a seated male figure, with a distinctive sacerdotal headdress, resembling those worn by the *ajk'uhu'n*, lit. 'worshipper' (Zender 2004). This was a particular group of priests that also had scribal functions, assisted the monarch and high members of the court in rituals and also cared for regalia and sacral statuary. This example, with crossed arms, appears to be gazing

into a mirror, presumably made of pyrite *tesseræ*, as part of what may be a scrying ritual. This is a well-achieved rendition, by a person who was well-versed in Maya iconography.

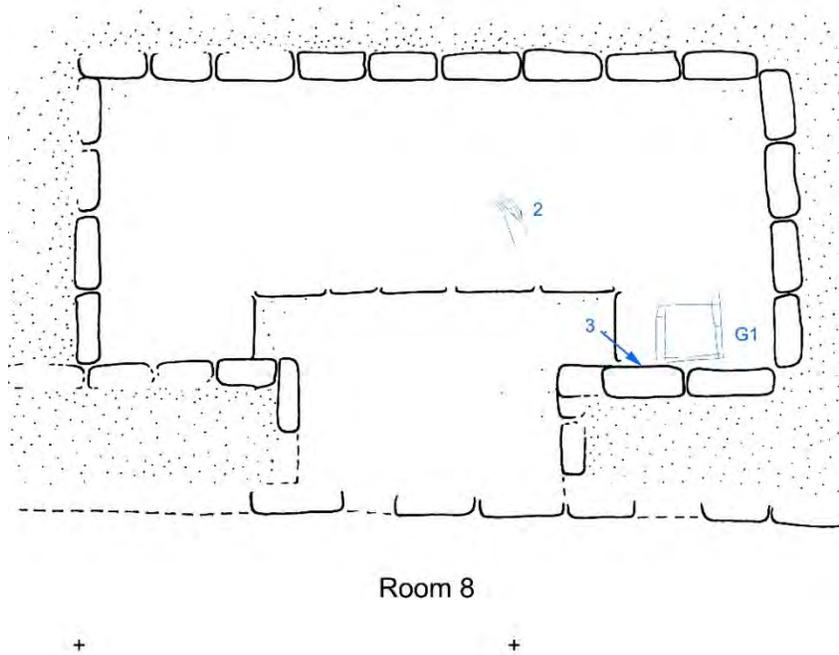
Graffito 5: This is a complex set of quadrangular lines that partly overlap with Graffito 4. Some of the fields were further embellished by parallel lines and others were left open and qualified by circular elements. None of these elements together form a coherent design that is liable to iconographic interpretation.

Graffito 6: This represents a squat warrior figure (apparently unfinished), bracing a spear, and wearing a large figurative headdress with a broad brim. The figure decorating the headdress is unclear but exhibits feature of a hare (although a deer would be more common and expected). The face of the warrior is highly stylized and stands in stark contrast to the well-executed Graffito 4, suggesting that multiple individuals incised graffiti in the same room.

Graffito 7: An abbreviated Calendar Round date, recording **11-AJAW**. The number in bars-and-dot is clear and the stylized face of the **AJAW** logogram and the scrolled “pedestal” of the Tzolkin sign are all readily apparent, making it clear that this is the date recorded. As a k’atun ending date this is very rare and most likely correlated to the Long Count 9.18.0.0.0 or AD 790. This provides an anchor for the primary phase of the usage of the room and indicates that the graffiti are part and parcel of this primary phase of use.

Graffito 8: A striding figure in a highly dynamic pose, as if leaping forward. The figure has a simple necklace and headdress and appears to hold a short atlatl dart in its right hand. As such this individual is interpreted as a warrior figure. Two parallel lines on the face may suggest that this individual is of advanced age, although this part of the design is not entirely clear.

## Room 8



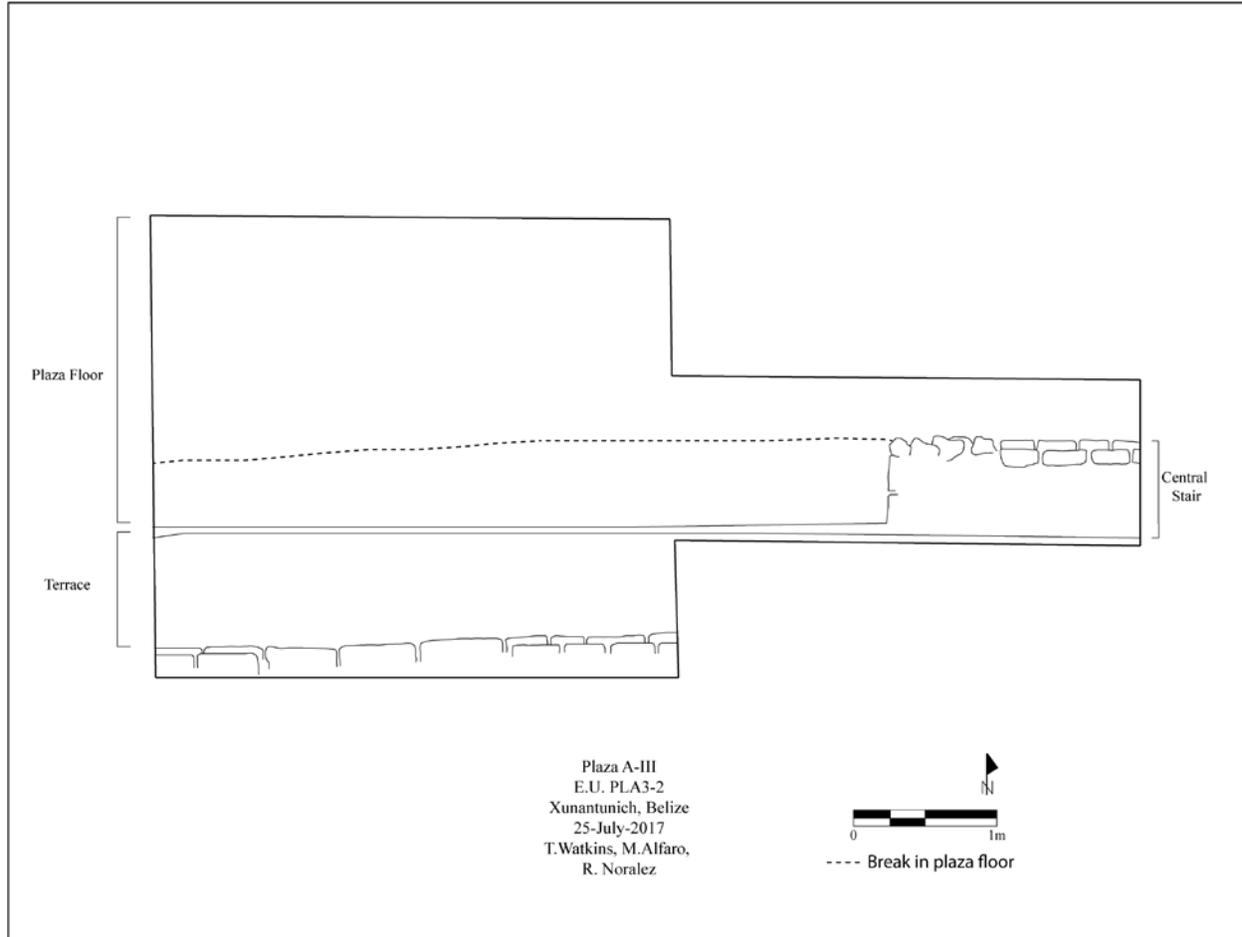
**Figure 10:** Plan of Room 8 showing the location of graffiti (plan by Christophe Helmke, based on surveys by Merle Alfaro, Tia Watkins and Christophe Helmke).

Graffito 1: Much like the graffiti in Rooms 6 and 7, that of Room 8 also exhibits a partial and unfinished *patolli* board in the southeastern corner of the room. Only the quadrangular outline was incised, parts of the double frame completed and some of primary subdivisions already applied, but the crossed bands of the middle of the frame are missing, as are all the other subdivisions and the X-shaped marking. Together these *patolli* boards provide us with an impression of the incremental steps through which these were realized.

Graffito 2: This is a cluster of angular lines on the bench surface, near the middle of the work area. Two longer, near-parallel, lines connect to a more elongated and pointed form, and an adjoining squared form, both of which are further subdivided by internal lines. At present, this cannot be interpreted further.

Graffito 3: Applied to the interior wall, above a perforation in the cornerstone that serves as a cord holder, this graffiti is only partly preserved. It evidently extended further above, but on account of collapse the superior course is missing and the plaster surface extending to the left has not preserved on the contiguous facing stone. As such only a small part of what was once a greater scene is preserved. What remains is a bold groundline and a partial human figure to the right. Only the lower portion of the finely rendered legs subsist, below the knees, with remarkably small feet and a prominent loincloth. Smaller lines extend downwards in front of the loincloth but these remain unidentified.

## Room 13 (Terrace)



**Figure 11:** Plan of the threshold to Room 13 showing the location of the patolli board on the terrace surface (plan by Tia Watkins, based on a survey by Merle Alfaro).

Graffito 1: This represents a complete patolli board, incised into the plastered terrace floor, at the threshold to Room 13. It has the same form as the other patolli of Structure A13, consisting of a square frame, and two intersecting bands in the middle of the frame. Where preserved, it is clear that the rows and columns are internally subdivided into 11 square fields. No distinctive X-shaped mark was applied to this board.

## APPENDIX C: PLAZA A-III ARTIFACT ANALYSIS

**Table 1:** Seriation for Plaza A-III excavations lot PLA3-1-2, fill below plaza floor (Floor 1).

<i>Ceramic Phase</i>	<i>Freq.</i>	<i>% of Assemblage</i>
Spanish Lookout	3	50%
Tiger Run	2	33%
Barton Creek	1	17%
<b>Total</b>	<b>6</b>	<b>100%</b>

**Table 2:** Seriation for Plaza A-III excavations lot PLA3-1-3, fill below Floor 2.

<i>Ceramic Phase</i>	<i>Freq.</i>	<i>% of Assemblage</i>
Spanish Lookout	26	32%
Tiger Run	10	12%
Hermitage	5	6%
Floral Park	4	5%
Barton Creek	21	26%
Jenny Creek	15	19%
<b>Total</b>	<b>81</b>	<b>100%</b>

**Table 3.** Lithic analysis for PLA-III lot PLA3-1-1, above plaza floor.

<i>Lithic Type</i>	<i>Freq.</i>	<i>% of Assemblage</i>
Debitage	6	75%
Bifacial Tools	0	0%
Flake Tools	1	13%
Cores	1	13%
<b>Total</b>	<b>8</b>	<b>100%</b>

**Table 4.** Lithic analysis for PLA-III lot PLA3-1-2, fill below Floor 1.

<i>Lithic Type</i>	<i>Freq.</i>	<i>% of Assemblage</i>
Debitage	10	53%
Bifacial Tools	1	5%
Flake Tools	1	5%
Cores	7	37%
<b>Total</b>	<b>19</b>	<b>100%</b>

**Table 5.** Lithic analysis for PLA-III lot PLA3-1-3, fill below Floor 2.

<i>Lithic Type</i>	<i>Freq.</i>	<i>% of Assemblage</i>
Debitage	88	78%
Bifacial Tools	2	2%
Flake Tools	5	4%
Cores	18	16%
<b>Total</b>	<b>113</b>	<b>100%</b>

**APPENDIX D: SPECIAL FINDS CATALOG**

**Table 6:** Special Finds Inventory for Structure A-13.

<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>SF Number</i>
Structure A-13	A13-1	1	A13-1-1	Collapse	Ob	1	SF A13-2017-1
Structure A-13	A13-1	1	A13-1-1	Collapse	Ob	1	SF A13-2017-2
Structure A-13	A13-1	1	A13-1-1	Collapse	Ch	1	SF A13-2017-3
Structure A-13	A13-1	1	A13-1-1	Collapse	Ob	1	SF A13-2017-4
Structure A-13	A13-1	1	A13-1-1	Collapse	Ob	1	SF A13-2017-5
Structure A-13	A13-1	2	A13-1-6	Fill	Cb	1	SF A13-2017-6
Structure A-13	A13-1	3	A13-1-8	Below Floor 1	OB	1	SF A13-2017-7
Structure A-13	A13-1	3	A13-1-8	Below Floor 1	Ch	1	SF A13-2017-8
Structure A-13	A13-1	4	A13-1-9	Below Floor 2	Qz	1	SF A13-2017-9
Structure A-13	A13-1	4	A13-1-9	Below Floor 2	Ls	1	SF A13-2017-10
Structure A-13	A13-1	1	A13-1-1	Collapse	Ch	1	SF A13-2017-11

**Table 7:** Special Finds Inventory for Plaza A-III.

<i>Area</i>	<i>E.U.</i>	<i>Level</i>	<i>Lot</i>	<i>Lot Description</i>	<i>Class</i>	<i>Freq.</i>	<i>SF Number</i>
Plaza A-III	PLA3-1	3	PLA3-1-3	Below Floor 2	Ce	1	SF PLA3-2017-1
Plaza A-III	PLA3-1	3	PLA3-1-3	Below Floor 2	Ob	1	SF PLA3-2017-2
Plaza A-III	PLA3-2	1	PLA3-2-4	Humus and Collapse	Ch	1	SF PLA3-2017-3
Plaza A-III	PLA3-1	2	PLA3-1-2	Below Floor 1	Qz	1	SF PLA3-2017-4
Plaza A-III	PLA3-1	3	PLA3-1-3	Below Floor 2	Ch	1	SF PLA3-2017-5

# MOBILITY AND DIET IN THE BELIZE RIVER VALLEY: A RESOURCE GUIDE

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## INTRODUCTION

Stable isotope geochemistry has become a common tool for archaeologists who hope to reconstruct aspects of population movement and diet in ancient Mesoamerica. Isotope data are now published for human populations for most parts of the Maya region, as well as the Valleys of Mexico and Oaxaca, in Chiapas and Soconusco, and in central Honduras. Strontium and oxygen values in human tooth enamel are widely used to identify non-local individuals in burial populations, with bone used less frequently because of concerns with diagenetic contamination. Carbon and nitrogen isotope values provide information on diet and show the proportions of types of grains and proteins in an individual's diet. This report presents an overview of stable isotope research in the Maya region, using the origin of the individual in the Xunantunich Structure A9 tomb as a case study on how bone chemistry can be used to reconstruct individual lives and patterns of population movement. The study is preceded by general information on mobility and diet, and how bone chemistry is used to address each question. I conclude with a list of studies on migration and diet in the Maya region that will serve as a useful guide for new researchers, as well as a method for processing isotope data in tooth enamel that maximizes preservation of the tooth.

## BACKGROUND

Research on prehistoric Maya diet relies on multiple lines of evidence, including iconography, epigraphy, ceramics and associated residues, faunal and botanical remains, and skeletal evidence of health problems (e.g., dental disease and anemia). Carbon and nitrogen stable isotope values in bone present direct evidence of the types of foods that were actually consumed by an individual and can be aggregated to reveal dietary patterns between the wealthy and poor, between women, men, and children, and in urban versus rural centers across the Maya lowlands and highlands. The axiom 'you are what you eat' provides a starting point for understanding how bone chemistry works. Each element reveals a different aspect of a person's general dietary choices: beginning with the food itself, isotopic variation in the element carbon reveals basic grain and meat components of the diet, while nitrogen reflects overall protein sources. New methods also include use of proteins or paleoproteomics (Hendy et al. 2018) and the isotopes or microbiome of dental calculus (Belanich forthcoming; Harvey et al. 2017), but  $^{13}\text{C}/^{12}\text{C}$  and  $^{15}\text{N}/^{14}\text{N}$  isotope ratios (represented by  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ , respectively) remain the primary biogeochemical method used to study diet in the Maya region.

The different forms, or isotopes, of the element carbon differ in tropical and temperate plants because of their photosynthetic pathways. Understanding which plants were available to the Maya, and that maize (*Zea mays*) was the main grain following a C4 pathway, allows us to interpret

enriched carbon isotope values in human tissues as heavy maize consumption. Marine foods also can result in elevated  $\delta^{13}\text{C}$  values. Nitrogen isotope ratios present more information on protein types, with the ratios shifting at each trophic level from legumes, to terrestrial game, to marine species. Nearly thirty years of research shows that the Maya relied on maize as a staple food, but that communities living in some regions had more diverse diets (e.g., Gerry 1993). Most people had access to some animal proteins, including large game such as whitetail deer, in addition to smaller mammals such as turtles, edible rodents, and a variety of other fauna such as freshwater gastropods. Table 1 (results section) presents a list of studies that each contain useful references on foundational aspects of isotopic research and its application in the Maya region (see Lori Wright and Robert Tykot, for example).

Isotope bone chemistry data from dozens of sites have identified in-migration to nearly every center analyzed. Even in small studies with only 10 to 20 individuals analyzed, results indicate that 10-25% of the sample relocated at least once between birth and burial. Studies from larger centers such as Copan, Honduras suggest that in-migration may have been significantly higher. Isotopic variation in strontium ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) and oxygen ( $^{18}\text{O}/^{16}\text{O}$ , or  $\delta^{18}\text{O}$ ) is useful for identifying this type of population movement, using the same principle that elements in what people eat and drink are incorporated into body tissues. However, these two elements vary geographically. While Sr values vary between different types of bedrock,  $\delta^{18}\text{O}$  values vary between different water sources. In the Maya region, most population movement seems to be among neighboring regions, though in some cases long-distance movement also has been identified. Useful overviews of each method also are found in Table 1 (results section), but work by Christine White and T. Douglas Price offer excellent examples of applications of isotope geochemistry to questions of population mobility in Mesoamerica.

## METHODS

Researchers can sample isotope values in different body tissues, and each tell a part of the story of an individual's life. Tooth enamel begins to form in utero in the first molars and continues to form across the dental arcade until adolescence, when the third molar, or wisdom tooth, crown formation is complete, and the tooth begins to erupt. Sr, O, and C isotopes are sampled in tooth enamel to provide a record of the *where* the enamel formed, and the types of plants and proteins consumed during infancy, childhood, and/or adolescence. The dentin in the tooth root remodels throughout life, but some (e.g., secondary or tertiary dentin) may be retained from childhood, and collagen can be sampled in this body tissue (see Beaumont and Montgomery 2016; Eerkens et al. 2011).

Bone, on the other hand, continues to model throughout life and samples of bone collagen (C and N) and apatite (Sr and O) provide an average of the individual's diet during his or her last decade of life. The structure of the hydroxylapatite (mineral form of calcium apatite) of the tooth enamel differs from that of bone apatite and collagen and is considered less susceptible to diagenesis (see Simon Hillson for useful references on dental anatomy). Researchers more commonly use tooth enamel to understand population movement because it is less likely that the enamel will take in elements from the burial environment and reflect the biogenic signature of the individual. To understand the basis for each elements' isotopic variation, researchers should look to original isotope geochemistry research and avoid citing only archaeological studies to explain

the underlying principles of the method (e.g., Faure and Powell 2012; Lachniet and Patterson 2009; Luz et al. 1984).

Archaeologists are more adept at applying isotopic techniques to anthropological questions. The remainder of this section will focus on understanding population movement rather than diet, where research topics are incredibly diverse and range from weaning age, to status, gender, and regional differences. Recent summaries of bioarchaeological research questions, including those focused on diet, include Scherer (2017), Somerville et al. (2013), and foundational work by Gerry (1993). In contrast, most studies on population movement investigate two key questions: in-migration to a center or the origin of an historic figure. We also should consider why people moved and explore the effects of mobility via theoretical frameworks of urbanism or cosmopolitanism (e.g., Halperin 2017). The large number of studies that now exist in the Maya region now allow us to conduct analyses more sophisticated than “were there migrants?” Yes, there were, and now we need to look at the broader implications of population movement.

Stable isotope analyses are revealing that indicators of origin traditionally considered by archaeologists, including ceramics, non-local grave goods, or exotic iconography, are generally a poor indicator of an individual's origin. For example, rulers Yax Nuun Ayiin at Tikal and K'inich Yax K'uk Mo' at Copan, whose graves and identities appear heavily laden with symbolism associated with the site of Teotihuacan, located in the Valley of Mexico, have strontium isotope values that link them instead to the Maya region (Price et al. 2010; Wright 2005a). I know of no cases where the non-local grave goods indicate a non-local identity, as revealed by isotopic research (Freiwald 2011a:28; Freiwald et al. 2011). It is perhaps more interesting to explore the meaning of the goods as indicators of political relationships or statements made by those who buried the deceased, which result in a more complex set of questions than a person's place of birth.

A key methodological focus is how ‘local’ and ‘foreign’ are defined. To understand who is *not* local, it is first necessary to define local isotope values. Most studies use straightforward statistical analyses based on the mean and standard deviation (but see Spotts 2013; Wright 2005b). Values that fall outside of two standard deviations from the mean are considered ‘non-local,’ providing a conservative estimate of the local population. However, this may overestimate the number of local individuals. Green (2016) defined ‘local’ for the site of Cahal Pech, located in the Belize River Valley of west-central Belize, using the range of data defined by the mean plus one standard deviation, which provides a conservative estimate of individuals with *non-local* origins. In my research, human values within one standard deviation of the mean match environmental baseline values defined by faunal samples collected in and around the sites in the study (Freiwald 2011a). However, it currently is most accepted to make conservative estimates of migration and assume a local status without strong evidence to the contrary.

If data are non-normally distributed, the local range can be estimated using the interquartile range based on median values. For a discussion on how this worked in the initial sample of Belize Valley individuals see Freiwald (2011a). It is critical to understand that statistical analysis are based only on the existing sample. In other words, the addition of a single value in a small dataset can result in the addition or elimination of outlier values, potentially changing the number of migrants and the interpretation of the study. Tightly clustered datasets may cause an individual with a nearly identical value to be a statistical outlier. Conversely, very large data ranges, such as

those found in the Maya Mountains of Belize, result in no outliers simply because the range of data at two standard deviations encompasses all known strontium isotope variation in the world (Freiwald 2011a). Understanding the local variation by using baseline fauna is a critical component in the interpretation of human strontium isotope data.

Baseline data are a useful—and necessary—tool for understanding the expected values for a site. Isotope values in water can identify trends even though they are not directly comparable to those found in human body tissues because fractionation occurs at each consumer level. In contrast, strontium isotope baseline values can be derived from water, rocks, and plants; however, samples from rocks and plants provide an idea of the  $^{87}\text{Sr}/^{86}\text{Sr}$  values that exist within a few feet of that sample, a very limited area. Water samples present the opposite problem, averaging strontium isotope variation over many miles, far beyond what the average catchment may have been for a community.

The best samples are provided by modern, non-human fauna found where people obtained their food. I salvage-collect fauna in and around archaeological sites in areas that most likely represent the main catchment. Opportunistically collecting bones and teeth from animals in the catchments where people acquired their food captures some, but not all, of the isotopic variation near a site. For example, Hodell and colleagues (2004) found Sr values in Mopan River water in the 0.707 range. Analysis of sites located on the river's floodplain revealed biogenic Sr values in the 0.708 range, suggesting that fauna can better predict human values than rocks or water (Freiwald 2011a, b).

There are cases where the human values exceed expected ones. Price and Gestsdóttir (2006) discovered that sea spray results in elevated human values in Iceland. Wright (2005b; Fenner and Wright 2014) suggest that non-local foods such as salt might explain the gap between faunal baseline values and the human average at the Tikal. In this case, the use of a faunal baseline allowed Wright to capture a human behavior that would not be visible using human values alone. If it is not possible to sample fauna, the human data set should provide a basic idea of the range of  $^{87}\text{Sr}/^{86}\text{Sr}$  values at a site. Strontium isotope values in a small sample population at Chaa Creek, for example, revealed a distinct set of isotope values in the range of 0.7095  $^{87}\text{Sr}/^{86}\text{Sr}$  that we did not predict from the geology. This value matched those in snail shells collected later from nearby fields, and similar values have since been identified elsewhere in the foothills of the Maya Mountains (Freiwald 2011a; Wrobel et al. 2017). Likewise, Sutinen's (2014) and Davie's (2012) samples from Minanha (Belize) and San Bartolo (Guatemala) were the first to reveal that the 0.708 range of Belize Valley values extend to the west, revealing a patchwork of values more complex than the concept of isoscapes (e.g., Wunder 2010).

The decision on which tooth (or teeth) to sample may rely on cost or the research question at hand. Studying the life histories of a few individuals may merit processing multiple samples for each set of skeletal remains, including a first molar to capture the place of birth and a third molar to find potential changes in residence as adulthood begins. Studies with access to more samples may choose to include just one tooth per individual for a broader view of the origins of the sample population. Cost per sample varies widely, depending on the relationship with the geochemistry lab, most of whom reduce the price if collaborators are trained and can assist in the processing, or if the research question is sufficiently novel and interesting. Lab personnel generally merit co-

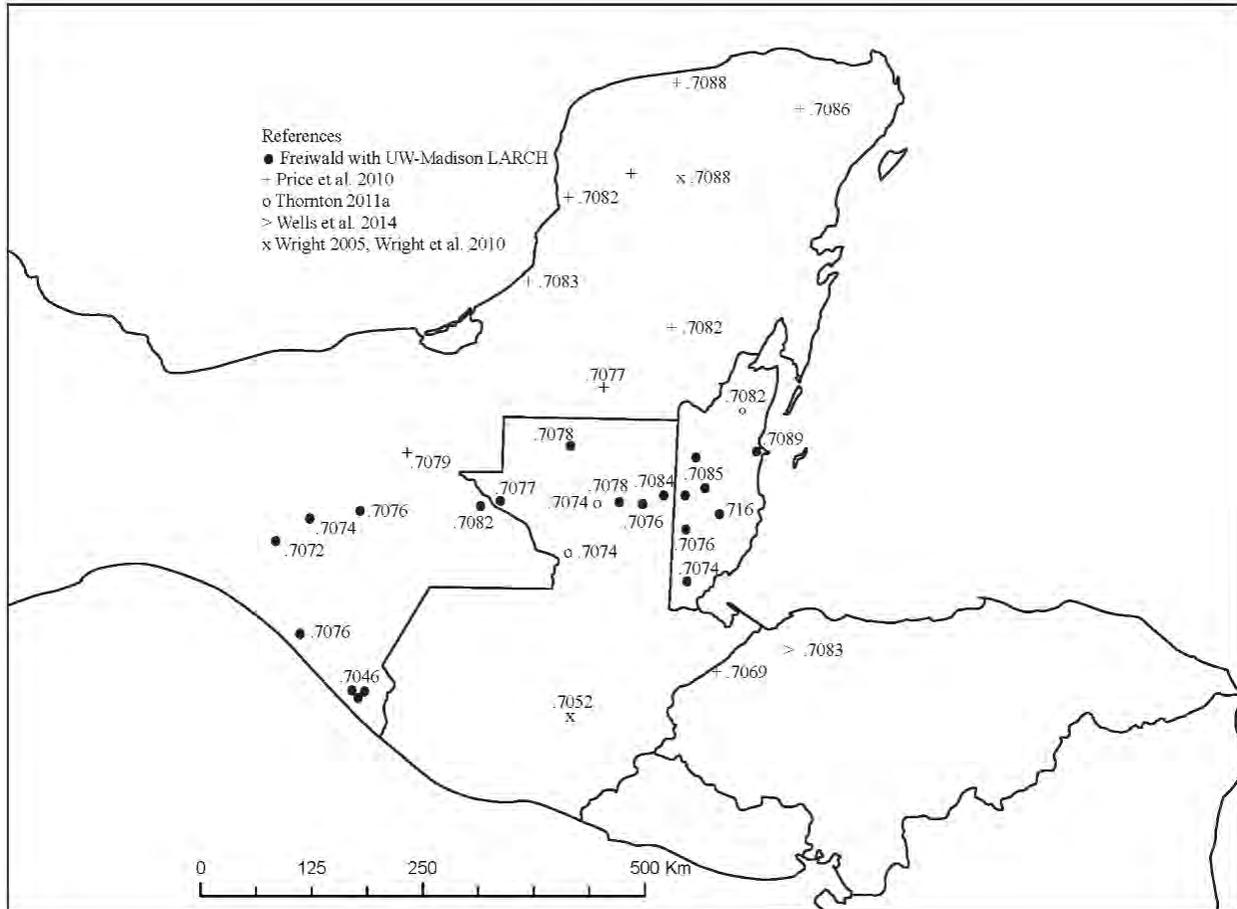
authorship as they frequently assist in interpretation of the data and invest heavily in obtaining precise and accurate results.

A final thought, before turning to the case study, relates to bioarchaeological ethics. There is some tension between replicating results, a foundation of the scientific method, and minimizing destructive analyses of scarce archaeological resources. Maya dentition are notoriously incomplete due to dental disease and the tendency of the Maya to remove skeletal parts such as crania or skulls. A long-term research strategy should precede any sample collection, allowing the interested parties on the project and supervising entities such as the Institute of Archaeology to determine the best plan for sampling the limited number of skeletal materials available at each site. This might include prioritizing which studies are conducted and reserving materials for future assays even though funds and expertise are not currently available. It is especially important to consider the order that data should be sampled in advance of destructive analyses. Biodistance research that records qualitative traits and metric ones, calculus analysis, and increasingly the potential to recover DNA should occur in conjunction with isotopic assays. The teeth also should be fully documented using high quality photographs and 3D scans or traditional molds and casts. This also mandates excellent curation of the skeletal remains, an investment of time and money that must extend decades beyond the excavations. The next section presents an example of reconstructing the life history of one individual from Xunantunich and provides a guide for how to collect and interpret isotopic data.

## **RESULTS: RECONSTRUCTING THE LIFE HISTORY OF A MAYA RULER**

One of the earliest applications of bone isotope chemistry in the Maya region sought to identify the origins of Maya rulers. Early Classic (~AD 250-500) burials at Tikal (Guatemala) and Copan (Honduras), for example, had Teotihuacan-associated iconography, artifacts, and even epigraphic evidence that led researchers to ask whether the rulers themselves were from Teotihuacan, and how much of an influence a foreign king may have had on Maya sociopolitical developments (Wright 2005a; Buikstra et al. 2004; Price et al. 2010). This question has great relevance in the Belize Valley as well, where larger polities such as Naranjo (Guatemala) and Caracol (Belize) may have held great sway over smaller polities during the Classic period (Helmke and Awe 2012; LeCount and Yaeger (Eds); LeCount et al. 2002).

Isotope values in the tooth enamel of the Belize Valley elite have not borne this out. That is, strontium isotope values in tooth enamel samples from individuals in elite graves match those found in the Belize Valley; they were not foreign kings.  $^{87}\text{Sr}/^{86}\text{Sr}$  values for elite burials including Cahal Pech Zopilote Burial 1 (0.708852) and Structure H1 Tomb 1 (0.708585), Baking Pot Burials B1-9 (0.708574), G1 P2 Cist 1 (0.709088), and Structure B1 Burial 1 (0.708831), Buenavista 88-B1-1 (0.70842) and 99-B11-1 (0.70832), and Xunantunich Structure A-4 cist (0.70872) each suggest a local origin. We identified one high outlier value at the site Buenavista in Burial 88-13-1 (0.70971), but do not interpret this as 'foreign' because similar values are found to the south in the foothills of the Maya Mountains, including within the Belize Valley (Freiwald 2011a; Freiwald et al. 2011; Mitchell 2006). Figure 1 shows isotope values in the Maya region, which will be explored in more detail below.



**Figure 1:** Isotope values in and around the Maya region (Miller Wolf and Freiwald 2018: Figure 1).

The 2016 field season of the Xunantunich Archaeology and Conservation Project XACP resulted in the discovery of a large tomb in Structure A9 (Tilden et al. 2017a, b). The tomb contained the remains of an adult male placed supine with his head oriented to the south. 30 to 39 years old at the time of his death and had an active lifestyle, but suffered from dental disease resulting in significant antemortem tooth loss (McKeown and Jantz in Tilden et al. 2017; Slocum 2018). His tomb was covered by a thin layer of chart flakes and included a high density of ceramics, slate, freshwater shell, and obsidian, as well as a shell ring near his left hand. Other personal ornamentation included two jade inlays on front maxillary teeth, shell ornaments, and possibly a jaguar pelt (Tilden et al. 2017a).

The identity of the individual interred in Structure A9 is particularly intriguing as the structure may have been built specifically to house his tomb. AMS radiocarbon dates situate the burial temporally during the same period associated with the building's construction and Naranjo's 7<sup>th</sup> century military defeat of Caracol, which is physically linked to Xunantunich by two hieroglyphic panels found at the base of Structure A9. Detailed analysis of the tomb and the panels are found elsewhere (Helmke and Awe 2016; Tilden et al. 2017a, b; Slocum 2018). We sampled strontium isotope values in the upper second left incisor to better understand his origins and

potential association with kingdoms such as Naranjo or Caracol. Isotopic analysis forms part of a series of studies underway at Xunantunich and San Lorenzo with the XACP, the Mopan Valley Preclassic Project, and the Mopan Valley Archaeological Project.

Before tooth enamel was removed for isotopic analysis, the qualitative and metric traits were scored by Nicholas Billstrand at the University of Mississippi in 2016 in order to collect biodistance information. Ideally, the same researcher would assess the complete dentition for the entire burial population. However, given the logistics and timeframe of the study, this initial step at minimum collected baseline information for later analyses. Then, Jonathan Belanich of Mississippi State University collected dental calculus as part of a pilot project to reconstruct the Maya dental microbiome. More information is forthcoming, but detailed instructions for the isotope preparation that occurred after these initial steps are found in Appendix A.

The  $^{87}\text{Sr}/^{86}\text{Sr}$  isotope value of the Structure A9 individual (0.708376) falls within the range of fauna sampled along the Belize River floodplain (0.70821-0.70908,  $n=17$ ) and within two standard deviations from the mean in the initial set of values in human tooth enamel described for the Belize Valley (0.70800-0.70916,  $n=115$ ; Freiwald 2011:85, 128). This suggests that he was born in the Belize Valley in or around any of the sites with similar values along the Belize River to the Caribbean Sea (also see Figure 1).

There are other places in the Maya region and elsewhere in Mesoamerica with similar Strontium isotope values, including the coastal Yucatan Peninsula, parts of the western lowland of Chiapas near Palenque, and east and south of the Belize Valley in certain locations, including San Bartolo (Davies 2012), Minanha (Sutinen 2014), and potentially at the site of Naranjo. A single *Neocyclotus* snail shell (Freiwald et al. 2014:113) shows a value (.70836  $^{87}\text{Sr}/^{86}\text{Sr}$ ) that is similar to those found in the Belize Valley. Unfortunately, this suggests that movement between these areas might be invisible isotopically. Values in the 0.708 range have even been found farther afield in Honduras as well (Wells et al. 2014); however, it is more parsimonious to attribute a local origin to this individual.

The individual buried in the Xunantunich Structure A-4 cist also had a Belize Valley value (0.70872), which contrasts with values from two atypical burials found at the site. Three individuals in a Structure A4 deposit, including a child and two adult crania/skulls, had strontium and oxygen isotope values that suggest a Central Petén origin, as did a young male whose body lay across the floor in a Structure A-11 room that was filled in and sealed (Freiwald et al. 2014). Individuals we interpret as non-local generally had atypical burial treatment at Xunantunich, though this is not always the case.

Other lines of evidence such as oxygen and carbon isotope values, biodistance studies, or DNA analyses might provide more information about this intriguing individual's identity and his relationship with Xunantunich and other Maya elites. For example, oxygen isotope values vary in parts of the central lowland where strontium isotopes do not. Individuals from Calakmul have a mean  $\delta^{18}\text{O}$  value of -1.2‰, suggesting that parts of the Central Lowlands differ from values in the -3‰ range that exist throughout much of the Maya region. Other exceptions include the Pacific Coast and Guatemala Highlands (see Price et al. 2010). Additional research on sulfur and lead

isotopes may add to our isotopic tool kit, as might elemental analysis although data derived from different instruments are not directly comparable.

## RESULTS: REGIONAL COMPARISONS

It is clear that an in-depth background is needed not just to interpret local signatures, but also to explore what a non-local value might mean. I will conclude with the list of studies (Table 1) that use isotope geochemistry—mainly strontium isotope values—to reconstruct population movement in the Maya region, especially in and around the Belize River Valley. Many of these studies are Master’s theses and Ph.D. dissertations that have not yet been formally published, and therefore require contact with the researcher and/or his/her project to use the information. It also is good practice to contact researchers before using their published information for a new publication or thesis; time permitting, established scholars frequently have additional data or advice to offer, including citations that are not included here. I also suggest to researchers that they spend time reading studies from other parts of the world, which can provide good examples of what to do, as well as (perhaps) what not to do, in Europe, Africa, and increasingly in Asia (Ariyama et al. 2012; Chenery et al. 2020; Frei and Frei 2011; Gregoricka 2013; Knudson et al. 2012; Laffoon et al. 2012; Montgomery 2010; Thornton 2011). In addition, a great deal of groundbreaking archaeometric research comes from the subdiscipline of zooarchaeology, and the field of forensics, including assessing illegal movement of materials such as elephant tusks and marijuana, provides a unique perspective on ‘sourcing’ biological materials that includes predictive modeling (Bowen 2010; Hobson et al. 2010; Juarez 2008; Wunder 2010).

**Table 1:** A snapshot of published and ongoing isotope studies on population movement in the Maya region. The list is extensive but does not include every published study or thesis.

<i>Location</i>	<i>Mobility: O, S, Sr</i>	<i>Diet (childhood) C tooth enamel</i>	<i>Diet (adult) C, N, or S bone</i>
Altun Ha	White et al. 2001a, b		
Ambergis Caye (Chac Balam, Marco Gonzalez, San Pedro, and San Juan)			Parker 2011; White et al. 2006; Williams et al. 2009
Baking Pot	Freiwald 2011a, 2011b; Hoggarth et al. forthcoming		Ebert et al. 2018; Piehl 2006
Bajo del Agua	Freiwald 2011a		
Barton Ramie	Freiwald 2011a; Freiwald forthcoming	Freiwald 2011a; Gerry 1993	Ebert et al. 2018; Freiwald 2011a; Gerry 1993; Gerry and Krueger 1997
Blackman Eddy	Freiwald 2011a		Piehl 2006
Buenavista	Freiwald 2011a; Spotts 2013	Freiwald 2011a	Mopan Valley Archaeological Project (Dr. Jason Yaeger)

<i>Location</i>	<i>Mobility: O, S, Sr</i>	<i>Diet (childhood) C tooth enamel</i>	<i>Diet (adult) C, N, or S bone</i>
Cahal Pech	Awe et al. 2017; Freiwald 2011a, 2011b; Novotny 2015; Green 2016		Ebert 2018; Ebert et al. 2018; Ebert et al, n.d.; Piehl 2006; Powis et al. 1999
Caledonia	Rand et al. 2015		
Campeche	Price et al. 2006, 2010, 2015		
Caracol	Freiwald 2011a		Chase et al. 2001; Ebert et al. 2018
Chaa Creek	Freiwald 2011a		
Chan	Novotny 2015		
Chapat Cave	Freiwald 2011a		
Chau Hiix			Metcalfe et al. 2009
Chinikihá			Montero López et al. 2011
Chuchucmil			Mansell 2006
Copan	Buikstra et al. 2004; Price et al. 2010, 2014; Miller Wolf 2015		Whittington and Reed 2006
Cuello			Tykot et al. 1996
El Peru-Waka'	Patterson and Freiwald 2015		Patterson and Freiwald 2018
Esperanza	Freiwald 2011a		
Floral Park	Freiwald 2011a		
Franz Harder/Midnight Terror Cave	Awe and Wroble, n.d., Freiwald 2011a; Kieffer, n.d.		
Holmul region (Uaxactun, La Sufricaya, K'o, Cival, and Harmonton)	Cormier and Estrada-Belli, n.d.		
Isla Cancun	Ortega et al. 2015 (cited in Duke 2017)		Duke 2017
Kaminaljuyu	Wright et al. 1999, 2010		Wright and Schwarcz 1998
Je'reftheel Cave	Wrobel et al. 2014		
La Corona	Patterson and Freiwald 2015		Patterson and Freiwald 2018
Lamanai	Donis 2013	Song 2004 (elemental analysis)	White and Schwarcz 1989
Northwest Belize	Locker, forthcoming Program for Belize Archaeological Project (PfBAP)		
Mayapan	Wright 2007		Kennett et al. 2016
Minanha	Sutinen 2014		Williams et al. 2017
Noh Bec	Cucina et al. 2015		
Nojol Nah	Das Neves, n.d.		
Pacbitun			White et al. 1993
Peligroso	Freiwald 2011a		

<i>Location</i>	<i>Mobility: O, S, Sr</i>	<i>Diet (childhood) C tooth enamel</i>	<i>Diet (adult) C, N, or S bone</i>
Pook's Hill	Freiwald 2011a		Ebert et al. 2018; Freiwald 2011a
Punto de Chimino	Wright and Bachand 2009		
Pusilha	Somerville et al. 2016		
Ramonal	Freiwald 2011a		
St. George's Caye	Spring, Garber, and Freiwald nd		
San Bartolo	Davies 2012		
San Bernabe	Freiwald et al. 2017		Miller Wolf et al., n.d.
San Lorenzo	Freiwald 2011a; MVAP (Dr. Jason Yaeger)		
Saturday Creek	Freiwald 2011a		
Tikal	Scherer and Wright 2015; Wright 2005a, b, 2012		
Tipu	Trask, n.d.	Trask, n.d.	Ebert et al. 2018
Uayazba Kab "Handprint" Cave	Wrobel et al. 2017		
Ucanal	Ucanal Archaeological Project (PAU), Yasmine Flynn nd		
Uxbenká	Trask et al. 2012		
Xcambo	Cucina et al. 2011 (elemental); Sierra Sosa 2014		
Xunantunich	Freiwald 2011a Freiwald et al. 2014		Ebert et al. 2018
Yalbac region	Valley of Peace Archaeology Project (VOPA), Dr. Lisa Lucero nd		
Yaxuna			Mansell 2006
Pasion region			Wright 2006
Regional	Price et al. 2008, 2010, 2015		Tykot 2002; Whittington and Reed 2006; Wright and White 1996
Regional			Somerville et al. 2013
Regional (Belize)			Freiwald 2011a, forthcoming; Gerry 1993, 1997; Gerry and Krueger 1997; Piehl 2006, BVAR (Ebert, Hoggarth, n.d.)

A second set of references provides non-human baseline  $^{87}\text{Sr}/^{86}\text{Sr}$  values, including rock, water, and plant samples (Gilli et al. 2009; Hodell et al. 2004) and data derived from modern faunal samples in the Maya region (Freiwald 2011a; Wright 2012). Foundational work by Price and colleagues (2008, 2010, 2015) includes values for much of the Maya region; however, it currently

is not possible to differentiate human from non-human faunal values for many sites in these publications. Baseline values also are now published in regions that border the Maya world, including many publications by Price, Manzanilla, and/or White in the Valleys of Mexico and Oaxaca, by Miller and Freiwald (2018) in Honduras, and in Chiapas, El Salvador, and the Caribbean (Bataille et al. 2012; Freiwald 2011a; Suzuki et al. 2015).

## **CONCLUSION**

This basic guide should serve as a starting point for researchers hoping to address anthropological questions using methods in bone chemistry. We continue research on the individual in Xunantunich Structure A9, including multiple aspects of DNA, that will help address broader sociopolitical questions in the Belize Valley. As more projects prioritize bioarchaeological work, we are building a dataset that will place Belize Valley at the forefront of research on diet and population movement in the Maya region. Science is a collaborative effort, especially in the Belize River Valley, and it is clear that research in the lab using aDNA, forensics, and isotope geochemistry will be at the forefront of many new discoveries.

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**APPENDIX A:  
UNIVERSITY OF MISSISSIPPI GUIDE TO ISOTOPE PREPARATION**

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**1. Inventory**

Make a written inventory of the teeth that have arrived for sampling.

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**2. Weigh teeth** (record on bag (inner and outer tags) and in lab notebook)

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**3. Assign lab numbers**

Assign each tooth to be sampled a sequential lab number, add to bag (inner and outer tag)

Example: UM1, UM2, etc.

If we process multiple samples from each tooth, label the vials:

UM1a (strontium isotope samples)

UM1b (oxygen and carbon isotope samples)

UM1c (strontium and barium elemental analysis (other elements also measured)

UM1d (other)

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**4. Photographs**

Use the dinocam and computer to take close-up photographs of each tooth surface (lingual, buccal, mesial, lateral, occlusal) to clearly see the detail on the tooth surface.

You do not need a label in the photo (too close-up), but use a mm scale.

Label photos by tooth after each tooth is photographed and check the quality.

You may need to identify the tooth. Ideally, the tooth was identified with the complete dentition before the sample was sent to us. We try to make sure the qualitative traits and health traits like pitting and hypoplasias have been assessed by the project archaeologist before we sample the teeth.

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**5. Polysiloxane impression**

Use the dental material to make an impression of the occlusal surface of the tooth. We can make casts from the impressions. It preserves the maximum width and length of the tooth and some of the features (not all – it isn't perfect, which is why we have photos).

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**6. Rinse the teeth**

Use the small sonicator to remove surface dirt, dust, etc. from each tooth:

It is very important *not* to mix the teeth at this stage (even though we have photos & weights as a back-up).

Place the teeth in order by sample #. Label a small vial for each tooth with a sharpie. Write the label high enough so the water won't rinse it off. You may also use Tyvek tags in the water with the tooth for labels.

Fill the sonicator ½ inch or so with purified water. Place the tooth in the labeled vial, filled with water to the same line as the sonicator (water inside and outside vial should be even so the vials don't float around).

Sonicate 15 minutes in purified water. You may change the water if it becomes cloudy.

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### **7. Dry the teeth overnight under the snorkel fume hood**

Pour out the water – use a small sieve to avoid dumping the tooth in the sink (or tooth parts that broke off).

Place on a clean plastic on the labeled bag. Keep samples in order to avoid mistakes.

Clean the vials – a scrubber will get the marker off. Always give a final rinse with the purified water to avoid calcium build up on the vials. Air dry – if you dry, use a clean towel that hasn't been used before.

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### **8. Taking the sample from the tooth**

#### ***Step 1***

You need clean tools:

- A diamond burr
- A dental saw
- Weighing papers
- Agate mortar and pestle
- Kimwipes
- Canned air

See tool cleaning below.

Inspect the tooth. Find the cusp without significant deterioration, without a lot of tartar buildup, to clean.

Clean the work area – no powder or enamel should be around from a previous tooth. Wipe down the floor in case you drop something and want to pick it up (see mistakes, below\*).

Use your mask and lab coat and make sure the snorkel fume hood is turned on.

Place a weighing paper on the microscope and place the tooth on it.

Mechanically remove a thin layer from the tooth surface you will sample with the burr. Use even, light strokes at a moderate speed. Use the microscope to see a detailed view of the tooth surface.

#### ***Step 2***

Switch to the saw. Cut a chip that will result in ~30 mg clean enamel. Do your best to avoid unnecessary damage to the tooth. Remember, though, we do have permission to do destructive analysis to get good information.

### ***Step 3***

Look at the enamel chip under the microscope – you may have clean enamel ready to use, more likely, you need to clean the dentin from the inside.

First, put the tooth away in its bag, along with any dust or other residue you are not using (we try not to throw any of the sample away.)

Switch back to the burr and finish cleaning the tooth.

### ***Step 4***

You are now ready to divide your clean enamel into pieces. Gently tap the enamel – you may want to cover the mortar and pestle with a kimwipe. The enamel likes to jump out. Luckily, because you clean your surface between samples, you can sometimes recover pieces that fall. \*You can only use enamel that falls if you are 100% sure (aka you saw it fall and know it belongs to your current sample). If not, we can't use it.

UM1a – strontium isotope 6-8 mg enamel chip(s)

UM1b – carbon/oxygen isotope 3-4 mg enamel – grind into powder, transfer to vial with weighing paper

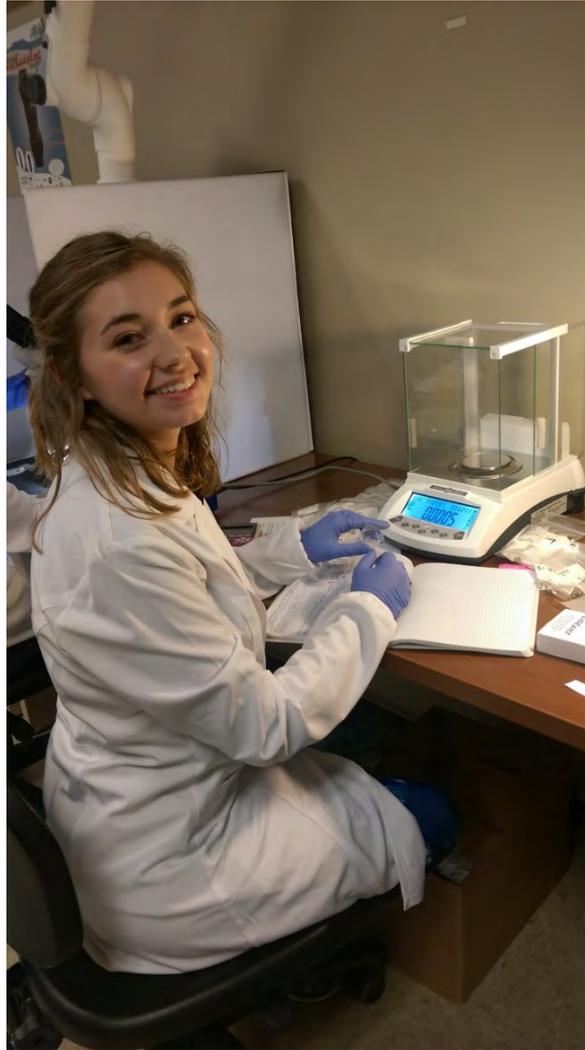
UM1c – elemental analysis 20 mg enamel chip(s)

UM1d – other leftover clean enamel

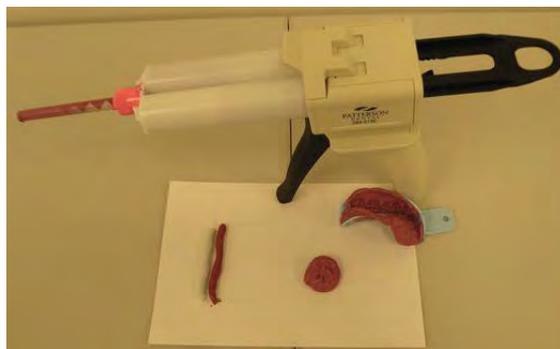
1 - weigh the vial and record the weight. Tare to zero. Add the sample and record the weight. Vials should be labeled a, b, c, d

Congrats! Now we sonicate the tools (one cycle) and then sterilize using hot water (use 4 oz water and its complete in 6 minutes. Air dry tools/dry with canned air. Clean workspace, including floor. Replace weighing papers & throw out kimwipes. On to the next sample.

**APPENDIX B:  
A PHOTOGRAPHIC GUIDE TO SAMPLE PREPARATION**



**Figure 2:** Skylar McCoy documenting, inventorying, and assigning lab numbers to samples.



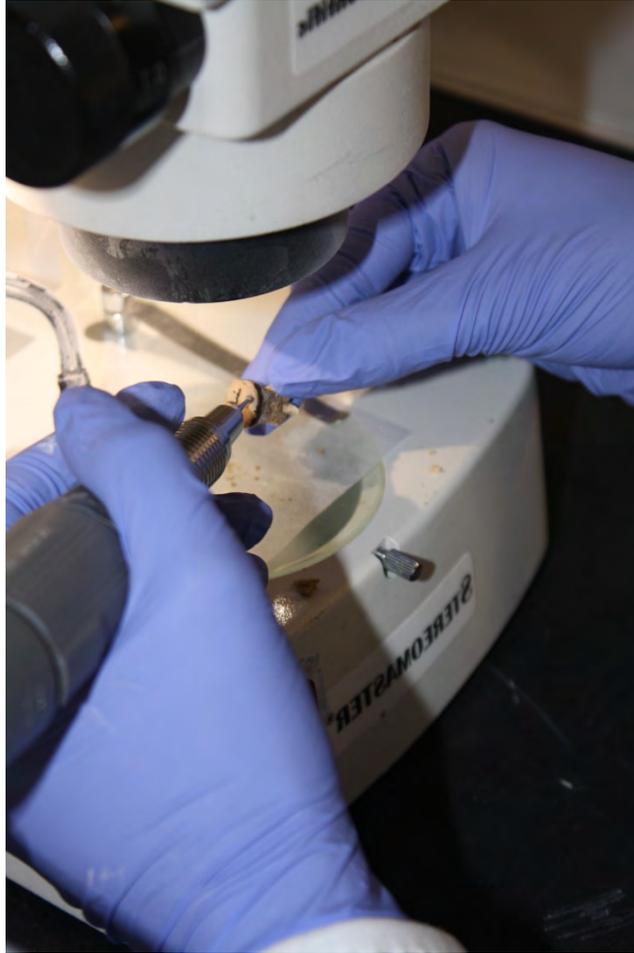
**Figure 3:** Making the polysiloxane molds. We used paper to make a ‘muffin cup’ holder so the mold was both wide enough (flexible to remove the tooth) and deep enough (to get the whole crown). I am not sure how reusable the molds will be. Photo credit: Internet.



**Figure 4:** Images of dental casts produce from the polysiloxane molds. We used Plaster of Paris and ours didn't look this good. I also think they are fairly fragile. Photo credit: Shutterstock.



**Figure 5:** Emily Moore abrading the surface of the tooth as the top layer of enamel is mechanically cleaned. We have a small snorkel-type fume hood and made an enclosed space to catch dust and flying enamel chips using a photography stand. Bright lights and a microscope aid in differentiating enamel from dentin and in cleaning small enamel pieces.



**Figure 6:** The tooth surface that will be sampled is mechanically cleaned using a diamond tip dental burr that was purchased from a dental supply company.



**Figure 7:** Removing the clean enamel chip – additional cleaning might be necessary to remove dentin using the burr dental tip again. Tools are cleaned between each sample.



**Figure 8:** Emily Moore using an agate mortar and pestle are used to prepare an 0.006 g enamel chip for strontium isotope analysis and 0.002 g powdered enamel for carbon and oxygen isotope analysis. The enamel is prepared according to the instrumentation needs of the UNC at Chapel Hill and University of Arizona geochemistry laboratories.



**Figure 9:** Using the agate mortar and pestle to break clean enamel into fragments.



Figure 10: Xunantunich Structure A9 tooth after sampling (0.77 gr before sampling).