The 2017 Season of the Chan Chich Archaeological Project

EDITED BY

Brett A. Houk and Claire Novotny

Papers of the
Chan Chich Archaeological Project, Number 12
Department of Sociology, Anthropology, and
Social Work
Texas Tech University • Lubbock, Texas
2017

Chan Chich Archaeological Project
CCAP
Chan Chich, Belize - Central America

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EDITED BY

Brett A. Houk
and
Claire Novotny

WITH CONTRIBUTIONS BY

Brooke Bonorden
Bridgette Degnan
Alyssa Farmer
Tomás Gallareta Cervera
Brett A. Houk
Gertrude Kilgore
Julia Kliene
Hunter Lee
Kevin A. Miller
Anna Novotny
Claire Novotny
Paisley Palmer
Rebecca Schultz
Marcus Schwimmer
Paul Schwimmer
Briana Smith
Chet Walker
Mark D. Willis
and
Gregory Zaro

Belize Estates Archaeological Survey Team
BEAST
Gallon Jug ◆ Belize ◆ Laguna Seca

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Cover art: Photograph of Imitation Fine Orange sherds with a conference scene, from Courtyard D-41 at Chan Chich. Photo by Mark Willis.

Acknowledgments

In 2017, the Chan Chich Archaeological Project (CCAP) and the Field School in Maya Archaeology (FSMA) completed their eleventh seasons of archaeological research, and, though it was not without its challenges, the 2017 season was a tremendously productive one. I would like to thank Dr. John Morris of the Institute of Archaeology (IA) for once again being supportive of our work and issuing us a permit to excavate at Chan Chich and conduct reconnaissance on Laguna Seca and Yalbac ranches. The other staff members at the IA provided assistance throughout the season. While they all deserve thanks, I would like to thank in particular George Thompson, Delsia Marsden, Josue Ramos, Antonio Beardall, and Melissa Badillo.

The 2017 season marked the second of three years of funding from the Alphawood Foundation Chicago. The project would like to thank Kristin Hettich, Program Officer at Alphawood, for her assistance and guidance throughout the grant process. I would also like to thank the board of directors of Alphawood for funding the project.

I am grateful to the Bowen family for allowing us to work at Chan Chich. Michael Bowen visited Chan Chich Lodge this summer, and it was a pleasure to see him. Alan Jeal, the general manager of Gallon Jug Ranch, has been a longtime friend of the project, and I would like to thank him for his continued support. In addition to Alan, I would like to thank the staff of Gallon Jug Ranch for helping us with access, fuel, and many other matters.

I would also like to thank Jeff Roberson, Alex Finkral, Esteban Alvarez, and everyone else associated with The Forestland Group who facilitated our access to work on Yalbac Ranch and Laguna Seca Ranch. In particular, the reconnaissance crew owes a debt of gratitude to Ediberto (Edi) Quewell and Arturo Pinelo, two employees of Yalbac Ranch, who led the team to two never-before recorded sites. When the crew arrived at Sak Mut after a four-hour trek and asked their guides how many gringos they had to bring back alive, Edi replied, "Zero."

Thanks to Alphawood funding, the project had the largest staff it has ever had. Drs. Claire Novotny and Tomás Gallareta Cervera joined the team as Field Director and Upper Plaza Operation Director, respectively. Other senior staff included Trudy Kilgore, Kevin Miller, Briana Smith, Paisley Palmer, Rebecca Schultz, Alyssa Farmer, Anna Novotny, and Mnemo Rice, our lab director in 2017. Newcomer Bridgette Degnan, an undergraduate student from University of Virginia, joined the project in 2017 and oversaw the excavations at Structure A-6, a lithic workshop in the North Plaza at Chan Chich, for her honors thesis research.

The authors in this report have real jobs or graduate school commitments that make writing their chapters a seemingly thankless task that takes away from other more important or entertaining pursuits. As always, I greatly appreciate their time and effort to complete their chapters by the deadline to get the report published in 2017. At times it was like wrestling a slime covered monster, but the report is finished!

Letty Martinez, the assistant manager of Chan Chich Lodge, deserves our thanks and appreciation for once again working to make

our stay great. The staff of Chan Chich Lodge always goes out of their way to make us feel more like friends than hotel guests. Migde Perdomo and Ram Singh, bartender and chef, respectively, also made us feel like we were at home...if our homes had bartenders and chefs. The project is also grateful to Crist Inman (and the rest of the La Paz group) for tolerating our presence at the lodge. Despite never visiting our excavations, even the one right by the pool, Crist never tried to monetize us beyond our previously agreed arrangements. I would like to thank the rotating crew of field assistants from Chan Chich and Sylvester Village who made our excavations possible. All told, 32 different individuals, including Jerviani Serminia, our lab assistant, worked for us over the course of the season. Abe Rempel once again helped us with rental vehicles, making sure what we needed was waiting at the airport for us.

In 2017, a number of consultants and analysts aided our investigations. First, I would like to thank Fred Valdez and Lauren Sullivan for analyzing our ceramics. Mark Willis, Chet Walker, Paul Schwimmer, and Marcus Schwimmer joined the project to map the site core. Douglas Kennett and Brendan Culleton of the Pennsylvania State University Human Paleoecology and Isotope Geochemistry Lab analyzed our radiocarbon samples from 2017. John Jones of Archaeological Consulting Services, Ltd. analyzed a pollen sample from a burial vessel, and E. Christian Wells of

2017 CCAP staff and regular-session students at Xunantunich. From left to right: Hector Salazar (Chan Chich Lodge), Paisley Palmer, Hannah Paredes, Mnemosyne Rice, Bridgette Degnan, Caleb Wright, Trudy Kilgore, Rebecca Schultz, Rachel Naasz, Briana Smith, Claire Novotny, Cora Mikolajczyk, Tomás Gallareta Cervera, Hannah Hughes, Alyssa Farmer, Hannah Bauer, and Brett A. Houk. Not pictured: Kevin Miller, Anna Novotny, and Leilah Perchaluk.

University of South Florida analyzed plaster samples from Courtyard D-4.

Kat Brown and Jason Yaeger of The University of Texas at San Antonio took time out of their busy field day to show our group around Xunantunich. We appreciate the welcome our group received from their crew! Leroy Lee once again visited the project with his family. He kindly treated the project director to dinner!

In addition to funding from the Alphawood Foundation Chicago, part of our funding came from the FSMA, a program run through Study Abroad at Texas Tech University. I would like to thank Elizabeth McDaniel, Whitney Longnecker, Rachel Jarnagin, and Adrianna Sotelo for all their help with our students, our travel arrangements, and our budgeting.

The students from the 2017 FSMA included Red Raiders and others divided over a 28-day regular session and a 14-day mini-session. The regular session included Hannah Bauer, Hannah Hughes, Cora Mikolajczyk, Rachel Naasz, Hannah Paredes, Leilah Perchaluk, and Caleb Wright. The two mini-session students were Julia Kliene and Brittany Zewe. The project staff and I would like to thank them for all their hard work.

Guns up!

Brett A. Houk, December 31, 2017

2017 CCAP staff, crew, and mini-session students in the Upper Plaza at Chan Chich. Back row, from left to right: Brett A. Houk, Alexis Cortez, Hory Monroy, Roel Romero, Kelvin Monroy, Emmanuel Cordova, and Israel Jones. Front pile of people from left to right: Alyssa Farmer, Claire Novotny, Trudy Kilgore, Julia Kleine, Paisley Palmer, Mnemosyne Rice, Briana Smith, Tomás Gallareta Cervera, Bridgette Degnan, Rebecca Schultz, and Brittany Zewe.

An Introduction to the 2017 Season of the Chan Chich Archaeological Project and the Belize Estates Archaeological Survey Team

Brett A. Houk

In 2017, the Chan Chich Archaeological Project (CCAP) and its regional component, the Belize Estates Archaeological Survey Team (BEAST), operated in the tropical forest of northwestern Belize alongside Texas Tech University's (TTU) Field School in Maya Archaeology, a study abroad program that offers students the opportunity to learn archaeological methods and techniques while contributing to an active research project. The CCAP completed its eleventh season of research in 2017. This chapter includes relevant project minutiae (dates, staff, permits, funding, and so on), summaries of the 2017 excavations, and an updated description of Chan Chich's site plan and chronology, based on the results of 11 seasons of research.

PERMIT AREA

As negotiated with the Institute of Archaeology (IA) in June 2014, the CCAP and BEAST operate on approximately 144,000 acres of land in northwestern Belize, with the official permit area encompassing Gallon Jug Ranch, Laguna Seca Ranch, and the northwestern corner of Yalbac Ranch (Figure 1.1). For a discussion of the rather complicated nature of the permit area and the recent history of land sales in the permit area, please see Houk and Zaro (2014). Eighteen numbered Belize Estate (BE) sites—BE numbers are assigned to large or important prehistoric and historic sites—are in or near the permit area (see Houk, Project Lists, this volume). CCAP and BEAST conducted archaeological work at three of the 18 sites in 2017—Chan Chich (BE-1) and the newly recorded sites of Sak Mut (BE-17) and Xma Ha Ak'al (BE-18)—and ground-truthed drone date collected in 2016 in the cleared pastures in Gallon Jug.

PROJECT TIME LINE, STAFF, AND CONSULTANTS

In 2017, the project included a short spring reconnaissance trip and a two-month long summer field season. The reconnaissance team, comprising Houk, Gregory Zaro (University of Maine), and Mark Willis, traveled to Belize on February 19, 2017. The crew spent the two days investigating the locations of two reported sites on Yalbac and Laguna Seca Ranches and a third day ground-truthing mapping data on Gallon Jug Ranch. All project personnel departed Belize on February 24, 2017.

The fieldwork phase of the summer session of the project began on May 22, 2017, with the arrival of the project director and most of the project in Belize (Table 1.1). The staff unpacked the lab and field equipment, secured the excavation permit, and made preliminary visits to the planned excavation areas. On

Houk, Brett A.
2017 An Introduction to the 2017 Season of the Chan Chich Archaeological Project and the Belize Estates Archaeological Survey Team. In *The 2017 Season of the Chan Chich Archaeological Project*, edited by Brett A. Houk and Claire Novotny, pp. 1–32. Papers of the Chan Chich Archaeological Project, Number 12. Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

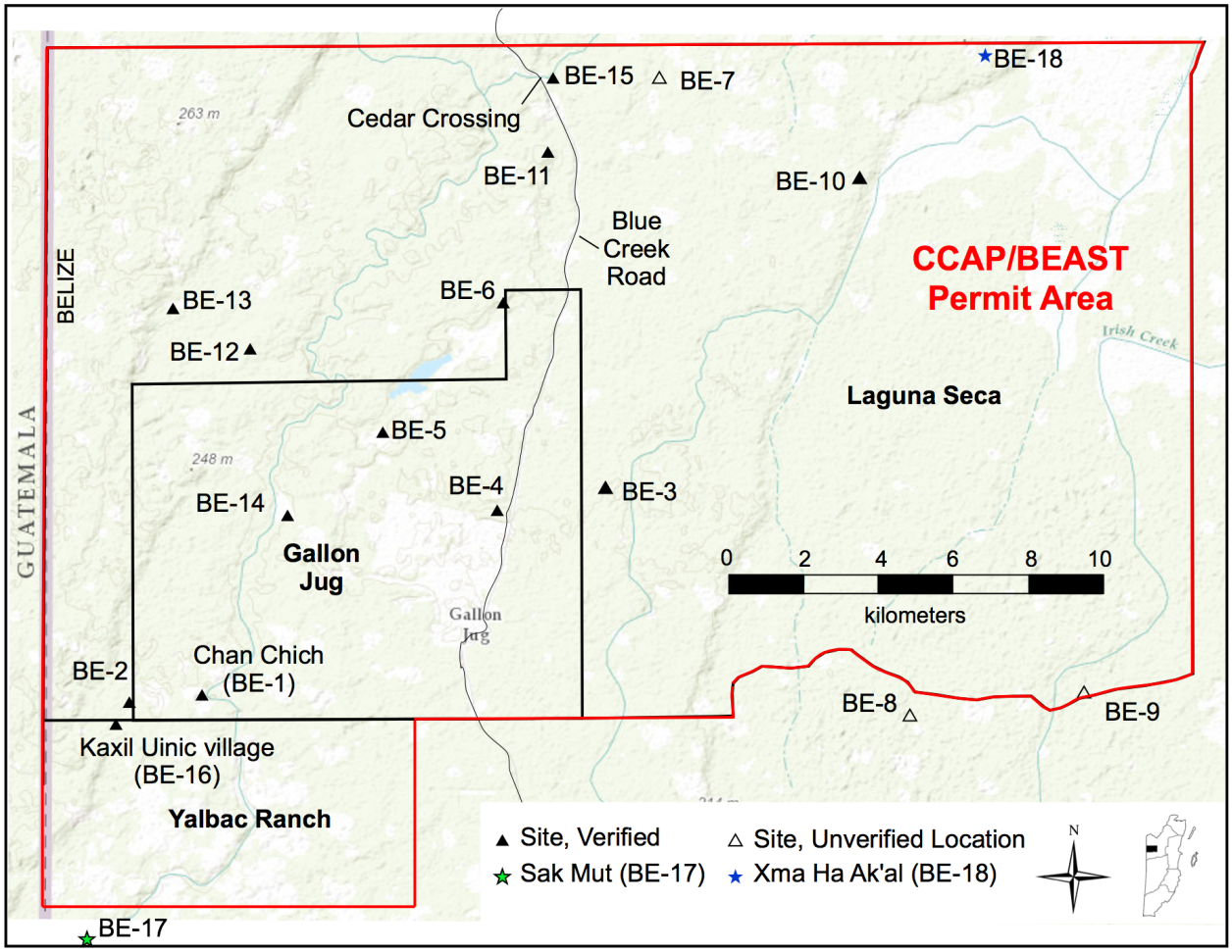

Figure 1.1. Map of the CCAP/BEAST permit area showing the locations of Chan Chich (BE-1), Sak Mut (BE-17), and Xma Ha Ak'al (BE-18). See Table 9.1 for list of BE numbers. The three escarpments in the area are, from west to east, the La Lucha Escarpment (LLE), the Río Bravo Escarpment (RBE), and the Booth's River Escarpment (BRE).

May 27, Drs. Claire Novotny and Tomás Gallareta Cervera, the 2017 Field Director and Upper Plaza Operation Director, respectively, arrived at Chan Chich. The group of eight first-time field school students and staff members Bridgette Degnan, Kevin Miller, and Rebecca Schultz arrived on May 29, 2017. The field school students departed on June 26, 2017, the same day that a team of surveyors, including Mark Willis, Chet Walker, Paul Schwimmer, and Marcus Schwimmer arrived for six nights. Two additional field school students arrived for a 14-day mini-session on June 28, 2017. Although some staff members left early, the field component of the 2017 field season ended on July 18 with the departure of Houk and the majority of the project staff.

PROJECT FUNDING

The 2017 season marked the second of three years of funding from the Alphawood Foundation of Chicago. The Alphawood grant to TTU supported all of the costs associated with fieldwork and analysis. The TTU Field School in Maya Archaeology, a cost-sharing program run through Study Abroad, served as the secondary source of funding for the 2017 season, but all field school funds went directly to costs associated with the student group.

Table 1.1. List of Project Staff and Consultants, Summer 2017

Name	Role	Affiliation	Arrival	Departure
Brett A. Houk	Project Director	TTU	5-22-17	7-18-17
Alyssa Farmer	Suboperation Director	TTU	5-22-17	7-6-17
Trudy Kilgore	Operation Director	TTU	5-22-17	7-18-17
Paisley Palmer	Suboperation Director	New Mexico State University	5-22-17	7-18-17
Mnemo Rice	Lab Director	Trinity College, Ireland	5-22-17	7-18-17
Briana Smith	Suboperation Director		5-22-17	7-18-17
Tomás Gallareta Cervera	Operation Director	Kenyon College	5-27-17	7-12-17
Claire Novotny	Field Director	Kenyon College	5-27-17	7-12-17
Bridgette Degnan	Operation Director	University of Virginia	5-29-17	7-18-17
Kevin Miller	Assistant Operation Director, Lithicist	SWCA, Inc.	5-29-17	6-9-17
Rebecca Schultz	Suboperation Director	TTU	5-29-17	7-18-17
Mark Willis	Remote Sensing specialist and Crew		6-26-17	7-2-17
Anna Novotny	Project Bioarchaeologist	TTU	6-15-17	6-30-17
Fred Valdez, Jr.	Project Ceramicist	UT-Austin	7-3-17	7-3-17
Lauren A. Sullivan	Assistant Project Ceramicist	UMASS-Boston	7-3-17	7-3-17

PROJECT PERMITTING

The IA, part of the Belizean National Institute of Culture and History, issued Permit No. IA/H/3/1/17(06) to Houk for the reconnaissance work and excavations at Chan Chich. At the time the permit was issued, Dr. John Morris served as Director of the IA. The landowners of Gallon Jug Ranch, Laguna Seca Ranch, and Yalbac Ranch also gave permission for the research.

RESEARCH FRAMEWORK OF THE CCAP: THE 2016–2018 SEASONS

The following discussion of the research framework is taken from Houk (2016a) with minor modifications. The long-term goal of CCAP is to investigate the development and nature of Maya urbanism, including the interdependent relationship between center and periphery, in the region. Maya cities in what is today Belize functioned in part as regal-ritual centers and homes to small royal courts (Houk 2015a). These cities and their ruling families, however, were entirely dependent on the surrounding, rural populace for corvee labor, subsistence, and, ultimately, the legitimacy to rule. As such, they were part of a complicated and interdependent settlement system that we are still unraveling. CCAP's research explores the development and nature of the urban landscape at Chan Chich, including examining how major cultural events such as the advent of divine kingship and the Classic Maya collapse are mapped onto the urban landscape and built environment, and provides a regional perspective for understanding the developments at Chan Chich by documenting settlement and landscape features across the permit area.

The culture history of the permit area is exceptionally long, spanning almost the entire sequence of Maya cultural development in the eastern lowlands. We can trace Maya

occupation from the beginnings of settled village life, to the rise of divine kingship, through the collapse of the great cities, and to the eventual resettlement of the landscape centuries later by the San Pedro Maya. The project, therefore, can ask research questions that require tremendous time depth to address.

Regarding the rise of divine kingship, it has only been in the past 15 years or so that archaeologists have identified evidence for Preclassic (1000 BC–AD 250) divine kings (Estrada-Belli 2011; Saturno 2006; Sharer and Traxler 2006). Chan Chich had a Terminal Preclassic divine king buried in Tomb 2 at the site's Upper Plaza (Houk et al. 2010). Changes in funerary practice and the use of monumental architecture from the Late Preclassic (400 BC–AD 100) to the Late Classic (AD 600–810) periods "reflect profound shifts in political rhetoric and ideology" (Martin 2003:5). In other words, monumental architecture changed in concert with the political institution of divine kingship.

We know very little about how the process started, or what the early royal buildings looked like because no project has successfully linked a Terminal Preclassic king to his royal house. Therefore, given the long-standing tradition of Maya kings' being associated with specific royal buildings (see Fash [1998] and Fash et al. [2004] for examples from Copan and Harrison [2003] for an example from Tikal) and the concomitant changes in kingship and dynastic architecture, linking early dynastic architecture at a site with an early king is an important step in studying the evolving relationship between kings, their architectural complexes, and the process of urbanization among the ancient Maya. Chan Chich is an excellent candidate for studying this relationship because (a) the site has one of the earliest royal tombs in the eastern lowlands, (b) its royal acropolis grew incrementally through the end of the Late Classic, and (c) looters' tunnels into the largest structures afford an opportunity to explore the oldest monumental buildings at the site without having to excavate (and destroy) the overlying construction phases.

As the monumental core of Chan Chich grew through time, occupants of the city constructed small residential courtyards in the spaces between and around the monumental plazas and buildings. How these courtyards and those farther from the site center reflect social organization is one aspect of the CCAP's research agenda. Specifically, the project is trying to identify ancient neighborhoods at the site (e.g., Smith 2010). As defined by Michael Smith (2010:139), a neighborhood has "considerable face-to-face interaction and is distinctive on the basis of physical and/or social characteristics." For a number of reasons, including their functional roles within cities, neighborhoods were important in urban life (Smith 2010:137). The people living in a neighborhood often shared ethnicity, class, or occupation; and these characteristics may be reflected in the archaeological record through shared patterns of material culture.

At Chan Chich, the farthest mapped residential area from the site core, Group H, demonstrates all the characteristics of a neighborhood where the occupants shared a common occupation; they were craft specialists who made thousands of stone tools for use in the surrounding fields and quarries (Houk and Zaro 2015). Other stone tool production areas are known at Chan Chich, but how they relate to Group H and to each other is a mystery. One production area is in Group B, in the suburban zone of the site, while the other is in the North Plaza, in the site's monumental core. As described below and by Degnan and colleagues (this volume) the 2017 investigations included our first excavations at Structure A-6 and its associated debitage deposit on the edge of the North Plaza.

Farther from the site core, as the urban center of Chan Chich grew and populations increased in the rural areas, the countryside became a complicated landscape of households, engineered features, and minor and major centers, all linked by interdependent systems of domestic and political economy. Limited data suggest that dense rural settlement and a network of minor centers developed across the permit area during the Classic period. The two largest problems with the regional data, however, are that only a fraction of the permit area has been systematically surveyed and that the ages of the recorded prehistoric Maya sites (except for Chan Chich, Kaxil Uinic, and Punta de Cacao) have not been established. Most known sites have also not been carefully mapped.

Most if not all of the sites in the permit area were abandoned at the end of the Late Classic period, as Chan Chich was (e.g., Houk 2016b). At Chan Chich, CCAP excavated a number of above floor Terminal Classic artifact scatters on the steps to elite palaces in the Western Plaza and the Norman's Temple complex that arguably relate to the abandonment of the site (Booher 2016a; Houk 2000a, 2016b). Similar deposits from the same time period have been found at other sites in the region (Clayton et al. 2005; Guderjan 2004; Houk 2000a; Zaro and Houk 2012). The Chan Chich examples, with the notable exception of a dense deposit that Booher (2016a) excavated in 2016, are light- to moderate-density scatters of artifacts that range from utilitarian ceramics and ground stone implements to more elite items like a suspected jaguar tooth, a tenoned ground stone artifact, and a partially reconstructable Pabellon modeled-carved bowl. While the Chan Chich surface deposits may be reverential offerings (see Navarro-Farr 2009), possibly left by commoners and elite alike decades after the structures were abandoned, they may alternatively be evidence of non-elite resistance to increasingly ineffective elite rule if not outright repudiation of the elite's authority to rule (e.g., Joyce and Weller 2007; McAnany 2010:197). McAnany (2010:197) notes that "efforts to terminate the authority of a court may appear only as subtle signs in excavated deposits," and the Chan Chich above floor deposits may be examples of such subtle signs. The Maya abandoned Chan Chich and the surrounding permit area sometime following the creation of these deposits, allowing the jungle to reclaim the landscape.

It was not until the 1800s that British loggers began to work in the area, which remained sparsely populated up until the 1850s. In 1857, however, the Maya began to resettle western Belize as about 1,200 San Pedro Maya splintered from their home village of Chichanha, Mexico and settled in western Belize to escape the violence of the Caste War (Jones 1977). With two sites, Qualm Hill camp and Kaxil Uinic village, dating to this colonial period in the permit area, the CCAP is able to investigate this final chapter of Maya settlement and interaction with the British in Belize prior to the modern era (see Bonorden 2016).

The project area—with its great time depth and wide range of site types and features—and the work previously conducted by the CCAP provide the foundation for the ambitious multi-year project proposed here to explore the development, decline, and reoccupation of the urban landscape in northwestern Belize. Over the course of three seasons (2016–2018) funded by Alphawood Foundation, the project proposes to investigate:

- the relationship between divine kingship and monumental architecture by tracing the development of both in the Upper Plaza at Chan Chich,
- the composition and organization of the urban landscape at Chan Chich by studying

households, neighborhoods, and craft production in the site core,

- the nature of minor centers, rural settlement, and landscape modification away from the Chan Chich site core,
- the subsequent abandonment of the monumental architecture by examining an elite courtyard group at Chan Chich, and
- the resettlement of the region by San Pedro Maya centuries after the Classic Maya abandoned the region.

AN OVERVIEW OF THE 2017 SEASON

During the 2017 season, our efforts targeted four diverse objectives related to the research goals enumerated above. In the spring, Houk led a small team to investigate reported sites on Yalbac and Laguna Seca Ranches. During the summer, at the site of Chan Chich, Tomás Gallareta Cervera directed the second season of Alphawood-funded research in the Upper Plaza (Operation [Op] CC-15), Trudy Kilgore investigated a residential courtyard east of the Main Plaza (Op CC-17), and Bridgette Degnan and Kevin Miller excavated a lithic workshop and related debitage deposits at Structure A-6 (Op CC-18). The project also included topographic and drone mapping of the Main and Upper Plazas area and Courtyard D-4. As always, the project afforded field school students opportunities to participate in excavations and to work in the field lab to gain experience in artifact processing and analysis.

BEAST Reconnaissance

As described by Houk and colleagues (this volume), BEAST conducted a short reconnaissance trip to the permit area in February 2017 to investigate two reported sites. The first location is near the western border of Yalbac Ranch where three different lines of evidence suggested a large site was located. The BEAST survey team recorded BE-17, Sak Mut (see Figure 1.1). The site is in a portion of Yalbac Ranch where Hurricane Richard heavily damaged the forest in 2010. Patches of dense secondary growth and numerous large tree falls prevented the crew's performing a systematic inspection of the site in the short time available. While there, the crew recorded the locations of three large mounds—the tallest between 15 and 20 m high—with a GPS unit and flew two drone missions to photograph the forest's canopy (Figure 1.2). Despite the cursory inspection's limited assessment, it is likely that Sak Mut is a major ceremonial center based on its proximity to a site visited by Lisa Lucero in 2004 and to a site location predicted by Francisco Estrada-Belli based on satellite images (Houk et al., this volume).

The second location the crew visited is near the northern boundary of Laguna Seca Ranch, approximately 1 km west of the Booth's River Escarpment. Large mounds reported by logging crews proved to be a major ceremonial center, which Houk and colleagues (this volume) named Xma Ha Ak'al (BE-18). During their short visit, the crew mapped a large plaza bounded by monumental structures, the tallest of which is an approximately 20-m high temple pyramid. The plaza houses an east-west oriented ball court, which is unusual for the region (see Houk 2015a), and the crew recorded one stela, which appears uncarved but may have been sawed by looters. North of the plaza is a small courtyard with another stone monument. A *sacbe* connects this courtyard to the plaza. Although the crew did not have time to explore much beyond the plaza and northern courtyard, the size of the structures and plaza suggest that other large groups or structures must be nearby.

Figure 1.2. Photograph of Gregory Zaro (left), contemplating the death march back to the truck, and Mark Willis (right), preparing for a drone mission, at Sak Mut.

Investigations at Chan Chich (CCAP)

During the 2-month long summer field season, the project directed all of its efforts at Chan Chich with a focused mapping project and three concurrent operations (Figure 1.3). The first, Op CC-15, built on the 2016 excavations in the Upper Plaza and was the second of three planned seasons of research at the group. The latter two operations fall under the research agenda to investigate non-monumental elements of Chan Chich under the rubric of suburban, household, and economy studies. In 2017, the CCAP targeted a suspected lithic workshop located at Structure A-6 (Op CC-18)—part of a larger interest in lithic production at the site going back to 1998 (see Houk and Zaro 2015; Meadows and Hartnett 2000) and including proposed future work at debitage deposits in Group B—to examine issues of stone tool production just outside the Main Plaza at the site. The project also mapped and excavated Courtyard D-4 (Op CC-17), a residential group east of the Main Plaza. These excavations represent the most intensive study yet of a household at Chan Chich.

Instrument and Drone Mapping

Mark Willis oversaw mapping of the Main and Upper Plaza areas as well as Courtyard D-4 over the course of two visits to Chan Chich. The mapping involved establishing two new georeferenced control points, surveying with total data stations (TDS), and supplementary Structure from Motion (SfM) mapping using

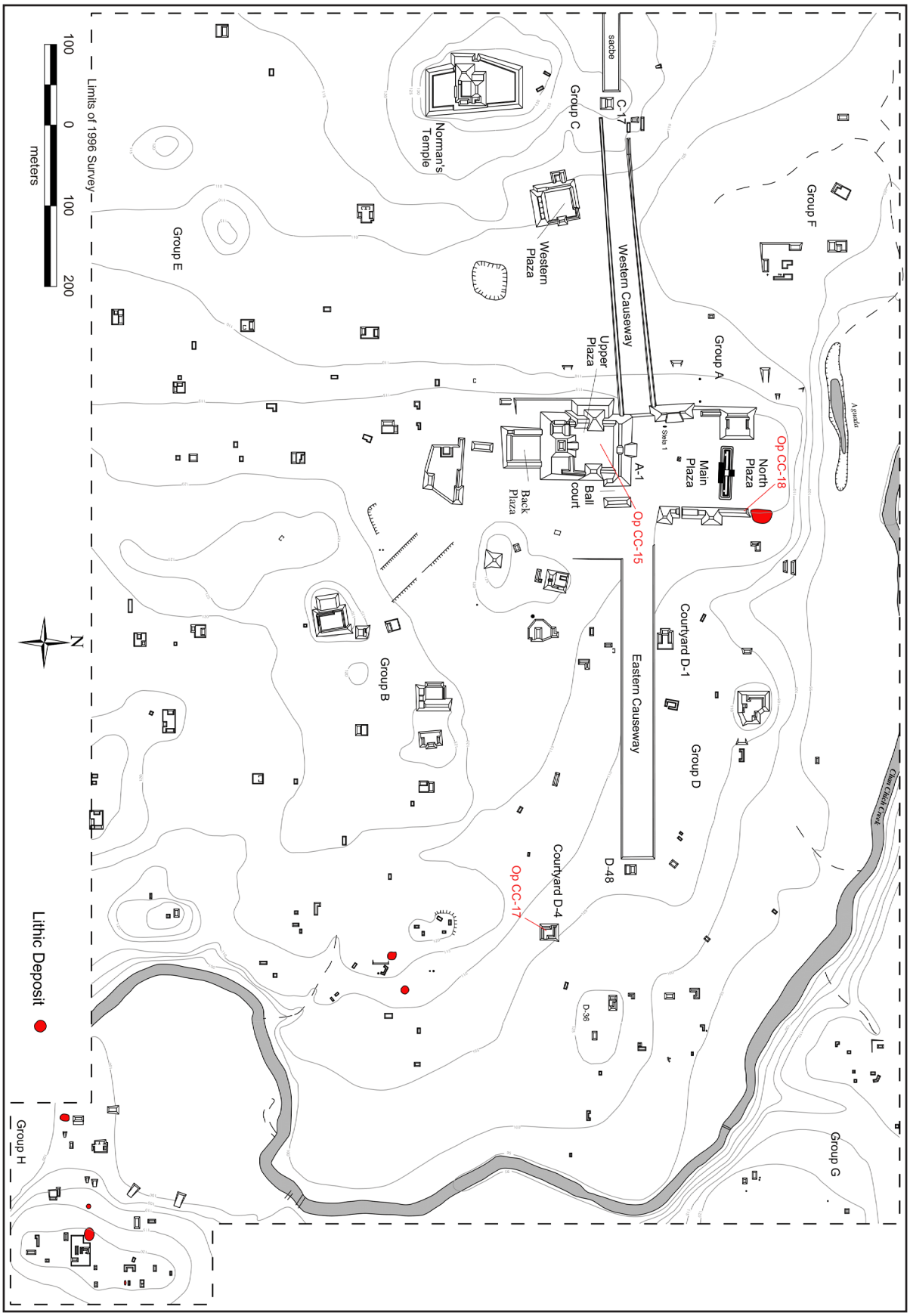

Figure 1.3. Map of Chan Chich with the Upper Plaza (Op CC-15), Courtyard D-4 (Op CC-17), and Structure A-6 (Op CC-18) highlighted.

drones and pole-based aerial photography. A father-son team of professional surveyors, Paul and Marcus Schwimmer—along with Chet Walker, TTU student Julia Kliene, and a team of workers—performed most of the TDS mapping, while Willis coordinated their activities and conducted the SfM data collection (Figure 1.4). Willis and colleagues (this volume) describe the methods, challenges, and results. Their new contour map of the site's epicenter will result in modifications and corrections to the rectified site map in the near future.

Continued Investigations in the Upper Plaza (Op CC-15)

The Upper Plaza has been an area of interest for the CCAP since its inception. Home to the largest and tallest buildings at the site and situated in the center of the monumental precinct, the Upper Plaza houses the oldest known occupation at the site. From 1997 to 1999, the CCAP conducted excavations in the Upper Plaza on Tomb 2 (Houk et al. 2010), Structure A-1 (Robichaux 1998, 2000; Robichaux et al. 2000), and Structure A-13 (Robichaux 2000), but only the Tomb 2 excavations were intensive. Since resuming operations in 2012, the CCAP has spent four seasons investigating the Upper Plaza through remote sensing work (Walker 2012), SfM mapping (Willis et al. 2014), instrument mapping (Willis et al., this volume) and excavations (Herndon et al. 2014; Houk 2016a; Kelley 2014; Kelley et al. 2012, 2013). A primary focus of this research is to establish a detailed construction chronology for the plaza and its surrounding structures by establishing a high-precision Bayesian chronology of the plaza development from bedrock to modern ground surface through carefully documented excavations and aggressive radiocarbon dating. We are also studying the development of the royal acropolis and its dynastic architecture subsequent to the interment of a divine king at the site ca. AD 250 to examine how architecture

Figure 1.4. Photograph of Mark Willis using a drone to collect SfM data in the Upper Plaza.

reflects the evolving relationship between political organization (i.e., divine kingship) and monumental construction.

In 2017, Tomás Gallareta Cervera supervised the second of three planned seasons of intensive work in the Upper Plaza, continuing where Valorie Aquino's work left off in 2016 (see Houk 2016a). The investigations focused on three primary agendas:

1. Block excavations in the northern part of the plaza to expose more of an apparent truncated platform face and to re-open Burial CC-B16, which was only partially excavated in 2016.

2. Excavations at the base of Structure A-1 to expose more of an apparent older, buried version of the building, initially exposed in Subop CC-15-B in 2016.

3. Conduct additional chronology-building excavations in the eastern, southeastern, and southwestern areas of the plaza.

As described by Gallareta Cervera and colleagues (this volume), the Upper Plaza work made some significant discoveries that are reshaping our understanding of the history of this architectural group. With 33 additional radiocarbon dates from 2017, we now have 49 dates from various contexts in the Upper Plaza from the past two seasons alone. The majority of these dates come from contexts beneath the plaza floor and provide data on the initial settlement and subsequent growth of the Upper Plaza.

The block excavations in the northern part of the Upper Plaza centered on Subops CC-15-A and -G, two units initially opened in 2016 (Figure 1.5). Subsequently, Subops CC-15-Kx, -N, -O, -P, -Px, -R, and -S were established around these initial units, providing approximately 47 m^2 of contiguous excavation area in the plaza. Some of the oldest floors and features, directly above bedrock, yet discovered at the site are from this block of excavations. As Gallareta Cervera and colleagues (this volume, Tables 2.2 and 2.3) report, the oldest floor in Subop CC-15-A has two radiocarbon samples with 2-sigma date ranges of cal 911–804 BC and cal 931–833 BC, placing initial occupation of the area in the early part of the Middle Preclassic period.

The two most noteworthy architectural discoveries of the 2017 season also came from the northern plaza block excavation. As originally proposed by Houk (2016a:17–18), the battered (sloping) platform face uncovered in Subop CC-15-A in 2016 proved to be part of a truncated, buried building (nicknamed "Blanca" due to its white stucco facing; Figure 1.6). After extensive excavations, we uncovered a portion of the southern face of the structure's platform, which measured 8.75 m east-west. Thus far, we know the platform extends 4.20 m north-south, and we know the structure continues to the east and north, beyond our excavation block. In plan, the exposed portion consists of two or possibly three tiers with a projecting axial outset. This outset is preserved to the height of the first two tiers and is slightly battered—this is the feature initially discovered in 2016. We estimate the outset would have measured 4.5 m wide but was partially destroyed by the second major find, Crypt 1, described below. The overall shape of the uncovered portion of Blanca is rectangular with rounded corners. While the axial outset is battered (sloping), the other faces are not. The two exposed tiers may actually be steps, and a third partially preserved tier appears to be present in the northern part of our block. We assume the building faced south, but this conclusion warrants further support—it is possible that the projecting outset we exposed is a rear outset, although this seems unlikely.

We believe Blanca was constructed ca. 400 BC, chopped, and then buried by a layer of

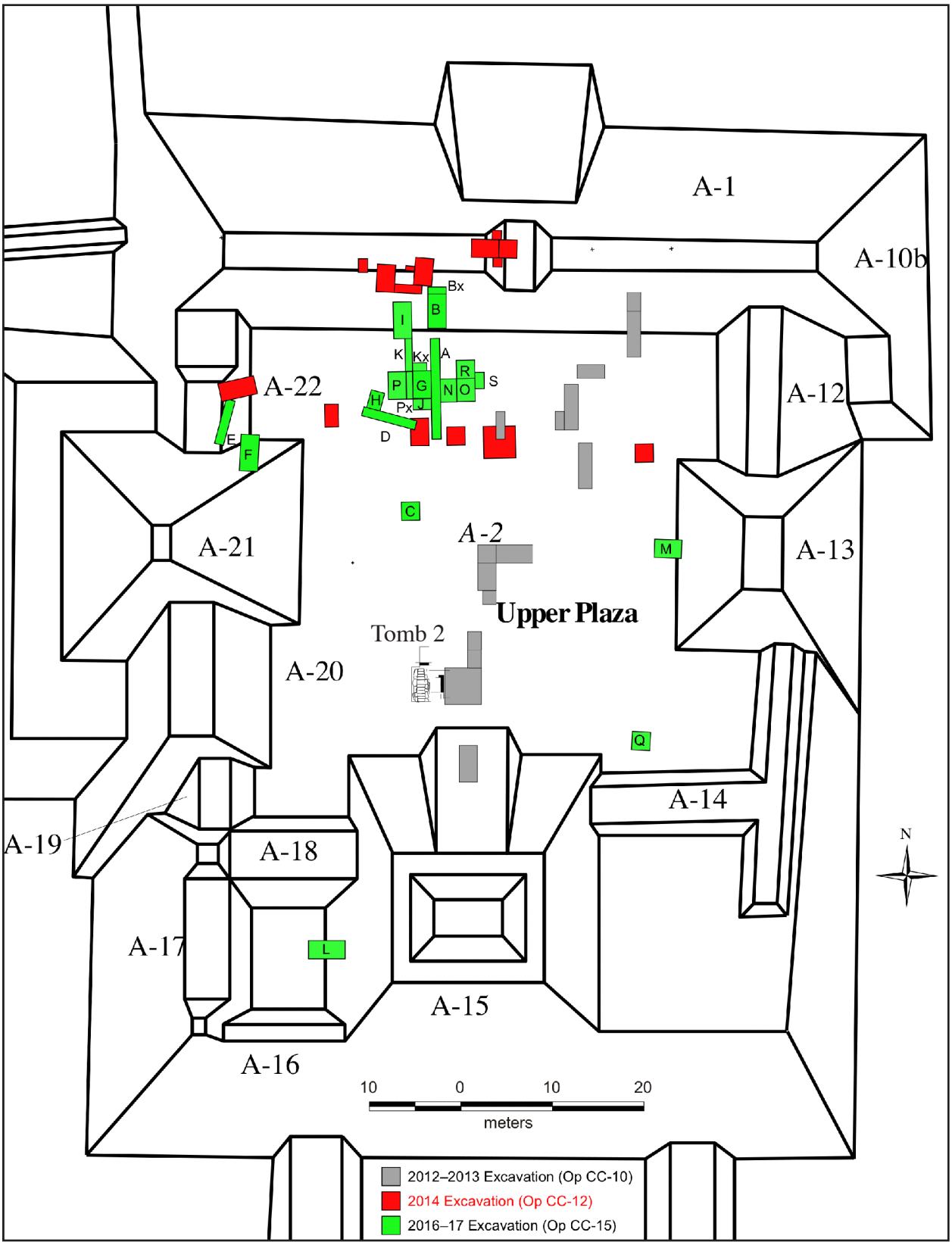

Figure 1.5. Map of the Upper Plaza showing the location of 2012–2017 excavations and Tomb 2.

Figure 1.6. Photograph of the excavation block in the northern part of the Upper Plaza at the end of the field season, view to the east. Blanca is in the foreground and background, and Crypt 1 is in the center of the photograph. An unidentified crew member is taking photographs on a bucket on the south side of the excavations.

fill, which raised the plaza to its current level. This event took place prior to cal 154 BC–AD 47, the age range for Burial CC-B17, a simple interment in the plaza fill above Blanca (Gallareta Cervera et al., this volume).

In 2016, Burial CC-B16 was discovered in Subop CC-15-G immediately west of the small portion of Blanca we exposed that season in Subop CC-15-A. By the end of the season, the context of Burial CC-B16 was unclear, and, due to time constraints, we had to leave some skeletal material *in situ* and backfill the unit prior to completing the excavations. In 2017, we reopened Subop CC-15-G and determined that our 2016 excavations had exposed part of an in-filled crypt. Gallareta Cervera and colleagues (this volume) determined the crypt is an intrusive feature constructed during the Early Classic period after Blanca had been buried and possibly forgotten. The builders of the crypt excavated a rectangular block through the plaza surface, cutting through the western edge of Blanca's projecting outset and through several underlying floors, before terminating the intrusion on a Middle Preclassic floor. They then built a 1.60-x-2.3-m vaulted chamber, oriented north-south. The chamber's vault, of which only the first course of vault stones was partially preserved on top of the walls, would have risen above the plaza's floor. A narrow stairway at the north end of the chamber apparently provided access from the plaza.

Whether or not the chamber was built to serve as a crypt originally is unclear, however its final use was as a burial for at least two individuals at the beginning of the Early Classic period. Excavating the crypt took multiple weeks (Figure 1.7). This complicated interment involved the initial burial of an individual in the center of the chamber. The Maya subsequently re-entered the crypt and moved some of the first individual's remains into two piles in the southwestern corner of the room before interring a second individual. Burial CC-B16B was an extended, supine, primary burial, with its head to the east, and its feet, crossed at the ankle, to the west (Novotny et al., this volume). An Early Classic Ixcanrio Orange Polychrome pedestal bowl, two *Spondylus* shell ear flares, and a serpentine helmet-bib head pendant accompanied this individual as grave goods (Figure 1.8).

Sometime after the placement of Burial CC-B16B, the Maya dismantled the crypt's vault and filled the chamber to the level of the plaza floor, preserving the walls of the chamber to a height of 1.25 m. A radiocarbon date on skeletal material from the second individual returned a 2-sigma calibrated date range of AD 247–353, suggesting the chamber's use ended sometime in the Early Classic period. The serpentine helmet-bib head pendant echoes the more finely crafted diadem that accompanied the individual buried in Tomb 2. This symbol of royalty suggests that perhaps Crypt 1 housed the remains of an Early Classic king of the site.

The Upper Plaza excavations also collected valuable chronological data from three new excavations. The first, Subop CC-15-M at the base of Structure A-13, documented a long construction sequence beginning in the Middle Preclassic. Subop CC-15-L at the western base of Structure A-15 in the courtyard on the southwestern corner of the Upper Plaza documented Late Preclassic deposits above bedrock and recorded a possible substructural platform. Subop CC-15-Q in the southeastern corner of the Upper Plaza also encountered a possible platform, radiocarbon dated to cal 358–278 BC (Gallareta et al., this volume). In general, these excavations add valuable data to our evolving model of the Upper Plaza's development (Figure 1.9).

Figure 1.7. Photograph of Briana Smith (top) and Anna Novotny (bottom) mapping Burial CC-B16B in Crypt 1, view to the east. The southern face of Blanca abuts the eastern wall of the crypt.

Figure 1.8. Photograph of the serpentine helmet-bib head pendant shortly after being excavated. The face of the pendant is covered in an unidentified resin.

Investigations at the Structure A-6 Lithic Workshop (Operation CC-18)

Structure A-6 is a low (0.75 m high) mound that extends north from Structure A-7. Although unimposing, this mound is notable for its apparent association with a lithic tool production and/or maintenance area. The structure is partially within the Main Plaza, but the northern end of it faces the North Plaza, an unstudied public space that marks the northern end of the monumental core of the site. One hypothesis is that the North Plaza functioned as a marketplace, and that lithic tool production may have been an important economic activity there.

The southern half of the mound is cleared and planted in grass, while the northern end is covered in forest. Large quantities of chert flakes are visible north of the mound, in a wooded area, and flakes are common on the surface of the mound. Prior to excavations, we hypothesized that Structure A-6 served as a lithic tool production and/or maintenance area and that the flakes to the north represent manufacturing debris.

Bridgette Degnan and Kevin Miller, with assistance from Houk, developed the excavation and analysis plan for Structure A-6, and Degnan is using the project for her undergraduate honors thesis at the University of Virginia. Specifically, our investigations proposed to determine the architectural form of Structure A-6 and the building's construction sequence, establish the limits of the associated

Figure 1.9. Photograph of Julia Kleine (center), Tomás Gallareta Cervera (obscured by Julia), and Claire Novotny (left) profiling Subop CC-15-Q. Claire admires the tarp-weighting rock in the foreground while Tomás and Julia work.

debitage deposit, and determine if the structure had been used as a lithic tool production area. If so, we also wanted to determine what types of tools the flint knappers had produced at Structure A-6.

As described by Degnan and colleagues (this volume), our investigations were largely successful in addressing our research objectives. Three excavation units on Structure A-6 proved that the building was a low platform with rather crude construction and no masonry superstructure. Abundant chert and chalcedony debitage on the summit of the platform confirmed that the area had been the site of stone tool production in the Late/Terminal Classic period. Penetrating excavations encountered an older construction phase that may date to the Late Preclassic period. Unfortunately, time prevented us from investigating this phase more fully, but it does not appear that stone tool production took place on this earlier version of Structure A-6.

Three 1-x-1-m test units encountered surprisingly thick debitage deposits north of Structure A-6. Although the surface indications are that the debitage deposit is a thin scatter of debris, the three test units determined it ranges from 30 to 50 cm thick. The few ceramics found in the debitage deposit suggest it formed in the Late/Terminal Classic period. While our initial hypothesis was that production on Structure A-6 resulted in the debitage deposit north of the mound, it is possible that additional workshops were located along the eastern edge of the North Plaza. Testing for additional tool production areas will be conducted in 2018; their presence

could lend support to the hypothesis that the North Plaza functioned as a marketplace.

The descriptions and analysis presented by Degnan and colleagues (this volume) are preliminary (Figure 1.10). Degnan's forthcoming honors thesis will compare the data from Structure A-6 to other workshops in urban or suburban contexts. She will also include a reanalysis of column samples from Group H to allow for a comparison of Structure A-6 data to a suburban workshop 1 km east/southeast of the Main Plaza.

Investigations at the Courtyard D-4 (Operation CC-17)

Trudy Kilgore oversaw extensive excavations at Courtyard D-4, a residential group 550 m east/southeast of Chan Chich's Main Plaza. The research will form the basis for Kilgore's MA thesis and proposes to examine how the identity of the inhabitants of Courtyard D-4 was consciously expressed through architecture and artifacts. The group consists of three mounds (Structures D-41 through D-43) grouped around a central courtyard. Kilgore's crew excavated 48 shovel tests around the group to look for off-platform middens and 23 suboperations on the structures and courtyard to examine spatial patterning, architecture, and construction history (Kilgore et al., this volume). Additionally, Kilgore's crews collected plaster samples from the floors and benches in Structures D-41 and D-42, but the results of multi-elemental analysis of those samples were still in process in December 2017 and so are not reported here.

Figure 1.10. Photograph of Bridgette Degnan conducting debitage analysis in the field lab.

While the shovel testing failed to discover any middens near the courtyard, the excavations yielded valuable architectural, chronological, and artifactual data. Radiocarbon and ceramic data indicate the courtyard was built in the Late Classic period and occupied into the beginning of the Terminal Classic period. The structural excavations exposed large portions of two rooms on Structure D-42 and one room on Structure D-41 (Figure 1.11). While those two buildings had low masonry walls and plaster benches, the excavations determined that Structure D-43, on the southern side of the courtyard, is a low platform with no masonry superstructure (Kilgore et al., this volume). Burial CC-B18, a rather simple double interment below a bench in Structure D-41, was excavated near the end of the season and is described by Novotny and colleagues (this volume).

Perhaps most importantly in terms of Kilgore's research design, the excavations also discovered three distinct artifact deposits on the courtyard. The northwest artifact deposit, which drapes up against the northern wall of Structure D-42 and extends to the edge of the platform, produced the greatest variety of artifacts (Figures 1.12 and 1.13). All together, the excavators recovered over 6,000 artifacts, comprising mostly ceramic sherds with lesser quantities of debitage, faunal bone, obsidian blades, ocarinas, modified shell, spindle whorls, and other items, from this midden-like deposit. Ceramics like Imitation Fine Orange sherds suggest a Terminal Classic date for this feature (Kilgore et al., this volume).

Figure 1.11. Mark Willis (foreground) and some of the Op CC-17 crew in the excavated room on Structure D-41. Burial CC-B18 was discovered beneath the hole in the bench in the lower left corner of the photograph.

Figure 1.12. Photograph of a bird-shaped ocarina, from the northwestern artifact deposit at Courtyard D-4.

Figure 1.13. Photograph of a shell artifact carved into the shape of a fish, from the northwestern artifact deposit at Courtyard D-4.

AN UPDATED DESCRIPTION OF CHAN CHICH

The following section updates the description of Chan Chich published in last season's introductory chapter (Houk 2016a) based on new data from 2017. This version and the 2015 (Houk 2015b) and 2016 versions are updates to the site description published by Houk and Zaro in 2014.

Chan Chich is in western Belize, approximately 4.25 km east of the border between Guatemala and Belize (Figure 1.14). The ruins are on the western bank of the northward flowing Chan Chich Creek, which joins Little Chan Chich Creek a few hundred meters north of the site to become the Río Bravo. The Río Bravo is one of three rivers from which the Three Rivers adaptive region draws its name. The site occupies a physiographic zone known as the Río Bravo Terrace Lowland. Irregular bajos and hemispherical hills characterize the area.

From the tops of the mounds in the Main Plaza at Chan Chich, the steep face of the La Lucha Escarpment is visible approximately 3.75 km to the west where it abruptly rises over 100 m (Figure 1.15). The prehistoric ruins of Kaxil Uinic sit near the base of this escarpment 2.6 km west of Chan Chich; the historic Kaxil Uinic village is approximately 500 m south of the prehistoric site of the same name. The Yalbac Hills are 18 km to the south, forming the divide between the Río Hondo and Belize River watersheds and marking the southern limit of

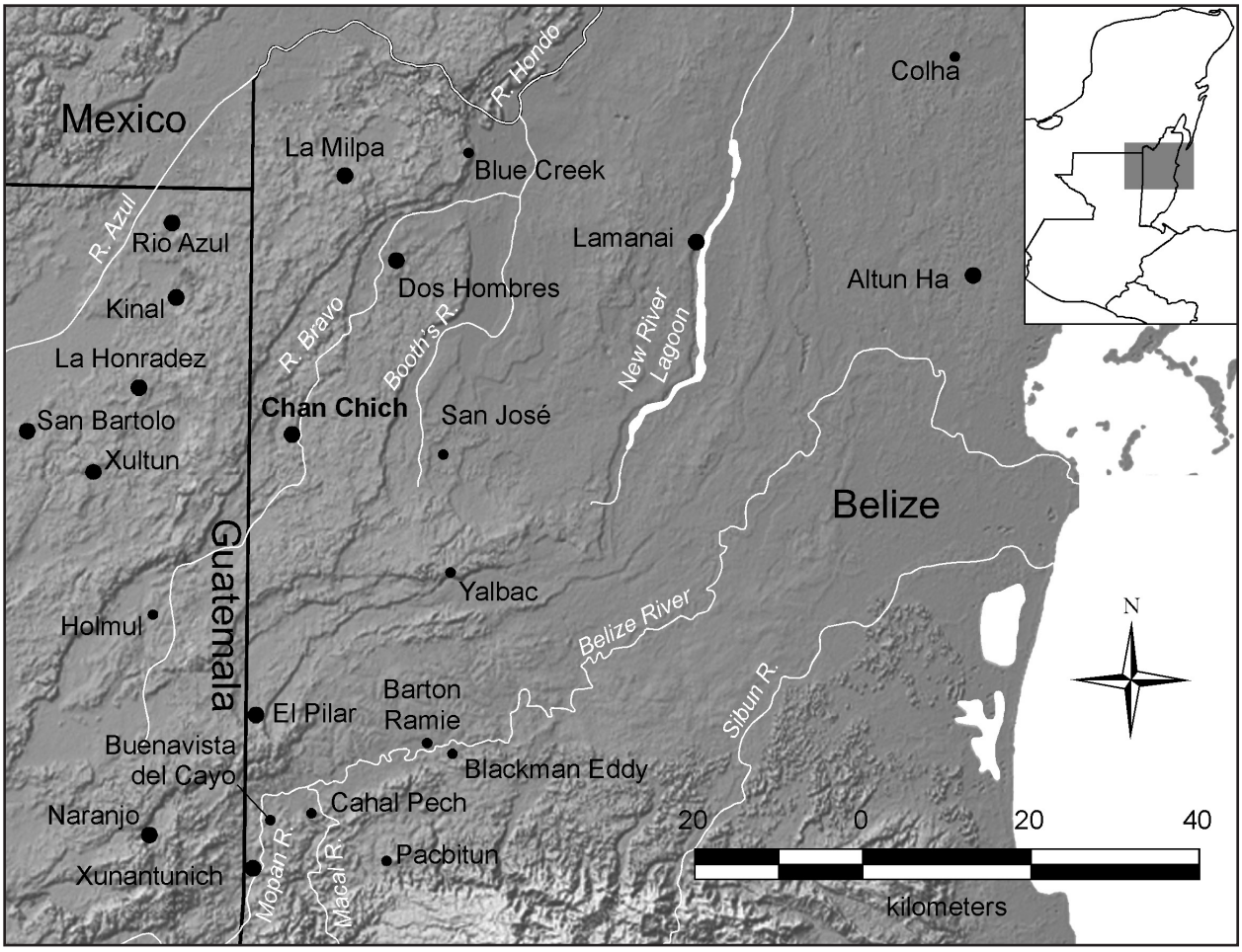

Figure 1.14. Locations of Chan Chich and other sites in western Belize.

Figure 1.15. Photograph of La Lucha Escarpment, view to the west from the summit of Structure A-4 at Chan Chich.

the Three Rivers adaptive region according to Garrison and Dunning (2009).

The major architecture at the site (see Figure 1.3) is centered on the Main Plaza (Plaza A-1) and the Upper Plaza (Plaza A-2). The Main Plaza is square in plan and is the third largest plaza in the region, encompassing 13,080 m^2 (Garrison 2007:Table 6.3). Mounds border the plaza on all sides, but gaps between structures allowed formal and informal access points. With the North Plaza at one end and the smaller Back Plaza at the other, the contiguous series of plazas and buildings extends approximately 350 m from north to south.

Structure A-1 is the largest building at Chan Chich; it is a 70-m long tandem range building that divides the Main Plaza from the Upper Plaza. A central landing on the summit of the building allowed access into the enclosed and private Upper Plaza, which is 7 m higher in elevation than the Main Plaza. Excavations in 2014 determined that Structure A-1 has two once-vaulted buildings on its summit. Each is a tandem-range building with four rooms facing the Main Plaza and four rooms facing the Upper Plaza (Herndon et al. 2014).

The Upper Plaza is arguably the site's acropolis and was home to the tomb of an early king at the site (Houk 2015a; Houk et al. 2010). Structure A-15 is situated across the plaza from Structure A-1 and is the tallest building at the site. Similar to the western temple-pyramid (Structure A-21), it has multiple looters' trenches and tunnels that reveal older architectural phases of unknown ages beneath the Late Classic buildings. Attached to the southern side of the Upper Plaza is the Back Plaza. This enclosed courtyard, encircled by low platforms on its other three sides, yielded evidence of food

preparation, perhaps by non-elite members of the royal court for the occupants of the Upper Plaza (Vazquez 2014).

Two causeways enter the Main Plaza from the east and west in front of Structure A-1. Curiously, the two have different architectural styles. The Eastern Causeway is an elevated sacbe that is 40 m wide. The Western Causeway is also elevated—at least near the Main Plaza, but it may be a ground-level feature farther west—and has parapets defining its northern and southern edges. Excavations in 2014 determined that each causeway was built in a single Late Classic construction phase (Booher and Nettleton 2014). The two causeways terminate at isolated mounds (Structure C-17 on the west and Structure D-48 on the east), which Booher (2016b) tested as part of her thesis research.

The site's ball court is at the southeastern corner of the Main Plaza, built on a level platform that extends off the Eastern Causeway. The ball court is atypical in that its western structure is physically attached to the base of Structure A-1, while its eastern structure is freestanding. The visible phase of the ball court was also constructed in the Late Classic period; Ford's (1998:56) excavations in 1997 did not penetrate the penultimate phase of either structure, but the alleyway yielded Late Preclassic ceramics from fill. When considered together, the two causeways with termini structures, Structure A-1, and the ball court must have been important architectural elements of ritual processions entering the Main Plaza (Booher 2016b; Houk 2015a).

Surrounding the core architecture are numerous smaller courtyards, the largest of which are the Western Plaza and Norman's Temple group. These two elite residential groups are approximately 250 m west and 400 m west/southwest of the Main Plaza, respectively. The Western Plaza sits at the base of a large hill, which is crowned by Norman's Temple group, a tightly enclosed courtyard with a small temple on its western edge and a range building on the north. Artificially leveled platforms extend north and south of the courtyard, and a low wall encircles the entire assemblage.

Another important group of architecture is Group H, which is located in the southeastern corner of the mapped portion of the site (see Figure 1.3). Situated on the opposite bank of Chan Chich Creek over 1 km from the Main Plaza, Group H comprises small house mounds interspersed with lithic workshops, made evident by mounds of chert flakes (Houk and Zaro 2015; Meadows and Hartnett 2000).

UPDATED SITE CHRONOLOGY

In 2012, students excavating a test pit at the base of Structure 3 at nearby Kaxil Uinic discovered an Early Preclassic sherd (ca. 1100–1000 BC) that is stylistically identical to Cunil ceramics, the earliest documented ceramics in Belize (Harris and Sisneros 2012:56; Valdez and Houk 2012:68). The deposit from which the sherd was recovered had a mixture of ceramics from the Middle and Late Preclassic periods as well, but the find suggests settlement began in the Chan Chich area by the end of the Early Preclassic period. Excavations in the Upper Plaza at Chan Chich discovered a buried Middle Preclassic period midden deposit, which was dated on the basis of ceramics and a calibrated 2-sigma radiocarbon age range of 800–415 BC with an intercept of cal 770 BC (Robichaux 1998:34). More recent excavations southeast of the midden have uncovered even older floors, the oldest of which dates to the early part of the Middle Preclassic period, supported by two charcoal dates with 2-sigma date ranges of cal 911–804 BC and cal 931–833 BC (Gallareta Cervera et al., this volume: Tables 2.2 and 2.3). To date, this represents the oldest documented cultural material at Chan

Chich itself. An early version of Structure A-1, only minimally explored in 2016, appears to date to the late part of the Middle Preclassic period. This structure covers additional, older Middle Preclassic floors (Houk 2016a).

Excavations show greater evidence of Late Preclassic occupation, as evidenced by floors and features in the Upper Plaza (Herndon et al. 2014; Gallareta Cervera et al., this volume; Houk 2016a; Kelley 2014; Kelley et al. 2012, 2013; Robichaux et al. 2000), the Main Plaza (Degnan et al., this volume; Houk 1998, 2000b), Structure C-8 in the Western Plaza (Guderjan 1991:41), and Norman's Temple group (Booher 2016a; Meadows 1998). Booher (2016b) also reports Late Preclassic foundations for Courtyard D-1, east of the Main Plaza.

As Gallareta Cervera and colleagues (this volume) describe, excavations in 2017 documented extensive Late Preclassic construction in the Upper Plaza. The most impressive construction documented in the plaza itself is the buried and truncated substructural platform nicknamed Blanca. Believed to have been built about 400 BC and terminated to make room for a northward expansion of the plaza prior the placement of Burial CC-B17 (cal 154 BC–AD 47), Blanca appears to be the foundation for a Late Preclassic temple-pyramid.

In the Terminal Preclassic period, the builders at the site cut through the floors of the Upper Plaza and into bedrock to construct Tomb 2 (Houk et al. 2010). Kelley et al. (2013) correlate the youngest floor cut through by the tomb with a 20-cm thick compact dirt surface that covers the southern and central portions of the plaza, and our current reconstruction of events places this tomb's construction after the destruction of Blanca. The tomb itself measured 3.25 m long and 0.8 m wide. It was originally sealed by 12 large capstones. A low shrine platform covered the tomb and marked its location within the plaza until a final Late Classic construction episode buried it (Houk et al. 2010; Kelley et al. 2013). The tomb's occupant was interred with the trappings of an early Maya king, namely a finely-crafted jade helmet-bib head pendant, making Tomb 2 the oldest known royal burial on the Belizean side of the Three Rivers adaptive region (Houk et al. 2010).

Early Classic architecture and discrete deposits eluded excavators until 2016. Excavations in the Upper Plaza in 2016 encountered Tzakol deposits in the northern end of the plaza. Excavations in 2017 determined these deposits were part of Crypt 1, an Early Classic chamber built in front of Structure A-1 (Gallareta Cervera et al., this volume). The once vaulted crypt housed the remains of at least two individuals. Although the crypt was rather impoverished in comparison to Tomb 2, one individual had a serpentine helmet-bib head pendant, suggesting he was a successor to the Terminal Preclassic king buried in Tomb 2.

It is probable that one of the construction phases exposed in looters' trenches in Structure A-15 and/or Structure A-21 is from the Early Classic period, but the CCAP has not yet excavated either structure to test that hypothesis. The lack of Early Classic deposits outside of the Upper Plaza suggests the site may have suffered a period of decline or stagnation.

It is clear that Chan Chich expanded greatly in the Late Classic period, and renovations to existing buildings and the construction of new buildings and features gave the site its final form ca. AD 700 or later. The architectural expansion included the final floors in the Upper Plaza and Main Plaza, where construction efforts completely buried older Late Preclassic features (Houk 1998, 2000b; Kelley et al. 2013), and the final phase of the ball court (Ford 1998). Burial CC-B11 dates the penultimate phase of Structure A-1 to the Late Classic period (see Novotny et al. 2015). The Western Plaza and

Norman's Temple were both expanded during the Late Classic period (Ford and Rush 2000), and Richard Meadows and Kristen Hartnett (2000) found that the Group H lithic workshops date to the Late Classic period, as well. The two sacbeob, which both represent single-phase constructions (Booher 2016b), are Late Classic features. Courtyard D-1 underwent significant renovations and a possible change in function during the Late Classic period following the construction of the Eastern Causeway (Booher 2016b). Degnan and colleagues (this volume) determined that the lithic workshop deposits at Structure A-6 formed in the Late Classic period, and Kilgore and colleagues (this volume) show that Courtyard D-1 was initially constructed during the Late Classic period, as well.

The site apparently went into decline during the Terminal Classic period around AD 800 before being abandoned around AD 850. Construction at the site at the end of the Late Classic was of noticeably inferior quality. At Structure A-5, the final phase of the southern stairs included robbed vault stones in the construction (Herndon et al. 2013), and the Terminal Classic occupants of Structure C-6 in the Western Plaza built a crude wall using robbed vault stones (Harrison 2000). That same structure included a Terminal Classic burial of a single adult male beneath a bench in the room. He was buried with a black-slipped anthropomorphic bowl and two shell discs (Harrison 2000:83). Vazquez et al. (2014) report numerous robbed vault stones used in the walls of structures in the Back Plaza, as well. Occupation continued into the Terminal Classic period in the Back Plaza based on materials found on the final floor of Structure A-23 (Vazquez et al. 2014), at Courtyard D-1 (Booher 2016b), and at Courtyard D-4 (Kilgore et al., this volume).

Deposits of elite artifacts left broken on the steps to the range building in the Norman's Temple group and on the largest structure in the Western Plaza are Terminal Classic in age, likely deposited at or shortly after the time of the site's abandonment (Houk 2016b). A newly discovered terminal deposit in the southeastern corner of the Norman's Temple courtyard (see Booher 2016a) adds to growing body of evidence related to the abandonment of the site. Arguably, the graffiti documented by Booher (2016a) in a room on Structure C-2 at the Norman's Temple complex was created near the time of abandonment; certainly, the walls of the room were never replastered.

Even though Chan Chich fell into ruin during the Terminal Classic period, Postclassic pilgrims made periodic visits to leave offerings, including an incense burner on the stairs to Structure A-5 (Herndon et al. 2013) and another on the top of Structure A-4 (Guderjan 1991:45). At Kaxil Uinic, pilgrims propped up half of the broken stela and placed offerings of incensarios around its base, during either the Late Postclassic period or Colonial period (Houk et al. 2013). Based on Bonorden's and Kilgore's (2015, 2016) work at the historic Kaxil Uinic village, the project ceramicists designated a new Postclassic ceramic complex called Vireo (Figure 1.16). This is not, at this stage, a functionally complete complex (Lauren Sullivan, personal communication, 2015).

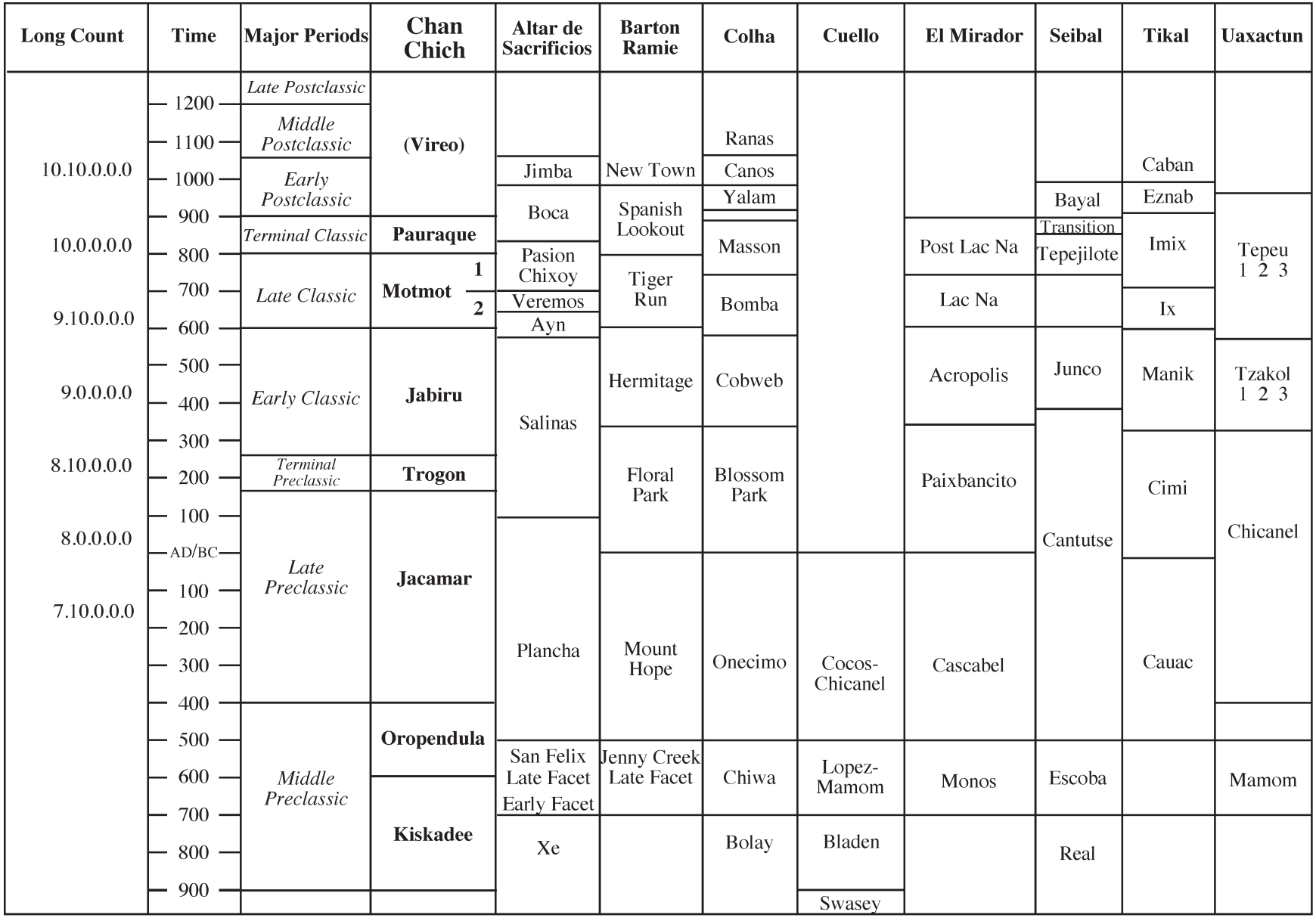

Figure 1.16. Chan Chich ceramic complexes and other ceramic sequences for the Maya lowlands (after Valdez and Sullivan 2014:Figure 9.1).

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The 2017 Investigations in the Upper Plaza at Chan Chich, Belize

Tomás Gallareta Cervera, Brett A. Houk, and Paisley Palmer

From 1997 to 1999, the CCAP conducted excavations in the Upper Plaza on Tomb 2 (Houk et al. 2010), Structure A-1 (Robichaux 1998, 2000; Robichaux et al. 2000), and Structure A-13 (Robichaux 2000), but only the Tomb 2 excavations were intensive. Since resuming operations in 2012, the CCAP has spent four seasons prior to 2017 investigating the Upper Plaza through remote sensing work (Walker 2012), Structure from Motion (SfM) mapping (Willis et al. 2014), and excavations (Herndon et al. 2014; Houk 2016; Kelley 2014; Kelley et al. 2012, 2013). In 2016, the CCAP began a three-year project in the Upper Plaza designed to answer a range of questions raised by previous investigations, and the Upper Plaza investigations are a major component of the 2016–2018 research agenda funded by Alphawood Foundation. A primary focus of the renewed research is to establish a detailed construction chronology for the plaza and its surrounding structures by establishing a high-precision Bayesian chronology of the plaza development from bedrock to the modern ground surface. Related to this aim is the goal of understanding the development of the royal acropolis and its dynastic architecture subsequent to the establishment of a royal dynasty at the site ca. AD 150–250 and to examine how architecture reflects the evolving relationship between political organization (i.e., divine kingship) and monumental construction.

In 2017, Tomás Gallareta Cervera directed the Upper Plaza investigations with assistance from Suboperation Directors Paisley Palmer and Briana Smith. Project Director Brett A. Houk and Field Director Claire Novotny assisted with planning and interpretations throughout the field season, and Project Osteologist Anna Novotny supervised burial excavations. A crew of hired workers and field school students on Texas Tech University's Field School in Maya Archaeology conducted most of excavations.

SUMMARY OF 2016 EXCAVATIONS

Valorie Aquino directed excavations in the Upper Plaza in 2016, and Houk (2016) summarized her findings. Under Operation (Op) CC-15, Aquino's crews excavated four suboperations and one suboperation extension to investigate a suspected buried platform first documented by Kelley (2014) in the northern part of the plaza and three more suboperations focused on chronology building (Houk 2016). Pertinent to the 2017 investigations are Aquino's Suboperations (Subops) CC-15-A and CC-15-G, which she placed in the northern part of the plaza to explore the poorly understood construction sequence and possible buried platform. As Houk (2016:17) notes, the two units "unexpectedly demonstrated that the northern part of the plaza has a much more complicated sequence of building events than previous excavations had suggested." Aquino's Subops CC-15-A and -G uncovered

Gallareta Cervera, Tomás, Brett A. Houk, and Paisley Palmer
2017 The 2017 Investigations in the Upper Plaza at Chan Chich, Belize. In *The 2017 Season of the Chan Chich Archaeological Project*, edited by Brett A. Houk and Claire Novotny, pp. 33–68. Papers of the Chan Chich Archaeological Project, Number 12. Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

multiple buried walls—some oriented east-west and others north-south—north of the wall-like feature originally recorded in by Kelley (2014) during her thesis research in 2012 and 2013. Subop CC-15-A exposed a small section of a battered platform face, made of white limestone blocks and sloping gently back to the north (Houk 2016). Excavations exposed only a 1-m section of this east-west feature, but Houk (2016:17) interpreted it to be part of a substructural platform that later plaza renovations had truncated. Immediately west of this feature, Aquino's team discovered an apparent cist or crypt containing the partial remains of at least two individuals (Houk 2016; Novotny et al. 2016). Due to time constraints, this feature in Subop CC-15-G could not be completely excavated, and some skeletal remains were left *in situ* and backfilled. Ceramic data and a radiocarbon date from charcoal in the fill of the feature suggested a Terminal Preclassic/early Early Classic date for the crypt (Houk 2016:19).

2017 RESEARCH QUESTIONS

The overarching research questions guiding our investigations in the Upper Plaza are:

- Are there linkages between the development of the institution of divine kingship and the architectural evolution of the Upper Plaza?
- Is it possible to identify the royal residence for the first king of Chan Chich based on iconographic elements or ritual deposits?

In 2017, CCAP continued the investigations of dynastic architecture in the Upper Plaza with plan accounting for the results of the 2016 season. Our objectives were to:

- Refine the construction chronology in the southwestern and southeastern areas of the Upper Plaza.
- Conduct large, horizontal excavations in the northern part of the Upper Plaza.
- Expose the more of the buried Preclassic structure under Structure A-1 (see Houk 2016).

METHODS

The Upper Plaza excavations in 2017 continued under Op CC-15 and involved the re-opening of all or portions of Subops CC-15-A and -G and the establishment of 13 new excavations: Subops CC-15-I through -S, -Kx, and -Px (Table 2.1). Excavations, recording, and artifact/sample collecting procedures followed those described by Houk and Zaro (2015) for the CCAP. As discussed below, Subops CC-15-M, -L, and -Q were chronology-building test pits at the base of Structure A-13, on the western base of Structure A-15, and in the southeastern part of the Upper Plaza, respectively. Subops CC-15-A, -G, -J, -K, -Kx, -N, -O, -P, -R, and -S formed an irregular block of units that investigated the crypt-like feature and truncated platform discovered in 2016. Subops CC-15-I and -K exposed final phase architecture at the base of Structure A-1 and probed for older structures, initially discovered in Subop CC-15-B in 2016.

RESULTS

Radiocarbon Sampling

To assist in developing a detailed construction history for the Upper Plaza, the 2016 and 2017 seasons included a robust program of radiocarbon dating. In 2016, the project obtained 16 radiocarbon ages from a variety of contexts, and in 2017 we added another 33 dates. In Tables 2.2 and 2.3, the contexts and ages of the 49 samples are organized by suboperation and lot number.

Table 2.1. Descriptions of Op CC-15 Suboperations Excavated in 2017 by Area

Area	Subop	Dimensions (m)	Purpose
Northern Block	CC-15-A	1 x 11	Opened in 2016 to explore stratigraphy north of Crystal; re-opened in 2017.
Northern Block	CC-15-G	2 x 3	Opened in 2016 as a stratigraphic test pit; re-opened in 2017 to excavate Burial CC-B16B.
Northern Block	CC-15-J	1.2 x 2	To clarify architecture associated with Crypt 1's south wall.
Northern Block	CC-15-K	0.78 x 3.6	To connect Subop CC-15-I to the northern excavation block around Subop CC-15-G.
Northern Block	CC-15-Kx	1 x 1.5	Extension of Subop CC-15-K to the east.
Northern Block	CC-15-N	2.5 x 1.5	To explore the form and construction sequence of Blanca.
Northern Block	CC-15-O	2.5 x 2	To explore the form and construction sequence of Blanca.
Northern Block	CC-15-P	3 x 2	To determine if Blanca continued west of Subop CC-15-G and Crypt 1.
Northern Block	CC-15-Px	3 x 0.75	Extension of Subop CC-15-Px to remove balk between Subops CC-15-G and –P.
Northern Block	CC-15-R	2 x 2	To explore the form and construction sequence of Blanca.
Northern Block	CC-15-S	1.8 x 2	To explore the form and construction sequence of Blanca.
Structure A-1	CC-15-I	4 x 2	To expose more of the Preclassic platform buried beneath Structure A-1 (Lot CC-15-B-04 in 2016).
East	CC-15-M	2 x 3	To collect chronological data in the eastern part of Upper Plaza at the base of Structure A-13.
Southeast	CC-15-Q	2 x 2	To collect chronological data in the southeastern corner of Upper Plaza
Southwest	CC-15-L	4 x 2	To uncover the west facade of Structure A-15 and collect chronological data in southwestern part of Upper Plaza. Unit stepped down to 2 x 2 below collapse debris.

Block Excavations in Northern Part of the Upper Plaza

The primary focus of the 2017 excavations was the complicated features—including an apparent truncated platform and a possible crypt—discovered south of the base of Structure A-1 in 2016 (Houk 2016). This area is located under the last plaza surface, and preliminary ceramic and radiocarbon data suggest the features exposed in 2016 were buried, plastered over, and became part of the plaza at the end of the Terminal Preclassic or during the early Early Classic period. Subop CC-15-G and portions of Subop CC-15-A were re-opened, while Subops CC-15-N, -O, -P, -Px, -R, and -S were all established with the purpose of exposing these buried features, defining the nature and extent of the architecture, and determining the associated dates of the various features and construction phases (Table 2.4; Figure 2.1). Subops CC-15-K and -Kx were opened to connect Subop CC-15-I, which was at the base of Structure A-1, to the block of units centered on Subops CC-15-A and -G.

Table 2.2. Contexts of 2016 and 2017 Radiocarbon Samples from the Upper Plaza by Lot Number

Sample	Lot	Context	Material
CC-15-S016	CC-15-A-08	Associated with construction of Lot 15-A-8 plaster floor	
CC-15-S043	CC-15-A-15	Associated with earliest use of plaza above bedrock	
CC-15-S119/120	CC-15-A-27	Floor 6, south of Blanca	Multiple charcoal
CC-15-S005	CC-15-B-03	Associated with terminal use of Structure A-1	
CC-15-S045	CC-15-B-04	Embedded on surface of Lot 15 B-7; associated with fill of buried Preclassic platform or top of underlying Middle Preclassic surface	
CC-15-S022	CC-15-B-04	Embedded in ballast; associated with construction of buried Preclassic platform	
CC-15-S029	CC-15-B-08	Associated with construction of buried Preclassic platform	
CC-15-S050	CC-15-B-10	Associated with intentional cutting event through Lot 15-B-9 plaster surface	
CC-15-S054	CC-15-B-11	Associated with construction of Lot 15-B-11 plaster floor	
CC-15-S051	CC-15-B-15	Embedded on compacted surface at base of intentional cut feature in Lot 15-B-9 (use of Lot 15-B-16/construction of Lot 15-B-15)	
CC-15-S004	CC-15-C-04	Embedded on compacted dirt stratum (below terminal plaza plaster floor fill)	
CC-15-S019	CC-15-C-05	Associated with surface of Lot 15-C-5 plaster floor	
CC-15-S007	CC-15-C-07	Associated with surface of Lot 15-C-7 plaster floor	
CC-15-S023	CC-15-C-08	Associated with Lot 15-C-8 plaster floor	
CC-15-S034	CC-15-C-10	Embedded in ballast of Lot CC-15-C-10 (7th plaster floor/8th living surface down from modern surface/eroded terminal plaza floor)	
CC-15-S039	CC-15-C-11	Associated with surface of Lot 15-C-11 plaster floor	
CC-15-S059	CC-15-G-04	Associated with intentional burning event	

Table 2.3. Ages of 2016 and 2017 Radiocarbon Samples from the Upper Plaza by Lot Number

Sample	14C age (BP)	±	Calibrated age (AD/BC)	% under curve	2σ Age Range
CC-15-S016	2470	25	767–482 BC	94.6	767–434 BC
			442–434 BC	8.0	
CC-15-S043	2700	35	911-804 BC	95.4	911–804 BC
CC-15-S119/120	2750	20	968–964 BC	0.8	968–833 BC
			931–833 BC	94.6	
CC-15-S005	1275	20	AD 675–770	95.4	AD 675–770
CC-15-S045	2435	25	749–684 BC	21.3	749–407 BC
			667–640 BC	6.8	
			589–578 BC	1.0	
			564–407 BC	66.3	
CC-15-S022	2485	20	766–540 BC	95.4	766–540 BC
CC-15-S029	2595	45	841–736 BC	73.4	841–547 BC
			689–663 BC	5.4	
			648–547 BC	16.6	
CC-15-S050	2490	25	774–536 BC	95.1	774–524 BC
			525–524 BC	0.3	
CC-15-S054	2520	30	795–728 BC	29.3	795–542 BC
			717–708 BC	1.0	
			694–542 BC	65.1	
CC-15-S051	2620	25	826–782 BC	95.4	826 –782 BC
CC-15-S004	1835	20	AD 128–236	95.4	AD 128–236
CC-15-S019	1840	20	AD 125–238	95.4	AD 125–238
CC-15-S007	2265	40	401–346 BC	38.3	401–206 BC
			322–206 BC	57.1	
CC-15-S023	2295	30	406–354 BC	75.1	406–231 BC
			291–231 BC	20.3	
CC-15-S034	2530	20	794–746 BC	42.7	794 –552 BC
			686–666 BC	13.5	
			644–552 BC	39.2	
CC-15-S039	2470	30	768–476 BC	92.4	768–431 BC
			464–453 BC	1.2	
			445–431 BC	1.8	
CC-15-S059	1895	25	55 BC–AD 175	91.8	55 BC–AD 211
			AD 191–211	3.6	

Table 2.2. Contexts of 2016 and 2017 Radiocarbon Samples from the Upper Plaza (continued)

Sample	Lot	Context	Material
CC-15-S065	CC-15-G-13	Fill of capstones at the south wall of crypt	multiple charcoal
CC-15-S063	CC-15-G-14	Burial CC-B16/Crypt context	multiple charcoal
CC-15-S067	CC-15-G-14	Burial CC-B16/Crypt context	multiple charcoal
CC-15-S070	CC-15-G-14	Burial CC-B16/Crypt context	multiple charcoal
CC-15-S071	CC-15-G-14	Burial CC-B16/Crypt context	single charcoal
CC-15-S073	CC-15-G-14	Burial CC-B16/Crypt context	multiple charcoal
CC-15-S141	CC-15-G-14	Individual B, Burial CC-B16	XAD amino acids
CC-15-S138	CC-15-G-19	Crypt floor	multiple charcoal
CC-15-S137	CC-15-G-21	Fill of crypt floor	multiple charcoal
CC-15-S079	CC-15-I-09	“Floor 3”	multiple charcoal
CC-15-S130	CC-15-L-16	Top of stone feature (outside)	multiple charcoal
CC-15-S126	CC-15-L-17	Inside of stone feature	single charcoal
CC-15-S075	CC-15-M-12	Floor 3 of east Upper Plaza construction sequence	single charcoal
CC-15-S075	CC-15-M-12	Floor 3 of east Upper Plaza construction sequence	single charcoal
CC-15-S083/085	CC-15-M-17	Fill of Preclassic platform floor	multiple charcoal
CC-15-S086	CC-15-M-21	Floor 6 of east Upper Plaza construction sequence	single charcoal
CC-15-S087	CC-15-M-22	Construction fill	single charcoal
CC-15-S088	CC-15-M-23	Surface of posthole	single charcoal

Table 2.3. Ages of 2016 and 2017 Radiocarbon Samples from the Upper Plaza (continued)

Sample	14C age (BP)	±	Calibrated age (AD/BC)	% under curve	2σ Age Range
CC-15-S065	1855	15	AD 121–227	88.9	AD 87–227
			AD 87–107	6.5	
CC-15-S063	1735	15	AD 247–353	92.5	AD 247–379
			AD 368–379	2.9	
CC-15-S067	1785	20	AD 140–197	14.1	AD 140–328
			AD 208–262	48.2	
			AD 277–328	33.1	
CC-15-S070	1715	15	AD 257–298	30.7	AD 257–387
			AD 320–387	64.7	
CC-15-S071	1780	15	AD 174–192	2.3	AD 174–330
			AD 212–264	50.8	
			AD 275–330	42.4	
CC-15-S073	2475	15	762–537 BC	95.4	762–537 BC
CC-15-S141	1725	20	AD 252–384	95.4	AD 252–384
CC-15-S138	1760	15	AD 237–333	95.4	AD 237–333
CC-15-S137	2540	20	796–748 BC	60.5	796–556 BC
			685–667 BC	10.4	
			641–587 BC	19.6	
			581–556 BC	4.9	
CC-15-S079	2175	15	355–291 BC	63.0	355–175 BC
			232–175 BC	32.4	
CC-15-S130	2185	15	358–281 BC	65.4	358–185 BC
			258–245 BC	2.3	
			236–185 BC	27.8	
CC-15-S126	2100	20	182–52 BC	95.4	182–52 BC
CC-15-S075	1710	15	AD 257–296	23.3	AD 257–390
			AD 321–390	72.1	
CC-15-S083/085	2415	20	542–406 BC	90.8	728–406 BC
			707–694 BC	2.5	
			728–717 BC	2.1	
CC-15-S086	2450	20	751–683 BC	31.9	751–413 BC
			669–637 BC	11.5	
			622–617 BC	0.6	
			591–413 BC	51.5	
CC-15-S087	2465	20	762–482 BC	94.8	762–434 BC
			441–434 BC	0.6	
CC-15-S088	2520	15	787–746 BC	32.0	787–552 BC
			686–666 BC	16.2	
			644–552 BC	47.2	

Table 2.2. Contexts of 2016 and 2017 Radiocarbon Samples from the Upper Plaza (continued)

Sample	Lot	Context	Material
CC-15-S127	CC-15-M-24	Inside of Posthole	single charcoal
CC-15-S143	CC-15-N-04	Burial CC-B17	XAD amino acids
CC-15-S092	CC-15-Q-02	Fill of Floor 1 of SE Upper Plaza construction sequence	single charcoal
CC-15-S117	CC-15-Q-09	Fill of dismantled Floor 4 of SE Upper Plaza construction sequence	single charcoal

Table 2.4. Summary of Suboperations and Lots in Northern Excavation Block

Subop CC-	Lot	Lot Description	Ceramic Data
15-A	01	Topsoil	Tepeu 2-3
	02	Construction Fill	Chicanel with Tepeu 2 admix
	03	Construction Fill	Tzakol and Chicanel mix
	04	Floor	Chicanel
	05	Other Surface	Tzakol and Chicanel mix
	06	Floor	Chicanel
	07	Floor	Chicanel
	08	Floor	Chicanel
	09	Floor	Tepeu 2 with Chicanel trace
	10	Floor	
	11	Floor	Chicanel
	12	Floor	
	13	Floor	
	14	Floor	
	15	Floor	Chicanel
	16	Other	Chicanel
	17	Construction Fill	Chicanel
	18	Construction Fill	Chicanel with Mamon trace

Table 2.4. Summary of Suboperations and Lots in Northern Excavation Block (cont.)

Subop CC-	Lot	Lot Description	Ceramic Data
15-A (cont.)	19	Construction Fill	Chicanel with Mamon trace
	20	Floor	Chicanel
	21	Floor	Chicanel and Mamon mix
	22	Wall	
	23	Wall	
	24	Construction Fill	Chicanel
	25	Floor	
	26	Floor	
	27	Floor	
	28	Construction Fill	
	29	Floor	
	30	Floor	
	31	Floor	
	32	Construction Fill	
	33	Floor	
	34	Midden	
	35	Construction Fill	
	36	Construction Fill	

Table 2.3. Ages of 2016 and 2017 Radiocarbon Samples from the Upper Plaza (continued)

Sample	14C age (BP)	±	Calibrated age (AD/BC)	% under curve	2σ Age Range
CC-15-S127	2430	15	730–692 BC	12.1	730–411 BC
			659–652 BC	1.7	
			544–411 BC	81.6	
CC-15-S143	2035	25	154–140 BC	1.9	154 BC–47 AD
			113 BC– AD 27	92.7	
			AD 42–47	0.8	
CC-15-S092	4475	20	3335–3211 BC	60.8	3335–3033 BC
			3193–3151 BC	13.5	
			3138–3088 BC	18.0	
			3057–3033 BC	3.0	
CC-15-S117	2195	15	358–278 BC	61.0	358–199 BC
			259–199 BC	34.4	

Table 2.4. Summary of Suboperations and Lots in Northern Excavation Block (cont.)

Subop CC-	Lot	Lot Description	Ceramic Data
15-G	01	Topsoil	
	02	Construction Fill	Tzakol and Chicanel mix
	03	Construction Fill	Tzakol with Chicanel and Mamon trace
	04	Other	Tzakol with Chicanel admix
	05	Wall	
	06	Wall	
	07	Wall	
	08	Other Surface	Tzakol with Chicanel admix
	09	Other	Tzakol and Chicanel mix
	10	Construction Fill	Tzakol with Chicanel trace
	11	Burial	Tzakol
	12	Construction Fill	Tzakol with Chicanel trace
	13	Other	Mamon

Table 2.4. Summary of Suboperations and Lots in Northern Excavation Block (cont.)

Subop CC-	Lot	Lot Description	Ceramic Data
15-G (cont.)	14	Burial	Floral Park and Chicanel
	15	Burial	Floral Park
	16	Floor	Floral Park
	17	Floor	
	18	Wall	
	19	Other	
	20	Floor	
	21	Bedrock	
15-J	01	Topsoil	Tepeu 2 with Mamom admix
	02	Construction Fill	Chicanel with Mamom admix
	03	Construction Fill	Chicanel
	04	Construction Fill	Chicanel
	05	Floor	
	06	Floor	
15-K	01	Topsoil	Tepeu 2-3?
	02	Collapse Debris	Tepeu 2-3?
	03	Construction Fill	Chicanel
	04	Construction Fill	Chicanel
	05	Construction Fill	

Table 2.4. Summary of Suboperations and Lots in Northern Excavation Block (cont.)

Subop CC-	Lot	Lot Description	Ceramic Data
15-Kx	01	Topsoil	Tepeu 2 and Chicanel mix
	02	Construction Fill	Tepeu 2 and Chicanel mix
	03	Construction Fill	Tepeu 2-3
15-N	01	Topsoil	Chicanel
	02	Construction Fill	Chicanel
	03	Construction Fill	Chicanel and Mamom mix
	04	Burial	Chicanel with Mamom admix
	05	Construction Fill	Chicanel with Mamom trace
	06	Construction Fill	Chicanel with Mamom admix
	07	Floor	Mamom
	08	Construction Fill	Mamom
	09	Construction Fill	Chicanel
	10	Floor	
15-O	01	Topsoil	Tepeu 2 with Chicanel trace
	02	Collapse Debris	Chicanel
	03	Collapse Debris	
	04	Construction Fill	
	05	Floor	
	06	Floor	
	07	Construction Fill	
	08	Floor	
	09	Construction Fill	
	10	Floor	
	11	Construction Fill	
15-P	01	Topsoil	
	02	Construction Fill	Tepeu 2
	03	Collapse Debris	Chicanel
	04	Construction Fill	Chicanel
	05	Construction Fill	Chicanel
	06	Construction Fill	Tepeu 2
	07	Floor	

Table 2.4. Summary of Suboperations and Lots in Northern Excavation Block (cont.)

Subop CC-	Lot	Lot Description	Ceramic Data
15-R	01	Topsoil	
	02	Construction Fill	
	03	Construction Fill	
	04	Construction Fill	
15-S	01	Topsoil	
	02	Construction Fill	

Summary of Subops CC-15-A and CC-15-G

Subop CC-15-A, opened south of Structure A-1, measured 11 x 1 m, oriented north-south. The unit was excavated in the 2016 season to gain chronological understanding of the suspected Preclassic platform exposed by earlier seasons (see Houk 2016). The feature, which consists of a basal course of cut and shaped limestone blocks and three or more courses of unshaped limestone boulders, is approximately 1.5 m tall (Figure 2.2), and excavations have determined it is at least 22.5 m east-west (Herndon et al. 2014:38). Following the 2014 season, Herndon and colleagues (2014:39) offered the following interpretation of the feature:

> Because this uncut, stone feature was uncovered in the midst of a large layer of construction fill and the fact that it lacks any remains of plaster on either side, it is possible that it served as a construction pen to stabilize the final large build-up of the plaza, rather than a platform face for a platform extending to the north. Researchers at other sites in western Belize…have identified similar construction pens beneath the large plaza construction phases. However, if this is the case, the cut and plastered stones beneath the upper section of uncut stones…still require explanation. Furthermore, as evidenced in Suboperation CC-12-Q, the stones

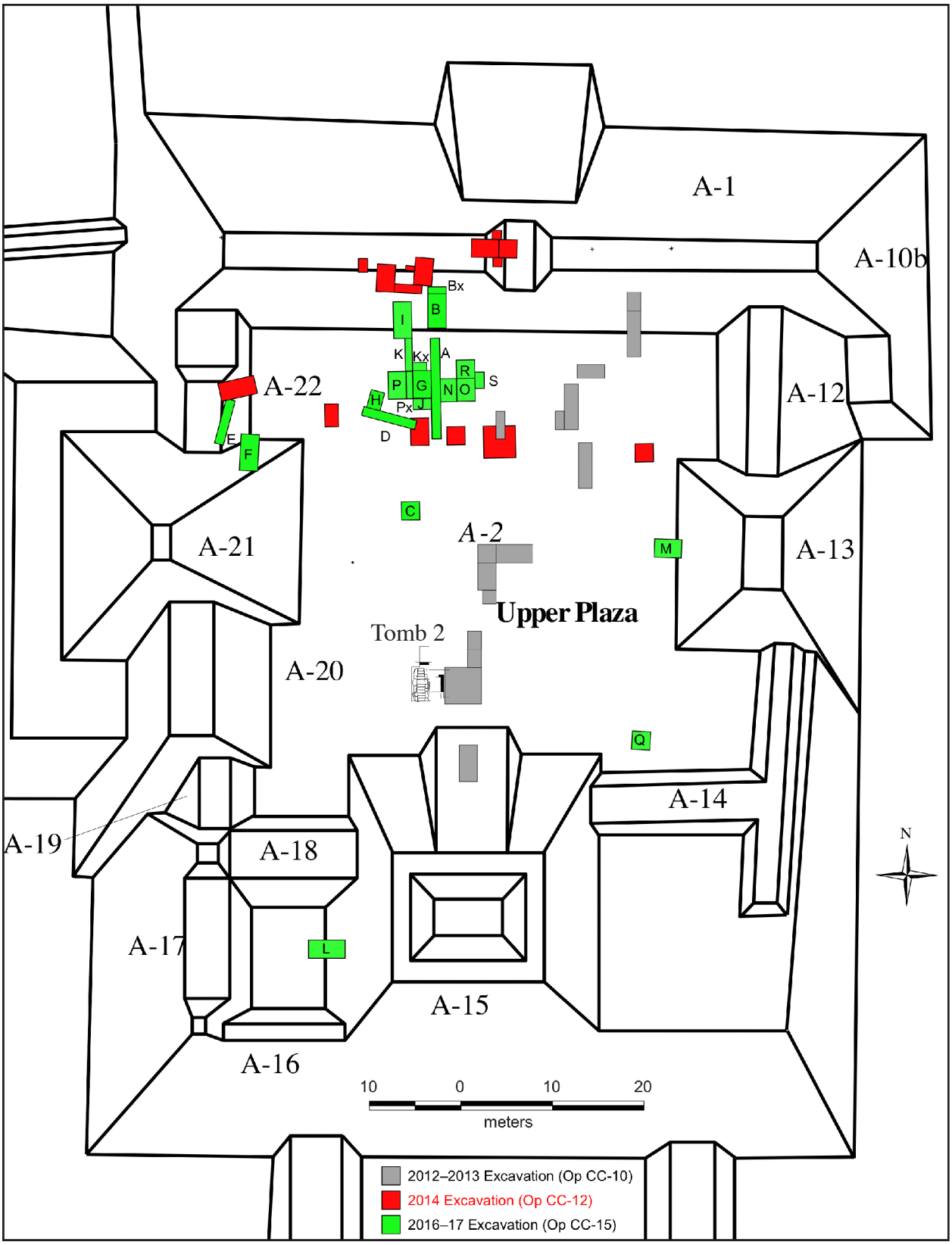

Figure 2.1. Map of excavations from 2012 through 2017 in the Upper Plaza.

Figure 2.2. Photograph from 2014 excavations of the southern face of the feature nicknamed Crystal. Note the lower courses of cut limestone blocks and the upper courses of unshaped boulders. After Herndon et al. (2014:Figure 3.2).

> appear to be roughly faced towards the south, possibly lending support to its use as a platform face.

For the sake of discussion, we dubbed this suspected platform face/wall-like feature Crystal in 2017. In 2016, the southern end of Subop CC-15-A exposed the southern face of Crystal. However, the unit also revealed a series of walls north of the feature. As a result, Aquino opened Subop CC-15-G to the west of Subop CC-15-A to increase the excavation area. As described by Houk (2016:17–18), the 2016 excavations raised more questions than they answered:

> This season's work unexpectedly demonstrated that the northern part of the plaza has a much more complicated sequence of building events than previous excavations had suggested… Subops CC-15-A and -G encountered multiple buried walls—some oriented east-west and others north-south—in addition to the wall-like feature originally recorded in 2013 and 2014. Most intriguingly, the excavations uncovered a small section of a slightly battered platform face, which slopes back to the north, made of cut and shaped stone blocks...Our preliminary interpretation is that this is the base of a platform that was truncated during a later plaza expansion. If correct, the cut stone course at the base of the east-west running wall [Crystal]…may be part of another truncated substructure or structure. That would mean the crude

stones on top might be part of a later construction pen.

As described below, the 2017 excavations determined that the slightly battered platform face discovered in Subop CC-15-A was in fact part of a truncated platform as Houk (2016) originally proposed. We reopened and removed the backfill from most of the southern 7 m of Subop CC-15-A to expose the various walls discovered in 2016, re-expose the southern face of Crystal, and allow us to define the truncated building—we dubbed this feature Blanca in 2017. Two sections of this re-opened unit were excavated to bedrock. This was used to add our understanding of the chronology of the plaza, and to determine the date of the floor associated with the first construction phase of Blanca.

Another early focus of the 2017 excavations was re-opening Subop CC-15-G to finish exposing Burial CC-B16. As described below, the excavations determined that the burial and some of the walls described by Houk (2016) in association with Subop CC-15-A were associated with an intrusive crypt, which post-dates Blanca, and is designated Crypt 1. Our understanding of Blanca and the crypt are discussed below.

Blanca

Excavations, from west to east, in Subops CC-15-P, -Px, -G, -A, -N, -O, -R, and -S exposed a large section of a truncated platform in the northern section of the Upper Plaza, south of Structure A-1 (Figure 2.3). Constructed from large rectangular, white blocks of cut limestone, the uncovered section of the structure measures 8.75 m east-west by 4.20 m north-south (Figure 2.4). Blanca's form is complex, and its partial dismantling and subsequent damage inflicted

Figure 2.3. Photograph of the buried platform known as Blanca and the intrusive Crypt 1 (left center), after partial backfilling. View to the north.

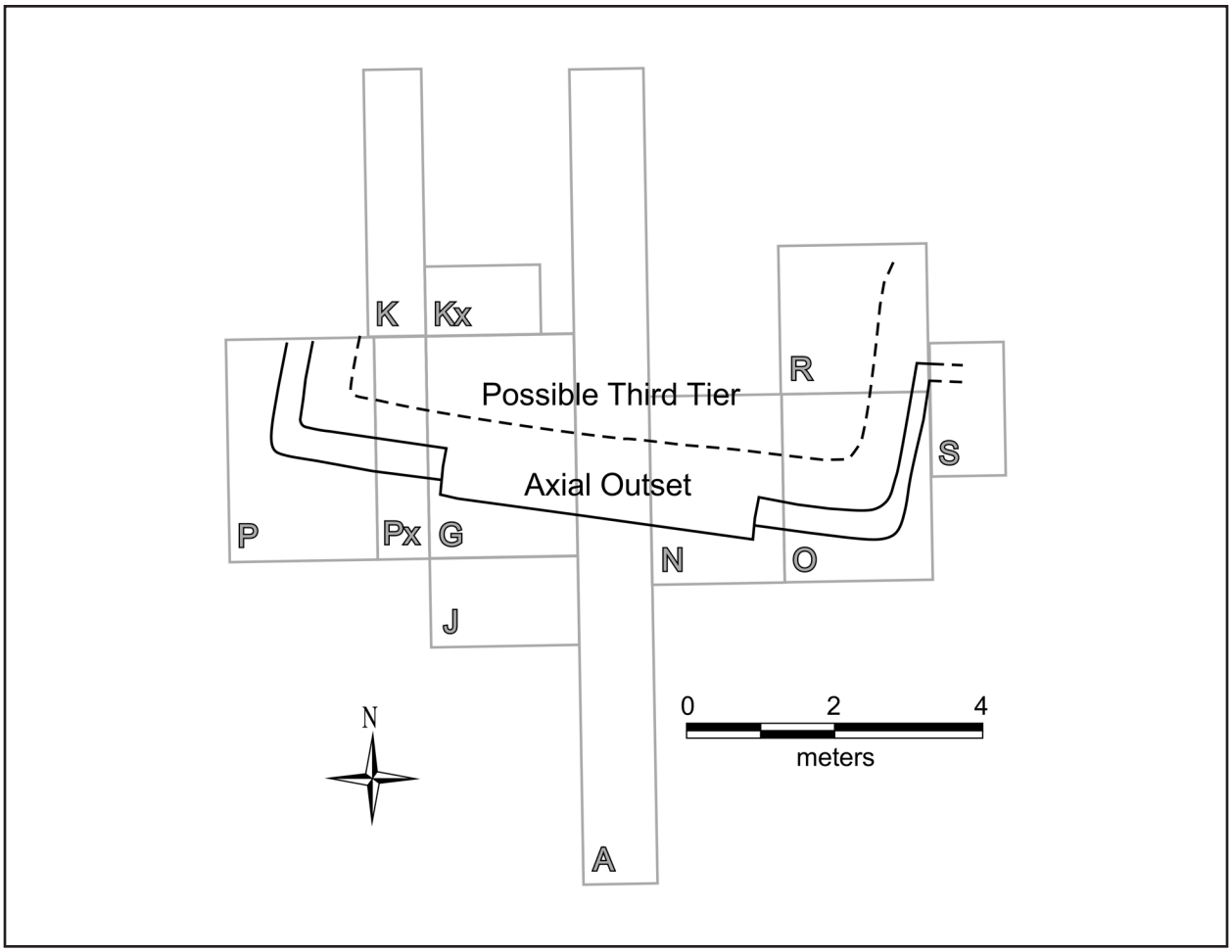

Figure 2.4. Plan map of Blanca in the northern excavation block.

by the construction of Crypt 1 obscure its final configuration. The portion we exposed consists of possibly three tiers with a projecting axial outset, which would have measured 4.5 m wide but was partially destroyed by Crypt 1 (discussed below). The overall shape is rectangular with rounded corners. The axial outset is battered, while the other faces are not. The lowest two tiers may be steps, while a possible third tier is indicated by a stone alignment located north of the lower tiers and axial outset. The full extent of Blanca is unknown, but the exposed portion extends from Subop CC-15-P, where our excavations uncovered part of the southern face, southwestern corner, and western face, across our excavation block to Subop CC-15-O, where we encountered the southeastern corner. The lowest tier appears to be cornering and turning to the east in Subop CC-15-S, and, assuming symmetry, the building likely turns to the west north of Subop CC-15-P. The turn in Subop CC-15-S could be the start of an inset corner or some other architectural feature.

The floor upon which Blanca sits, was buried by two subsequent flooring episodes while Blanca was in use. The three plaster floors, separated vertically by thin layers of fill, are spaced close together and climb the lowest course of stones at Blanca's base. Ceramics recovered above the last floor associated with Blanca are from the Mamom (600–400 BC) and Chicanel (400 BC–AD 150) spheres. Ceramics from fill inside of Blanca were mostly Chicanel (400 BC–AD 150) types. Based on architectonic style and

associated ceramic materials we suggest that Blanca was constructed around 400 BC.

As part of an extensive renovation, the architects of the Upper Plaza "chopped" Blanca and buried it under fill, which raised the plaza's floor to its modern level. Subsequent to or as part of the renovation, the occupants of the group placed Burial CC-B17 (Lot CC-15-N-04), on top of Blanca in the Upper Plaza fill. We encountered this burial shallow buried beneath the modern ground surface in Subop CC-15-N. As described by Novotny and colleagues (this volume), Burial CC-B17 consisted of the remains of a young to middle age adult who was buried in an extended position with the head oriented to the north. The skeletal material was in poor condition with very few bones preserved. The only grave offering was a Late Preclassic Society Hall Impressed bowl inverted over the individual's cranium. It is unclear if the individual was buried in a prepared cist or deposited as a simple burial; although we noticed three rough stones to the west of the burial, we cannot say conclusively that any funerary architecture or prepared surfaces were present. A radiocarbon date from a piece of bone from the burial returned a 2-sigma age range of cal 154 BC–AD 47 (see Tables 2.2. and 2.3).

Because this burial took place after Blanca was truncated, it a terminus ante quem for Blanca's destruction, and excavations in the vicinity of the burial provide some additional chronological data related to Blanca's construction and subsequent burial. Beneath Burial CC-B17 was construction fill consisting of brown clay loam (10YR4/3) and small and large rocks; this construction fill likely was used to cover Blanca when it was dismantled. Artifacts from the northern portion of Subop CC-15-N (Lot CC-15-N-05) are from the interior of Blanca and mostly date to the Late Preclassic (400 BC–AD 150) period. Lots from the exterior of Blanca (Lots CC-15-02, -06, -07, -08, -09, and -10) include material from the Chicanel and Mamom spheres, suggesting the fill covering Blanca dates to the Late Preclassic, but includes some older Middle Preclassic ceramics from secondary contexts. Although we lack a direct date on Blanca's construction, all indications are that the building was constructed and eventually terminated in the Late Preclassic period. Unresolved is the relationship between Blanca and Crystal, although the two possibly coeval constructions based on stylistic similarities and stratigraphic location.

Crypt 1

Excavations in Subop CC-15-G, designed to recover the human skeletal material first exposed in 2016 but backfilled due to time constraints, resulted in the discovery of an intrusive, in-filled chamber, designated Crypt 1. The rectangular chamber, oriented north-south, was built after Blanca had been buried. The intrusive feature cut through the plaza floor and removed a portion of Blanca's platform face (Figure 2.5) and several older floors beneath Blanca. The chamber's builders terminated their intrusion on an eroded Middle Preclassic floor, which they re-used as the chamber's floor. Charcoal samples from under the floor date its construction between cal 796 to748 BC (see Tables 2.2 and 2.3). The chamber measured 1.60 m east-west by 2.3 m north-south.

The chamber's four walls, which are preserved as high as 1.25 m above the floor, demonstrate different styles and construction techniques, although all have evidence of eroded plaster. The northern wall demonstrates the best construction and is composed of large, cut blocks covered with stucco that has faint traces of red paint remaining in places. The north wall was apparently the entryway into the chamber and had a possible step in its center, composed of two large, shaped stones of the same size and configuration (Figure 2.6). A

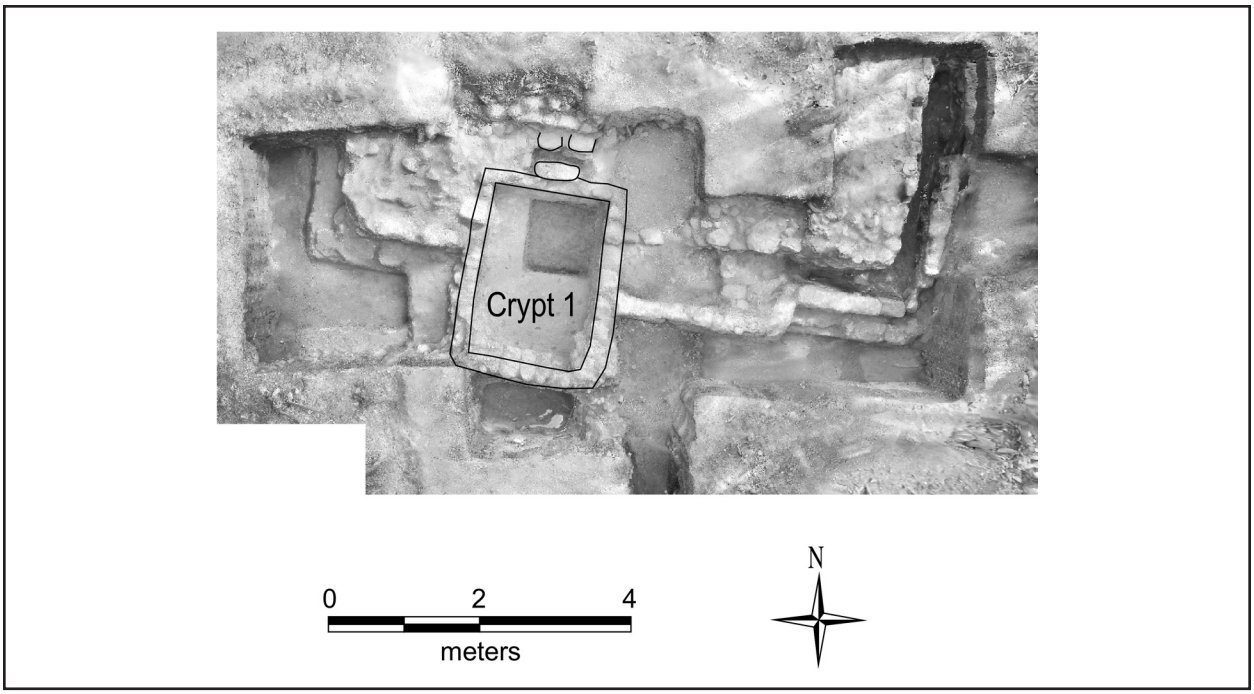

Figure 2.5. Orthomosaic of the northern excavation block with Crypt 1 indicated.

Figure 2.6. Photograph of Crypt 1 following excavations, view to the north.

carved stone directly to the south of this wall on the floor of the chamber might have been used as a step into the chamber. The east and west walls are made of small, roughly faced limestone blocks. While the north, east, and west walls are built on the floor of the chamber as new construction associated with the crypt, the south wall is different, consisting of two parts (Figure 2.7). The lower part is a layer of compact soil between the chamber's floor and

Figure 2.7. Photograph of Crypt 1, view to the south. Note Burial CC-B16D still *in situ* and the vault stones on the east, south, and west walls.

a plaster floor approximately 50 cm above the chamber's floor. Plaster on the chamber floor rolled up onto the dirt fill, suggesting perhaps the architects simply plastered over compact dirt fill to create the lower half of the south wall. Above the dirt fill and capping floor, the upper half of the wall consisted of roughly shaped stones.

The upper preserved courses on the west, east, and south walls were apparent vault stones (see Figure 2.7). In 2016, prior to the crew's recognizing they were digging into an infilled chamber, most of the vault stones on the west wall's upper course were removed. The few preserved examples jut into the chamber and clearly represent the vault's spring. Excavations in Subop CC-15-J, a unit on the south side of Subop CC-15-G uncovered the southern wall of the crypt and confirmed the presence of vault stones along the upper preserved course of the wall. The combined data suggest the chamber was built as a sunken, vaulted room, which was accessed from the north via steps down from the plaza surface. Given that the vault does not begin to spring until almost the level of the plaza floor, originally the vault would have projected above the plaza's surface, and the feature would have been highly visible. However, after an unknown period of use, the occupants of the Upper Plaza destroyed the vault and filled the chamber to the level of the plaza.

Funerary chambers are frequently difficult to categorize typologically as crypts or tombs since their characteristics commonly overlap. Typologically, the chamber located at the north of the Upper Plaza fits Fitzsimmons' (2009:64) definition of a crypt: "a carefully walled grave with capstones, sometimes a plastered floor, and which may or may not have been filled with earth." Other crypt definitions, such as Smith's (1972), also fit the characteristics of this chamber with the exception of flat stone slabs used as a lid.

Whether or not the Maya originally built the chamber to function as a crypt, prior to its dismantling and burial it was used as one. Excavations in 2016 and 2017 recovered the remains of at least two individuals, both on the floor in the southern half of the chamber. One of these individuals (Burial CC-B16B) was an apparent adult male buried in an extended, supine position, with his head to the east and his feet, crossed at the ankle, to the west (Figure 2.8; see Novotny et al., this volume). This individual was wearing two *Spondylus* shell ear flares and a serpentine helmet-bib head pendant as funerary regalia and was buried with an Ixcanrio Orange Polychrome pedestal bowl (Figures 2.9 and 2.10).

The pendant is an exciting find and contributes to our understanding of early kingship at Chan Chich. The location of the pendant on the remains suggests it may have been attached to a belt, or possibly placed in the individual's hands, becoming dislodged as decomposition proceeded. The serpentine is sculpted into a helmet-bib pendant (see Proskouriakoff 1974:10) similar to a pendant recovered from Tomb 2 at Chan Chich in 1997 (Houk et al. 2010). Although similar in style to the diadem from Tomb 2, the helmet-bid head pendant from Crypt 1 is thinner, less well crafted, and of inferior-quality raw material. The pendant from 1997 is argued to be a royal insignia jewel, an indicator of kingship during the Late and Terminal Preclassic periods in the Maya region (see Hammond 1987:22; Proskouriakoff 1974:11; Schele and Friedel 1990:98–121). Since Burial CC-B16B dates to the Early Classic period, this serpentine jewel may be an heirloom piece and an example of social memory connecting this individual to the individual in Tomb 2.

Although we suggest that Burial CC-B16B was the intended occupant of the crypt, he was not the first. Burials CC-B16A, -B16C and -B16D consisted of clusters of isolated skeletal

Figure 2.8. Photograph of Burial CC-B16B during the 2017 season, view to the south. The remains recorded as Burial CC-B16C are visible at the right edge of the photograph, north of Burial CC-B16B's feet, and the remains recorded as Burial CC-B16D include the cranium and long bones visible south of Burial CC-B16B's lower legs. Burial CCB-16A is not in this photograph as it was excavated in 2016.

elements or disarticulated bone fragments, which were apparently disturbed and displaced when the Maya interred Burial CC-B-16B. Burial CC-B16A, excavated in 2016, consisted of bones of the left foot, an articulated right leg, and an articulated right wrist and hand (Novotny et al. 2016). Burial CC-B16C was a dense cluster of highly fragmented bone located adjacent to the feet of Burial CC-B16B, approximately 10 cm to the south of Burial CC-B16A. Burial CC-B16D, a cranium stacked on a pile of long bones, was immediately south of the lower legs of Burial CC-B16B against the south wall of the crypt. Novotny and colleagues (this volume) believe that Burial CC-B16A was placed in the crypt first. During a re-entry event before decomposition was complete, the Maya disturbed Burial CC-B16A, moving some of the bones into two piles (our Burials CC-B16C and CC–B16) to inter Burial CC-B16B.

At some point after Burial CC-B16B was interred, the Maya destroyed the crypt's vault and filled the chamber with large, medium, and small boulders and sediment, before covering it with the final floor of the Upper Plaza. The fill in the northern part of the chamber yielded higher artifact densities as well as evidence of burning, approximately 65 cm above the floor in the room. The nature of this event is unclear,

Figure 2.9. Photograph of the two *Spondylus* shell ear flares and serpentine helmet-bib head pendant from Burial CC-B16B in Crypt 1.

Figure 2.10. Photograph of the Ixcanrio Orange Polychrome pedestal bowl found with Burial CC-B16B, Crypt 1.

but charcoal from the deposit yielded a date of cal 55 BC–AD 211 (see Tables 2.2 and 2.3). Charcoal recovered from beneath possible capstones in the fill returned a date range of cal AD 87–227. Ceramics from the chamber's context are mixed, yielding a mix of Early Classic and Late Preclassic types. Despite these two Terminal Preclassic dates, six other samples from the crypt largely date to the Early Classic period, including a piece bone from Burial CC-B16B which dates to cal AD 247–353 (Figure 2.11; see Tables 2.2 and 2.3).

The lead author and the lab director, Mnemosyne Rice, excavated the sediment in the vessel associated with Burial CC-B16B in 1-cm levels. Dr. John Jones of Archaeological Consulting Services, Ltd. analyzed a pollen sample (Table 2.5) from the bottom level of the vessel to assess the potential for pollen preservation. Jones (2018:1) determined "extreme oxidizing conditions at the site resulted in the loss of most pollen grains from the sediment sample." In all, 100 grains of pollen were counted, with most representing durable and abundant taxa. However, the sample did contain a single maize grain and a grain from the morning glory family, which contains several possible hallucinogens. Jones (2018:1) noted, "The occurrence of a domesticated maize grain in the sample is significant, although it is not known whether this grain represent part of an offering or possibly an ambient grain that somehow found its way into the vessel."

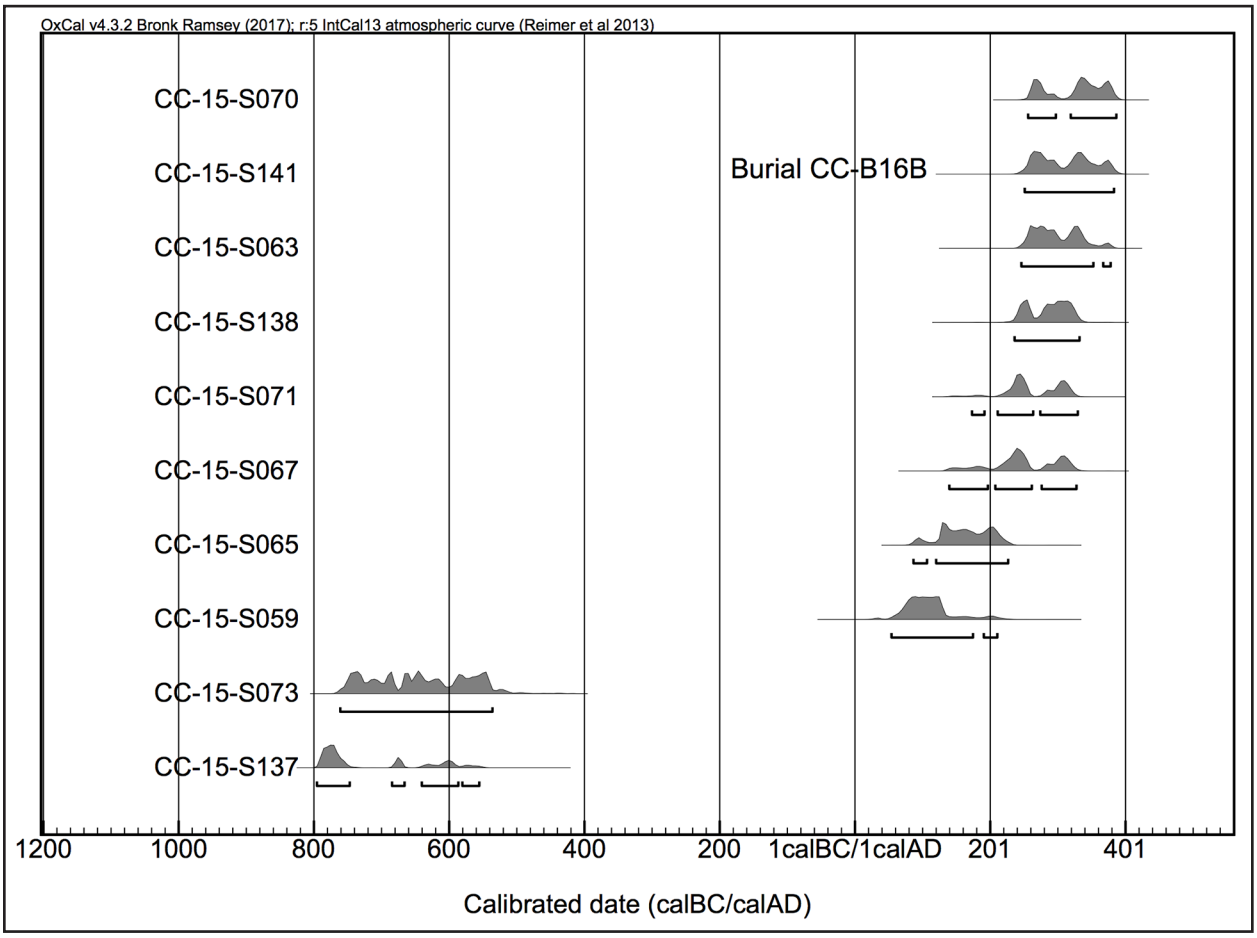

Figure 2.11. Plots of radiocarbon dates from Crypt 1.

Table 2.5. Pollen Taxa Identified in the Crypt Vessel

Taxa	Count	Taxa	Count
Asteraceae High Spine	6	Moraceae	2
Asteraceae Low Spine	39	*Pinus*	4
Cheno-Ams	14	*Quercus*	2
Convolvulaceae	1	*Salix*	1
Croton/Manihot	1	Sapotaceae	1
Poaceae	8	Indeterminate	12
Polygonaceae	2	Total Pollen Sum	100
Zea mays	1	Tracer Spores	363
Coccoloba	2	Concentration Value	574
Combretaceae	2	*Salvinia*	9
Hirea	2		

Pre-Blanca Deposits in Northern Excavation Block

The oldest radiocarbon dates come from the deepest floors in the north-central part of the Upper Plaza and suggest the first occupants of the site settled there in the early Middle Preclassic period. The two samples, which came from floor fill above bedrock and were collected over the course of two seasons from Subop CC-15-A, returned 2-sigma date ranges of cal 911–804 BC and cal 968–833 BC (see Tables 2.2 and 2.3). Excavations in the southern end of Subop CC-15-A documented six floors spanning the early Middle Preclassic into the Late Preclassic that predate the alignment known as Crystal. One of the goals of the 2018 season will be to correlate the floor sequence in the northern excavation block and tighten up the construction chronology.

Excavations at the Base of Structure A-1: Subop CC-15-I

Aquino's 2016 excavations in Subops CC-15-B and -Bx at the base of Structure A-1 encountered an apparent buried structure (Lot CC-15-B-4), although it was initially mistaken for the final version of the plaza floor and basal terrace of a Late Classic version of Structure A-1. Penetrating excavations, however, proved this feature to be much older. Two radiocarbon samples date it to cal 766–540 BC and 749–407 BC as described by Houk (2016:11; see Tables 2.2 and 2.3). This appears to be an early version of Structure A-1, and it seems that this is the same feature that Hubert Robichaux (1998) encountered approximately 10 m to east in 1997. Robichaux (1998) excavated a thick plaster surface, which rolled down as a step or terrace, similar to the feature Aquino excavated in Subop CC-15-B.

Below the lower surface on this structure, which is actually 20 cm higher than the modern plaza floor level, Aquino excavated 1.1 m of cobble and small boulder fill before encountering a well-preserved plaster floor (Lot CC-15-B-9), which had an approximately 1-m diameter hole cut through its surface (see Houk 2016). Below this surface, excavations into the intrusion and below it recorded five more floors above bedrock, 2.5 m below the plaza surface. These older floors span the Middle Preclassic period, with a radiocarbon date from above the oldest floor of cal 826–782 BC (see Tables 2.2. and 2.3).

Based on the floor sequence exposed in Subops CC-15-B and -Bx during the 2016 season, Subop CC-15-I was placed 0.76 m south and

0.5 m west of Subop CC-15-B on the south side of Structure A-1 in 2017. Measuring 4 x 2 m, the main objective of Subop CC-15-I was to explore the Preclassic floor and architectural feature that were exposed in Subop CC-15-B beneath the Classic period collapse.

Backdirt, topsoil, and collapse debris were removed from the slope of Structure A-1 (Lots CC-15-I-1–4). Artifacts recovered from the collapse debris include lithic debitage, ceramic sherds, obsidian, jute shell, faunal remains, and marine shell. The ceramic materials date the collapse debris to the Late Classic period (Table 2.6).

The matrix comprising Lot CC-15-I-4 was a light gray-brown color from the eroding limestone plaster mixed with natural soil deposits. Though it was damaged by massive roots, a plaster floor (Floor 1) was encountered, which was followed to the north where it rolled up to a step or terrace (Lot CC-15-I-5). The step/terrace was well-preserved where the plaster rolled up from the floor, but the top of it was difficult to define, with no remaining plaster and eroding limestone blocks (Figure 2.12). We believe this is the same feature Aquino recorded as Lot CC-15-B-4.

Table 2.6. Summary of Lots in Subop CC-15-I

Lot	Lot Description	Ceramic Data
01	Topsoil	
02	Topsoil	Tepeu 2 with Floral Park trace
03	Collapse Debris	Tepeu 2 with Floral Park trace
04	Collapse Debris	Tzakol with Mamom trace
05	Floor and Step/ Terrace	
06	Construction Fill	Tepeu 1 and Chicanel admix
07	Construction Fill	Chicanel
08	Construction Fill	Chicanel
09	Construction Fill	Chicanel
10	Construction Fill	Chicanel

A surprising number of artifacts were recovered from Lot CC-I-4, the collapse debris immediately above the floor surface of Lot CC-15-I-5, including three lithic tools, debitage, and over 500 ceramic sherds. These sherds include Middle Preclassic and Early Classic types; some of the sherds were from finely crafted, slipped, and polished vessels, but the majority of the sherds were from jars and large utilitarian vessels with burning towards some of the bases, which may indicate their use as cooking vessels. Cooking is usually associated with residential architecture, so their presence here is somewhat surprising since Structure A-1 has not been interpreted as a residence. Furthermore, the age of the ceramics is incongruous with their context in collapse debris. Perhaps these materials are from a re-deposited midden context, although that too would be strange.

Another goal of Subop CC-15-I was to refine the chronology of the sequence below Lot CC-15-I-5, and the southern end of the unit was excavated through Lot-CC-15-I-5's surface. The excavations exposed an apparent set of limestone cobble steps (Lot CC-15-I-9) running east-west that comprise a previously unknown architectural feature. We decided to leave them undisturbed until they could be investigated during another season. Additionally, the penetrating excavations documented Late Preclassic floors which may correspond to floors encountered in Subop CC-15-B, however the ceramic age assessments from Subop CC-15-I are younger than the radiometric ages for the floors in Subop CC-15-B.

Figure 2.12. Photograph of exposed surface and step/terrace in Subop CC-15-I. View to the north.

Chronology Building: Other Excavation Units in the Upper Plaza

Eastern Upper Plaza: Subop CC-15-M

Subop CC-15-M was a 2-x-3-m unit located at the base of the west face of Structure A-13, placed roughly along the centerline of the structure. The purpose of this excavation was to document the Upper Plaza floor sequence in the eastern part of the plaza. Although Robichaux excavated the area in 1998, it was not clear from his report whether or not he penetrated the terminal plaza floor since his excavations were primarily concerned with the summit of Structure A-13 (Robichaux et al. 2000).

Our excavations began with the removal of Robichaux's backfill (Lot CC-15-M-1), followed by collapse debris from Structure A-13, Lots CC-15-M-2–5 (Table 2.7). The upper stratigraphy was impacted by Robichaux's excavations—it appears that he did excavate through the terminal plaza floor, and our excavations partially clipped his old excavation and a section of intact terminal floor, which we preserved in the eastern end of our unit. Below Robichaux's disturbances, Subop CC-15-M encountered intact floors approximately 30 cm below the modern ground surface. Including the partially destroyed terminal plaza floor, Subop CC-15-m documented six floors spanning the Middle Preclassic through Late Classic periods (Figure 2.13).

A Preclassic platform (Lot CC-15-M-15) consisting of one course of cut-stone blocks oriented east-west was revealed between Floors 4 and 5 (Lots CC-15-M-12 and -16). This platform was not excavated; we preserved it in the southern half of the unit (Figure 2.14). Beneath this early platform were Floors 5 and 6 (Lots CC-15-M-16 and -17); the fill associated with Floors 5 and 6 dates these features back as far as the Middle Preclassic period. Floor 6 continues underneath the Preclassic platform, which suggests that it also dates from this time period. A radiocarbon

Table 2.7. Summary of Lots in Subop CC-15-M

Lot	Lot Description	Ceramic Data	2σ Age Range
01	Topsoil	Tepeu 3?	
02	Floor 1	Tepeu 2-3	
03	Construction Fill	Tepeu 3 with Tzakol trace	
04	Construction Fill		
05	Construction Fill	Tepeu 2-3	
06	Construction Fill	Tzakol?	
07	Construction Fill	Tepeu 2-3?	
08	Floor 2		
09	Floor 3	Floral Park to Tzakol	
10	Sascab Floor?	Floral Park	
11	Construction Fill	Floral Park	
12	Floor 4	Floral Park	AD 257–390
13	Construction Fill	Floral Park	
14	Construction Fill	Floral Park	
15	Floor/Platform	Chicanel	
16	Floor 5	Chicanel with Mamom trace	
17	Floor 6	Mamom	728–406 BC
18	Construction Fill	?	
19	Construction Fill	Mamom?	
20	Construction Fill	Mamom	
21	Construction Fill	Mamom with Swasey trace	751–413 BC
22	Construction Fill	early Mamom	762–434 BC
23	Construction Fill	early Mamom	787–552 BC
24	Other Surface		730–411 BC

date indicates that Floor 6 dates to 751–413 BC. Furthermore, the construction fill beneath Floor 6 (Lot CC-15-M-22) was radiocarbon dated to 762–434 BC. On the same level as the posthole surface (Lot CC-15-M-23) we found a human tooth in the southwest area of the unit. A charcoal sample was recovered (Sample CC-15-S88) as well, and dated this deposit to 787–552 BC. At this depth we also observed the remains of a posthole that predated the Preclassic platform (Figure 2.15). Excavation of the posthole did not reveal any artifactual evidence, except for one charcoal sample (CC-15-S127) that radiocarbon dated the structure to 730–411 BC, or the Middle Preclassic period.

Southeastern Upper Plaza: Subop CC-15-Q

Subop CC-15-Q was a 2-x-2-m unit located at the southeastern corner of the Upper Plaza between Structure A-15 and A-13. The objective of this unit was to document the stratigraphic sequence in the southeastern corner of the plaza, an area that has not been previously explored.

Subop CC-15-Q was excavated in 11 lots based on natural and cultural stratigraphic layers (Figure 2.16), which revealed five different plaster floor levels dating from the Late Preclassic period to the Late Classic period (Table 2.8). The Late Classic floor of the Upper Plaza (Floor 1) did not preserve in this unit,

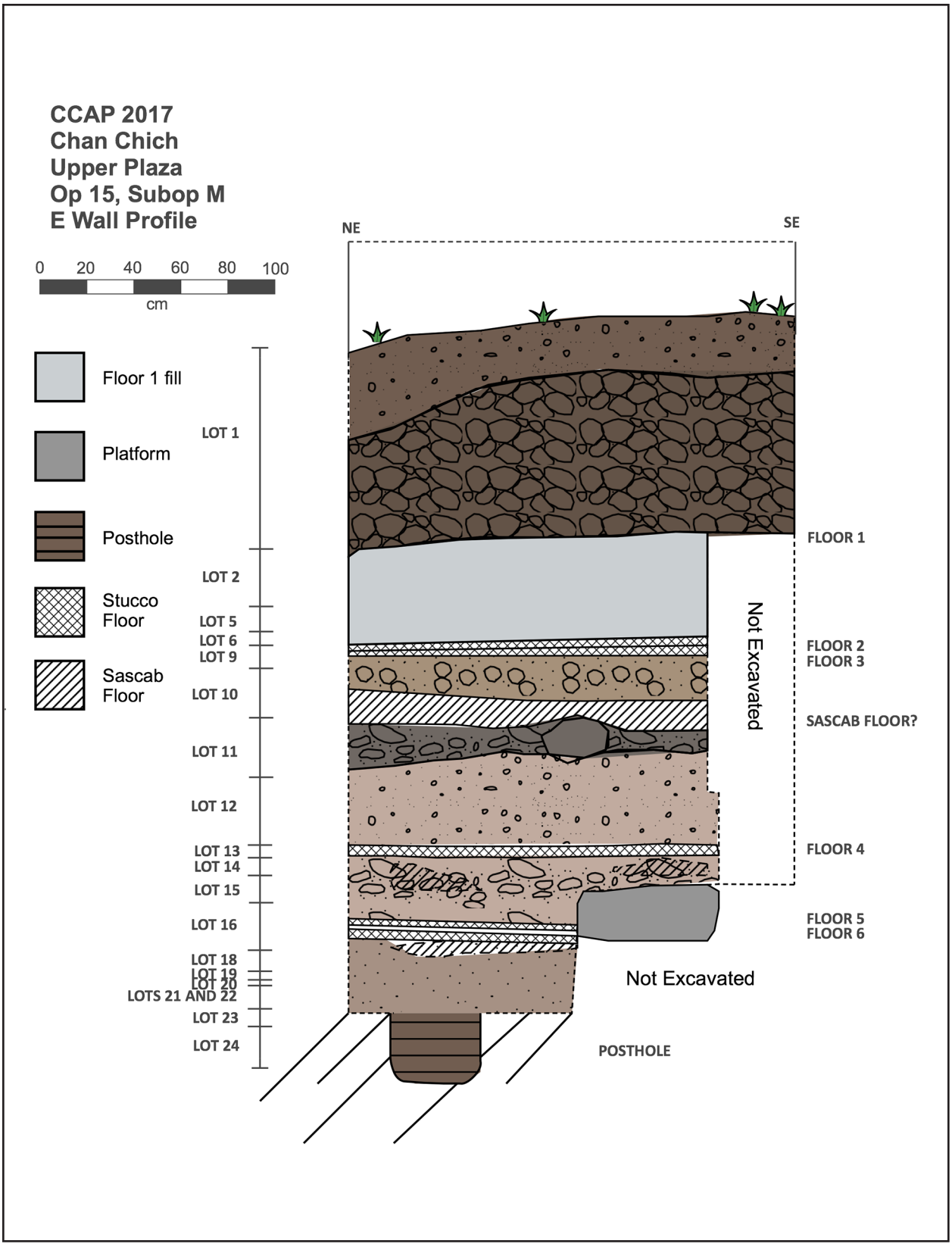

Figure 2.13. East wall profile of Subop CC-15-M.

Figure 2.14. Preclassic platform (Lot CC-15-M-15) exposed in the southern half of Subop CC-15-M. View to the east.

Figure 2.15. Photograph of posthole at the base of Subop CC-15-M. View to the south.

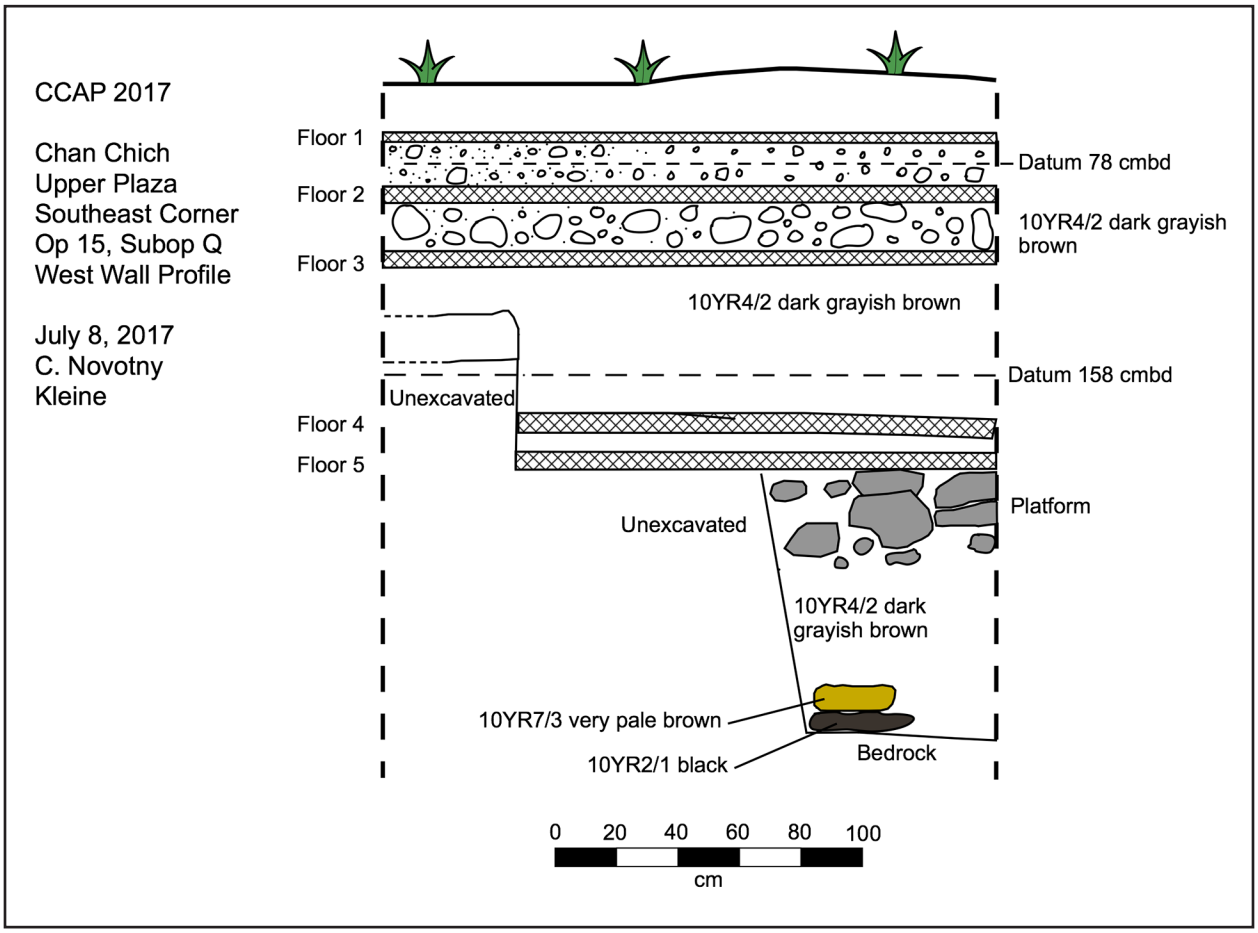

Figure 2.16. Idealized west wall profile of Subop CC-15-Q.

Table 2.8. Summary of Lots in Subop CC-15-Q

Lot	Lot Description	Ceramic Data	2σ Age Range
01	Topsoil/Floor1		
02	Floor 2	Tepeu 2-3 with Chicanel admix	3335–3033 BC
03	Floor 3	Tepeu 2-3 with Chicanel admix	
04	Construction Fill	Tzakol and Floral Park	
05	Construction Fill	Tzakol and Floral Park	
06	Construction Fill		
07	Floor 4	Tepeu 2 and Chicanel mix	
08	Construction Fill		
09	Floor 5		358–199 BC
10	Construction Fill of Platform		
11	Construction Fill of Platform		

though it was identified through the remains of its ballast. The ceramics from this context varied, Lots CC-15-Q-2 and -3 had mix of Tepeu 2 and Tepeu 3 types, which some Chicanel admix. An extremely old radiocarbon sample from Lot CC-15-Q-02 returned a 2-sigma age range of call 3335–3033 BC, and is interpreted to be old charcoal incorporated into fill. Floor 2 was a poorly preserved stucco floor present in the southeastern part of the unit but not preserved in the northeast; the level had mixed ceramics that date mostly to the Late and Terminal Classic periods (Lot CC-15-Q-2). Floor 3 (Lot CC-15-Q-3) dated to the Late Preclassic and Early Classic periods as indicated by the ceramics located in its construction fill. Floor 4 (Lot CC-15-Q-7) was partially dismantled; the stucco floor in this unit appears to have been cut in antiquity, with only a portion in the southwestern part of the unit still preserved. The fill of this dismantled plaster floor was dated from a charcoal sample (CC-15-S117; Lot CC-15-Q-9) which dates Floor 4 to 358–199 BC. Finally, Floor 5 (Lot CC-15-Q-9), is associated with a Preclassic platform (Figure 2.17), but could not be securely dated (Lots CC-15-Q-10 and -11). The platform consisted of rough medium sized and small stones placed together without any evidence of mortar. We also observed a clay feature in the northwest baulk, beneath the platform. There is a lens of very pale brown clay capping a lens of black clay. We also took a carbon sample (Sample CC-15-135) from the base of the unit, but it has not been submitted for dating. We terminated Subop CC-15-Q on bedrock, 2.13 m below the modern plaza surface.

Southwestern Courtyard, Upper Plaza: Subop CC-15-L

A small courtyard occupies the southwestern corner of the Upper Plaza, bound on all sides by

Figure 2.17. Photograph of Subop CC-15-Q showing two partially exposed platforms. View to the east.

low structures, except on the east side, which is occupied by Structure A-15. Because the center of this courtyard is covered in over 1 m of looters' backdirt from a trench that bores into the western face of Structure A-15, we could not excavate in the courtyard itself. We chose to place Suboperation CC-15-L, a 4-x-2-m unit, on the west side of Structure A-15, abutting the southern edge of the looters' trench (Figure 2.18). Because the edge of the looter's trench was irregular, the northern edge of our excavation unit was partially floating in space until the excavations reached the depth of the trench floor. The goals of Subop CC-15-L were to uncover the west facade of Structure A-15, explore how Structure A-15 articulates with the plaza, and to document the stratigraphic sequence for the southwest portion of the Upper Plaza. Additionally, we were exploring the possibility of the inclusion of stucco masks on top of the staircases of Structure A-15. Such masks are typical of Petén architectural styles during the Late Preclassic and Early Classic periods.

The first layers consisted of a) the rubble and backdirt from the looters' trench north of the unit and b) rubble and collapsed debris from the top of the structure (Lots CC-15-L-1–3). We excavated through this material before encountering stratified deposits (Table 2.9). In Lot CC-15-L-4 we recovered multiple fragments of flat stucco belonging to the western staircase of Structure A-15, which were revealed as excavations continued. These

Figure 2.18. Photograph of western looters' trench on Structure A-15 and Subop CC-15-L after removing looters' backdirt and topsoil. View to the southeast.

Table 2.9. Summary of Lots in Subop CC-15-L

Lot	Lot Description	Ceramic Data	2σ Age Range
01	Collapse Debris	Tepeu 2	
02	Collapse Debris		
03	Collapse Debris		
04	Collapse Debris	Tepeu 2-3	
05	Floor 1	Tepeu 2-3?	
06	Floor 2	?	
07	Floor 3	Floral Park	
08	Construction Fill	Floral Park	
09	Construction Fill	Chicanel	
10	Construction Fill	Floral Park	
11	Collapse Debris	Chicanel	
12	Construction Fill	Chicanel	
13	Construction Fill	Chicanel	
14	Construction Fill	Chicanel	
15	Other Surface	Chicanel	
16	Construction Fill (outside substructure)	Chicanel	358–185 BC
17	Construction Fill (inside substructure)	Chicanel	182–52 BC

steps belonged to the final construction phase of Structure A-15. We uncovered portions of three steps, which measure 40 cm high by 37 cm deep, and an apparent courtyard floor surface (Lot CC-15-L-5) at the base of the steps. This floor surface extends west beyond the limits of our unit and is visible on the north side of the looters' trench. Upon reaching the floor, we only excavated the western 2-x-2-m section of the unit for safety reasons.

Excavation revealed the presence of three plaster floors dated between the Late Preclassic period and the Late Classic period. The floors were built in succession directly on top of each other, supported by a layer of construction fill. Floor 1 is contemporaneous with the western steps of Structure A-15, which dates this architectural feature to the Late Classic period. We found a large quantity of ceramic sherds (N=370) in this lot, which might indicate the presence of a midden within the fill. Ceramics analysis dates this context to the Late-to-Terminal Classic period with Tepeu 2-3 ceramics. Below the three floors we found at least three different fills levels before hitting a Late Preclassic substructure (211 cm below the Floor 1) that was constructed on top of bedrock (Figures 2.19 and 2.20). This Preclassic substructure was covered with a layer of dark brown sterile dirt that was 80 cm thick. The layer of dark grayish brown soil with almost no rocks is intriguing, since we suspect that they brought all this soil, maybe from an agricultural field, to use as fill in the area. The north-south wall of the Preclassic substructure had four to five courses of semi-carved rocks and rose to a height of 65 cm above bedrock. Interestingly, the wall is not vertical, but leans a little to the east. Radiocarbon samples from inside and outside the feature, returned date ranges of cal 182–52 BC and 358–185 BC, respectively.

Though no stucco masks were revealed in Subop L, our other goals were achieved. We defined some of the architecture on the Late Classic version of Structure A-15, and documented the stratigraphy in the southwestern courtyard.

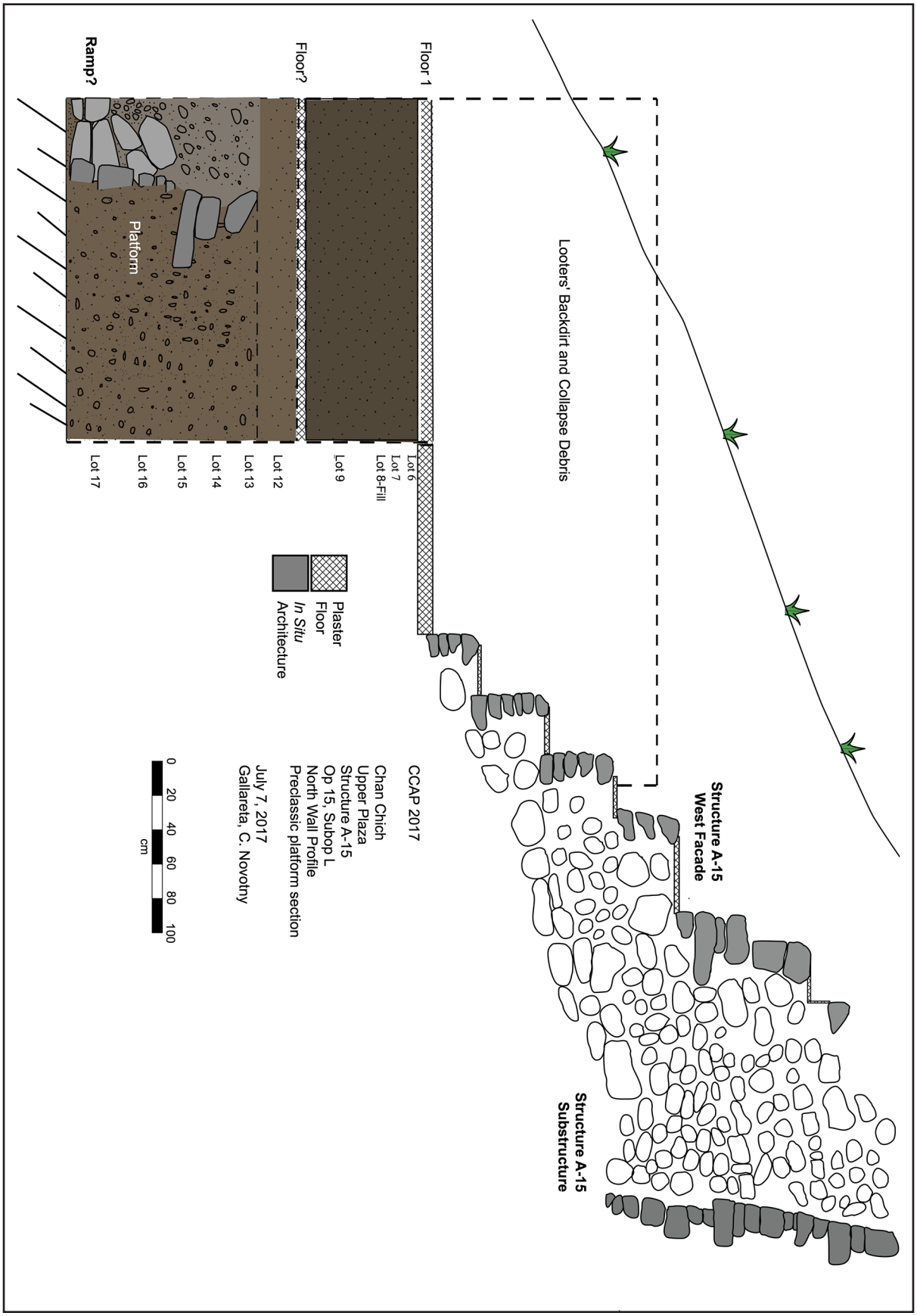

Figure 2.19. North profile of Structure A-15 looters' trench and Subop CC-15-L.

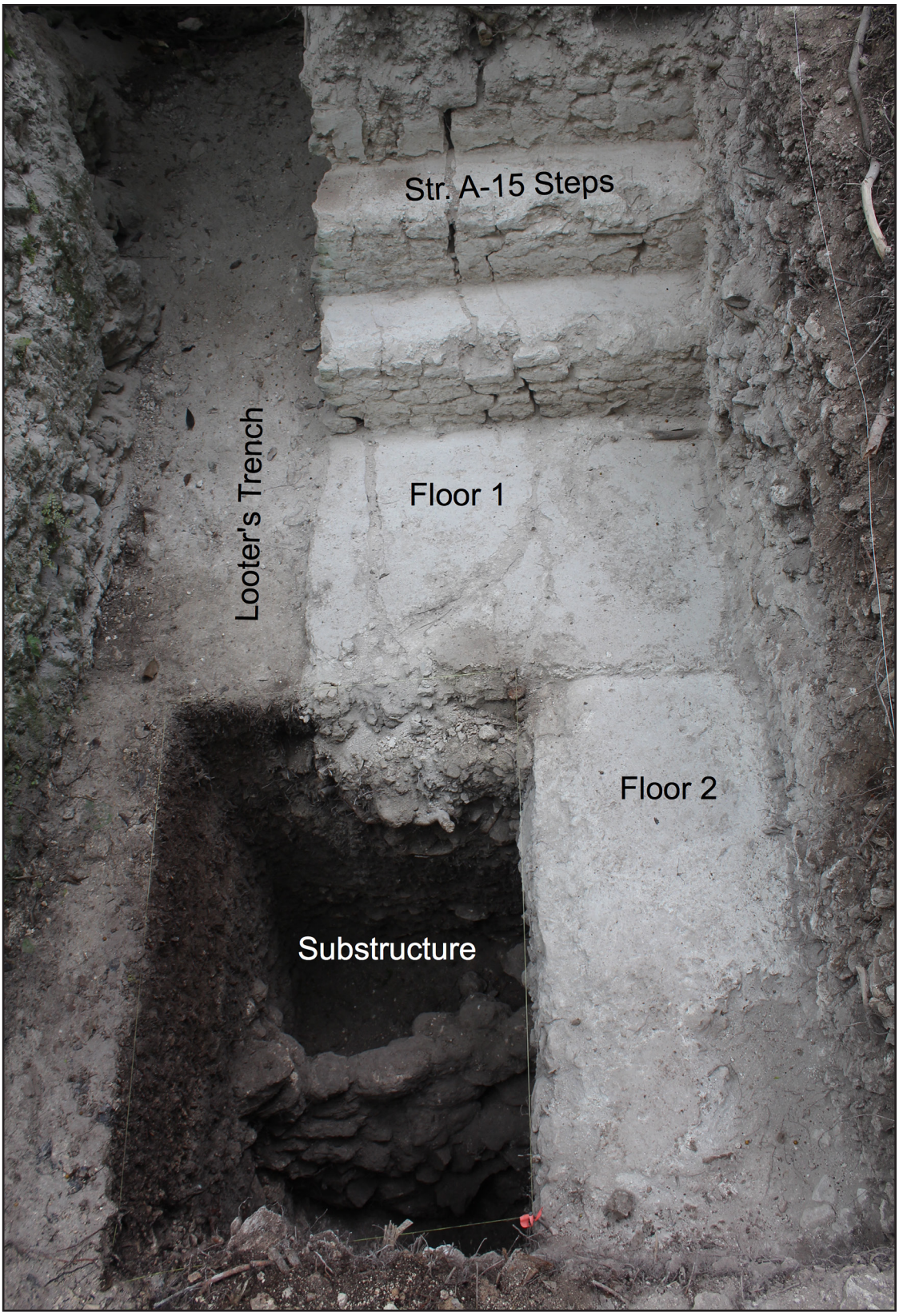

Figure 2.20. Annotated photograph of Subop CC-15-L at the end of excavations. View to the east.

With the exception of the layer just below Floor 3 (Lot CC-L-15-7), which was dated to the Terminal Preclassic, the deeper cultural levels were dated to the Late Preclassic period. The lack of multiple floor levels, unlike the contexts in the northern and eastern parts of the plaza, suggest a different construction sequence for the southern area. However, the presence of the Preclassic substructure evidences some significant construction activity in the area during this period, perhaps related to an early version of Structure A-15.

CONCLUSIONS

The second of three planned seasons of work to document the construction history of the Upper Plaza built on the important foundation established in 2016 and greatly expanded our understanding of the buried features in the northern part of the plaza and the chronology in previously untested areas of the plaza. While more work is necessary to fill in several gaps in the sequence, the emerging picture is shows the growth of a small Middle Preclassic village, which occupied primarily the north and central portions of the plaza, to a larger occupation covering the entire Upper Plaza hilltop during the Late Preclassic period. As the village grew, monumental architecture appeared by the early Late Preclassic period, if not slightly earlier, and significant renovations took place near the end of the Late Preclassic with the truncation and burial of Blanca, an elaborate Late Preclassic platform. By the Terminal Preclassic period, the elite turned the village into a small kingdom and used the plaza as a royal necropolis for an early king (Tomb 2) and a likely successor (Crypt 1) in the Terminal Preclassic and Early Classic periods, respectively. Planned excavations in 2018 will expand our understanding of the construction sequence in the northern part of the plaza while simultaneously exploring Late Classic construction on Structure A-1.

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Results of the 2017 Excavations at Courtyard D-4, Chan Chich, Belize

Gertrude Kilgore, Claire Novotny, Alyssa Farmer, and Rebecca Schultz

The 2017 field season of the Chan Chich Archaeological Project (CCAP) included an intensive study of the functional, social, economic, and cultural meanings of the domestic spaces associated with the final occupation phase at Courtyard D-4, a Late Classic household. This project represents the first explicit study of domesticity and everyday life at the site. Fieldwork at Courtyard D-4 took place over six weeks from May 23 to July 9, 2017. The authors supervised a crew of students from two different field school sessions and local workers from Chan Chich Lodge and nearby Sylvester Village. Field Director Claire Novotny and Operation Director Gertrude Kilgore oversaw excavations with assistance from Suboperation Directors Alyssa Farmer and Rebecca Schultz. The authors conducted artifact analysis from July 3 to July 17, 2017.

Courtyard D-4 is located 550 m east/southeast of Chan Chich's Main Plaza just beyond and south of Structure D-48, the terminus shrine structure for the Eastern Causeway (Figure 3.1). The group consists of three structures situated around a central courtyard on a common platform with openings at the northwestern and southeastern corners. The entire platform measures approximately 26 m by 23 m with a central courtyard surface of about 16 m by 14.5 m. The surface of the courtyard is 50–60 cm higher than the surrounding ground surface. Structure D-41, an L-shaped mound, creates the northeastern corner of the courtyard group. The two smaller mounds are oriented north-south (Structure D-42) and east-west (Structure D-43). Ceramics and radiocarbon samples date the final occupation of this residential courtyard group to the Late Classic period (AD 600–800) and Terminal Classic period (ca. AD 810–850).

RESEARCH DESIGN

Households represent a foundational element of any society. The everyday activities that occur within domestic spaces construct and reinforce the social, economic, and political framework upon which societies are built. Repetition of quotidian activities forms social identity and memory within households in a quasi-ritualized manner (Hendon 2010). Relational identities, between people and their objects or spaces, within domestic activity areas demonstrate how the inhabitants consciously chose to portray their identity and memorialize it in objects (Hutson 2010; Mixter 2017). Spatial analysis of artifacts in context with the architectural features and spaces allow insight into the everyday activities and ways that residents conceptualized their role in the wider social environment.

Investigations of the household identity and domestic activity areas in Courtyard D-4 addressed the following research questions:

- What were the functions of Structures D-41, D-42, and D-43?

Kilgore, Gertrude, Claire Novotny, Alyssa Farmer, and Rebecca Schultz
2017 Results of the 2017 Excavations at Courtyard D-4, Chan Chich, Belize. In *The 2017 Season of the Chan Chich Archaeological Project*, edited by Brett A. Houk and Claire Novotny, pp. 69–96. Papers of the Chan Chich Archaeological Project, Number 12. Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

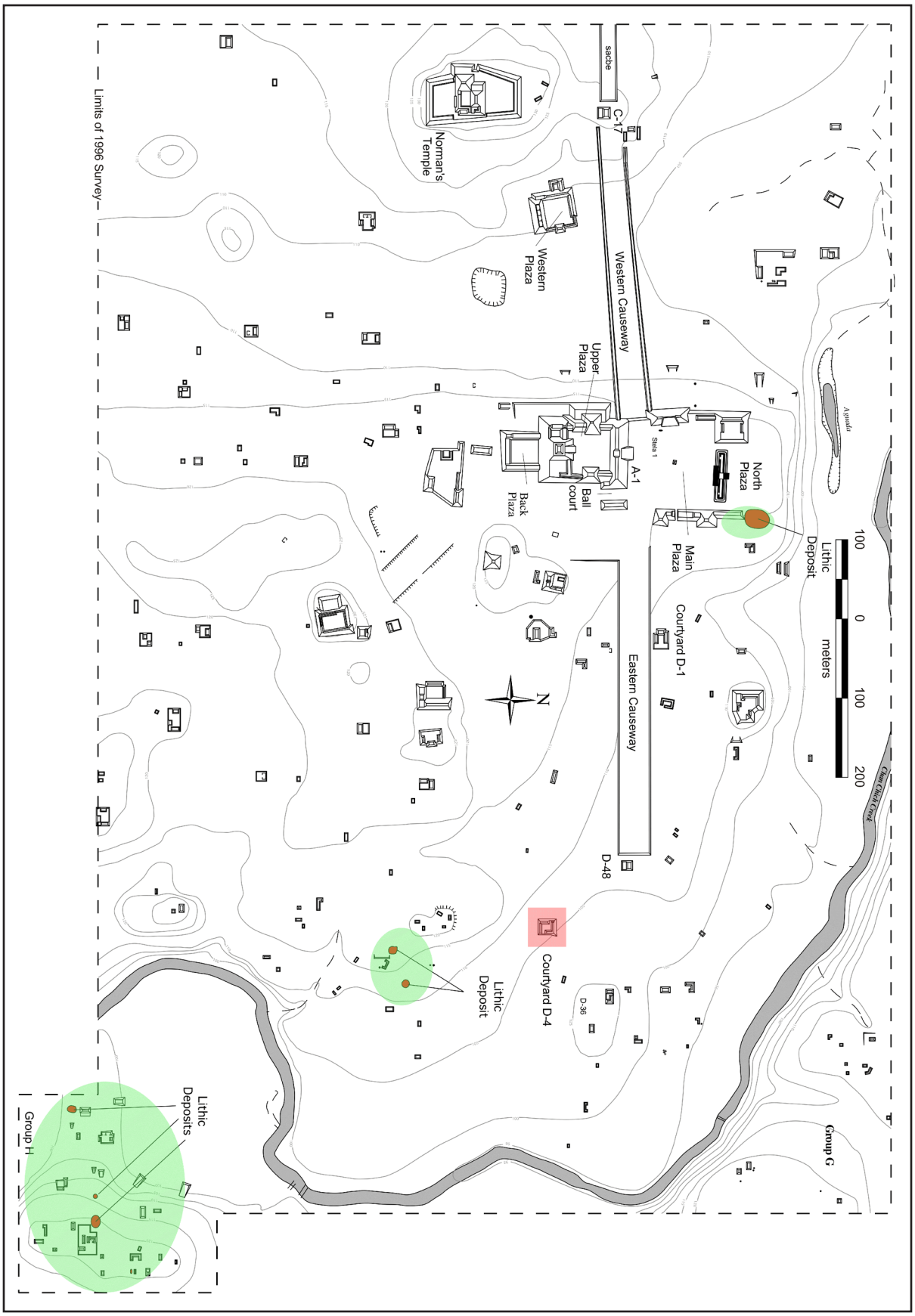

Figure 3.1. Map of Chan Chich with Courtyard D-4 highlighted in red and lithic workshops highlighted in green.

- How did the architectural, courtyard, and extramural spaces associated with Courtyard D-4 function together as a domestic unit?
- How are characteristics of socioeconomic class and identity visible in the use of objects and space at Courtyard D-4?

Using the architectural, geochemical, and artifactual data Courtyard D-4 as a case study, this project offers a first look into the nature of everyday life at Chan Chich. The research objectives principally focus on identifying domestic activity areas and establishing the function of the courtyard group. Explorations of function investigated architecturally defined spaces as well as courtyard and extramural spaces to understand the division (or lack thereof) of space for specific activities. Analysis of the spatial relationship between activity and refuse areas alongside artifactual and mortuary evidence enables reconstructions of how daily routines contribute to constructions of identity and memory (Hendon 2010; Hutson 2010; Robin 2013).

METHODOLOGY

This project consisted of a tripartite research plan that investigated architectural, artifactual, and soil chemical remains of the domestic activity areas of Structures D-41, D-42, and D-43, Courtyard D-4, and extramural spaces. The three research components offer insight into the production, consumption, and disposal patterns in three different contexts associated with Courtyard D-4. The investigations at Courtyard D-4 were designated Operation (Op) CC-17.

First, studies of the exterior domestic activity areas attempted to determine the function of extramural spaces associated with everyday life in Courtyard D-4 beyond courtyard surfaces. Excavators dug 48 posthole shovel tests to 30 cm below surface (where possible) on a 5-by-5-m staggered lattice grid (Figure 3.2) radiating 5 m beyond the existing mounds (see McManamon 1984; Robin 2013). Considering household middens generally are encountered beyond the structures, excavators kept sampling close to the mounds to identify areas associated with domestic refuse (Huston and Stanton 2007). All matrices were screened using ¼-inch mesh. A specialized version of the CCAP lot form in Filemaker Pro was used to document these shovel tests. All posthole shovel tests were labeled as Suboperation (Subop) CC-17-ST, each individual posthole received its own lot number, and each 10-cm level was numbered sequentially.

The next phase focused on reconstructing domestic activities associated with the central courtyard surface. Initial excavations on the courtyard surface were associated with suboperations on structures to define the edges of the courtyard and thus determine its dimensions.

Additionally, excavators dug test units in central locations to determine courtyard construction phases. Finally, we investigated the extent of the courtyard platform with suboperations in the northwestern and southeastern corners. These units sought to understand how residents entered Courtyard D-4.

The third and final phase explored the architecture of Structures D-41, D-42, and D-43 to understand the function of interior domestic spaces at Courtyard D-4. We excavated units on all three structures to determine the construction and function of the final phase of occupation. Additionally, excavators dug through select interior surfaces commonly associated with household burials, such as c-shaped benches, in search of mortuary evidence and to recover ceramics and other dateable materials from sealed contexts. We screened the matrix associated with burials through 1/4-inch mesh.

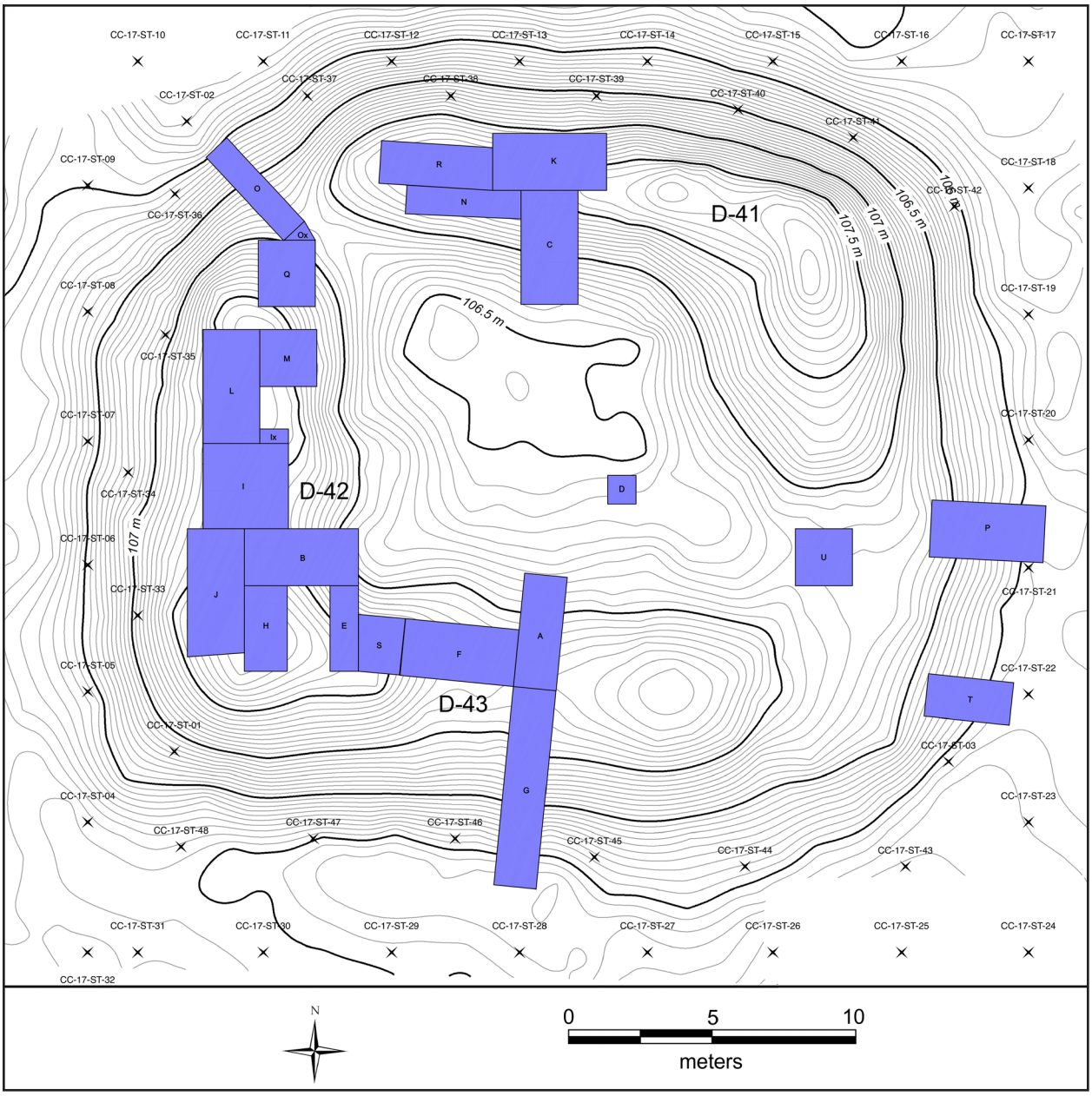

Figure 3.2. Topographic map of Courtyard D-4 with excavation units and shovel tests.

Once the final phase of the interior surfaces were exposed in Structures D-41 and D-42, we systematically collected point samples of the plaster of the final surface using a 0.5-m staggered lattice, following the guidelines outlined by Wells (2010). We then exported the soil samples to Dr. E. Christian Wells at the University of South Florida for multi-elemental analysis. That analysis is ongoing, and results are expected in January 2018.

Geochemical residue analysis of soils and plaster surfaces in courtyards and extramural spaces allows archaeologists to delineate different activity areas by studying the levels of chemical compounds in samples. Phosphate is a vital element in anthropogenic and botanical biochemical processes, and appears in greater concentrations as a result of repetitive human deposition of organic matter (Holliday and Gartner 2007). However, Lisa J. LeCount

and colleagues (2016) highlight the benefits of multi-elemental analyses for identifying a wider variety of activities evidenced in the geochemical residues. When combined with analysis of the distribution of architectural, artifactual, and osteological remains, studying spatial patterning of chemical compound concentrations can reveal areas used for storage, refuse, sleeping, eating, cooking, and ritual activities (Terry et al. 2000).

SUMMARY OF EXCAVATIONS

This section describes the suboperations opened over the course of the 2017 field season grouped according to context. We excavated 24 suboperations and 48 posthole shovel tests during the 2017 season. The total surface area of excavations, excluding shovel tests, measured approximately 126 m^2 in total. Excavations conducted under Operation CC-17 comprised three main contexts: structures (Structures D-41, D-42, and D-43), the courtyard surface, and extramural shovel testing.

Shovel Tests

The field crew dug 48 posthole shovel tests to 30 cm below surface (where possible) in two rings placed on a staggered lattice just beyond the extent of the courtyard platform (see Figure 3.2). Unfortunately, only low numbers of very small fragments of ceramics were recovered, and we were unsuccessful in identifying middens, suggesting that the residents of Courtyard D-4 may have disposed of household waste farther away.

Structure D-41

Structure D-41 is an L-shaped structure in the northeastern corner of the courtyard group. The largest part of the structure runs slightly off east-west before creating a right angle at the corner of the courtyard. Rising 1.35 m above the courtyard surface, Structure D-41 is the largest structure in the courtyard group. Four suboperations were opened on the east-west section of Structure D-41 to investigate the architecture. The north-south section of Structure D-41 was unexcavated due to significant disturbance caused by a large fallen mahogany tree close to the corner of the L-shaped structure. Table 3.1 lists the Suboperations and corresponding lots opened

Table 3.1. Summary of Structure D-41 Suboperations and Lots

Subop	Lot	Lot Description	Ceramics
CC-17-C	01	Humus	Tepeu 2
	02	Collapse Debris	Tepeu 2
	03	Darker Matrix above Courtyard Surface	Tepeu 2
	04	Collapse Debris	Tepeu 2
	05	Courtyard Surface	--
	06	Exterior Wall	--
	07	Bench	--
	08	Interior Floor	--
	09	Construction Fill	Unanalyzed
	10	Burial	Unanalyzed
CC-17-K	01	Humus	Unanalyzed
	02	Collapse Debris	Tepeu 2
	03	Collapse Debris	Tepeu 2
	04	Bench	--
	05	Floor	--
	06	Wall	--
	07	Wall	--
CC-17-N	01	Humus	Unanalyzed
	02	Collapse Debris	Unanalyzed
	03	Floor	--
	04	Bench	--
	05	Wall	--
	06	Wall	--
CC-17-R	01	Humus	Unanalyzed
	02	Collapse Debris	Chicanel
	03	Bench	--

on Structure D-41 with a brief description. Excavators uncovered the westernmost room of the structure and a small portion of an adjacent room to the east.

Western Room

Investigations of the western room of Structure D-41 uncovered the entire interior space of the room, measuring approximately 4 by 2 m. Cut stones formed the 1.1-m-wide entrance to the room in the southern, courtyard-facing wall. Aside from the doorway, none of the walls were preserved above the first or second course. Excavators did not encounter the westernmost wall of this room. However, the plaster surface and northern and southern walls deteriorated approximately 1 m east of the unit wall of CC-17-N, leaving a faint wall scar (Figure 3.3). The exterior faces of the northern and southern walls extended beyond the excavated areas.

A 0.4-m-tall c-shaped bench with generally well-preserved plaster covered the majority of the interior space of the room. We collected 40 samples of the plaster on the bench surface (Samples CC-17-S15-001 to -040) to conduct multielemental analysis of the final occupation phase activities (Figure 3.4). Samples CC-17-S15-028 to -040 comprised mostly soil, and may extend beyond the interior of the western

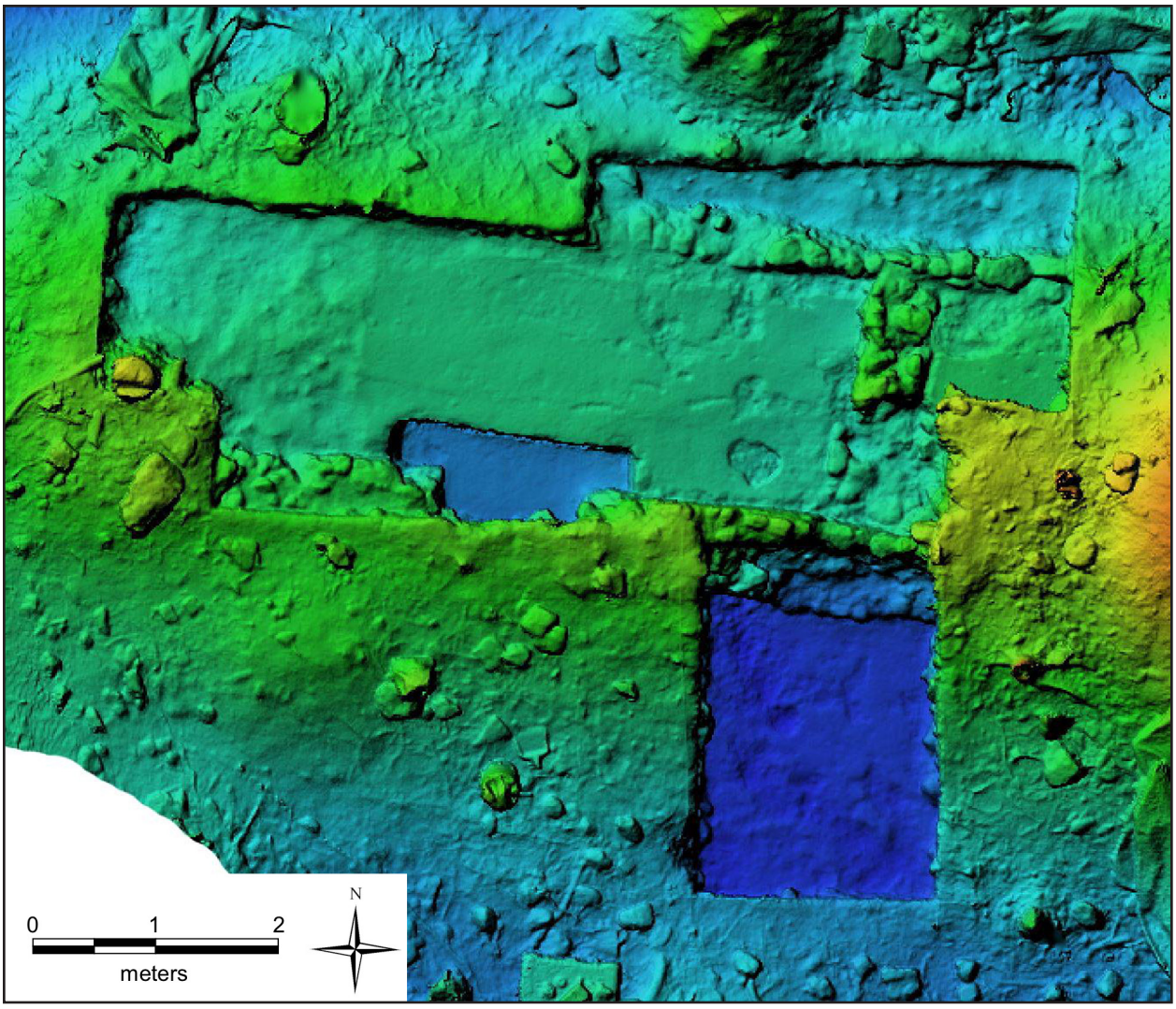

Figure 3.3. Digital elevation model of excavations on Structure D-41.

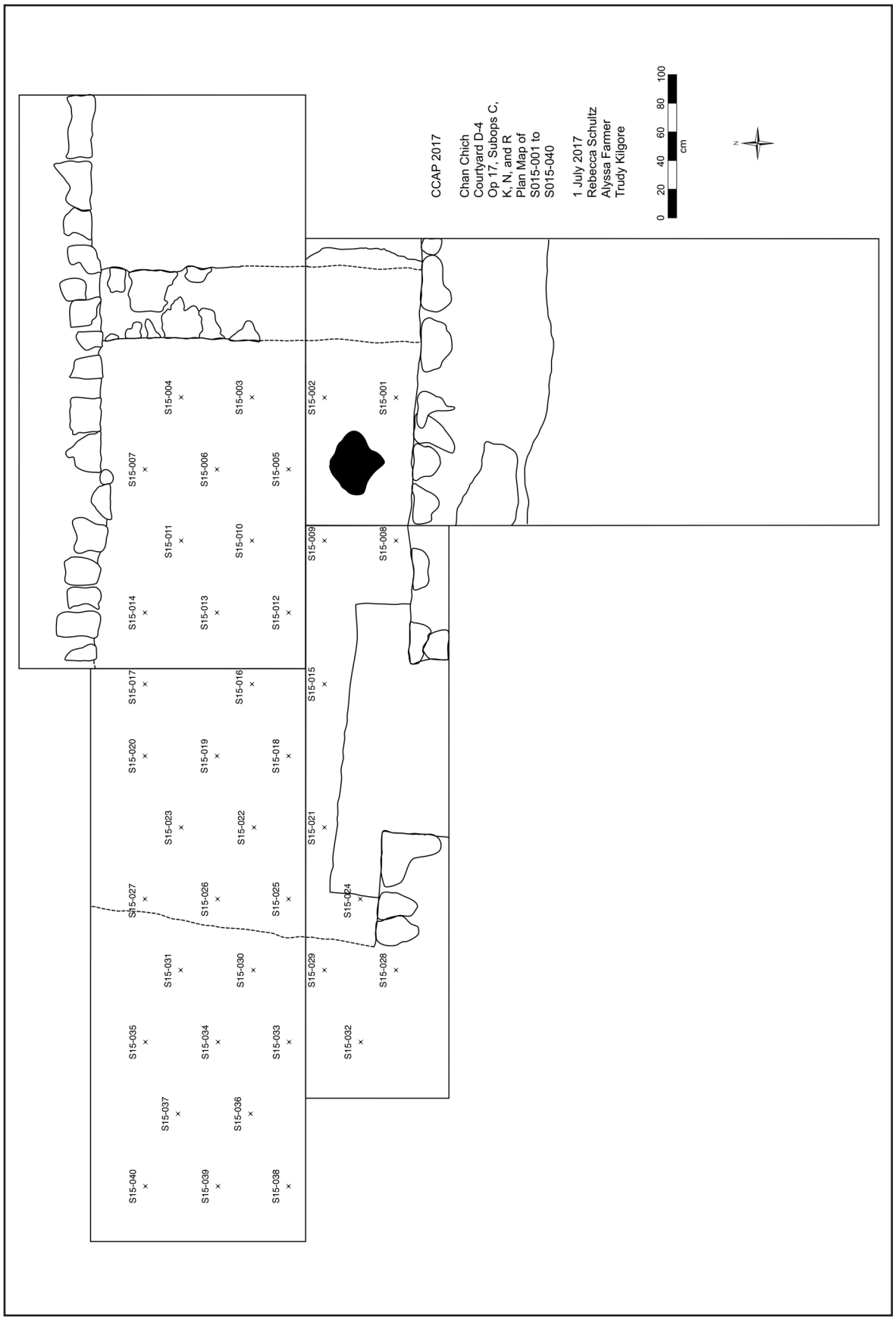

Figure 3.4. Plan map of excavations in Structure D-41 with soil sampling grid.

room. Excavators also encountered a burial while investigating a void in the southeastern corner of the bench surface. A schist slab footed metate (Spec. # CC3016-01) was found just above the lower floor surface associated with some faunal bones. Otherwise very few artifacts were recovered from inside the room.

Burial C-B18

Excavators encountered a weak spot in the plaster bench surface that became a void while excavating in the southeastern corner of the western room. We excavated through the southeastern corner of the bench surface in a 1-by-1.4-m section around the void and encountered Burial CC-B18 in the construction fill resting atop a lower plaster surface, which corresponds in elevation to the interior floor in the room (Figure 3.5). Briana Smith supervised the burial excavations. Burial CC-B18 consisted of two individuals. Individual A was in a flexed position in the western part of the burial area oriented east-west, but no cranium was found. Individual B was also in a flexed position in the northeastern corner of the burial area oriented east-west. Individual B was much better preserved than individual A. No formal construction, nor any grave goods aside from some artifacts in the subfloor fill, was associated with the two individuals in Burial CC-B18. Novotny and colleagues (this volume) present an analysis of the skeletal material.

Eastern Room

Only a 1-x-1.3-m portion of the northwestern corner of the eastern room of Structure D-41 was excavated. The plaster surface, much like the enclosing walls, was very poorly preserved and 20 cm higher than in the adjacent room to the west. The height disparities between the surfaces inside these adjacent rooms suggest that the eastern room had a higher bench, but further investigations are required.

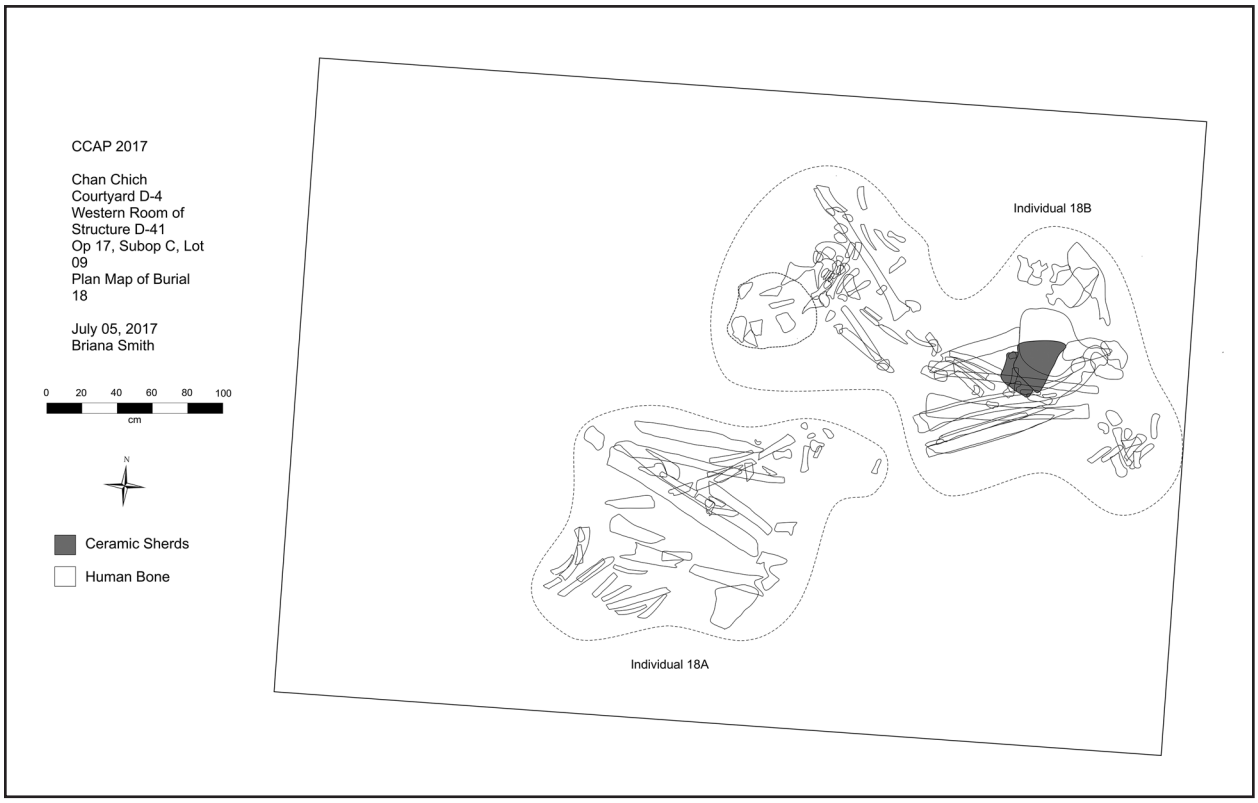

Figure 3.5. Plan map of Burial CC-B18.

Structure D-42

Structure D-42 is a rectangular structure on the western side of the courtyard group. The northern end of the mound is 1.2 m higher than the courtyard surface, and the southern end is slightly taller, rising 1.35 m above the courtyard. The final construction phase consists of two rooms (Figure 3.6). Table 3.2 lists the suboperations and corresponding lots opened on Structure D-42 with a brief description. A relatively thin (0.4-m-wide) partition wall divides the northern and southern rooms of Structure D-42. Slumping over time has created a gap between the partition wall and perpendicular exterior wall to the east, suggesting that the partition was constructed later.

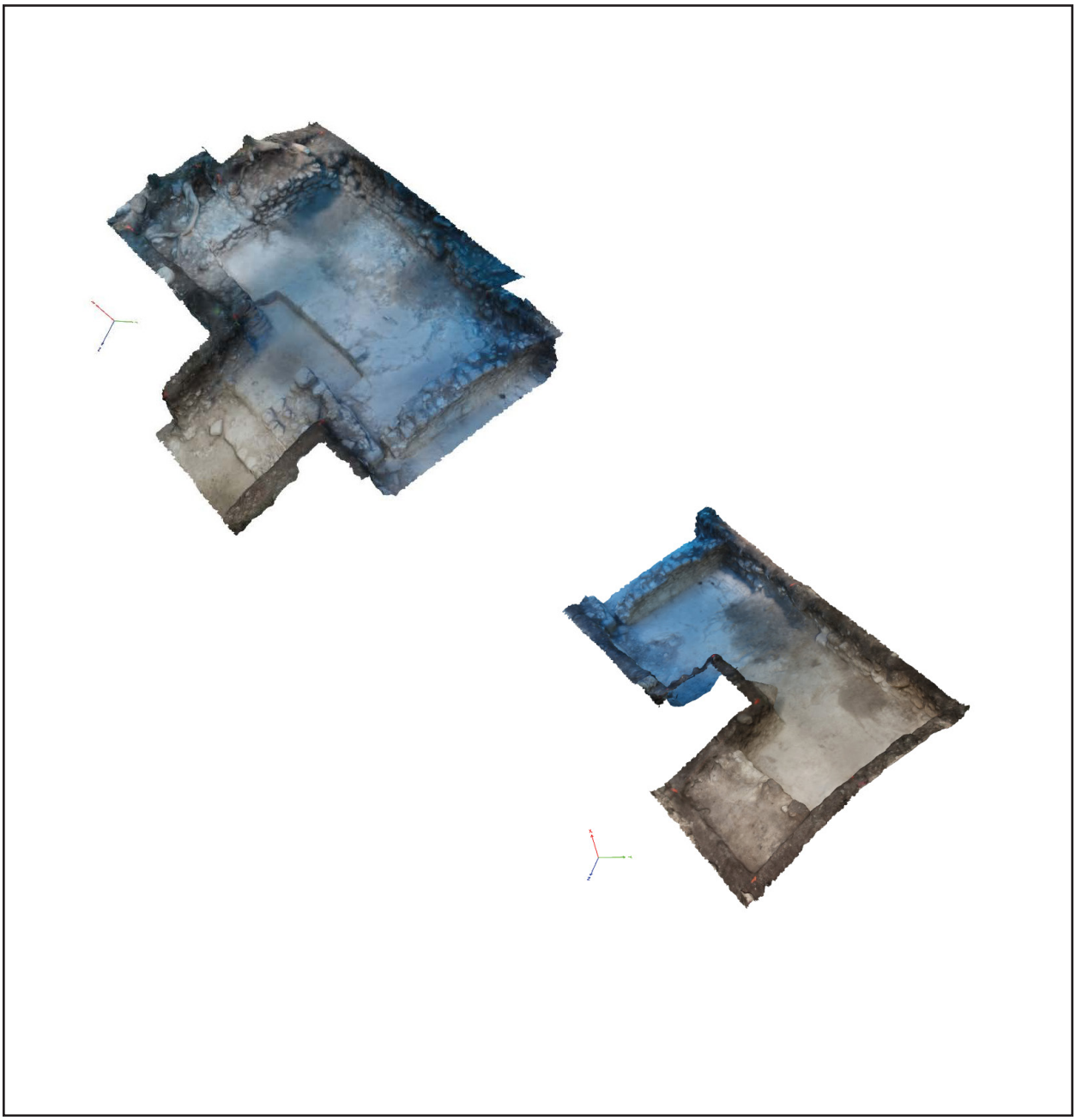

Figure 3.6. Perspective orthophotos of the northern (bottom of image) and southern (top of image) rooms of Structure D-42, view to the southwest.

Table 3.2. Summary of Structure D-42 Suboperations and Lots

Subop	Lot	Lot Description	Ceramics
CC-17-B	01	Humus	Tepeu 2
	02	Collapse Debris	Tepeu 2
	03	Collapse Debris	Tepeu 2
	04	Courtyard Surface	--
	05	Step	--
	06	Interior Floor	--
	07	Bench	--
	08	Wall	--
	09	Problematic Deposit	Tepeu 2
	10	Artifacts on Step	Tepeu 2
	11	Artifacts on Interior Floor	Tepeu 2
	12	Problematic Deposit	Tepeu 2
CC-17-H	01	Humus	Tepeu 3?
	02	Collapse Debris	Tepeu 2
	03	Wall	--
	04	Interior Floor	--
	05	Bench	--
	06	Artifacts on Bench	Tepeu 2
	07	Wall	--
CC-17-I	01	Humus	Tepeu 3
	02	Collapse Debris	Tepeu 2
	03	Bench	--
	04	Wall	--
	05	Wall	--
	06	Floor	--
	07	Wall	--
	08	Artifacts on Interior Floor	--
CC-17-Ix	01	Humus/Collapse Debris	Tepeu 2
	02	Floor	--
	03	Artifacts on Interior Floor	--

Table 3.2. Summary of Structure D-42 Suboperations and Lots (continued)

Subop	Lot	Lot Description	Ceramics
CC-17-J	01	Humus	Tepeu 3
	02	Collapse Debris	Tepeu 2
	03	Bench	--
	04	Wall	--
	05	Wall	--
	06	Artifacts on Bench	--
	07	Construction Fill	Unanalyzed
	08	Construction Fill	Tepeu 2 and Chicanel mix
	09	Floor	--
CC-17-L	01	Humus	Unanalyzed
	02	Collapse Debris	Tepeu 2 with Tzakol trace
	03	Floor	--
	04	Wall	--
	05	Wall	--
CC-17-M	01	Humus	Unanalyzed
	02	Collapse Debris	Unanalyzed
	03	Floor	--

Northern Room

The northern room consists of a large (6 by 2.5 m) open space lacking a bench. The interior floor consisted of variably preserved plaster with a number of cracks concentrated in the southwestern corner. We collected 54 samples of the plaster floor inside the room (Samples CC-17-S04-001 to -054) according to a staggered lattice (Figure 3.7). A charcoal sample (CC-17-S14) collected from the center of the plaster floor during geochemical sampling dates its construction to around cal AD 775–890 (see Discussion below). The northernmost wall was constructed of small roughly cut stones, but was the best-preserved wall in the room, measuring 1.5 m tall and 0.8 m wide. Although the majority of the western and eastern walls were poorly preserved, they

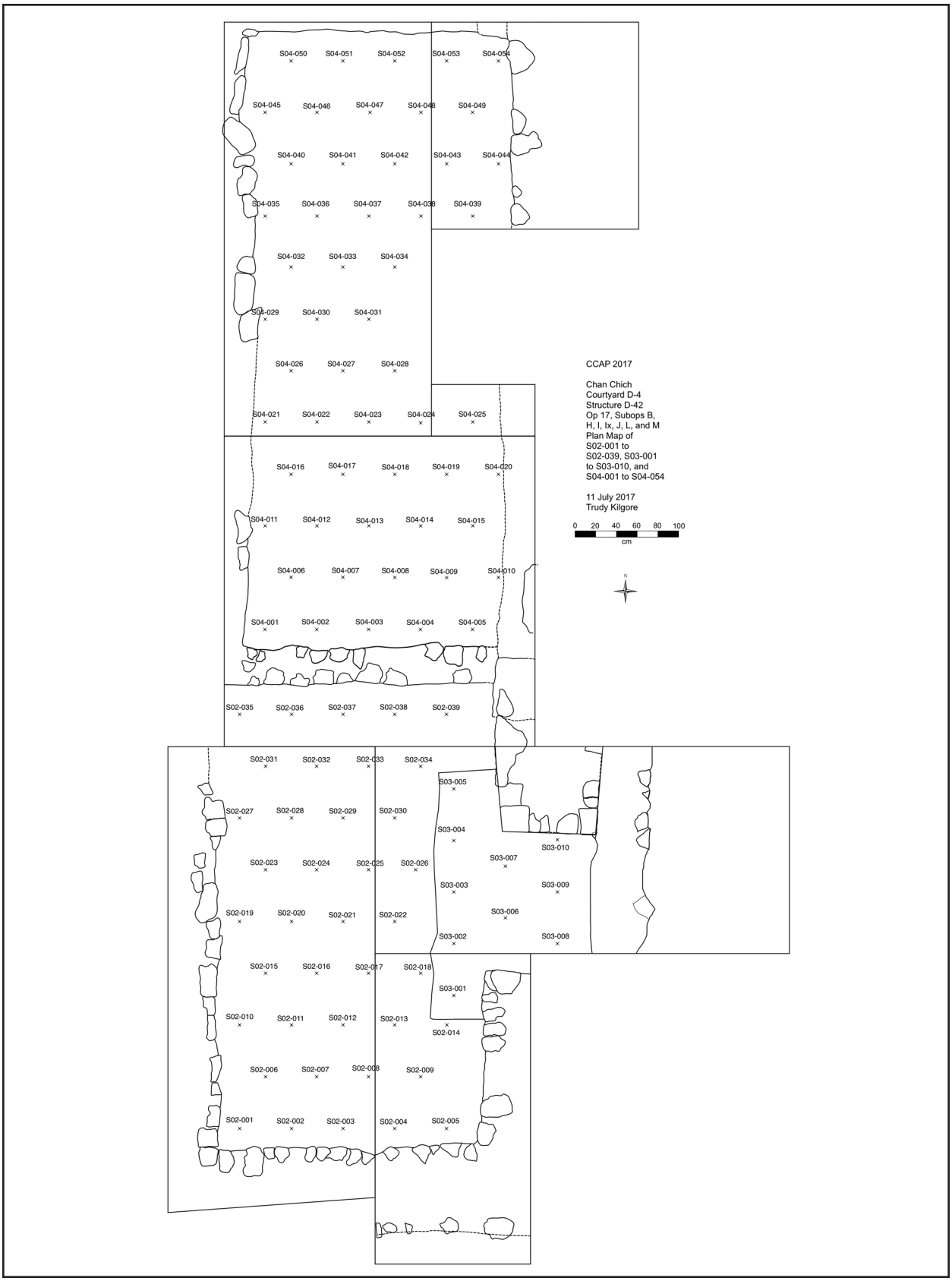

Figure 3.7. Plan map of excavations in Structure D-42 with soil sampling grid

both reached a maximum height of 20 cm and 50 cm respectively at their intersections with the northernmost wall. The exact widths of both walls is unknown because the exterior faces extended beyond the excavated areas. The distance between the interior face of the eastern wall and the eastern edge of Subop CC-17-M measured 1.2 m. Due to the 0.8-m width of the northernmost wall, the eastern wall was likely thinner than 1.2 m. However, excavators encountered no promising alignments in Lot CC-17-M-02, and did not excavate in the eastern extent of the suboperation to avoid digging through wall core.

Despite the poor preservation of the eastern and western walls, a number of large facing stones (33 by 49 cm to 40 by 60 cm) were removed from the collapse debris (Figure 3.8). One complete granite basin metate (Spec. # CC3018-01) was found face down in the southeastern portion of the room associated with a complementary granite mano (Spec. # CC2944-01). Additionally, a limestone drain stone was recovered face down on the floor in the northernmost extent of the room. Otherwise, relatively few artifacts were recovered from inside the room.

Southern Room

Our excavations of the southern room exposed the exterior courtyard floor, the entrance to the room, and a large portion of the room's interior, which is dominated by a short (20 cm high) c-shaped bench measuring 2.3 by 4.35 m. The entrance to the room opens to the courtyard area via a step on the eastern side of the structure, and the floor in the room is 45 cm higher than the courtyard surface. The entrance is 1.3 m wide, and the eastern walls are 0.9 m thick. The walls were preserved to a maximum height of 0.5 m above the interior floor. Aside from

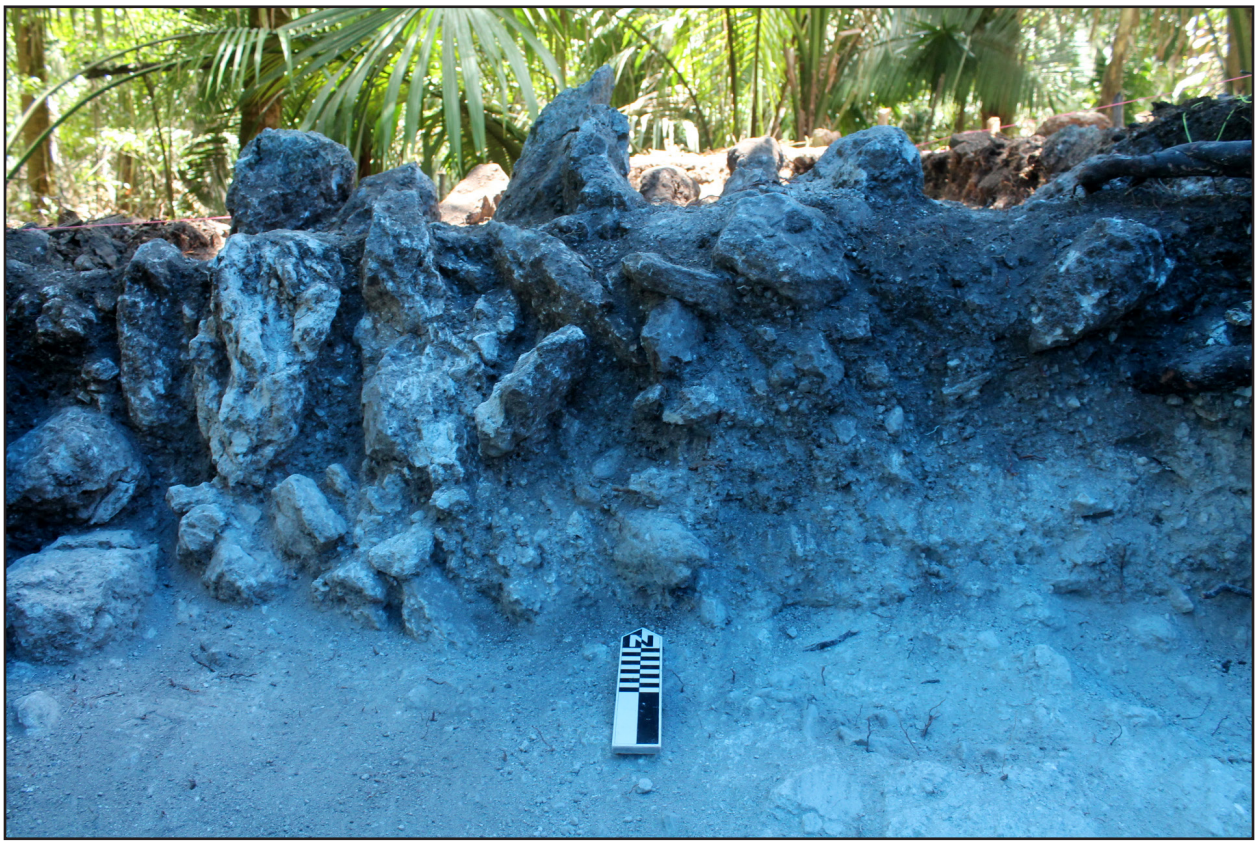

Figure 3.8. Photograph of large stone collapse in northern room of Structure D-42.

the large faced stones framing the entrance to the room, the walls are constructed of small roughly cut stones. While the eastern wall and doorway jambs are well preserved, the western wall is poorly preserved. It is only preserved to a maximum height of 15 cm above the bench surface. The western face of the wall has largely collapsed down the backside of the structure. Other than deterioration on the western extent of the bench, both interior plaster surfaces are well preserved throughout the room. We excavated a 1.5-x-1.3-m section through the poorly preserved center of the c-shaped bench to determine the construction phases of the room. The c-shaped bench was constructed on top of the lower interior floor, which is poorly preserved underneath a thin layer of dry, small subfloor fill.

Several artifacts were found *in situ* inside and directly outside the southern room of Structure D-42 (Table 3.3). Ceramic sherds, including one partially reconstructable Tinaja Red jar (Spec. # CC2807-01), were found in clusters on the bench surface, lower interior floor, step, and courtyard surface. One complete granite basin metate (Spec. # CC2990-01) and one large fragment of a quartzite basin metate (Spec. # CC3017-01) were recovered face down on the bench surface. We collected 39 samples of the plaster bench surface (CC-17-S02-001 to CC-17-S02-039) and 10 samples of the lower plaster floor inside the room (CC-17-S03-001 to CC-17-S03-010) according to a staggered lattice (see Figure 3.7). A charcoal sample collected from the center of the bench during sampling dates its construction to cal AD 681–770 (Sample CC-17-S06, see Discussion below).

Structure D-43

Structure D-43 is a platform that forms the southern side of the courtyard group. It measures approximately 40 cm tall from the courtyard surface and 1.3 m higher than bedrock. Table 3.4 lists the suboperations and corresponding lots opened on Structure D-43 with a brief description. The platform consists of a step down to the courtyard surface on the north side and a two-tiered terrace the southern side. The lower terrace face was well preserved, 60 cm high, and constructed of faced stones placed directly on top of bedrock. The second tier was 70 cm high to the summit of the mound and offset 60 cm to the north of the lower terrace. Excavations demonstrated that the platform did not have any masonry walls on its summit, and

Table 3.3. Lots CC-17-B-10, -B-11, -B-12, -H-06, -J-02, and -J-06 Artifacts

Subop	Lot	Artifact Category	Catalog #	Count	Description
CC-17-B	10	Ceramics	CC2706	23	100% jar fragments; Some striated and Cayo Unslipped
	11	Ceramics	CC2805	32	100% jar fragments; Some Tinaja Red and Belize Red
	12	Ceramics	CC2804	17	Mostly jar fragments; Some Belize Red and striated
		Lithic Tools	CC2991	1	Chert scraper
CC-17-H	06	Ceramics	CC2807	24	Partially reconstructable Tinaja Red jar
		Ground Stone	CC2990	1	Complete granite basin metate
CC-17-J	02	Ceramics	CC2803	8	100% jar fragments; Some Cayo Unslipped and striated
	06	Ground Stone	CC3017	1	Quartzite basin metate fragment

Table 3.4. Summary of Structure D-43 Suboperations and Lots

Subop	Lot	Lot Description	Ceramics
CC-17-A	01	Humus	Tepeu 3
	02	Collapse Debris	Tepeu 2
	03	Platform Face	--
	04	Courtyard Surface	--
	05	Artifact Concentration	Unanalyzed
	06	Construction Fill	Tepeu 2 and Chicanel mix
CC-17-F	01	Humus	Tepeu 3
	02	Collapse Debris	Tepeu 2
	03	Collapse Debris	Tepeu 2
	04	Floor	--
	05	Platform Face	--
	06	Step	--
CC-17-G	01	Humus	Tepeu 3
	02	Collapse Debris	Tepeu 2
	03	Platform Face	--
	04	Step	--
	05	Unexcavated Section	--
	06	Other	Unanalyzed
	07	Construction Fill	Tepeu 2
	08	Construction Fill	Unanalyzed
	09	Floor	--
	10	Construction Fill	Unanalyzed
	11	Other	--
	12	Bedrock	--
CC-17-S	01	Humus	Unanalyzed
	02	Collapse Debris	Tepeu 2
	03	Step	--
	04	Platform Face	--
	05	Floor	--

no postholes were found. Due to the shallow topsoil on the mound, no prepared surfaces preserved on top of the platform.

Excavators investigated a 1.5-x-1.5-m section in the center of the platform to determine its construction phases. These penetrating excavations encountered dry-laid construction fill composed of small cobbles all the way down to bedrock with the courtyard surface visible only in the northern profile.

Artifact quantities associated with Structure D-43 were significantly higher than those recovered from Structures D-41 or D-42 (Table 3.5). The total artifacts recovered from the lots associated with the final occupation of Structure D-43 comprised 1,780 ceramic sherds, 79 pieces of lithic debitage, 18 lithic tools, four ground stone artifacts, four faunal bone fragments, and four obsidian fragments. The distribution of ceramic forms favored jars (64 percent) followed by bowls and basins (26 percent), plates (4 percent), and other or unidentifiable (6 percent).

Courtyard Surface

We excavated three main categories of suboperations on the courtyard surface (Table 3.6): courtyard test pits, structure/courtyard units to determine the dimensions of the courtyard, and excavations at the edges of the courtyard platform. Courtyard test pits were placed in central locations to establish the construction sequences and locate exterior activity areas on the courtyard surface. Subop CC-17-D was roughly in the center of the courtyard and was excavated 1 m deep to bedrock. It encountered only one unpreserved courtyard surface below a thin layer of topsoil. Construction fill below the presumed courtyard surface increased in size from cobbles to small boulders closer to bedrock. The highest quantities of artifacts were recovered from the first 20 cm of topsoil (Lot CC-17-D-01) on top of the unpreserved courtyard surface. The 119 ceramic sherds recovered from Lot CC-17-D-01 represented a fairly even distribution between jars, bowls and basins, plates, and other/unidentifiable subforms. The assemblage

Table 3.5. Lots CC-17-A-01, -A-02, -F-01, -F-02, -F-03, -G-01, -G-02, -S-01, and -S-02 Artifacts

Subop	Lot	Artifact Category	Catalog #	Count	Description
CC-17-A	01	Ceramics	CC2553	90	Subin Red, Striated, Tinaja Red, Cayo Unslipped
		Debitage	CC2554	4	Secondary chert and chalcedony flakes
	02	Ceramics	CC2563	226	Tinaja Red with Jug handle, Cubeta Incised
		Debitage	CC2564	3	Secondary chert flakes
		Lithic Tools	CC2565	2	General Utility Biface
		Ground Stone	CC2566	1	Granite Plano-convex Mano
		Obsidian	CC2567	1	Blade fragment
CC-17-F	01	Ceramics	CC2613	262	Cayo Unslipped, Tinaja Red, Belize Red, Dolphin Head Red, Subin Red
		Debitage	CC2614	1	Secondary chert flake
		Ground Stone	CC2615	1	Granite Basin Metate fragment
		Obsidian	CC2616	1	Blade fragment
	02	Ceramics	CC2624	337	Imitation Slate, Roaring Creek Red, Cayo Unslipped, Striated, Subin Red
		Debitage	CC2625	10	Primary, Secondary, and Tertiary flakes
		Lithic Tools	CC2626	1	General Utility Biface
		Obsidian	CC2627	2	Straight Stem Point fragment, Blade fragment
	03	Ceramics	CC2640	68	Cayo Unslipped, Achote Black, Tinaja Red
		Debitage	CC2641	5	Chunk and Primary and Secondary flakes
CC-17-G	01	Ceramics	CC2617	115	Subin Red, Tinaja Red, Striated, Cayo Unslipped
		Debitage	CC2618	20	Chunks; Primary, Secondary, and Tertiary flakes
		Lithic Tools	CC3031	3	Utilized flakes and Chert Blade fragment
	02	Ceramics	CC2728	560	Striated, Achote Black, Cayo Unslipped with red wash, Subin Red, Tinaja Red, Tinaja Red with pie crust rim, Buff/Cream Slipped plate fragment
		Debitage	CC2729	30	Shatter, Chunks, and Primary, Secondary, and Tertiary flakes
		Lithic Tools	CC2730	7	Expanding Stem Biface, Cores, Scraper, Utilized flake, and Graver
CC-17-S	01	Ceramics	CC3067	11	Unanalyzed
		Debitage	CC3043	1	Tertiary chalcedony flake
		Lithic Tools	CC3061	3	Chalcedony Blade fragment, General Utility Biface, and Utilized flake
	02	Ceramics	CC2992, CC2988	111	Cayo Unslipped, Tinaja Red
		Debitage	CC3044	5	Primary, Secondary, and Tertiary flakes
		Lithic Tools	CC3062	2	General Utility Biface
		Ground Stone	CC3013	2	Granite Basin Metate fragments
		Faunal Bone	CC3244	4	Unanalyzed

Table 3.6. Summary of Courtyard Surface Suboperations and Lots (North to South)

Subop	Lot	Lot Description	Ceramics
CC-17-O	01	Humus	Tepeu 2
	02	Collapse Debris	Tepeu 2-3
	03	Courtyard Surface	--
	04	Platform Face	--
	05	Bedrock	--
CC-17-Ox	01	Humus	Tepeu 2
	02	Collapse Debris	Tepeu 2
	03	Courtyard Surface	--
CC-17-Q	01	Humus	Tepeu 2
	02	Collapse Debris	Tepeu 3
	03	Courtyard Surface	--
	04	Wall	--
	05	Problematic Deposit	Tepeu 2
	06	Problematic Deposit	Tepeu 3
	07	Problematic Deposit	Unanalyzed
CC-17-D	01	Humus	Tepeu 2 with Chicanel and Floral Park trace
	02	Subfloor Fill	Tepeu 2-3?
	03	Construction Fill	Tepeu 1
	04	Bedrock	--

Table 3.6. Summary of Courtyard Surface Suboperations and Lots (continued)

Subop	Lot	Lot Description	Ceramics
CC-17-B	04	Courtyard Surface	--
	09	Problematic Deposit	Tepeu 2
	12	Problematic Deposit	Tepeu 2
CC-17-E	01	Humus	Tepeu 3
	02	Collapse Debris	Tepeu 2
	03	Courtyard Surface	--
	04	Problematic Deposit	Tepeu 2
	05	Step	--
	06	Floor	--
	07	Floor	--
CC-17-U	01	Humus	Unanalyzed
	02	Collapse Debris	Unanalyzed
	03	Construction Fill	Tzakol with Chicanel admix
CC-17-P	01	Humus	Tepeu 2-3
	02	Collapse Debris	Unanalyzed
	03	Platform Face	--
CC-17-T	01	Humus	Tepeu 3
	02	Collapse Debris	Tepeu 2
	03	Platform Face	--

dates to the Tepeu 2 ceramic sphere (AD 700–800) with trace amounts of Chicanel/Floral Park (350 BC–AD 250) sherds. Ceramics recovered from the construction fill were overwhelmingly jar fragments dated to the Tepeu 1 sphere (AD 600–700)

Subop CC-17-U was excavated in a large open area in the southeastern corner of the platform between Structures D-41 and D-43 where a number of artifacts were visible on the surface. Although the unit was only excavated 50 cm deep, the construction pattern aligned with the one observed in Subop CC-17-D. Artifacts were concentrated in the upper matrix and subfloor fill directly below the eroded surface in both suboperations. The Tzakol (AD 250–600) and Chicanel admix ceramics recovered from the construction fill (Lot CC-17-U-03) reveal earlier dates than those found at similar depths in Subop CC-17-D.

Investigations of the other two categories of courtyard surface excavations uncovered three dense artifact deposits in the northwestern, southwestern, and southeastern corners of the courtyard platform. These excavations also recovered architectural data on the structures and courtyard platform.

Northwestern Artifact Deposit: Subops CC-17-O, -Ox, and -Q

The operation director placed Subop CC-17-O, a 1-x-4-m trench, oriented at 42 degrees east of north, in the gap between Structures D-41 and D-42 on the northwestern corner of the courtyard's platform. The goal of the suboperation was to approach a roughly northeast/southwest alignment of stones visible on the surface to determine if they were steps extending from the courtyard surface to the base of platform. The southeastern half of the unit encountered a dense artifact deposit on the courtyard floor, prompting the excavation of two additional units: Subop CC-17-Q, a 2-x-2.33-m unit located south of Subop CC-17-O, and Subop CC-17-Ox a triangular unit that connected all three Suboperations into one contiguous excavation block. Subop CC-17-Q was placed 0.8 m north of the wall encountered in Subops CC-17-L and -M to catch the northern face of Structure D-42 without excavating wall core. Both new units also encountered the same dense artifact deposit.

The northwestern deposit yielded the highest counts and most varied artifacts of the three dense artifact deposits encountered on the courtyard surface (Table 3.7). Located adjacent to the northernmost exterior wall of Structure D-42, excavations of this dense artifact deposit covered a surface area of 9.028 m^2 and stretched to the edge of the courtyard platform.

Table 3.7. Northwestern Deposit Artifacts and Corresponding Catalog #s by Suboperation and Lot

Subop	Lot	Artifact Category	Catalog #	Count	Description
CC-17-O	02	Ceramics	CC2852, CC2796	1,773	Subin Red, Cayo Unslipped, Cubeta Incised, Tinaja Red, Belize Red, Achote Black with pedestal base, flat rim with Cream Slipped on interior, Roaring Creek Red, Tres Mujeres Mottled plate fragment with foot scar, censer foot (Terminal Classic to Postclassic), God head foot (Postclassic), Female figurine head, Bird ocarina
		Debitage	CC3032	104	Primary, Secondary, and Tertiary flakes
		Lithic Tools	CC3026	59	Hammerstones, Scrapers, Gravers, Utilized flakes, General Utility Bifaces, Oval Bifaces, Narrow Bifaces, Cores
		Ground Stone	CC3011	9	Girdled stone, Plano-convex and Rectangular Mano fragments, Basin Metate fragments
		Shell	CC2810	1	Fish Pendant
		Faunal Bone	CC3242	26	Unanalyzed
CC-17-Ox	02	Ceramics	CC2866	163	Achote Black, Brown Slipped?, Belize Red, Tinaja Red, Cayo Unslipped, Striated, 1 cylinder base
		Debitage	CC3045	4	Secondary and Tertiary flakes
		Lithic Tools	CC3079	2	Utilized flake, Chert Blade
		Obsidian	CC3001	1	Blade fragment

Table 3.7. Northwestern Deposit Artifacts and Corresponding Catalog #s (continued)

Subop	Lot	Artifact Category	Catalog #	Count	Description
CC-17-Q	02	Ceramics	CC2853	1,380	Imitation Fine Orange that refits with sherd form CC-17-Q-06, Striated, Cayo Unslipped, Subin Red, Late Classic Buff, sherd with white coating on interior (stucco?), Late Classic foot with very large vent hole, Roaring Creek Red, Roaring Creek Red drum fragment
		Debitage	CC3034	68	Primary, Secondary, and Tertiary flakes
		Lithic Tools	CC3075	7	Narrow Biface, Scrapers, Utilized flake, Hammerstone
		Ground Stone	CC3010	4	Domed Spindle Whorls, Plano-convex mano fragments
		Faunal Bone	CC3245	76	Unanalyzed
		Obsidian	CC3007	3	Blade fragments and Utilized flake
	05	Ceramics	CC2814, CC2815, CC2816	247	Cayo Unslipped, Striated, Roaring Creek Red, Garbutt Creek Red, Cubeta Incised, Subin Red, Striated, Alexanders Unslipped, comal lid/ rim
		Debitage	CC3038	8	Secondary and Tertiary flakes
		Lithic Tools	CC3076	6	Cores, Bifaces, Utilized flakes
		Ground Stone	CC3012	2	Basin metate fragments
		Faunal Bone	CC3251	34	Unanalyzed
		Obsidian	CC3006	1	Utilized Flake
	06	Ceramics	CC2854	2,340	Cubeta Incised censer, Imitation Fine Orange bowl fragment that refits with sherd in CC-17-Q-02, Subin Red, Cayo Unslipped with pie crust rim, Kaway Impressed, Sierra Red, Striated, Achote Black, Zibal Unslipped, Belize Red, Roaring Creek Red, Tinaja Red, Cameron Incised (more buff), one Postclassic God head foot, Brown Slipped
		Debitage	CC3033	105	Primary, Secondary, and Tertiary flakes
		Lithic Tools	CC3025	52	Chert and Chalcedony Blades, General Utility Bifaces, Cores, Oval Bifaces, Gravers, Hammerstones, Utilized Flakes,
		Ground Stone	CC2997	8	Oval Bark Beater, Basin Metate fragments, Plano-convex Mano fragments
		Shell	CC3082	7	Mother of Pearl Ring fragment, Tinklers, Unworked Marine Shell
		Faunal Bone	CC3238	95	Unanalyzed
		Obsidian	CC3008	7	Blade fragments, Utilized flake, Biface fragment with Straight Stem Point
	07	Ceramics	CC2963	12	Partially reconstructable plate

The deposit's thickness ranged from 40 cm to 75 cm. Higher concentrations of charcoal were encountered closer to the exterior wall of Structure D-42 among the highest concentrations of artifacts. One charcoal sample, collected in this matrix, was dated to cal AD 775–893 (Sample CC-17-S10, see Discussion below). Relative chronology based on ceramic data echoes this Late/Terminal Classic date. Although the ceramic artifacts represent a mix of time periods, the vast majority date firmly to the Late Classic/Terminal Classic period. The lack of stratification suggests that the depositional process occurred within a relatively short time span.

The excavations produced 5,915 ceramic sherds, 289 pieces of debitage, 126 lithic tools, 23 ground stone artifacts, eight shell artifacts, 231 faunal bone fragments, and 12 obsidian blade fragments from this context. The estimated excavated volume of this deposit is 4.2 m^3, which means the density of the deposit was 1,572.38 artifacts per m^3. The types of artifacts found in this context represent a mix of high quality ceramic vessels, ritual items, articles of personal adornment, and utilitarian objects. Painted ocarinas (Spec. #s CC2976-02, CC2854-03, and CC2854-04), a Roaring Creek Red drum fragment (Catalog # CC2853), female head figurine fragment (Spec. # CC2796-01), a ground stone bark beater (Spec. # CC2997-01), god head ceramic feet (Spec. # CC2796-05), censer fragments (Spec. #s CC2853-03 and CC2854-09), a marine shell pendant carved like a fish (Spec. # CC2810-01), and fragments of an Imitation Fine Orange vessel with a conference scene (Spec. #s CC2853-01 and CC2854-01) were among the special finds (Figure 3.09). However, the majority of the deposit comprised utilitarian items, such as general utility bifaces, metates, chert blades, spindle whorls (Spec. #s CC3010-01 and CC3010-02), and an unslipped sherd with protective interior coating, repair holes, and striations.

Southeastern Artifact Deposit: Subop CC-17-P

Subop CC-17-P was excavated to look for steps to the platform in the open southeastern corner of Courtyard D-4. This unit extended from the summit of the platform to its base. Small cobble subfloor fill was encountered in the westernmost 30 cm of the 2-x-4-m unit. Although excavators did not encounter any steps or a preserved platform face, the unit yielded a dense, 20-cm thick artifact deposit draped down the platform face (Table 3.8). The artifact assemblage from the southeastern deposit comprised of 2,560 ceramic sherds, 115 pieces of debitage, 35 lithic tools, five pieces of ground stone, and one obsidian blade fragment. With 1.6 m^3 of the deposit excavated, the density of artifacts was 1,697.5 artifacts per m^3, higher than the northwestern deposit, despite the fact that the deposit is not as thick.

Though abundant, ceramic sherds found in this deposit were generally from utilitarian vessels and more badly eroded than either of the other deposits. Ceramic counts could be slightly inflated because of the highly fragmentary nature of the collected ceramic sherds. Notable ceramic finds included one small censer fragment with remnants of Maya blue, reworked sherds (one disc and one striation tool), and a fragmentary ceramic spindle whorl. Some finely made bifaces were found among the badly eroded ceramic sherds.

Southwestern Artifact Deposit: Subops CC-17-B and -E

The southwestern deposit consisted of the lowest concentration of artifacts of the three courtyard surface deposits (Table 3.9). Approximately 2.69 m^3 was excavated from this deposit, making the artifact density roughly 165.8 artifacts per m^3. This artifact deposit was located in the corner between Structures D-42 and D-43. The artifact assemblage associated with the southwestern deposit was more

Figure 3.9. Special finds from northwestern artifact deposit. Top row (L-R): Ceramic female figurine fragment (Spec. # CC2796-01), Fragments of an Imitation Fine Orange vessel depicting a conference scene (Spec. #s CC2853-01 and CC2854-01), Censer fragments (Spec. # CC2854-09). Bottom Row (L-R): Painted female ocarina fragments (Spec. # CC2854-04), Bird ocarina (Spec. # CC2976-02), Carved fish shell pendant (Spec. # CC2810-01), Ground stone spindle whorls (Spec. #s CC3010-02 and CC3010-01), Oval bark beater fragment (Spec. # CC2997-01).

Table 3.8. Southeastern Deposit Artifacts and Corresponding Catalog #s by Suboperation and Lot

Subop	Lot	Artifact Category	Catalog #	Count	Description
CC-17-P	01	Ceramics	CC2811	2,171	Cayo Unslipped, Subin Red with impressions, Tinaja Red, Garbutt Creek Red form with buff slip, Striated, Censer fragment with Maya blue, eroded Belize Red, Ceramic Making Tool, Sherd Disc, Domed Spindle Whorl
		Debitage	CC2797	92	Primary, secondary, and tertiary flakes
		Lithic Tools	CC2800	33	Oval Bifaces, Utilized Flakes, Cores, Chert Blades, General Utility Bifaces, Stemmed Biface Fragment
		Ground Stone	CC2962	1	Metate fragment
		Obsidian	CC3005	1	Blade fragment
	02	Ceramics	CC3063	389	Unanalyzed
		Debitage	CC3040	23	Chunk, Primary, Secondary, and Tertiary flakes
		Lithic Tools	CC3077	2	Bifacial Cores
		Ground Stone	CC3015	4	Square, Plano-Convex, and Oval Mano Fragments, Limestone Spheroid

Table 3.9. Southwestern Deposit Artifacts and Corresponding Catalog #s by Suboperation and Lot

Subop	Lot	Artifact Category	Catalog #	Count	Description
CC-17-B	09	Ceramics	CC2698	28	100% jar fragments, Some striated
		Lithic Tools	CC2699	1	Unanalyzed
		Ground Stone	CC2700	1	Plano-convex granite mano
	12	Ceramics	CC2804	17	Belize Red, Striated
		Lithic Tools	CC2991	1	Scraper
CC-17-E	02	Ceramics	CC2703	244	Tinaja Red, Cubeta Incised, paste of sherd similar to Irish Creek paste, sherd possibly used as ceramic making tool
		Debitage	CC2704	23	Primary, Secondary, and Tertiary flakes
		Lithic Tools	CC2705	4	Core, General Utility Biface, Scraper
	04	Ceramics	CC2883, CC2886	75	Tinaja Red, Censer base, Cayo Unslipped, Subin Red, Striated, Partially reconstructable Tinaja Red vessel
		Debitage	CC3035	43	Primary, Secondary, and Tertiary Flakes
		Ground Stone	CC2989	5	Celt fragment, Square Mano fragment, Basin Metate Fragments
		Shell	CC3083	2	Jute, Tinkler
		Faunal Bone	CC3240	19	Unanalyzed

diverse than the one in the southeastern corner. The recovered materials included 347 ceramic sherds, 66 pieces of debitage, six lithic tools, six ground stone artifacts, two shell artifacts, and 19 faunal bone fragments. Aside from a shell tinkler (Spec. # CC3083-02), the artifacts are overwhelmingly utilitarian in nature.

DISCUSSION

Although some ceramics date to the Early Classic and Late Preclassic period, the majority of the occupation of Courtyard D-4 dates firmly in the Late Classic period, however the Tepeu 3 ceramics from the topsoil in multiple units and the northwestern and southeastern artifact deposits indicate continued occupation and activity into the Terminal Classic period. Three construction events are evident in Courtyard D-4: the initial platform built on top of bedrock; the construction of Structures D-41, D-42, and D-43; and the remodeling episodes inside Structures D-41 and D-42. Radiocarbon (see Houk, Project Lists, this volume, Tables 9.11 and 9.12) and ceramic data consistently date construction of the final phase of Structures D-41 and D-42 to the Late Classic period with occupation and use continuing into the Terminal Classic period. Although we do not have radiocarbon dates for Structure D-43, the ceramics recovered on top of the platform date to Tepeu 2-3 (AD 700–850) with some Chicanel (400 BC–AD 250) admix inside the construction fill, corresponding with the dates of the other structures and courtyard construction phases.

Attempts to assign distinct functions to domestic structures are generally difficult to support archaeologically (see Chase and Chase 2013; Haviland 1988; Haviland et al. 1985). No hearths were found, making designating a single structure as the kitchen of Courtyard D-4 problematic. Disturbances to the eastern arm of Structure D-41 prevented testing for the general pattern of eastern shrine structures (Becker et al. 1999). However, the architecturally diverse interior spaces provide multiple configurations facilitating different types of activities. Ethnographic, ethnohistoric, and archaeological data suggest that households like Courtyard D-4 may have housed multiple generations of the same family or even multiple families, and the presence of multiple rooms with benches of variable size could have slept more people (Wilk 1988). Although raised benches in ancient Maya domestic structures are generally associated with sleeping quarters, the variability in bench height suggest they served a variety of functions beyond sleeping (Hendon 1991:902).

Furthermore, the lack of a bench in the northern room of Structure D-42 creates an open interior space that could have hosted activities involving more individuals or requiring larger tools or furniture that either did not preserve or was removed before abandonment. Additionally, there are vast differences between the suite of activities associated with open platforms and courtyards as opposed to structures with stone walls. Forthcoming multi-elemental analysis of the interior plaster surfaces will supply further detail toward a more complete reconstruction of the functions of the two rooms in Structure D-42 and western room of Structure D-41. Although architecturally defined spaces are important, recent developments in ancient Maya household archaeology emphasize the importance of exterior spaces to domestic activities (Hutson et al. 2007; Robin 2013).

For the purposes of this report, we simply categorize the artifact deposits in the northwestern, southeastern, and southwestern corners of the courtyard surface as dense artifact deposits. These deposits could represent middens. Although middens provide a wealth of knowledge about a household's production and consumption habits through their disposal practices, the composition and location of these

deposits deviate from midden definitions in a number of ways (Deal 1985, 1998; Hayden and Cannon 1983; Hutson and Stanton 2007; Needham and Spence 1997). The courtyard surface location, however, is the biggest obstacle to categorizing any of these deposits as middens. Although the fragmentary nature of the recovered faunal remains inflate the counts, the relative paucity of faunal remains in the southeastern and southwestern deposits does not fit the general definition of household middens. The northwestern deposit consists of the most compelling evidence for a midden. However, the quality and type of artifacts, when considered alongside the apparent lack of chronological stratigraphy, suggest a ritual connection beyond mere domestic waste (see Stanton et al. 2008).

These deposits could represent termination rituals associated with the abandonment of the courtyard group. Excavations at Norman's Temple, Courtyard D-1, and the Western Plaza yielded similarly dense above floor terminal artifact deposits containing faunal remains and well-crafted ceramic, lithic, shell, and ground stone artifacts (Booher 2016; Booher et al. 2015; Harrison 2000; Houk 2016). The southwestern deposit most closely resembles the one found at Courtyard D-1 in terms of density, location, and chronology. However, the most notable divergence from other Chan Chich examples lies in the lack of evidence for intentional burning present in any of the Courtyard D-4 contexts.

Ceramic artifacts represented the majority of the assemblage recovered from Courtyard D-4. Although the ceramic record is heavily biased by the large quantities recorded from the three courtyard surface deposits, the overwhelming majority of identifiable ceramics were fragments of jars. Using the deposit ceramic data as an example, jar fragments represented between 50 percent to 81 percent of the total ceramic forms (Figure 3.10). Both the percentages of

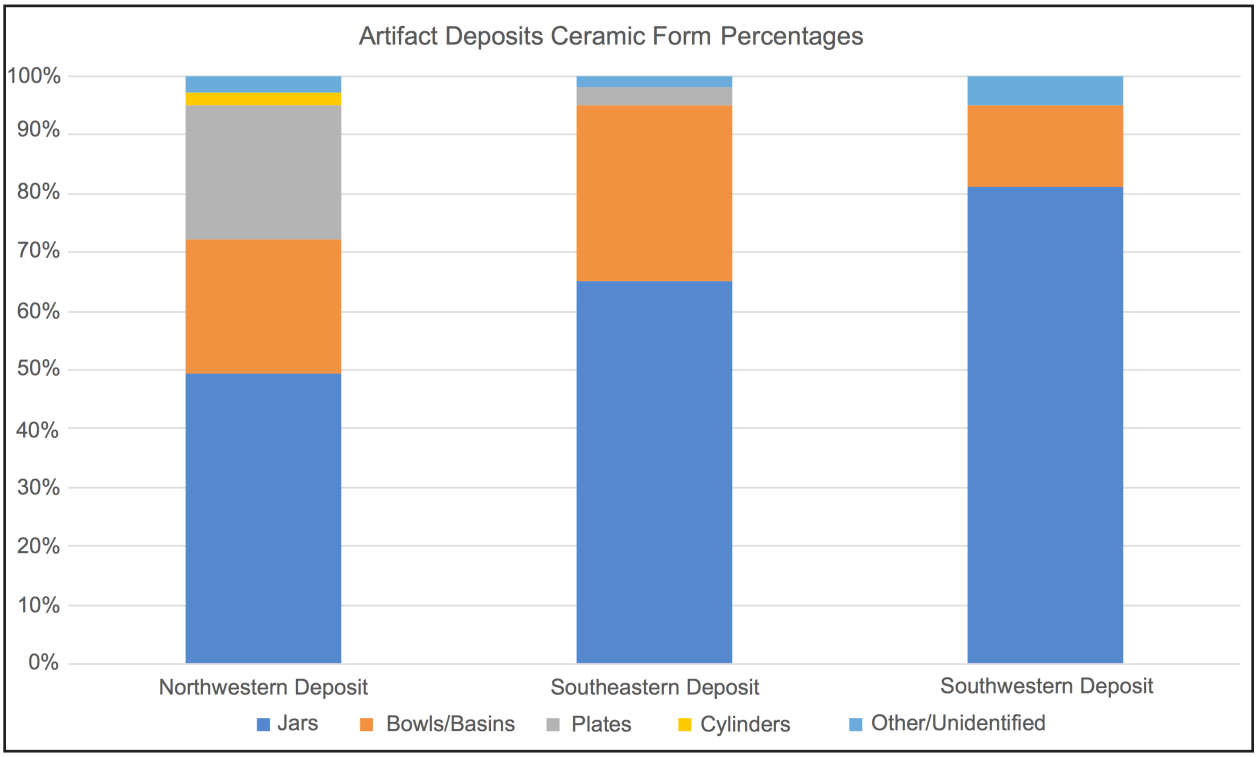

Figure 3.10. Percentages of ceramic forms (jars, bowls/basins, plates, cylinders, and other/unidentified) recovered from each artifact deposit context.

bowls and basins (14–30 percent) and relative lack of cylinder fragments (0–2 percent) are also similar across the three deposit contexts. The distribution of ceramic forms from the assemblage associated with Structure D-43, the only other context with significant amounts of ceramic artifacts, aligns with the ceramic form patterns observed in the southeastern and southwestern deposits. However, the proximity and compositional similarities between the artifacts from the southwestern deposit and the final occupation of Structure D-43 suggest that they are related.

Additionally, we measured the diameters of a sample of the rim sherds recovered from the lots associated with the deposits. The general distribution patterns of each 5-cm-diameter increment were similar among artifacts from the northwestern and southeastern deposits, favoring vessels with diameters between 21 and 50 cm (Figure 3.11). Diameters of jars, bowls/basins, and plates were comingled, making conclusive arguments about the distribution of vessels for communal versus individual use more difficult. However, the larger quantities of vessels with diameters in the middle ranges indicate a higher density of vessels for communal use or larger storage (Gifford 1976). The southeastern deposit has both the highest percentage of bowls/basins and more rim diameters from the smaller ranges, suggesting some vessels for individual use were present. Additionally, the higher percentages of plates recovered from the northwestern deposit could explain the higher diameter measurements.

The amount of debitage found at Courtyard D-4 is relatively low in comparison to lithic tool counts, suggesting the inhabitants did not make or repair their own tools often. With dense lithic deposits located in the site core, Group H, and just 100 m south of the courtyard (see Figure 3.1), residents of Courtyard D-4 likely relied on other lithic workshops at the site for their specialized skills in lithic production and repair (Degnan et al., this volume; Meadows and Hartnett 2000). Use wear analysis conducted at other sites indicate that lithic tools were used in a variety of domestic activities, including processing meat or hides, quarrying limestone, cutting grass and trees, digging, and

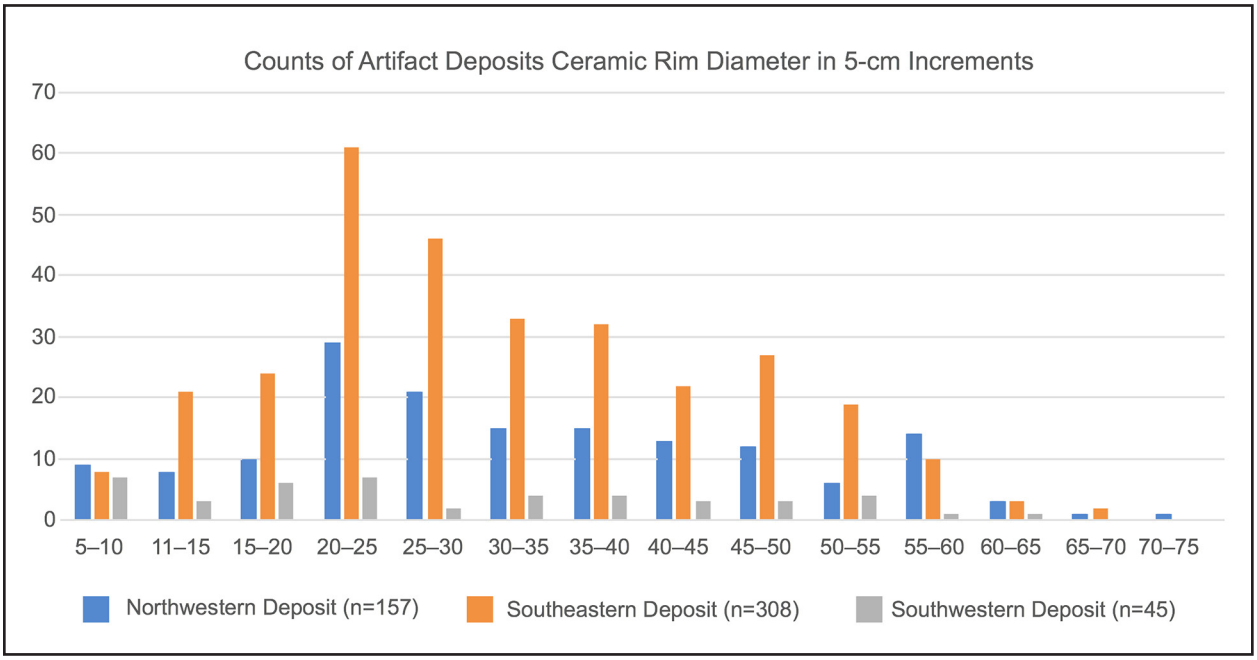

Figure 3.11. Ceramic rim diameter counts sampled from each artifact deposit context.

shaping wood, shell, bone, or antler (Aoyama 2007). Blades were particularly useful for the quotidian activities most commonly associated with domestic activity areas (Aoyama 2007; Hendon 2010). The prevalence of obsidian blades (21 specimens) alongside ones made from local chert (17 specimens) and chalcedony (three specimens) suggest that the inhabitants of Courtyard D-4 tapped into long-distance trade in some capacity.

Osteological and artifactual evidence of mortuary remains within households contributes to contextualized understandings of more long-term displays of identity through memory and ancestor veneration (McAnany 2013). As part of the suite of ritual activities essential to ancient Maya domestic life, the ancient Maya commonly practiced funerary rituals resulting in the interment of deceased family members beneath surfaces both in courtyards and inside household structures (McAnany 2013). Though lacking in grave goods and formal cist construction, Burial CC-B18 provides insight into one form of ancestor veneration practiced at Courtyard D-4.

CONCLUSION

Overall, the architectural and artifactual evidence recovered from Courtyard D-4 do not definitively indicate any strict demarcation of domestic activity areas, but the results from the multi-elemental analysis of plaster samples from within the structures are not yet available. The higher densities of artifacts on the courtyard surfaces reinforce the importance of exterior domestic space. Additionally, the variety of artifacts indicate a mix of quotidian activities, such as weaving and grinding maize, and ceremonies of ritual and symbolic significance. This inextricable relationship between the mundane and the supernatural lay at the heart of everyday life for the ancient Maya.

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Archaeological Investigations at an Epicentral Lithic Workshop: Structure A-6 and the North Plaza Debitage Deposit, Chan Chich, Belize

Bridgette Degnan, Kevin A. Miller, and Brett A. Houk

In the 2017 field season, the Chan Chich Archaeological Project (CCAP) conducted excavations on and around Structure A-6 to investigate a potential lithic tool workshop and the nature of lithic production in the site core. Houk (2017) identified the proposed lithic workshop in the 2016–2018 CCAP research design under an initiative to study the urban landscape at Chan Chich. Specifically, we proposed to explore and understand the relationship between lithic workshops in this urban context and those in the suburban contexts of Groups B and H. This study draws upon previous excavations at Group H conducted by Richard Meadows and Kristen Hartnett (2000) in 1998 to facilitate later comparative analysis between the two workshops. We also hope the data presented in this report will be used in a future study to compare the workshop at Structure A-6 to other urban lithic production sites in the region. Finally, these excavations serve as an opening measure to begin to assess the hypothesis of the North Plaza as a marketplace.

STRUCTURE A-6 AND THE NORTH PLAZA

The potential workshop is concentrated at Structure A-6, a low-standing mound extending to the north of Structure A-7, on the northeastern corner of the Main Plaza and the southeastern corner of the North Plaza (Figure 4.1). The Main Plaza is the largest public space at Chan Chich, and large mounds—including the twin temple-pyramids of Structure A-7 and A-9, the massive tandem-range building of Structure A-1, and Structure A-5, which separates the Main and North Plazas—bound its margins. Today, these two plazas house the tourist infrastructure associated with Chan Chich Lodge, including 12 cabanas, a bar, and a restaurant in the Main Plaza, and a swimming pool, two cabanas, a laundry facility, and a private residence in the North Plaza. The lodge area is landscaped with San Augustine grass, walking paths, and native vegetation, but dense tropical forest surrounds the manicured lodge. In the North Plaza, the forest's edge roughly corresponds to the topographic edges of the plaza's platform. The southern two-thirds of Structure A-6 are part of the manicured area, and this section of the mound is covered in low grass and trees (Figure 4.2). The northern end of the mound, however, has not been cleared, and is covered in forest.

Prior to these investigations, the CCAP had not conducted excavations in the North Plaza. The plaza itself is open to the north and defined by Structure A-4 on its southwestern corner, Structure A-5 along its southern edge, and Structure A-6 in its southeastern corner.

Degnan, Bridgette, Kevin A. Miller, and Brett A. Houk
2017 Archaeological Investigations at an Epicentral Lithic Workshop: Structure A-6 and the North Plaza Debitage Deposit, Chan Chich, Belize. In *The 2017 Season of the Chan Chich Archaeological Project*, edited by Brett A. Houk and Claire Novotny, pp. 97–142. Papers of the Chan Chich Archaeological Project, Number 12. Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

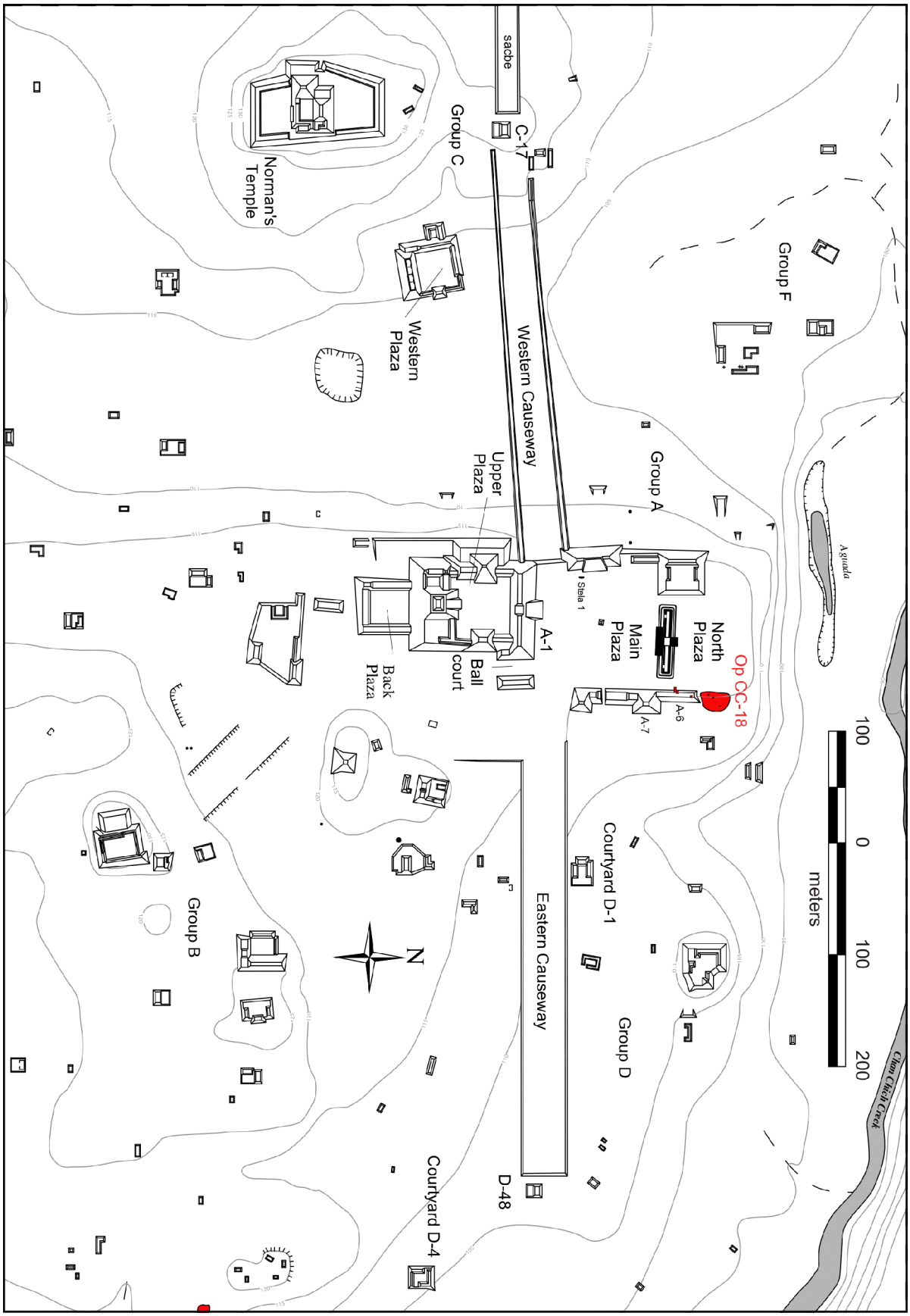

Figure 4.1. Map of Chan Chich showing the location of Op CC-18 and the excavation units on and near Structure A-6.

Figure 4.2. Photograph of Miller (left) and Degnan (right) on Structure A-6 prior to excavations. View to the northeast.

Although it lacks impressive structures, the plaza has scattered chert debitage and occasional broken stone tools visible in many areas on the modern ground surface.

Based on chert flakes visible on the surface of Structure A-6 and a dense concentration of flakes on the ground surface in the forested area north of the mound, Houk (2017) hypothesized the structure was the site of lithic tool production. The significance of the workshop lies in its position as an urban production site, located in a central and accessible location in relation to the Main and North Plazas—in fact, the mound faces one of only two access points between the two plazas. The 2017 excavations, designated Operation (Op) CC-18, focused on first understanding the architecture and its relationship to production activity, and then evaluating the nature of the debitage deposit north of the mound. Prior to our investigations, all that was known about the debitage deposit was that abundant chert flakes were exposed in a foot path running through the forest. The horizontal and vertical extents of the feature were unknown, but it was evident that debitage was present on the plaza and spilling downslope across the platform's eastern edge (along and beyond the aforementioned footpath).

As noted previously, Structure A-6 lies in the site core, and Chan Chich Lodge has developed around it. While the southern end of the mound is cleared and planted in grass, the lodge's construction did not disturb the mound. However, approximately 10 m to the west lies

the Chan Chich Lodge swimming pool, and its construction did impact a significant portion of the North Plaza. To the east of the pool but off of the plaza, the pool's pump house potentially disturbed part of the debitage deposit, and buried utility lines connecting the pump house to the pool certainly disturbed a portion of the feature. We took potential disturbed areas into consideration when placing units within the debitage deposit and avoided placing units directly next to the pool house and in line with the utility trenches.

Field excavations of Structure A-6 took place from May 30 to June 17, 2017, a period of roughly 3 weeks. Fieldwork was carried out by students on Texas Tech University's Field School in Maya Archaeology and workers from Chan Chich Lodge and Sylvester Village. With assistance from Project Director Brett A. Houk and the guidance of Kevin Miller, Bridgette Degnan oversaw excavations at Structure A-6. Upon completion of the fieldwork, the research focus moved to the lab beginning on June 19 and extending until July 16. Degnan conducted all debitage analysis, and Houk analyzed most of the lithic tools and obsidian from Op CC-18. Drs. Fred Valdez, Jr. and Lauren A. Sullivan analyzed the ceramics from the excavations, and Lab Director Mnemo Rice performed all other artifact analyses.

Our investigations included three excavation units on Structure A-6 and three 1-x-1 m units placed in intervals down the sloping debitage deposit north of the mound (Figure 4.3). All told, we recovered approximately 682 ceramic sherds, 24 pieces of obsidian, two quartzite hammerstones, 11 shell/shell fragments, and two pieces of bone. The bulk of the artifacts were of chert and chalcedony, including 45 stone tools (bifaces, cores, and blades), 387 possible utilized flakes, and 20,702 flakes of non-utilized debitage. The terminal architecture of Structure A-6 was determined to be a low standing, two-tiered mound directly associated with the debitage deposit to the north. Activity on the terminal phase mound was concluded to be in direct association with the deposit spread to the north; most likely, the ancient Maya participated in the production and maintenance of stone tools and dumped the refuse to the north, creating and sustaining this deposit.

RESEARCH DESIGN AND FIELD METHODS

Prior to our investigations, we hypothesized that Structure A-6 served as a lithic tool production and/or maintenance area and that the flakes to the north represent the resulting manufacturing debris. The preliminary research questions guiding our investigations at Structure A-6 were:

- What is the horizontal and vertical extent of the debitage scatter/deposit associated with the structure?
- What is the architectural form of Structure A-6?
- How many architectural phases are evident at Structure A-6?
- Is there evidence that lithic tool making took place on Structure A-6 during its final phase of use?
- Is there evidence that lithic tool making took place on Structure A-6 during any earlier phases of use?
- What types of lithic tools were being manufactured or refurbished at Structure A-6?
- What types of lithic tool production were employed at Structure A-6?

The research design for Op CC-18 was developed using an approach analogous to the excavations conducted by Meadows and Hartnett (2000) in 1998 on the Group H

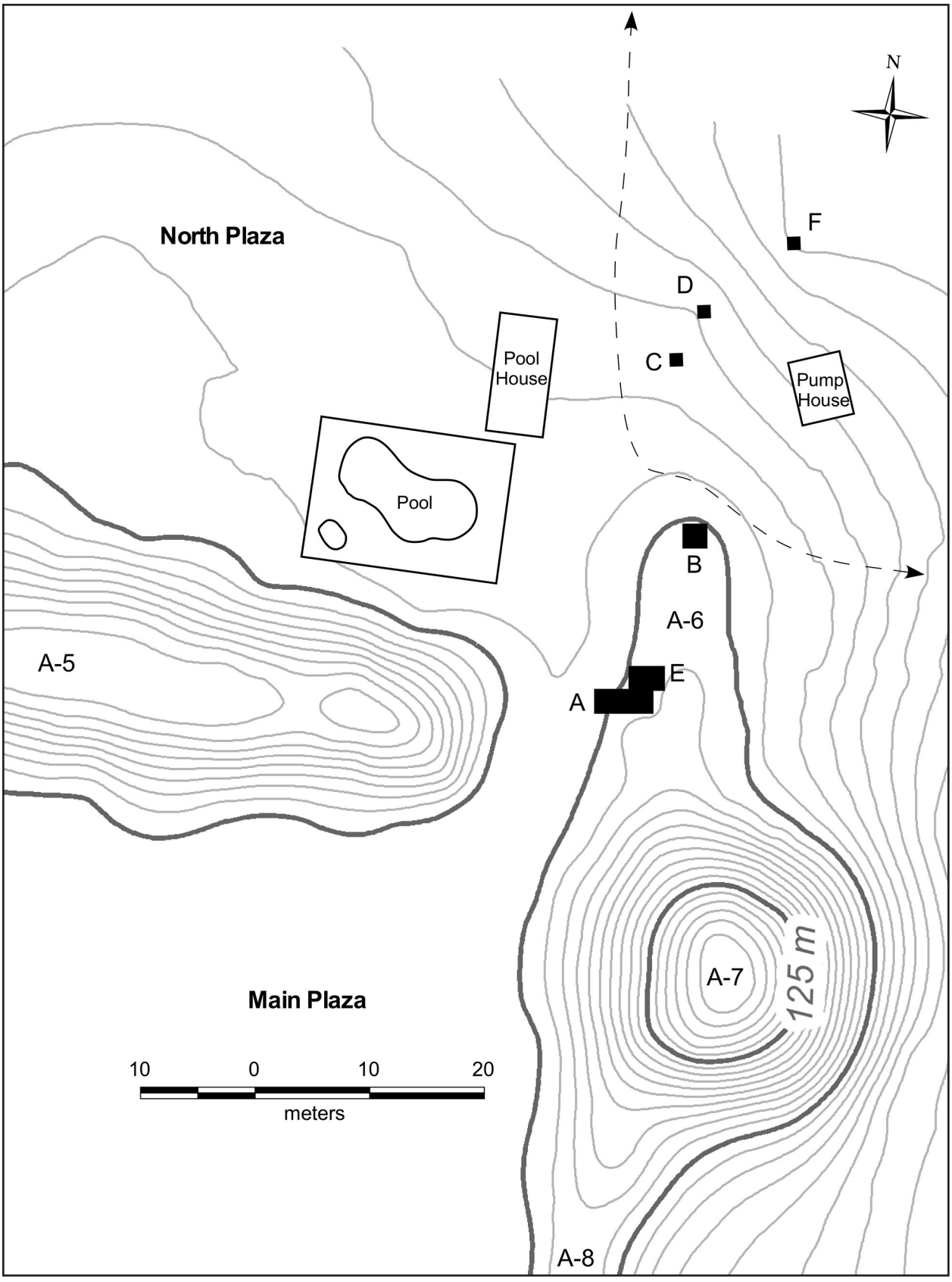

Figure 4.3. Topographic map of Structure A-6 showing the location of excavation units.

lithic deposits, focused first on defining the architectural scope of the workshop, and next gathering a representative sample from the debitage deposits. In general, we followed the standard excavation and recording system used by other investigators on the CCAP (see Houk and Zaro 2015), except as noted in the descriptions below. Unit elevations are based on 2017 mapping data,which have not been correlated with previous elevations (see Table 9.3).

As described in this chapter, we were able to answer most of our research questions. The methods we used included: 1) cutting a narrow brecha through the wooded area north of Structure A-6 to improve visibility of the debitage deposit and determine its horizontal extent; and 2) excavating three 1-x-1-m units in the deposit to determine its thickness. These units were excavated in 10-cm thick levels, and crews collected 10-x-10-x-10-cm column samples from one or two corners of each level. In these deposits, opening and closing elevations were consistent, meaning that in some cases the first level or two may not have been 10-cm thick across the entire unit. Tools, tool fragments, and ceramic sherds larger than 2 cm were collected from these test excavations, but debitage—other than the column samples—was not screened or collected.

To investigate Structure A-6, three horizontal stripping units were excavated on its summit to look for evidence of lithic tool making activities. Initially, excavations terminated at the final phase architecture. We screened 100-percent of the matrix through ¼-inch mesh from these initial levels. To determine if Structure A-6 had older construction phases buried within it, we conducted deeper excavations by sectioning one of the structural units. We screened 25-percent of the matrix from these later levels.

Degnan and Miller devised a methodology for flake analysis to record the same basic attributes used in the analysis by Whittaker et al. (2009) of an axe workshop in the city center of El Pilar and by Heindel et al. (2012) in their analysis of an urban lithic workshop at Buenavista. This was done deliberately to ensure validity in a future study comparing the urban workshop at Chan Chich with those of El Pilar and Buenavista. Choosing to mirror this analysis will also require a reevaluation of a sample of the lithics collected from Group H in 1998 to record comparable flake data. The stone tool and debitage analyses methods are described in the artifact analysis section below.

SUMMARY OF 2017 EXCAVATIONS

The suboperations (subops) for Op CC-18 consisted of three architectural units on Structure A-6 (Subops CC-18-A, -B, and -E) and three 1-x-1-m units in the debitage deposit (Subops CC-18-C, -D, and -F). The goals of these units included exposing terminal architecture and looking for evidence of tool production at Structure A-6, determining if Structure A-6 had earlier construction phases, and testing the debitage deposit. The excavations of each unit are summarized below, organized by research goal and area.

Terminal Phase Architecture on Structure A-6

Subop CC-18-A

Houk placed the initial excavation unit, Subop CC-18-A, prior to Degnan's and Miller's arrival at Chan Chich. It was located in the center of Structure A-6, roughly 10 m to the north of Structure A-7 (see Figure 4.3). The unit measured 2 x 5 m, stretching from the western face at the base of Structure A-6 up its summit, covering the full slope of the mound east to west. The suboperation datum was placed in a tree 120.74 m above sea level. It was located 38 cm above the southeast corner

of the unit, which had the highest elevation prior to excavation.

Our initial goals for Subop CC-18-A were to locate the final phase architecture of the mound and evaluate the extent and character of lithic production on the structure. The ground surface at the top of the slope was located some 38 to 45 cm below the datum, and the base of the mound 88 to 90 cm below datum, accounting for a slope of 45 to 50 cm over the 5-m long unit. In accordance with the original research design (Houk 2017), we began by collecting a 100-percent ¼-inch screened sample from the field for the lots corresponding to the terminal phase architecture. Due to the high volume of debitage recovered from these initial phases of Subop CC-18-A's excavation, the co-authors decided screening all the matrix was inefficient in terms of time and effort. Beginning with Lot CC-18-A-5, we began to screen every fourth 5-gallon bucket filled to provide a random 25 percent in-field sample (Table 4.1).

Lot CC-18-A-1 consisted of the 10-cm thick topsoil layer, which covered the entire unit (see Table 4.1). The eastern edge of the unit uncovered a rough, poorly preserved and potentially once-plastered floor (Lot CC-18-A-7/-10) at the summit of the mound. This extended 110 cm from the eastern wall, terminating at a potential alignment of stones stretching north to south. This alignment consisted of nine medium, uncut stones, which were later designated Lot CC-18-A-6 (Figures 4.4 and 4.5). These rocks were at depths between 47 and 57 cmbd. Our initial hypothesis was that this alignment delineated the edge of the top level of the structure. To further explore the validity of this hypothesis we opened Subop CC-18-E to the north, as discussed below. However, we did not observe this alignment extending into the 2-m wide addition of Subop CC-18-E.

After removing the topsoil, we excavated collapse debris (Lot CC-18-A-2) at the western end of the unit, with the intention of exposing

Table 4.1. Summary of Lots in Subops CC-18-A and -E

Subop	Lot	Lot Description	% of Matrix Screened	Ceramic Data
CC-18-A	1	Humus	100	Tepeu 2
CC-18-A	2	Collapse Debris	100	Tepeu 2
CC-18-A	3	Collapse Debris	100	Tepeu 2
CC-18-A	4	Step	N/A	N/A
CC-18-A	5/9	Construction Fill	25	Tepeu 1-2
CC-18-A	6	Stone Alignment	N/A	N/A
CC-18-A	7/10	Floor	25	Floral Park, Tzakol
CC-18-A	8	Construction Fill	25	Tzakol
CC-18-A	11	Other Surface	25	Cunil?
CC-18-A	12	Construction Fill	25	Tepeu 2
CC-18-A	13	Cut Stones	N/A	N/A
CC-18-A	14	Intrusion/ Construction Fill (?)	0*	Chicanel
CC-18-E	1	Humus	25	unanalyzed
CC-18-E	2	Floor	N/A	N/A

*Lot CC-18-A-14 was not screened in field, but visible sherds and other artifacts excluding debitage were collected

Figure 4.4. Photograph of alignment of stones, Lot CC-18-A-6, on summit of Structure A-6. View to east.

the plaza floor at the base of the mound and then proceeding eastward to uncover architectural features. The matrix of consisted of light brownish gray (10YR 6/2) silty clay loam with abundant inclusions—pebbles, rocks, and cultural material—and little bioturbation. The plaza floor was at a depth of 57 cm below the ground surface at the top of the platform and 23 cm below the ground surface at the base of the platform (107 cmbd at the center of CC-18-A-2). This floor was hard packed dirt and no longer plastered, though it had potentially eroded, with flakes lying flat against the surface. We then extended to the east until we encountered two heavily deteriorated rocks interpreted as a step. The feature was exactly 2 m from the western wall of the unit and later designated Lot CC-18-A-4. The northernmost rock measured 43 x 24 cm, and the southernmost, which appeared to be an eroded cut stone, measured 54 x 30 cm (Figures 4.5 and 4.6).

Directly east of these rocks, continuing up the slope of the platform, the composition of the matrix turned to packed cobbles, and we terminated Lot CC-18-A-2. The cobble layer was at a depth roughly equivalent to the rise of the step. It was slightly higher on the southern end, and dipped down on the northern side—on the southern end of the unit, the top of the cobbles occurred 31 cm above the plaza floor (80 cmbd) to the west, and 11 cm above the floor (1.02 cmbd) on the northern side of the unit. We later excavated the packed cobble surface as Lots CC-18-A-5 and -9.

To improve horizontal control, Miller and Degnan decided to arbitrarily switch from Lot CC-18-A-2 to Lot CC-18-A-3. The decision to switch lots was influenced by the high volume of debitage recovered from the 100-percent screening method employed in the field for Lots CC-18-A-1 through -4 (Table 4.2).

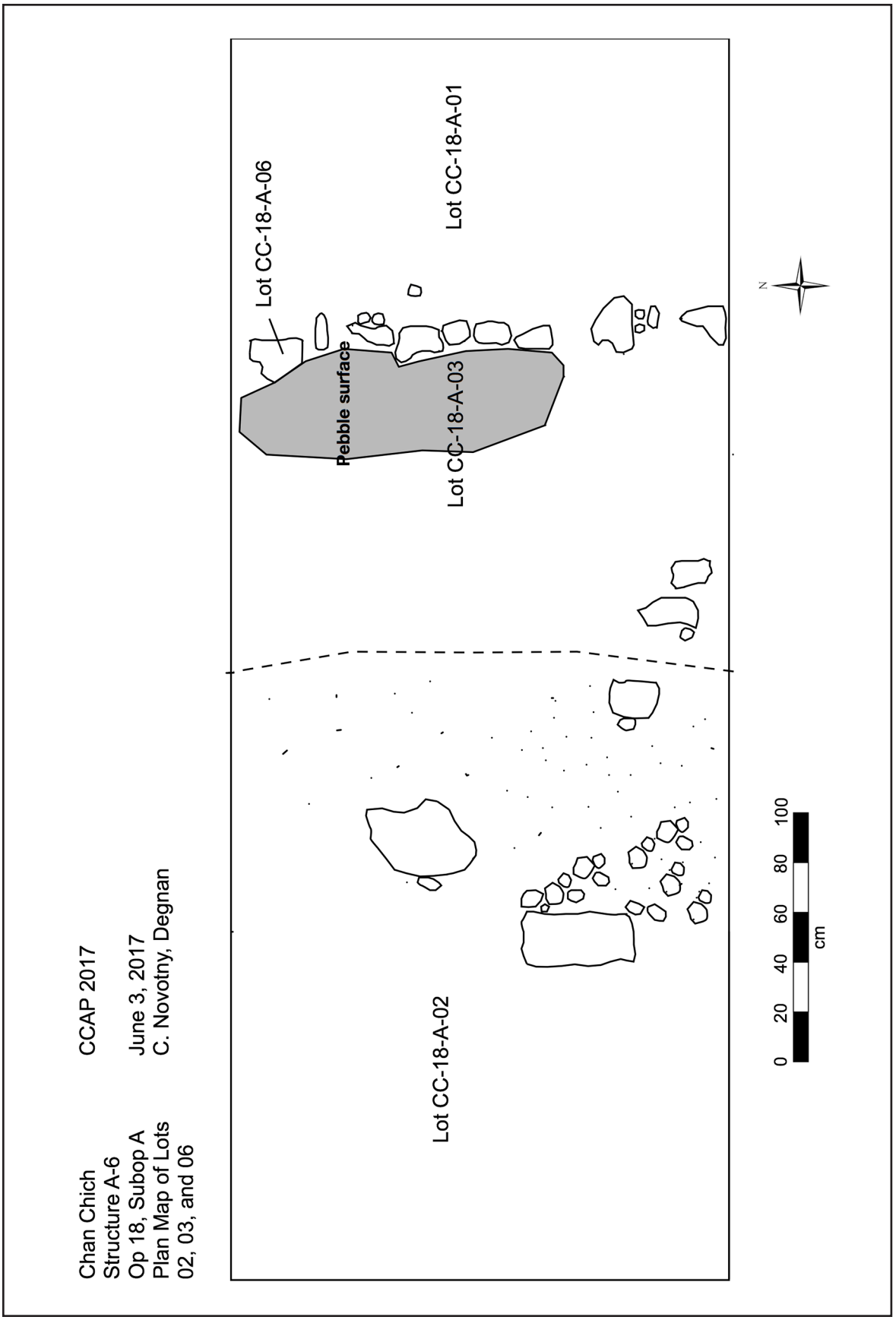

Figure 4.5. Plan map of Subop CC-18-A.

Figure 4.6. Photograph of Lot CC-18-A-6, stone alignment, during excavations of Lot CC-18-A-2, the surrounding matrix. View to the east.

Splitting the collapse debris into two lots would allow for a better horizontal understanding of the flake distribution during analysis. Lot CC-18-A-2 was closed with a final measurement of 2.6 x 2 m. Lot CC-18-A-3 measured 1.3 x 2 m and extended from the eastern end of Lot CC-18-A-2 to the alignment of rocks designated Lot CC-18-A-6. The goal for Lot CC-18-A-3 was the same as Lot CC-18-A-2; to find the final phase surface of Structure A-6 as it extended up from the plaza floor.

Lot CC-18-A-3 revealed a continuation of the packed pebble surface found in CC-18-A-2 as the terminal floor of Structure A-6, which sloped slightly upward to meet the north-south alignment of rocks. These rocks stood at a depth between 47 and 57 cmbd below datum. Ultimately, we concluded this surface was another eroded floor, despite the lack of plaster, due to the compact nature of the pebbles and cobbles and chert flakes lying flat across its horizontal surface.

We therefore conclude that Lots CC-18-A-1 to -3 comprehensively form the terminal phase architecture of the horizontal strip of Structure A-6 that is Subop CC-18-A. Excavations at this point recovered 3,501 flakes, 26 lithic tools, 473 ceramic sherds, 16 pieces of obsidian, six shells, and two bone fragments.

Subop CC-18-E

Subop CC-18-E was placed directly north of Subop CC-18-A and measured 3 x 2 m, oriented north-south, and offset 1 m to the east of Subop CC-18-A's eastern edge (see Figure 4.3) This unit's datum shared the same elevation as Subop CC-18-A's datum, 120.74 m above sea level. Subop CC-18-E was specifically established

Table 4.2. Artifact Recovery from Terminal Phase Architecture of Subops CC-18-A and -E

Subop CC-	Lot	Ceramics	Deb.	Deb. Weight (g)	Hammer-stones	Stone Tools	Possible Utilized Flakes	Obsidian	Shell	Bone
18-A	1	74	1118	2398	0	3	15**	1	0	0
18-A	2	386	1815	4195	0	20	286	13	6	2
18-A	3	13	568	1073	0	3	22**	2	0	0
18-A	4									
18-A	5	36	662	1442	0	1	0	2	1	0
18-A	6									
18-A	7	18	799	1065	1	1	0	0	0	0
18-A	8	10	70	85	0	0	0	0	0	0
18-A	9	22	1043	1392	0	0	0	2	0	0
18-A	10	27	901	1496	0	1	1	0	0	0
18-A	11	5	31	65	0	0	0	0	0	0
18-A	12	8	36	66	0	1	0	0	0	0
18-A	13									
18-A	14	12	0*	0*	0	0	0	0	1	0
18-E	1	26	1229		1	2	9	1	0	0
18-E	2									

* 0% of matrix screened, debitage not collected
**Represents 25% in lab sample

to better evaluate the north-south alignment of rocks (Lot CC-18-A-6) in Subop CC-18-A, to gain a better understanding of Structure A-6's architecture, and to expand our sample size of debitage. We sampled 25 percent of the matrix from Subop CC-18-E, screening every fourth, 5-gallon bucket filled.

Subop CC-18-E only had two lots: the topsoil layer, which covered the expanse of the entire unit and averaged 7.5 cm in thickness, and an underlying, heavily eroded floor (Lot CC-18-E-2). Our initial goal was to expose the eroded summit floor found in the eastern end of Subop CC-18-A (CC-18-A-7/-10) and to expose more of the alignment of stones. Interestingly, excavations here revealed that the north-south alignment of rocks did not continue. This finding leads us to reject our hypothesis that the alignment of rocks served as a step up onto the final level of the platform and renders the evaluation of Lot CC-18-A-6 inconclusive. We remain confident that the packed surface to the east of the alignment is the summit floor of the structure's final phase construction. This floor continued into Subop CC-18-E as Lot CC-18-E-2 (Figure 4.7). The excavations of Lot CC-18-E-1 recovered 764 flakes, three lithic tools, 26 ceramic sherds, and one piece of obsidian (see Table 4.2).

Subop CC-18-B

Subop CC-18-B was located 10 m north of Subop CC-18-A and directly east of the pool. It was a 2-x 2-m unit that sat atop the summit of Structure A-6, near the northern end of the mound and outside of the landscaped area. The goal of Subop CC-18-B was to reveal the top of the platform and to supplement our sample of debitage. Datum B was established to the

Figure 4.7. Photograph of Lot CC-18-E-2. View to the east.

northwest in a tree about a meter away, at an elevation of 120.54 m above sea level.

To begin excavations, we cleared off overgrowth and removed a pile of burned wood and charcoal left in the northwest center of the unit roughly a year before by Chan Chich staff (Figure 4.8). The matrix in Subop CC-18-B was screened utilizing the 25-percent in-field sampling methodology described above.

Lot CC-18-B-1 was the topsoil layer, a black (10 YR 2/1) clay loam with abundant roots. At an average depth of 8 cm below surface we came down upon the summit floor of Structure A-6 (Lot CC-18-B-2), a compact dirt surface with no remaining plaster (Table 4.3). Excavations through the floor encountered dry laid construction fill, with a large amount of big, medium, and small rocks (Lot CC-18-B-3). Below this, the original plaza floor was located at an average depth of 24 cm below Lot CC-18-B-2 on the southern wall and 18 cm on the northern end. The floor was assigned Lot CC-18-B-4, and was heavily deteriorated and damaged by the construction fill. Initially, Lot CC-18-B-3 was designed to extend over the full 2-x-2-m unit, but, since it was fully composed of construction fill with low artifact density (Table 4.4), it was deemed inefficient to excavate the entire unit. Lot CC-18-B-3 extended from the southern wall of the unit and measured 0.8 m on the western wall, 0.72 m on the eastern wall, and had a width of 2 m. Excavations at Subop CC-18-B recovered 1,298 flakes, no lithic tools, 10 ceramic sherds, one piece of obsidian, and two shells (see Table 4.4).

Summary of Terminal Phase Structure A-6

Our limited exposure of the final phase of Structure A-6 suggests the structure was a rather crudely built, two-tiered platform, rising

Figure 4.8. Photograph of Subop CC-18-B prior to excavations.

Table 4.3. Summary of Lots in Subop CC-18-B

Subop CC-	Lot	Lot Description	% of Matrix Screened	Ceramic Data
18-B	1	Humus	25	Tepeu 2-3?
18-B	2	Floor	N/A	
18-B	3	Construction Fill	25	Tepeu 2?
18-B	4	Floor	N/A	

Table 4.4. Artifact Recovery from Lots in Subops CC-18-B

Subop CC-	Lot	Ceramics	Deb.	Deb. Weight (g)	Hammer-stones	Stone Tools	Possible Utilized Flakes	Obsidian	Shell	Bone
18-B	1	5	1214	1392	0	0	0	1	2	0
18-B	2									
18-B	3	5	84	347	0	0	0	0	0	0
18-B	4									

an average of 60 cm above the plaza floor. Our excavations did not determine whether or not the platform supported a perishable superstructure, but the abundant chert and chalcedony flakes recovered above the final floor support our hypothesis that the final phase of the structure functioned as a lithic tool production and/or maintenance workshop. The ceramics dated activity on the terminal architecture to the Late and Terminal Classic periods. Ceramics from the construction fill of the final phase in Subops CC-18-A and -B suggest the platform's construction dates to Late Classic period. The entirety of the terminal architecture was heavily deteriorated, with no remaining plaster or intact steps. This is likely attributed to erosion, since the low mound lacked significant amounts of collapse debris—as it had no masonry superstructure—or other protection from the elements. This could be supplemented by the nature of a lithic workshop; if the platform supported a structure, that structure might have been as informal as a ramada or simple shade structure. The matrix in Subop CC-18-B was screened utilizing the 25-percent in-field sampling methodology described above.

Earlier Phases of Structure A-6

Once excavations of Subop CC-18-A's terminal phase architecture were complete, focus shifted to defining evidence of previous construction phases. As mentioned above, at this phase we switched to screening every fourth 5-gallon bucket to collect a 25-percent in-field sample of debitage. Deeper excavations commenced by sectioning Subop CC-18-A exactly in half along an east-west line to create a northern section and a southern section. The southern section was chosen first for excavation to preserve the profile in the north for later expansion into Subop CC-18-E.

We planned to excavate this southern bisection by beginning on the western end of Subop CC-18-A and moving eastward up the slope of the mound. We first removed the southern step of Lot CC-18-A-4. We found that the plaza floor continued under the terminal architecture of Structure A-6, though it was very uneven. The fill between the terminal floor and the plaza floor between Lots CC-18-A-4 (the steps) and CC-18-A-6 (the alignment of stones) was a packed cobble fill deemed Lot CC-18-A-5 (Figure 4.9). We next removed the southern half of the alignment of rocks (Lot CC-18-A-6). Under this terminal phase floor (the bottom of Lot CC-18-A-1) we found another sloped floor at an average depth of 57 cmbd. Here, there was still some plaster remaining in the northeast corner. We dug below this surface to find three narrow large, but extremely fragile, cut stones, extending past the eastern wall of the unit farther into Structure A-6. They were placed directly on the plaza floor and rose 25 cm above it (Figures 4.10 and 4.11). We designated this alignment of stones Lot CC-18-A-13. To the north of these stones was a packed cobble fill, visible in Figure 4.10.

In order to get a better understanding of this underlying construction phase, we opened up the northern bi-section and excavated it analogously to the southern half. This resulted in the creation of numerous additional lots. Lot CC-18-A-9 was analogous to CC-18-A-5, and Lot CC-18-A-10 to CC-18-A-7. The northeastern section of Lot CC-18-A-10 revealed a plaster floor level with the top of the cut stones. There was a notable intrusion of packed construction fill cut into this floor, measuring 0.62 x 1.18 m (north-south, east-west). We designated this fill Lot CC-18-A-11 and brought it down to the level of the plaza floor. The dimensions of the intrusion lessened, but certainly continued down into the plaza floor. This feature was designated Lot CC-18-A-14 (see Figure 4.11).

We decided to excavate Lot CC-18-A-14 to determine if the intrusion was possibly a cache

Figure 4.9. Photograph of the bottom of Lot CC-18-A-5. View to the north.

Figure 4.10. Photograph of cut stones, Lot CC-18-A-13, in the center of the frame. The unshaped limestone boulders to the right are Lot CC-18-A-16. View to the east.

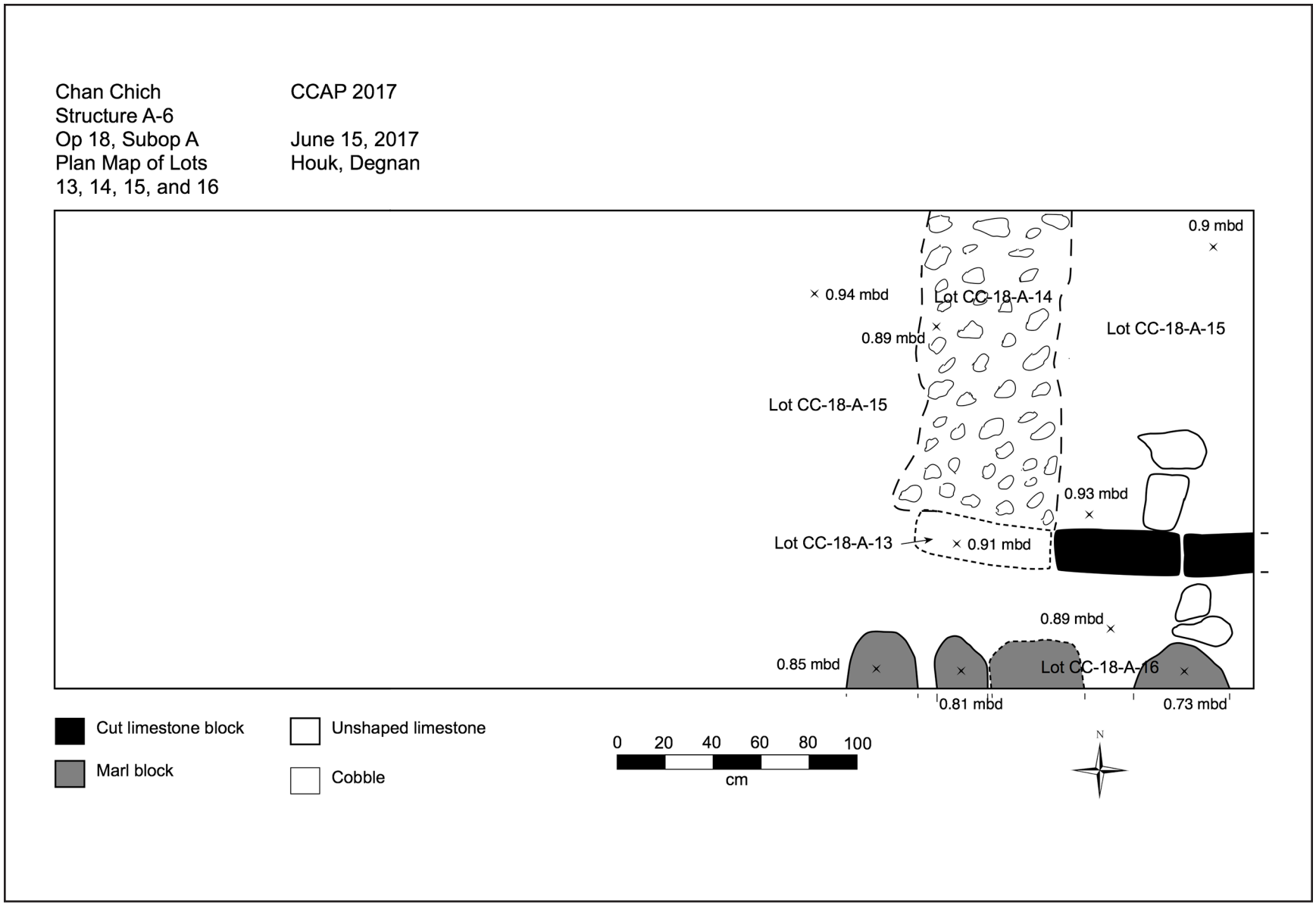

Figure 4.11. Plan map of Lot CC-18-A-13, cut stones, and related lots.

or burial. After digging down half a meter without encountering a feature, we determined this effort inefficiently strayed from the research design. Although we did not screen any buckets from this feature, we collected ceramics, which dated this feature to the Late Preclassic period.

In summary, our excavations revealed that there is at least one earlier construction period beneath the final phase of Structure A-6, however we could not determine its form. Ceramics from Lot CC-18-A-14, although represented by a small sample, date the intrusion to the Late Preclassic period, indicating the cut stone blocks also date to the Late Preclassic period or earlier. The cut stone blocks contrast starkly with the crude architecture of the final form of the platform and resemble Late Preclassic stone work from the Upper Plaza (see Gallareta Cervera et al., this volume). In total, excavations from the prior construction phases recovered 2,792 flakes, four lithic tools, 138 ceramic sherds, four pieces of obsidian, and one shell (see Table 4.2).

Lithic Deposit Excavations

Subops CC-18-C, -D, and -F were 1-x-1-m units excavated using consistent collection and sampling methods to allow for a standardized evaluation of the nature of Structure A-6's debitage deposit in three locations. As noted in the introduction, this deposit laid directly north of Structure A-6 over an area covering minimally 950 m^2 on the edge of the North Plaza (see Figure 4.3). The western portion is on the level plaza, but the eastern portion drapes the steeply sloping face of the plaza's platform. To sample the deposit's variability, a unit was placed on each stage of the slope. Subop CC-18-C sat on the level plaza near its edge, Subop CC-18-D midway down the slope, and Subop CC-18-F at the base of the slope. The excavation methodology for these units was based off that used by Meadows and Hartnett (2000) at Group H and is described above. The methods used to process and analyze the column samples collected from the units are described in the Analysis section of this chapter. Our intent was to take the column samples from the same corner in each unit, but in lots where the sample would have been heavily dominated by large unworked rocks or roots, the sample was taken from a different corner. Therefore, there is some variation in corners across units. In addition to the column samples, any tools or ceramics found within the unit were collected. This was done to expand the database of tools and to collect a viable ceramic sample for chronology.

Subop CC-18-C

Subop CC-18-C was strategically placed at the summit of the slope and on a visibly thick section of the debitage deposit east of the Chan Chich pool (see Figure 4.3, Figure 4.12). About half a meter from the unit is a trodden path that employees of Chan Chich Lodge use as a shortcut from the lodge to their houses; abundant flakes are visible in the path. Therefore, there may be minor disturbance in the first layer related to this path, but we believe the lower strata are completely undisturbed by modern activity. Datum C was a nail placed in a tree to the west of the unit, 119.45 m above sea level.

The initial goal for Subop CC-18-C was to take samples from both the southwest and southeast corners of the unit, but only a southwest column sample was collected for Lot CC-18-C-1, as the slight slope of the modern surface prevented any other corner from having a full 10 cm thickness. There was some modern trash noticed, though not collected, in this level. In Lot CC-18-C-2, only a southeast column sample was collected, as rocks and roots dominated the southwest corner. The layers of dense debitage extended 30 more cm through Lots CC-18-C-3, -4, and -5, from which both a southwest and

Figure 4.12. Photograph of Subop CC-18-C with Chan Chich pool house visible in the background and a footpath immediately south of the unit. View to the west/northwest.

a southeast sample were collected from each. At a depth of roughly 50 cmbs, excavations encountered a hard, packed surface interpreted to be a floor associated with the North Plaza. This floor may once have been plastered, but if so the plaster had since worn away (Figure 4.13). Underneath this surface was pebble and small cobble fill that we dubbed Lot CC-18-C-6. We excavated this as one lot another 30 cm deeper before hitting bedrock. We did not collect a column sample from this subfloor fill; instead we reverted to our previous field method of screening every fourth bucket for a 25-percent sample. The ceramics in the fill dated to the Late and Terminal Classic, indicating the deposit could not have been laid any earlier than this.

In Subop CC-18-C, the debitage deposit was roughly 50 cm thick, and the density of debitage was very uniformly high (Table 4.5). The matrix ranged from 10YR 2/1 (black) clay loam in the first two lots, to 2.5YR 3/1 (dark reddish gray) in Lot CC-18-C-3 and -4, to 10YR 3/2 (very dark grayish brown) silty clay loam in Lot CC-18-C-5. As shown in Table 4.5, the amount of microdebitage in the 10-cm^3 samples varied, giving the clay loam matrix an increasingly sandy texture where the portions were high. In total, excavations from Subop CC-18-C recovered 6,452 flakes, 15 lithic tools, 34 ceramic sherds, and one piece of obsidian (Table 4.5).

Subop CC-18-D

Subop CC-18-D was located roughly 3 m north and 2 m west of Subop CC-18-C, midway down the slope of the deposit. Its location was chosen to sample the deposit down the slope. The pool house is far enough away to assume its construction did not disturb the deposit,

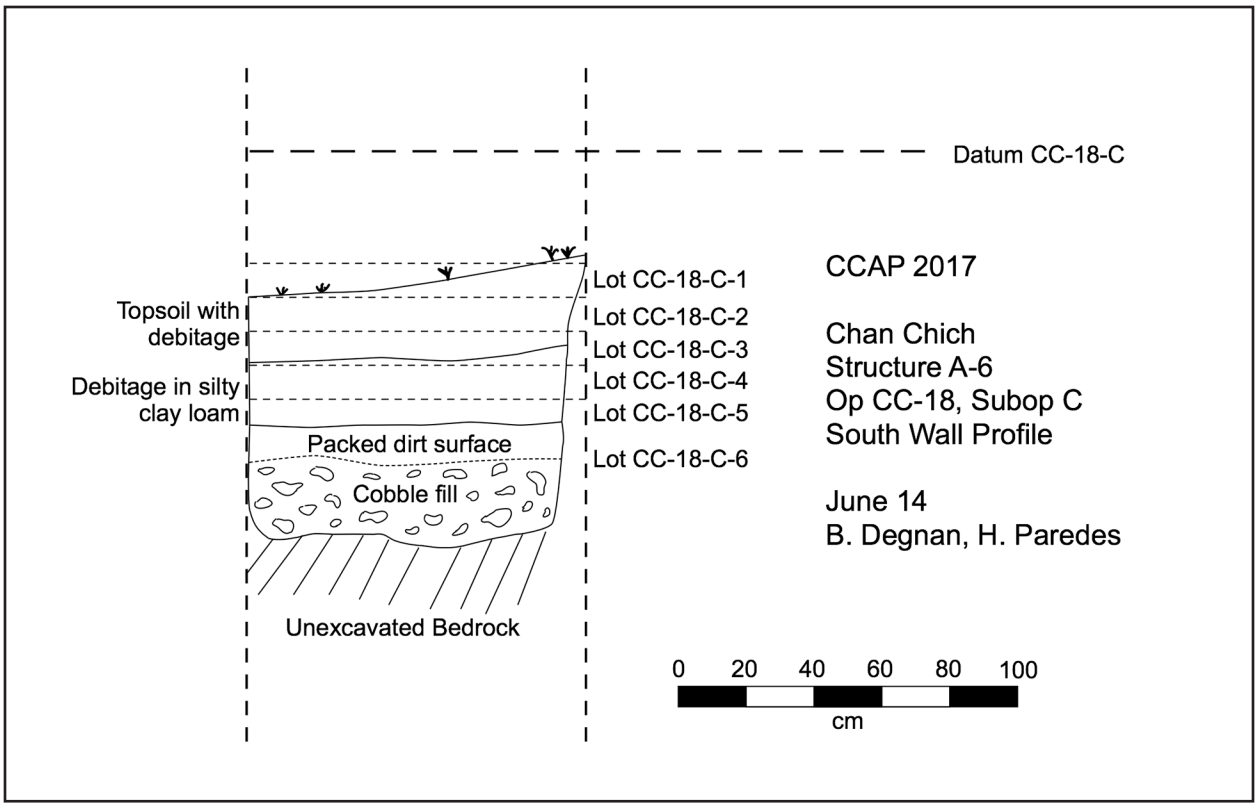

Figure 4.13. South wall profile of Subop CC-18-C.

Table 4.5. Artifact Recovery from Subop CC-18-C

Lot CC-18-	Type	Depth (cmbd)	Column Samples	Ceramics	Deb.	Deb. Weight (g)	Micro-debitage (g)	Lithic Tools	Obsidian
C-1	Debitage deposit	33–43	SW corner	1	438	450	120	1	0
C-2	Debitage deposit	43–53	SW corner	1	404	554	79	1	0
C-3	Debitage deposit	53–63	SW corner	4	521	492	155	3	0
C-3	Debitage deposit	53–63	SE corner	*See above	1134	1020	259	* See above	* See above
C-4	Debitage deposit	63–73	SW corner	0	1160	1115	337	2	0
C-4	Debitage deposit	63–73	SE corner	* See above	1473	857	704	* See above	* See above
C-5	Debitage deposit	73–81.75	SW corner	1	100	79	99	3	0
C-5	Debitage deposit	73–81.75	SE corner	* See above	911	673	328	* See above	* See above
C-6	Floor and fill	81.75 – 112.75	25% sample	27	311	515	N/A	5	1

especially in the lower layers (see Figure 4.3). Due to the slope, erosion and other natural factors likely have impacted the deposit to some extent. Datum D was a nail placed on a tree about a meter north of the unit, at an elevation of 118.81 m above sea level.

The initial plan for Subop CC-18-D was to collect a column sample from both the northwest and the northeast corners, although this was not realized. The downward slope toward the east created a 17-cm difference in depth between the western and eastern edges of the unit. This prevented taking a full 10-cm thick sample from the northeast corner for the first two lots. In fact, Lot CC-18-D-1 covered less than 28 percent of the total area of the unit, and Lot CC-18-D-2 just more than 50 percent. Both lots were sampled on the northwest corner, as it had the highest elevation. For continuity, we planned to continue sampling the northwest corner. Unfortunately, the northwest corner of CC-18-D-3 contained a high percentage of non-debitage constituents, so this column sample looks compositionally different than other samples from Subop CC-18-D (Table 4.6). Starting in Lot CC-18-D-4, the clay loam matrix was full of cobbles and small cobbles. Debitage decreased markedly, and the northwest column sample contained just two discernable flakes. We therefore we collected the sample from the northeast corner, since this was at the same depth as the northwest corner but still in the debitage deposit. There appeared to be no packed surface at the bottom of the deposit, like there was in Subop CC-18-C. The excavations terminated after CC-18-D-4. Although there was no surface here to define the deposit's end, flakes became sparse and the matrix comprised mostly dirt, pebbles, and small cobble. In Subop CC-18-D, the debitage deposit across the unit was roughly 30 cm thick. In total, excavations from Subop CC-18-D recovered 2,202 flakes, one lithic tool, and two ceramic sherds (Table 4.6).

Subop CC-18-F

Subop CC-18-F is located at the bottom of the sloped debitage deposit, northwest of Subop CC-18-D. It was placed to evaluate the deposit at the very base of the North Plaza's platform. Datum F was a nail placed in a tree to the south, at an elevation of 116.76 m above sea level.

A column sample was collected from the northeast corner for the first level, as this corner was the least impacted by roots, and theoretically the purest representation. The opening depth of the northeast corner was the lowest, therefore, to encompass a full 10-cm^3 sample, the first lot was thicker than 10 cm in the other corners. The remainder of

Table 4.6. Artifact Recovery from Subop CC-18-D

Lot CC-18-	Type	Depth (cmbd)	Column Samples	Ceramics	Deb.	Deb. Weight (g)	Micro-debitage (g)	Lithic Tools	Obsidian
D-1*	Debitage deposit	20–30	NW corner	1	719	616	143	0	0
D-2*	Debitage deposit	30–40	NW corner	0	351	224	93	0	0
D-3	Debitage deposit	40–50	NW corner	0	57	47	20	0	0
D-4	Clay loam with cobbles	50–60	NE corner	1	1075	1073	255	1	0

*Lot did not extend throughout entire unit

column samples were then taken from both the northeast and southeast corners, but due to time constraints only the northeast column samples were processed in the lab. The composition of the debitage in this unit was more comparable in density to Subop CC-18-C than Subop CC-18-D. The total depth was shallower, however; midway through Lot CC-18-F-4, the matrix had common pebbles and small cobbles. By Lot CC-18-F-5, the debitage terminated. In fact, there is a visible drop in density when comparing the raw number of flakes in the first three lots to the last two (Table 4.7). Just as in Subop CC-18-D, there was no surface at the bottom of the deposit in Subop CC-18-F, therefore excavations terminated after CC-18-F-5. In this unit, the debitage deposit was roughly 50 cm thick. Excavations from Subop CC-18-F recovered 2,405 flakes, four lithic tools, 12 ceramic sherds, one piece of obsidian, and one shell (see Table 4.7).

Summary of Lithic Deposit Units

Excavations at these three units placed along the slope of the debitage deposit display a consistent spread of concentrated lithic production refuse. Both the summit and the base of the spread had a density of roughly 50 cm in thickness, while on the slope this thickness was reduced to 30 cm. We further discuss the composition of the debitage in the deposit below in the Analysis section. At this point, it should be clearly noted that the overwhelming majority of material recovered is consistent with lithic tool production A total of 23 sherds was collected during excavation, all of which were small, non-diagnostic, and ultimately unanalyzed. Furthermore, the amount of disposed lithic tools was low, as excavations recovered only 14 tools total, consisting of eight broken bifaces, four exhausted cores, and two unifaces.

ARTIFACT ANALYSIS

This section describes the methods and results of lithic analysis of tools and debitage from Op CC-18. Lithic tool and debitage analyses were focused on answering the following two questions, first mentioned above:

- What types of lithic tools were being manufactured or refurbished at Structure A-6?
- What types of lithic tool production were employed at Structure A-6?

Methods

Lithic Tools

Analysis of stone tools from Op CC-18 was conducted during the final weeks of the 2017 field season, particularly between July 7 and July 15. All tools were processed and catalogued in the lab prior to analysis by lab director Mnemo Rice. Houk conducted the

Table 4.7. Artifact Recovery from Subop CC-18-F, NE Corner Column Sample

Depth (cmbd)	Ceramics	Deb. Count	Deb. Weight (g)	Micro-debitage Fraction* (g)	Estimated Percent Micro-debitage	Lithic Tools	Obsidian	Shell
30–40	1	259	364	98	50	1	0	0
40–50	0	808	803	179	80	3	0	0
50–60	4	912	1061	147	85	0	0	0
60–70	4	249	284	275	20	0	1	1
70–80	3	177	213	268	25	0	0	0

*All microdebitage weights are unfiltered in CC-18-F

majority of lithic tool analysis, although Briana Smith and Rebecca Schultz did much of the analyses in the final days.

The morphological typology employed by CCAP in this analysis is consistent with that developed at the Northern Belize site of Colha (Hester 1982, 1985; Hester and Shafer 1994; Shafer and Hester 1983, 1991). The decision to do so was to ensure continuity between the lithic tool terminology used on Structure A-6 tools and that used at Group H (see Meadows and Hartnett 2000). Meadows and Hartnett (2000) argued to employ the Colha typology because of the similarities displayed between Colha lithic tools and Chan Chich lithic tools, particularly the forms of oval bifaces, general utility bifaces, narrow bifaces, and thin bifaces, which were all observed at Group H. All the listed types, save thin bifaces, were likewise observed at Structure A-6, which retroactively strengthened support for adopting this methodology.

In addition to grouping tools under a typology, the following attributes were observed on each tool: raw material type, quality of raw material, weight, the parameters of maximum length, width, and thickness (in centimeters), completeness of the tool, and evidence of battering and burning. Furthermore, bifaces were observed for their production stage, the percent of visible cortex, evidence of use/reuse, and, if broken, the type of fracture the tool suffered. Finally, a photograph was taken of each tool, and additional space was given to write freehand notes and observations.

All of the methods described above were settled upon before analysis. Once the analysis was underway, a new issue arose which was not addressed in the Group H lithic tool assemblage. During debitage analysis of flakes from the terminal phase architecture of Structure A-6, an uncharacteristically high number of potential utilized flakes was observed. This was an unexpected phenomenon; while the volume of flakes on the ground surface of Structure A-6 was high enough to ensure some edge damage on non-utilized flakes through trampling and scraping in-situ, the extent of wear observed on some flakes may be indicative of utilization in some other context. Since wear on the artifacts was sure to have occurred regardless, the most conservative approach was employed when classifying utilized flakes. Only flakes of which we were absolutely confident had wear from utilization as a tool, rather than post-deposition activity, were defined as utilized flakes. To be even more conservative, until use-wear analysis can be conducted to confirm these are truly utilized flakes and not a result of tramping and crushing, the identified flakes from these contexts will be considered to be "possible utilized flakes," and all utilized flake counts have been kept separate from lithic tool counts.

The majority of the potential utilized flakes were discovered during the analysis of debitage from Lots CC-18-A-1, -2, and -3. During excavations these were the only lots that underwent 100-percent screening. As described below, to characterize the sheer amount of debitage recovered, we sampled 25-percent of the debitage collected from these three lots in the lab. Therefore, the potentially utilized flakes represent a sample as well. Details of the sampling methodology are discussed below.

Debitage Analysis

Lithic debitage was unquestionably the most prevalent artifact type present throughout Op CC-18, and logically much of the research design was oriented around the guaranteed collection of a large quantity of it. Upon terminating excavations, Degnan conducted all of the lithic debitage analysis between June 19 and July 16. All told, 17,076 flakes were analyzed from a total of 23 lots.

Each flake was examined to determine type of raw material (either chert or chalcedony) and evidence of a platform. It was then sorted into one of four size categories: 0.01–2 centimeters, 2.01–4 centimeters, 4.01–6 centimeters, or 6.01 centimeters and larger. Any flake identified with a platform was further analyzed for percent of visible dorsal cortex (either 0–25 percent or 25.01–100%) and the number of flakes scars on its dorsal side, hereafter referred to as dorsal scars (either 0, 1, 2, or 3+). Once every flake in a lot was sorted into its appropriate category, the flakes in each category were counted and weighed as a whole.

We adopted the theoretical backing of how documenting the above characteristics can answer the listed research questions from both Whittaker et al. (2008) and Hiendel et al. (2012) in their analyses of lithic production at urban workshops in El Pilar and Buenavista del Cayo, respectively. In a specific sense, observing a combination of attributes in a single flake can suggest any of three things. First, it may point to a specific method of lithic production, such as pressure flaking. Second, it may indicate a specific point in the production process, such as a decortication flake from the beginning stages of reducing a lithic tool. Finally, it could allude to the manufacture of a specific tool type, such as a biface thinning flake. Rather than combining the observed characteristics into a typology of flake types as other studies have, our analysis does two things. First, we focus on examining the different recorded attributes in isolation across the excavated space. Then we examine how these individual attributes can interact together to form trends across our excavations that allow us to begin to answer the research questions listed above.

Sampling Methodology

As mentioned previously, Lots CC-18-A-1, -2, and -3 underwent 100-percent in field sampling. We determined analyzing the entirety of collected debitage would be an inefficient use of time and that a 25-percent sample taken in the lab would be both robust and congruent to the 25-percent in field sampling conducted on all other lots. We describe the sampling method performed on each of the three lots below. This account also describes the sampling of possible utilized flakes.

Lot CC-18-A-3

The first lot that underwent sampling in the lab was Lot CC-18-A-3. We decided the least biased and most time efficient way to take the 25-percent sample was by weight. First, the entire assemblage of lithic flakes was weighed, and we calculated 25 percent of the total weight. This was designated the goal weight. To ensure an even distribution in size, all the flakes were laid out and sorted on a continuous scale based on size (i.e. 0-2 cm, 2-4 cm, 4-6 cm, 6-8 cm, and so on). Then, one-quarter of each size grade was separated, weighed, and compared with the sample weight. Flakes were added evenly from each size grade until as close a value to the goal weight as possible was achieved (Table 4.8).

The presence of utilized flakes was noticed after the sampling of Lot CC-18-A-3, during the debitage analysis. The utilized flakes were identified only from this 25-percent sample, on a conservative basis as mentioned previously.

Table 4.8. Sampling Weights of Lots CC-18-A-1 through -3

Lot	Total Weight of Sample (g)	Goal Sample Weight (g)	Observed Sample Weight (g)
A-1	9,481	2,370.25	2,262
A-2	17,596	4,399.00*	4,398*
A-3	4,679	1,169.75	1,170

*Does not include utilized flakes

Lot CC-18-A-2

Now aware of the high presence of utilized flakes, all possible utilized flakes were identified and separated before the 25-percent sampling of Lot CC-18-A-2. The non-utilized debitage was sampled identically to Lot CC-18-A-3. The total count of possible utilized flakes was 286, with a total weight of 3,165 g. The sampling method for the isolated possible utilized flakes mirrored that of the non-utilized debitage, except the 25-percent sample was drawn by count from each size grade rather than weight. As before, one quarter of the size grade was identified and separated out. They were then counted until we reached the goal count of 72. This method was done to avoid having large utilized flakes skew the weighted sample and thereby have a bias representation in the data.

Lot CC-18-A-1

Due to time constraints, utilized flakes from Lot CC-18-A-1 were sampled using a slightly different strategy. In order to develop the debitage analysis format (described below under Debitage Analysis Methods), Degnan and Miller analyzed a randomly selected 44-percent weighted sample from Lot CC-18-A-1's debitage early in the season. To take a 25-percent sample of the total assemblage, 57 percent of the analyzed debitage was separated out by weight. This then contained 25-percent of the total excavated debitage. From this 25 percent, all utilized flakes were then removed for analysis.

Column Samples

All column samples were processed identically in the lab. First, the entire unprocessed matrix was weighed and recorded. Next, a piece of 1/16-inch wire mesh (common window screen) was placed on top of an empty 5-gallon bucket and pushed down to create space in which to place the sample. The mesh was tightly secured with bungee cords around the circumference of the bucket, but with enough give so that the unprocessed matrix of each sample could lie in the mesh and not rise above the walls of the bucket. We then ran water over the sample so that the soil ran through the wire mesh and collected into the bottom of the bucket. Once the sample was completely submerged in water, it was left to soak for a few hours. Because the soil contained a lot of clay, we added powered laundry detergent to the water to help break down the lumps of clay.

After soaking, the window screen containing the sample was spread out and left to dry. When dry, all roots, limestone pebbles, and other debris were removed and the sample was sifted a final time over a ¼-inch screen. All lithic material smaller than 1/4 inch in this study is considered microdebitage, and all lithic material larger than ¼ inch is considered macrodebitage. Following screening, Degnan recorded the weights of each component of the column sample (non-debitage constituents, microdebitage, and macrodebitage). The macrodebitage was then analyzed following the methods described above.

Results

Lithic Tools

In total, we recovered 47 stone tools (Table 4.9). Of these tools, 22 were bifaces, subdivided into eight oval bifaces, three general utility bifaces, one narrow bifaces, and 10 unknown bifaces. There were 11 blades, eight cores, one scraper, and two hammerstones. In addition, we recovered 387 possible utilized flakes, with 111 analyzed and separately displayed in Table 4.10. This table also includes three unknown unifaces recovered.

Debitage

Debitage from the following lots was analyzed in the lab: CC-18-A-1, -2, and -3; CC-18-B-1;

Table 4.9. Lithic Tools Recovered from Op CC-18

Lot -18-	Spec. # CC	Form	Subform	Raw Material	Raw Material Quality	Battering	Comp-ness	L (cm)	W (cm)	Th (cm)	W (g)	Burn-ing	Cortex	Fracture	Product-ion Stage	Use/Reuse
A-1	2585-02	Biface	Unknown	Chert	Coarse Grained	N	Comp	6.57	5.94	2.75	90	No	1	N	Early-stage Preform	None
A-1	2585-03	Biface	Unknown Thin Biface	Chert	Coarse Grained	N	Prox	3.6	4.07	1.07	18	No	2	S	Late-stage Preform	None
A-1	2585-18	Blade	Blade	Chert	Coarse Grained	N	Frag	2.96	1.53	0.34	2	No				
A-2	2609-01	Biface	Unknown	Chert	Fine Grained	N	Comp	9.7	6.46	4.13	204	No	2	N	Early-stage Preform	None
A-2	2609-02	Biface	GUB	Chert	Coarse Grained	N	Prox	9.45	6.22	3.83	202	No	2	S	Late-stage Preform	None
A-2	2609-03	Biface	Unknown	Chert	Coarse Grained	N	Comp	16.9	9.58	4.92	713	No	1	N	Early-stage Preform	None
A-2	2609-05	Uniface	Scraper	Chert	Coarse Grained	N	Comp	7.65	7.19	33.8	169	No				
A-2	2609-06	Biface	Unknown	Chert	Fine Grained	N	Medial	4.25	3.31	1.71	31	No	0	I	Finished Tool	None
A-2	2609-07	Biface	Oval	Chert	Coarse Grained	N	Prox	4.54	3.96	2.01	29	No	0	S	Late-stage Preform	Burin spall removed from one edge
A-2	2609-08	Biface	Unknown	Chert	Fine Grained	D	Comp	7.41	6.27	2.24	118	No	0	N	Finished Tool	Reworked unknown biface
A-2	2609-15	Biface	GUB	Chert	Course Grained	D	Dist	5.3	7.5	3.1	171	No	2	S	Early-stage Preform	Some crushing present on one edge.
A-2	2609-16	Biface	Unknown	Chert	Fine Grained	N	Prox	2.4	2.9	1	8	No	0	H/S	Finished Tool	Crushing present on edges.

Table 4.9. Lithic Tools Recovered from Op CC-18 (continued)

Lot -18-	Spec. # CC	Form	Subform	Raw Material	Raw Material Quality	Battering	Comp-ness	L (cm)	W (cm)	Th (cm)	W (g)	Burn-ing	Cortex	Fracture	Product-ion Stage	Use/Reuse
A-2	2609-17	Biface	Unknown	Chert	Course Grained	N	Medial	2.9	3	1.7	14	Yes	0	H/S	Finished Tool	Crushing on edges
A-2	2609-31	Blade	Blade	Chert	Very Course Grained	N	Frag	8.4	2.9	1.1	34	No				
A-2	2609-45	Blade	Blade	Chert	Course Grained	N	Medial	4.2	1.9	0.6	6	No				
A-2	2609-49	Blade	Blade	Chert	Fine Grained	N	Prox	3.2	2.2	0.4	5	No				
A-2	2609-54	Blade	Blade	Chert	Course Grained	N	Comp	3.6	2.2	0.5	4	Yes				
A-2	2609-55	Blade	Blade	Chert	Fine Grained	N	Prox	3	1.9	0.5	3	No				
A-2	2609-56	Blade	Blade	Chert	Fine Grained	N	Comp	4.3	1.8	0.5	4	No				
A-2	2609-57	Blade	Blade	Chert	Course Grained	N	Dist	2.1	1.4	0.3	2	No				
A-2	2609-71	Blade	Blade	Chert	Course Grained	N	Dist	2.7	1.6	0.4	3	No				
A-2	2609-80	Blade	Blade	Chert	Course Grained	N	Comp	4.1	1.4	0.8	4	No				
A-3	2630-01	Biface	Oval	Chert	Coarse Grained	N	Prox	11.05	5.65	1.99	129	No	0	I	Finished Tool	Broken in use
A-3	2630-25	Blade	Blade	Chert	Fine Grained	N	Frag	2.9	0.9	0.4	2	No				
A-5	2675-01	Core	Bifacial	Chert	Coarse Grained	N	Comp	10.33	8.79	6.12	397	No				
A-7	2755-01	Battered Cobble	Hammer-stone	Qtz	Coarse Grained	AM	Comp	5.91	5.71	4.15	190	No				

Table 4.9. Lithic Tools Recovered from Op CC-18 (continued)

Lot -18-	Spec. # CC	Form	Subform	Raw Material	Raw Material Quality	Battering	Comp-ness	L (cm)	W (cm)	Th (cm)	W (g)	Burn-ing	Cortex	Fracture	Product-ion Stage	Use/Reuse
A-7	2755-02	Biface	GUB	Chert	Coarse Grained	N	Comp	15.6	9.8	5.28	792	No	2	N	Early-stage Preform	None
A-10	2760-01	Core	Multi-directional	Chert	Fine Grained	N	Comp	8.49	5.79	5.33	210	Unk				
A-12	2765-01	Core	Multi-directional	Cha	Coarse Grained	N	Frag	5.29	4.36	2.85	73	No				
C-1	2767-01	Biface	Oval	Chert	Coarse Grained	N	Prox	6.9	6.11	1.47	42	None	1	S	Early-stage Preform	None
C-2	2769-01	Core	Bifacial	Chert	Very Fine Grained	N	Comp	10.88	7.6	4.45	293	No				
C-3	2771-01	Biface	Unknown	Chert	Coarse Grained	N	Comp	8.97	4.18	3.02	112	No	0	N	Late-stage Preform	None
C-3	2771-02	Core	Multi-directional	Chert	Coarse Grained	N	Comp	8.13	6.85	5.86	274	No				
C-4	2772-01	Biface	Oval	Chert	Coarse Grained	N	Dist	5.08	5.71	1.87	47	No	0	S	Late-stage Preform	None
C-5	2775-01	Core	Multi-directional	Chert	Very Fine Grained	N	Comp	8.77	7.28	3.06	256	No				
C-6	2778-01	Core	Multi-directional	Chert	Coarse Grained	N	Comp	9.07	8.82	5.3	272	No				
C-6	2778-03	Biface	Narrow Biface	Chert	Very Fine Grained	N	Prox	5.79	2.91	2.23	43	No	0	S	Finished Tool	Lateral crushing
C-6	2778-04	Core	Multi-directional	Chert	Coarse Grained	N	Comp	8.13	5.55	3.72	136	No				
D-4	2793-01	Core	Multi-directional	Chert	Very Fine Grained	N	Comp	3.88	3.91	3.21	68	No				

Table 4.9. Lithic Tools Recovered from Op CC-18 (continued)

Lot -18-	Spec. # CC	Form	Subform	Raw Material	Raw Material Quality	Battering	Comp-ness	L (cm)	W (cm)	Th (cm)	W (g)	Burn-ing	Cortex	Fracture	Product-ion Stage	Use/Reuse
E-1	2747-01	Biface	Oval	Chert	Coarse Grained	N	Dist	7.9	7.93	3.04	166	No	1	S	Late-stage Preform	None
E-1	2747-02	Core	Multi-directional	Chert	Fine Grained	N	Comp	5.74	5.54	3.99	72	No	1			
E-1	2747-03	Battered Cobble	Hammer-stone	Qtz	Coarse Grained		Frag	2.85	2.4	1.19	4	No				
F-1	2785-01	Biface	Oval	Chert	Fine Grained	N	Prox	6.91	6.24	2.24	73	No	1	S	Late-stage Preform	None
F-2	2786-01	Biface	Oval	Chert	Coarse Grained	N	Prox	7.79	5.5	1.49	70	No	1	S	Late-stage Preform	None
F-2	2786-02	Biface	Oval	Chert	Very Coarse Grained	N	Prox	6.51	6.52	2.11	78	No	1	S	Late-stage Preform	None
F-2	2786-03	Biface	Unknown	Chert	Coarse Grained	D	Frag	1.63	3.72	1.12	7	No	0	S	Finished Tool	Evidence of wear along edge

Table Abbrevations:

Raw Material: Qtz = Quartzite, Cha = Chalcedony

Battering: N = None, D = Distal, AM = Along Margins

Completenes: Comp = Complete; Proximal = Proximal Fragment, Dist = Distal Fragment, Frag = Fragment

Cortex: 0 = None, 1 = Present on one face, 2 = Present on both faces

Fracture: I = Impact, H/S = Hinge/Step, N = None, S = Snap

Table 4.10. Possible Utilized Flakes Recovered from Op CC-18

Context	Full Spec Number	Subform	Raw Material	Raw Material Quality	Battering	Complete-ness	L (cm)	W (cm)	Th (cm)	W (g)	Burning
CC-18-A-1	CC2585-01	Utilized Flake	Chert	Coarse Grained	None	Complete	7.95	6.5	2.12	133	No
CC-18-A-1	CC2585-04	Utilized Flake	Chalcedony	Coarse Grained	None	Complete	4.97	3.42	0.67	10	No
CC-18-A-1	CC2585-05	Utilized Flake	Chert	Coarse Grained	None	Fragment	3.47	3.21	0.65	6	No
CC-18-A-1	CC2585-06	Utilized Flake	Chert	Coarse Grained	None	Fragment	5.4	3.3	0.78	12	No
CC-18-A-1	CC2585-07	Utilized Flake	Chert	Fine Grained	None	Complete	5.13	3.43	0.87	14	No
CC-18-A-1	CC2585-08	Utilized Flake	Chert	Coarse Grained	None	Complete	4.13	3.95	0.65	10	No
CC-18-A-1	CC2585-09	Utilized Flake	Chert	Fine Grained	None	Fragment	2.86	2.43	0.57	4	No
CC-18-A-1	CC2585-10	Utilized Flake	Chert	Very Fine Grained	None	Fragment	3.43	2.2	0.53	6	No
CC-18-A-1	CC2585-11	Utilized Flake	Chert	Coarse Grained	None	Fragment	3.72	2.81	0.39	4	No
CC-18-A-1	CC2585-12	Utilized Flake	Chert	Coarse Grained	None	Complete	4	2.79	0.7	8	No
CC-18-A-1	CC2585-13	Utilized Flake	Chalcedony	Fine Grained	None	Fragment	2.38	1.86	0.43	3	No
CC-18-A-1	CC2585-14	Utilized Flake	Chert	Fine Grained	None	Fragment	2.4	2.01	0.44	2	No
CC-18-A-1	CC2585-15	Utilized Flake	Chert	Coarse Grained	None	Fragment	2.69	1.54	0.41	3	No
CC-18-A-1	CC2585-16	Utilized Flake	Chert	Coarse Grained	None	Fragment	2.42	1.67	0.32	2	No
CC-18-A-1	CC2585-17	Utilized Flake	Chert	Fine Grained	None	Fragment	2.37	2.09	0.43	3	No
CC-18-A-2	CC2609-04	Unknown Uniface	Chert	Coarse Grained	None	Complete	9.8	5.94	3.24	169	No
CC-18-A-2	CC2609-09	Utilized Flake	Chert	Fine Grained	None	Complete	4	4.1	0.6	8	No
CC-18-A-2	CC2609-10	Utilized Flake	Chalcedony	Fine Grained	None	Complete	6.3	5.7	2.1	79	No
CC-18-A-2	CC2609-11	Utilized Flake	Chert	Fine Grained	None	Fragment	6.9	7.6	1.6	71	No
CC-18-A-2	CC2609-12	Utilized Flake	Chert	Fine Grained	None	Complete	5.6	4.5	2	55	No
CC-18-A-2	CC2609-13	Utilized Flake	Chert	Fine Grained	None	Fragment	5.5	4.5	1	25	No
CC-18-A-2	CC2609-14	Utilized Flake	Chert	Course Grained	None	Fragment	4.4	3	1.1	27	No
CC-18-A-2	CC2609-18	Utilized Flake	Chert	Course Grained	None	Complete	5	4.8	0.8	17	No
CC-18-A-2	CC2609-19	Utilized Flake	Chert	Course Grained	None	Fragment	4.2	3.6	0.8	14	No
CC-18-A-2	CC2609-20	Utilized Flake	Chert	Fine Grained	None	Fragment	5.8	5.1	1.4	38	No

Table 4.10. Possible Utilized Flakes Recovered from Op CC-18 (continued)

Context	Full Spec Number	Subform	Raw Material	Raw Material Quality	Battering	Complete-ness	L (cm)	W (cm)	Th (cm)	W (g)	Burning
CC-18-A-2	CC2609-21	Utilized Flake	Chert	Fine Grained	None	Complete	4.5	6.8	1.8	58	No
CC-18-A-2	CC2609-22	Utilized Flake	Chert	Course Grained	None	Complete	3.8	5.4	1.2	22	No
CC-18-A-2	CC2609-23	Utilized Flake	Chert	Fine Grained	None	Complete	5.2	2.9	0.5	11	No
CC-18-A-2	CC2609-24	Utilized Flake	Chert	Course Grained	None	Complete	6.4	3.7	1.1	25	No
CC-18-A-2	CC2609-25	Utilized Flake	Chert	Very Fine Grained	None	Complete	5.2	5.8	2	59	No
CC-18-A-2	CC2609-26	Utilized Flake	Chert	Fine Grained	None	Fragment	4.6	3.7	0.7	16	No
CC-18-A-2	CC2609-27	Utilized Flake	Chert	Fine Grained	None	Fragment	3.7	2.9	0.4	5	No
CC-18-A-2	CC2609-28	Utilized Flake	Chert	Fine Grained	None	Complete	4.1	5.1	0.9	15	No
CC-18-A-2	CC2609-29	Utilized Flake	Chert	Course Grained	None	Complete	7.8	5.8	3	151	Unknown
CC-18-A-2	CC2609-30	Utilized Flake	Chert	Fine Grained	None	Fragment	3.9	4.8	0.8	14	No
CC-18-A-2	CC2609-32	Utilized Flake	Chert	Fine Grained	None	Complete	5.9	2.8	0.9	12	No
CC-18-A-2	CC2609-33	Utilized Flake	Chert	Fine Grained	None	Complete	5.6	2.6	0.8	11	No
CC-18-A-2	CC2609-34	Utilized Flake	Chert	Course Grained	None	Complete	6	3.4	1	30	No
CC-18-A-2	CC2609-35	Utilized Flake	Chert	Course Grained	None	Medial Fragment	1.8	4.3	0.7	6	No
CC-18-A-2	CC2609-36	Utilized Flake	Chert	Fine Grained	None	Fragment	3.9	2.5	0.3	4	No
CC-18-A-2	CC2609-37	Utilized Flake	Chert	Course Grained	None	Fragment	3.5	4.3	0.8	15	No
CC-18-A-2	CC2609-38	Utilized Flake	Chert	Fine Grained	None	Fragment	5.1	5	0.7	19	No
CC-18-A-2	CC2609-39	Utilized Flake	Chert	Course Grained	None	Fragment	5.3	4.1	0.7	18	No
CC-18-A-2	CC2609-40	Utilized Flake	Chalcedony	Course Grained	None	Fragment	4.3	3.1	0.6	11	No
CC-18-A-2	CC2609-41	Utilized Flake	Chert	Course Grained	None	Medial Fragment	3.9	3.6	0.5	11	Unknown
CC-18-A-2	CC2609-42	Utilized Flake	Chert	Fine Grained	None	Complete	4.3	3.4	0.7	13	No
CC-18-A-2	CC2609-43	Utilized Flake	Chert	Very Fine Grained	None	Fragment	4	2.4	0.4	4	No
CC-18-A-2	CC2609-44	Utilized Flake	Chert	Course Grained	None	Fragment	4.6	1.9	0.6	6	No
CC-18-A-2	CC2609-46	Utilized Flake	Chert	Fine Grained	None	Complete	3.2	2.4	0.6	6	No
CC-18-A-2	CC2609-47	Utilized Flake	Chert	Fine Grained	None	Medial Fragment	4.5	2.9	0.9	13	No

Table 4.10. Possible Utilized Flakes Recovered from Op CC-18 (continued)

Context	Full Spec Number	Subform	Raw Material	Raw Material Quality	Battering	Complete-ness	L (cm)	W (cm)	Th (cm)	W (g)	Burning
CC-18-A-2	CC2609-48	Utilized Flake	Chert	Course Grained	None	Proximal Fragment	2.9	2.9	0.6	6	No
CC-18-A-2	CC2609-50	Utilized Flake	Chert	Fine Grained	None	Complete	2.4	2.9	0.5	4	No
CC-18-A-2	CC2609-51	Utilized Flake	Chert	Fine Grained	None	Complete	3	3.7	0.6	7	No
CC-18-A-2	CC2609-52	Utilized Flake	Chert	Course Grained	None	Complete	3.5	2.1	0.4	4	No
CC-18-A-2	CC2609-53	Utilized Flake	Chalcedony	Fine Grained	None	Proximal Fragment	3.3	2.2	0.5	44	No
CC-18-A-2	CC2609-58	Utilized Flake	Chert	Course Grained	None	Distal Fragment	3.3	3.6	0.3	4	No
CC-18-A-2	CC2609-59	Utilized Flake	Chert	Course Grained	None	Distal Fragment	3.5	2.2	0.6	6	No
CC-18-A-2	CC2609-60	Utilized Flake	Chert	Course Grained	None	Medial Fragment	2.8	3	0.4	5	No
CC-18-A-2	CC2609-61	Utilized Flake	Chert	Course Grained	None	Distal Fragment	2.9	3.6	0.7	9	No
CC-18-A-2	CC2609-62	Utilized Flake	Chalcedony	Fine Grained	None	Proximal Fragment	2.8	2.6	0.4	4	No
CC-18-A-2	CC2609-63	Utilized Flake	Chert	Very Fine Grained	None	Complete	3.9	2	0.5	4	No
CC-18-A-2	CC2609-64	Utilized Flake	Chert	Course Grained	None	Medial Fragment	2.4	2.9	0.5	5	No
CC-18-A-2	CC2609-65	Utilized Flake	Chert	Fine Grained	None	Proximal Fragment	3.8	2.5	0.4	4	No
CC-18-A-2	CC2609-66	Utilized Flake	Chert	Very Fine Grained	None	Complete	3.4	1.9	0.3	3	No
CC-18-A-2	CC2609-67	Utilized Flake	Chalcedony	Fine Grained	None	Distal Fragment	2.6	2.5	0.5	4	No
CC-18-A-2	CC2609-68	Utilized Flake	Chert	Very Fine Grained	None	Fragment	3.2	3.3	0.6	7	No
CC-18-A-2	CC2609-69	Utilized Flake	Chert	Course Grained	None	Fragment	2.2	3.3	0.7	6	No
CC-18-A-2	CC2609-70	Utilized Flake	Chalcedony	Course Grained	None	Fragment	2.9	1.7	0.4	3	No
CC-18-A-2	CC2609-72	Utilized Flake	Chert	Fine Grained	None	Fragment	3	2.4	0.6	5	No

Table 4.10. Possible Utilized Flakes Recovered from Op CC-18 (continued)

Context	Full Spec Number	Subform	Raw Material	Raw Material Quality	Battering	Complete-ness	L (cm)	W (cm)	Th (cm)	W (g)	Burning
CC-18-A-2	CC2609-73	Utilized Flake	Chert	Fine Grained	None	Complete	3.1	3.5	0.6	6	No
CC-18-A-2	CC2609-74	Utilized Flake	Chert	Course Grained	None	Complete	2.5	1.8	0.4	2	No
CC-18-A-2	CC2609-75	Utilized Flake	Chert	Fine Grained	None	Proximal Fragment	3.2	2	0.4	3	No
CC-18-A-2	CC2609-76	Utilized Flake	Chert	Course Grained	None	Complete	4	1.6	0.8	6	Unknown
CC-18-A-2	CC2609-77	Utilized Flake	Chert	Course Grained	None	Distal Fragment	1.9	2.7	0.5	4	No
CC-18-A-2	CC2609-78	Utilized Flake	Chert	Fine Grained	None	Distal Fragment	1.9	2	0.4	2	No
CC-18-A-2	CC2609-79	Utilized Flake	Chert	Fine Grained	None	Fragment	2.7	1.8	0.4	3	No
CC-18-A-2	CC2609-81	Utilized Flake	Chert	Fine Grained	None	Fragment	1.8	1.6	0.5	2	No
CC-18-A-2	CC2609-82	Utilized Flake	Chert	Fine Grained	None	Fragment	2.6	3.5	0.9	11	No
CC-18-A-2	CC2609-83	Utilized Flake	Chert	Fine Grained	None	Proximal Fragment	1.4	2.9	0.8	4	No
CC-18-A-3	CC2630-02	Utilized Flake	Chert	Course Grained	None	Complete	7.9	6.6	2.1	98	No
CC-18-A-3	CC2630-03	Utilized Flake	Chalcedony	Fine Grained	None	Complete	4.3	3.5	0.6	14	No
CC-18-A-3	CC2630-04	Utilized Flake	Chert	Course Grained	None	Complete	5.1	4.8	1	26	No
CC-18-A-3	CC2630-05	Utilized Flake	Chert	Fine Grained	None	Fragment	4.5	4.9	1.2	25	No
CC-18-A-3	CC2630-06	Utilized Flake	Chert	Fine Grained	None	Complete	3.8	4.6	1	15	No
CC-18-A-3	CC2630-07	Utilized Flake	Chert	Fine Grained	None	Fragment	4.9	2.6	0.3	8	No
CC-18-A-3	CC2630-08	Utilized Flake	Chert	Course Grained	None	Fragment	3.2	2.5	0.4	6	No
CC-18-A-3	CC2630-09	Utilized Flake	Chert	Very Fine Grained	None	Complete	4	5	0.8	13	No
CC-18-A-3	CC2630-10	Utilized Flake	Chert	Course Grained	None	Complete	4.8	2.9	1	15	No
CC-18-A-3	CC2630-11	Utilized Flake	Chert	Fine Grained	None	Fragment	4.4	2.4	0.8	8	No
CC-18-A-3	CC2630-12	Utilized Flake	Chalcedony	Course Grained	None	Fragment	3.7	2.2	0.6	7	No
CC-18-A-3	CC2630-13	Utilized Flake	Chalcedony	Course Grained	None	Fragment	2.5	2.8	0.3	4	No
CC-18-A-3	CC2630-14	Utilized Flake	Chert	Course Grained	None	Fragment	3	2.4	0.6	7	No
CC-18-A-3	CC2630-15	Utilized Flake	Chert	Fine Grained	None	Fragment	3.5	2.8	0.3	6	No

Table 4.10. Possible Utilized Flakes Recovered from Op CC-18 (continued)

Context	Full Spec Number	Subform	Raw Material	Raw Material Quality	Battering	Complete-ness	L (cm)	W (cm)	Th (cm)	W (g)	Burning
CC-18-A-3	CC2630-16	Utilized Flake	Chert	Very Fine Grained	None	Complete	4.6	2	0.5	8	No
CC-18-A-3	CC2630-17	Utilized Flake	Chalcedony	Fine Grained	None	Fragment	3.6	2.6	0.5	7	No
CC-18-A-3	CC2630-18	Utilized Flake	Chert	Fine Grained	None	Fragment	2	2.6	0.3	3	No
CC-18-A-3	CC2630-19	Utilized Flake	Chert	Course Grained	None	Complete	3.1	3.4	0.5	6	No
CC-18-A-3	CC2630-20	Unknown Uniface	Chert	Fine Grained	None	Distal Fragment	2.4	3	1	6	No
CC-18-A-3	CC2630-21	Utilized Flake	Chert	Fine Grained	None	Complete	2.4	1.9	0.4	4	No
CC-18-A-3	CC2630-22	Utilized Flake	Chert	Very Fine Grained	None	Complete	2.5	3.9	1	10	No
CC-18-A-3	CC2630-23	Utilized Flake	Chert	Fine Grained	None	Fragment	6.1	1.6	0.8	9	No
CC-18-A-3	CC2630-24	Utilized Flake	Chert	Very Fine Grained	None	Fragment	2.5	1.3	0.5	3	No
CC-18-A-10	CC2760-02	Utilized Flake	Chert	Very Course Grained	None	Complete	5.5	5.1	1.3	34	No
CC-18-C-4	CC2772-02	Utilized Flake	Chert	Coarse Grained	None	Complete	2.48	2.39	0.72	4	No
CC-18-C-6	CC2778-02	Unknown Uniface	Chert	Coarse Grained	None	Complete	8.65	5.72	3.1	160	No
CC-18-E-1	CC2747-04*	Utilized Flake	Chert							13	
CC-18-E-1	CC2747-05*	Utilized Flake	Chert							13	
CC-18-E-1	CC2747-06*	Utilized Flake	Chert							9	
CC-18-E-1	CC2747-07*	Utilized Flake	Chert							8	
CC-18-E-1	CC2747-08*	Utilized Flake	Chalcedony							6	
CC-18-E-1	CC2747-09*	Utilized Flake	Chalcedony							6	
CC-18-E-1	CC2747-10*	Utilized Flake	Chalcedony							6	
CC-18-E-1	CC2747-11*	Utilized Flake	Chalcedony							4	
CC-18-E-1	CC2747-12*	Utilized Flake	Chert							15	

*Not fully analyzed

CC-18-E-1; 17 column samples from Subops CC-18-C, -D, and -F; and Lot CC-18-C-6. These lots correspond to the terminal phase architecture of Structure A-6 and all excavations concerning the debitage deposit.

Table 4.11 gives subtotals for each attribute analyzed by suboperation and lot. For each lot, the following is listed: total count, total weight, number of flakes with a platform, weight of all flakes with a platform, number of flakes without a platform, the weight of all flakes without a platform, number of chert flakes, weight of chert flakes, number of chalcedony flakes, weight of chalcedony flakes, and the weight of microdebitage in lots from column samples.

After having presented the targeted attributes on each flake, we now move on to examine trends in these attributes across the excavated space. We assess proportional changes of the distribution of dorsal scars, size of flakes, and the percentage of cortex. From this point forward in the discussion we do not distinguish between raw materials. The distribution of raw material type gives insight to local and nonlocal sources, and addresses the potential for trade. That analysis is beyond the scope of this chapter.

The charts below are separated into four spatial areas. The first, "Terminal Architecture," refers to Lots CC-18-A-1, -2, and -3; CC-18-B-1; and CC-18-E-1. The second group, "Column Sample C," refers to all lots in Subop CC-18-C except Lot CC-18-C-6. As mentioned in the excavation section, Lot CC-18-C-6 lies below the packed surface found at the bottom of Subop CC-18-C, and is therefore interpreted as outside of the debitage deposit. The last two spatial groups, "Column Sample D" and "Column Sample F" refer to all lots of the respective Subops CC-18-D and -F.

The first column of charts (Figures 4.14–4.17) below shows the distribution of the number of dorsal scars on each flake. These data are presented proportionally; that is, the number observed for each category was divided by the total number of flakes analyzed in the lot.

The second column of charts (Figures 4.18–4.21) below shows the size distribution of the flakes. Again, these data are presented proportionally, as explained above.

Finally, the last two charts (Figures 4.22 and 4.23) show the data averages across the four groups juxtaposed with one another. The values of every lot within the four spatial groups (Terminal Architecture, Column Samples C, D, and F) are averaged out to produce a representational average for each group.

Column Samples

Table 4.12 shows two things. The first six columns show the density of lithic material in the column sample matrix using preprocessing and processed weights. The final two columns show the density of microdebitage within the processed weight, which alludes to the distribution of macro and microdebitage within each sample.

Interpretation

Debitage

A clear trend is visible in the analyzed debitage; the overwhelming majority of flakes are characterized by three or more dorsal scars and measure between 0 and 2 cm. Overall, there is very low variation within each group, pointing to a consistency in activity as the deposit was created. The two summary charts show extremely low variation among the column samples, but the terminal architecture is strikingly different. The terminal architecture has a lower proportion of flakes between 0 and 2 cm by 10 to 20 percent, and a higher proportion of flakes with three dorsal scars by 20 percent.

Table 4.11. Analyzed Debitage Summary

Lot CC-18-	Column Sample	Total Analyzed Debitage Count	Total Analyzed Debitage Weight (g)	Platform Count	Platform Weight (g)	No Platform Count	No Platform Weight (g)	Chert Count	Chert Weight (g)	Chal-cedony Count	Chal-cedony Weight (g)	Micro-debitage Weight (g)
A-1	N/A	1118	2398	271	737	847	1661	909	1991	209	407	N/A
A-2	N/A	1815	4195	815	2455	1000	1740	1106	2611	709	1584	N/A
A-3	N/A	568	1073	283	651	285	422	379	673	189	400	N/A
B-1	N/A	1302	1474	771	1084	531	390	931	987	371	487	N/A
E-1	N/A	1214	1392	666	864	548	528	764	1039	450	353	N/A
C-1	SW corner	438	450	279	350	159	100	230	246	208	204	120
C-2	SW corner	404	554	280	454	124	100	178	269	226	285	79
C-3	SW corner	521	492	368	414	153	78	295	308	226	184	110
C-3	SE corner	1134	1020	764	833	370	187	608	587	526	433	259
C-4	SW corner	1160	1115	800	924	360	191	652	756	508	359	337
C-4	SE corner	1473	857	1016	642	457	215	809	485	664	372	704
C-5	SW corner	100	79	55	57	45	22	45	55	55	24	99
C-5	SE corner	911	673	551	492	360	181	613	479	298	194	328
C-6	25% sample	311	515	226	459	85	56	187	396	124	119	N/A
D-1	NW corner	719	616	334	422	385	194	328	353	391	263	143
D-2	NW corner	351	224	165	140	186	84	265	169	86	55	93

Table 4.11. Analyzed Debitage Summary (continued)

Lot CC-18-	Column Sample	Total Analyzed Debitage Count	Total Analyzed Debitage Weight (g)	Platform Count	Platform Weight (g)	No Platform Count	No Platform Weight (g)	Chert Count	Chert Weight (g)	Chal-cedony Count	Chal-cedony Weight (g)	Micro-debitage Weight (g)
D-3	NW corner	57	47	35	40	22	7	32	35	25	12	20
D-4	NE corner	1075	1073	602	737	473	336	529	629	546	444	255
F-1	NE corner	259	364	158	300	101	64	181	276	78	88	49 *
F-2	NE corner	808	803	540	627	268	176	564	554	244	249	143 *
F-3	NE corner	912	1061	566	818	346	243	623	685	289	376	125 *
F-4	NE corner	249	284	139	207	110	77	158	155	91	129	55 *
F-5	NE corner	177	213	97	143	80	70	126	168	51	45	54 *
Tot	**N/A**	**17076**	**20972**	**9781**	**13850**	**7295**	**7122**	**10512**	**13906**	**6564**	**7066**	**2973**

*All microdebitage weights are unfiltered in CC-18-F

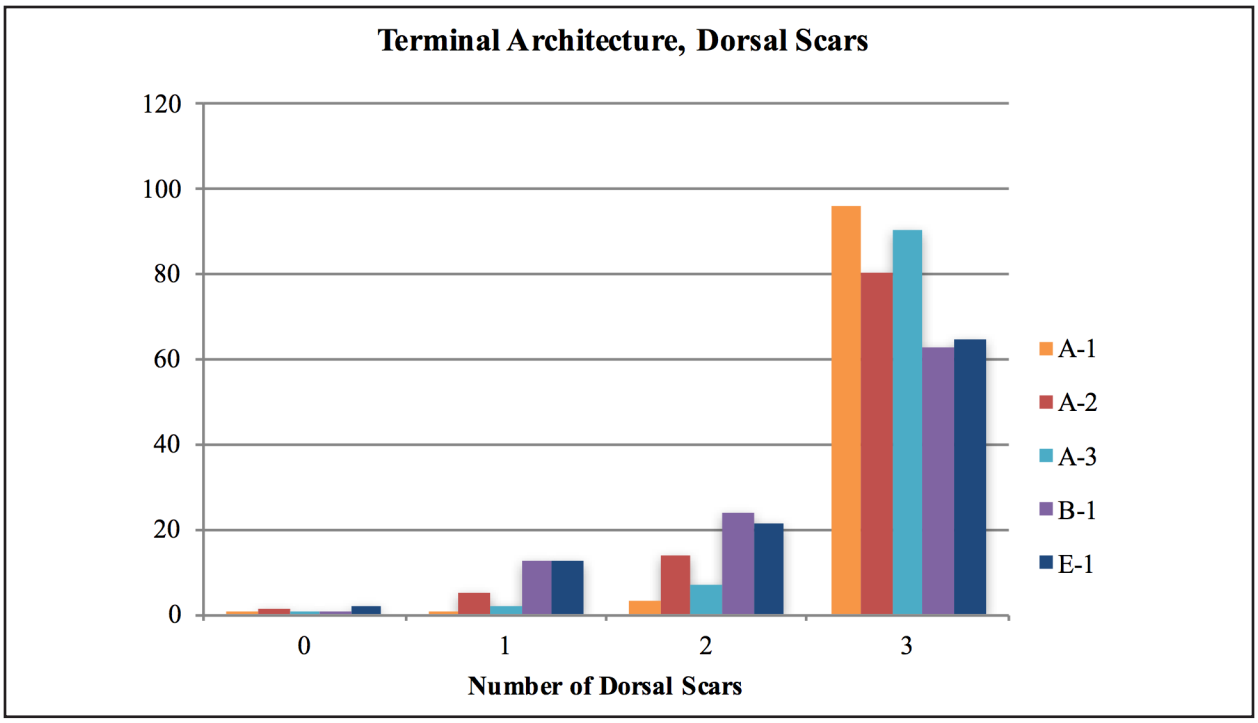

Figure 4.14. Analysis of dorsal scars per flake by lot in Structure A-6 terminal architecture contexts.

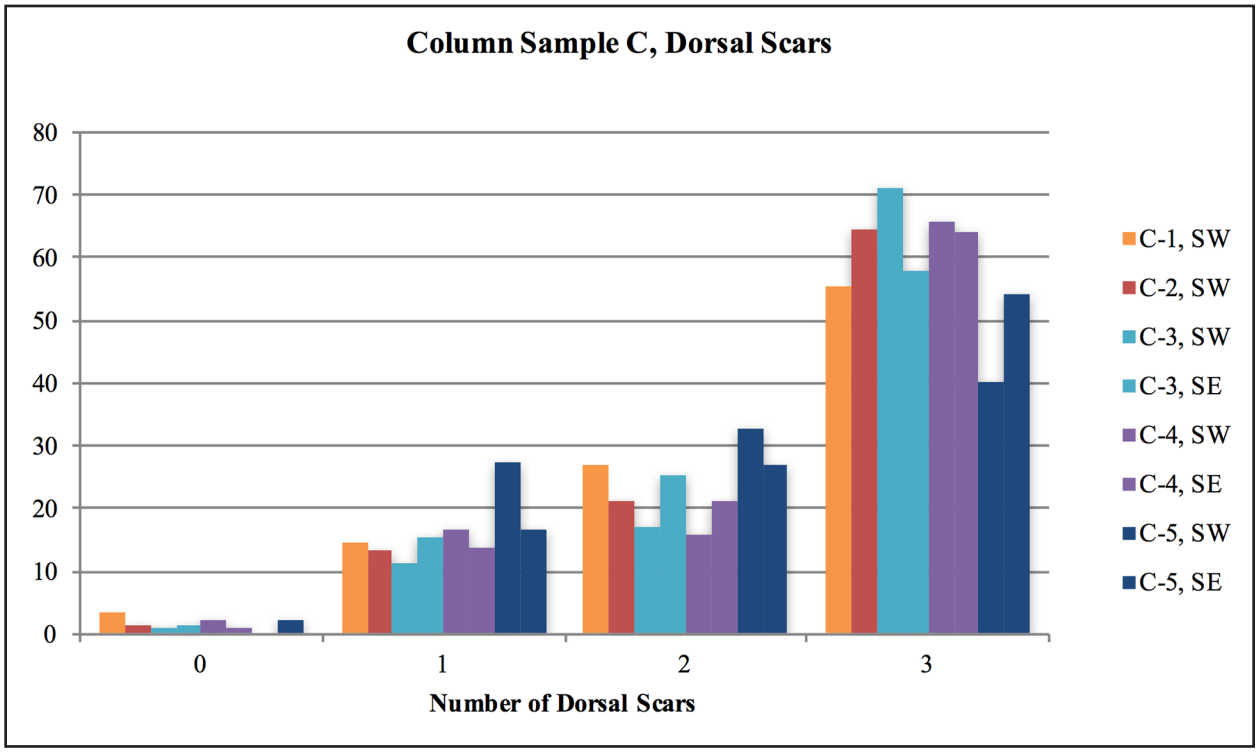

Figure 4.15. Analysis of dorsal scars per flake from column samples in Subop CC-15-C.

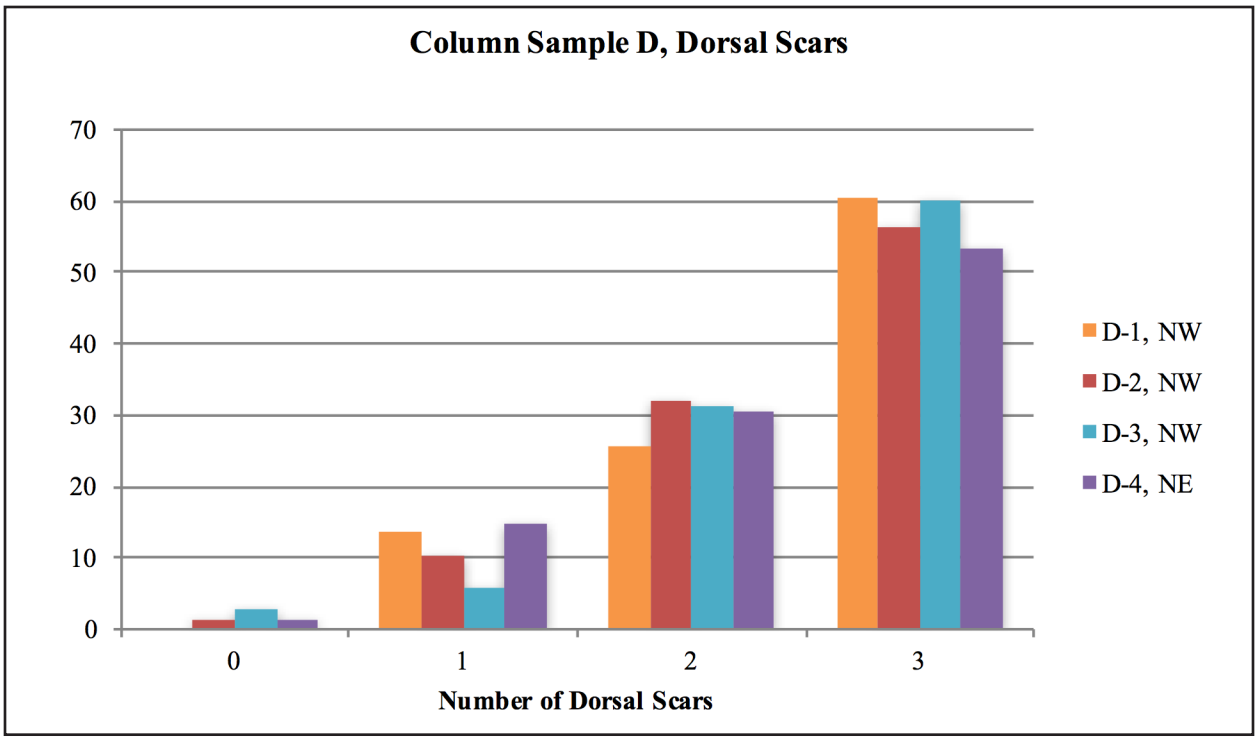

Figure 4.16. Analysis of dorsal scars per flake from column samples in Subop CC-15-D.

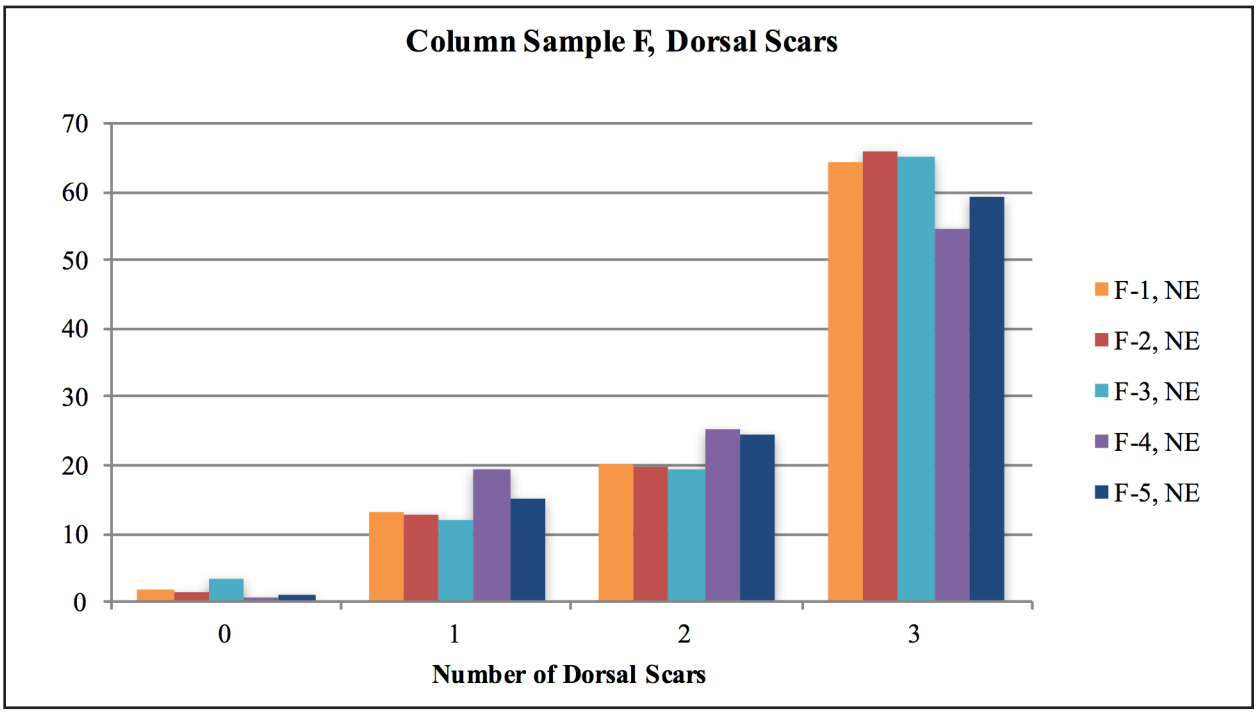

Figure 4.17. Analysis of dorsal scars per flake from column samples in Subop CC-15-F.

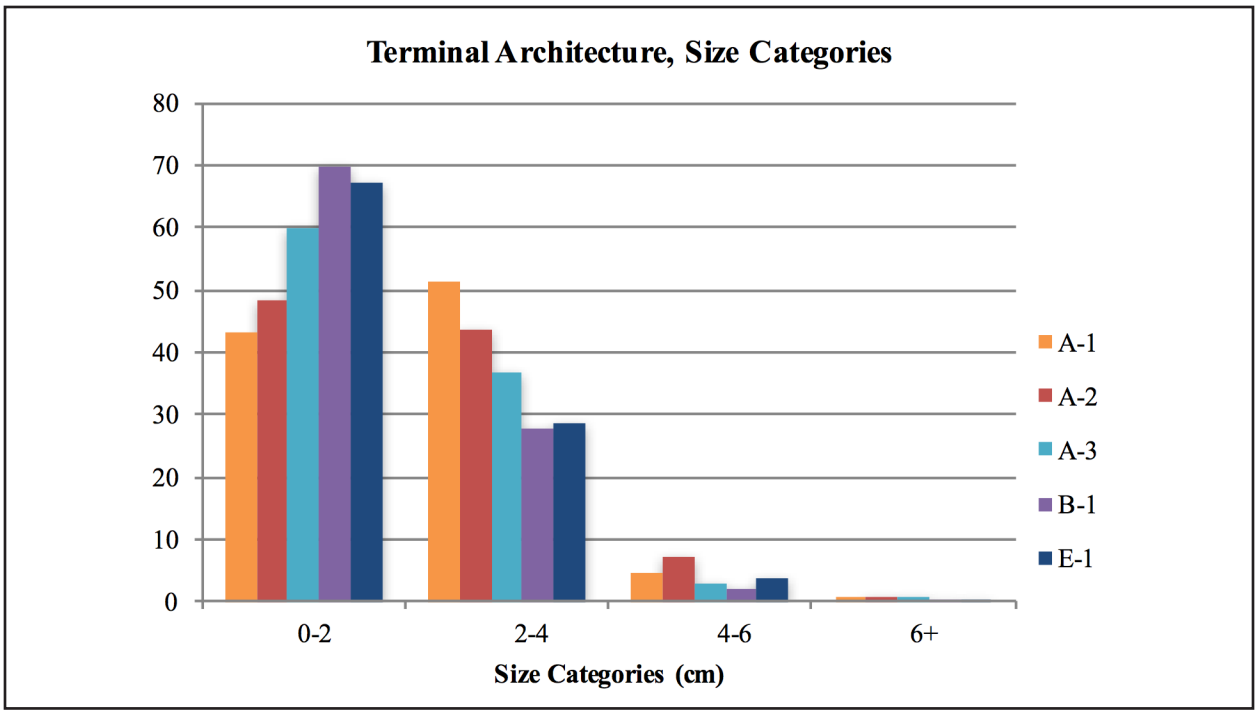

Figure 4.18. Analysis of size of flakes by lot in Structure A-6 terminal architecture contexts.

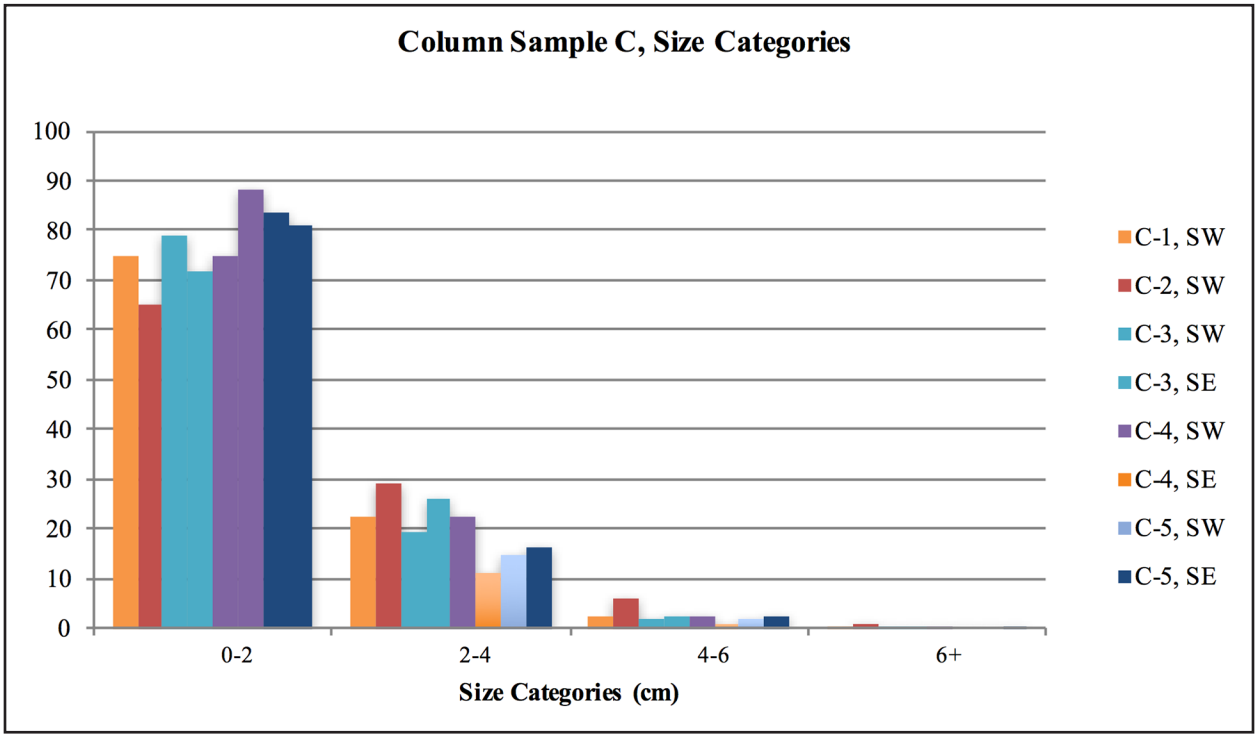

Figure 4.19. Analysis of size of flakes from column samples in Subop CC-15-C.

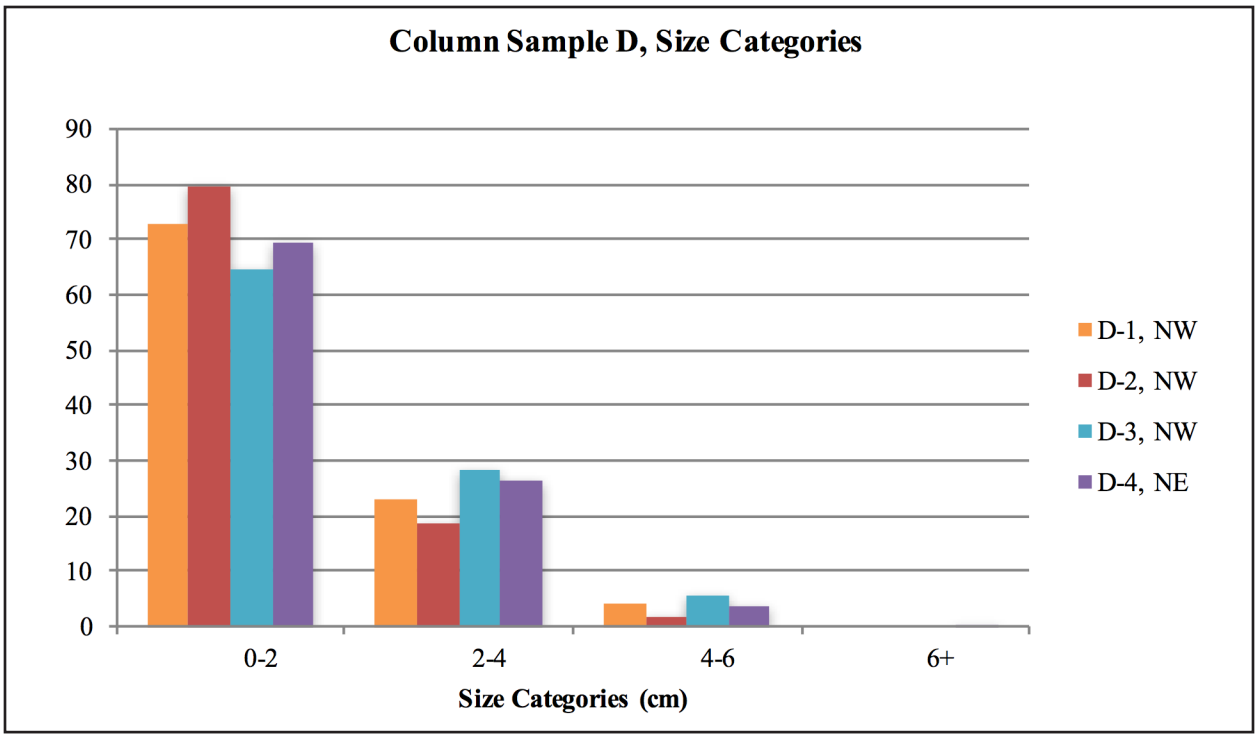

Figure 4.20. Analysis of size of flakes from column samples in Subop CC-15-D.

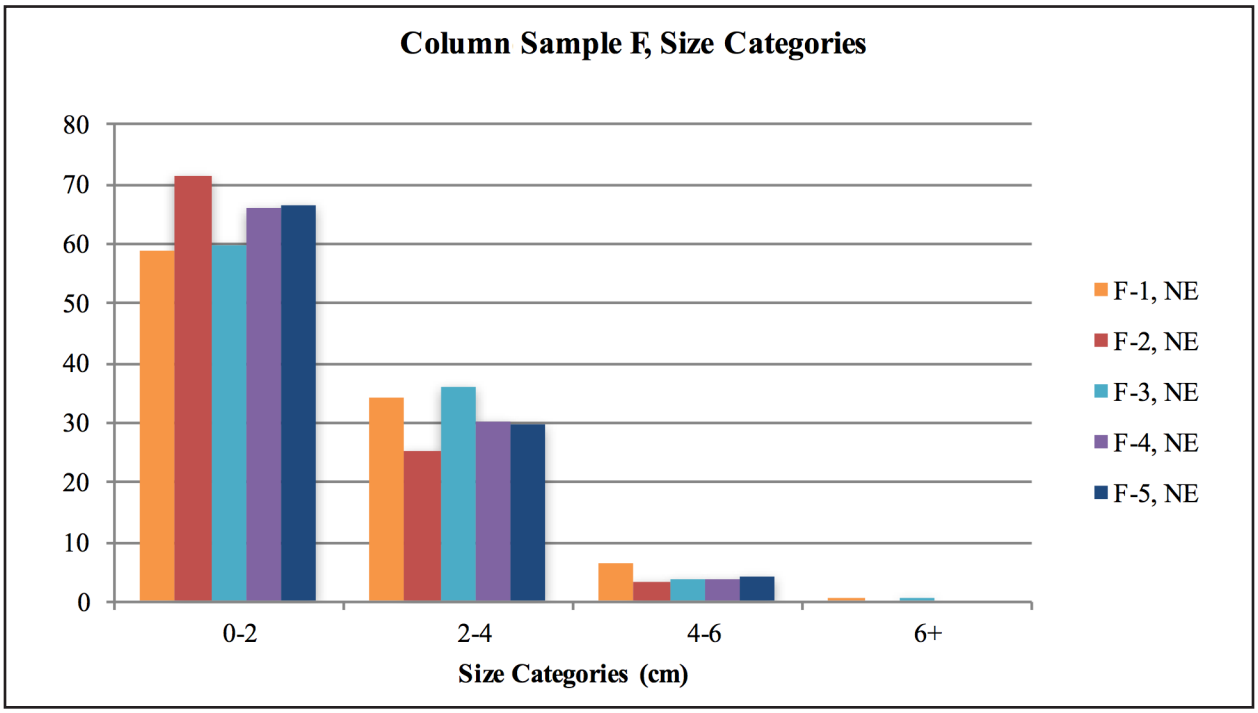

Figure 4.21. Analysis of size of flakes from column samples in Subop CC-15-F.

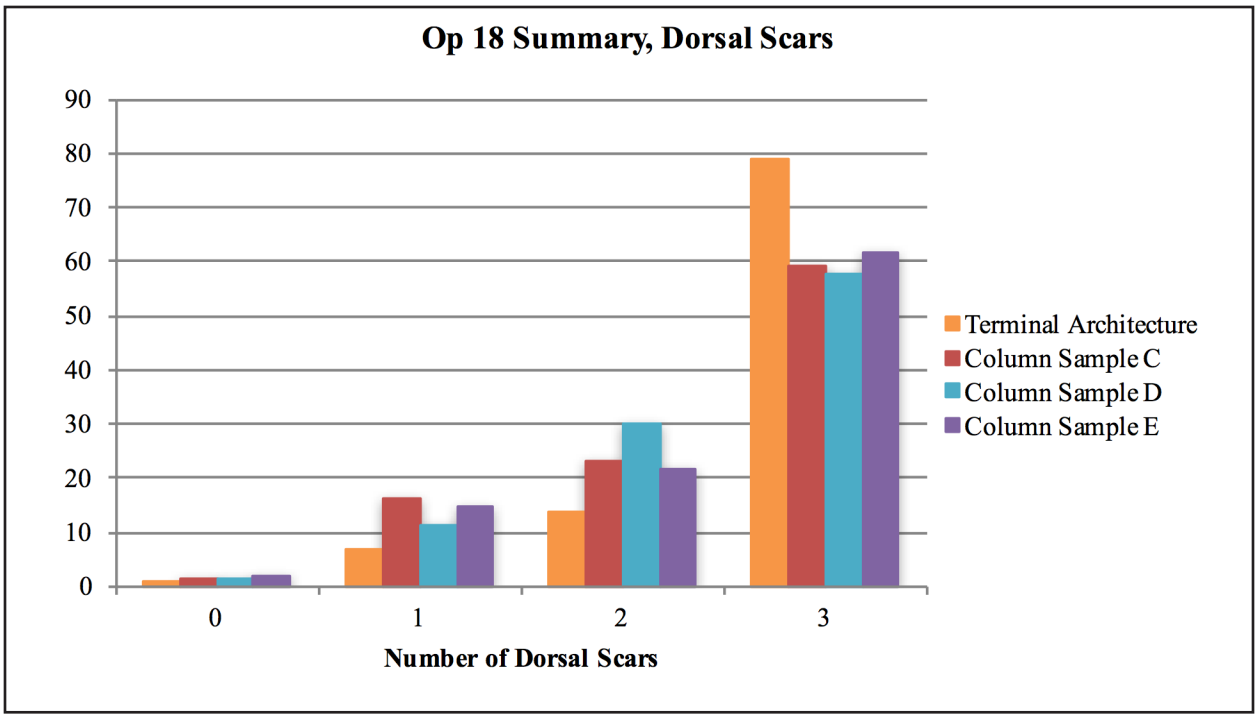

Figure 4.22. Summary of dorsal scars per flake from all contexts, Op CC-18-A.

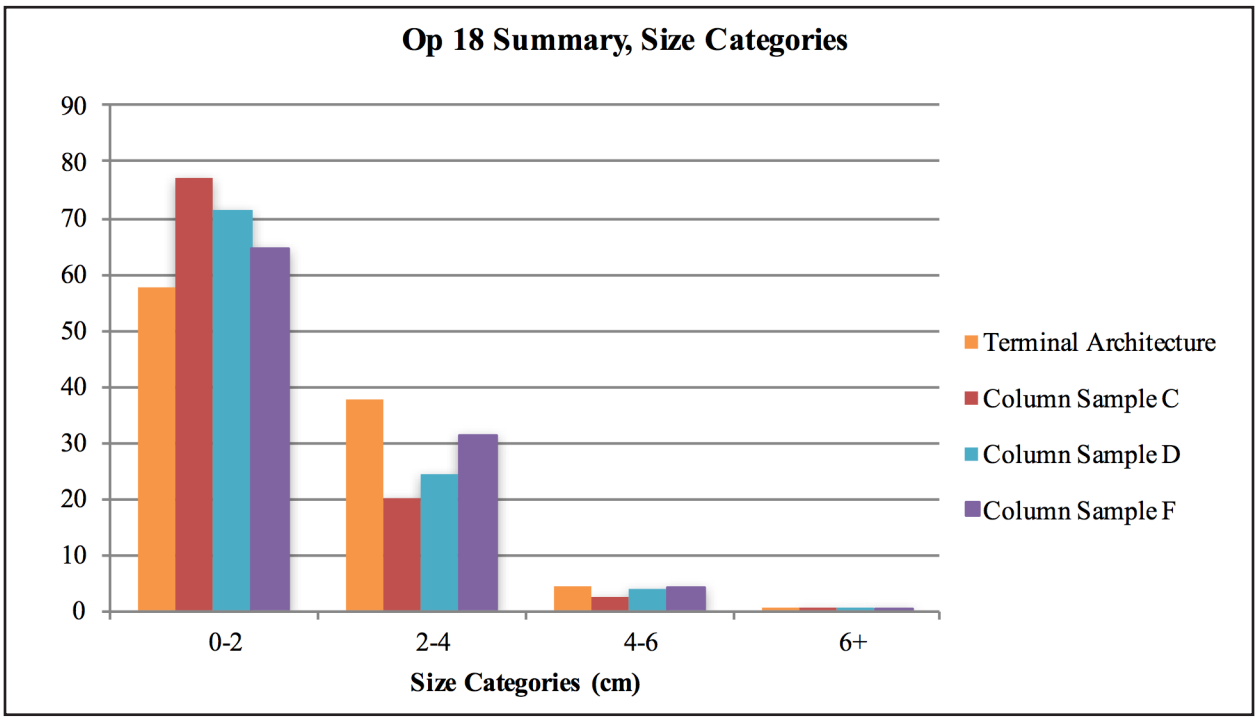

Figure 4.23. Summary of size of flakes from all contexts, Op CC-18-A.

Table 4.12. Pre- and Post-Processing Weights of Column Samples

Lot CC-18-	Depth (cmbd)	Column Sample	Pre-processing Weight (g)	Processed Weight (g)	Percentage of total	Micro-debitage Weight (g)	Percentage of Processed Weight
C-1	33–43	SW	1564	570	36.45%	120	21.05%
C-2	43–53	SW	1637	633	38.67%	79	12.48%
C-3	53–63	SW	2433	602	24.74%	110	18.27%
C-3	53–63	SE	1936	1279	66.06%	259	20.25%
C-4	63–73	SW	1972	1452	73.63%	337	23.21%
C-4	63–73	SE	2295	1561	68.02%	704	45.10%
C-5	73–81.75	SW	2341	178	7.60%	99	55.62%
C-5	73–81.75	SE	2048	1001	48.88%	328	32.77%
D-1	20–30	NW	1483	759	51.18%	143	18.84%
D-2*	30–40	NW	1296	317	24.46%	93	29.34%
D-3*	40–50	NW	527	67	12.71%	20	29.85%
D-4	50–60	NE	2266	1328	58.61%	255	19.20%
F-1	30–40	NE	1112	462	41.55%	49**	10.61%
F-2	40–50	NE	1768	982	55.54%	143**	14.56%
F-3	50–60	NE	1687	1208	71.61%	125**	10.35%
F-4	60–70	NE	1901	559	29.41%	55**	9.83%
F-5	70–80	NE	2035	481	23.64%	54**	11.23%

*Lot did not extend across entire unit
**All microdebitage weights are unfiltered in CC-18-F

Much of this difference can be attributed to sample bias; the lots that compose the terminal architecture group were screened in the field, while all lots in the column samples were processed and screened in the lab. Therefore, for each column sample, every small flake still larger than ¼ inch was collected and analyzed. In field screening likely skewed the sample toward larger flakes, explaining the difference in proportion of the size categories. Moreover, larger flakes have a larger surface area on the dorsal side, making it more likely to observe three or more dorsal scars. Under these considerations, we feel comfortable to infer that the true sample of the terminal architecture likely looks similar to that of the column samples. With this we can conclude continuity in activity across the four spatial groups.

Finally, Table 4.13 shows the distribution of flakes with 0 to 25 percent cortex present versus those with greater than 25 percent. Again, the trend is glaringly clear and consistent; the average lot was composed of 85 percent flakes with 0 to 25 percent cortex with a standard deviation of roughly 4 percent.

This trend we see—small flakes with many flake scars and little cortex—clearly points to late stage production of stone tools, with the possibility of tool maintenance as well. To evaluate this, we must turn to the tools. If all lithic tools recovered from Structure A-6 are broken or disposed of during manufacture, without evidence of wear, this would point to late stage production and little to no maintenance. Contrastingly, if a majority of the tools show evidence of use or retouch before disposal, this

Table 4.13. Distribution of Cortex on Flakes in Analyzed Lots of Op CC-18

	Raw Counts		Proportions	
Lot	0–25	25.01–100	0–25	25.01–100
A-1	205	66	75.65	24.35
A-2	670	145	82.21	17.79
A-3	248	35	87.63	12.37
E-1	633	131	82.85	17.15
C-1	240	39	86.02	13.98
C-2	240	40	85.71	14.29
C-3, SW	327	41	88.86	11.14
C-3, SE	656	108	85.86	14.14
C-4, SW	660	140	82.50	17.50
C-4, SE	901	115	88.68	11.32
C-5, SW	47	8	85.45	14.55
C-5, SE	494	57	89.66	10.34
D-1	186	27	87.32	12.68
D-2	147	18	89.09	10.91
D-3	32	3	91.43	8.57
D-4	539	63	89.53	10.47
F-1	135	23	85.44	14.56
F-2	452	88	83.70	16.30
F-3	489	86	85.04	14.96
F-4	122	17	87.77	12.23
F-5	76	22	77.55	22.45
		Mean:	85.62	14.38
		Standard Deviation:	3.92	3.92

would imply that activity on Structure A-6 also included tool maintenance.

We do know for certain that the material used for tool production at Structure A-6 was quarried elsewhere, likely prepared for transport by removing a large percentage of the cortex, and likely knapped into its final form on Structure A-6. Workers likely brought the quarried stone to the production site in the shape of a preform, like the one shown in Figure 4.24.

Figure 4.24. Photograph of Spec. # CC2609-03, an early stage preform.

Lithic Tools

Of the 22 bifaces recovered, fifteen were preforms—six early stage preforms and nine late stage preforms. Seven were finished tools (32% of the total bifaces), six of which displayed signs of use and wear. While the preforms imply production failure before the tools were completed, the finished tools found in the assemblage imply that some tool maintenance took place alongside production at Structure A-6.

We then took a look at the tools recovered from Debitage Deposits 1 and 3 at Group H (Meadows and Hartnett 2000). Of the 115 bifaces recovered between the two deposits, 80 were finished tools, and 35 were preforms. This is a much higher density of finished tools at the Group H deposit; 70 percent finished tools as opposed to 32 percent finished tools at Structure A-6. This signifies a clear difference in activity between the two tool production sites.

The Significance of the Possible Utilized Flakes

The presence of possible utilized flakes on the terminal architecture of Structure A-6 was unexpected and has implications for the role of the structure. What could be a very large number of utilized flakes is not indicative of standard workshop practices, and signifies activity beyond production and maintenance of stone tools. While the flakes themselves may have been shed during tool production, they were being transformed into tools themselves, likely to be used on a raw material other than stone. While we cannot characterize the role of the utilized flakes beyond the occurrence of some activity requiring their use, this could redefine and broaden the proposed scope of activity at Structure A-6.

In addition, it is significant to note that while the possible utilized flakes were commonly found in Subops CC-18-A and -E, absolutely none were identified in the terminal architecture at Subop CC-18-B on the northern end of the structure. This is notable because the two excavations areas are located only a few meters away from each other. While it is important to remember the conservative approach used in identification of the tools, there is nonetheless a clear compositional difference in the presence of possible utilized flakes in the two locations. This implies localized activity and opens up discussion of the North Plaza's hypothesized role as a marketplace. Specifically, the localized activity is congruent with the organization of marketplace stalls, which have been evidenced in other marketplaces in the Maya lowlands (Dahlin et al. 2007; Heindel et al. 2012). Although there was no evidence of impermanent structures (which may include wattle and daub, or evidence of post holes) found during excavations, it does not rule out this possibility. Ultimately, this find opens up more questions and possibility going forward as CCAP continues to explore the North Plaza's possible role as a marketplace.

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Bioarchaeological Analysis of Human Skeletons from Chan Chich, Belize: The 2017 Field Season

Anna Novotny, Tomás Gallareta Cervera, Briana Smith, and Gertrude Kilgore

This report details the preliminary osteological analysis of human remains recovered from the ancient Maya site of Chan Chich during the 2017 field season. Each burial is listed below according to burial number and provenience (Operation, Suboperation, and Lot) and is described beginning with the archaeological context from which the remains were recovered. Details of the archaeological context include grave location, time period in which the interment occurred, position and orientation of the skeleton, and any grave goods recovered. The following section records the osteological analysis of each individual including the approximate percentage of the remains recovered, age at death, biological sex, dentition, and skeletal pathologies, if any were observed.

All skeletal data were collected in accordance with the Standards for Collection of Data from Human Skeletal Remains (Buikstra and Ubelaker 1994). Standards is a compilation of techniques used in osteological analysis that outlines methods of determining age at death, biological sex, pathological conditions, and cultural modifications to the body. As much of these data as possible were collected for each individual. Analysis of the dentition was done according to Standards and supplemented by Simon Hillsons' (1996) text *Dental Anthropology* and Timothy D. White's and Pieter A. Folkens' (2005) text *The Human Bone Manual*. Pathologies were identified with reference to *Identification of Pathological Conditions in Human Skeletal Remains* (Ortner 2003). We have refrained from citing the above texts in the report except where necessary.

BURIAL CC-B16, LOTS CC-15-G-13 AND CC-15-G-14 (THREE INDIVIDUALS)

Burial CC-B16 Description

Burial CC-B16 was initially discovered during the 2016 field season (Houk 2016). At the time, the context and nature of the burial were not well understood, but excavators identified two individuals, Burials CC-B16A and CC-B16B, in a possible cist in the Upper Plaza south of Structure A-1 in Subop CC-15-G (Novotny et al. 2016). Burial CC-B16A consisted of an articulated right leg, an articulated right hand, and the remains of the left and right feet located within fill below large cut limestone blocks that may have served as capstones. Burial CC-B16B was found adjacent to Burial CC-B16A in the southern profile of Subop CC-15-G and was identified as a fully articulated right arm and right femur (Novotny et al. 2016). The burial was left *in situ* and backfilled due to time constraints. During the 2017 field season, Subop CC-15-G was reopened and extended farther south to catch the extent of Burial CC-B16B.

Novotny, Anna, Tomás Gallareta Cervera, Briana Smith, and Gertrude Kilgore
2017 Bioarchaeological Analysis of Human Skeletons from Chan Chich, Belize: The 2017 Field Season. In *The 2017 Season of the Chan Chich Archaeological Project*, edited by Brett A. Houk and Claire Novotny, pp. 143–156. Papers of the Chan Chich Archaeological Project, Number 12. Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

The 2017 excavations in Subop CC-15-G revealed that Burial CC-B16A and CC-B16B were buried within a rectangular crypt (see Welsh 1988 for definition) contained by four cut limestone block walls. As described by Gallareta Cervera and colleagues (this volume), the crypt was constructed by excavating through the Upper Plaza floor, subfloor fill, and buried architectural features—including the southern face of the buried Preclassic structure known as Blanca—until a Middle Preclassic plaza floor was encountered. The architects of the crypt reused this floor as the crypt's floor. The crypt measured 1.5 m east-west by 2.16 m north-south, and the walls were preserved to a height of 1.25 m—the level of the modern plaza surface. It appears as if the crypt was originally vaulted, and the interior was accessed via stairs at the north end, which descended from the plaza floor. Following the interment of Burial CC-B16B, the vault was destroyed and the crypt was in-filled to the level of the plaza surface. Stratigraphy, artifacts, and radiocarbon dates suggest the crypt was constructed and in-filled in the Early Classic period.

Burial CC-B16B

Archaeological Context

Burial CC-B16B was discovered at the southern end of the crypt below fill on top of a plaster floor. Two other individuals, Burials CC-B16C and CCB-16D, were also found at the southern end of the crypt and are discussed below.

Burial CC-B16B was a primary burial of an individual in an extended position with the head oriented to the east (Figure 5.1). The arms were flexed slightly at the elbow with the hands placed on the abdomen and the right lower leg crossed over the left. The cranium was positioned with the eye orbits to the north; the mandible was resting on the cervical vertebrae. The position of the mandible suggests that the skull was likely originally placed in a supine position. During decomposition the mandible fell away from the cranium, and the cranium slumped to the north. Bone preservation was good *in situ*, with the exception of the ribs, vertebrae, and feet bones. However, the bones were very brittle and friable upon removal. Numerous well-preserved human teeth were found scattered throughout the burial, including near the left arm as well as near the sacrum.

Various grave goods were found interred with Burial CC-B16B. Most notably, a complete Ixcanrio Orange Polychrome pedestal bowl dating to the Early Classic was uncovered adjacent to the proximal end of the left femur (Figure 5.2). Two *Spondylus* shell ear ornaments were found with the individual, one immediately south of the cranium and one beneath the cranium. A small serpentine diadem or bib-helmet pendant was discovered near the lumbar vertebrae of the individual. Various other artifacts were also found in association with Burial CC-B16B, including ceramic sherds, lithic flakes, unidentified marine shell fragments, and *jute* shell (*Pachychilus indiorum*). A single radiocarbon date on bone from Burial CC-B16B returned a 2-sigma age range of cal AD 252–384 (Gallareta Cervera et al., this volume, Tables 2.2 and 2.3).

Osteological analysis

Even though the skeleton was complete and appeared well preserved *in situ*, the bones deteriorated significantly upon removal. Elements of the entire body were recovered during the excavation, including some elements that likely belong to other individuals within the crypt.

Age and Sex

No good osteological indictors of age at death were recovered. Based on dental development and attrition the individual was an adult, possibly of middle age. Sex was estimated to be

Figure 5.1. Orthomosaic of Burials CC-B-16B, CC-B-16C, and CC-B16D.

Figure 5.2. Photograph of Burials CC-B16B and CC-B16D and associated ceramic vessel.

probable male based on carpal measurements of the left scaphoid (Mastrangelo et al. 2011).

Dentition

The teeth from CC-B16B were well preserved, but none of the teeth were in occlusion (Table 5.1). Several anterior teeth were recovered beneath the mandible. The enamel was completely worn away along with approximately half of the tooth root. Due to the extreme wear, these teeth were not identifiable as to number or side, but the single roots and their small size suggest they were all anterior teeth and probably mandibular. Six teeth were recovered intermingled with the skeletal remains of CC-B16B. Several of these were redundant with the teeth recovered from the vicinity of the skull of CC-B16B and also were of a different morphology. Three of the isolated teeth also had dental calculus, which was not present on

Table 5.1. Dentition Recovered Associated with CC-B16B

RM^3	RM^2	RM^1	RP^4	RP^3	RC^1	RI^2	RI^1	LI^1	LI^2	LC^1	LP^3	LP^4	LM^1	LM^2	LM^3
		X	X	X	X	X				X		X	X	X	
X			X	X	X	X?	X?	X?	X?	X	X	X	X		
RM_3	RM_2	RM_1	RP_4	RP_3	RC_1	RI_2	RI_1	LI_1	LI_2	LC_1	LP_3	LP_4	LM_1	LM_2	LM_3

Question marks indicate the anterior teeth that were extremely worn and were otherwise unidentifiable.

any of the CC-B16B teeth directly associated with the mandible and maxilla. The isolated teeth with dental calculus are associated with CC-B16D and a third individual, as discussed below.

Pathology and Trauma

The tibiae show striations on the medial aspects consistent with long-healed periostitis, an infection of the membrane lining the exterior surface of the bone (Ortner 2003). Periostitis is a non-specific indicator of systemic stress, meaning that it could have been caused by a number of different factors. No other evidence of pathology or trauma was observed.

Conclusion

Burial CC-B16B was the primary interment of an adult, probable male. The individual was placed in an extended, supine position with hands placed over the pelvis and feet crossed at the ankle. The head was towards the east. A small vessel, jadeite/serpentine pendant, and Spondylus earflares accompanied the body, which was interred during the Early Classic period.

Burial CC-B16C

Archaeological Context

Burial CC-B16C was also found within the Upper Plaza crypt south of Structure A-1 in Subop CC-15G. Burial CC-B16C represents the partial remains of an individual, including multiple fragile bone fragments and several well-preserved teeth situated in a small isolated mound against the western wall of the crypt. The cluster of bones was found adjacent to the feet of Burial CC-B16B and located approximately 10 cm to the south of Burial CC-B16A (see Figure 5.1). Several ceramic sherds were found mixed in with the teeth and bone fragments of Burial CC-B16C. Like Burial CC-B16B, Burial CC-B16C was buried below fill on top of the plaster floor in the crypt.

Osteological Analysis

The skeletal material designated Burial CC-B16C consisted of fragments of radius, ulna, and a metacarpal, all of unknown side. Two teeth, both from the right maxilla, were also recovered.

Age and Sex

The individual was likely an adult based on dental development and attrition. None of the skeletal elements were diagnostic for age or sex.

Dentition

Two teeth were found in association with the CC-B16C remains (Table 5.2). Both teeth exhibited mild dental attrition, and the RI^1 had minor deposits of dental calculus. The enamel of RM^1 was severely eroded.

Pathology and Trauma

Apart from the dental calculus on the mandibular incisor, there was no evidence of pathology or trauma on the remains from CC-B16C.

Conclusion

The skeletal remains designated CC-B16C were either a secondary deposit of human remains or elements that were part of CC-B16A or CC-

Table 5.2. Dentition Recovered with CC-B16C

RM^3	RM^2	RM^1	RP^4	RP^3	RC^1	RI^2	RI^1	LI^1	LI^2	LC^1	LP^3	LP^4	LM^1	LM^2	LM^3
		X					X								
RM_3	RM_2	RM_1	RP_4	RP_3	RC_1	RI_2	RI_1	LI_1	LI_2	LC_1	LP_3	LP_4	LM_1	LM_2	LM_3

B16D that were disturbed upon the placement of CC-16B in the crypt. The elements were extremely poorly preserved, as result very little information was obtained from them. One important aspect of these remains is that the two teeth recovered are not redundant with any teeth associated with CC-B16D. Several of the teeth associated with CC-B16D also exhibit minor calculus, very little attrition, and in a few cases the enamel is not well preserved.

Burial CC-B16D

Archaeological Context

Burial CC-B16D was discovered within the same context as Burials CC-B16A, CC-B16B, and CC-B16C (see Figure 5.1). The mostly complete individual was located in the southwestern corner of the Upper Plaza crypt in Subop CC-15-G, immediately south of the feet of Burial CC-B16B. The remains of the individual in Burial CC-B16D appear to have been intentionally stacked in the corner of the crypt. The cranium was placed on top of the stacked bones with the face towards the west. The long bones were placed next to the left side of the cranium against the southern crypt wall. Other than a small marine shell fragment found near the cranium, no other grave goods were found in association with this individual. The skeletal remains of Burial CC-B16D were somewhat well preserved but very fragile upon removal. As with Burials CC-B16B and CC-B16C, Burial CC-B16D was found beneath fill and had been placed on top of the crypt's plaster floor.

Osteological Analysis

Very little identifiable material was recovered from CC-B16D, even though the bones appeared well preserved *in situ*. Elements present include a cranium and mandible, left and right humeri, the left femur, and the left tibia. Bones of both hands, but primarily of the left hand, were also recovered. No skeletal elements of the feet were found.

Age and Sex

No diagnostic elements for age at death were recovered, besides the dentition. The individual was an adult at death; minimal dental wear suggests that they were not of advanced age when they died.

Sex was estimated to be male according to measurements of the left lunate, left scaphoid, and left capitate (Mastrangelo et al. 2011).

Dentition

There was not a full set of dentition associated with CC-B16D; only one tooth, the mandibular first molar, was recovered in occlusion. The other teeth recovered, which are both mandibular and maxillary, were dispersed throughout the pile of bones (Table 5.3).

Pathology and Trauma

No pathologies or signs of trauma were observed on these remains.

Conclusion

Burial CC-16D was the secondary deposit of a single, adult, probable male. The remains had been stacked neatly in the southwest corner of the crypt, south of the feet of Burial CC-

Table 5.3. Dentition Found with Burial CC-B16D

RM^3	RM^2	RM^1	RP^4	RP^3	RC^1	RI^2	RI^1	LI^1	LI^2	LC^1	LP^3	LP^4	LM^1	LM^2	LM^3
										X	X	X			
		X								X	X				X
RM_3	RM_2	RM_1	RP_4	RP_3	RC_1	RI_2	RI_1	LI_1	LI_2	LC_1	LP_3	LP_4	LM_1	LM_2	LM_3

B16B. The skeletal elements are not redundant with those of CC-B16A. CC-B16D consists of left and right humerii, bones of the left leg, and the left hand. CC-B16A consists of the bones of a right leg and right hand as well as bones of the left feet. CC-B16C, a cluster of miscellaneous elements, consists of radius and ulna fragments, neither of which were found with either CC-B16A or CC-B16D. In additions both individuals are estimated to have been male. This suggests that CC-B16A, CC-B16C, and CC-B16D may have been from the same person.

Burial CC-B16 Discussion

The crypt containing Burial CC-B16 was first excavated during the 2016 field season. Burial CC-B16A was recovered in 2016 and CC-B16B was discovered but left unexcavated (Novotny et al. 2016). Burial CC-B16A consisted of bones of the left foot, an articulated right leg, and an articulated right wrist and hand (Novotny et al. 2016). Two teeth were also recovered from Burial CC-B16A—a LC^1 and a LP_4. Carpals and hand phalanges associated with Burial CC-B16B were discovered in 2016. Burial CC-B16B was excavated in 2017 and was the primary interment of a single adult male in an extended and prone position with hands on the pelvis and the right leg crossed over the left.

During excavation of CC-B16B a small deposit of teeth and bone were identified and designated as CC-B16C. The skeletal remains were largely unidentifiable but consisted of fragments of metacarpals, a radius, and an ulna, all of unknown side. None of these skeletal elements were articulated. In addition, two teeth were also part of this deposit, an RM_1 and RI^1. These remains are located just north of CC-B16B and south of CC-B16A (Figure 5.3).

On the south side of CC-B16B, in the southwest corner of the crypt, a complete cranium and stack of long bones was discovered (CC-B16D). These remains were of a single individual, probably male, disarticulated and consisting of left and right humerii, the left femur and tibia, and fragments of a left hand, in addition to the cranium and mandible fragments. No bones of the feet were recovered in CC-B16D.

Based on the presence of three LC^1, the minimum number of individuals (MNI) in CC-B16 is three. The skeletal elements were very poorly preserved and many bones were unidentifiable in both the field during excavation as well as in the lab. Based on identifiable skeletal elements, the MNI was two.

Preliminary analysis suggests that there are no redundant skeletal elements between CC-B16A, CC-B16C, and CC-B16D, which may indicate that these are all from the same individual. The best explanation for their location in the crypt is that an individual was buried there, perhaps in a flexed position given the position of the right leg (CC-B16A), and disturbed by the interment of CC-B16B before decomposition was complete. Teeth found on the sacrum of CC-B16B and below the right elbow may indicate that the skull was originally in this area before it was moved to accommodate CC-B16B. The living moved part of the body of CC-B16A to the southwest corner of the crypt (which we called CC-B16D). The loose teeth may have fallen out of the alveolar bone when CC-B16D was moved to the southwest corner of the crypt.

The preceding scenarios assume that CC-B16A was placed in the crypt in a flexed position on its right side given the position of the right leg. If the body was fleshed at burial then the flexed, right side position would most likely result in the right hand positioned with the dorsal aspect down and the palmar aspect up. The articulated right hand was positioned palmar aspect down, around a small stone (Figure 5.4). The position of the right hand can be explained two ways. First, it was still fleshed when it was disturbed

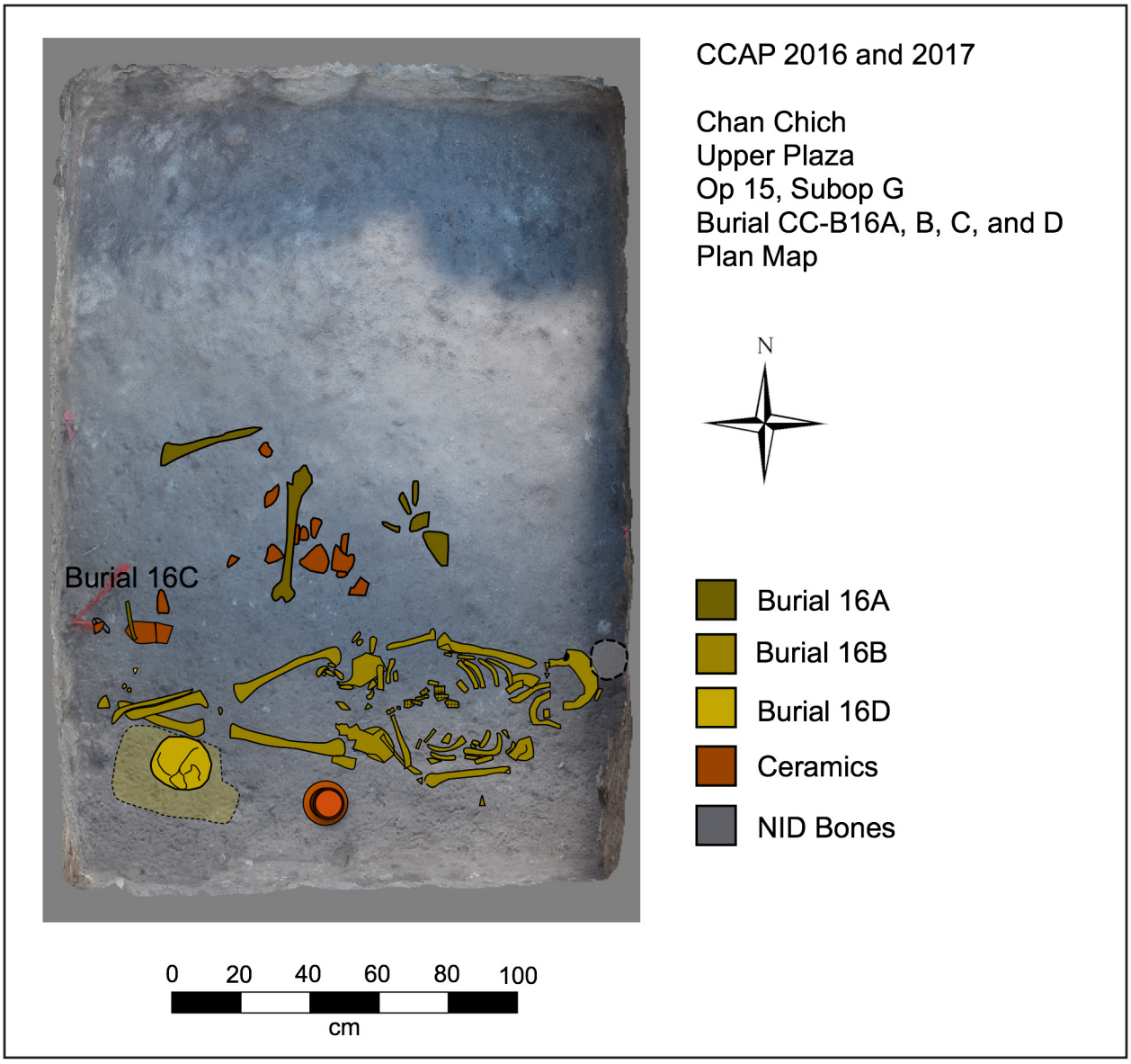

Figure 5.3. Composite drawing of Burials CC-B16A–D superimposed on orthomosaic of crypt floor.

and was turned over, coming to rest with the dorsal aspect up in plan view. Alternatively, the original position of CC-B16A when the individual was buried in the crypt was laid in a haphazard way. The first scenario seems more likely.

Finally, these scenarios also assume that the bones from CC-B16A, the articulated right leg and hand, were from the same person. It is possible that they were not, but there is no way to confirm this. The LC^1 associated with CC-B16A that is redundant with two other LC^1 (both of which have matching RC^1) suggest a third individual, or part of one, was also in the crypt.

To conclude, there were at least three people, based on the presence of an additional LC^1, in the Upper Plaza crypt. A partially decomposed individual (CC-B16A/C) was disturbed by the interment of CC-B16B and some of the remains were moved to the southwest corner of

Figure 5.4. Photograph of Burial CC-B16A right hand (to the right of the north arrow) from 2016.

the crypt (CC-B16D). The sequence of events occurred during the Early Classic period.

BURIAL CC-B17, LOT CC-15-N-04 (ONE INDIVIDUAL)

Archaeological Context

Burial CC-B17 was discovered in the Upper Plaza south of Structure A-1 in Subop CC-15-N (Figure 5.5; Gallareta Cervera et al., this volume). The grave was encountered relatively close to the modern Upper Plaza surface, just below top soil and a thin layer of fill. Burial CC-B17 was identified as a single individual located in a simple cist (see Welsh 1988 for definition) set within dry fill (see Figure 5.5). The fill was used to cover the Preclassic structure nicknamed Blanca, situated south of Structure A-1. The Preclassic structure was later identified below Burial CC-B17. The crypt containing the other Upper Plaza burials is located to the west of where Burial CC-B17 was found.

The individual was placed in an extended position with the head oriented to the north. A complete ceramic dish was intentionally placed over the skull. The orange ceramic dish has a finger-impressed rope band pattern and was dated to the Late Preclassic (Gallareta Cervera et al., this volume). A single radiocarbon date from a piece of bone returned a 2-sigma age range of cal 154 BC–AD 47 (Gallareta Cervera et al., this volume, Table 2.2 and 2.3). The skeletal material was in poor condition with very few bones preserved. Other than the ceramic dish, no other grave goods were found interred with the individual in Burial CC-B17.

Osteological Analysis

Burial CC-B17 was extremely poorly preserved. Very little osseous material was recovered during excavation.

Age and Sex

Age was estimated to be young to middle age adult at the time of death based on dental

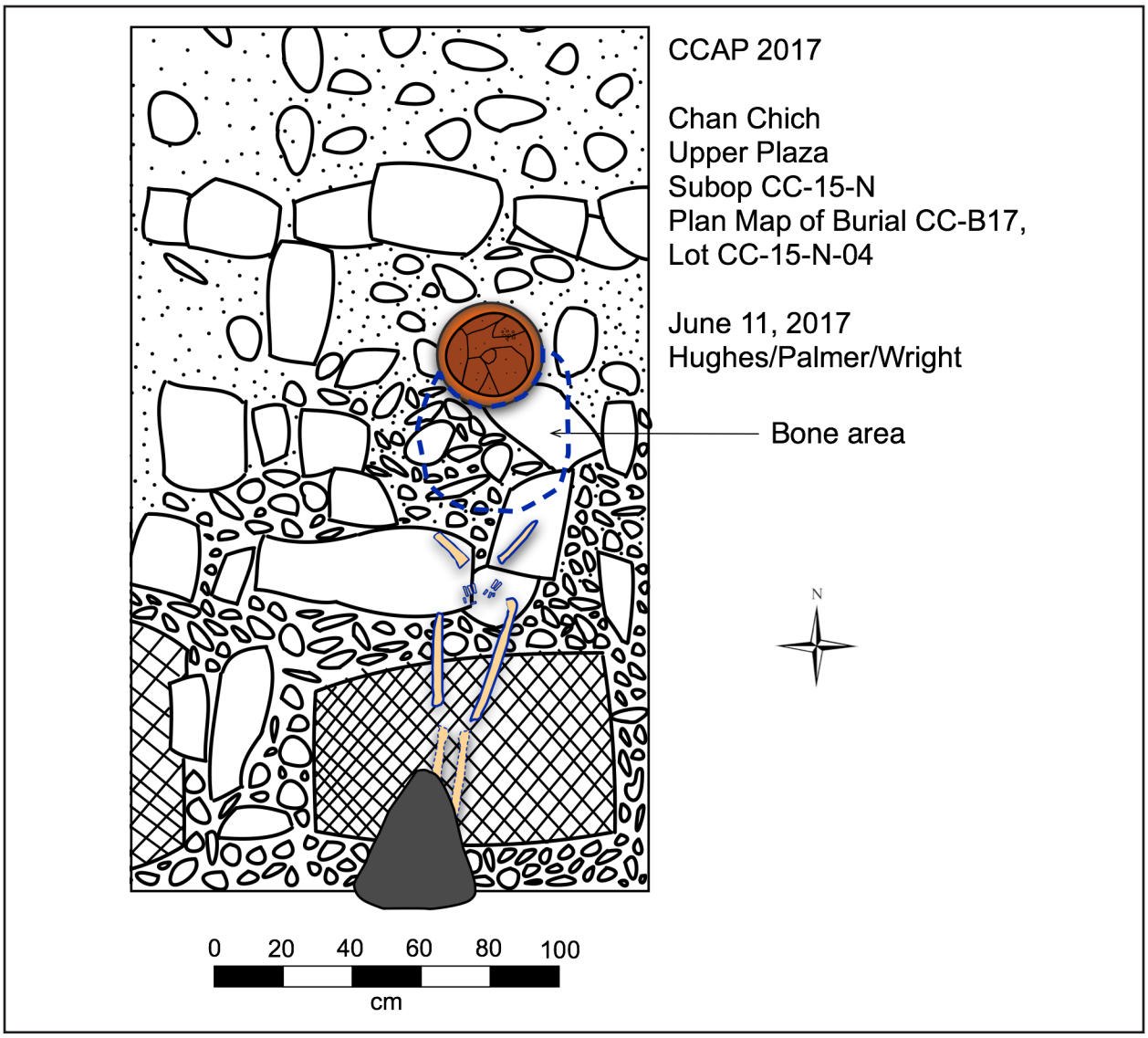

Figure 5.5. Plan map of Burial CC-B17.

attrition. No skeletal remains indicative of sex were preserved.

Pathology and Trauma

No pathologies or signs of trauma were observed on these remains.

Dentition

Even though not many complete bones were recovered from Burial CC-B17, nearly all the teeth were recovered (Table 5.4). The dental attrition was minor, and the teeth showed no pathologies, like calculus or caries.

Pathology and Trauma

The skeletal elements available for analysis did not show any pathologies or trauma.

Conclusion

Burial CC-B17 consisted of a young adult individual of unknown sex in an extended, supine position with head to the north. A ceramic dish had been placed over the skull.

Table 5.4. Dentition Present from Burial CC-B17

RM^3	RM^2	RM^1	RP^4	RP^3	RC^1	RI^2	RI^1	LI^1	LI^2	LC^1	LP^3	LP^4	LM^1	LM^2	LM^3
X	X	X	X	X	X	X	X		X	X	X	X	X	X	
	X			X	X	X		X		X	X	X	X		
RM_3	RM_2	RM_1	RP_4	RP_3	RC_1	RI_2	RI_1	LI_1	LI_2	LC_1	LP_3	LP_4	LM_1	LM_2	LM_3

Preservation of the skeleton was poor due to its shallow depth, so no further information was available.

BURIAL CC-B18A, LOT CC-17-C-10 (TWO INDIVIDUALS)

While excavating in the southeastern corner of the western room of Structure D-41 in Courtyard D-4, excavators encountered a weak spot in the plaster bench surface that eventually become a void (Kilgore et al., this volume). Upon investigating the relatively loose packed subfloor fill, Kilgore's crew excavated through the southeastern corner of the bench surface in a 1-x-1.4-m section around the void. The excavations encountered Burial CC-B18 in the construction fill, resting on a lower plaster surface, which was the same surface as the floor in the room. Burial CC-B18 consisted of two individuals (Figure 5.6). Individual CC-B18A was in a flexed position in the western part of the burial area, oriented east-west. No cranium was found with this individual. The second skeleton, Individual CC-B18B was also in a flexed position in the northeastern corner of the burial, oriented east-west. Individual CC-B18B was much better preserved than individual CC-B18A. Neither formal construction nor any grave goods, aside from some artifacts in

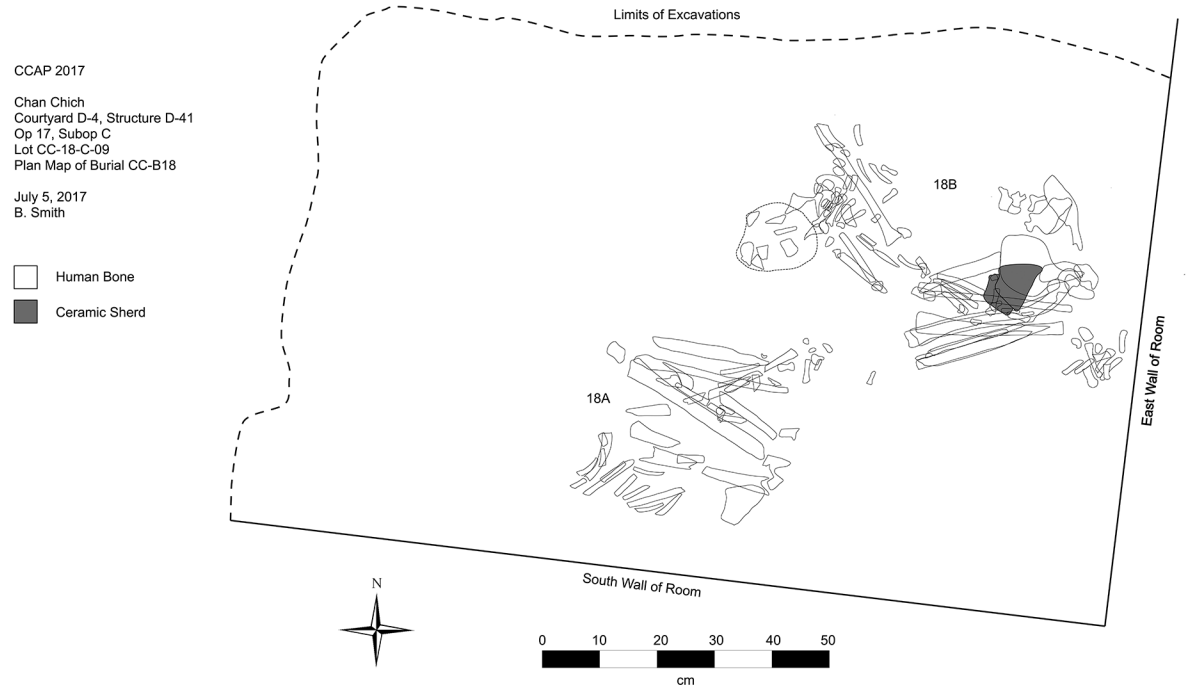

Figure 5.6. Plan drawing of Burials CC-B18A and CC-B18B.

the subfloor fill, were associated with the two individuals in Burial CC-B18.

Burial CC-B18A

Osteological Analysis

The skeletal material from CC-B18A was poorly preserved. Elements present for analysis include fragments of the diaphysis of the bones of the left and right arms and legs and the right hand. Bones of the thorax and skull were present but extremely fragmented.

Age and Sex

Age was estimated to be middle adult based on the development and attrition of the dentition. No cranial or pelvic elements were present for assessment of sex, but several carpals were preserved well enough to measure. Sex was estimated to be probably female based on measurements of the right scaphoid, left lunate, and right capitate (Mastrangelo et al. 2011).

Dentition

Only three teeth were recovered from CC-B18A (Table 5.5). The teeth showed no pathologies, like caries or dental calculus. Dental attrition was moderate suggesting a middle adult age at death.

Pathology and Trauma

No evidence of pathology or trauma was observed on any of the skeletal elements recovered from CC-B18A.

Conclusion

The remains from CC-B18A were poorly preserved but were likely those of an adult, probable female placed in a flexed position and oriented east-west, with head to the east. While a few isolated cranial fragments were recovered, the skull and nearly all of the dentition were missing. It was not clear from the archaeological context if CC-B18A was made before, after, or at the same time as CC-B18B. However, if the bench was opened to inter CC-B18B, the living may have removed the skull of CC-B18A for the purposes of ancestor veneration (e.g., McAnany 1995; Welsh 1988).

Burial CC-B18B

Osteological Analysis

The remains from CC-B18B consisted of fragments of skull, ribs, vertebrae, left and right arms, legs, hands, and feet.

Age and Sex

Age at death was estimated to be young adult based on dental development and attrition, which was minimal. The vertebrae recovered do not show any age related osteoarthritic changes.

Sex was estimated to be female based on features of the cranium and measurements of the left scaphoid and right lunate (Mastrangelo et al. 2011).

Dentition

Nearly all of the teeth were recovered from CC-B18B (Table 5.6). Dental attrition was minor and no dental calculus was observed. The RI2 and LI2 had a very high degree of shoveling, so much so that the RI2 was nearly barrel shaped.

Table 5.5. Dentition Recovered from Burial CC-B18A

RM^3	RM^2	RM^1	RP^4	RP^3	RC^1	RI^2	RI^1	LI^1	LI^2	LC^1	LP^3	LP^4	LM^1	LM^2	LM^3
										X				X	
	X														
RM_3	RM_2	RM_1	RP_4	RP_3	RC_1	RI_2	RI_1	LI_1	LI_2	LC_1	LP_3	LP_4	LM_1	LM_2	LM_3

Table 5.6. Dentition Recovered from Burial CC-B18B

RM^3	RM^2	RM^1	RP^4	RP^3	RC^1	RI^2	RI^1	LI^1	LI^2	LC^1	LP^3	LP^4	LM^1	LM^2	LM^3
X	X	X	X	X	X	X	X	X	X	X	X	X	X		X
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
RM_3	RM_2	RM_1	RP_4	RP_3	RC_1	RI_2	RI_1	LI_1	LI_2	LC_1	LP_3	LP_4	LM_1	LM_2	LM_3

Pathology and Trauma

None of the skeletal remains from CC-B18B showed any signs of pathology or trauma.

Conclusion

The skeletal remains from CCB-18B consisted of a young adult female in a flexed position with head to the west. CC-B18B was recovered from within a bench and was accompanied by a second individual, CC-B18A. The sequence of interment is not clear, but the missing cranium of C-B18A suggests that individual was interred first and CC-B18B was interred second, disturbing CC-B18A or resulting in the curation of the skull of CC-B18A by the living. A single radiocarbon date on bone from CC-B18B returned a 2-sigma date range of AD 769–886 indicating the burial dates to the Late Classic or Terminal Classic period.

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Mapping at Chan Chich

Mark D. Willis, Julia Kleine, Marcus Schwimmer, Paul Schwimmer, and Chet Walker

Mapping archaeological sites in dense jungle has always been a challenge. During the 2017 field season at Chan Chich, we used a combination of methods to document the landscape around the core of the site as well as at Courtyard D-4, which is located to the east of the site's center. This chapter describes the use of traditional Total Data Station (TDS) mapping that was augmented with Structure from Motion (SfM) modeling data. SfM data was generated from an Unmanned Aerial Vehicle (UAV) and from Pole Aerial Photography (PAP). These were combined to create a comprehensive topographic map.

METHODOLOGY

Two datums, with centimeter accuracy positions were established before other mapping work began. These rebar datums were placed at prominent locations at Structures A-1 and A-5 and recorded using a CHC OPUS X-90 GPS unit. The datum at Structure A-1 is located at UTM (Zone 16 NAD83) coordinates of 275,877.58E, 1,940,390.49N, with an elevation of 131.00 m, and the datum at Structure A-5 is at 275,907.97E, 1,940,519.81N, with an elevation 124.33 m. The X90 GPS was situated above each datum for several hours in order to get centimeter accuracy locations for each rebar. Data from the X90 GPS were upload to the USGS OPUS website, and the USGS provided corrected high-resolution coordinates for the datums via email. The presence of the datums with high quality, real world locations allowed for the establishment of a grid system that the other mapping equipment used during the rest of the recording effort. Most importantly, the fact that the grid system is in real world coordinates means that future researchers can lock into the same grid without the use of our datums.

Paul and Marcus Schwimmer, of Michigan based Arbor Land, Inc., provided professional surveyor services for the project. Julia Kleine, a student at Texas Tech, and Chet Walker of Archeo-Geophysical Associates (AGA), along with a crew of local workers, helped with the TDS mapping of the site. This effort involved manual clearing of understory in the Upper Plaza so that survey equipment would have clear line-of-sight between recording stations and mapping points (Figure 6.1). The crews used two Leica TS12P Robotic TDS units. The TDS works by shooting a laser from the base station to a reflective prism located on the top of a mapping rod. As the rod is manually moved to various locations around the site, the Leica records the exact coordinates of each mapping location (Figure 6.2). This provides highly accurate three-dimensional map of the surface of the site that is tied directly into the UTM grid system mentioned previously. While the technology has become easier to use and more sophisticated in recent years, this is how traditional TDS mapping has been conducted for the past 25 years or more. The benefit of TDS mapping is that a trained surveyor can

Willis, Mark D., Julia Kleine, Marcus Schwimmer, Paul Schwimmer, and Chet Walker
2017 Mapping at Chan Chich. In *The 2017 Season of the Chan Chich Archaeological Project*, edited by Brett A. Houk and Claire Novotny, pp. 157–166. Papers of the Chan Chich Archaeological Project, Number 12. Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

Figure 6.1. Clearing of understory at Upper Plaza.

place the mapping points at precise locations that define the shape of the landform very efficiently.

In addition to TDS mapping, SfM modeling was employed on the project. SfM modeling is a digital technique that creates a 3D model from multiple overlapping photographs (Willis et al. 2016). Two separate but similar SfM mapping approaches were used on this project. The first involved the flying of small UAV, or drone, and the second employed pole-based aerial photography. The UAV was used to map the mostly open-air portion of Chan Chich's Main Plaza. This is the area that houses most of the facilities associated with Chan Chich Lodge and is the part of the site with the least amount of vegetation. The drone used was a small quadcopter. The area was flown in north/south and east/west grid transects with the drone taking photos straight down at regularly spaced intervals. Additional grids were flown over the Main Plaza with the drone's camera at various oblique angles. The oblique photos were important because they produced imagery of areas that were obscured by overhead. This provided for clear imagery of the base of trees, areas covered by roof overhangs, and other hard to see places from the images taken straight down from the drone and allowed for the greater modeling of details than would have been possible from a normal drone mapping approach.

The Upper Plaza was also carefully mapped with the UAV after much of the understory had been cut back to facilitate the TDS mapping effort. While the lower vegetation had been removed there was still a large amount of plant growth above head height. The drone was manually flown very slowly and cautiously among the branches of the overstory and around the occasional howler monkey. All the while taking a number of down facing and oblique photographs. In the past, this sort of flying would have been much more difficult or impossible as the drone technology typically relies entirely on GPS connectivity. A GPS signal is very hard to maintain under heavy vegetation like that found at Chan Chich. What

Figure 6.2. TDS mapping in the Upper Plaza.

made this mapping possible is that the drone was equipped with an optical flow sensor. This sensor allowed the UAV to maintain its attitude based on optical data collected around the drone by cameras, making it possible to pilot the drone within 50 cm or less of branches while remaining extremely steady without a reliable GPS signal (Figure 6.3). The result was the ability to SfM model portions of the Upper Plaza that could be combined with the other mapping techniques.

Courtyard D-4 was mapped using PAP and with TDS. PAP has been used extensively at Chan Chich in the past Houk et al. 2013; Willis et al. 2014) and involves placing a digital camera on the end of long pole and taking photographs using a remote camera trigger. The camera is walked across the subject area in transects and hundreds of photographs are taken and later processed using SfM software. PAP was chosen for use at Courtyard D-4 because the area is fairly small, about 35 m by 35 m, and the vegetation overstory is too close to the ground to employ UAV mapping, as was done in the Upper Plaza. A total of 1,533 photos was collected using PAP at Courtyard D-4.

Both the UAV mapping in the Upper and Main Plazas and the PAP work at Courtyard D-4 used Ground Control Points (GCPs) to tie into the UTM grid that was established with the OPUS X-90 GPS. This ensured that the data collected using SfM would accurately overlay with the TDS mapping.

Figure 6.3. Flying the UAV within the overstory in the Upper Plaza.

RESULTS AND DISCUSSION

Arbor Land, Inc.'s surveying crews collected a total of 1,829 points in the Upper Plaza and Courtyard D-4 area using the Leica TDS. Their efforts involved five days of fieldwork and extensive trimming of the understory. The data collected by the survey crews were imported into AutoCAD and turned into a contour map. This map clearly defines the orientation and general shape of the mounds in the areas mapped.

The drone data for the Upper and Main Plazas was processed using SfM software and locked into the same UTM grid system as that used in the TDS mapping. The drone data resulted in a point cloud of 50,568,506 points. While this point density is high, many of the points in the cloud are tree tops, buildings, and areas other than bare ground. The point cloud was manually cleaned of as many non-ground points as possible (Figure 6.4). This tedious process was accomplished by manually selecting points that were above ground level and deleting them in the software. Once a point cloud was created with most extraneous points removed, a Digital Elevation Model (DEM) was created. The resulting DEM was highly accurate but still provided areas with gaps in the mapping data or places obscured by vegetation. To make the most of this data, the DEM was remapped virtually. This new process, developed for this project, allowed for "Virtual Surveying" of the area. In the computer, the DEM data was examined and treated as if it were a landscape that would be traditionally surveyed. Instead of taking physical TDS shots on the landscape, which would have taken an enormous amount of time due to the lack of line-of-sight required by the TDS, a series of points were collected from the DEM at strategic places on the DEMs surface. The points locations were selected to provide the best and most accurate contour map of the site while avoiding those areas that were problematic in the 3D model. In other words, the model was treated as if a real surveyor was trying to map the landform but without the usual constraints of TDS mapping. This resulted in a contour map that could also take advantage of the contour data collected with the TDS (Figure 6.5). This cleaned up version of the map provides highly accurate results while removing the details of the 3D model that are distracting or non-archaeological in nature (Figure 6.6).

The SfM mapping with PAP at Courtyard D-4 also provided strong results. This area had been thoroughly cleaned of most understory during excavations at this location making the bare ground very visible. It was especially good for 3D modeling, and a point cloud consisting of 415,040,224 points was created from the processed PAP data. The Virtual Surveyor mapping technique was also used to create a clean topographic map of the courtyard (Figure 6.7).

CONCLUSION

The site of Chan Chich continues to be a challenging environment in which to conduct mapping projects. The challenges have led to new techniques to cartographically record the landscape such as the Virtual Surveyor method we developed. The processes documented here show how the use of traditional methods of mapping can be combined with 3D modeling to create results that take advantage of the best parts of each approach. In the particular, Virtual Surveyor mapping method we present has potential to be useful in all forms of SfM mapping where a clean contour map is the desired result.

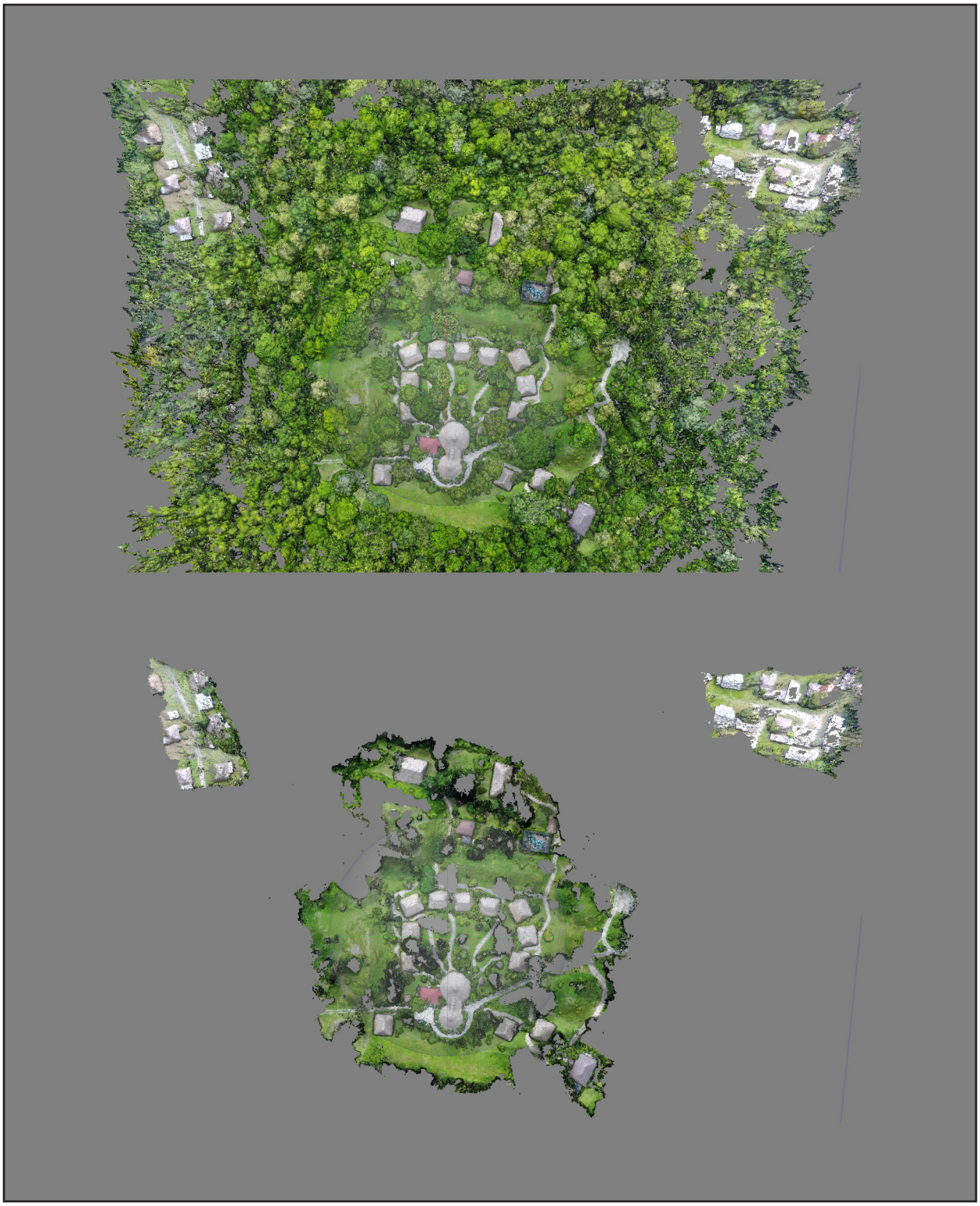

Figure 6.4. Original point cloud on top with cleaned point cloud on bottom.

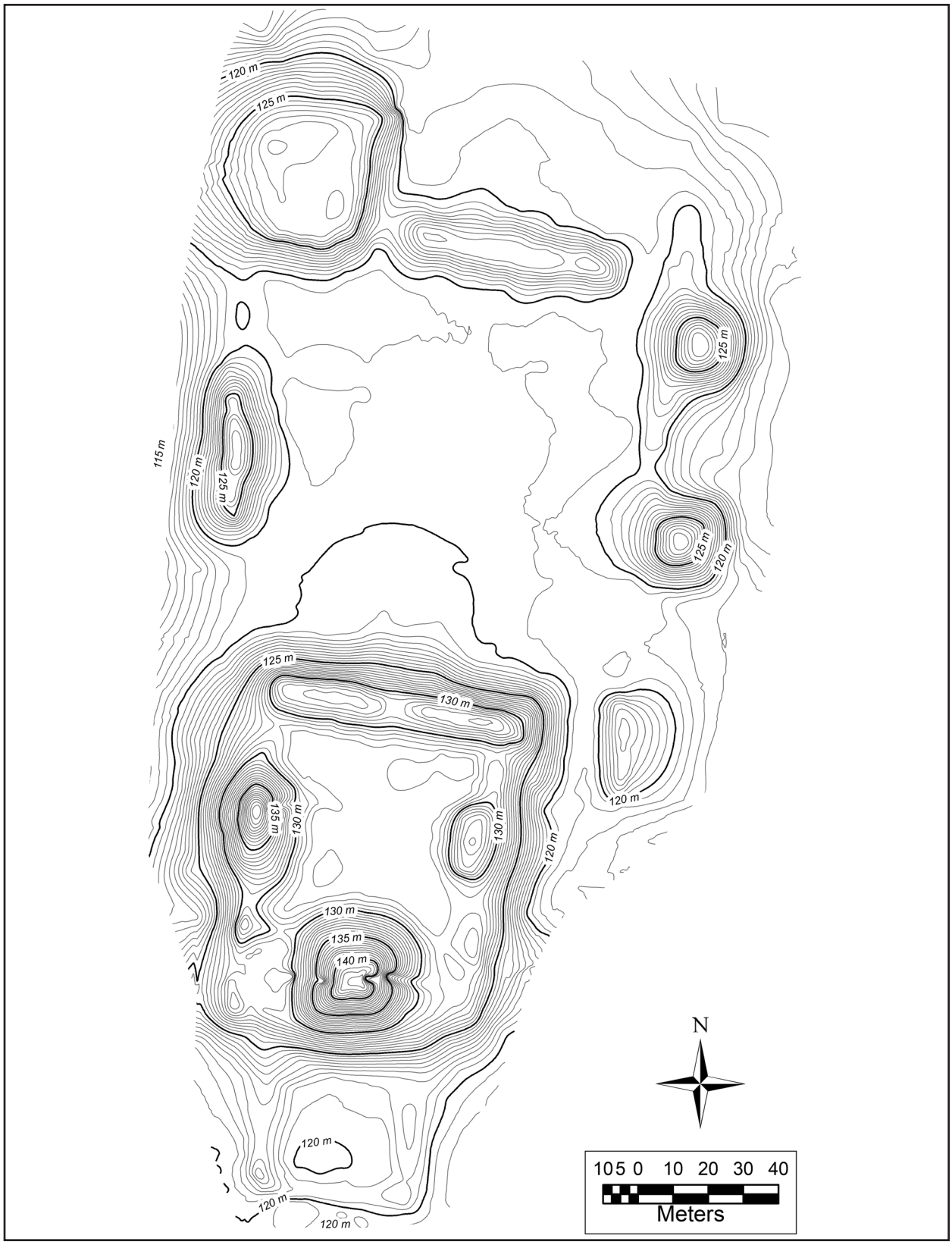

Figure 6.5. 50-cm contour map of the Main and Upper Plazas at Chan Chich derived from combination of TDS and SfM mapping data.

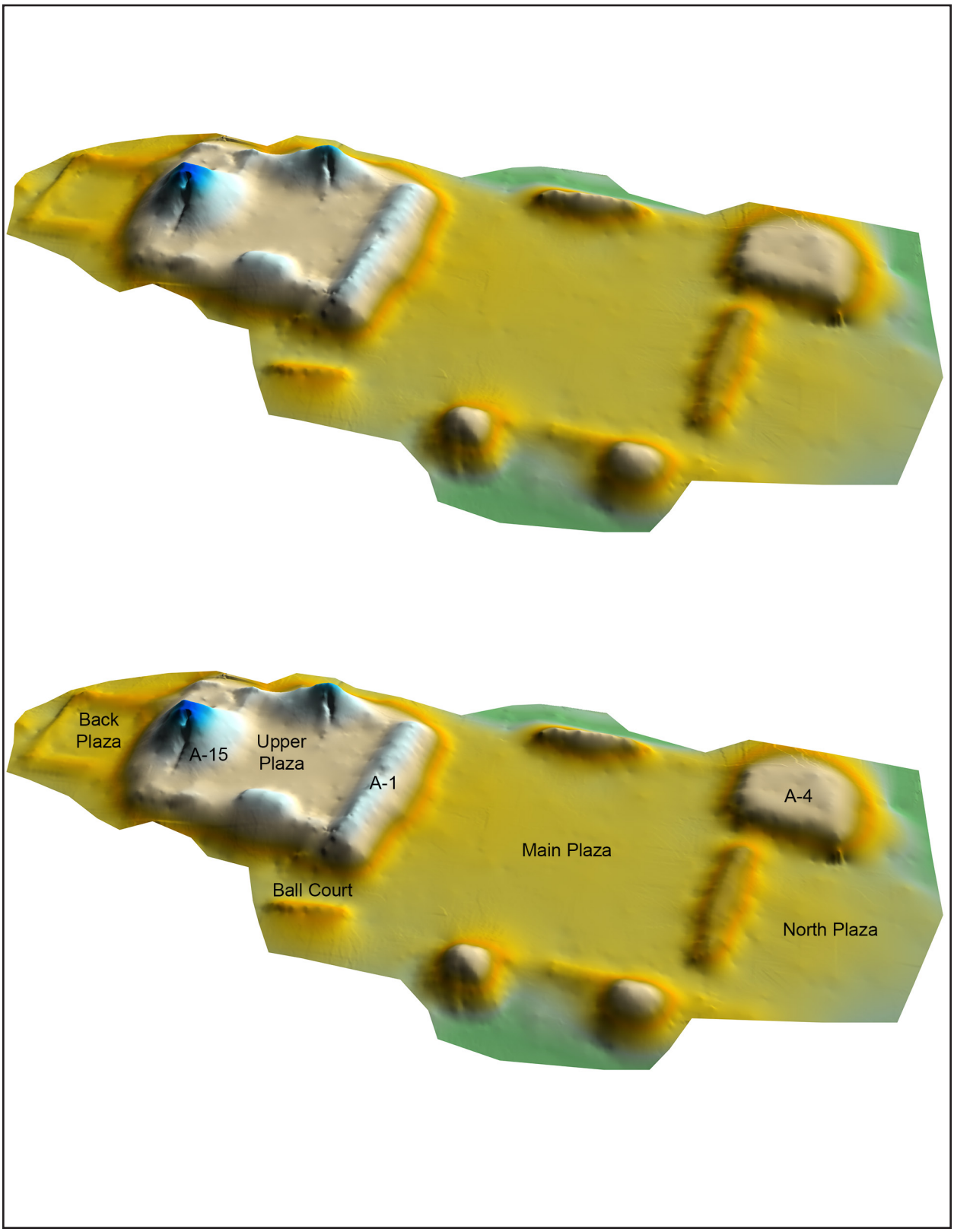

Figure 6.6. Oblique view to the west/southwest of modeled TDS and SfM data.

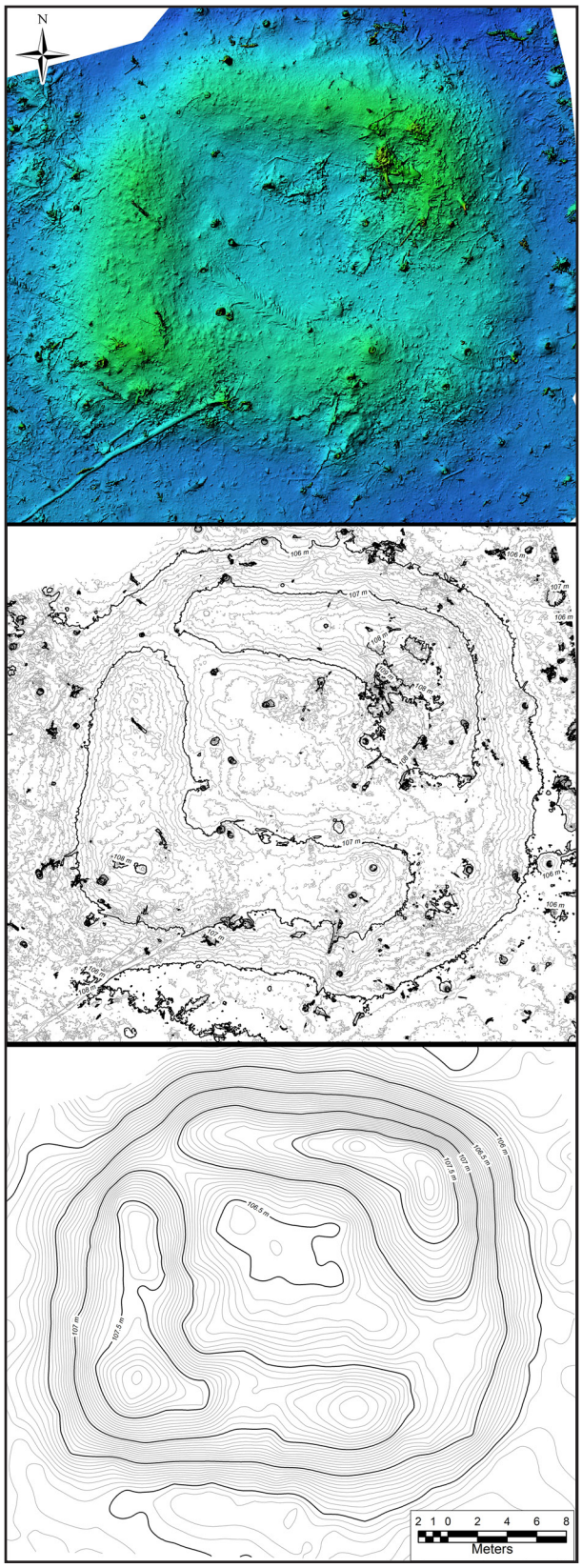

Figure 6.7. 3D model of the surface of Courtyard D-4 at top, automatically created 10-cm contours in the middle image, and 5-cm contours derived from the Virtual Surveyor method at bottom.

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Archival Data on Kaxil Uinic and the San Pedro Maya

Brooke Bonorden, Hunter Lee, and Brett A. Houk

In addition to excavations carried out by the Belize Estates Archaeological Survey Team (BEAST) as part of the 2016 season of the Chan Chich Archaeological Project's (CCAP) investigation of Kaxil Uinic village (see Bonorden and Kilgore 2016), the senior author conducted extensive archival research at three repositories in Jamaica and the United Kingdom, in search of direct references to the village site in official correspondence dating to the Late Colonial period (ca. 1850–1900). Because British Honduras was a British colony (1862–1871) and later a Crown colony (1871–1981), the project director, Brett A. Houk, and the senior author theorized that most colonial correspondence regarding British Honduras (present-day Belize), and, by extension, the colonial interactions with the inhabitants of Kaxil Uinic village, would be housed among official British governmental documents. Methodist missionaries sent to British Honduras from England at the turn of the century maintained detailed records of their interactions with the "Indians" they were attempting to convert; it was reasoned that such accounts could provide further insight into the daily lives of the San Pedro Maya that are absent from colonial administrative records. From the late 1600s until 1884, British Honduras was under the jurisdiction of the Governor of Jamaica, presenting the possibility that additional archival records related to Kaxil Uinic might be housed in Spanish Town. Through an inspection of such archival data, the investigators aimed to thoroughly examine the nature of cultural contact between the Maya and British during the late nineteenth century, and clarify the subaltern colonial experience of the San Pedro Maya.

Over a two-day period in March 2016, the project director and senior author transcribed 48 letters housed in the Jamaica Archives and Records Department (JA) in Spanish Town, Jamaica from source copies. The senior author traveled to England in April 2016 and visited two additional archives. Over a two-day period at the Wesleyan Methodist Missionary Archives at the School of Oriental and African Studies in London, the senior author located and transcribed five pieces of correspondence from microfilm that mention interactions with the Maya during the Late Colonial period. The senior author also traveled to the Public Records Office (PRO) in Kew, England, where she photographed numerous pieces of official colonial correspondence over a three-day period. Hunter Lee then transcribed the photographs of 438 historical documents over a period of three months. Alphawood Foundation funded the archival work as part of a three-year grant supporting the Chan Chich Archaeological Project.

PREVIOUS RESEARCH

In 2012, project director Brett A. Houk conducted a literature review of archival records related to Kaxil Uinic village housed at

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the Field Museum of Chicago, Illinois (Houk 2012:31). These documents detail Sir J. Eric S. Thompson's 1931 archaeological expedition to Belize. Thompson (1963) had planned to excavate the nearby prehistoric ruins of Kaxil Uinic as part of the Third Marshall Field Archaeological Expedition to British Honduras (sponsored by the Field Museum of Natural History) with laborers from the historic village, reasoning that this would cut the costs of importing laborers and providing them with food and transportation to the ruins. Transporting and feeding the workers proved to be a costly endeavor during his 1928 and 1929 excavations in the region (Conservator of the Forests 1930). The authors consulted these archival records from the Field Museum, as well as Houk's (2012) summary of their contents, when constructing a historical background for the site.

Thompson's (1963:233) description of the settlement in 1931 provides some sense of the size and layout of the village. Thompson (1963:233) described the village shortly after its abandonment as a "score of huts scattered around a dirty water hole," which presented a "melancholy" appearance. Thompson's (1963:233) observation indicates the presence of approximately 20 huts around the only source of drinking water for the villagers, known as an *aguada*. A telegram to Thompson from the Office of the Conservator for the Forests in British Honduras (Conservator of the Forests 1930), regarding his request to excavate the area around "Xaxe Venic," recommended that Thompson reside in the "court house" in the village, as the structure was considered "quite habitable" by the colonial administration. This building is later referred to as a "*Cabildo*" by the Colonial Secretary's Office (Colonial Secretary, March 5, 1931) when they requested that the *alcalde* of Kaxil Uinic allow Thompson's party to stay there. Despite a sense of political autonomy, the San Pedro Maya at Kaxil Uinic paid rent to Belize Estate and Produce Company (BEC) for use of the land (Thompson 1963:224–225). According to plans housed in the Surveyor General's Office at the time, Kaxil Uinic was included in BEC's "Armstrong" estate on the Rio Bravo (Conservator of the Forests 1930; Figure 1).

Upon arriving in Belize in 1931, Thompson (1963:228) was forced to change his plans to excavate at Kaxil Uinic ruin. BEC had forcibly moved the village's inhabitants to San José Yalbac. While the reasons for the closure are not entirely clear, Thompson (1963:233–234) notes that the village was well situated to smuggle *chicle* out of Guatemala without paying export taxes and had been a smuggler's hangout for many years. However, BEC may have moved the population of Kaxil Uinic for the same reasons the company later transferred the population of San José to Orange Walk in 1936: "partly the result of friction between the Maya and negro lumbermen of the company, and partly because of damage done to young timber by the villagers in their indiscriminate felling and burning of forest for milpa cultivation" (Thompson 1939:4). With no local labor available at Kaxil Uinic, Thompson shifted his research to ruins near San José Yalbac (Houk 2012:35). The best San Pedro laborers at San José Yalbac, which now included the former residents of Kaxil Uinic, were observed by Thompson (1963:230) to be presently employed by BEC or occupied with their *milpas*. The remaining laborers appeared "hookwormy or malarial."

Prior to the 2015 CCAP field season, three researchers examined archival records housed at the Belize Archives and Records Service (BA) in Belmopan for information pertaining to Kaxil Uinic village. The Belize Archives and Records Service is the national repository for archival documents in Belize, containing census records, historic maps, and

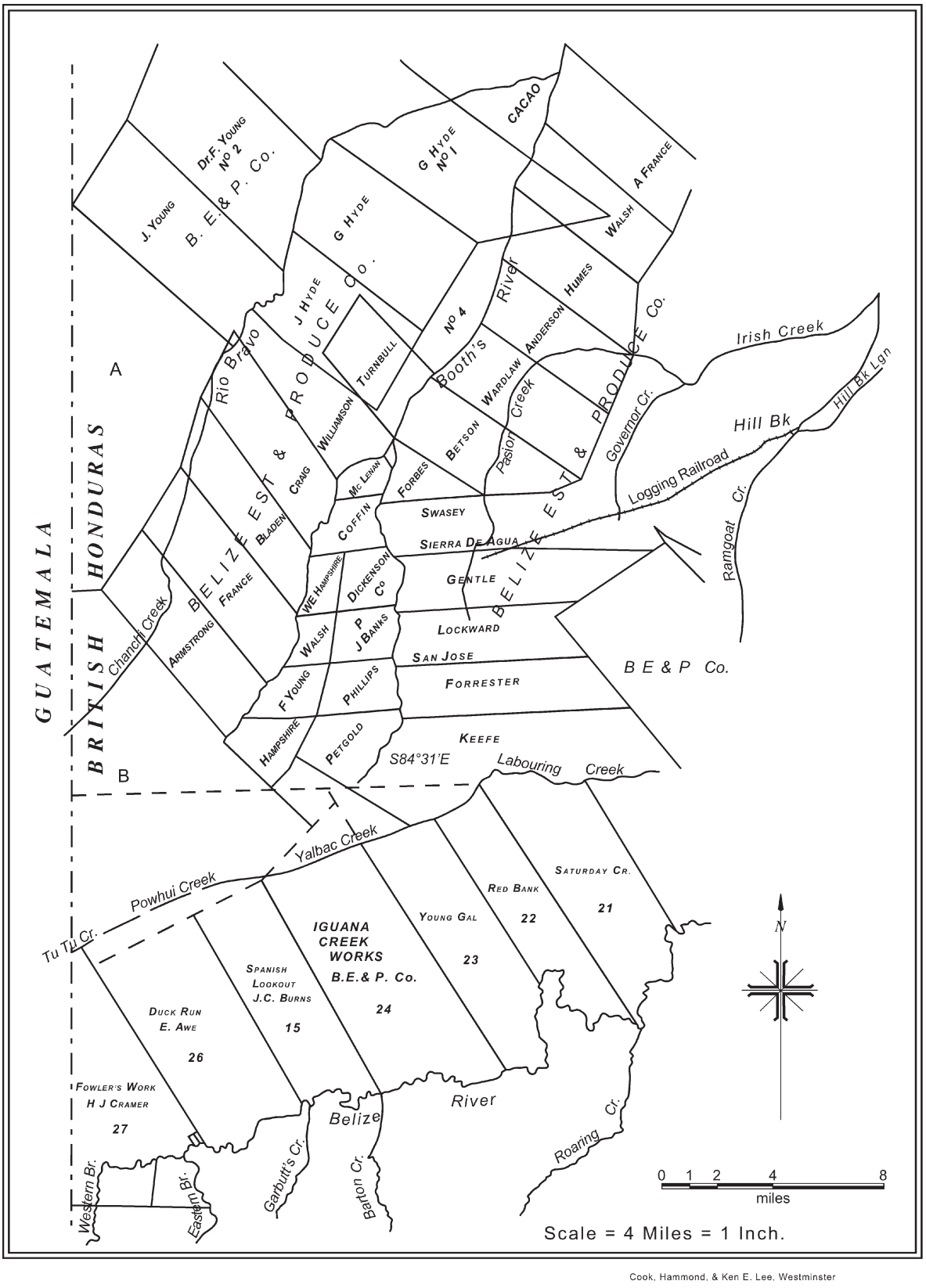

Figure 7.1. Map of Belize Estate and Produce Company Lands in 1936 (PRO CO 123/355 2). Redrawn from photograph of the original.

governmental correspondence related to the British colonial governance of Belize. It was anticipated that archival research conducted from this repository would yield more detailed descriptions of the village, such as the approximate locations and sizes of structures within the known site area, BEC land rental agreements with the San Pedro Maya, and so forth, and such information would maximize the potential for data recovery within the time constraints of the CCAP field season.

Documents consulted at the BA included newspapers, census records, US consular reports, maps, and fact books. Unfortunately, very little information pertaining to Kaxil Uinic was found among these documents (Bonorden 2016). General descriptions of the daily lives of Caste War Maya groups, however, were found in ethnohistorical accounts (Gann 1918; Rugeley 2001). Although these anecdotes cannot be directly attributed to the San Pedro Maya at Kaxil Uinic, one may assume that circumstances in the village were similar to those described. Excerpts from British archaeologist Thomas Gann's (1918:16) ethnographic account of Maya groups in Quintana Roo and Belize, for example, describe the daily routines of Yucatec Maya women, stating that they prepared tortillas, corn cakes, and cigarettes each morning before gathering cotton, which was spun and woven to make garments. Conversely, Gann (1918:17) also asserts that "among the Indian women of British Honduras, the old customs [were] rapidly dying out; spinning and weaving [were] no longer practiced, pottery making [had] been rendered unnecessary by the introduction of cheap iron cooking pots, and even the metate [was] rapidly superseded by small American hand mills for grinding the corn." Gann's (1918:17) statement is consistent with notions that the San Pedro Maya were incorporated into the colonial social structure of British Honduras after 1900 (Bolland 2003). Gann (1918:17) also describes the daily tasks of Maya men, who "[did] light work for the rancheros and woodcutters," though they often "[left] their work as soon as they [had] acquired sufficient money for their immediate needs," implying that the San Pedro Maya sought to maintain their autonomy in the face of external pressures.

Methodist missionary Richard Fletcher, who visited Maya villages near Corozal, British Honduras between 1854 and 1880, similarly describes his encounters with the Caste War Maya in a letter (reprinted in Rugeley 2001) written to the Wesleyan home office in London in 1867. Although the descriptions in Fletcher's (Rugeley 2001) letter predate the settlement of Kaxil Uinic in the 1880s, his accounts of Yucatec Maya life are corroborated by Gann's later observations in 1918.

When describing Maya dress, Fletcher (Rugeley 2001:107) and Gann (1918:18–19) state that cheap American and English imported goods gradually replaced homespun cotton garments, and sandals gave way to imported shoes. Gann (1918:19) further indicates that local embroidery was rapidly replaced by cotton manufactured in England and the United States, which had colors and designs stamped onto them.

Despite the adoption of attire produced by western manufacturers, it appears that the San Pedro Maya continued to employ traditional construction techniques within their villages. When describing a typical house in a Caste War Maya village, Fletcher (Rugeley 2001:105) states that these single-room houses were constructed without nails, and their only openings were the doorways cut out on each side of the house. The inhabitants slept in hammocks and cooked corn and soups, with iron pans and earthen pots, on three-stone hearths called *k'óoben* (Rugeley 2001:105–106).

When describing Maya religious beliefs, Fletcher (Rugeley 2001:109, 111) notes that Maya children were baptized by Catholic priests at a charge of four pesos, and processions often took place when visiting priests arrived in the villages. In additional references to Maya Catholicism, Gann (1918:40) asserts that they often believed images of Christian saints were endowed with life and used their powers to answer the prayers of their devotees. Fletcher (Rugeley 2001:106), meanwhile, states that houses often contained altars on which "two or three crosses [were] placed." Gann (1918:42) concludes that the Christianity practiced by the Maya he encountered was "merely a thin veneer, and that fundamentally their religious conceptions and even their ritual and ceremonies [were] survivals" of Pre-Columbian beliefs, often associated with agriculture, though somewhat changed through time and cultural contact. Fletcher (Rugeley 2001:111), who recounts that he procured two clay idols from the Maya he visited, echoes this sentiment.

Although the references to Kaxil Uinic (and the Maya in general) collected by BEAST in 2012 and 2015 from British colonial accounts inherently reflect a politically and socially biased perspective of circumstances, some vital clues about life for the San Pedro Maya may be extracted from these sources. As colonial legislation prohibited the San Pedro Maya from owning land, BEC acquired the title for lands around Kaxil Uinic (Conservator of the Forests 1930). The residents probably participated in wage labor positions in the cash economy of British Honduras as loggers or *chicleros* so that they could pay rent to BEC (Thompson 1963:230). Thompson (n.d.b:4) reported in his 1931 field notes the following about *chicle*:

> Chicleros now paid $15 for …100 lbs. During the war rose as high as $80. Boleto to work in Guatemala $50. In B.H. gratis s. Export tax in G. $7. Contrabanders pay the customs man about half this.

However, it appears that the San Pedro Maya might have only engaged in *chicle* harvesting long enough to acquire the requisite cash for their immediate needs (Rugeley 2001:172) as a further effort to maintain their autonomy in the face of external pressures. Consequently, many traditional customs of Maya dress and food preparation appear to have been replaced by English and/or American substitutes (Rugeley 2001:171). This predicament, further frustrated by competing designs for resource extraction in northwestern Belize (which was rich in mahogany and sapodilla), ultimately led to the relocation of the Kaxil Uinic villagers in 1931.

To remedy the lack of archival data available on Kaxil Uinic in the BA, the project director and senior author concluded that further archival research should be conducted elsewhere. Although other researchers such as Cal (1991), Dornan (2004), and Ng (2007) documented the usefulness of archival records stored in England, the JA was an untapped resource for Caste War studies prior to the 2016 season of the CCAP. With additional information gleaned from the proposed investigations, the colonial experiences of the San Pedro Maya at Kaxil Uinic might become more apparent, as well as how those experiences differed from the inhabitants of other San Pedro Maya villages, such as San Pedro Sirís and Holotunich.

REVIEW OF JAMAICA ARCHIVES

At the JA, Bonorden and Houk combed through numerous "minute papers" produced in the nineteenth century. According to the United States Bureau of Insular Affairs (1905:687), minute papers were a record keeping system employed across the British colonies, where "all communications relating to one case or paper [were] put in a cover…which [received] a serial number, a brief of the subject, and the

name of the writer of first communication." Officials would then add commentaries (like memorandums) to these compilations. When researching these documents at the JA, it became apparent that most minute papers in the repository predated the settlement of Kaxil Uinic village (ca. 1880). Despite such circumstances, Bonorden and Houk discovered several accounts that described the political climate of British Honduras during the Late Colonial period.

Following the outbreak of the Caste War (1847–1901) in the Yucatán, over a thousand Maya refugees fled into northern Belize (Cal 1983:19). While some Maya populations united in rebellion against the Ladino ruling class in Mexico, factionalism, religious schisms, and policy disagreements led to the creation of an opposing Maya force, collectively known as the *pacificios del sur*. The *pacificios del sur* signed a series of treaties with Mexico in 1851 and 1853, acknowledging the authority of the Mexican government (Bolland 2003:106; Dumond 1977:108; Ng 2007:8). Per the terms of the 1853 treaty, the *pacificos* promised to supply the Mexican army with 400 men to fight the rebel Maya and, in return, Mexico promised to grant them control over land along the disputed border with British Honduras (Dornan 2004:89; Dumond 1977:109). The treaty, which was never ratified by the Yucatecan government, was also signed by British Superintendent Phillip Woodhouse for unknown reasons (Dornan 2004:89; Dumond 1977:109). This action, which gave the *pacificos* the impression that the British also acknowledged their claim to the borderlands, served as the basis for future land disputes between loggers from British Honduras and San Pedro Maya refugees settled along the border (Dornan 2004:89).

After suffering repeated attacks by rebel Maya forces, a group of surviving *pacificos* fled to Santa Clara de Icaiche in 1857 (Bolland 2003:107). This group was henceforth known as the Icaiche Maya (Ng 2007:9). Due to a crisis of leadership within the Icaiche and increased military pressures from the rebels (Jones 1977:144), a group of approximately 1,000 of the Icaiche moved into territory claimed by Guatemala and British Honduras between 1857 and 1862 (Bolland 2003:107; Dumond 1977:113). This group became known as the San Pedro Maya, named after their main village established at San Pedro Sirís (Jones 1977; Ng 2007:9). The San Pedro Maya emigrated to the disputed zone between Belize, Mexico, and Guatemala relatively peacefully, as neither the governments of Mexico or British Honduras (each preoccupied with other conflicts) wanted to provoke fighting between their governments by stationing troops in the area (Ng 2010:3). The San Pedro Maya took advantage of this situation and laid claim to the area themselves.

Far from the principal population centers of the Yucatán, the Petén, and Belize, the only other inhabitants of this territory were the logging gangs who seasonally inhabited the mahogany camps in northwestern Belize (Jones 1977:139–141). The two groups' differing uses of the landscape led to conflicts between the San Pedro Maya and British loggers. The "forestocracy" that ruled in northwestern Belize discouraged agricultural pursuits in the region, as swidden agriculture, utilized by the Maya in traditional *milpa* farming, destroyed valuable timber resources (Ng 2007:68). Conversely, the cattle used by loggers to haul felled timber to nearby rivers for transport wreaked havoc on Maya *milpas* when left unfenced (Cal 1991:249–250). Relations between loggers and the San Pedro Maya were further strained by rental disagreements. The Maya cited Superintendent Woodhouse's signature on the 1853 treaty, between the *pacificos* (and by extension the San Pedro Maya) and Mexico, as British recognition of their rightful ownership to the land west the Rio Bravo (Cal 1991:361;

Dornan 2004:89). The Maya therefore reasoned that loggers should set up rental agreements with them for use of land in the disputed zone (Ng 2007:10). Individual loggers were generally amicable to the terms of these agreements, but larger logging firms routinely sent teams into this territory (which was a prime mahogany habitat) with little intention of honoring previously established terms (Ng 2007:10). Continuous defaults on the terms of these leases by logging firms ultimately prompted the Maya to forcibly coerce payment from the loggers, resulting in numerous raids on mahogany works in northwestern Belize.

Archival information from the JA fleshes out some detail at this point in the narrative. The earliest account of a raid irrefutably carried out by a Caste War Maya group dates to 1856. According to a letter written to Major General Bell by the superintendent of British Honduras, William Stevenson, Luciano Tzuc (*comandante general* of the Chichanha Maya) attacked a mahogany works operated by Young, Toledo and Company along the east bank of Blue Creek. The foreman was restrained in his own home, and Tzuc demanded a ransom for the prisoners (who were held hostage for three weeks) because loggers had failed to supply him with the firearms or cash that he demanded as payment for mahogany cut along the river (Stevenson 1856a). According to a letter sent to the owners of Young, Toledo and Company (Pauting 1856), logging agents considered Tzuc's price of four dollars per log cut "exorbitant." In a letter dated September 2, 1856, Tzuc (Zuc 1856a) warned Mr. Toledo that if the company did not pay their debts in a period of eight days, he would either embargo the cut mahogany or set fire to the river bank and all felled logs.

It appears that the company disregarded Tzuc's warnings because they believed that he was laying claim to the "English" side of Blue Creek, thus including wood felled on British territory in his rental estimate. One logging agent concluded that Tzuc was "very ignorant and stubborn" for stationing troops in this disputed area and demanding $400 upfront, underscoring the tense relations between loggers and the Maya (Pauting 1856). The agent also requested that "some intelligent person that understands the Indian language" be dispatched to the camp, implying that language barriers between the loggers and the Maya further aggravated the situation (Pauting 1856). Rather than acquiescing to Tzuc's demands outright, the company planned to negotiate with him, a strategy Stevenson preferred "to that of any more forcible means of expelling Luciano Zuc and his armed men from his position at Blue Creek—a step which [he] should resort to with great regret…" (Stevenson 1856b). The company sent copies of rental agreements secured from the Mexican government to Blue Creek, which side-stepped any rental payments to the Maya in the area.

In the same minute paper, a translated letter originally penned by Tzuc contended that the loggers "[injured] all the plantation…by letting cattle into [them]" and building houses on top of fields located on the "Spanish side" of the Rio Hondo (Zuc 1856a). Furthermore, Tzuc stated that the loggers "[took] everything they set eyes on," suggesting that the men stole goods from the *milpas* to avoid purchasing foodstuffs from the company store (Zuc 1856b). Tzuc requested that the managers speak with their agents, warning that if such behavior continued he would put a stop to logging in the area. In a letter sent to the Commandante of Bacalar on September 8, 1856, the colonial administration argued that Tzuc's complaints were "pretended" and "[had] nothing to do with the real object of this threatened violence" (Zuc 1856b). However, Stevenson (1856c) wrote in a letter to the company owners that he intended to stridently avoid "all of [those actions that] may give occasion to unfriendly feelings or

movements on the part of the neighboring Indians and others, particularly any acts of aggression on their persons or plantations or other property to cultivate," which may be perceived as an assumption of guilt on the part of the loggers. The juxtaposition of British and Maya accounts of the same conflict illustrates the complexity of relations along the northwestern frontier, leaving one to ponder whether the raids on logging camps were indeed unwarranted or justified.

In April of 1866, the Maya raided a logging camp called Qualm Hill, which is now located in the BEAST permit area and which Bonorden (2016) investigated archaeologically, prompting a hostage situation and demanding a hefty ransom from the company to settle delinquent rent payments. Felipe Camara (1866a) told Sir Peter Grant on October 13, 1866, that 53 men, 15 women, and 11 children were kidnapped in the raid. A month later, he relayed that the British Honduras Company (BHC) planned to request that the Lieutenant Governor of British Honduras petition the Mexican government for compensation from the injuries sustained by the logging company during the raid (because they considered the perpetrators Mexican citizens), totaling an estimated $42,750 (Camara 1866b).

According to a minute paper dated August 3, 1866, Mr. Gustav Von Ohlahfen (a retired Austrian officer), reported to the colonial administration that an arrangement made between the agent of BHC and Tzuc in 1863 required either payment for rent of the lands between the Rio Bravo and Blue Creek or for the protection of mahogany gangs working in the area (Minute Paper, August 3, 1866). Mr. Hodge of BHC had supposedly entered in an agreement with an Icaiche Maya leader, named Marcus Canul, to pay an annual subsidy of $250 for such protection in 1864, but failed to uphold the terms of the arrangement. Prior to 1865, BHC had been on reasonably good terms with the Icaiche, allowing them to borrow $300 worth of goods from the company (Minute Paper, August 3, 1866). Mr. Robateau, the foreman of the camp, reasoned that this loan canceled out any rent owed to Canul.

After a year had passed with no rental payment, Mr. Robateau (1865) wrote to BHC on February 11, 1865, that he met Canul in Achiote upon receiving a letter from him, and went to see what Canul considered "Mexican" land. Canul's (1865a) letter, dated February 9, 1865, requested that Robateau come to Achiote to discuss the logging of mahogany on Mexican territory. If Robateau refused to meet with him, Canul warned that he "[would] suffer a great loss" (Canul 1865a). According to Robateau (1865), Canul "[stated] very indignantly [during their meeting] that he knew [Robateau] had the map of English land, and that he likewise knew which was English and which was Mexican," but he "did not care what the English claimed but as soon as he reached his place, he would come over and see where [the British] were working." Robateau (1865) went on to say that he warned Canul that trespassing on Crown lands could "[incur] the displeasure of the English Government," but Canul did not care and left the meeting very purposefully.

At the conclusion of the meeting, Canul cautioned Mr. Robateau of the impending raid stating, "when you have to cry don't say that I did not give you notice" (Minute Paper, August 3, 1866). Robateau (1865) described Canul as "both a tyrant and a brute," observing that "the people are so afraid of him that they will do anything he orders."

According to Mr. Von Ohlahfen, it was "quite evident that an attack was imminent and could only have been averted either by payments of the subsidy or by vigorous defensive measures," and "the agents of the company…had no right to jeopardize the lives and property of the employees at a station so remote and exposed that no government could possibly guarantee

protection at all times" (Minute Paper, August 3, 1866). In the same minute paper, the colonial administration conceded that "it [was] not quite clear where the Qualm Hill bank [was] situated" (on British or Mexican territory) and "indeed the agents of the company [should have arranged] with the Indians for the protection of labourers" (Minute Paper, August 3, 1866). Ironically, Canul wrote to Robateau on February 15, 1865, requesting that BHC pay $2,000 for eight years of back-rent for logging on Mexican territory, with business "arranged in the usual friendly manner" (Robateau 1865). The lack of cooperation from Mr. Robateau ultimately prompted a show of force from the Maya in the form of a raid. The Minutes of the Executive Council of the Colony from February 4, 1867, recounted Lieutenant Governor Austin's frustration with the "vacillating policy which had been pursued in not defining the boundary, and the previous payments of ransoms for parties seized on British territory" that had enabled the dilemma at Qualm Hill to escalate, as two of the prisoners were European (Executive Council of the Colony, February 4, 1867). Subsequently, Canul refused to accept a $3,000 ransom offered by a Mr. Blockley (an amount greater than his original back-rent request), instead demanding $12,000 to release his captives (Executive Council of the Colony, February 4, 1867).

Following the raid, Lieutenant Governor Austin (1866a) wrote to Captain Delamere that he should attempt to capture any Maya "who were of the party that committed the murders, arsons, and robberies at Betson's Bank and Qualm Hill," as Mr. Hodge could only get two laborers to return to the camp unless the government provided military protection. The raid on Qualm Hill ultimately served as a catalyst for a brief confrontation between British troops and the San Pedro Maya on December 21, 1866. The confrontation began with the arrival of the 42 men from the 4th West Indian Regiment, under the command of Major MacKay, at San Pedro Sirís, who are described in a letter from Lieutenant Colonel Robert William Harley, dated September 7, 1867, as quietly marching through the territory to escort a Civil Commissioner (Harley 1867) when they were supposedly ambushed by 400 to 500 "Indians" (Ng 2007:69). After about 30 minutes of fighting, in which 16 British soldiers were wounded, five were killed, and the Commissioner was lost, never to be seen again, the British troops retreated to Orange Walk, abandoning all equipment in the village (Ng 2007:69). A letter written by Lieutenant Governor John Gardiner Austin (1867a) on January 12, 1867, includes a post-action sketch (Figure 2) of the skirmish, illustrating where British troops crossed the Belize River and the location of the engagement (Austin 1867a). This map also shows that the Orange Walk to which the British retreated was on the Belize River—this is not the same Orange Walk in northern Belize where the final battle between the British and Icaiche Maya took place in 1872, which is discussed below. Austin (1867b) later wrote to Peter Grant on April 11, 1867, that mahogany cutting was completely suspended in the western district following "the events of December last," and the "disturbed state of Yucatan and the lethargic condition of mercantile affairs," underscoring the tumultuous effect of the raids on the British economy and possibly motivated the colonial administration's escalated response to such events. On December 23, 1866, Austin (1866c) even requested permission to appeal to the Governor General of Cuba for naval assistance, declaring that "the colony [was] in so critical a state" that an attack was imminent. Austin (1866c) confided in a letter to the Consul General at Cuba that "the retreat of her Majesty's troops before the Indians [destroyed their] prestige entirely," and he was also seeking assistance from the colonial administration in Jamaica.

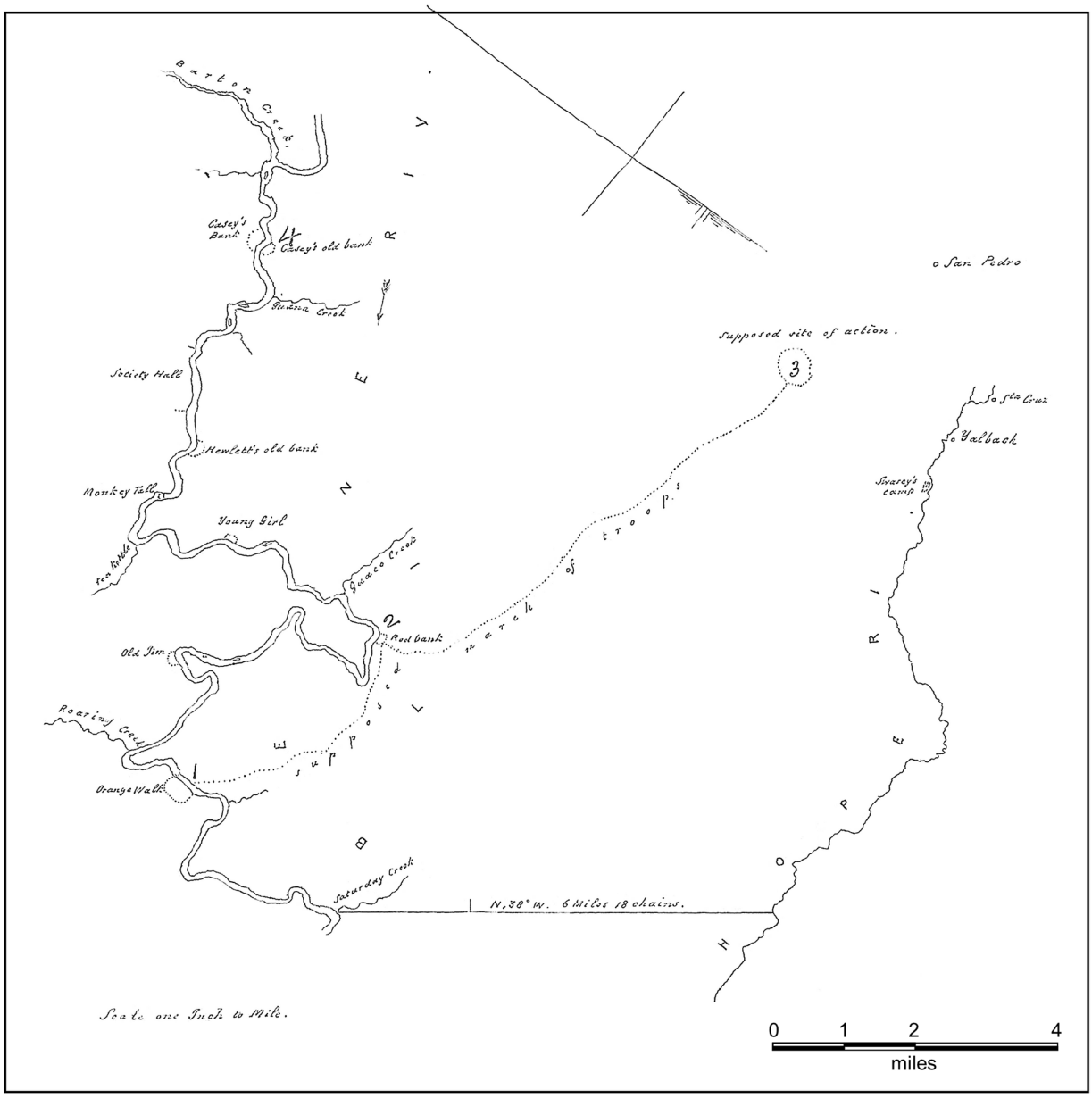

Figure 7.2. Post-action engagement map from the Battle of San Pedro, on file at the JA (1B5/56/32). 1) the point at which the troops crossed the river; 2) the route to Red Bank, "where they ought to have crossed;" and 3) "the place (no 3) at which the engagement is believed to have taken place." Redrawn from photograph of the original with graphical scale added.

According to a letter written by Austin (1867c) on February 2, 1867, to Carmichael, not only were logging operations suspended along the western frontier of the colony, but the British also restricted the sale of gunpowder to the Maya. Austin (1867d) wrote to Harley on March 4, 1867, that a supply of powder and shot, intended for the Maya rebels in Mexico (in an attempt by the British to antagonize the Mexican government), was intercepted by the San Pedro Maya, warranting an increased presence of troops within the colony and the expansion of martial law in the northwestern districts.

With the arrival of reinforcement troops from Jamaica in January of 1867, Harley led a punitive expedition into San Pedro territory with orders to drive off any hostile "Indians" his troops encountered (Jones 1977:150; Ng 2007:11). Harley and the West India Regiment attacked San Pedro Sirís, San José Yalbac, Chunbalache, and other small villages in what became known as the Battle of San Pedro (Ng 2007:11). Harley's troops burned all buildings and at least some of the *milpas* in these villages, effectively destroying the cornfields and food stockpiles. In a letter from Austin (1867e) to Governor J. P. Pleasant dated April 10, 1867, Austin detailed the plans for Captain Delamere to lead troops to destroy Naranjal. The colonial administration believed that "a portion of the fugitive Indians from San Pedro, San Jose, and Santa Theresa [had] taken refuge" in the village and the Maya had hidden supplies taken during raids on nearby mahogany camps there as well (Austin 1867e). Austin (1867e) stated that Delamere is authorized to take prisoners, with whom Austin would "finally" deal. In the event that any Maya escaped from Naranjal, Delamere was instructed to attack the nearby village of Chorro, destroying their plantations and granaries (Austin 1867e). Austin (1867e) also revealed that most of the Maya in the settlements attacked by Delamere had retreated (with their "domestic utensils") prior to the arrival of British troops, and no actual combat occurred.

Austin (1867e) concluded his letter with a comment that he hoped Lieutenant Abbs "[had] been more successful" in the direction of Qualm Hill, where he had ventured on a "scientific duty," requiring an escort for his protection. Similarly, a letter from Captain Delamere (1867) dated March 9, 1867, recounted that after destroying Cerro and Naranjal, he returned to Qualm Hill. These brief accounts suggest that despite the 1866 raid on the logging works at Qualm Hill, some viable establishment remained in the area possibly with a military detachment stationed near the remains of the camp.

A final mission led by Captain Carmichael to destroy settlements in the San José settlement cluster ultimately pushed the Maya rebels across the border into the Yucatán in February 1867 (Jones 1977:151). According to a letter written by Carmichael (1867) on March 30, 1867, his troops (numbering 65 men) followed the Maya from Holotunich and burned Santa Cruz, Chunbalche, and San José without suffering any casualties. Carmichael (1867) noted that the Maya at San José retreated prior to their arrival, taking cattle and mules to Noscab and Yocuik. Austin (1867d) later wrote to Harley, however, that "the Indians [had] not [actually] fled from the western district but [had]…simply retired into the woods," making Father Eugene Biffi (an Italian priest) aware of their intentions.

At some point during these incursions, Canul was captured, as evidenced by a letter from Austin (1867f) to Pablo Encalada dated March 4, 1867. Austin (1867f) reported that he had Canul in his custody, and had "a force sufficient to apprehend the other chiefs" (namely Pech, Rafael Chan, Camara, Ascunsion Ek, Carlista Medina, and Juan Balam) so that he might "obtain more data concerning the crimes committed by the Icaiches [and] impose a corresponding penalty." Austin (1867f) related Canul's insistence that the Maya were merely defending themselves against the violent and unexpected attacks by British troops on "Yucatán" territory, but in a later letter dated March 18, 1867, Austin (1867g) questioned why Canul's contingent was armed when encountering British troops if they sought peace. Austin (1867g) argued that "the entrance of armed men into a neighboring country is a violation of international law…[prompting] retaliatory measures." The circumstances of Canul's capture and release remain uncertain.

The British were unsure how to deal with Canul, as evidenced in a letter from Mr. Scarlett (1866a) to Dr. Mandin de Castillo. Mr. Scarlett stated that Canul was a Mexican citizen, but the colonial administration could not directly negotiate on Mexico's behalf with him because the country was also at war with him (via the Caste War). The following month, Mr. Scarlett (1866b) wrote to the Earl of Clarendon that the administration should consider Canul independent of any ties to the Mexican government.

Despite a decree issued by Lieutenant Governor Austin following the battle that delegitimized San Pedro Maya claims to land in northwestern Belize and commanded the Maya to pay rent to the colonial government in order to farm (Church et al. 2011:185), Icaiche leaders continued to demand rent payments from loggers via the inhabitants of San José Yalbac into the 1870s, claiming jurisdiction over the San Pedro Maya settlement area. In 1872, Canul launched an attack on the military barracks in Orange Walk, clashing with West India Regiment troops stationed there (Eltringham 2010:79). The skirmish, called the Battle of Orange Walk, resulted in Canul's death and forced the Icaiche to flee across the Rio Hondo (Eltringham 2010:79).

Although each of the instances described in colonial correspondence housed in the JA predate the establishment of Kaxil Uinic village, they collectively illustrate the political climate of British Honduras during the Late Colonial period and the circumstances from which the village was founded. Events preceding the Battle of Orange Walk (ca. 1872–1940) were described in greater detail in Minute Papers housed in the PRO in Kew, England.

REVIEW OF PUBLIC RECORDS OFFICE

The 484 documents that Bonorden photographed at the PRO and Lee transcribed are primarily Minute Papers from both the Foreign Office and War Office, as well as memorandums from BEC. In the aftermath of the Battle of Orange Walk, Maya relations with the British colonial administration in Belize began to change (Ng 2007:12), climaxing the long period of hostility between the two groups (Cal 1991:361). O. Nigel Bolland (2003:111) designates this shift as the final phase of British-Maya relations (ca. 1872–1900), during which the British consolidated their jurisdiction over the Maya, and the Maya were ultimately incorporated into the colonial social structure. Canul's successor, Rafael Chan, pursued a peaceful relationship with the British, and friendlier relations with the colonial administration were established by the 1880s (Ng 2007:12).

As evidenced by a letter written by Sir Spenser St. John (1886b) on July 9, 1886, the governments in both British Honduras and Mexico wished to formalize the disputed boundary between the two territories, so long as the other refrained from supporting the various Maya factions present on both sides of the border. Specifically, "the sale of arms, either from Mexico or from British Honduras, to Indians of all denominations in the districts adjoining the frontiers" was prohibited (St. John 1886b), although a Minute Paper dated October 29, 1887, indicates that the British colonial government planned to continue to allow the sale of arms to the Santa Cruz Maya until a treaty was officially signed (Author Unknown 1877d). In a letter penned by St. John (1886c) to the Earl of Rosebery, St. John noted that such an agreement would "remove the last vestige of irritation against the British…and enable [them] to…put an end to a long controversy." A letter included among the Minute Papers (author unknown) dated July 1887 reported

the border conflict between British Honduras and Mexico stemmed from the fact that "the Mexican Republic had protested on different occasions against the existence of a British Colony in a territory disputed between Mexico and Guatemala, and which before fixing the limits between these two nations was reputed by the former as its own wholly or in part." In 1859, a treaty between the British and the Republic of Guatemala defined the extent of a British colony in the Bay of Honduras, vaguely declaring that it extended as far north as the "Mexican frontier" (Author Unknown 1887c). The ambiguity of these treaties ultimately led to territorial disputes between the British and the Mexican government in the Yucatán. Although it was agreed that the northern boundary of British Honduras was defined by the Rio Hondo (Ng 2007:6), liberal interpretations of the boundary resulted from the fact that the Rio Hondo has two southern branches (Blue Creek and Booth's River). Each group naturally asserted that whichever branch afforded them a larger swath of territory was the "True Hondo" (Ng 2007:6).

On August 18, 1886, J.P.H. Gastrell (1886) noted in a letter to the Earl of Rosebery that an enclosed copy of the "Gavarrete Map," which shows the perceived northern boundary line, was also annotated with the locations of "Ycaiché" Indians, who "[kept] their power or jurisdiction to nearly as far south as Garbutt's Falls and control…Xaxa Venic which [was then] supposed to be within [the] Belize frontier." This reference to "Xaxa Venic" (Kaxil Uinic) is consistent with observations that the *alcalde* (mayor) of the village considered his village to be in Mexican territory (Bolland 2003:149) and displayed strong Icaiche sympathies the same year (Jones 1977:166). The village is later illustrated on an 1887 map, published by William Miller for his official survey of the Belize/Guatemala border in the late 1880s. At the time of the survey (January 17, 1887), however, a regent of Governor Goldsworthy wrote that General Tamay, chief of the Icaiche, referred to the surveyed boundary line as a "tentative" one, emphasizing the strained relations between the British and the Maya concerning the frontier zone (Author Unknown 1887a).

Sir Spenser St. John (1886a) wrote to the Marquis of Salisbury, on January 27, 1886, that General Vicente Mariscal directed the Governor of Campeche to "inform the Ycaiché Indians that they were not to interfere with the Survey, but that if the line were pushed North of the boundary agreed upon between Mexico and Guatemala, they should immediately report the circumstance to the Governor." This passage indicates some level of cooperation between the Icaiche and the Mexican government.

E. Hertslet (1887), an employee of the Foreign Office, wrote to the Colonial Office on May 10, 1887, that Miller's survey line was taken into consideration with numerous others when proposing a boundary between Mexico and British Honduras. The colonial government in British Honduras aimed to minimize the effect of this territorial dispute on the mahogany estates operating in the area (Hertslet 1887). As described in a letter written to Governor Goldsworthy on January 31, 1887, logging companies like BEC complained of Indian woodcutters trespassing on their frontier lands, requesting a police presence in the region (E.W. 1887). Sir Spenser St. John (1888a) later wrote to the Marquis of Salisbury on July 28, 1888, that "the Indians who threatened to interfere with the survey of [the British frontier] were those living south of the boundary line between Mexico and Guatemala….as part of the Ycaiché tribe, they considered themselves as under the government of the State of Campeche," highlighting the differing opinions between the British and the Maya as to who controlled land along the frontier. St. John (1888b) wrote to the Marquis of Salisbury on September 22, 1888,

however, stating that he gave "no importance to the utterance of a drunken Indian" when referring to Icaiche General Gabriel Tamay's warnings to the British.

Based on a letter written by a Secretary Knutsford (1887) to Sir R.G.W. Herbert on March 10, 1887, BEC was still wary of the Icaiche and San Pedro Maya, referencing the raid on Qualm Hill, and stating that, "neither Indians nor labourers have any fear of nor respect for policemen," so imperial soldiers were required to protect their works. Although the varying factions of the Caste War Maya should not be homogenized, it should be noted that intragroup relations (among the Santa Cruz, Icaiche, and San Pedro Maya, for example) were complex. A letter to a Mr. Wilson dated January 11, 1897, states that the British colonial government "[didn't] think [they had] any ground for making a distinction between the Icaiché and the Santa Cruz, [as both were] on territory [they] recognize[d] as Mexican" (Author Unknown 1897). In fact, the colonists were primarily concerned with the threat posed by the Icaiche, rather than the San Pedro Maya. In the absence of the Icaiche, the San Pedro Maya cautiously co-existed with British colonists (Ng 2007:78), only attacking logging camps when provoked (Ng 2007:79). Governor Goldsworthy (1887) wrote on February 7, 1887, that an Indian woodcutter, named Sr. Contreras, had recently trespassed on BEC lands, and the managers of the company involved Icaiche leader Gabriel Tamay in the matter, as they were still paying "blackmail" to the Maya to prevent further raids on their camps.

On September 6, 1886, St. John (1886c) again wrote to the Earl of Rosebery that, although it would be unwise for the British to join forces with Mexico against the rebellious Santa Cruz Maya, it would be "equally an error in policy to encourage their raids into Mexican territory by supplying them with arms and ammunition," noting that "it is of national importance [for the British to] be on the most friendly terms with the Mexican people…[which they] never can really be so long as [they] practically act as the allies of their barbarous enemies." By January of 1887, it appears that the Icaiche marked the contentious boundary between Belize and Mexico with Mexican flags against the wishes of the government in British Honduras, as evidenced by a letter written to the Under Secretary of State in the Colonial Office by P. W. Currie (1887a), dated February 18, 1887. The subsequent offer by the Chan Santa Cruz Indians to place themselves under the protection of the British government and have their territory annexed to British Honduras would have been difficult to pass up, as detailed in a letter to the Under Secretary of State of the Colonial Office by P. W. Currie (1887b), dated April 6, 1887. Declining the offer, the colonial government in British Honduras instead advised the Santa Cruz Maya to come to a settlement with the Mexican government, and, per a letter written to Colonial Secretary Fowler on April 9, 1887, the British also allowed any Santa Cruz Maya seeking refuge in the colony to reside there as long as they gave up their arms (Author Unknown 1887b). Meanwhile, the Mexican government vowed to make "every possible effort…to prevent Indian incursions into [British] colonial territory," but also reasoned that their government could not be held responsible "for the conduct of those Indians who [were] in open rebellion" (St. John 1887). Despite numerous attempts to draft a treaty regarding the Mexico-British Honduras boundary as early as 1887, it would be years before both parties reached a formal arrangement.

As the Anglo-Mexican border was formalized with the ratification of the Spenser-Mariscal Treaty in 1893, British troops were able to occupy the San Pedro Maya settlement area without fear of reprisals from Mexico (Ng

2007:12). This event, combined with a series of epidemics and drought that severely reduced the populations of San Pedro Maya villages at the turn of the century, considerably diminished San Pedro autonomy, although there is some evidence that the Maya continued to collect rent from loggers well into the 1890s (Church et al. 2011:191; Eyles 1897; Jones 1977:151; Ng 2007:12l; Stronge 1898). As noted by the surgeon of the colony, C. H. Eyles (1897), on May 7, 1897, for the first time since records were kept by the colonial administration, "the number of deaths among the Indian population in the Colony [did] not exceed the births." That same year, a letter from Icaiche general Gabriel Tamay indicates that he adopted a more cooperative attitude towards the British (Tamay 1897; Wilson 1897). Despite increased cooperation with colonial authorities, it appears that the attitude of the government in British Honduras towards the Maya remained unsympathetic. In a report from the General Registry of Belize to the Colonial Secretary dated April 7, 1920, "the high death rate among the Indians [was] partly…explained by the fact that they [comprised] the most backward section of the population, and [evinced] little desire to effect recovery from disease" (General Registry of Belize, April 7, 1920).

As the sizes of San Pedro settlements dramatically decreased, the remaining inhabitants of many smaller villages and hamlets coalesced into larger settlements. For example, Grant Jones (1977:162) speculates that Kaxil Uinic was settled in the 1880s by migrants from Holuitz, a San Pedro Maya village to the southwest on the Guatemalan side of the border. Holuitz was abandoned sometime after 1868, presumably after a series of epidemics, including cholera and small pox, severely reduced the settlement's population and subsistence potential (Jones 1977:168).

Prior to our visit to the PRO, virtually nothing was known of the nature of British-Maya contact at Kaxil Uinic between the initial settlement of the village in the 1880s and its abandonment in 1931. A letter to the Colonial Secretary from Cayo District Commissioner Rob H. Franklin (1913) written in 1913, however, mentioned that Franklin recently received a report from the *alcalde* at San José stating that "strangers from Xaxe Tenic and elsewhere" wished to settle in San José Yalbac. The following month, Manuel Perez (1913), the *alcalde* at San José, wrote to Franklin that settlers from "Churchquitam" arrived at "Cashiwinik," (Kaxil Uinic) applying for a place to live. According to Perez (1913), when asked if they planned to obey the laws and regulations of "the company" (BEC), the settlers said that they were willing. This interaction marks a contrast in the level of cooperation exhibited by the inhabitants of Kaxil Uinic during Miller's survey of the frontier in the 1880s.

In a 1916 report from Captain Fraser (1916) to Major James Cran, various interactions with Guatemalan troops planning to attack revolutionaries positioned along the shared border with British Honduras are described. Fraser mentioned that around the time he is writing, he was given a letter from the *alcalde* of "Kaxevinic," which reported that four revolutionaries were seen in the village on May 2, and he overheard a rumor that they might return. Fraser (1916) consequently sent a military inspection patrol to San José the following day, with instructions to go on to "Kaxevinic" if necessary. Fraser (1916) noted that the patrol returned on May 11th, stating that the *alcalde* of San José relayed a message from a resident of "Kaxevinic." According to the man from "Kaxevinic," four revolutionaries from "Yalloch" stayed in the village for two days, before a messenger came and told them to return to "Yalloch" because the arrival of Guatemalan troops was imminent (Figure 3). The four men promptly left "Kaxevinic," abandoning their two mules. The *alcalde* of San Jose explained

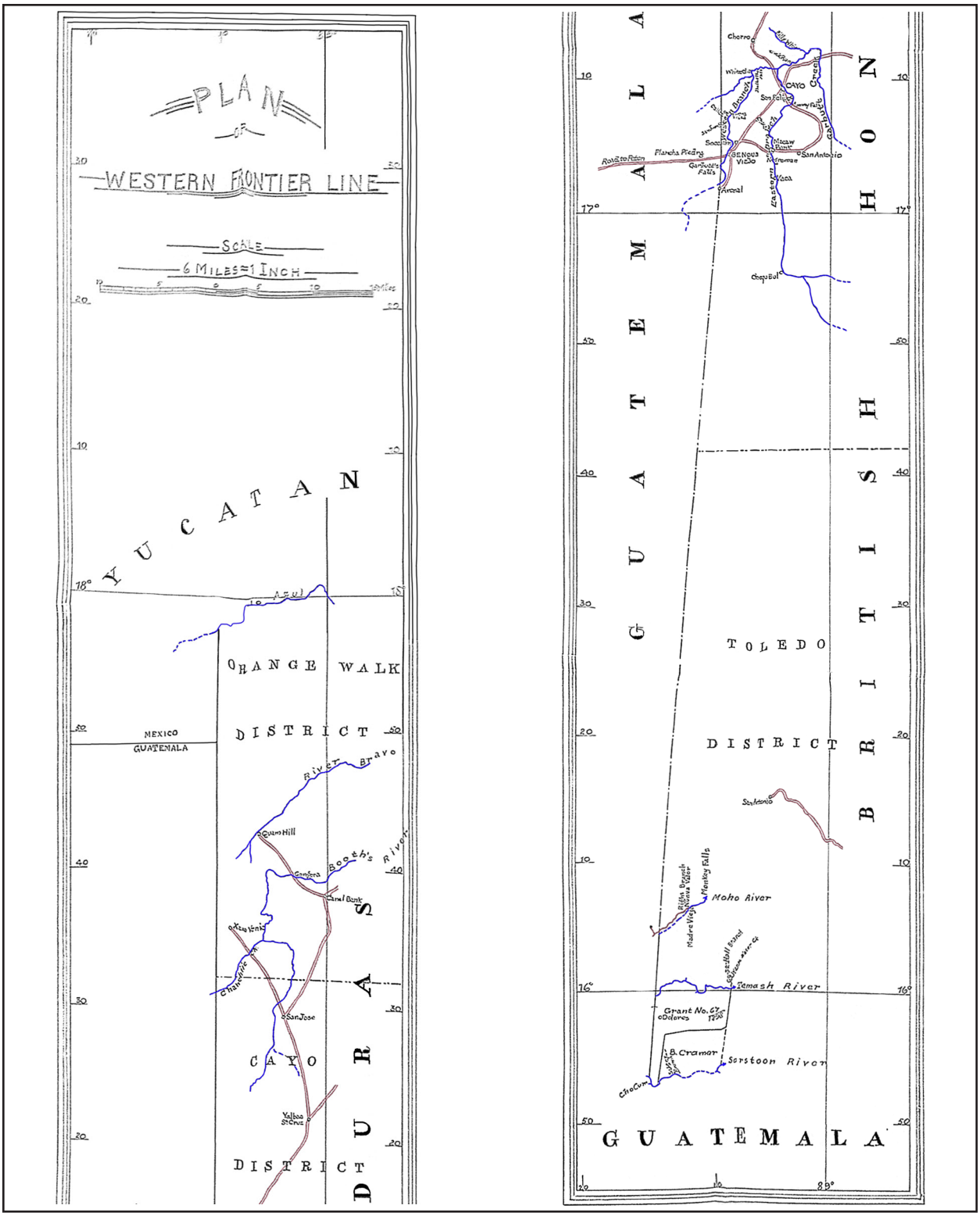

Figure 7.3. 1873 Map of the Mahogany Works, the Crown Lands, the Indian Villages near to, and the Western Front Line (PRO FO 881/2641). Redrawn from photographs of the original, which was one long, narrow map. Because the original map was folded, some sections were severely distorted in the photographs. Some of the distortion is still present in this redrawn version, particularly at the top (left image) of the map.

that the "population of Kaxevinic [was] quiet and unafraid of the Revolutionaries" (Fraser 1916), perhaps because of the connection between the villagers and the illegal import of chicle from Guatemala.

The inhabitants of Kaxil Uinic village were forcibly relocated to San José Yalbac by BEC in 1931 (Thompson 1963), presumably over tensions with BEC over timber cutting and illegal *chicle* harvesting or smuggling by the residents. As early as 1909, A. R. Usher (1909), then-manager of BEC, wrote to colonial secretary C. Rees Davies that *chicle* bleeders were illegally working along the British Honduras-Guatemala border, and that the company would be willing to fund the clearing of this boundary line to prevent such illicit activities. A report published in 1908 by a Mr. Starkey (1908) conveyed that the colonial government considered the *chicle* industry to be profitable yet destructive, "carried on with a total disregard for the life of the tree [and lacking] proper regulation and supervision of the Chicle collection." It is more likely, however, that the relocation of the San Pedro Maya may be attributed to an estimated loss of $300,000 in mahogany stands from *milpa* farming activities at Xaxe Venic (Kaxil Uinic), as cited by later company manager, C. S. Brown, in 1935 (Kray et al. 2016). In a letter from Mr. Starkey (1917) to the Undersecretary of the State Colonial office dated July 12, 1917, there was a boom in mahogany demand from the colony to produce airplane propellers, and the activities of *chicleros* and *milperos* likely hindered the potential output of raw materials from the colony.

The Honduras Land Titles Act allowed logging companies to purchase most of the land in northwestern Belize, while the Maya were prohibited from owning it. Kaxil Uinic village was included in BEC's land holdings by 1930, and the inhabitants paid rent to the company to use the land for their *milpas* (Conservator of the Forests 1930). A 1942 Report of the Interdepartmental Committee on Maya Welfare in British Honduras indicated that rental prices for land varied, with house lots costing "between $1 and $3 per annum and for milpas either 10 cents per mecate of 25 yards by 25 yards or from $3 to $5 for a milpa not exceeding 50 mecates in area. The combined price for [a] house and milpa [varied] from $3 to $8…" (Colonial Secretary 1942). BEC managed a vast estate in order to keep the general population of Belize dependent upon them for access to resources and jobs, offering limited opportunities for socioeconomic advancement (Ng 2007:320).

According to Bolland (2003:125), the loss of *milpa* farmland, which had sustained Maya self-sufficiency in colonial Belize, forced the Maya to participate in the colonial cash economy, and practically all of those resources previously acquired from *milpas* had to be imported (Church et al. 2011:191). The pressure to obtain cash for paying rent drove large numbers of San Pedro men into the logging or *chicle* industries as wage-laborers (Kray et al. 2016).

With technological advances in railway transportation that developed in the 1920s, mahogany enterprises increased in efficiency and logged previously inaccessible areas (Ng 2007:13). As these firms expanded their territories, even the largest San Pedro Maya settlements were relocated. In 1936, villagers in San José Yalbac, where the residents of Kaxil Uinic had taken up residence, were also moved by BEC (Jones 1977:151). BEC, whose administrators occupied prestigious positions in the colonial government, were able to evict the residents of San José Yalbac without fear of reprimand by transferring company lands near Orange Walk Town to the colony as a "trust" for the villagers (Kray et al. 2016).

Loaded into logging railway carts, the villagers from San José Yalbac were transported to

Hill Bank, where they were sent down river by barge to Orange Walk Town (Kray et al. 2016). In Orange Walk, the villagers were given temporary residence at the site of some former army barracks that were being used as a pasture and playground. These were the same barracks attacked by the Maya in the Battle of Orange Walk in 1872, and the relocation of the San Pedro Maya to this spot, as BEC burned their settlement at San José Yalbac, might be symbolic of the ultimate defeat of the Maya in Belize (Kray et al. 2016).

By 1941, P. Rogers (1941) reported that there were no longer any *alcaldes* in the Northern District, and that drunkenness was rampant among the Maya in the region, as well as marijuana addiction. A Medical Report produced the following year attributes the increased infant mortality rate among the Maya to "many factors e.g. racial traditions, Stone Age antipathy to modern ideas, and difficulty of access," underscoring the colonial administration's attitudes towards its indigenous subjects (Author Unknown 1942). The 1942 Report of the Interdepartmental Committee on Maya Welfare in British Honduras indicates that village schools were largely unaided by the colonial government, and that "the inhabitants of many small villages [desired] schools but in most cases this [was] impracticable for financial reasons, nor [was] it possible for the children in these villages to reach the nearest school easily" (Colonial Secretary 1942). The ways in which the Maya are represented in these British colonial accounts and historically marginalized within the colonial system reverberates in contemporary relations and power dynamics in Belize.

REVIEW OF SOAS ARCHIVES

Although the senior author visited the Wesleyan Methodist Missionary Archives at the School of Oriental and African Studies in London over a two-day period, correspondence from Methodist missionaries stationed in British Honduras largely predates the settlement of Kaxil Uinic and primarily focuses on the operation of schools in the territory. Aside from the general descriptions of the Caste War Maya, previously summarized by missionary Richard Fletcher's reports (Rugeley 2001), no pertinent data was collected from the SOAS archives.

CONCLUSION

From this review of archival data, it becomes apparent that conflicts arose between the Maya and logging companies in British Honduras as a result of the two groups' differing uses of the landscape and disagreement over the locations of international borders, resulting in a substantial level of mistrust between the San Pedro Maya and the colonial government. Continuous defaults on land rent by logging firms ultimately prompted the Maya to coerce payment from the logging companies, resulting in numerous raids on mahogany works in northwestern Belize. Abstractions of historical events from colonial perspectives, however, ignore the fact that most raids on mahogany works in Belize were carried out by Chichanha and Icaiche forces. The San Pedro Maya, in contrast, cited their "separation" from these groups as early as 1860 (Jones 1977:146), and attempted to maintain peaceful relations with the colonial administration in exchange for guns and ammunition to protect themselves against Chichanha and/or Icaiche raids (Jones 1977:148–149). Furthermore, upon reviewing the events that precipitated the raid on Qualm Hill, it seems that BHC antagonized the situation, ultimately provoking the raid.

In retaliation for the raid, BHC raised the rents on *milpas*, increasing the animosity among the Icaiche, colonists, logging firms, and the San Pedro Maya. Thus, the earliest inhabitants of Kaxil Uinic village displayed strong Icaiche

sympathies rather than colonial loyalty, aiding several individuals in evading police capture after committing murders at a mahogany bank (Jones 1977:159,161), allowing them to escape through the village to Santa Clara de Icaiche. By the early 1900s, however, it appears that the residents of Kaxil Uinic were cooperative with the colonial administration, a strategic decision that occurred after a serious small pox epidemic killed at least 30 people in the village. The epidemic severely reduced the villagers' population, farming labor force, and, by extension, their autonomy (Bolland 2003:169). Based on this information, a clearer understanding of San Pedro Maya motivations and strategies to navigate the political landscape as they did emerges, providing a better illustration of their subaltern colonial experience.

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Two Newly Recorded Sites in Northwestern Belize: Sak Mut and Xma Ha Ak'al

Brett A. Houk, Mark D. Willis, and Gregory Zaro

In February 2017, the Belize Estates Archaeological Survey Team (BEAST) conducted targeted reconnaissance of two locations where employees of Yalbac Ranch had reported coming across large mounds during the course of inventorying different areas for logging. Because both locations would be difficult to access during the rainy season, the BEAST crew, comprising this report's three authors, conducted the investigations in February during the dry season. One location is on Yalbac Ranch just south of the established Chan Chich Archaeological Project (CCAP)/ BEAST permit area (Figure 8.1). The second

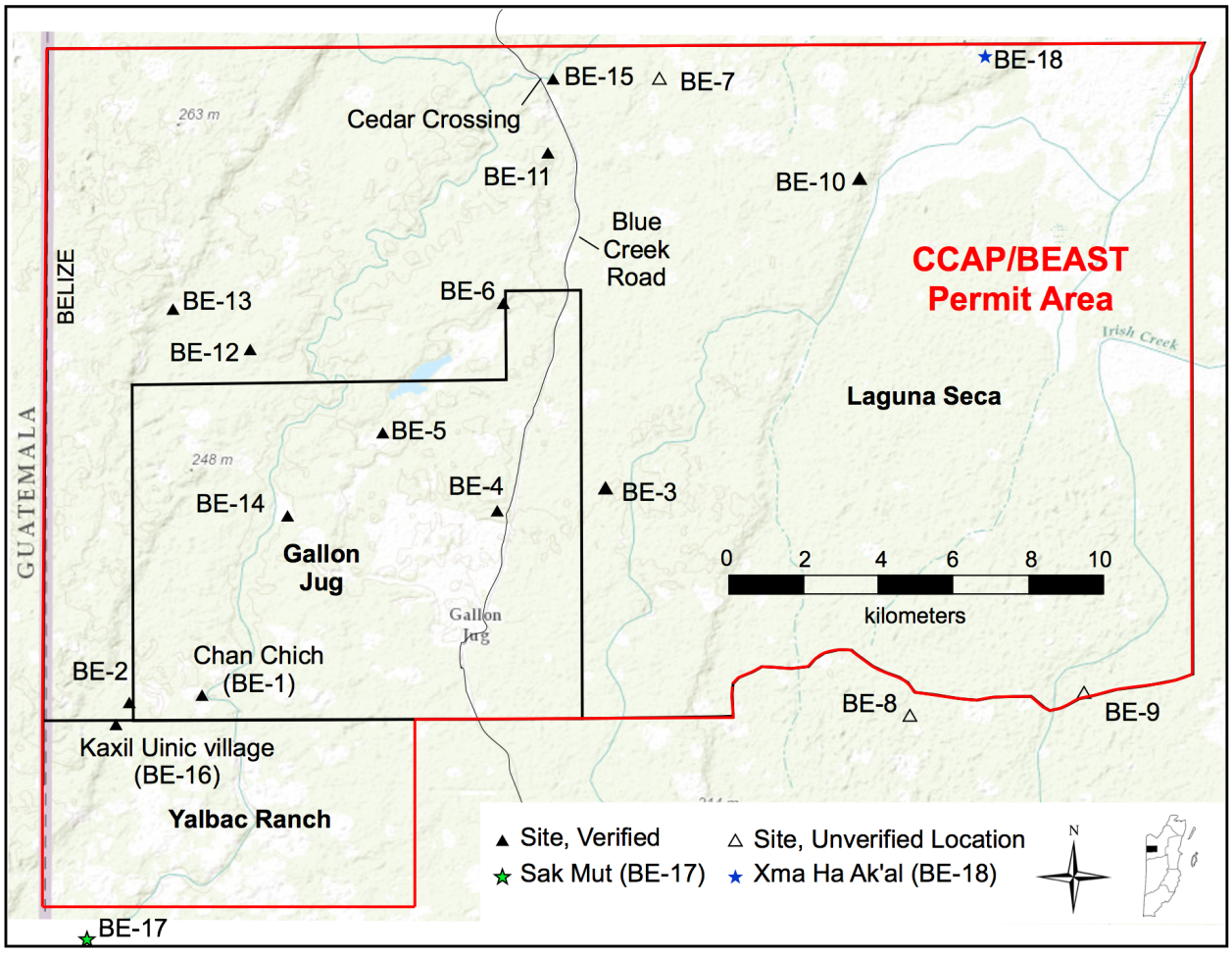

Figure 8.1. Location of newly recorded sites in relationship to the CCAP/BEAST permit area.

Houk, Brett A., Mark D. Willis, and Gregory Zaro
2017 Two Newly Recorded Sites in Northwestern Belize: Sak Mut and Xma Ha Ak'al. In *The 2017 Season of the Chan Chich Archaeological Project*, edited by Brett A. Houk and Claire Novotny, pp. 191–202. Papers of the Chan Chich Archaeological Project, Number 12. Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

is on Laguna Seca Ranch near the northern border of the property and the Booth's River Escarpment. Originally, the crew planned to reconnoiter a third location to look for El Infierno, a site first recorded in the early 1970s, but lost since then. However, the crew could not reach the targeted location because the logging road running north from Sylvester Village, known as the river road, was blocked by numerous tree falls.

The reconnaissance team traveled to Belize on February 19, 2017. Houk met with Dr. John Morris, Director of Research at the Institute of Archaeology (IA), on February 20 to secure permission to conduct the research. The team then met with Jeff Roberson and his foreman, Esteban Alvarez, at Yalbac Ranch headquarters to coordinate access and schedules for the planned reconnaissance. The crew traveled to Gallon Jug that afternoon and spent the next two days investigating the two reported sites on Yalbac and Laguna Seca Ranches. On the third day, they ground truthed mapping data on Gallon Jug Ranch. All project personnel departed Belize on February 24, 2017.

SAK MUT (BE-17)

Location and Activities

In May 2015, Jeff Roberson of Yalbac Ranch reported to Houk that Esteban Alvarez had come across some large ruins in western Yalbac at E 272728, N 1934414. Separately, in August 2015, Dr. Francisco Estrada-Belli, who conducts archaeological work in northeastern Petén, contacted Houk to report that he suspected a Preclassic site is located south of the BEAST permit area, based on satellite imagery. He reported the possible site's location to be at E 272731, N 1934996. In January 2017, Houk contacted Dr. Lisa Lucero, who conducts archaeological work elsewhere on Yalbac Ranch, and Lucero (personal communication, 2017) reported she had visited two large sites in the western part of the ranch in 2004. In her unpublished report to the Institute of Archaeology, Lucero (2005) described a site "about the size of Yalbac with an acropolis with at least three sunken plazas, temples, and a ballcourt" at E 272715, N 1934076. These three different locations are within 1 km of each other (Figure 8.2).

On February 21, 2017, Ediberto (Edi) Quewell and Arturo Pinelo, two employees of Yalbac Ranch, led the BEAST crew to the location of the ruins initially reported to Roberson by Esteban Alvarez. The route to the site involved driving down an old logging road (from where it intersects with the segment of the paved Chan Chich road that is on Yalbac Ranch) southwest for 30 minutes to a logging camp on Chan Chich Creek. From there the team walked the same logging road for approximately 2 km until it intersected an east-west inventory baseline. The crew then walked approximately 2 km west along the baseline, then 3.5 km south along an inventory transect. The route crossed through approximately 500 m of *bajo* that would not be passible during the rainy season.

At the end of this 3.5-hour hike, the crew encountered BE-17, a site of unknown size and layout, but with several large mounds (Figure 8.3). The crew spent approximately 3 hours at the site exploring and documenting the forest canopy with two drone missions (Figure 8.4). We propose to name this site Sak Mut (Mayan for "white bird"), after a white hawk or black and white hawk eagle greeted us upon arrival to the site.

Site Description

Sak Mut is located in a portion of Yalbac Ranch that was heavily damaged by Hurricane Richard in 2010. Numerous tree falls and patches of dense secondary growth made a systematic inspection of the site impossible in the short time available to the crew. The largest mound

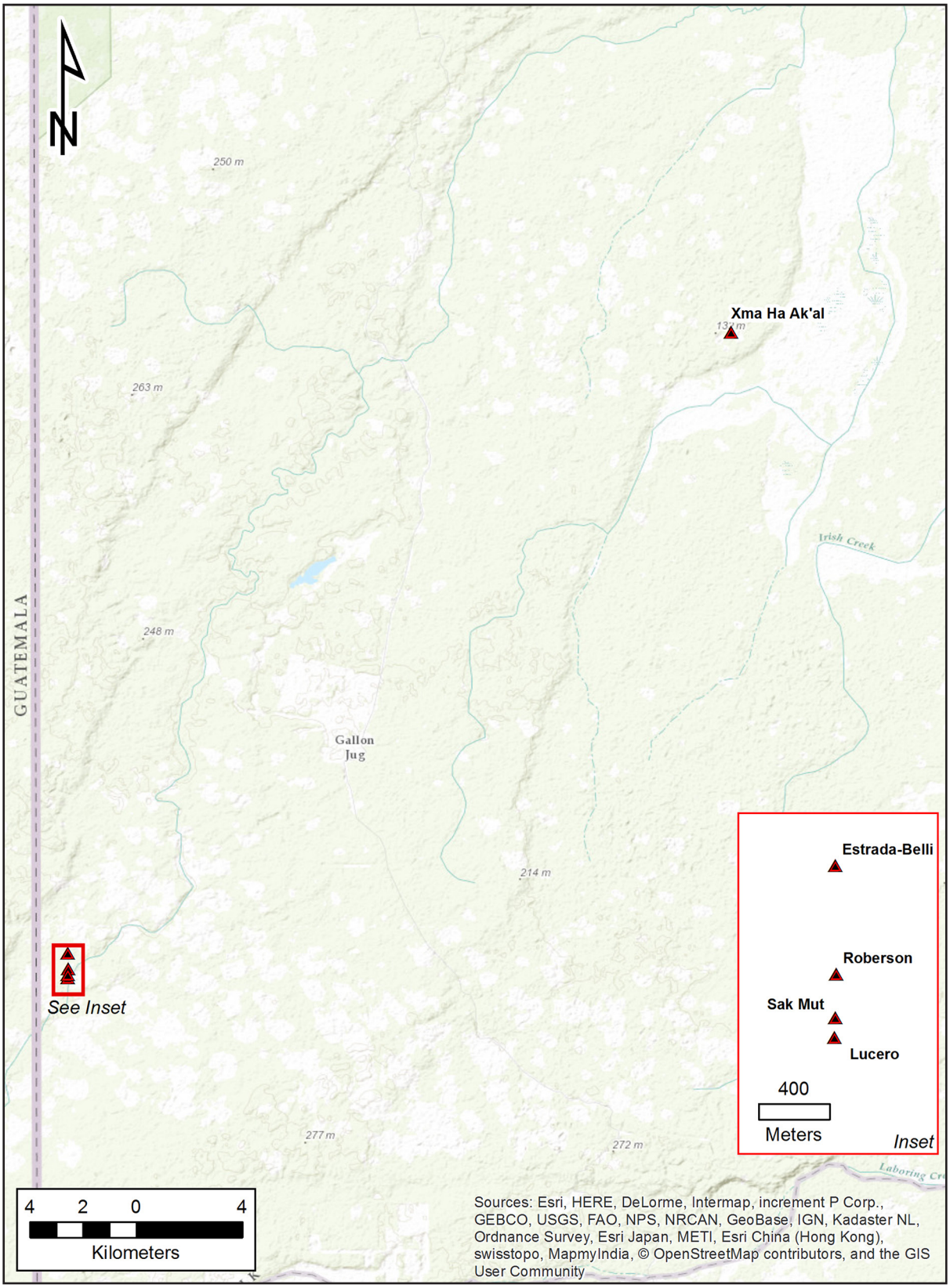

Figure 8.2. Map of reported site locations in western Yalbac Ranch and locations of newly recorded sites Sak Mut and Xma Ha Ak'al.

Figure 8.3. Orthophoto of forest canopy at Sak Mut with GPS-recorded locations of large mounds.

the crew inspected is approximately 15 to 20 m high. In several places, tree falls have exposed numerous ceramics. Based on photographs of one concentration of sherds, Lauren Sullivan (personal communication, 2017) identified Early Classic and Late Classic types.

At the summit of the tallest mound we recorded during our short visit, the crew inspected a possible looters' trench extending into the mound but opening up into a roughly circular area of disturbance. However, because the feature does not have obvious back dirt piles next to the trench, the crew concluded it is more likely the result of a collapsed chamber inside the mound. In the profile of the feature, Houk observed an approximately 30-cm thick plaster floor roughly 1 m below the summit of the mound. No other architectural features were apparent, but Houk only briefly inspected

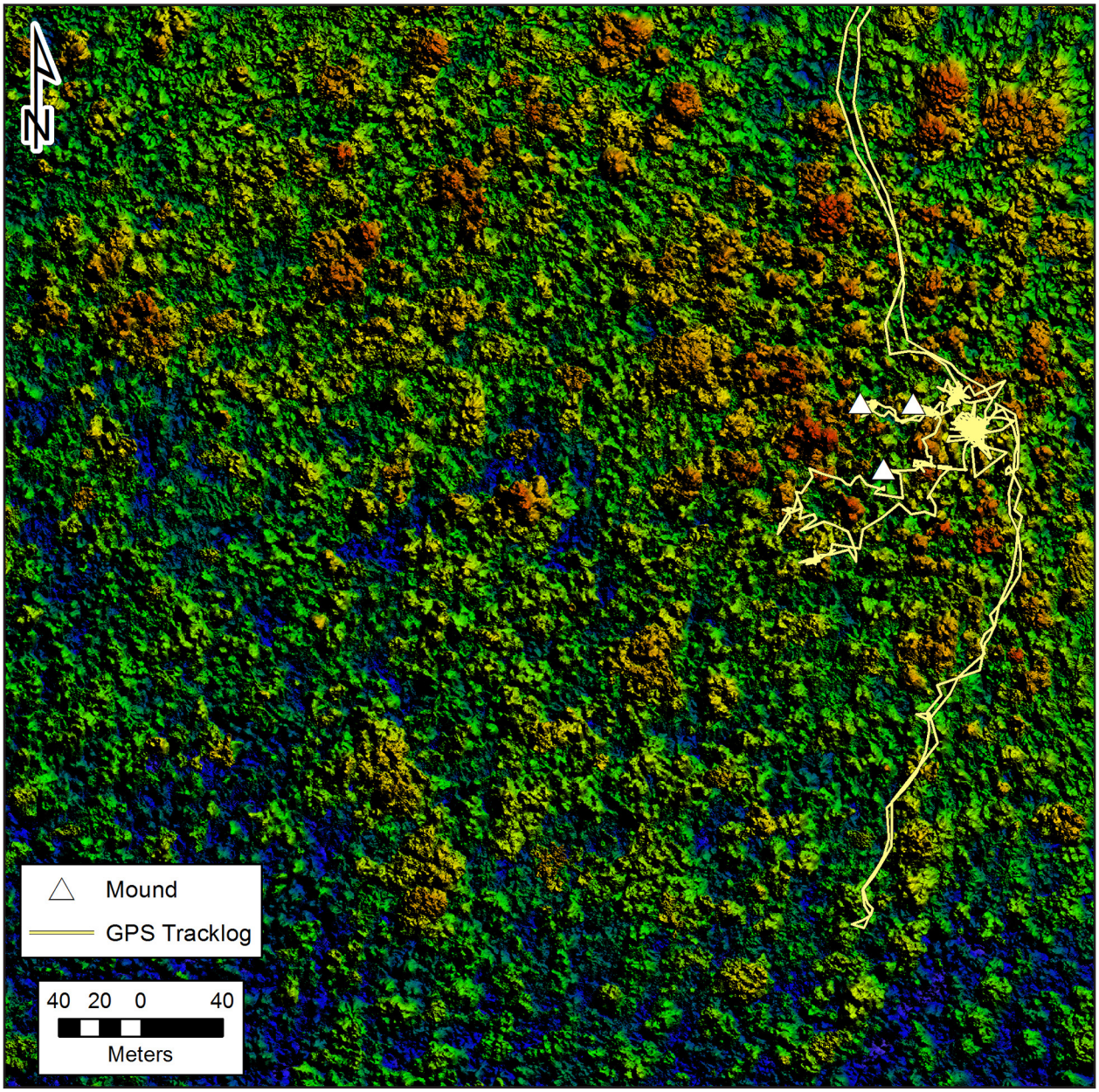

Figure 8.4. Digital Elevation Model (DEM) of the forest canopy at Sak Mut with GPS-recorded locations of large mounds and track of Mark Willis' path at the site.

the collapsed feature. During our short visit, we did not identify any other looted buildings.

Discussion

Unfortunately, the dense forest made it impossible to produce a sketch map of the site or even determine the number of mounds in the immediate area. Given the size of the mound with the collapsed feature, the site is likely to be relatively large. Because Lucero (2005) reported looters' trenches at the site she visited and a ball court, it is unclear if Sak Mut is a different site or part of the same site she saw in 2004. However, since the reported location of the site she visited is only 100 m south of the mounds we visited, it seems likely that Sak Mut is part of the site Lucero (2005) first reported over a decade ago. Nevertheless, it remains unclear if Sak Mut is the Preclassic

site hypothesized by Estrada-Belli; his proposed site based on satellite data is 800 m north of Sak Mut, and we walked right past his proposed site location without noting any large mounds. Although the thick plaster floor Houk observed in the trench/hole on the large mound at Sak Mut is a trait of Preclassic architecture, the ceramics on the surface suggest a Classic-period occupation.

Given the remoteness of the site and the nature of the forest in this area of Yalbac Ranch, Sak Mut is a perfect candidate for aerial LiDAR mapping. Additional ground inspections would be difficult and time-consuming, and could only be conducted in the dry season. Travel time could be reduced by opening the old logging road up farther, but the *bajo* will still prevent access to the site from the north when it is raining.

XMA HA AK'AL (BE-18)

Location and Activities

The BEAST crew visited the reported location of ruins in the northeastern corner of Laguna Seca Ranch on February 22, 2017, and encountered a relatively large, previously unrecorded Maya site approximately 1 km west of the Booth's River Escarpment. This site is designated BE-18, and we propose to name it Xma Ha Ak'al (Mayan for "lagoon without water"), after the ranch on which it is located. To access the site, the crew drove for approximately 45 minutes from Gallon Jug north along the Blue Creek road to Cedar Crossing and from there along an improved logging road to a large clearing that was once the site of a Maranco oil well. Although the old logging road continues past the clearing, it has not been reopened in years. The crew walked several hundred meters along an existing trail from the clearing and then east along a cleared logging inventory baseline for approximately 3 km. The final leg of the journey entailed walking north along a logging transect for another kilometer before reaching the ruins. The hike took approximately 2.5 hours.

Upon reaching the site, the crew split apart to investigate the ruins. After a quick and informal reconnaissance, it was clear that the site has a very large plaza surrounded by massive structures. The crew regrouped after approximately 45 minutes of exploration to discuss strategy. In the remaining 2.25 hours at the site, Houk and Zaro walked the ruins, while Zaro made a preliminary sketch map, estimating structure height, and Willis used a GPS receiver to record points along the bases and summits of mounds. At approximately 1:00 pm, Houk and Zaro left the Main Plaza to look for other groups of mounds to the south, while Willis flew a single drone mission to map the forest canopy around the ruins.

Site Description

Xma Ha Ak'al, as noted above, is a major ceremonial center. The BEAST crew only saw and documented a large plaza and an attached courtyard, but, based on the size of the plaza, there certainly are other monumental structures nearby. Based on topography and the fact that the logging crews from Laguna Seca did not inventory to the east of the recorded mounds, we predict there is a large acropolis or additional plazas approximately 200 m east of the mapped area (see discussion below). The map shown in Figure 8.5 is a sketch map of the plaza, and Figure 8.6 is a 3D model produced by Mark Willis based on the sketch map and estimated heights of mounds. The circled letters on the Figure 8.5 map refer to the annotations below. Because the survey crew undoubtedly overlooked some structures during the brief inspection of the site, we have chosen not to assign structure numbers at this stage of the research. An old logging road passes through the site at the southern end of the plaza, running east-west. This road is apparently the same one

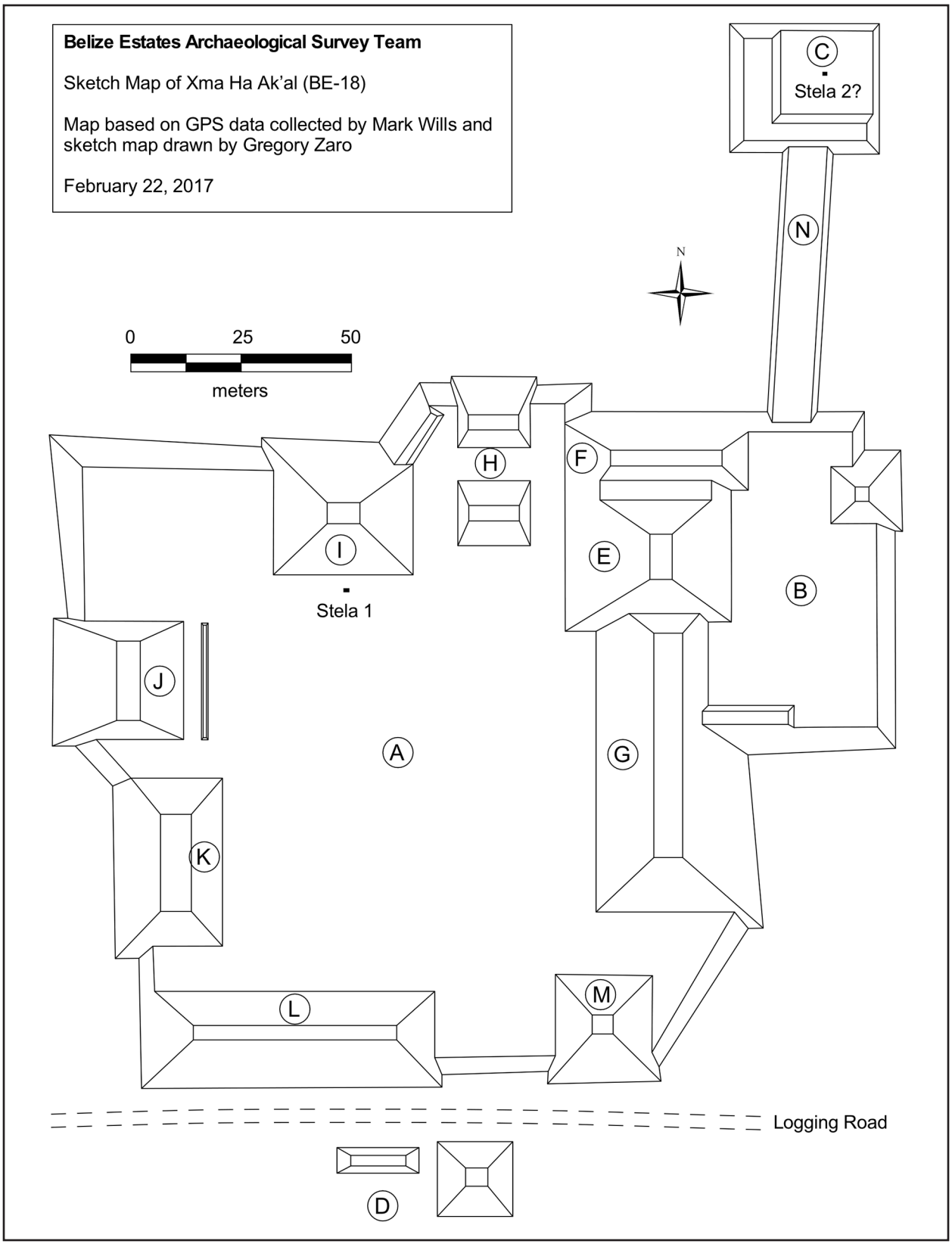

Figure 8.5. Map of plaza at Xma Ha Ak'al. See text for explanation of annotations.

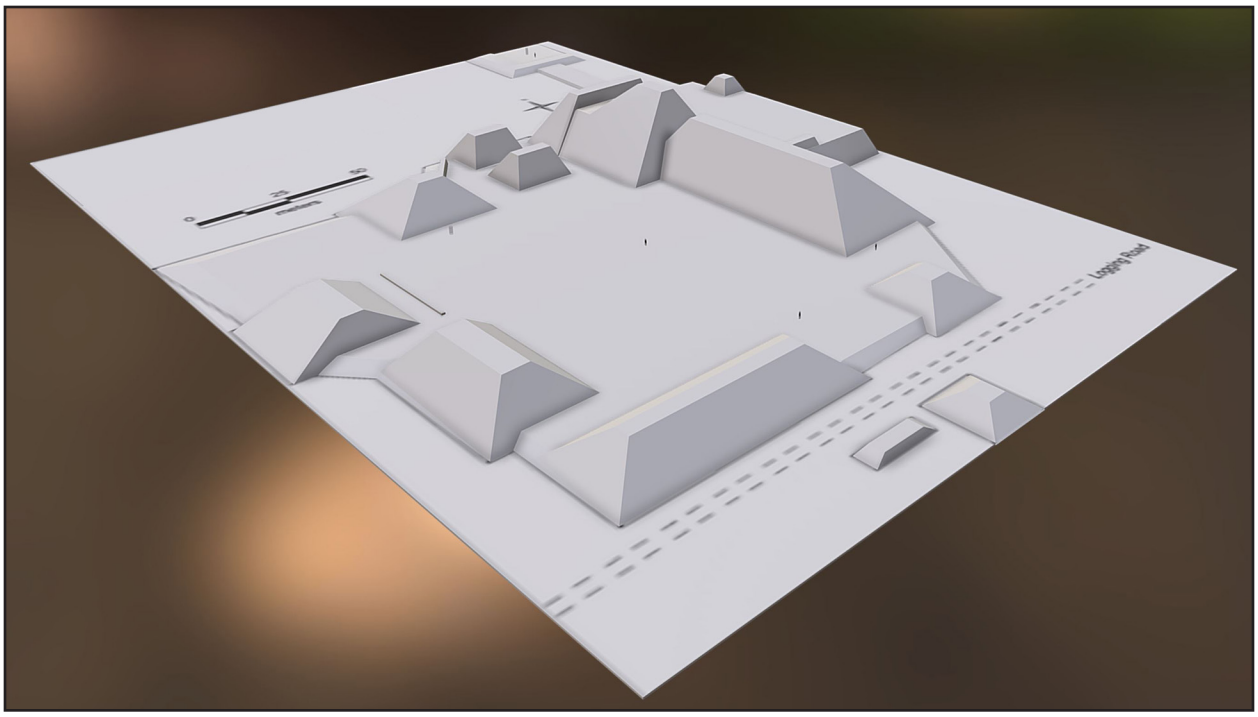

Figure 8.6. 3D model of plaza at Xma Ha Ak'al, perspective view to the northeast.

the crew drove as far as the old oil well pad, based on topographic maps of the area.

Plazas and Courtyards

A. The plaza documented here is oriented north-south and roughly rectangular in plan. As described below, the plaza contains a ball court at its northern end, one stela, and an assemblage of large, connected structures along its eastern side. At its maximum extent, the plaza is nearly 150 m north-south; between the temple pyramid on the north (Figure 8.5:I) and the range building on the south (Figure 8.5:L), the plaza measures 94 m. The width of the plaza varies from approximately 85 m (between the range building on the west [Figure 8.5:K] and the range building on the east [Figure 8.5:G] to 125 m (near the southern end from plaza edge to plaza edge). Although not depicted on the map, the crew noted a low berm in the northwestern corner of the plaza loosely defining the plaza's edge and another low berm in the northeastern corner of the plaza, connecting the northern ball court structure to the range building to its east. The plaza as drawn is clearly an artificially constructed platform. The natural terrain drops off steeply to the west and east and more gently to the north and south.

B. Attached to the back of the large structures on the eastern side of the plaza is an elevated courtyard. Based on GPS data and visual inspection, this courtyard's surface is approximately 8 m higher than the surface of the plaza. The western side of the courtyard is entirely enclosed by the large structures that also face the plaza. The southern side of the courtyard is partially enclosed by a low mound. Curiously, the eastern side of the courtyard is largely open—another reason we suspect more, large structures may lie to the east. A small pyramidal mound sits near the northeastern corner of the platform. Between this mound and the end of a large range structure (Figure 8.5:F), there is an opening along the northern side of the courtyard where

a *sacbe* (Figure 8.5:N) extends from the platform to a small courtyard to the north (see 'C' below).

C. Approximately 62 m north of the elevated courtyard described above is a small rectangular courtyard with a 1.5 m tall, L-shaped structure bordering its western and southern edges. The eastern and northern edges of the courtyard are open. In the approximate center of the courtyard, the survey team recorded a possible stela, preliminarily designated Stela 2, described below.

D. Separated from the southern edge of the plaza by an old logging road is another small courtyard. Due to time constraints, the crew did not explore this group fully, and there may be another structure or two associated with the two that are depicted in Figure 8.5. The eastern end of the courtyard is marked by a small temple-pyramid that is approximately 5 m tall. This mound has been looted, as evidenced by a trench piercing its western face.

Structures

E. The tallest mound at the site is a temple pyramid on the eastern side of the plaza that rises approximately 20 m above the plaza surface and 12 m above the courtyard behind it on the west. The mound shows evidence of minor looting, but the structure is largely undamaged. Although not drawn on Figure 8.5, there is an apparent stairway on the mound's western face.

F. To the north of the large temple pyramid is an attached range building that is rather oddly oriented east-west. Its western end aligns with the western face of the pyramid, but its eastern end extends farther to the east than the pyramid does. Between the two structures is a narrow platform. This structure is unusual and it may face to the north, away from the plaza.

G. Attached to the south of the large temple pyramid is a range building that is likely the most massive structure in the plaza. It is roughly 15 m tall and 64 m long, which puts it on par with the 15-m tall, 70-m long Structure A-1 at Chan Chich. The crew noted only minor looting on this structure.

H. At the north end of the plaza is a ball court, formed by two parallel, 8-m tall mounds. The playing alley is approximately 16 m long. The ball court is atypical for the region in that it is oriented east-west; the only other example of a ball court with an east-west orientation in northwestern Belize is found at La Milpa. The ball court has not been looted.

I. An 8-m high temple pyramid occupies the northern edge of the plaza, west of the ball court. This unlooted mound is also notable for its association with Stela 1, discussed below.

J. Two range buildings line the western edge of the plaza. The northern one is approximately 6 m high. About 4 m east of the base of the mound is a low linear mound measuring 1.5 m wide, 0.5 tall, and 27 m long. This unusual feature runs parallel to the range building from end to end; its function is unknown.

K. The second range building on the western side of the plaza is approximately 8 m tall and 37 m long. Like its neighbor, this mound has not been looted.

L. A long range building marks the southwestern corner of the plaza. This building is approximately 64 m long, 6 m tall and oriented east-west to define the southern margin of the plaza. It is also unlooted.

M. A 5-m tall temple pyramid occupies the southeastern corner of the plaza. A gap between this building and the range building to the west may have served as the primary entrance into the plaza. The crew noted evidence of looting on this pyramid.

N. A 10-m wide *sacbe* connects the isolated courtyard north of the plaza to the northeastern courtyard behind the large temple. This feature appears to follow a natural ridge and varies in height from about 0.25 m to 1 m over its 62-m length.

Monuments

The crew discovered Stela 1 lying face down in front of the temple-pyramid in the northwestern part of the plaza. It was evident that looters had cleared collapse debris from around the stela. The stela measures 1.15 m tall, by 0.7 m wide, and 0.27 m thick. The crew could find no evidence of carving on the visible face of the monument or on the sides. With the assistance of Edi and Arturo, Houk partially lifted the monument to inspect the buried face. No carving was observed, but it is possible that the face of the monument had been chain sawed by looters, based on indications observed by Houk. A rounded stone nearby may be the top of the monument, perhaps broken off by the looters. If so, the monument would have been approximately 1.5 m tall.

Houk and Zaro observed a second monument laying flat in the center of the courtyard north of the plaza. Although this could be an altar, we have tentatively designated it Stela 2. This monument is 0.90 m long, 0.67 m wide, and 0.32 m thick. Houk observed what may be the base of the stela near the western end of the monument, apparently still *in situ*. The crew did not see evidence of carving on the monument.

Discussion

Xma Ha Ak'al is a major ceremonial site, following the classification system used by the IA. Undoubtedly, more monumental structures remain undiscovered at the site, as it would be unprecedented for a site with a plaza this large not to have a large acropolis or several elite palace structures. The DEM of the forest canopy (Figure 8.7) suggests the terrain to the east, which was not explored by Yalbac Ranch's forestry crews, is elevated and could contain additional large mounds. If so, this site may prove to be the largest ruin recorded in northwestern Belize since Dos Hombres was first identified by archaeologists in 1992. The plaza covers roughly 11,600 m^2, which makes it one of the largest public plazas in Belize (Table 8.1).

The site exhibits a number of unusual traits from a site planning perspective. First, its east-west ball court is highly unusual for the region. Second, while causeways are not unusual, the north-south *sacbe* connecting the plaza to the small courtyard at the north end of the site is unique for the region. Typically, causeways in northwestern Belize connect major architectural groups and always enter directly into the main plaza. The causeway at Xma Ha Ak'al connects to the elevated platform attached to the eastern side of the plaza, not the plaza itself.

SUMMARY AND CONCLUSIONS

During the short reconnaissance trip in February 2017, we successfully visited two previously unrecorded sites. Sak Mut (BE-17) remains largely unknown as time, tree falls, and dense vegetation limited our time and abilities at the site. It is likely, however, that Sak Mut is a major ceremonial center based on the proximity of a site visited by Lisa Lucero in 2004 and predicted site location based on Francisco Estrada-Belli's review of satellite images.

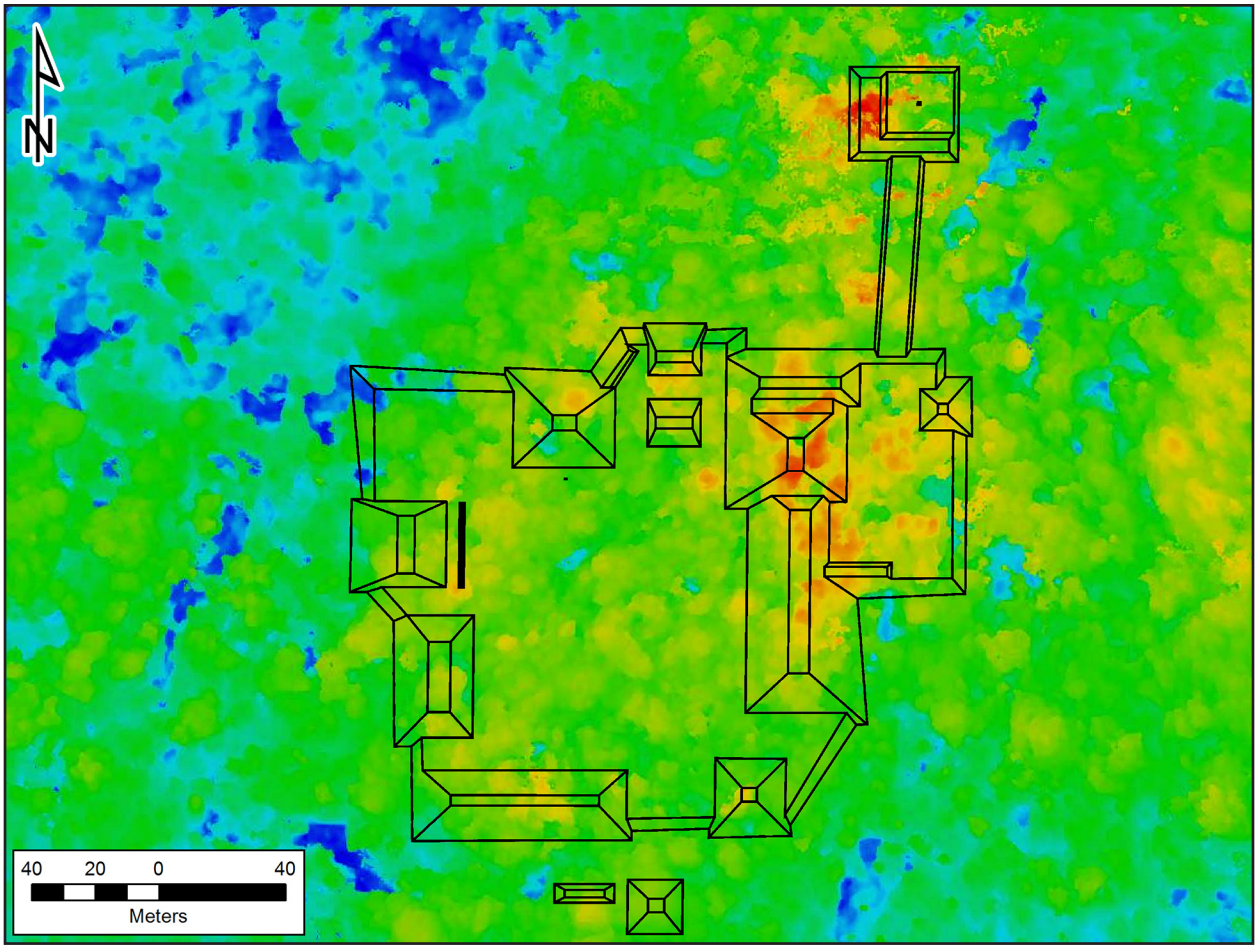

Figure 8.7. DEM of the forest canopy at Xma Ha Ak'al with the locations of mapped structures superimposed. Note the rough correspondence between the highest canopy (in orange) and the mapped plaza and structures. The blue areas are areas where the canopy's top is lower in elevation, reflecting the natural drop where the ground slopes downward to the north and west of the plaza. The higher canopy to the east may indicate additional structures.

Table 8.1. Open Plaza Areas in Northwestern and Western Belize (After Houk 2015:Table 10.2)

Site	Plaza	Open Plaza Area (m^2)
La Milpa	Great Plaza	17,710
Chan Chich	Plaza A-1	12,490
El Pilar	Plaza Copal	12,240
Dos Hombres	Plaza A-1	11,650
Xma Ha Ak'al	mapped plaza	11,600
Xunantunich	Plazas A-I and A-II*	9,550

*Prior to the end of the Late Classic period, Xunantunich had one large plaza that was subdivided after Structure A-1 was built.

Xma Ha Ak'al (BE-18) is a major ceremonial center near the northern boundary of Laguna Seca Ranch, approximately 1 km west of the Booth's River Escarpment. We recorded a large plaza bounded by monumental structures, including a 20-m tall temple pyramid. The plaza contains at least one stela and an east-west oriented ball court. A *sacbe* extending north from a courtyard attached to the northeastern side of the plaza connects to a small courtyard with another stone monument, tentatively designated Stela 2. Based on the size of the plaza and its associated structures, we believe other large structures or architectural groups are present at the site. Although we noted some looting at Xma Ha Ak'al, most of the structures in the plaza have not been looted or exhibit minimal damage from looting.

Both newly recorded sites warrant further investigation and protection.

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The Chan Chich Archaeological Project: 1996 to 2017 Project Lists

Compiled by Brett A. Houk

This chapter includes lists of sites, operations, tombs, burials, caches, stone monuments, and radiocarbon dates most recorded by the Chan Chich Archaeological Project (CCAP) since its inception in 1996 and the Belize Estates Archaeological Survey Team (BEAST) since 2013. It is meant to serve as a reference document for future seasons and is updated each year.

SITES

Table 9.1 lists Maya sites on and near the Gallon Jug (GJ), Laguna Seca (LS), and the adjacent Yalbac (Y) properties with Belize Estate (BE) designations. As noted by Sandrock (2013) and Sandrock and Willis (2014), BEAST assigned BE numbers to previously named sites and to newly discovered sites with four or more structures, the tallest of which must be at least

Table 9.1. Recorded BE Sites (UTM Zone 16N)

BE #	Site Name	Property	Original Source	UTM N	UTM E
1	Chan Chich	GJ	Guderjan (1991)	19 40 412	2 75 875
2	Kaxil Uinic (E'kenha)	LS	Guderjan et al. (1991)	19 40 538	2 73 381
3	Punta de Cacao	LS	Guderjan et al. (1991)	19 46 100	2 86 728
4	Gallon Jug	GJ	Guderjan et al. (1991)	~19 43 900	~2 83 450
5	Laguna Verde	GJ	Guderjan et al. (1991)	~19 47 250	~2 80 500
6	Laguna Seca	GJ/LS	Guderjan et al. (1991)	~19 50 850	~2 84 000
7	Qualm Hill (ruin)	LS	Guderjan et al. (1991)	~19 57 300	~2 87 500
8	Wamil	Y?	Guderjan et al. (1991)	~19 39 900	~2 94 900
9	Sierra de Agua	Y/LS?	Guderjan et al. (1991)	~19 40 600	~2 99 500
10	Gongora Ruin	LS	Guderjan et al. (1991)	19 54 400	2 93 459
11	Ix Naab Witz	LS	Sandrock (2013)	19 55 187	2 85 854
12	La Luchita	LS	Sandrock (2013)	19 50 011	2 77 178
13	Montaña Chamaco	LS	Sandrock (2013)	19 51 187	2 75 043
14	Sylvester Camp	GJ	Sandrock (2013)	19 45 510	2 78 128
15	Qualm Hill camp	LS	Sandrock and Willis (2014)	19 57 213	2 85 282
16	Kaxil Uinic village	Y/LS	Thompson (1963)	19 40 073	2 73 487
17	Sak Mut	Y	Houk et al. (this volume)	19 34 386	2 72 740
18	Xma Ha Ak'al	LS	Houk et al. (this volume)	19 58 096	2 96 807

Houk, Brett A. (compiler)
2017 The Chan Chich Archaeological Project: 1996 to 2017 Project Lists. In *The 2017 Season of the Chan Chich Archaeological Project*, edited by Brett A. Houk and Claire Novotny, pp. 203–224. Papers of the Chan Chich Archaeological Project, Number 12. Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

4 m high including structure and substructure or basal platform, that are not within 1 km of another recorded site BE site.

In addition to prehistoric sites, a number of historic sites are present in and near the BEAST survey area. Table 9.2 includes a list of those visited by the CCAP or BEAST or reported by other researchers. Significant historic sites are also assigned BE numbers.

Table 9.2. Known and Reported Historic Sites

Name	Location	Description	Source(s)
Kaxil Uinic village BE-16	Approximately 500 m south of BE-2 primarily on Yalbac Ranch, although the northern limits of the village are on Laguna Seca Ranch.	In 2012, the CCAP re-located the remains of the historic Maya village and *chicle* camp known as Kaxil Uinic and its associated *aguada*. The village was probably settled in the 1880s, and was closed in 1931 by the Belize Estate Co. BEAST mapped and excavated the site in 2015, recording seven three-stone hearths and multiple artifact scatters, which included turn of the century glass bottles and cast iron pots. BEAST returned to the site in 2016 and mapped additional surface finds, hearths, and mounds. The 2016 work included archival research in Jamaica and England.	Bonorden (2016); Bonorden and Houk (2015, 2016); Bonorden and Kilgore (2015, this volume); Booher et al. (2016); Houk (2012); Houk and Bonorden (2015); Houk et al. (2015); Thompson (1963)
Qualm Hill camp BE-15	Immediately west of Cedar Crossing on the west bank of the Río Bravo.	A 215-x-90-m scatter of historic artifacts that likely represents the location of Qualm Hill (also known as Quam or Quam Hill), which was "the seasonal headquarters of the British Honduras Company during the mid 1800s" (Cackler et al. 2007:124). Qualm Hill is historically important as the site of a "Chichina" Maya raid led by Marcus Canul in 1865 (Bristowe and Wright 1888:27–28), yet artifacts recovered from the 2015 survey and excavation generally post-date the raid. The site, which primarily consists of surface artifact deposits, has been disturbed in recent years by individuals scavenging the historic logging equipment and modern loggers camping in the middle of the historic camp.	Bonorden (2016); Bonorden and Houk (2016); Bonorden and Smith (2015); Bristowe and Wright (1888:27–28); Houk et al. (2015); Cackler et al. (2007:124)
El Infierno logging camp	Reportedly 1 km east of Guatemala border, northwest of Gallon Jug	This site is mentioned in reference to the location of the Maya site of El Infierno, which is described as "behind" the logging camp; no other details provided.	Guderjan et al. (1991:61)
Unnamed	Approximately 75 m southwest of BE-13, 50 m west of a swamp	BEAST located a possible abandoned *chiclero* camp, as evidenced by a small collection of bottles, in 2013.	Sandrock (2013)

CHAN CHICH CONTROL POINTS

Table 9.3 lists the UTM coordinates for important mapping control points at Chan Chich. Most of the points described are marked with metal surveyor spikes or large nails. Elevations are given for the top of the spike or nail. All points are OPUS corrected. Although the project shot several new control points in 2014, they are not included in this list because the total data station apparently was not properly calibrated. Willis and colleagues (this volume) established two new control points in 2017. The elevations for these points have not yet been matched to previous control point elevations.

Table 9.3. Chan Chich Control Point UTM Coordinates

Point	Description	Northing	Easting	Elev (m)
Main Site Datum (2012)	Spike in asphalt near pavement's edge between bar and Structure A-1	1940412.85	275875.56	118.72
Structure A-1 Central Datum	Spike in central landing, summit of Structure A-1	1940390.29	275877.30	129.49
Structure A-1 East Datum	Eastern summit of mound	1940385.65	275895.98	131.76
Structure A-1 West Datum	Western summit of mound	1940395.39	275847.77	131.27
Structurea A-4 Datum	Western summit of mound	1940535.23	275863.09	126.02
Structure A-5 Central Datum	N1010 E1030 in local A-5 grid	1940519.90	275904.50	123.01
Structure A-5 West Datum	Western summit of mound	1940523.61	275891.81	122.95
Structure A-8 Datum	Summit of mound	1940494.17	275964.40	126.30
Structure A-9 Datum	Summit of mound	1940434.43	275958.13	126.41
Upper Plaza West Datum	East of Structure A-21	1940358.03	275857.15	125.99
Upper Plaza Southeast Datum	In southeast corner of plaza	1940337.89	275891.17	126.11
2017: Structure A-1	In central landing area	1940390.49	275877.58	131.00
2017: Structure A-5	Summit of structure	1940519.81	275907.97	124.33

OPERATIONS

To date, the CCAP has conducted excavations at Chan Chich and Kaxil Uinic ruins, and BEAST has made surface collections of isolated finds and at Qualm Hill camp and conducted excavations there and at Kaxil Uinic village. Operations numbers are assigned sequentially by site, preceded by a site abbreviation. Thus, the first operation at Chan Chich is designated Op CC-01. Table 9.4 lists the operations that have been assigned through the 2017 season.

Table 9.4. List of Operations Opened by CCAP and BEAST

Op	Season	Definitions	Subops	Source(s)
CC-01	1997	Excavations on the northern stairs of Structure A-1	A–C	Houk (1998)
CC-02	1997	Excavations at the Upper Plaza	A–J	Robichaux (1998)
CC-02	1998	Excavations at the Upper Plaza, including landing of Structure A-1	K–W	Robichaux et al. (2000)

Table 9.4. List of Operations Opened by CCAP and BEAST (continued)

Op	Season	Definitions	Subops	Source(s)
CC-02	1999	Excavations at the Upper Plaza including summits of Structures A-1 and A-13	X–AK	Robichaux (2000)
CC-03	1997	Excavations at the ball court	A–E	Ford (1998)
CC-04	1997	Test pits in Group C	A–C	Meadows (1988)
CC-04	1998	Test pit in Plaza C-2	D	Ford and Rush (2000)
CC-05	1998	Excavations at Courtyard C-1	A–L	Ford and Rush (2000)
CC-06	1998	Excavations at Group H	A–F	Houk and Zaro (2015); Meadows and Hartnett (2000)
CC-07	1999	Excavations at Structure C-6	A–E	Harrison (2000)
CC-08	1999	Excavations at Structure A-11	A–B	Houk (2000)
CC-09	2001	Excavations at Plaza C-2	A–M	Unpublished field notes
CC-10	2012	Excavations at the Upper Plaza	A–F	Kelley (2014); Kelley et al. (2012)
CC-10	2013	Excavations at the Upper Plaza	G–T (plus Ix)	Kelley (2014); Kelley et al. (2013)
CC-11	2013	Excavations at Structure A-5	A–R (plus Fx)	Herndon et al. (2013)
CC-12	2014	Excavations at the Upper Plaza, Chan Chich Dynastic Architecture Project	A–T (plus Ax)	Herndon et al. (2014, 2015)
CC-13	2014	Excavations at the Back Plaza	A–N (plus ST, seven shovel tests)	Herndon et al. (2015); Vazquez (2014); Vazquez et al. (2014)
CC-14	2014, 2015	Excavations associated with processional architecture including the Eastern and Western Causeways, Courtyard D-1, Structure D-48, Structure C-17, and Structure C-18A, and Structure D-36	A–AW (plus Ex, ARx, AMx, and SF)	Booher (2016a); Booher et al. (2015); Booher and Houk (2016); Booher and Nettleton (2014); Houk et al. (2015)
CC-15	2016, 2017	Excavations at the Upper Plaza, Chan Chich Dynastic Architecture Project. The 2016 and 2017 seasons focused on chronology building and the northern part of the plaza.	A–S (plus Bx, Kx, and Px)	Booher et al. (2016); Gallareta Cervera et al. (this volume); Houk (2016)
CC-16	2016	Excavations at Norman's Temple complex.	A–X (plus Dx)	Booher (2016b); Booher et al. (2016)
CC-17	2017	Excavations at Courtyard D-4	A–U (plus Ix, Ox, and ST)	Kilgore et al. (this volume)
CC-18	2017	Excavations at Structure A-6	A–F	Degnan et al. (this volume)
KU-01	2012	All excavations at Kaxil Uinic in 2012	A–H	Harris (2013); Harris and Sisneros (2012); Houk (2012); Houk et al. (2012, 2013)

Table 9.4. List of Operations Opened by CCAP and BEAST (continued)

Op	Season	Definitions	Subops	Source(s)
KUV-01	2015, 2016	All excavations at Kaxil Uinic village in 2015 and 2016.	A–AD (plus Rx and SF)	Bonorden (2016); Bonorden and Houk (2016); Bonorden and Kilgore (2015, 2016); Booher et al. (2016); Houk (2012); Houk and Bonorden (2015); Houk et al. (2015)
QHC-01	2014	Surface collections made by BEAST at Qualm Hill Camp	SF	Phillips and Sandrock (2014); Sandrock and Willis (2014)
QHC-02	2015	All excavations at Qualm Hill camp made by BEAST in 2015	A–S and SF	Bonorden (2016); Bonorden and Houk (2016); Bonorden and Smith (2015); Houk et al. (2015)
SF-01	2014	Surface collections made by BEAST that were not associated with a site	SF1–SF3	FileMaker Pro database

SPECIAL DEPOSITS

Over the course of eight seasons of research, the CCAP has excavated one cache, one tomb, one crypt, and 18 burials. Table 9.5 lists the burials thus far recorded, and Table 9.6 lists the tombs and crypts documented at the site, including a looted tomb first recorded by Guderjan (1991). Table 9.7 includes the single cache entry in the list of special deposits.

Table 9.5. List of Burials

Burial #	Season	Provenience	Context	Source(s)
CC-B1	1997	CC-4-A-3	Primary burial in Late Preclassic fill, Courtyard C-1	Meadows (1998)
CC-B2	1997	CC-2-J-6	Tomb 2, Terminal Preclassic burial in Upper Plaza	Houk et al. (2010)
CC-B3 (4, 6)	1998	CC-5-C-3 and -H-2	Secondary scatter of human bone associated with surface deposit of artifacts on steps of Structure C-2; Terminal Classic (?). Burials CC-B3, -B4, and -B6 combined by Frank and Julie Saul into Burial CC-B3.	Ford and Rush (2000)
CC-B5	1998	CC-6-C-9	Late Classic (?) primary burial beneath Courtyard H-3	Meadows and Hartnett (2000)
CC-B7	1998	CC-4-D	Secondary scatter of human bone associated with surface deposit of artifacts on steps to Structure C-6; Terminal Classic (?)	Ford and Rush (2000)
CC-B8	1999	CC-7-B	Primary Terminal Classic burial beneath bench in Structure C-6	Harrison (2000)
CC-B9	2001	CC-9-G-7	Primary burial of a child in Structure C-12 patio; Late Classic (?)	Unpublished field notes

Table 9.5. List of Burials (continued)

Burial #	Season	Provenience	Context	Source(s)
CC-B10	2012–2013	CC-10-A-8 (extends into CC-10-G)	Primary (?) subfloor, simple cist, burial, poorly preserved; early Late Preclassic. Interment consisted of a single, adult individual, likely of a young age at death. The presence of 19 unmodified dog teeth suggests that an animal was placed in the grave with the human individual. Oldest burial yet excavated at Chan Chich.	Kelley (2014); Kelley et al. (2013); Novotny et al. (this volume)
CC-B11	2014	CC-12-D-9	Primary burial of an adult in a small crypt in Structure A-1. The burial is associated with the penultimate construction phase and was encountered beneath the central landing on the structure. The small crypt contained four complete vessels. Likely associated with Cache CC-C1.	Herndon et al. (2014); Novotny et al. (2015)
CC-B12	2014	CC-14-F-3	Primary, simple found in dry-laid fill within a bench, very close to the surface. Burial contained a single shallow Achote Black bowl with nubin feet and post-firing graffiti—incised quadripartite designs—on two exterior sides and in the middle of the vessel's interior.	Booher et al. (this volume); Booher and Nettleton (2014); Novotny et al. (2015)
CC-B13	2014	CC-12-H-13	Primary burial of robust adult in a small crypt associated with the penultimate phase of Structure A-18 in the Upper Plaza. No grave goods.	Herndon et al. (2014); Novotny et al. (2015)
CC-B14	2015	CC-14-J-04	Primary burial of adult female buried in a seated position within a bench in Structure D-1. She was interred with a piece of anlter, a small shell bead, a *jute* shell, and a mold-made ceramic spindle whorl.	Booher (2016); Booher et al. (2015); Mitchell and Booher (2015); Novotny et al. (2015)
CC-B15	2016	CC-16-L-02	Late Classic; primary interment of a single, young adult, male individual interred in a simple cist within a bench. The individual was placed in a tightly flexed position with head to the east. Grave goods included a small, modified shell, a shell labret, two obsidian blades, and a complete Cameron Incised bowl.	Booher (2016b); Novotny et al. (2016)

Table 9.5. List of Burials (continued)

Burial #	Season	Provenience	Context	Source(s)
CC-B16	2016, 2017	CC-15-G-11, -13, and -14	Discovered in 2016, but only partially excavated, Burial CCB-16 was located in Crypt 1 in the Upper Plaza. The burial dates to the Early Classic period. Excavations on the crypt were completed in 2017. Burial CC-B16A, excavated in 2016, consisted of bones of the left foot, an articulated right leg, and an articulated right wrist and hand (Novotny et al. 2016). Burial CC-B16B was excavated in 2017 and was the primary interment of a single adult male in an extended and prone position with hands on the pelvis and the right leg crossed over the left. Burials CC-B16C and CC-B16D were clusters of human bone likely associated with Burial CC-B16A. The best explanation is that an individual was buried in crypt, perhaps in a flexed position given the position of the right leg (CC-B16A), and disturbed by the interment of CC-B16B before decomposition was complete. The primary individual was buried with a bib-helmet head pendant, which may indicate he was a member of the ruling family.	Gallareta Cervera et al. (this volume); Houk (2016); Novotny et al. (2016, this volume)
CC-B17	2017	CC-15-N-4	Burial CC-B17 is a Late Preclassic burial of a young to middle age adult found shallowly buried beneath the plaza surface of the Upper Plaza. The individual was placed in an extended position with the head oriented to the north. A complete Society Hall Impressed bowl was intentionally placed over the skull.	Gallareta Cervera et al. (this volume); Novotny et al. (this volume)
CC-B18	2017	CC-17-C-9	Late Classic Burial CC-B18 was found within the southeast corner of a bench in Structure D-41, in Couryard D-4. Burial CC-B18 consisted of two individuals. Individual CC-B18A was in a flexed position in the western part of the burial area, oriented east-west. No cranium was found with this individual. The second skeleton, Individual CC-B18B was also in a flexed position in the northeastern corner of the burial, oriented east-west.	Kilgore et al. (this volume); Novotny et al. (this volume)

Table 9.6. List of Tombs

#	Season	Provenience	Location	Source(s)
Tomb 1	--	Structure C-31	Looted tomb referred to as the King's Tomb; Late Classic (?)	Guderjan (1991)
Tomb 2	1997–1999	Upper Plaza, CC-2-J-6	Tomb 2, Terminal Preclassic tomb in Upper Plaza	Houk et al. (2010); Robichaux (1998, 2000); Robichaux et al. (2000)
Crypt 1	2016, 2017	Upper Plaza, Subop CC-15-G	Early Classic crypt in northern part of Upper Plaza	Gallareta Cervera et al. (this volume); Houk (2016)

Table 9.7. List of Caches

Cache #	Season	Provenience	Context	Source(s)
CC-C1	2014	CC-12-D-8	Structure A-1, penultimate phase. This cache contained 17 obsidian blades, found loose but grouped together in fill, resting on one of the capstones of Burial CC-B11.	Herndon et al. (2014)

STONE MONUMENTS

Table 9.8 lists the stone monuments recorded within the CCAP and BEAST permit area. To date, no monuments with legible texts or dates have been found in the area. The only monument with evidence of carving is Stela 1 at Kaxil Uinic (see Harris and Sisneros 2012; Thompson 1939).

Table 9.8. Recorded Stone Monuments in CCAP/BEAST Permit Area

BE #	Site	Monument	Location	Description	Source(s)
1	Chan Chich	Stela 1	Main Plaza, base of Structure A-2	Uncarved and burned stela	Guderjan (1991:43)
2	Kaxil Uinic	Stela 1	Main plaza, base of Structure 3	Broken in two pieces, heavily eroded stela with evidence of carving, illegible; 1.95 m tall, 80 cm wide, 55 cm thick	Guderjan et al. (1991); Harris and Sisneros (2012:52); Thompson (1939)
		Altar 1	Main plaza, base of Structure 3	Round, limestone altar (ca. 130 cm diameter; 30 cm thick), uncarved	Guderjan et al. (1991); Harris and Sisneros (2012:56–56); Thompson (1939)
3	Punta de Cacao	Stela 1	Plaza A, near base of Structure A-5	Uncarved stela	Robichaux (2004:200)
		Possible stela or altar	Plaza A, in front of Structure A-5	Large, uncarved block of stone, 82 x 82 x 40 cm, broken into two parts.	Hartnett (2005)

Table 9.8. Recorded Stone Monuments in CCAP/BEAST Permit Area (continued)

BE #	Site	Monument	Location	Description	Source(s)
4	Gallon Jug	Stela 1	Main plaza	Very small stela that may not actually be a monument, only 45 cm high	Sandrock (2013)
7	Qualm Hill	Stela 1	Northeastern corner of Plaza A	Uncarved stela, laying flat; 1.8 m long, 0.6 m wide, and 0.4 m thick	Cackler et al. (2007:121)
		Altar 1	Plaza B	Broken in half, plain altar measuring 1.5 m in diameter and 1 m thick	Cackler et al. (2007:123)
10	Gongora Ruin	Stela 1	In plaza in front of Structure 1	Small, uncarved stela. Note that BEAST was unable to re-locate this monument in 2014.	Guderjan et al. (1991:81); Sandrock and Willis (2014)
11	Ix Naab Witz	Stela 1	Upper plaza near southwestern corner of Structure 6	Small, uncarved stela, 1.05 m tall, 40–60 cm wide, 35 cm thick	Sandrock (2013)
18	Xma Ha Ak'al	Stela 1	Northwest corner of mapped plaza	The stela measures 1.15 m tall, by 0.7 m wide, and 0.27 m thick. Uncarved or possible chain sawed by looters	Houk et al. (this volume)
		Stela 2?	Courtyard north of mapped plaza	Uncarved, 0.90 m long, 0.67 m wide, and 0.32 m thick. May be an altar.	Houk et al. (this volume)

RADIOCARBON DATES

Table 9.9 presents the results of radiocarbon samples run by the project from 2012 to 2015. Table 9.10 presents the calibrated age ranges and isotope data for those same samples. Table 9.11 presents the results of samples from the 2016 and 2017 seasons. Table 9.12 presents the isotope data for 2017 samples from human bone.

Table 9.9. Radiocarbon Samples from the 2012 to 2015 Seasons

Area	Context	Sample #s	Comments	PSU #	UCIAMS #	Modern Fraction	±	$D^{14}C$ (‰)	±	^{14}C age (BP)	±
Upper Plaza	Lot CC-10-C-7	CC-10-S12	Charred material. This sample came from a midden in the northern part of the Upper Plaza. This midden is above floor Lot CC-10-C-8.	6390	154684	0.7273	0.0013	-272.7167	1.3023	2560	15
Upper Plaza	Lot CC-10-C-8	CC-10-S16	Charred material. This sample comes from subfloor fill associated with the oldest floor in the northern part of the Upper Plaza.	6386	151874	0.7271	0.0019	-272.9396	1.9490	2560	25
Upper Plaza	Lot CC-10-C-4	CC-10-S03	Charred material. This sample is from the second plaster floor above the midden in the northern part of the Upper Plaza.	6385	151873	0.7561	0.0020	-243.8584	2.0222	2245	25
Upper Plaza	Lot CC-10-H-4	CC-10-S28	Charred material.This sample is associated with dense artifact deposit within northern platform buried in Upper Plaza.	6397	154691	0.7631	0.0013	-236.8672	1.3000	2170	15
Upper Plaza	Lot CC-12-O-8	CC-12-S16	Charred material.This sample comes from the lowest (fifth) identified layer of the 20-cm thick compact dirt surface that covers most of the southern part of the Upper Plaza.	6393	154687	0.7669	0.0013	-233.0904	1.2797	2130	15
Upper Plaza	Lot CC-12-O-4	CC-12-S14	Charred material. This sample comes from the second identified layer of the 20-cm thick compact dirt surface that covers most of the southern part of the Upper Plaza.	6392	154686	0.7941	0.0015	-205.9289	1.4563	1850	15
Upper Plaza	Lot CC-12-D-6	CC-12-S08	Charred material. This sample is from the plaster cap that patched the floor above Burial CC-B11.	6396	154690	0.8289	0.0016	-171.1195	1.5594	1510	20

Table 9.9. Radiocarbon Samples from the 2012 to 2015 Seasons (continued)

Area	Context	Sample #s	Comments	PSU #	UCIAMS #	Modern Fraction	±	$D^{14}C$ (‰)	±	^{14}C age (BP)	±
Upper Plaza	Lot CC-12-D-7	CC-12-S13	Charred material. This sample comes from a charcoal rich layer of fill covering Burial CC-B11.	6394	154688	0.8292	0.0014	-170.7725	1.4281	1505	15
Upper Plaza	Lot CC-12-C-4	CC-12-S03	Charred material. This sample is from the subfloor fill of the final floor in a room on Structure A-18.	6391	154685	0.8489	0.0013	-151.0105	1.3403	1315	15
Upper Plaza	Lot CC-12-D-9	CC-12-S17	Charred material. This sample comes from Burial CC-B11 in the penultimate phase of Structure A-1.	6387	151875	0.8494	0.0023	-150.5843	2.2638	1310	25
Upper Plaza	Lot CC-12-A-4	CC-12-S05	Charred material. This sample is from the final phase of construction in a room in Structure A-1 (from the floor).	6395	154689	0.8512	0.0014	-148.8458	1.4124	1295	15
Back Plaza	Lot CC-13-M-3	CC-13-S14	Charred material. This sample comes from a probable cooking feature in Structure A-23. Will help date terminal occupation.	6388	151876	0.8554	0.0023	-144.6185	2.2870	1255	25
Str. D-1	Lot CC-14-F-3	CC-14-S04	Bone. This sample is human bone from Burial CC-B12 in Structure D-1.	6418	154712	0.8589	0.0017	-141.0115	1.6736	1220	20

Table 9.10. Calibrated Age Ranges and Isotope Data for Radiocarbon Samples from 2012 to 2015 Seasons

Sample #	$\delta^{13}C$ (‰ VPDB)	$\delta^{15}N$ (‰ Atm N2)	%C	%N	C:N	From	To	%
CC-10-S12						799 BC	766 BC	95.4
CC-10-S16						805 BC	569 BC	95.4
CC-10-S03						390 BC	280 BC	95.4
CC-10-S28						355 BC	171 BC	95.4
CC-12-S16						204 BC	96 BC	95.4
CC-12-S14						AD 91	AD 231	95.4
CC-12-S08						AD 435	AD 608	95.4
CC-12-S13						AD 540	AD 602	95.4
CC-12-S03						AD 659	AD 764	95.4
CC-12-S17						AD 658	AD 768	95.4
CC-12-S05						AD 667	AD 768	95.4
CC-13-S14						AD 673	AD 863	95.4
CC-14-S04	-10.49	8.83	52.73	18.60	3.31	AD 713	AD 885	95.4

Table 9.11. Charcoal Samples Processed from the 2016 and 2017 Seasons

Sample	Lot	Context	^{14}C age (BP)	±	Calibrated age (AD/BC)	% under curve	2σ Age Range
15-S016	15-A-08	Associated with construction of Lot 15-A-8 plaster floor	2470	25	767–482 BC	94.6	767–434 BC
					442–434 BC	8.0	
15-S043	15-A-15	Associated with earliest use of plaza above bedrock	2700	35	911-804 BC	95.4	911–804 BC
15-S119/120	15-A-27	Floor 6, south of Blanca	2750	20	968–964 BC	0.8	968–833 BC
					931–833 BC	94.6	
15-S005	15-B-03	Associated with terminal use of Structure A-1	1275	20	AD 675–770	95.4	AD 675–770
15-S045	15-B-04	Embedded on surface of Lot 15 B-7; associated with fill of buried Preclassic platform or top of underlying Middle Preclassic surface	2435	25	749–684 BC	21.3	749–407 BC
					667–640 BC	6.8	
					589–578 BC	1.0	
					564–407 BC	66.3	
15-S022	15-B-04	Embedded in ballast; associated with construction of buried Preclassic platform	2485	20	766–540 BC	95.4	766–540 BC
15-S029	15-B-08	Associated with construction of buried Preclassic platform	2595	45	841–736 BC	73.4	841–547 BC
					689–663 BC	5.4	
					648–547 BC	16.6	
15-S050	15-B-10	Associated with intentional cutting event through Lot 15-B-9 plaster surface	2490	25	774–536 BC	95.1	774–524 BC
					525–524 BC	0.3	
15-S054	15-B-11	Associated with construction of Lot 15-B-11 plaster floor	2520	30	795–728 BC	29.3	795–542 BC
					717–708 BC	1.0	
					694–542 BC	65.1	
15-S051	15-B-15	Embedded on compacted surface at base of intentional cut feature in Lot 15-B-9 (use of Lot 15-B-16/ construction of Lot 15-B-15)	2620	25	826–782 BC	95.4	826 –782 BC
15-S004	15-C-04	Embedded on compacted dirt stratum (below terminal plaza plaster floor fill)	1835	20	AD 128–236	95.4	AD 128–236

Table 9.11. Charcoal Samples Processed from the 2016 and 2017 Seasons (continued)

Sample CC-	Lot CC-	Context	^{14}C age (BP)	±	Calibrated age (AD/BC)	% under curve	2σ Age Range
15-S019	15-C-05	Associated with surface of Lot 15-C-5 plaster floor	1840	20	AD 125–238	95.4	AD 125–238
15-S007	15-C-07	Associated with surface of Lot 15-C-7 plaster floor	2265	40	401–346 BC	38.3	401–206 BC
					322–206 BC	57.1	
15-S023	15-C-08	Associated with Lot 15-C-8 plaster floor	2295	30	406–354 BC	75.1	406–231 BC
					291–231 BC	20.3	
15-S034	15-C-10	Embedded in ballast of Lot 15-C-10 (7th plaster floor/8th living surface down from modern surface/ eroded terminal plaza floor)	2530	20	794–746 BC	42.7	794 –552 BC
					686–666 BC	13.5	
					644–552 BC	39.2	
15-S039	15-C-11	Associated with surface of Lot 15-C-11 plaster floor	2470	30	768–476 BC	92.4	768–431 BC
					464–453 BC	1.2	
					445–431 BC	1.8	
15-S059	15-G-04	Associated with intentional burning event	1895	25	55 BC–AD 175	91.8	55 BC–AD 211
					AD 191–211	3.6	
15-S065	15-G-13	Fill of capstones at the south wall of crypt	1855	15	AD 121–227	88.9	AD 87–227
					AD 87–107	6.5	
15-S063	15-G-14	Burial B16/Crypt context	1735	15	AD 247–353	92.5	AD 247–379
					AD 368–379	2.9	
15-S067	15-G-14	Burial B16/Crypt context	1785	20	AD 140–197	14.1	AD 140–328
					AD 208–262	48.2	
					AD 277–328	33.1	
15-S070	15-G-14	Burial B16/Crypt context	1715	15	AD 257–298	30.7	AD 257–387
					AD 320–387	64.7	
15-S071	15-G-14	Burial B16/Crypt context	1780	15	AD 174–192	2.3	AD 174–330
					AD 212–264	50.8	
					AD 275–330	42.4	
15-S073	15-G-14	Burial B16/Crypt context	2475	15	762–537 BC	95.4	762–537 BC
15-S141	15-G-14	Individual B, Burial B16	1725	20	AD 252–384	95.4	AD 252–384
15-S138	15-G-19	Crypt floor	1760	15	AD 237–333	95.4	AD 237–333

Table 9.11. Charcoal Samples Processed from the 2016 and 2017 Seasons (continued)

Sample CC-	Lot CC-	Context	^{14}C age (BP)	±	Calibrated age (AD/BC)	% under curve	2σ Age Range
15-S137	15-G-21	Fill of crypt floor	2540	20	796–748 BC	60.5	796–556 BC
					685–667 BC	10.4	
					641–587 BC	19.6	
					581–556 BC	4.9	
15-S079	15-I-09	"Floor 3"	2175	15	355–291 BC	63.0	355–175 BC
					232–175 BC	32.4	
15-S130	15-L-16	Top of stone feature (outside)	2185	15	358–281 BC	65.4	358–185 BC
					258–245 BC	2.3	
					236–185 BC	27.8	
15-S126	15-L-17	Inside of stone feature	2100	20	182–52 BC	95.4	182–52 BC
15-S075	15-M-12	Floor 3 of east Upper Plaza construction sequence	1710	15	AD 257–296	23.3	AD 257–390
					AD 321–390	72.1	
15-S083/085	15-M-17	Fill of Preclassic platform floor	2415	20	542–406 BC	90.8	728–406 BC
					707–694 BC	2.5	
					728–717 BC	2.1	
15-S086	15-M-21	Floor 6 of east Upper Plaza construction sequence	2450	20	751–683 BC	31.9	751–413 BC
					669–637 BC	11.5	
					622–617 BC	0.6	
					591–413 BC	51.5	
15-S087	15-M-22	Construction fill	2465	20	762–482 BC	94.8	762–434 BC
					441–434 BC	0.6	
15-S088	15-M-23	Surface of posthole	2520	15	787–746 BC	32.0	787–552 BC
					686–666 BC	16.2	
					644–552 BC	47.2	
15-S127	15-M-24	Inside of Posthole	2430	15	730–692 BC	12.1	730–411 BC
					659–652 BC	1.7	
					544–411 BC	81.6	
15-S143	15-N-04	Burial B17	2035	25	154–140 BC	1.9	154 BC–47 AD
					113 BC– AD 27	92.7	
					AD 42–47	0.8	
15-S092	15-Q-02	Fill of Floor 1 of SE Upper Plaza construction sequence	4475	20	3335–3211 BC	60.8	3335–3033 BC
					3193–3151 BC	13.5	
					3138–3088 BC	18.0	
					3057–3033 BC	3.0	
15-S117	15-Q-09	Fill of dismantled Floor 4 of SE Upper Plaza construction sequence	2195	15	358–278 BC	61.0	358–199 BC
					259–199 BC	34.4	

Table 9.11. Charcoal Samples Processed from the 2016 and 2017 Seasons (continued)

Sample CC-	Lot CC-	Context	^{14}C age (BP)	±	Calibrated age (AD/BC)	% under curve	2σ Age Range
16-S01	16-L-3	Associated with Burial CC-B15 in final phase of Structure C-2	1165	35	AD 771–970	95.4	AD 771–970
17-S19	17-C-10	Bone from Burial CC-B18 in final phase of Structure C-41	1205	20	AD 769–886	95.4	AD 769–886
17-S08	17-E-04	Charcoal from dense artifact concentration found on the courtyard surface in the southwestern corner of Courtyard D-4	1205	15	AD 771–883	95.4	AD 771–883
17-S14	17-I-06	Charcoal from the plaster floor in northern room of Structure D-42	1180	15	AD 775–890	95.4	AD 775–890
17-S06	17-J-03	Charcoal from plaster of the c-shaped bench in southern room of Structure D-42	1270	15	AD 681–770	95.4	AD 681–770
17-S10	17-Q-05	Charcoal from dense artifact concentration in the northwestern corner of Courtyard D-4	1175	15	AD 775–893	95.4	AD 775–893

*Lots beginning with CC-15 are from the Upper Plaza. The lot beginning with CC-16 is from the Norman's Temple complex. Lots beginning with CC-17 are from Courtyard D-4.

Table 9.12. Isotope Data for Radiocarbon Samples from Burials, 2017 Season

Sample # CC-	Burial CC-	Fraction Modern	±	D^{14}C (‰)	±	^{14}C age (BP)	±	δ^{13}C (‰)	δ^{15}N (‰)	%C	%N	C:N
17-S19	B18B	0.8607	0.0018	-139.3	1.8	1205	20	-12.7	9.4	14.0	5.0	3.29
15-S141	B16B	0.8066	0.0017	-193.4	1.7	1725	20	-11.1	8.2	16.0	5.8	3.22
15-S143	B17	0.7763	0.0020	-223.7	2.0	2035	25	-11.4	10.0	8.7	3.0	3.42

STUDENT RESEARCH

Much of the research conducted by CCAP and BEAST supports graduate student thesis projects. Beginning with the 2012 season, seven graduate students—six completed and one in progress—and one undergraduate, in progress, have collected thesis data through CCAP or BEAST research (Table 9.13).

Table 9.13. List of Theses Resulting from CCAP and BEAST Research

Harris, Matthew C.
2013 A Short Walk from Paradise: Initial Excavations at Kaxil Uinic. Unpublished MA thesis, Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

Kelley, Krystle
2014 Establishing the Acropolis: Two Seasons of Investigations in the Upper Plaza of Chan Chich, Belize. Unpublished MA thesis, Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

Vazquez, Edgar
2015 In Service of the King: The Form, Function, and Chronology of Courtyard A-3 at Chan Chich, Belize. Unpublished MA thesis, Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

Booher, Ashley M.
2016 Assessing the Form and Function of the *Sacbeob* and Associated Structures at Chan Chich, Belize. Unpublished MA thesis, Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

Bonorden, Alyssa Brooke
2016 Comparing Colonial Experiences in Northwestern Belize: Archaeological Evidence from Qualm Hill Camp and Kaxil Uinic Village. Unpublished MA thesis, Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

Sandrock, David
2017 BEAST Mode: Two Seasons of Archaeological Survey on the Gallon Jug-Laguna Seca Property in Northwestern Belize. Unpublished MA thesis, Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

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Bonorden, Alyssa Brooke
2016 Comparing Colonial Experiences in Northwestern Belize: Archaeological Evidence from Qualm Hill Camp and Kaxil Uinic Village. Unpublished master's thesis, Department of Anthropology, Texas Tech University, Lubbock.

Bonorden, Brooke, and Brett A. Houk
2015 Navigating the Cultural Landscape of 19th-Century Belize: An Archaeological Examination of Kaxil Uinic Village. Paper presented at the 6th Annual South-Central Conference on Mesoamerica, The University of Texas at San Antonio.
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