The 2016 Season of the Chan Chich Archaeological Project

EDITED BY

Brett A. Houk

Papers of the
Chan Chich Archaeological Project, Number 11
Department of Sociology, Anthropology, and
Social Work
Texas Tech University • Lubbock, Texas
2016

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

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EDITED BY

Brett A. Houk

WITH CONTRIBUTIONS BY

Valorie V. Aquino
Brooke Bonorden
Ashley Booher
Brett A. Houk
Gertrude Kilgore
Anna C. Novotny
AND
Mark D. Willis

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Cover art: Photograph of ceramic pendant from Norman's Temple at Chan Chich. Photo by Brett A. Houk.

Acknowledgments

In 2016, the Chan Chich Archaeological Project (CCAP) and the Field School in Maya Archaeology (FSMA) both celebrated their half-k'atun jubilees, marking 10 seasons of archaeological research! Many things go into a successful research project, but two of the most important are permits and funding. With respect to the former, I would like to thank Dr. John Morris of the Institute of Archaeology (IA) for once again being supportive of our work. 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. Melissa graciously assisted the project with passport extensions, drone permits, and our export permit. With respect to the latter, the 2016 season marked the first of three years of funding from the Alphawood Foundation Chicago. The project would like to thank Kristin Hettich, Program Officer at Alphawood, for her interest in the project and assistance during the application stage. Kristin also visited the project in the field, and my staff and I enjoyed the opportunity to show her around the excavations. 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. Alan Jeal, the general manager of Gallon Jug Ranch, has been a longtime friend of the project, and I would like to think him for his continued support. In addition to Alan, I would like to 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, Thomas Kennerly, and everyone else associated with The Forestland Group who facilitated our access to work on Yalbac Ranch and Laguna Seca Ranch.

The project staff in 2016 included operation directors Ashley Booher, Brooke Bonorden, and Valorie Aquino. Suboperation directors Kevin Miller, Trudy Kilgore, and Carolyn Nettleton assisted in the field and helped supervise the excavations. The field staff trained the students in excavation methods, recording, and mapping. Samantha Mitchell oversaw the field lab in 2016 and taught the students how to process, catalog, and analyze artifacts. The project's bioarchaeologist, Anna Novotny, joined us in the field for analysis and excavation of human skeletal remains in 2016. Returning students Paisley Palmer, Danielle Ruffe, and Erik Pearl assisted with the excavations and proved to be invaluable in the field. Valorie Aquino deserves additional thanks for traveling to Penn State for a week to prepare our radiocarbon samples for analysis.

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 entertaining pursuits. I greatly appreciate their time and effort to complete their chapters in time to get the report published in 2016. To each, I offer, not money, but total consciousness on their deathbeds. So, they've got that going for them, which is nice.

Letty Martinez, the 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. I would like to single out Emil Flota, Migde Perdomo, Luis Romero, and Jerry Serminia for going above and beyond to assist us. We will miss Emil next season! Jerry spent three days of vacation time working in the field with us and keeping our gang of teenage workers in line. Speaking of which, I would like to thank the rotating crew of field assistants from Chan Chich and Sylvester Village who made our excavations possible. Abe Rempel once again helped us with rental vehicles, making sure what we needed was waiting at the airport for us.

In 2016, a number of consultants and analysts aided our investigations. First, I would like to thank Dr. Fred Valdez and Dr. Lauren Sullivan for analyzing our ceramics. Lori Phillips holed up in my hotel room and analyzed our faunal remains during the Belize Archaeology and Anthropology Symposium. Mark Willis joined the project twice in 2016 to conduct a drone survey—the first drone crashed! Douglas Kennett and Brendan Culleton of the Pennsylvania State University Human Paleoecology and Isotope Geochemistry Lab analyzed our radiocarbon samples from 2016. Claudio Ferrera, the son of the Bowen and Bowen chief financial officer, graciously worked with us for a couple of weeks.

The project staff and students visited the ruins of Caracol in 2016 and spent the night at Moonracer Farms. Despite the first massive rainstorm of the season, our overnight stay was fantastic. I'd like to thank Tom and Marge Gallagher for making our group feel so welcome (and for fixing the battery on our truck).

2016 CCAP staff and students at Chan Chich. From left to right, front row: Ernesto Esquivel-Amores, Danielle Ruffe, Mnemosyne Rice, Samantha Zurita, Jeremy Anderson, Inez Sosa, Chloe Lowetz, Ashley Booher, Trudy Kilgore. From left to right, back row: Brett A. Houk, Kevin Miller, Samantha Mitchell, Paisley Palmer, Carolyn Nettleton, Erik Pearl, Megan Fridley, Melissa Kemmerly, Rachel Schneider, Allison Duncan, Brooke Bonorden, Valorie Aquino.

I would like to thank Laura Kosakowsky for storing our equipment and luggage while the project staff explored Mexico for nearly two weeks. Leroy Lee graciously drove half of our group to the airport after we returned from Mexico and spared at least one of us a ride in the back of our pickup truck.

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, Rachel Jarnagin, and Adrianna Sotelo for all their help with our students, our travel arrangements, and our budgeting.

We had a diverse group of students in 2016 from Texas Tech and beyond. As always, the students deserve thanks for choosing our program over others. They are Jeremy Anderson, Allison Duncan, Ernesto Esquivel-Amores, Megan Fridley, Melissa Kemmerly, Chloe Lowetz, Mnemosyne Rice, Rachel Schneider, Inez Sosa, and Samantha Zurita.

Guns up!

Brett A. Houk, December 31, 2016

2016 CCAP staff and students at Caracol. From left to right, front row: Danielle Ruffe, Mnemosyne Rice, Carolyn Nettleton. From left to right, back row: Allison Duncan, Jeremy Anderson, Inez Sosa, Megan Fridley, Melissa Kemmerly, Ernesto Esquivel-Amores, Erik Pearl, Rachel Schneider, Chloe Lowetz, Samantha Zurita, Paisley Palmer, Brooke Bonorden, Valorie Aquino, Samantha Mitchell, Ashley Booher, Trudy Kilgore, Brett A. Houk.

An Introduction to the 2016 Season of the Chan Chich Archaeological Project and the Belize Estates Archaeological Survey Team

Brett A. Houk

The Chan Chich Archaeological Project (CCAP) and its regional component, the Belize Estates Archaeological Survey Team (BEAST), operate 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 tenth season of research in 2016.

This chapter includes relevant project details (dates, staff, permits, funding, and so on), summaries of the 2016 excavations, and an updated description of Chan Chich's site plan and chronology, based on the results of 10 seasons of research at the site by the CCAP. Finally, the chapter closes with a preview of the rest of the volume.

PERMIT AREA

As negotiated with the Institute of Archaeology (IA) in June 2014, the CCAP/BEAST permit area covers approximately 144,000 acres of land in northwestern Belize, 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). Sixteen 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 Project Lists, this volume). CCAP and BEAST conducted archaeological work at two of the 16 sites in 2016—Chan Chich and Kaxil Uinic village—and used a drone to survey cleared pastures in Gallon Jug Ranch and the largest lagoon, Laguna Seca, in the permit area. In addition to the fieldwork component of the season, project staff conducted archival research in Jamaica and England.

PROJECT TIME LINE, STAFF, AND CONSULTANTS

The project director (Houk) and Brooke Bonorden, the operation director for investigations at Kaxil Uinic village, conducted archival research at the Jamaica Archives and Records Department in Spanish Town on March 30 and 31, 2016 (Table 1.1). Bonorden visited two additional archives in England—the Wesleyan Methodist Missionary Archives at the School of Oriental and African Studies (SOAS) in London and the National Archives in Kew—on April 25–29, 2016. The fieldwork phase of the project began on May 17, 2016, with the arrival of the project director in Belize (Table 1.2). On May 19, most of the project staff, along with remote sensing specialist Mark Willis, arrived in Belize and traveled to Chan Chich Lodge that afternoon. The staff

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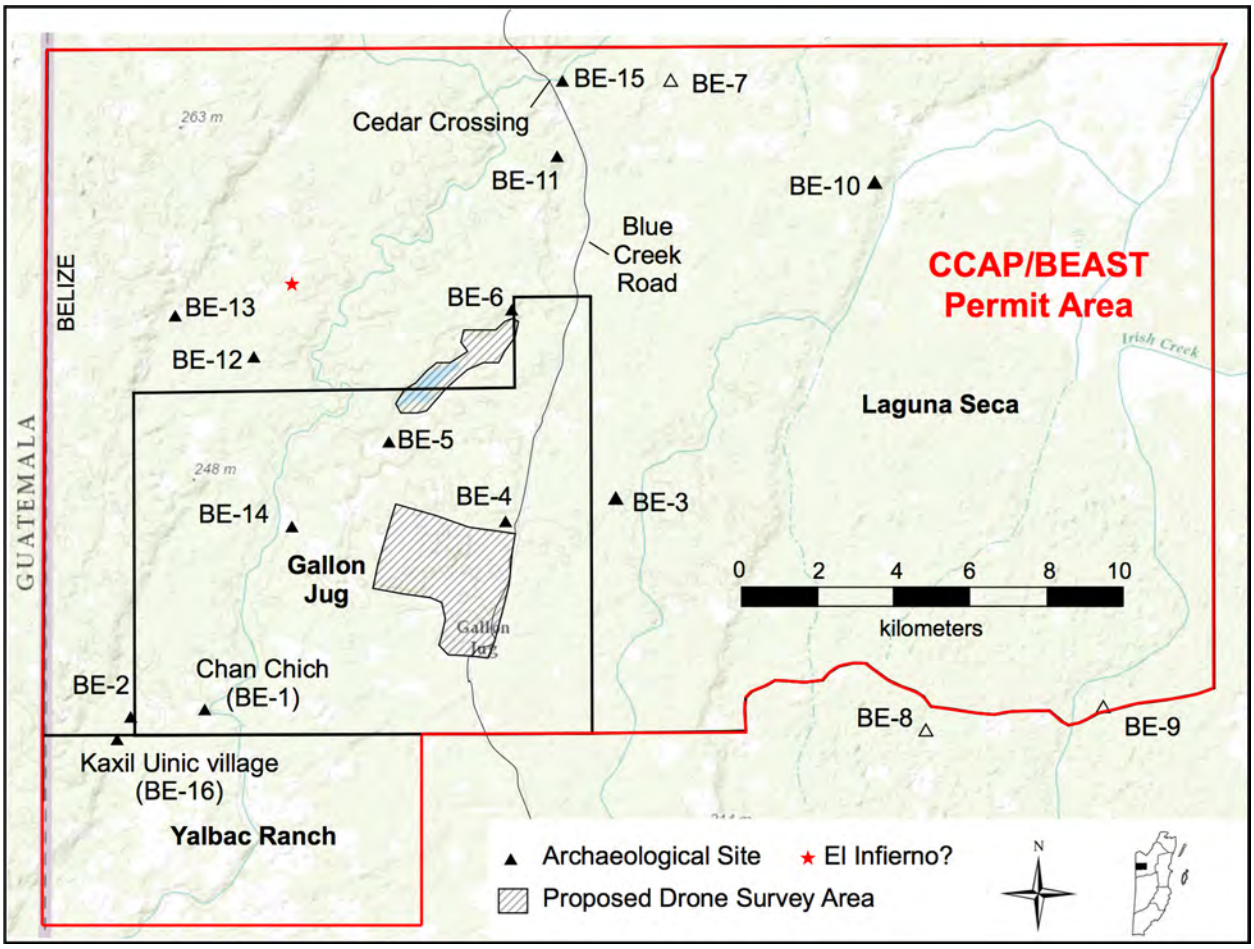

Figure 1.1. Map of the CCAP/BEAST permit area. See Table 7.1 for list of BE numbers.

unpacked the lab and field equipment and made preliminary visits to the planned excavation areas over the next few days. The group of 10 first-time field school students, three returning students, and staff member Trudy Kilgore arrived on May 24, 2016. The field school students and staff member Carolyn Nettleton departed June 27. The remainder of the staff departed the lodge on July 8, ending the 2016 field season.

PROJECT FUNDING

The 2016 season marked the first of three years of funding from the Alphawood Foundation Chicago. The Alphawood grant to TTU supported most of the costs associated with the archival work, 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 2016 season of the CCAP, and the Department of Sociology, Anthropology, and Social Work also provided a minor amount of financial support.

PROJECT PERMITTING

The IA, part of the Belizean National Institute of Culture and History, issued Permit No. IA/H/2/1/16(07) to Houk for the excavations at Chan Chich and Kaxil Uinic village and the drone survey of Gallon Jug and Laguna Seca. 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.

Table 1.1. Timeline of Archival Investigations

Name	Activity	Begin	End
Dr. Brett A. Houk	Archival research at Jamaica Archives and Records Department, Spanish Town	3-30-16	3-31-16
Brooke Bonorden	Archival research at Jamaica Archives and Records Department, Spanish Town	3-30-16	3-31-16
Brooke Bonorden	Archival research at SOAS Library, London, England	4-25-16	4-26-16
Brooke Bonorden	Archival research at National Archives, Kew, England	4-27-16	4-29-16
Hunter Lee	Transcription of photographs of archival records from National Archives	9-1-16	11-4-16

Table 1.2. List of Project Staff And Consultants

Name	Role	Affiliation	Arrival	Departure
Dr. Brett A. Houk	Project Director	TTU (Anthropology)	5-17-16	7-8-16
Valorie V. Aquino	Operation Director	New Mexico (Anthropology graduate student)	5-17-16	7-8-16
Brooke Bonorden	Operation Director	TTU (Anthropology graduate student)	5-19-16	7-8-16
Ashley Booher	Operation Director	TTU (Anthropology graduate student)	5-19-16	7-8-16
Samantha Mitchell	Lab Director	TTU (Anthropology graduate student)	5-19-16	7-8-16
Kevin Miller	Suboperation Director, Lithicist	SWCA, Inc.	5-19-16	5-28-16
Carolyn Nettleton	Suboperation Director		5-19-16	6-27-16
Mark Willis	Remote Sensing Specialist		5-19-16	5-23-16
			6-4-16	6-8-16
Trudy Kilgore	Suboperation Director	TTU (incoming Anthropology graduate student)	5-24-16	7-8-16
Dr. Anna Novotny	Project Bioarchaeologist	TTU (Anthropology)	6-19-16	7-4-19
Dr. Fred Valdez, Jr.	Project Ceramicist	UT-Austin (Anthropology)	--	--
Dr. Lauren A. Sullivan	Assistant Project Ceramicist	UMASS-Boston (Anthropology)	--	--

RESEARCH FRAMEWORK OF CCAP: THE 2016–2018 SEASONS

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. The largest Maya sites in what is today Belize functioned primarily 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. With this goal in mind, 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 the great arc of 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 who was 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 alongside the political institution of divine kingship. We know very little about how the process started and 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; 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 unknown. 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.

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 2016). 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 (Houk 2000a, 2016). 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 are light- to moderate-density scatters of artifacts that range from utilitarian ceramics and ground stone implements to more exotic 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 in Belize prior to the modern era.

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 a foundation for an ambitious multi-year project to explore the development, decline, and reoccupation of the urban landscape in northwestern Belize. Over the course of three seasons (2016–2018), 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.
- The resettlement of the region by San Pedro Maya centuries after the Classic Maya abandoned the region.

AN OVERVIEW OF THE 2016 SEASON

During the 2016 season, our efforts targeted four diverse objectives related to the research goals enumerated above. At the site of Chan Chich, Ashley Booher directed the excavations at the Norman's Temple complex (Operation [Op] CC-16), a hilltop courtyard group in the western part of the site core, and Valorie Aquino initiated a three-season continuation of the Chan Chich Dynastic Architecture Project (CCDAP) in the Upper Plaza as Op CC-15 (Figure 1.2). Under the auspices of BEAST, Mark Willis conducted a drone survey of Gallon Jug Ranch and Laguna Seca, and Brooke Bonorden completed the second and final season of excavations at Kaxil Uinic village, a historic San Pedro Maya site a few kilometers west of Chan Chich (Op KUV-01). The Kaxil Uinic investigations included archival research in Jamaica and England. The project afforded field school students opportunities to participate in excavations at Chan Chich and Kaxil Uinic and work in the field lab to gain experience in artifact processing and analysis.

Investigations at Chan Chich (CCAP)

Investigations in the Upper Plaza

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 three seasons 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; 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. 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 200–250 and to examine how architecture reflects the evolving relationship between political organization (i.e., divine kingship) and monumental construction.

To investigate the relationship between divine kingship and dynastic architecture over the next three field seasons, the CCAP is building on the work already accomplished in the Upper Plaza in the 1990s (Houk et al. 2010; Robichaux 1998, 2000; Robichaux et al. 2000) and since 2012 (Herndon et al. 2014; Kelley et al. 2012, 2013; Walker 2012; Willis et al. 2014). One of the most intriguing mysteries resulting from the recent excavations was an apparent large Late Preclassic platform in the northern part of the Upper Plaza. The feature's southern face had been revealed in six suboperations, but excavations had not established the platform's dimensions or its function. Prior to the 2016 season, we surmised that the platform was built in two phases (at least), with a lower course of well-shaped cut stones forming the original base, and a taller face constructed of crudely shaped stones extending above the older surface almost to the modern plaza surface.

The project also has not tested the deposits in the plaza's southeastern and southwestern sections. Until the construction sequence has

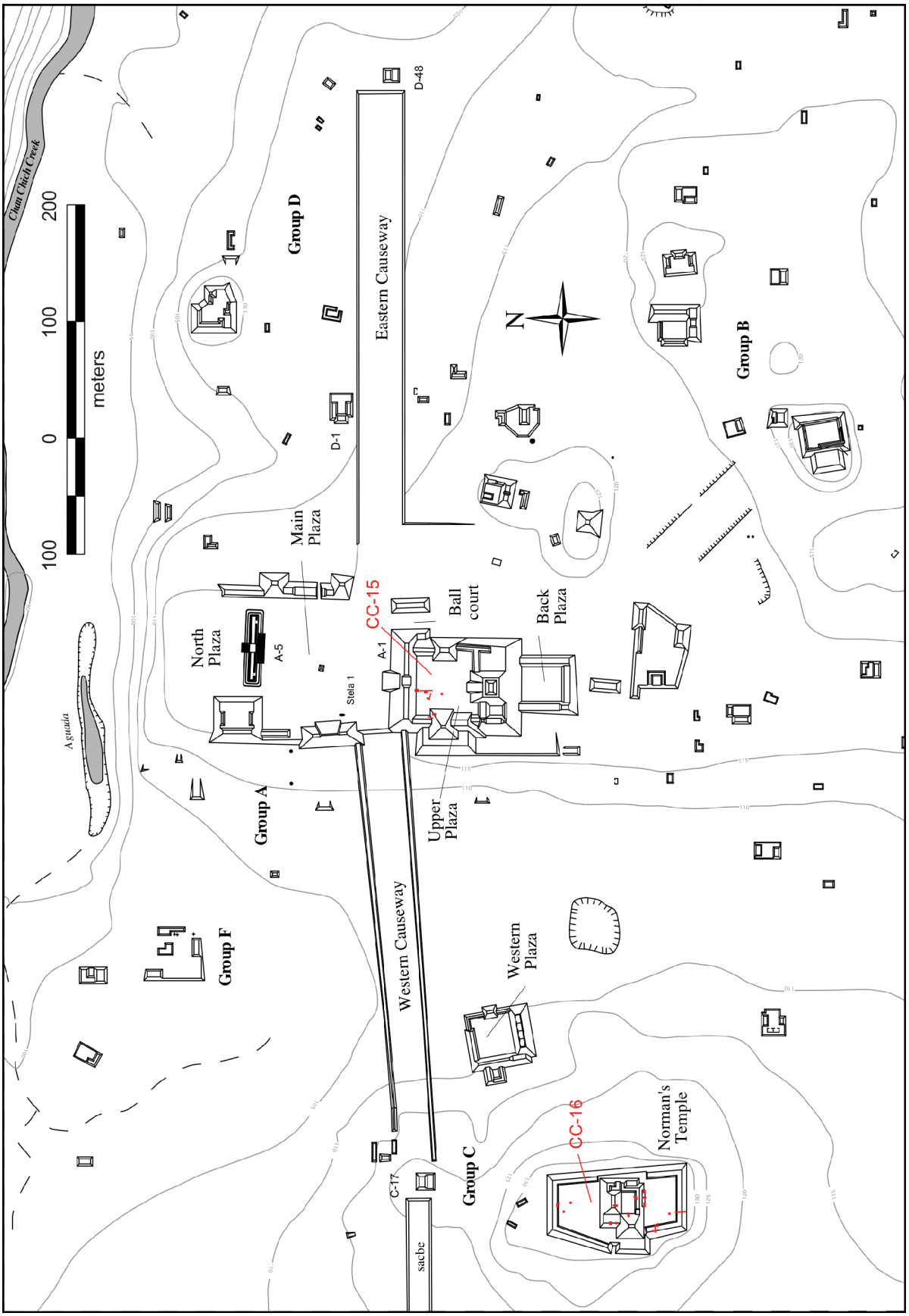

Figure 1.2. Map of Chan Chich with the Upper Plaza (Op CC-15) and Norman's Temple (Op CC-16) highlighted.

been documented in those areas of the plaza, it will not be possible to fully understand how the royal acropolis developed through time. Excavations in the southwestern corner are also necessary to clarify the sequence of floors related to the construction of Tomb 2.

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?

Over the 2016 to 2018 field seasons the project proposed to target the following objectives to address these questions:

- Define the extent, form, construction sequence, and function of the buried platform in the northern part of the plaza.
- Conduct additional stratigraphic excavations and radiocarbon sampling to clarify the age of the floors that pre-date the construction of the buried platform as well as the age of the platform.
- Establish the plaza's construction chronology in the southwestern and southeastern sections of the plaza.
- Conduct excavations on the monumental buildings surrounding the plaza to establish construction sequence, form, and function. This objective includes:
    - Examining collapsed rooms on Structure A-1.
    - Tunneling at Structures A-15 and A-21 to identify early architecture associated with the founding of the royal dynasty at the site.
    - Excavating Structures A-12, A-13, A-14, and A-22.

Methods

As shown in Figure 1.3, CCAP opened eight suboperations and one suboperation extension within Op CC-15, with units focused largely or in part on chronology building represented by Suboperations (Subops) CC-15-A, -B, and -E. Subops CC-15-A, -D, -Dx, -G, and -H targeted the buried platform in the northern end of the plaza. As described below, thick collapse debris at the base of Structure A-21 on the western side of the plaza and an enigmatic cut feature at the base of Structure A-1 hampered our chronology building efforts. Thus, the results presented here are preliminary.

Throughout the season, excavators obtained multiple charcoal samples associated with each floor construction or remodeling episode, although a number of those associated with the oldest floors proved to be too poorly preserved to date. In October 2016, Valorie Aquino processed 29 charcoal samples collected from the 2016 Upper Plaza excavations and an additional charcoal sample and a femur fragment from Burial CC-B15 from Structure C-2 at Norman's Temple complex (discussed below). Aquino selected samples from well-documented stratigraphic contexts and prepared them, along with standards and backgrounds, at the Pennsylvania State University Human Paleoecology and Isotope Geochemistry Lab following standard practices. When possible, she selected a single piece of charcoal to avoid the averaging inherent in bulk samples. All dates reported below in the results section as conventional radiocarbon ages were corrected for fractionation with measured $\delta^{13}C$ according to Stuiver and Polach (1977). Calibrated calendar ages were produced using OxCal 4.2

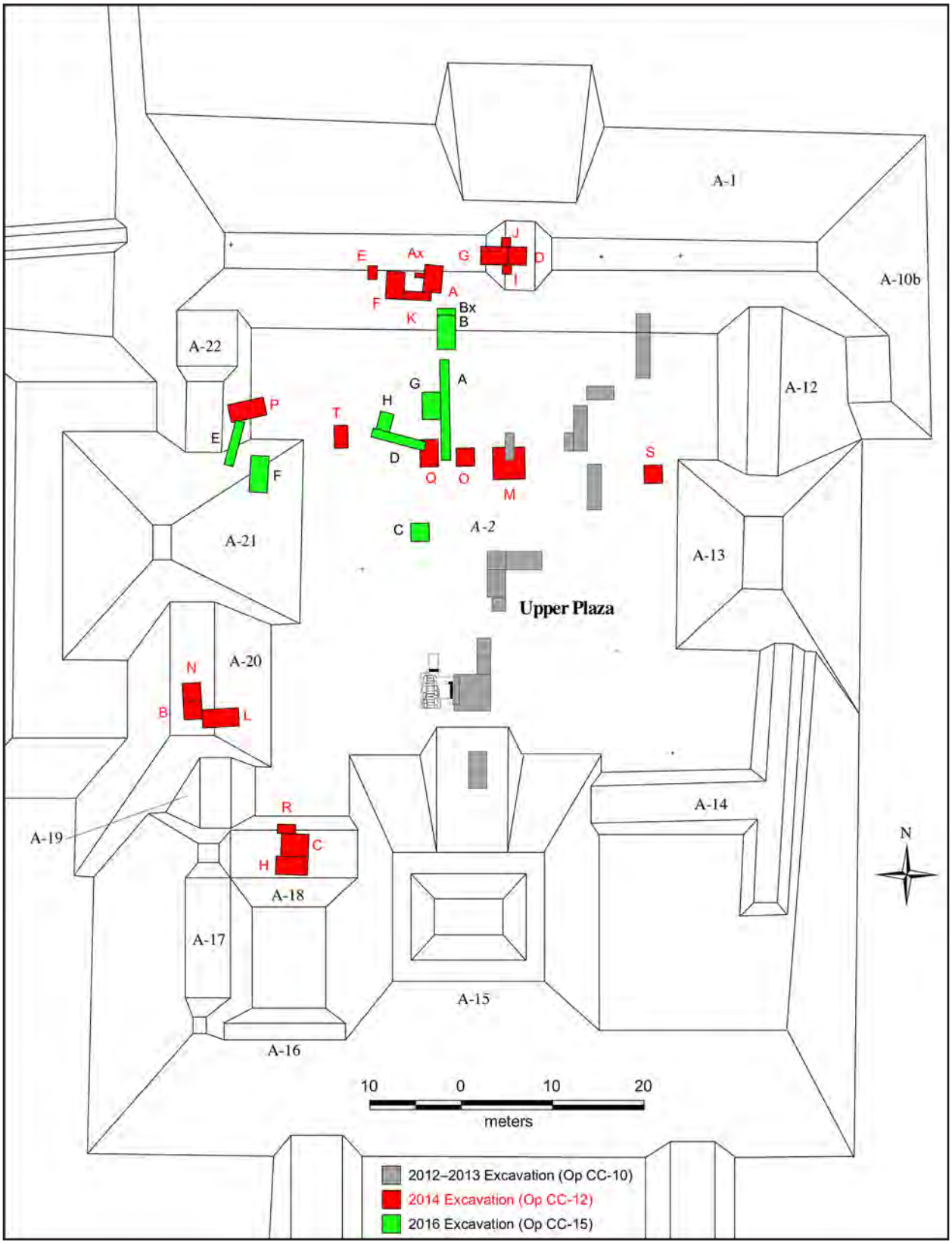

Figure 1.3. Map of Op CC-15 showing the location of units from 2012–2016.

(Bronk Ramsay 2009) employing the IntCal13 atmospheric curve (Reimer et al. 2013). Due to poor preservation and deterioration during the radiocarbon dating pretreatments, however, only 16 charcoal samples from the Upper Plaza and one charcoal sample from Norman's Temple yielded enough dateable material to be analyzed on the Accelerator Mass Spectrometer.

Results

CCAP received the results of the radiocarbon analyses on December 21, 2016. They are included here, but all interpretations of their significance are considered preliminary. The context of and results from the 16 Upper Plaza samples are presented in Tables 1.3 and 1.4. The single sample from Norman's Temple is discussed in Booher (this volume) and presented in Table 7.11. The data in Table 1.3 are organized spatially, from south to north and from top to bottom (stratigraphically) by suboperation. Preliminary interpretations of the data are presented in the relevant excavation sections below.

Subops CC-15-A, -B, and -E uncovered excellently preserved portions of the terminal plaza plaster floor, which is thick and intact near the base of the perimeter structures but completely eroded at modern ground surface in the open central areas of the plaza. Beneath this terminal plaza floor, excavations encountered a minimum of nine plaster floors in the southern end of Subop CC-15-A, eight plaster floors in Subop CC-15-C, which is roughly at the center of the plaza (and thus presumably contains only plaza plaster floors as opposed to floors from buried structures), and seven plaster floors in Subop CC-15-B, a unit placed at the base of Structure A-1, before reaching bedrock.

In Subop CC-15-C (Table 1.5), south of the buried platform, ceramic data generally correspond to the construction sequence reported by Kelley (2014) for that part of the plaza, and our new radiocarbon dates provide additional chronological information. The terminal plaza surface, Lot CC-15-C-2, dates to the Late Classic period, but the ceramic data suggest an Early Classic age for the floor's underlying fill (Lot CC-15-C-3). In other units in the southern and central parts of the Upper Plaza, ceramics associated with the final floor's fill suggest a Late Classic date (see Kelley et al. 2013:Table 2.1). This construction event, which we presume took place in the Late Classic period despite the ceramic data from Lot CC-15-C-3, raised the floor of the plaza approximately 70 cm in Subop CC-15-C. Below the fill, excavators documented a 15-cm thick compact dirt surface (Lot CC-15-C-4) that ceramics date to the Early Classic period. A single radiocarbon date from the dirt surface suggests a slightly older age than the ceramic data, with a date range of cal AD 128–236 (Sample CC-15-S04). These two age assessment roughly correspond to the Early Classic/Terminal Preclassic age proffered by Kelley et al. (2013:Table 2.1) for the same surface. As in other units, Subop CC-15-C encountered a series of eroded plaster floors below the dirt surface continuing to bedrock, which was encountered roughly 75 cm below the dirt surface. These lower floors each have a thin (roughly 2 cm) layer of pebbly fill below them. In all cases, ceramics suggest Late Preclassic ages for the floors (see Table 1.5). This assessment generally corresponds to Kelley et al.'s (2013:Table 2.1) sequence, although Kelley's crews reported Middle Preclassic ages for the deepest floors. The radiocarbon ages from the 2016 season align well with Kelley et al.'s (2013:Table 2.1) assessment with Late Preclassic period ages for Lots CC-15-C-7 and -8, and Middle Preclassic period ages for Lots CC-15-C-10 and -11 (see Table 1.5).

In 2014, Herndon and colleagues (2014) investigated the summit of Structure A-1,

documenting the final and penultimate construction phases in several locations. In 2016, Aquino's team targeted the base of Structure A-1 to investigate the structure and the underlying constructions. Excavations documented the final and penultimate construction stages of the south face of Structure A-1 in Subop CC-15-B. The excavations determined that the final phase, at least on the southern face of the building, represented a significant expansion to Structure A-1 as it elevated the building's platform by 1.1–1.2 m above that of the penultimate stage.

Beneath the construction fill underlying the earliest plastered step and its associated plaza floor (Lot CC-15-B-4), Aquino's crew found another intact plaster floor (Lot CC-15-B-9) but with an intentional circular cut feature (Figure 1.4). Encountering the cut forced changes to the excavation plan, which had been to excavate the southern section of the unit to bedrock as an element of the chronology-building agenda. Aquino's crew excavated the final and penultimate architecture overlying the northern part of the cut to expose the feature, which measured approximately 60–70 cm in diameter. Rather than continue with the original excavation plan, the crew excavated the interior of the cut feature. The feature contained cobble fill and penetrated four additional floors, terminating on a fifth. Aquino's team excavated the earliest floor and its subfloor fill, which were constructed on top of natural bedrock. The fill thickened to the north as bedrock dipped in that direction.

The cut feature proved to be about 80 cm deep (Figure 1.5). The expectation had been that the cut would contain a cache or burial, but the excavations did not encounter any artifacts other than ceramic sherds in the cobble fill. Either the feature once contained perishable materials or it was created to extract something rather than place something. By cutting back one side of the feature's profile, Aquino was able to recover charcoal from beneath each floor exposed in the profile of the feature and from the earliest floor's fill.

The recently obtained radiocarbon results (see Tables 1.3 and 1.4) suggest an alternative interpretation for the stratigraphy in Subop CC-15-B. Aquino's team believed the thick plaster surface of Lot CC-B-4 was the terminal plaster floor, which would be Late Classic in age, but the calibrated age ranges of Samples CC-15-S22 and -S45 are firmly in the Preclassic period (cal 766–540 BC and 749–407 BC, respectively). The ceramic data, which suggested a Late Preclassic age for the plaster floor, corroborate the radiocarbon ages. Furthermore, with the exception of Lot CC-B-15-7, the ceramics from the underlying floors date to the Middle or Late Preclassic periods. It is worth noting that although the ceramicists classified the ceramics from Lot CC-B-15-7 as Tepeu 2 with a Chicanel trace the sample comprised only 21 sherds, which the analysts described as "Sierra Red, eroded Tepeu 2 sherds." Therefore, the Tepeu 2 age assessment may not be accurate. The alternative interpretation for the stratigraphy, then, is that Lot CC-15-B-4 is the summit of a buried Late Preclassic platform and Lot CC-15-B-9, the floor with the cut in it, is part of an older buried Preclassic platform or surface. The cut could possibly be a very large posthole in the floor rather than an intrusive feature to place or remove something.

Robichaux (1998) excavated a 2-x-2-m unit to the east of Subop CC-15-B and documented similar architecture. His "Floor 5," which rolled down as a step or terrace, may correspond to Aquino's Lot CC-15-B-4, which included a 35–40-cm step. The base of the riser of this step is visible in the top of Figure 1.4. Robichaux (1998:35) reported Middle and Late Preclassic ceramics from the fill beneath his Floor 5.

Originally, the project planned a third chronology unit at the corner of Structure A-21

Table 1.3. Contexts of Charcoal Samples from the Upper Plaza Processed from the 2016 Season

Lot CC-15-	Sample CC-15-	E (cm)	N (cm)	Elev. (m)	Context
C-04	S04	162	176	125.07	embedded on compacted dirt stratum (below terminal plaza plaster floor fill)
C-05	S19	56	185	124.93	associated with surface of Lot 15-C-5 plaster floor
C-07	S07	94	59	124.71	associated with surface of Lot 15-C-7 plaster floor
C-08	S23	108	158	124.62	associated with Lot 15-C-8 plaster floor
C-10	S34	NA	NA	124.47	embedded in ballast of Lot CC-15-C-10 (7th plaster floor/8th living surface down from modern surface/eroded terminal plaza floor)
C-11	S39	139	144	124.44	associated with surface of Lot 15-C-11 plaster floor
A-08	S16	32	107	124.59	associated with construction of Lot 15-A-8 plaster floor
A-15	S43	75	28	124.12	associated with earliest use of plaza above bedrock
B-03	S05	10	203	127.19	associated with terminal use of Structure A-1
G-04	S59	143	195	124.90	associated with intentional burning event
B-04*	S45	81	293	126.14	embedded on surface of Lot 15-B-7; associated with use of earliest iteration of terminal plaza floor
B-04*	S22	76	318	126.27	embedded in ballast; associated with construction of terminal plaza plaster floor (Lot 15-B-4)
B-08	S29	28	245	126.82	associated with construction of terminal plaza floor
B-10	S50	125	169	124.70	associated with intentional cutting event through Lot 15-B-9 plaster floor
B-11	S54	83	131	124.59	associated with construction of Lot 15-B-11 plaster floor
B-15	S51	138	180	123.97	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)

*See discussion in text regarding alternate interpretation of Lot 15-B-4.

Table 1.4. Ages of Charcoal Samples from the Upper Plaza Processed from the 2016 Season

Lot CC-15-	Sample CC-15-	14C Age (BP)	+/-	Calibrated age (AD/BC)	% under curve	2σ Age Range
C-04	S04	1835	20	AD 128–236	95.4	**AD 128–236**
C-05	S19	1840	20	AD 125–238	95.4	**AD 125–238**
C-07	S07	2265	40	401–346 BC	38.3	**401–206 BC**
				322–206 BC	57.1	
C-08	S23	2295	30	406–354 BC	75.1	**406–231 BC**
				291–231 BC	20.3	
C-10	S34	2530	20	794–746 BC	42.7	**794 –552 BC**
				686–666 BC	13.5	
				644–552 BC	39.2	
C-11	S39	2470	30	768–476 BC	92.4	**768–431 BC**
				464–453 BC	1.2	
				445–431 BC	1.8	
A-08	S16	2470	25	767–482 BC	94.6	**767–434 BC**
				442–434 BC	8.0	
A-15	S43	2700	35	911–804 BC	95.4	**911–804 BC**
B-03	S05	1275	20	AD 675–770	95.4	**AD 675–770**
G-04	S59	1895	25	55 BC–AD 175	91.8	**55 BC–AD 211**
				AD 191–211	3.6	
B-04	S45	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	
B-04	S22	2485	20	766–540 BC	95.4	**766–540 BC**
B-08	S29	2595	45	841–736 BC	73.4	**841–547 BC**
				689–663 BC	5.4	
				648–547 BC	16.6	
B-10	S50	2490	25	774–536 BC	95.1	**774–524 BC**
				525–524 BC	0.3	
B-11	S54	2520	30	795–728 BC	29.3	**795–542 BC**
				717–708 BC	1.0	
				694–542 BC	65.1	
B-15	S51	2620	25	826–782 BC	95.4	**826 –782 BC**

Table 1.5. Ceramic Date and Radiocarbon Age Ranges from Subop CC-15-C

Lot CC-15-C-	Description	Avg Th (cm)	Catalog #	Sherds	Ceramic Complex	Ceramic Time Period	2σ Calibrated Age Range
2	Terminal plaza floor	14.63	CC1931	51	Tepeu 2-3	Late Classic	
3	Dry laid cobble fill	57.50	CC1986	348	Tzakol and Chicanel mix	Early Classic	
4	Compact dirt surface	18.25	CC2013	438	Tzakol and Chicanel mix	Early Classic	**AD 128–236**
5	Floor	9.25	CC2032	62	Chicanel	Late Preclassic	**AD 125–238**
6	Floor	17.00	CC2109	9	Chicanel	Late Preclassic	
7	Floor	5.50	CC2088	50	Chicanel	Late Preclassic	**401–206 BC**
8	Floor	5.75	CC2095	52	Chicanel	Late Preclassic	**406–231 BC**
9	Floor	5.50	CC2134	12	Chicanel	Late Preclassic	
10	Floor	6.25	CC2155	34	Chicanel	Late Preclassic	**794 –552 BC**
11	Floor	2.50	CC2162	22	Chicanel	Late Preclassic	**768–431 BC**
12	Floor	4.50	CC2169	10	Chicanel	Late Preclassic	

and Structure A-22. After removing backfill from Subop CC-12-P, a unit excavated in 2014 that exposed the eastern face of Structure A-22, Aquino established Subop CC-15-E, a 1-x-5-m trench extending south along the face of Structure A-22 onto the slope of Structure A-21. The unit ultimately encountered the corner where the two structures meet and the terminal plaza plaster floor (Figure 1.6), but the collapse debris from Structure A-21 was over 4 m deep in the southern end of the unit; excavating through the plaza floor to collect chronological data would have first required removing massive amounts of collapse debris to create a larger excavation unit. Furthermore, excavators noted a rectangular cut in the plaza floor (Figure 1.7), suggesting that a feature similar to the pit excavated in Subop CC-15-B may exist near the intersection of Structures A-21 and A-22.

Despite failing in its intended objective, Subop CC-15-E confirmed and expanded on a conclusion reached by Herndon and colleagues (2014) based on the adjacent Subop CC-12-P. The excavations in 2012, which originally exposed the eastern face of Structure A-22, documented an apparent infilled doorway. The much longer exposure of the face of the building in 2016 exposed additional infilled doorways (Figure 1.8). The combined excavations reveal three apparent piers and two or three infilled openings. The piers are constructed of larger cut limestone blocks, while the infilled openings have smaller and less uniform blocks. By infilling the openings, the Maya may have converted a masonry

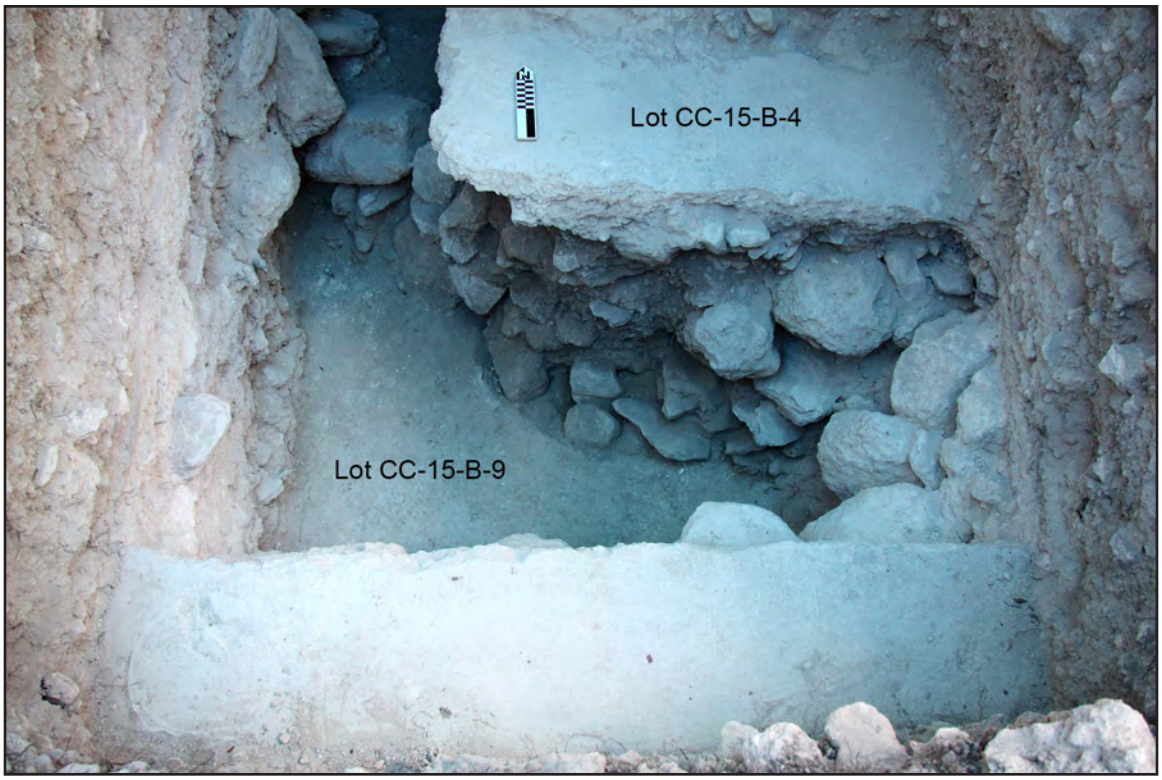

Figure 1.4. Photograph of the cut feature in Lot CC-15-B-9. View to the north.

Figure 1.5. Photograph of the cut feature, Lot CC-15-B-10, after it and the floor below it had been completely excavated to bedrock. View to the north.

Figure 1.6. Photograph of the intersection of Structure A-21 and Structure A-22 (right side of photo). View to the southwest.

Figure 1.7. Photo of apparent cut in the terminal plaza floor in Subop CC-15-E. View to the south.

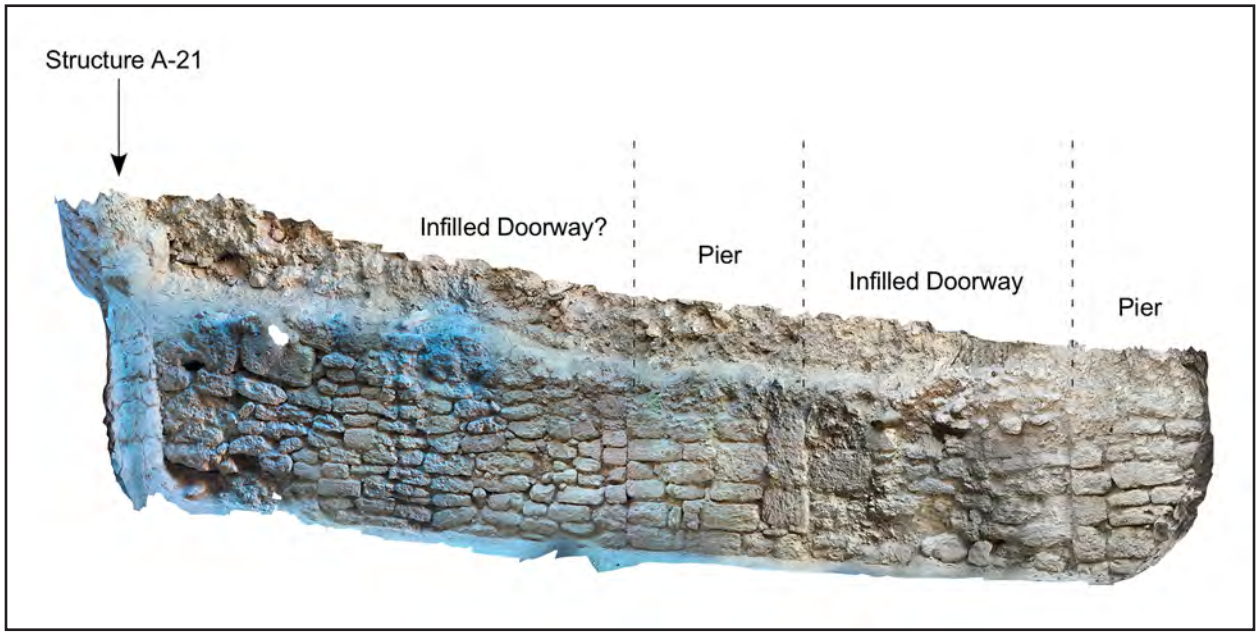

Figure 1.8. Orthophoto of Structure A-22's eastern platform face exposed in Subop CC-15-E with piers and infilled openings indicated.

building into a substructural platform, although without additional excavations it is impossible to know.

Ultimately and futilely, the project opened Subop CC-15-F, 1.8 m east of Subop CC-15-E. This unit, designed to follow the final phase of Structure A-21 to the terminal floor, had to be abandoned due to time constraints after excavating only collapse debris.

Aside from chronology building, the 2016 excavations aimed to better understand the form and function of a suspected buried Late Preclassic platform in the plaza. Units excavated in 2013 and 2014 encountered an east-west wall made of one course of cut and faced stones at its base and several courses of crude, unshaped boulders on top (Figure 1.9). These units determined the feature extended at least 18 m in the northern part of the plaza, and Herndon et al. (2014) concluded it was either the southern face of a Late Preclassic platform or possibly a construction pen.

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 (Figure 1.10). 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 (Figure 1.11). Our preliminary interpretation is that this is the base of a platform that was truncated during a later plaza expansion. If correct, the

Figure 1.9. Photograph of the buried platform face in Subop CC-12-O (2014) showing the lower course of cut stones capped by upper courses of unshaped boulders (after Herndon et al. 2014:Figure 3.2). View to the north.

Figure 1.10. Photograph of excavations in the Upper Plaza. View to the south from Structure A-1. Subop CC-15-A is the trench visible in the middle of the photograph.

cut stone course at the base of the east-west running wall shown in Figure 1.9 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.

To the west of the truncated platform, excavations encountered a crude cyst with a minimum of two individuals that appears to have intruded into multiple plaster floors. Designated Burial CC-B16 and Lot CC-15-G-11, this cyst contained the partial remains of two individuals, designated Burials CC-B16A and -B16B. As discussed by Novotny and colleagues (this volume) the remains considered part of CC-B16A consist of an articulated right leg, articulated right hand, and articulated left foot placed with plaza fill; the hand was found 50 cm east of the other elements (Figure 1.12). Excavators discovered Burial CC-B16B in the south profile of Subop CC-15-G in the Upper Plaza while excavating Burial CC-B16A. Anna Novotny identified the exposed remains as an articulated right arm (humerus, radius, ulna, and hand phalanges). Because the remains extended south out of the unit, project staff decided to backfill the partially exposed arm *in situ* and excavate the remainder of the burial in 2017. Novotny and colleagues (this volume) preliminarily interpret the dismembered remains of Burial-B16A to be "likely the result of human sacrifice."

Although our understanding of the features encountered in Subops CC-15-A and -G is incomplete, the ceramic and radiocarbon data

yielded additional surprises. The ceramics from all excavated in lots in Subop CC-15-G, including Burial CC-B16, are Tzakol types with a trace, mix, or admix of Chicanel types. A radiocarbon sample from Lot CC-15-G-4, which was a burn feature stratigraphically higher than the burial, returned a date range of cal 55 BC–AD 211 (Sample CC-15-S59). The combined data from Subop CC-15-G suggest significant construction activity in the northern part of the Upper Plaza occurred during the Terminal Preclassic or Early Classic period. Previous excavations did not encounter Early Classic construction events, creating perhaps a false model of an Early Classic lull in activity at the site (see Houk 2015:196).

Figure 1.11. Photograph of Anna Novotny excavating in Subop CC-15-G with the truncated platform face visible in Subop CC-15-A (highlighted by arrow). View to the east.

Because the Upper Plaza work is designed to span three field seasons, the investigations to date cannot answer any of the research questions posed above. However, the unexpected discoveries of apparent Terminal Preclassic/Early Classic construction activity in Subop CC-15-G, possible sacrificial victims in Burial CC-B16, a truncated platform face Subop CC-15-A, and a possible buried Preclassic platform in Subop CC-15-B suggest that much of the data needed to answer our research questions may be found in the northern part of the plaza. Kelley et al. (2013:22) proposed that the compact dirt surface found across much of the Upper Plaza corresponded to floor in use immediately prior to the construction of Tomb 2. The radiocarbon ages for the floor and burned feature in Subop CC-15-G overlap in the Terminal Preclassic period, suggesting that perhaps the construction activity in the northern part of the plaza was associated with the early king buried in the Terminal Preclassic Tomb 2.

The complicated construction features and deposits in the northern part of the plaza will require us to modify our future plans to include horizontal excavations adjacent to Subops CC-15-A and -G. This approach should make it easier to trace individual features and decipher the sequence of

Figure 1.12. Informal field photo of the disarticulated hand *in situ*. Courtesy of Gertrude Kilgore.

construction, demolition, and renovation. Furthermore, additional excavations adjacent to Subop CC-15-B will expose the buried Preclassic platform under Structure A-1.

Investigations at Norman's Temple

The Norman's Temple complex is a hilltop group approximately 400 m west/southwest of the Main Plaza at Chan Chich. The group includes a large, level platform, which measures 110 m north-south by 65 m east-west. The group is almost entirely surrounded by low platforms, which we initially suspected were walls, along its edges and is crowned by a small courtyard with restricted access. This courtyard is home to Norman's Temple, an approximately 8-m tall, unlooted temple, which forms the western side of the courtyard. Structure C-2, a 4- to 5-m tall range building, occupies the northern side. Structure C-3 defines the eastern and southern sides of the courtyard.

CCAP conducted minor excavations at the Norman's Temple complex in the late 1990s including a courtyard test pit, which had to be abandoned at 2.85 m below surface for safety reasons before reaching bedrock. Other units targeted the base of Structure C-1 and the steps to Structure C-2. Meadows (1998) encountered a moderately dense deposit of artifacts—including a figurine fragment, a ceramic whistle, imitation Fine Orange ceramic sherds, and a thin biface fragment—on the surface of the final courtyard floor in a 1-x-4.5-m unit at the base of Structure C-1 in 1997, and Ford and Rush (2000) found exotic artifacts, including a partially reconstructable Fine Orange bowl,

broken on the steps to Structure C-2. These terminal deposits are presumably related to the abandonment of the site (Houk 2016).

Research Questions

The research interest in Norman's Temple relates to these above floor deposits, the surrounding "walls," and the Terminal Classic abandonment of the site. Specifically, the 2016 research planned to test the possibility that the group was a defensive position for members of the elite class. The specific research questions that the project addressed were:

- Is there archaeological evidence that the "walls" around Norman's Temple were constructed or used as defensive features?
- Is there evidence that the abandonment of the group was due to or accompanied by violence?

To answer those questions, the project proposed to:

- Determine the age and construction sequence of the artificial platform upon which Courtyard C-1 was built.
- Define the form, age, and function of the "walls" that surround the edges of the platform and evaluate the possibility that they were defensive features.
- Determine if additional above floor, terminal artifact deposits are located at the base of Structure C-1.
- Assess the condition of the rooms on Structure C-2 to determine if artifacts are present on the floors or benches and if there is any evidence of violence, such as burning or intentional defacement of architecture.
- Conduct clearing excavations on the platform west of Structure C-2 to look for above floor deposits.

Results

As described by Booher (this volume), the investigations at the Norman's Temple complex refuted some of our pre-excavation assumptions but also produced some exciting discoveries. Multiple test pits on the artificial platform demonstrated that the hill upon which the complex sits has an uneven summit with bedrock shallowly buried in the northern test units—actually protruding through the construction fill and final platform floor in one unit—and covered by as much as 1.77 m of fill in the southern test unit. In the south, it is clear that multiple construction events took place throughout the Late Classic period and perhaps beginning earlier, gradually raising the level of the platform. A trench exposed the base of the southern face of the platform and showed that they Maya had swept the natural bedrock clean before constructing the platform (Figure 1.13).

What was mapped as a 2-m wide wall-like feature in 1996 proved to be a 4- to 5-m wide, 30-cm high platform, or series of discontinuous platforms, that almost completely encircles the modified hilltop. Excavations demonstrated that in places this feature supports a low, 1-m wide masonry wall near the platform's edge. On the southern side of the complex, penetrating excavations documented two phases of construction, one dating to Tepeu 1 (early Late Classic period) and a second dating to Tepeu 2 (Late Classic period). Tepeu 3 ceramics in the topsoil demonstrate continued use of the platform into the Terminal Classic period. Unfortunately, the function of the platform and its summit wall remain unknown. Our excavations did not uncover any indications, however, that the feature was defensive in nature (Booher, this volume).

In 1997, Meadows (1998) encountered above floor artifacts at the base of Structure C-1, Norman's Temple. Attempts this season to uncover similar deposits were unsuccessful, although excavations successfully exposed

Figure 1.13. Photograph of Norman's Temple southern platform face, constructed directly on bedrock.

portions of four very badly preserved final-phase steps to the building. Similarly, clearing excavations on the platform west of Structure C-2 and north of Structure C-1 failed to locate above floor artifact deposits, but they did expose a poorly preserved wall and platform surface. Previously unplanned excavations at the base of the southern leg of Structure C-3, however, did encounter a dense terminal artifact deposit resting on the final courtyard floor and buried by collapse debris. The excavated portion of the 30-cm thick artifact deposit measured 2.5 m east-west by 1.12 m north-south. Although our excavations caught the western extent of the feature, its eastern extent remains unknown. Booher (this volume) reports the excavations recovered abundant ceramic sherds, a ceramic pendant, part of a ceramic whistle, obsidian blades, lithic tools, a polished stone celt, modified shell, faunal remains, and ground stone artifacts.

Booher's (this volume) excavations on Structure C-2 exposed a portion of a collapsed room on the southwestern corner of the building. Only the western end of the room was uncovered, but the excavations determined the room has a bench, which contained a Late Classic burial (Burial CC-B15), and discovered ancient Maya graffiti on the poorly preserved plaster on the western and northern walls in the room (Figure 1.14). Although the preserved graffiti is fragmented and no elements can be identified confidently, the discovery has prompted us to propose additional excavations on the structure in 2017.

To return to the research questions, the "walls" surrounding the Norman's Temple complex turned out not to be walls, but to be a series of low platforms. Our limited excavations did not uncover any indications that the platform was built or served as a defensive feature. The functions of the surrounding platforms remain

Figure 1.14. Mark Willis photographing the graffiti in Structure C-2.

unknown. The graffiti on the walls of the Structure C-2 room is not necessarily evidence of violence, but it does likely date to just before or after the abandonment of the group. The terminal artifact deposit at the base of Structure C-3, however, is almost certainly associated with the abandonment of the Norman's Temple complex. Although contextually similar to deposits excavated in the 1990s (Ford and Rush 2000; Meadows 1998), the above floor deposit discovered in 2016 is much more dense and akin to terminal deposits excavated at Dos Hombres (Houk 2000a) and Baking Pot (Helmke et al. 2016).

Additional excavations of the rooms on Structure C-2 and the terminal deposit at the base of Structure C-3 are planned for the 2017 season. A focus of the future excavations will be the recovery of organic material to date the terminal deposit.

Regional Investigations (BEAST)

Unmanned Aerial Vehicle Surveys

In 2014, BEAST mapped 120 acres (0.49 km^2) of pasture in Gallon Jug Ranch using a custom-modified DJI Phantom quad-copter unmanned aerial vehicle (UAV), or drone, in about an hour, and documented one hilltop courtyard group with four structures and an isolated structure on another hill (Sandrock and Willis 2014). Since the pastureland is just south of the minor ceremonial center named Gallon Jug, it is probable that the courtyards and house mounds in the cleared area are part of Gallon Jug's peripheral settlement.

In 2016, BEAST proposed to map the approximately 14 km^2 of pastureland to collect data on rural settlement size and density, following the approach used successfully to map cleared fields at the site of Saturday Creek near Belmopan (Harrison-Buck et al. 2015). The project also proposed to map the largest lagoon in the permit area, Laguna Seca. In the case of Laguna Seca, we felt there was a high potential for ancient Maya agricultural fields to be present in the lagoon or around its margins. Raised or ditched fields have been documented to the east of the permit area at the base of the Booth's River and Rio Bravo Escarpments (Beach et al. 2013). Discovering fields at Laguna Seca would potentially open up new avenues of investigation for agricultural and environmental studies in the permit area. The project proposed to employ a MultiSpek Near-Infra Red (NIR) digital camera during the survey of Laguna Seca to assist with the search for agricultural fields. Designed to assess the health of plants, the MultiSpek NIR camera was developed for use in commercial agriculture, but its multi-spectral imaging capabilities could be useful in looking for evidence of ancient raised or ditched fields.

Research Questions

The specific research questions for BEAST's UAV studies were:

- What is the density and nature of settlement in the Gallon Jug pastures?
- Are there raised or ditched fields at Laguna Seca?

To address our research questions, the project proposed to:

- Conduct drone mapping of 14 km^2 of pastureland on Gallon Jug Ranch.
- Conduct drone mapping of Laguna Seca to look for evidence of ancient Maya agricultural fields.

Results

As stoically noted by Mark Willis (this volume), "every drone will at some point crash." Ultimately, BEAST required two trips by Willis to the project area and two Skywalker drones to complete the planned surveys, but Willis (this volume) successfully mapped 14 km^2 of pastureland and 4.8 km^2 of lagoon and lagoon margins. Whereas Willis' previous survey of cleared agricultural fields at the site of Saturday Creek discovered hundreds of ancient Maya house mounds (see Harrison-Buck et al. 2015), the survey of Gallon Jug's pastures discovered very low settlement density. In fact, only a few courtyards and mounds, several of which Willis mapped during the 2014 drone work (see Sandrock and Willis 2014), are visible in the surveyed area (Willis, this volume). These structures occupy the summits of the hemispherical hills that characterize the terrain of the pastures. These results mirror Jason Yaeger's (1991) findings from a 1990 pedestrian survey of a portion of the BEAST survey area. Yaeger (1991:91) noted that indications of settlement, floors, and artifact scatters "were clustered on ridges and hilltops, while the low-lying areas were generally devoid of archaeological materials." Yeager's (1991:92) conclusion that the hilltops offered better drainages and breezes, while the flat, low-lying areas had better agricultural potential, is entirely reasonable; in fact the modern settlement and land use follows the same pattern for these very reasons.

Adding to our growing knowledge about the historic archaeology of the permit area, the drone data show the bed of the historic logging railroad that once connected Gallon Jug to Hillbank (Willis, this volume). The feature is clearly visible in the southern portion of the drone survey area.

Unfortunately, the NIR data collected at Laguna Seca did not reveal any relic wetland agricultural fields. In fact, the only anomaly noted is a

linear feature, running due north-south near the northeastern end of the lagoon. Although we initially speculated that perhaps this was an ancient Maya causeway associated with the site known as Laguna Seca, conversations with Alan Jeal of Gallon Jug Ranch determined it is the recently cleared property line between Gallon Jug Ranch and Laguna Seca Ranch (Willis, this volume).

Kaxil Uinic Village

In 2016, BEAST conducted archival and archaeological work on Kaxil Uinic village, which was settled by San Pedro Maya in the 1880s and occupied until 1931. This marked the second season of research on the village, which is located west of Chan Chich (see Figure 1.1). In 2015, BEAST completed initial testing of Kaxil Uinic village, and in just over two weeks of fieldwork crews identified and sampled 36 surface scatters of historic artifacts and completed nine excavation units. Artifacts visible on the surface and found in our excavation units at the site included numerous glass bottles, small cosmetic jars, medicine bottles, metal cooking utensils, *chiclero* equipment (machetes, spurs, pots, etc.), imported metal corn grinders, a lantern, parts of a cart wheel, and more modern items (batteries, shoes, plastic bottles, etc.) likely associated with individuals who camped at the village site in the 1980s to loot nearby ancient Maya ruins. The surface inspection of the site also discovered seven three-stone rock clusters characteristic of Maya hearths. Such hearths were usually present in the center of Maya dwellings, so it is likely that each hearth represents a household (Bonorden 2016).

At the conclusion of the 2015 season, approximately 25 percent of the site had been thoroughly surveyed, and an even smaller percentage of the site had been excavated. The second season of work at Kaxil Uinic village included archival research and fieldwork to locate and excavate additional three-stone hearths and to excavate several cobble mounds to determine if they area ancient Maya constructions with historic reoccupation or if the are entirely historic Maya platforms. Crews also excavated some control units, away from surface artifact scatters, to reduce sample bias in our overall excavation plan (Bonorden and Kilgore, this volume).

Research Questions

The overarching research questions that the project attempted to address were:

- How did Maya participation in the colonial economy change during this phase of colonial contact?
- Did the Maya maintain their traditional religion, or did they adopt colonial religious practices?
- Is Bolland's (2003) generalization of cultural contact corroborated or refuted by archaeological data from Kaxil Uinic village?

To address these research questions, the project proposed to complete the following objectives in 2016:

- Conduct archival research at archives in Jamaica and England.
- Conduct hand-clearing of vegetation at the site to improve surface visibility.
- Map the topography and distribution of artifact clusters, three-stone hearths, and the aguada at the site.
- Excavate four control units in areas without visible surface artifacts.
- Excavate four additional three-stone hearths.

- Excavate one or more cobble mounds at the site to determine if they are historic or prehistoric constructions.

Results

Prior to the field season, project staff conducted archival research in Jamaica and England. Houk and Bonorden transcribed 48 documents housed in the Jamaica Archives and Records Department in Spanish Town, Jamaica over a two-day period in March. Bonorden traveled to England in April, spending two days at SOAS in London and three days at the Public Records Office in Kew. At SOAS she transcribed five pieces of correspondence mentioning interactions with the Maya during the Late Colonial period from microfilm. Bonorden's research at the Public Records Office was much more successful, and she photographed numerous pieces of official colonial correspondence. Hunter Lee then transcribed the photographs of 438 historical documents over a period of three months as part of an independent study course at TTU. The results of the archival work will be published separately once Bonorden and Lee have completed their analysis of the transcribed documents.

The fieldwork component of the investigations included surveying, mapping, clearing, and excavations. With the assistance of Kevin Miller, Brooke Bonorden's team cut a square transect around the *aguada* at the site to facilitate survey and mapping of the historic village as an initial step. In areas targeted for excavations, workers conducted hand clearing to improve ground visibility. The 2016 investigations resulted in the discovery of 30 additional surface artifact scatters, three more three-stone hearths and one multi-stone hearth feature (bringing the total number of hearths to 10), and four previously undocumented mounds, including Structures 1 and 2, which form Courtyard 1 (Bonorden and Kilgore, this volume).

Bonorden's crews excavated 18 suboperations in 2016, which included four control units in areas devoid of surface artifacts (Figure 1.15). In all cases, the control units encountered buried cultural material, which is line with Ng's (2007) findings at Holotunich. In one case, control unit excavations discovered an apparent *chiclero* activity area, yielding machetes, part of a shotgun, *chiclero* spurs, and *chicle* pots (Bonorden and Kilgore, this volume). Based on the manufacturing age ranges of associated shotgun shells, Bonorden and Kilgore (this volume) attribute the activity area to the San Pedro Maya occupation.

The excavations of three-stone hearths, however, did encounter evidence of recent overprinting and disturbance. Two hearths in the southwest area of the site encountered fairly recent debris, likely associated with looters who apparently reoccupied the site in the 1980s, around and below hearth stones, indicating the features are either modern or disturbed. Two hearths, however, yielded better results with evidence of colonial Maya domestic activities and associated house floors (Bonorden and Kilgore, this volume).

Excavations on two mounds and the floor of Courtyard 1 determined the constructions are prehistoric platforms and/or buildings that had fallen into disrepair and, in the case of Structure 1, collapsed long before the San Pedro Maya reoccupied the site. The San Pedro Maya, however, reoccupied or at least re-used these prehistoric features as evidenced by historic artifacts in the topsoil on the mounds (Bonorden and Kilgore, this volume).

To return to the overarching research questions, Bonorden and Kilgore (this volume) conclude that the San Pedro Maya at Kaxil Uinic village were never fully integrated into the British colonial economy. Rather, they strategically interacted with colonial agents including loggers, *chicleros*, and government officials,

Figure 1.15. Excavations at Kaxil Uinic village in 2016. Courtesy of Gertrude Kilgore.

as needed to acquire imported goods and cash. Until the Belize Estate Company forcibly removed them from their homes, the villagers at Kaxil Uinic remained largely autonomous, socially, politically, and economically. The archaeological record shows a mixture of religious concepts, including apparent colonial-period monument veneration at the nearby prehistoric ruins and Catholic religious artifacts at the historic village. Bonorden and Kilgore (this volume) suggest "the inhabitants of Kaxil Uinic village did not think of themselves as incorporating new elements of Catholicism so much as practicing their traditional religion with new objects and symbols borrowed from Christianity along previously-established lines."

AN UPDATED DESCRIPTION OF CHAN CHICH

The following section updates the description of Chan Chich published in last season's introductory chapter based on new data from 2016 (Houk 2015b). This version and the 2015 version are updates to the site description published by Houk and Zaro (2014). Chan Chich is in western Belize, approximately 4.25 km east of the border between Guatemala and Belize (Figure 1.16). 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. 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 the Three Rivers adaptive region according to Garrison and Dunning (2009).

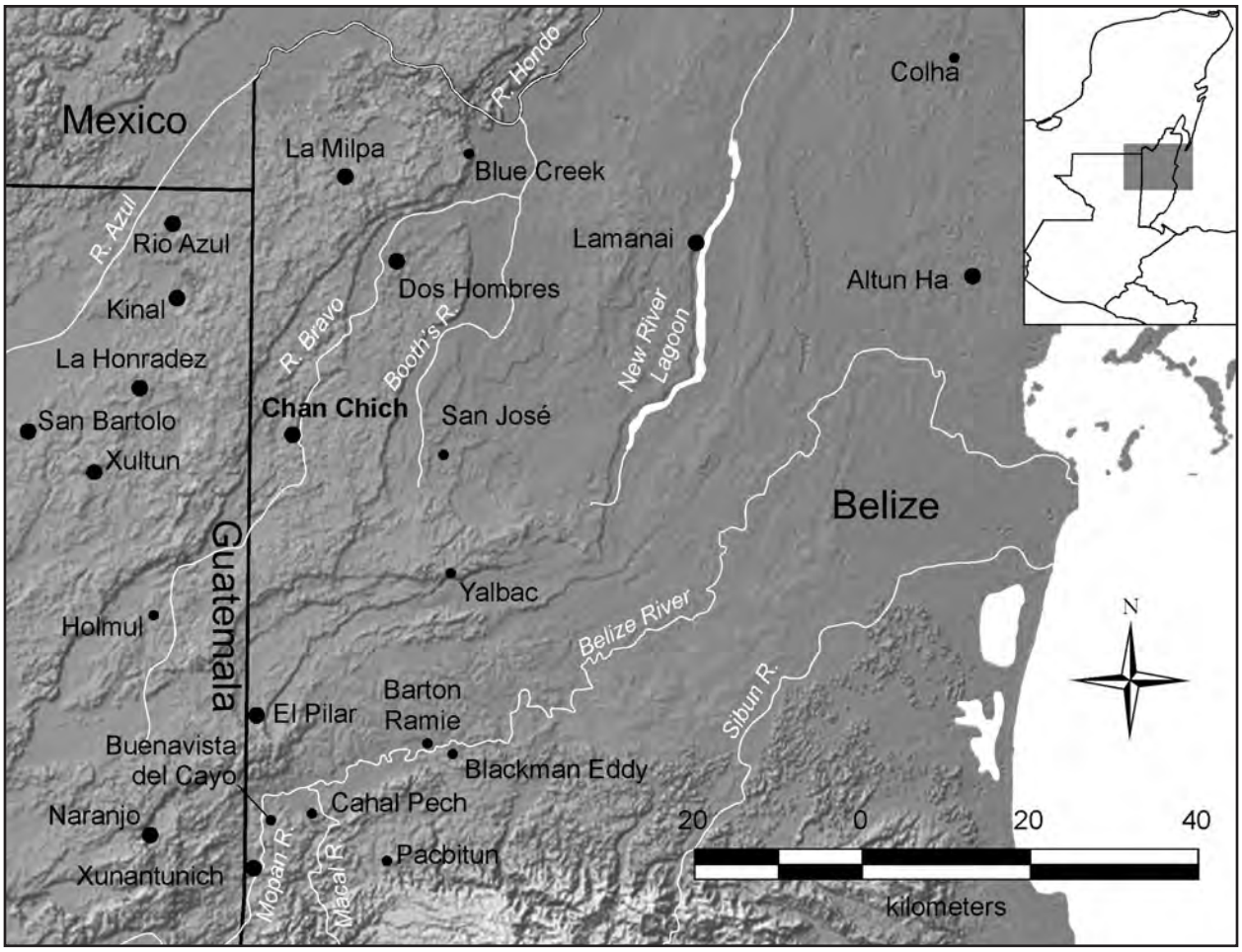

Figure 1.16. Locations of Chan Chich and other sites in western Belize.

The major architecture at the site (see Figure 1.2) 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 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 similar structures (Structure C-17 on the west and Structure D-48 on the east), which are mapped as east-west oriented structures with low platforms extending to the south.

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 2016; Houk 2015a).

Surrounding the core architecture are numerous smaller courtyards, the largest of which are the Western Plaza and the Norman's Temple complex. 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 the Norman's Temple complex, which consists of a large elevated platform with low mounds bordering its edges and a tightly enclosed courtyard in its center.

Another important group of architecture is Group H, which is located in the southeastern corner of the mapped portion of the site. 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

As shown in Figure 1.17, human occupation in the area of Chan Chich, based on ceramic data, extends from the early Middle Preclassic period into the Postclassic/Colonial period. 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). Samples from 2016 provide even older ages for floors in the center of the plaza. Sample CC-15-S43 from the southern end of Subop CC-15-A dates the earliest use of the plaza to cal 911–804 BC.

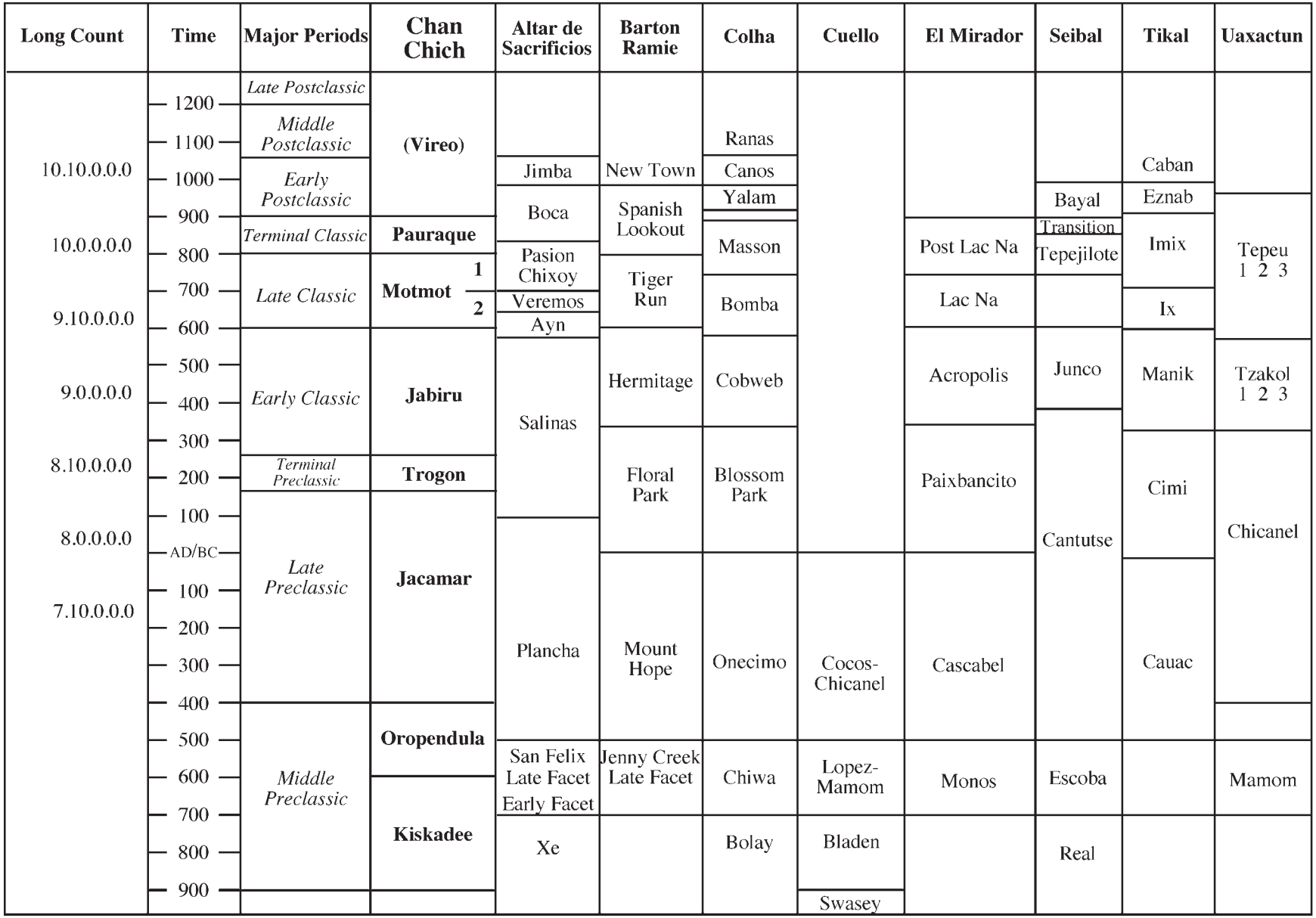

Figure 1.17. Chan Chich ceramic complexes and other ceramic sequences for the Maya lowlands (after Valdez and Sullivan 2014:Figure 9.1).

Excavations show greater evidence of Late Preclassic occupation, as evidenced by floors and features in the Upper Plaza (Herndon et al. 2014; Kelley 2014; Kelley et al. 2012, 2013; Robichaux et al. 2000), the Main Plaza (Houk 1998, 2000b), Structure C-8 in the Western Plaza (Guderjan 1991:41), and Norman's Temple group (Meadows 1998). Booher and colleagues (2015) report Late Preclassic foundations for Courtyard D-1, east of the Main Plaza.

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. A radiocarbon sample from 2016 dates this surface to AD 128–236 (Sample CC-15-S04). 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, making Tomb 2 the oldest known royal burial in the Belizean side of the Three Rivers adaptive region (Houk et al. 2010).

Early Classic architecture and discrete deposits have long eluded excavators, until 2016. Excavations in the Upper Plaza in 2016 encountered Tzakol deposits in the northern end of the plaza associated with as yet poorly understood construction pens and/or truncated platforms. We have known for decades that Early Classic features are present at the site—Guderjan (1991:45) found two broken Early Classic polychrome bowls in a looters' camp—but previous excavations did not encounter discrete Early Classic contexts. Sample CC-15-S59 from 2016 returned a date of cal 55 BC–AD 211 from a burn feature in the northern part of the Upper Plaza. 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.

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 2016), 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 2016).

The site apparently went into decline during the Terminal Classic period around AD 800 before being abandoned by 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 at Courtyard D-1 (Booher 2016) and in the Back Plaza, based on materials found on the final floor of Structure A-23 (Vazquez et al. 2014).

Deposits of exotic artifacts left broken on the steps to the range building in the Norman's Temple complex and to 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 2016). A newly discovered terminal deposit in the southeastern corner of the Norman's Temple courtyard (see Booher, this volume) adds to growing body of evidence related to the abandonment of the site. Arguably, the graffiti documented by Booher (this volume) 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).

Better documented than the Postclassic period is the settlement of Kaxil Uinic village by San Pedro Maya around 1880 (Bonorden 2016). A small group of Caste War refugees lived there until 1931, when the Belize Estate Company moved them to San José (see Bonorden 2016). Based on Bonorden's and Kilgore's (2015, this volume) work at the historic Kaxil Uinic village, the project ceramicists designated a new Postclassic ceramic complex called Vireo (see Figure 1.17). This is not, at this stage, a functionally complete complex (Lauren Sullivan, personal communication, 2015).

ORGANIZATION OF THIS VOLUME

Unfortunately, two planned chapters are not included in this volume: the chapter on the Upper Plaza investigations and the analysis of the archival data from Jamaica and England. For the former, data from the 2016 season will be combined with data from the 2017 season in one chapter on the Upper Plaza in next season's report. The archival chapter will either be published as its own volume or included in a revised edition to this report in 2017.

As for the rest of this report, Ashley Booher reports on the excavations at Norman's Temple in the second chapter of this volume. That work also yielded surprising results in the form of graffiti and a dense above floor deposit. Anna Novotny and colleagues describe the results of osteological analysis of burials from the Upper Plaza and Norman's Temple in the third chapter. Bonorden and Trudy Kilgore describe the second season of excavations at the historic village in the fourth chapter. Mark Willis, the project's remote sensing specialist, describes the results of his drone mapping of cleared pastures and Laguna Seca in the fifth chapter. Trudy Kilgore's analysis of ground stone artifacts collected by BEAST and CCAP since 2012 constitutes the sixth chapter. Finally, the volume concludes with updated project lists.

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Results of the 2016 Norman's Temple Complex Investigations at Chan Chich

Ashley Booher

A focus of the 2016 Chan Chich Archaeological Project (CCAP) was to revisit the Norman's Temple complex, with a specific goal of understanding the Terminal Classic abandonment of the site. Norman's Temple complex is located approximately 400 m west of the Upper Plaza and occupies the highest hilltop in the site core (Figure 2.1). A large artificial platform caps the summit of the hill and measures 110 m north-south and 65 m east-west. A tightly enclosed, elevated courtyard, Courtyard C-1, occupies the center of the platform with structures surrounding all sides. The courtyard itself is small, but is home to the largest, unlooted temple at Chan Chich, Structure C-1, which measures 8 m tall. Two other structures, Structure C-2 and Structure C-3, occupy the north and south sides of the courtyard respectively. A low but wide platform borders the edges of the artificially modified hilltop.

Prior excavations in the 1990s at Normans Temple complex focused on Courtyard C-1 and the surrounding structures. Excavators placed a courtyard test pit in the center of the courtyard but abandoned the unit at 2.85 m below the surface before reaching bedrock (Meadows 1998). Structural excavations at the base of Structure C-1 and the south face of Structure C-2 discovered above floor artifact deposits. At the base of Structure C-1 Meadows (1998) found an artifact deposit consisting of a figurine fragment, a ceramic whistle, imitation fine orange sherds, and a thin biface fragment on the final courtyard surface. A smaller artifact deposit that included a partially reconstructable Fine Orange bowl was found broken on the steps of Structure C-2. Houk (2016) has argued that these deposits are related to the abandonment of the site. The research interest for the 2016 excavations at Normans Temple complex are related to these above floor artifact deposits, the low platform surrounding the complex, and the Terminal Classic abandonment of the site.

RESEARCH DESIGN AND METHODOLOGY

Fieldwork took place over eight weeks from May 19 to July 8, 2016, and was carried out by field school students and local workers from Chan Chich Lodge and Sylvester Village. Project director Brett A. Houk and operation director Ashley Booher oversaw the excavations. Suboperation director Danielle Ruffe led the north courtyard (Courtyard C-4) excavations and, along with Kevin Miller, oversaw the excavations of Structure C-2. Carolyn Nettleton assisted with the excavations of Structure C-5. The Norman's Temple complex excavations were assigned Operation (Op) CC-16. All excavations conducted followed the guidelines established in the *Chan Chich Archaeological Project Field Manual* (Houk and Zaro 2015). The senior author and project director directed the initial placement of suboperations based upon previous excavations conducted during

Booher, Ashley
2016 Results of the 2016 Norman's Temple Complex Investigations at Chan Chich. In *The 2016 Season of the Chan Chich Archaeological Project*, edited by Brett A. Houk, pp. 39–66. Papers of the Chan Chich Archaeological Project, Number 11. Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

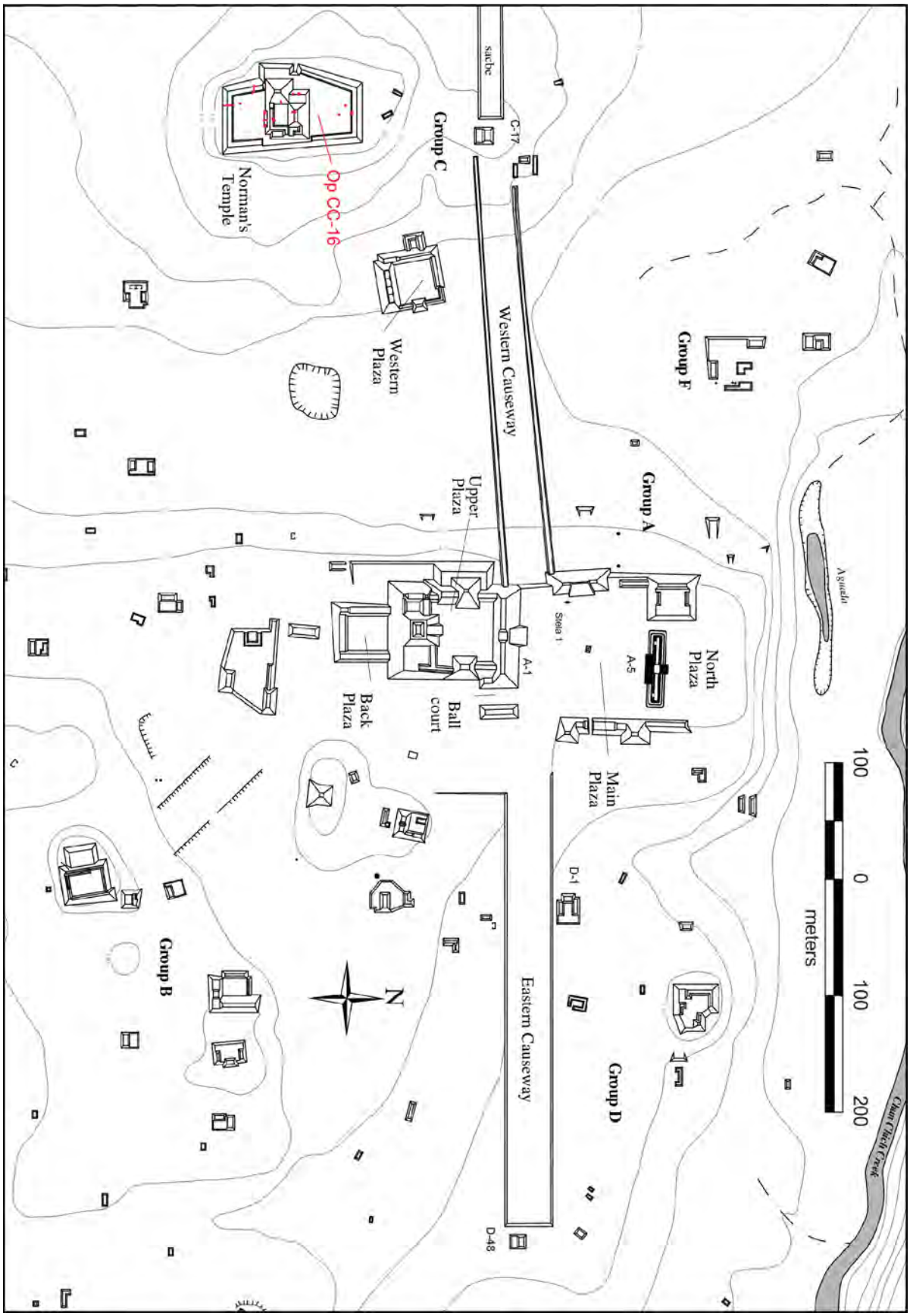

Figure 2.1. Map of Chan Chich showing the site core and the location of Norman's Temple and Op CC-16.

the late 1990s or surface indications of possible architectural features. Lab director Samantha Mitchel processed all artifacts collected in the field in the CCAP field lab,

The primary objectives of the 2016 excavations related to the above floor artifacts deposits documented during excavations of the complex in the late 1990s, and the low platform surrounding the complex. Specifically, the excavations were to test the possibility that the complex was a defensive position for members of the elite class. Excavations were to determine if the low platform surrounding the margins of the group was the remains of a defensive wall and look for any evidence that the abandonment of the group was due to or accompanied by violence. Vertical excavations of the north and south courtyards of the hilltop platform, Courtyard C-4 and C-5, respectively, were also conducted to obtain chronological data.

Excavations in Courtyard C-1 were placed to look for additional above floor, Terminal Classic artifact deposits. Excavations of Structure C-1 were designed to further expose the central staircase that was partially exposed during the 1998 field season (Ford and Rush 2000) and to look for additional deposits at the base of the structure and on the stairs. Structural excavations of Structure C-2 were placed to expose and assess the conditions of the rooms and to determine if artifacts were present on the floors or benches. Additionally, excavations looked for any evidence of violence such as burning or intentional defacement of architecture on Structure C-2. Lastly, excavations on the platform west of Structure C-2 were placed to look for above floor deposits.

PREVIOUS EXCAVATIONS

In 1997, the CCAP carried out a test pit program in Group C that included Norman's Temple. Initial excavations at Norman's Temple focused on documenting the number of construction episodes in Courtyard C-1 (Meadows 1998:60). Meadows (1998) placed a 2-x-2-m excavation unit in the middle of Courtyard C-1. Ceramic data collected from the excavation indicated a Late Preclassic occupation followed by a Late Classic remodeling of the courtyard with no intervening Early Classic construction. Excavations exposed two cultural features, a burial, located 85 cm below the ground surface, and a concentration of potsherds. Analysis of the skeletal material from Burial 1 determined that the individual was most likely a small, adult female. The second feature consisted of fragments of two vessels approximately 40 cm below the surface. The majority of the sherds were part of a large, shallow, reconstructable bowl, which dates to the Late Classic period. The test pit was excavated to a depth of 2.85 m below surface before it had to be abandoned due to instability (Meadows 1998:61–62).

Excavators placed an additional test pit unit at the base of Structure C-1 to determine the "thickness of deposits that accumulated as midden material at the base of structures at the end of the site's occupation" (Meadows 1998:62). The excavation unit extended 4.5 m up the eastern face of Structure C-1. Excavation encountered marl, ashy matrix in which the density of artifacts substantially increased. An artifact deposit that consisted of a number of black and red slipped wares, a fragment of an Imitation Fine Orange vessel, and a figurine fragment were found sitting directly on top of a plaster floor at the base of the structure (Meadows 1998:63).

The 1998 objective of the excavations at Courtyard C-1 was to determine the architectural nature of the courtyard group. Ford and Rush (2000:41) conducted excavations on Structures C-1, C-2, and C-3, and the southern half of the platform (Courtyard C-5) supporting the courtyard group. Excavators

placed a 2-x-2-m unit adjacent to the 1997 test pit unit on Structure C-1. Excavations exposed two poorly preserved steps at the base of the structure before excavations were terminated due to unstable profiles (Ford and Rush 2000).

Excavations at the base of Structure C-2 exposed a well-preserved courtyard surface along with the first thee steps of the staircase. The excavations encountered a concentration of smashed ceramics that included a partially reconstructable Fine Orange bowl and other artifacts, including human skeletal remains, on the steps and courtyard surface (Ford and Rush 2000). Designated Burial 3 analysis concluded that the remains represent a minimum of two individuals – a female or small male and a robust young adult male (Ford and Rush 2000:44).

Excavations on the south portion of Structure C-3—the structure forms the eastern and southern edges of Courtyard C-1—exposed a well-preserved surface and an intact portion of a wall approximately 60 cm high (Ford and Rush 2000). Investigations of the east portion of Structure C-3 exposed the final courtyard surface and a three-tiered platform. Excavations on the east architectural face exposed a 1-m high wall and an infilled doorway. The wall likely represents a room filled to create a platform at a later date; a plaster cap covered both the wall and infilled doorway (Ford and Rush 2000:45). Excavators placed two suboperations on the southern half of the platform that supports Courtyard C-1. Both units failed to encounter any preserved courtyard floors (Ford and Rush 2000:45).

SUMMARY OF 2016 EXCAVATIONS

The excavations falling under Operation CC-16 focused on five areas of the Norman's Temple complex: the north courtyard (Courtyard C-4), the south courtyard (Courtyard C-5), and structural excavations of Structure C-1, C-2, and C-3. A total of 25 suboperations was opened (Table 2.1 ; Figure 2.2). The results of the excavations are described below.

Courtyards C-4 and C-5

Courtyard C-4 is the north portion of the artificial platform that caps the hilltop on which Norman's Temple complex was constructed. Courtyard C-4 measures approximately 40 m north-south by 50 m east-west and is surrounded by a low platform, Structure C-14. Courtyard C-5 is located to the south of Structures C-1 and C-2 and is the southern portion of the artificial platform. Courtyard C-5 measures 32 m north-south and 50 m east-west and is surrounded by a low, but wide platform, Structure C-5 (refer to Figure 2.1). Initially, Structures C-5 and C-14 were thought possibly to be the remains of a defensive wall surrounding Norman's Temple complex. Excavations of the wall were designed to determine if the abandonment of the complex was due to or accompanied by violence.

Table 2.1. Summary of Suboperations and Lots (from North to South)

Structure	Subop	Lot	Lot Description	Ceramic Data
Courtyard C-4	CC-16-O	01	Humus/Floor	Tepeu 3
		02	Bedrock	
	CC-16-U	01	Humus	
		02	Construction fill/Floor	Tepeu 2-3
		03	Rock alignment	
		04	Bedrock	

Table 2.1. Summary of Suboperations and Lots (continued)

Structure	Subop	Lot	Lot Description	Ceramic Data
Structure C-14	CC-15-R	01	Humus	Tepeu 3
		02	Collapse Debris	Tepeu 2
		03	Floor	
		04	Platform face	
		05	Platform surface	
	CC-16-W	01	Humus	Tepeu 3
		02	Collapse debris	Tepeu 2-3
		03	Floor	
		04	Platform face	
		05	Platform surface	
Structure C-1	CC-16-I	01	Humus	
		02	Collapse debris	Tepeu 3
		03	Backfill	Tepeu 2-3
		04	Collapse debris	Tepeu 2-3
		05	Floor	
		06	Steps	
Structure C-2	CC-16-D	01	Humus	
		02	Collapse debris	Tepeu 2
		03	Bench surface	
		04	West exterior wall	
		05	Spine wall	
		06	Exterior surface	
	CC-16-Dx	01	Humus	
		02	Collapse debris	Tepeu 2
		03	Exterior surface	
	CC-16-H	01	Humus	
		02	Collapse debris	Tepeu 2
		03	Bench surface	
		04	West exterior wall	
		05	Spine wall	
	CC-16-J	01	Humus	Tepeu 3
		02	Collapse debris	Tepeu 2-3
		03	Wall core	
		04	Floor	
		05	Wall	
	CC-16-N	01	Humus	Tepeu 3
		02	Collapse debris	Tepeu 2-3
		03	Floor	
		04	Wall	

Table 2.1. Summary of Suboperations and Lots (continued)

Structure	Subop	Lot	Lot Description	Ceramic Data
Structure C-3	CC-16-M	01	Humus	Tepeu 2
		02	Collapse debris	Tepeu 2
		03	Courtyard C-5 surface	
		04	Steps	Tepeu 2
		05	Construction fill	Tepeu 2
		06	Earlier Courtyard C-5 surface	Tepeu 2
	CC-16-P	01	Humus	Tepeu 3
		02	Collapse debris	Tepeu 3
		03	Artifact deposit	Tepeu 2-3
		04	Floor	
		05	Floor	
		06	Platform face	
	CC-16-Q	01	Humus	Tepeu 3
		02	Collapse debris	
		03	Courtyard C-5 surface	
		04	Steps	
		05	Floor	
	CC-16-S	01	Humus	Tepeu 2-3
		02	Collapse debris	Tepeu 2 with Tzakol trace
		03	Courtyard C-5 surface	
		04	Steps	
	CC-16-V	01	Humus	Tepeu 3
		02	Collapse debris	Tepeu 2-3
		03	Floor	
	CC-16-X	01	Humus	Tepeu 2
		02	Collapse debris	Tepeu 2
		03	Artifact deposit	Tepeu 2
		04	Collapse debris	
		05	Floor	
		06	Platform face	
Courtyard C-5	CC-16-C	01	Humus	
		02	Cobble fill	Tepeu 2-3
		03	Floor	Tzakol with Chicanel trace
		04	Floor	
		05	Floor	Tepeu 2
		06	Natural ground surface	
		07	Bedrock	

Table 2.1. Summary of Suboperations and Lots (continued)

Structure	Subop	Lot	Lot Description	Ceramic Data
Structure C-14	CC-16-A	01	Humus	Tepeu 2-3
		02	Collapse Debris	Tepeu 2-3
		03	Collapse debris/fill	Tepeu 1
		04	Platform face	
		05	Construction fill	
		06	Platform face on bedrock (Lot 07)	
	CC-16-B	01	Humus	
		02	Collapse debris	Tepeu 2-3
		03	Floor	
		04	Wall	
		05	Exterior surface	
	CC-16-E	01	Humus	Tepeu 1
		02	Collapse debris	Tepeu 2
		03	Floor	
		04	Construction fill	Tepeu 2
		05	Platform surface	Tepeu 2
		06	Platform surface	Tepeu 2
		07	Courtyard C-5 surface	
	CC-16-F	01	Humus	Tepeu 3
		02	Collapse debris	
		03	Floor	
		04	Platform face	
		05	Construction fill	Tepeu 2-3
		06	Platform surface	Tepeu 2
		07	Platform surface	
	CC-16-G	01	Humus	Tepeu 2
		02	Collapse debris	Tepeu 2-3
		03	Platform surface	Tepeu 2
		04	Wall	
		05	Exterior surface	
		06	Platform surface	
	CC-16-K	01	Humus	Tepeu 3
		02	Collapse debris	Tepeu 2
		03	Platform surface	Tepeu 2
		04	Platform surface	Tepeu 1
		05	Courtyard C-5 surface	
	CC-16-T	01	Humus	Tepeu 3
		02	Collapse debris	Tepeu 2-3
		03	Platform surface	
		04	Wall	

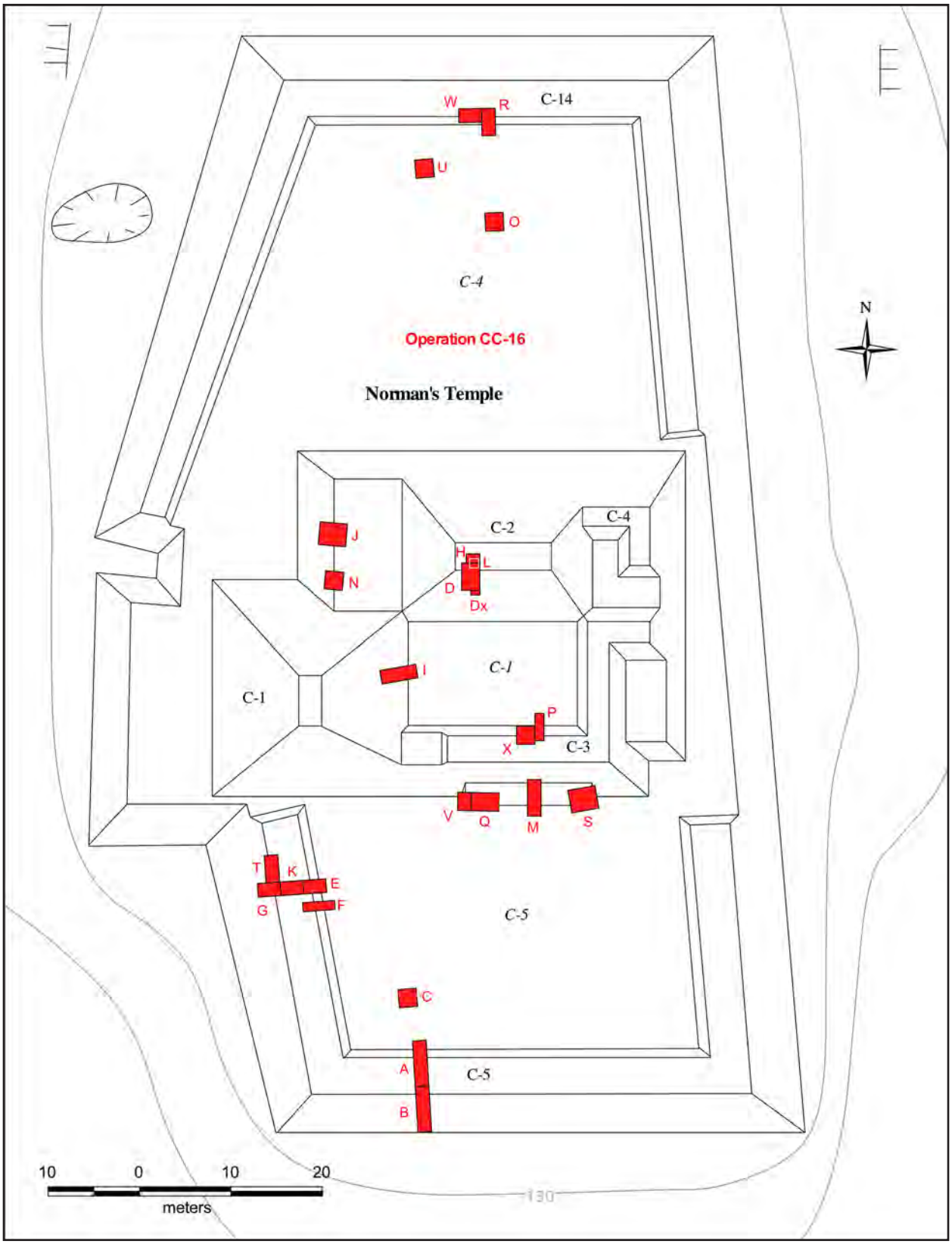

Figure 2.2. Locations of suboperations in Op CC-16 opened at Norman's Temple complex in 2016.

Excavations of Courtyard C-4

Excavation of the north portion of Structure C-14 exposed and documented the architectural form of the platform. Excavations of Structure C-14 exposed a platform face (Lots C-16-R-04 and CC-16-W-04) constructed from large, faced stones. The platform face was preserved to a height of approximately 30 cm and constructed on the final courtyard surface, designated Lots CC-16-R-03 and CC-16-W-03 (Figure 2.3). The preservation of the courtyard surface was variable; the surface at the base of the platform exhibited the best preservation. The surface of the platform (Lots CC-16-R-05 and CC-16-W-05) was highly eroded. Subops CC-16-O and -U were placed in the courtyard to obtain chronological data. Excavations exposed a single, Late Classic period construction sequence for Courtyard C-4, and encountered bedrock at approximately 30 cm below surface.

Excavations of Courtyard C-5

Excavation of the southern face of Structure C-5 revealed a two-tiered platform. The lower platform (Lot CC-16-A-04) was constructed of large, faced limestone blocks and preserved to a height of 1.2 meters, and constructed on top of undulating bedrock, the first of its kind documented at Chan Chich (Figure 2.4). The upper platform (Lot CC-16-A-06) is 42 cm high and poorly preserved. The east portion of the platform partially collapsed with only two courses of stones preserved; the west portion is preserved up to four courses high and constructed from small, crudely faced stones. North of the upper platform face is a highly eroded platform surface (Lot CC-16-B-05). North of the platform surface is a poorly preserved wall (Lot CC-16-B-03). The wall is two courses high and preserved to a height of 32 cm. Portions of the north face of the wall are no longer preserved, and only the bottom

Figure 2.3. Photo of Structure C-14's platform face in Lots CC-16-R-04 and -W-04.

Figure 2.4. Photo of the lower face of Courtyard C-5's platform.

course of stones are preserved on the south face of the wall. The wall was constructed on top of the final courtyard surface (Lot CC-16-B-03).

The western portion of Structure C-5 was extensively excavated, and excavations documented two construction sequences for the platform. The platform is approximately 30 cm high and 7.5 m wide with a low wall defining its western edge. A low platform face (Lot CC-16-F-04) defines the eastern edge of Structure C-5 and separates the higher platform surface from the final courtyard surface (Lots CC-16-E-03 and -F-03). The platform face is two courses high and preserved to a height of 29 cm. The final platform surface (Lots CC-16-E-05, -F-06, -G-03, -K-03, and -T-03) was poorly preserved. Excavators documented two small obsidian blade fragments on top of the platform surface. A low wall (Lot CC-16-G-04 and T-04) defines the western edge of the platform. The wall is 78 cm wide, four courses high, and preserved to a height of 30 cm. The wall is constructed on top of Lot CC-16-G-03 and –T-03, the final platform surface (Figure 2.5). The function of the wall remains unclear. A highly eroded exterior surface (Lot CC-16-G-05) lies to the west of the wall.

Excavation revealed two construction sequences for the platform surface. An early Late Classic construction event raised the platform surface approximately 28 m above the final courtyard surface (Lots CC-16-E-07 and -K-05). This earlier platform surface (Lots CC-16-E-06, -F-07, and -K-04) was poorly preserved and did not extend into the western portion of the platform. Excavation through the earlier platform surface did not uncover an interface that would account for the absence of the floor surface in the western half of the platform. A Late Classic construction event raised the platform surface an additional 26 cm

Figure 2.5. Photo of Structure C-5's west wall in Lot CC-16-T-04.

creating the final platform surface (Lots CC-16-E-05, -F-06 and -K -03).

Excavations in Courtyard C-5

In the west-central portion of Courtyard C-5, excavators placed Subop CC-16-C, a 2-x-2-m unit, to collect chronological data. Excavation exposed three different construction phases and revealed that the courtyard was heavily modified throughout its occupation history (Figure 2.6). A large construction event, employing small boulders and large cobbles as fill, raised the earliest courtyard surface approximately 112 cm above the natural ground surface. Excavators did not recognize this floor, thus the artifacts collected below this floor were comingled with the artifacts collected from the fill above this surface, producing inaccurate date ranges for the first floor. A second early Late Classic construction event raised the courtyard surface an additional 75 cm. This surface (Lot CC-16-C-04) was highly eroded in most places. A final Late Classic construction event raised the courtyard surface approximately 100 cm, creating the final courtyard surface. This surface (Lot CC-16-C-03) displayed the best preservation and corresponds to the courtyard surfaces exposed in Lots CC-16-E-07 and -K-05.

CCAP excavated the south face of Structure C-3 for the first time this season. Vegetation clearing revealed indications that the structure had a previously unmapped stairway on its southern face. Excavations subsequently exposed a broad central stairway that extends approximately 12 m across the southern face of Structure C-3. Excavations exposed the bottom five steps (Lots CC-16-M-05, -Q-02 and -S-04) of the staircase; the steps positioned higher up on the structure had collapsed away. The preservation of the steps varied; the bottommost step (Step 1) exhibited the best preservation, and Steps 4

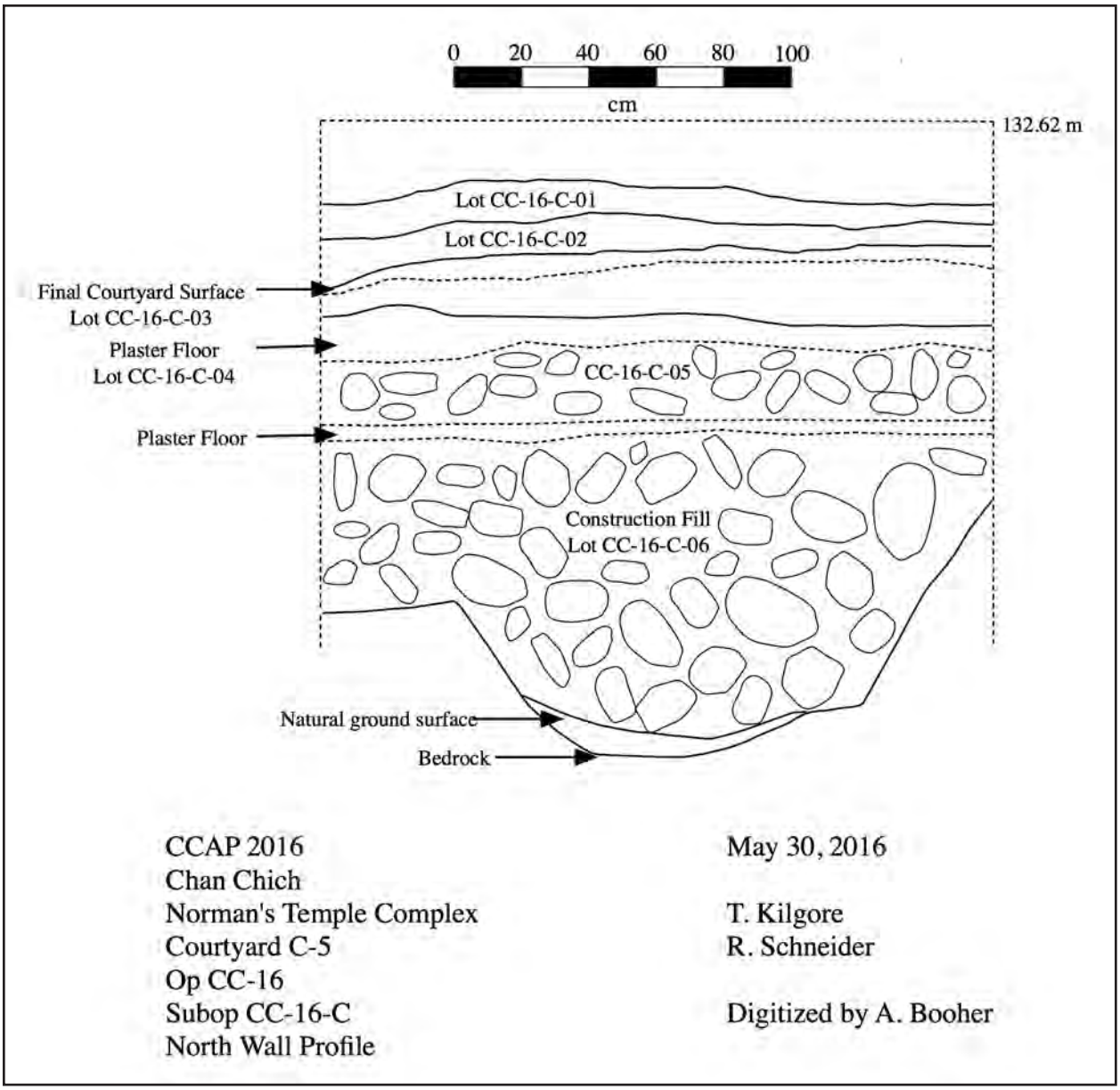

Figure 2.6. Profile of the north wall of Subop CC-16-C.

and 5 were poorly preserved (Figure 2.7). Step 1 was constructed on top of the final courtyard surface (Lots CC-16-M-03, -Q-03, and -S-03) and measured 15 cm high and approximate 50 cm deep. Step 1 was constructed from large cut stones; the largest stone measured 40 x 20 cm. Step 2 measured approximately 10 cm high and 28 cm deep. The second step was poorly preserved with several of the facing stones no longer present. Step 3 is approximately 15 cm high and 28 cm deep and displayed similar preservation to Step 1. Step 4 is approximately 20 cm high and 35 cm deep and constructed from considerably smaller, irregularly faced stones. Step 5 measured approximately 20 cm high and appeared to summit a terrace or landing with poorly preserved plaster. The step itself was poorly preserved with only three cut blocks in situ. Excavator's encountered small, broken pieces of ceramics scattered across the steps; excavators left the ceramics on the steps in situ, which were mapped and collected as a

Figure 2.7. Orthophoto of the exposed, southern staircase on Structure C-3, Subop CC-16-M.

separate lot (Lot CC-16-M-05). The ceramic sherds were highly eroded but were dated to coincide with the middle Late Classic period.

The bottom three steps (Lot CC-16-M-04) were removed and the construction fill behind the steps, and the final courtyard surface (Lot CC-16-M-03) was excavated down to an earlier courtyard surface (Lot CC-16-M-07). The earlier courtyard surface corresponds to the courtyard surface exposed in Subop CC-16-C-04. The construction of the staircase dated to the middle Late Classic period.

Interpretations of Courtyard C-4 and C-5

Initially, Structures C-5 and C-15 were mapped as low walls surrounding Norman's Temple complex, and it was hypothesized that the wall functioned as a defensive feature. Clearing and excavations of Structures C-5 and C-14 revealed that the wall was a low, wide platform—much wider than originally mapped—that surrounds the complex. No evidence of violence, such as burned architecture or defensive weaponry, was documented along the platform to suggest that the abandonment of the site was due to violence. The function of the platform is still unclear.

Extensive excavation of Courtyard C-5 revealed that the courtyard underwent several renovations beginning in the early Late Classic period with occupation through to the Terminal Classic period. Structure C-14 was constructed following the final Late Classic construction episode of the courtyard. Excavations documented two construction episodes for Structure C-14 with the final architectural form coinciding with the Late Classic period with use into the Terminal Classic period. The final form of Structure C-14 was a low but wide platform defined by a platform face on the eastern and northern edges. The southern face of Structure C-14 was terraced, and a low wall defined the western edge of the structure. The function of the wall or platform is unclear. Earlier phases of the platform were documented, but the construction sequences are unclear. More, extensive excavations need to be completed to determine the function of the platform and the earlier construction sequences.

Structure C-3's northern stairway was unidentified prior to the 2016 season. A 12-meter central stairway was exposed with the steps in varying degrees of preservation. Ceramic analysis indicates that the construction of the northern stairway took place during the middle Late Classic period with use through to the Terminal Classic period. The presence of the stairway is important because it indicates that Courtyard C-5 is a functioning courtyard associated with Structure C-3.

Structural Excavations of Norman's Temple Complex

The Norman's Temple complex occupies the highest hilltop in the site core. A tightly enclosed, elevated courtyard (Courtyard C-1) occupies the center of the complex and measures 9 x 11 m. Courtyard C-1 is surrounded by four structures. Structure C-1, which measures 8 m tall, occupies the western side of the courtyard and is the largest unlooted temple at Chan Chich. Structure C-2 is a 5-m tall range building that occupies the northern side of the courtyard. Structure C-3 is a z-shaped mound that encloses the eastern and southern sides of the courtyard. Structure C-4 is located on the northeast corner of Structure C-2 and shares a small patio space with the northern end of Structure C-3.

Structure C-1

A 1.5-x-4-m excavation unit (Subop CC-16-I) was placed on the east face of Structure C-1 to expose the final courtyard surface and the stairs and to determine if any additional above floor, Terminal Classic artifact deposits are located at the base of the structure. Previous excavation in 1998 exposed the bottom two steps to the structure and the final courtyard surface along with a moderately dense deposit of artifacts (Ford and Rush 2000). This year's excavation exposed the final courtyard surface (Lot CC-16-I-05) and an additional two steps (Lot CC-16-I-06). The final courtyard surface was highly eroded, and a portion of the surface was excavated through inadvertently. The construction fill from below the surface dated the final courtyard surface to the Late Classic period. Excavation exposed the bottom four steps of the structure; the steps positioned higher up on the structure had collapsed down the face of the structure. Step 1 is the bottommost step, constructed on top of the final courtyard surface. Only one, large faced stone preserved. Step 2 consisted of four stones; two of the stones partially collapsed and were no longer in alignment with the remainder of the step. Step 3 displayed similar preservation to the first step, with only one faced stone that measured approximately 60 cm preserved. Step 4 is the highest preserved step exposed by excavations. Only the south portion of the step preserved, represented by two large faced stones positioned at an angle in partial collapse; the northern part of the step collapsed and fallen

down the face of the structure. Excavation did not encounter an artifact deposit similar to the deposit recorded in 1998.

Structure C-2

Excavations of Structure C-2 exposed a portion of the southeastern room. Excavators uncovered a portion of the south exterior wall, the west exterior wall of the room, the central spine wall of the structure, a portion of a bench, and a burial (Figure 2.8). Preservation of portions of the room was remarkable, with the remains of plaster still preserved on the walls. The southern exterior wall exhibited

Figure 2.8. Orthophoto of the southwest room in Structure C-2. View from the southeast with the southern and eastern walls of the excavation cut away.

the worst preservation. Table 2.2 depicts the suboperations and corresponding architecture opened on Structure C-2.

Excavations of the room uncovered the southern exterior wall (Lot CC-16-D-05) and a well-preserved exterior surface (Lots CC-16-D-06 and -Dx-03). Most of the southern wall had collapsed down the southern face of the structure, but the northern extent of the southern wall is partially preserved in the room. Four courses of faced stones, preserved to a height of 52 cm, formed the preserved base of the exterior face of the southern wall.

The south exterior wall articulates with the west interior wall (Lots CC-16-D-04 and -H-04), orientated north/south, and defines the southwestern corner of the room. The wall is preserved from approximately five courses of stones up to 12 courses of stones at the northern end. The west wall articulates with the spine wall of the structure. The spine wall is preserved to a height of 2.08 m. The west exterior wall articulates with the spine wall and forms the northwestern corner of the room. The entrance to the room is presumably located to the east of the excavated area, and it is likely that the room was vaulted given the large amount of vault stones found in the collapse debris.

Table 2.2. Lots by Op CC-16 Suboperations with Corresponding Architecture and Ceramic Ages on Structure C-2

Context	D	Dx	H	L	Age
Topsoil	01	01	01	01	Tepeu 2
Collapse Debris	02	02	02	02	Tepeu 2
Exterior Surface	06	03			
South Exterior Wall	05				
West Interior Wall	04		04		
Spine Wall			05		
Bench Surface	03		03	01	Tepeu 2
Burial CC-B15				02	Tepeu 2
Interior Surface				04	

The north portion of the west exterior wall and the spine wall both exhibited excellent preservation with much of the plaster still intact (Figure 2.9). The corner formed by where both walls articulate was severely burned at the base of the wall, along with portions of the spine wall. Graffiti was preserved on the back spine wall and portions of the western exterior wall, extending from just above the bench's surface to a maximum preserved height of 90 cm on the spine wall. Mark Willis produced a Structure from Motion model of the graffiti (Figure 2.10), although, due to the poor preservation of the graffiti, it is difficult to determine what the image is depicting. It is possible the triangular shaped design with hatch marks may represent a perishable structure on top of a temple. The documented graffiti from Tikal has numerous depictions of buildings, many of which are topped with a triangular structure with similar hatch marks (Trik and Kampen 1983).

It is possible that a child produced the graffiti on the wall. Scott Hutson (2011) argues that children authored a portion of the graffiti from Tikal. Some of the cruder examples of Tikal graffiti were likely authored by people with limited artistic experience. Hutson (2011) argues that the height of the graffiti may help to determine the age of the artists. Higher graffiti should indicate taller and therefore older artists, and graffiti found low on the wall may likely indicate a child was responsible for the image. However, seated adults could have produced the graffiti that is close to the floor. The location of graffiti above benches supports the idea that people sometimes sat down when they incised graffiti (Hutson 2011). The location of the graffiti at the base of the wall may indicate that a child is responsible, however due to the poor preservation of the graffiti, it is difficult to assess the quality of the image. It is also possible that an adult sitting on the interior bench of the room produced the graffiti.

Figure 2.9. Photo of the preserved plaster and graffiti on the spine wall of Structure C-2.

Excavation of the interior room exposed a portion of a bench surface that spanned from the spine wall to the south exterior wall. The interior room measures 2.40 m north-south, however the east-west dimensions are not known. A 1-x-1-m suboperation (Subop CC-16-L) was placed across the interior bench surface that encompassed portions of both Subop CC-16-D and Subop CC-16-H. Excavation through the bench near the base of the spine wall uncovered a burial (Burial CC-B15). Below the burial was the final interior floor surface (Lot CC-16-L-04) on which the bench was constructed. The construction fill from within the bench dated to the Late Classic period. Figure 2.11 shows the location of the burial within the room on Structure C-2.

Burial CC-B15

Burial CC-B15 was located in the bench exposed in Lots CC-16-D-03 and -H-03. Three large faced rocks surrounded the burial and delineated the boundary of the burial within the fill of the bench. Two capstones covered the burial; one large capstone covered the west portion of the burial and a smaller capstone partially covered the east. The burial measured approximately 60 cm east-west by 40 cm north-south.

Burial CC-B15 contained the remains of a single, young male, interred in a tight flexed position and laid on his right side (Novotny et al., this volume). The body was orientated east-west, with the skull located on the east and facing north and the pelvis to the west. The burial was placed on top of a plaster floor (Lot CC-16-L-04) that is likely the final interior floor surface of the room. Figure 2.12 is a plan map of the burial, and Figure 2.13 is an orthophoto of the burial. Most of the bones were present and well preserved. The skull was highly fragmented but preserved enough for sex determination. The mandible was nearly complete with two teeth still in occlusion. The long bones were relatively complete in situ, but, upon removal from the soil matrix, fragmented into several pieces. The pelvis was well preserved with the head of the femur still articulated in the

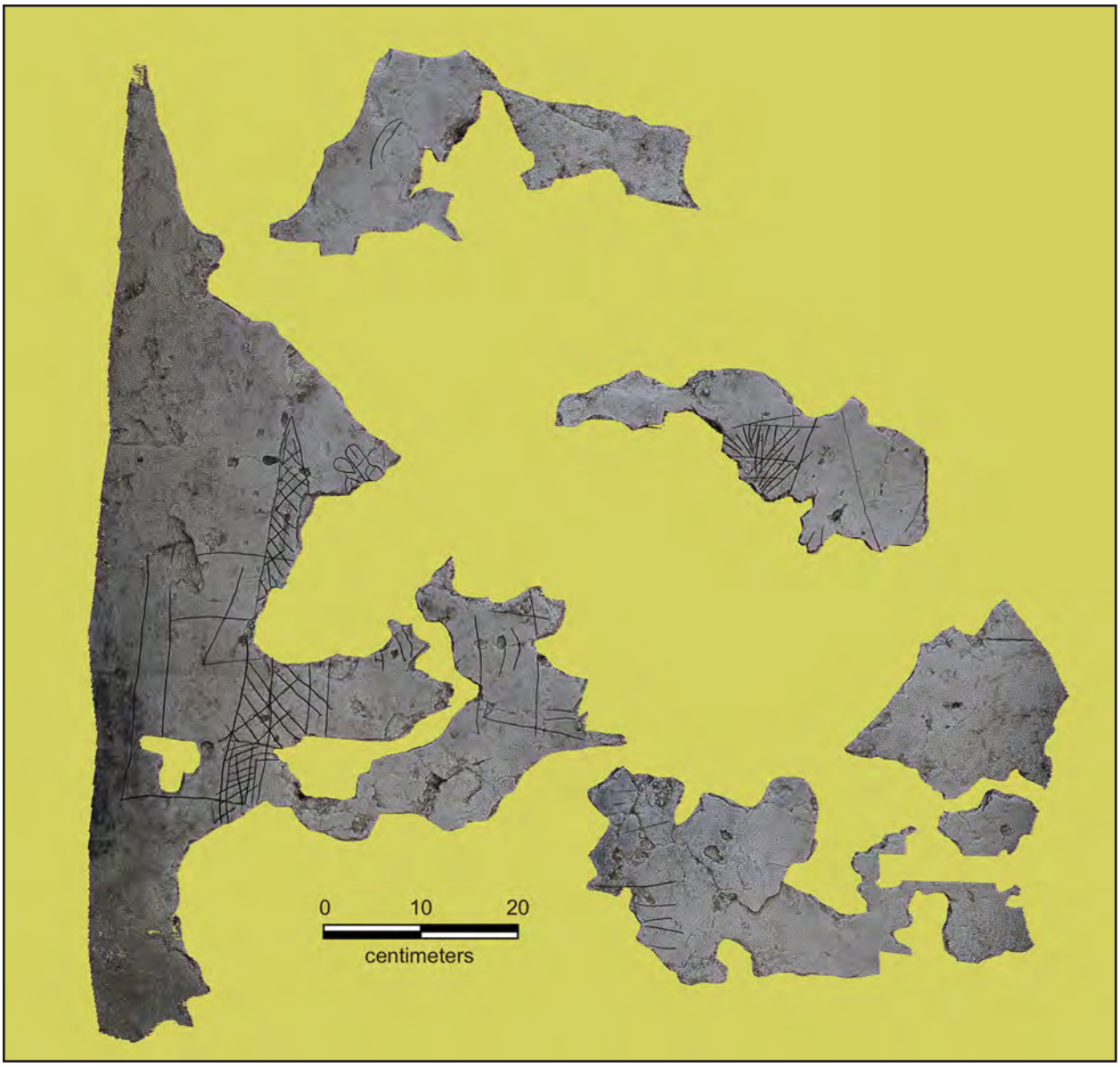

Figure 2.10. Orthophoto of the preserved graffiti (courtesy of Mark Willis).

acetabulum of the right pelvis. The hands were found underneath the skull, which suggests the individual was buried with his hands placed underneath his head or in front of the head. For a complete skeletal analysis of Burial CC-B15, see Novotny et al. (this volume). A total of 276 pieces of bone was collected that ranged from complete long bones to highly fragmented, unidentifiable pieces of bone. The bones were found in the correct anatomical position, and the presence of the hand and feet bones indicate a primary interment.

Several grave good were collected from Burial CC-B15. A small, modified shell was found near the vessel, and a shell labret was found underneath the skull (Figure 2.14). Two obsidian blades were found near the pelvis. Located behind the pelvis (northwest) was a ceramic bowl (Spec. #2508-01) with three feet and found positioned on its side. The bowl was broken into three pieces and reconstructed by

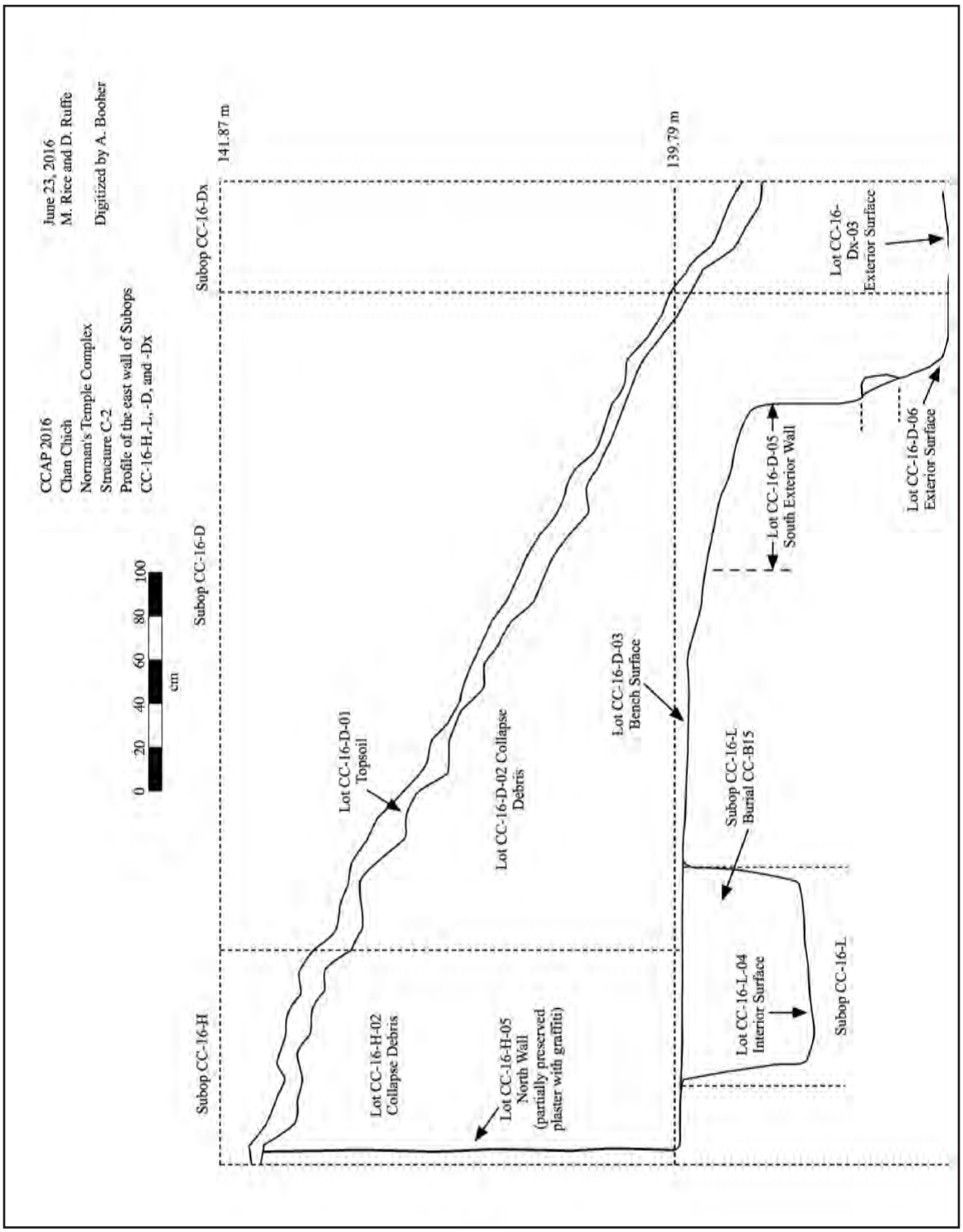

Figure 2.11. Profile map of Subops CC-16-D, -Dx, -H, and -L with the location of Burial CC-B15.

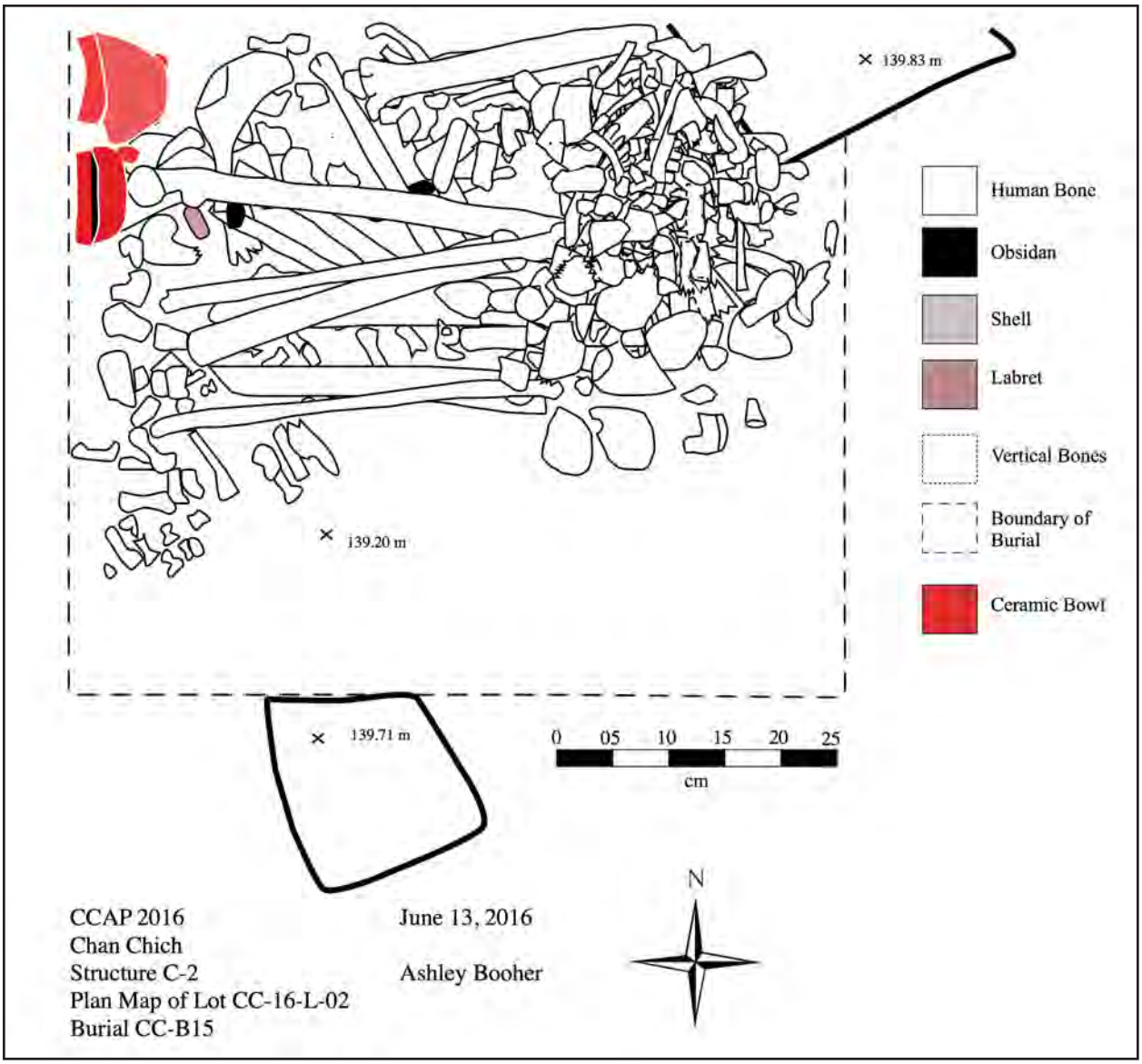

Figure 2.12. Plan Map of Burial CC-B15.

lab director Samantha Mitchell. Fred Valdez (personal communication) identified the vessel as a Cameron Incised bowl with an incised design on the interior base of the bowl (Figure 2.15). A radiocarbon date of charcoal from the burial returned an age range of cal AD 771–970 (Sample CC-16-S01; see Table 7.11, this volume). That rather long range spans the end of the Late Classic period, the Terminal Classic period, and the beginning of the Postclassic period. The Cameron Incised bowl is a Tepeu 2 vessel. Combined, the data suggest a Late-to-Terminal Classic date for the burial.

Western End of Structure C-2

The basal platform supporting Structure C-2 extends west of the building. Two suboperations (Subops CC-16-J and CC-16-N) were placed on the platform to look for possible above floor artifacts associated with the abandonment of the site or the function of the platform. A low wall (Lots CC-16-J-05 and -N-04) defined the western portion of the platform. The west face of the wall collapsed and no longer preserved. The east face was preserved up to two courses high and constructed on the platform surface (Lots CC-16-J-04 and -N-03). The surface was

Figure 2.13. Orthophoto of Burial CC-B15 in Lot CC-16-L-02.

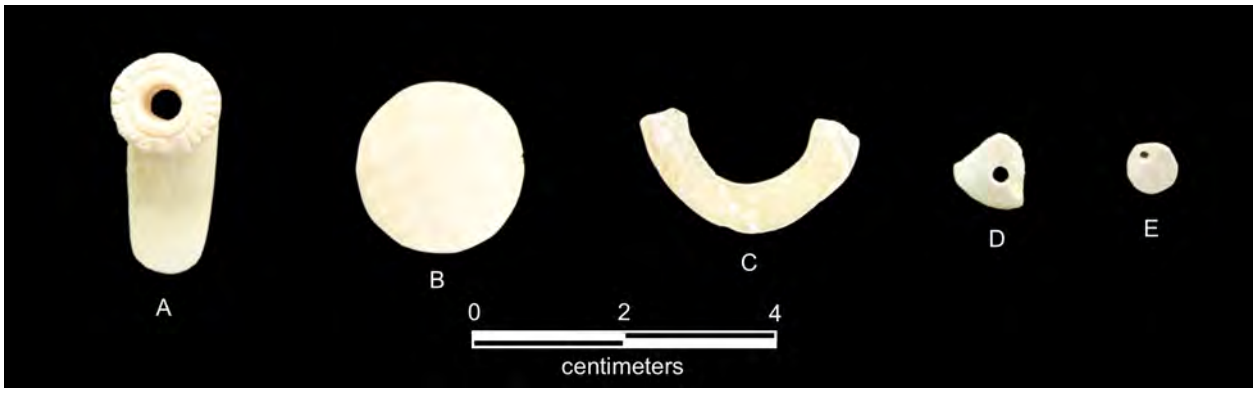

Figure 2.14. Shell artifacts associated with Burial CC-B15 (Lot CC-16-L-02). A: labret (Spec. # CC2510-01); B: disc (Spec. # CC2510-06); C: adorno disk fragment (Spec. # CC2510-05); D: triangular bead (Spec. # CC2510-02); E: disk bead (Spec. # CC2510-04).

Figure 2.15. Reconstructed Cameron Incised bowl from Burial CC-B15 (Lot CC-16-L-02), interior (left) and exterior (right), Spec. # CC2508-01.

well preserved, and excavators encountered a moderate concentration of artifacts above the floor surface. Two pieces of ground stone, an obsidian blade, and a ceramic sherd with a possible k'in glyph were collected (Figure 2.16). The above floor ceramics dated to the Terminal Classic period (Tepeu 3). The function of the platform remains unclear, and the artifacts collected from above the platform surface are not similar to other deposits documented at Norman's Temple; thus, it is unlikely the artifacts are associated with the abandonment of the site.

Structure C-3

The northeast corner of Structure C-3 was excavated to document the architecture of the north face of the structure and to look for above floor artifacts similar to the deposits found on Structures C-1 and C-2 in the late 1990s. Excavation documented the final courtyard surface that was replastered (Lots CC-16-P-04 and -X-5) and a platform face (Lots CC-16-P-06 and -X-06) on the northeast portion of Structure C-3. The platform face was five to six courses high and measured approximately 50 cm tall (Figure 2.17). A change in the soil matrix to a dark gray occurred below the collapse debris, and excavators encountered a dense deposit of artifacts (Lots CC-16-P-03 and -X-03). The excavated portion of the artifact deposit extended 2.5 m along the platform face and terminated 50 cm from the west edge of Subop CC-16-X. The east extent of the deposit is unknown. The deposit extends 1.12 m to the north from the platform and is approximately 30 cm thick. Excavators collected a substantial amount of artifacts from the deposit, including lithic tools, ground stone, a partial ceramic vessel, ceramic sherds, obsidian, modified shell, and faunal remains (Table 2.3). Of the ceramic sherds collected, 70 percent were from jars, 20 percent were from bowls or basins, and 10 percent were from plates. Also found among the deposit was a nearly complete polished shell pendant with two perforations on the top of the shell (Spec. # CC2513-01), a small, fragmented figurine whistle top (Spec. # CC2523-01), a highly polished celt of unknown material (Spec. # CC2545-01), and a small ceramic pendant (Spec. # CC2524-01), which are all shown in Figure 2.18. The pendant depicts the face of an old god with a mixture of human and feline features that dates to the Terminal Classic period. The ceramics collected from the deposit date to the Late-to-Terminal Classic period.

Figure 2.16. Photo of ceramic sherd with possible k'in glyph collected from Lot CC-16-N-02.

INTERPRETATIONS OF NORMAN'S TEMPLE COMPLEX

The final architectural form of the structures surrounding Norman's Temple courtyard were

Figure 2.17. Photo of Structure C-3's platform face, view to the southeast.

constructed during the Late Classic period with use into the Terminal Classic period. The final architectural form of Structure C-1 was partially uncovered; the bottom four courses of the east facing stairs were exposed. A room on the southwest corner of Structure C-2 was partially exposed and contained a large bench that likely encompassed most of the usable interior floor space. The north and west wall of the room had portions of preserved graffiti, although it is difficult to determine what is depicted in the graffiti. The northwest corner of the room and portions of the graffiti were severely burned, which indicate that the graffiti was made before the walls of the room were burned. Excavations through the bench encountered a burial of a young male individual interred with a small Cameron Incised bowl with three feet and an incised design on it its interior base along with modified shell and obsidian. Aside from the burned northwest corner of the room and the graffiti, no evidence of violence or intentional defacement of architecture was documented on Structure C-2.

On the northeast corner of Structure C-3, excavations documented an above floor Terminal Classic artifact deposit, similar to those found in the 1990s. Excavations at Norman's Temple in the 1990s documented broken scatters of artifact deposits at the base of Structure C-1 and on the steps to Structure C-2. The deposits consisted of broken figurine fragments, imitation Fine Orange pottery, and partially reconstructable vessels that date to the Terminal Classic period. At the Western Plaza group a similar artifact deposit was found at the base of Structure C-6 (Harrison 2000). The deposits dated to at or near the time of abandonment, and Houk (2016) argues the deposits represent abandonment related acts.

Table 2.3. Lots CC-16-P-03 and CC-16-X-03 Artifacts and Corresponding Catalog/Spec. #s

Lot CC-16-	Artifact	Catalog/Spec. #	Count	Description
P-03	Ceramic sherds	CC2393	1,380	Subin Red, Tinaja Red, Striated, Cayo Unslipped, Achote Black, some mend holes
	Ceramic Vessel	CC2393	1	Partially reconstructable vessel
	Debitage	CC2393-01, -02	12	Primary, secondary, and tertiary flakes
	Lithic tool	CC2392-01	1	Core
	Obsidian	CC2394-01–04	4	Blade
	Ground Stone	CC2396-01, -02	2	Square mano; metate fragment
	Faunal	CC2397-01–11	11	Unanalyzed
	Shell	CC2513-01–04	4	Shell pendant, modified shell
	Ceramic whistle top	CC2523-01	1	Whistle top/whistle fragment
X-03	Ceramic sherds	CC2426	1,300	Cayo Unslipped, Tinaja Red, Subin Red, Striated, Meditation Black, Achote Black
	Debitage	CC2531-01–30	30	Primary, secondary, and tertiary flakes
	Lithic Tools	CC2463-01–05	5	Hammerstone, two bifaces, a uniface, and a core
	Obsidian	CC2515-01	1	Blade
	Faunal	CC2516-01, -02	2	Unanalyzed
	Ground Stone	CC2523-01, -02	2	Rectangular mano; basin metate
	Shell	CC2514-01	1	Unworked shell
	Ceramic Pendant	CC2524-01	1	
	Celt	CC2545-01	1	Polished stone

The above floor artifact deposit located at the base of the northeast corner of Structure C-3 is similar in composition to the deposits found at Structures C-1 and C-2, however the density of the deposits differ. Similar to the previous deposits, the above floor artifact deposit dates to the Terminal Classic period and was likely created near the time of abandonment of the site.

These types Terminal Classic surface deposits are not unique to Chan Chich, but are found at other sites in northwestern Belize. At the site of Dos Hombres, excavators discovered a Terminal Classic period artifact deposit in Courtyard C-7 at the entrance to the site's acropolis (Houk 2016). The deposit consisted of a layer of artifacts 50 cm thick and contained some of the most exotic artifacts excavated at the site (Houk 2016). At La Milpa, a Terminal Classic period artifact deposit was found against the inside and outside of a low masonry wall to Structure 104. The deposit contained over 28,000 sherds, animal bones, obsidian, and over two dozen whistle or figurine fragments (Houk 2016). The deposits from Chan Chich, Dos Hombres, and La Milpa differ in location and density, but have a similar composition and date to the Terminal Classic period. These above floor surface deposits were likely created at or around the time of abandonment for the sites and reflect some of the final activities that occurred at these sites (Houk 2016).

Figure 2.18. Artifacts collected from the above floor deposit. A: celt (Spec. # CC2545-01); B: ceramic pendant (Spec. # CC2524-01); C: ceramic whistle fragment (Spec. # CC2523-01); D: distal end of spatulate ornament or tool with polish from use (Spec. # CC2513-02); E. miscellaneous shell (Spec. # CC2513-03); F: cut Olividae shell fragment (Spec. # CC2513-04); G: shell pendant (Spec. # CC2513-01).

CONCLUSIONS

The research design for Norman's Temple complex was to look for evidence of violence related to the Terminal Classic abandonment of the site, determine if the elite occupied the complex as a defensive strategy, and locate additional above floor Terminal Classic artifact deposits. Excavations of the platform surrounding Norman's Temple complex did not find any evidence to suggest the site was abandoned due to violence. Excavations did not find any evidence of violence or intentional defacement of architecture, other than the graffiti documented in Structure C-2, to suggest the group was occupied as a defensive position for the elite of the site. Excavators documented an above floor artifact deposit at the northwest corner of Structure C-3. The deposit was similar to the previous deposits in terms of artifacts collected and age (see Houk 2016). It is likely related to the abandonment of the site.

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Bioarchaeological Analysis of Human Skeletons from Chan Chich, Belize: The 2016 Field Season

Anna Novotny, Ashley Booher, and Valorie V. Aquino

This report details the complete osteological analysis of human remains recovered from the ancient Maya site of Chan Chich in 2013 and 2016. Each burial is listed below according to burial number and provenience (Operation, Suboperation, and Lot). Each burial is described beginning with the archaeological context from which the remains were recovered. Details of grave location, time period in which the interment occurred, position and orientation of the skeleton, and any grave goods are recounted in this section. 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.

The lead author conducted the skeletal analysis in the Chan Chich Archaeological Project's field laboratory during the 2016 field season. 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-B10, LOT CC-10-A-8 (ONE INDIVIDUAL)

Archaeological Context

Kelley and colleagues (2013) first discovered Burial CC-B10 in the Upper Plaza at Chan Chich during the 2013 field season (Figure 3.1). The Upper Plaza is a private, elite space that overlooks the Main Plaza and contains some of the earliest occupation at the site. Excavations in the Upper Plaza were focused within the plaza itself with the expressed goal of better defining the construction sequences of the plaza and how the space changed over time (Kelley et al. 2013). Excavators also aimed to associate plaza floors with surrounding architecture and to tie in their work with previous excavations of the plaza (see Robichaux 2000). Burial CC-B10 was initially encountered beneath plaster floor 5 in Subop CC-10-A, located roughly in the center of the Upper Plaza, at the end of the 2012 field season and was reburied due to time constraints (Kelley et al. 2013). The 2013 excavations, designated Subop CC-10-G, uncovered two large stones were found protruding through plaster floor 5. It was to the

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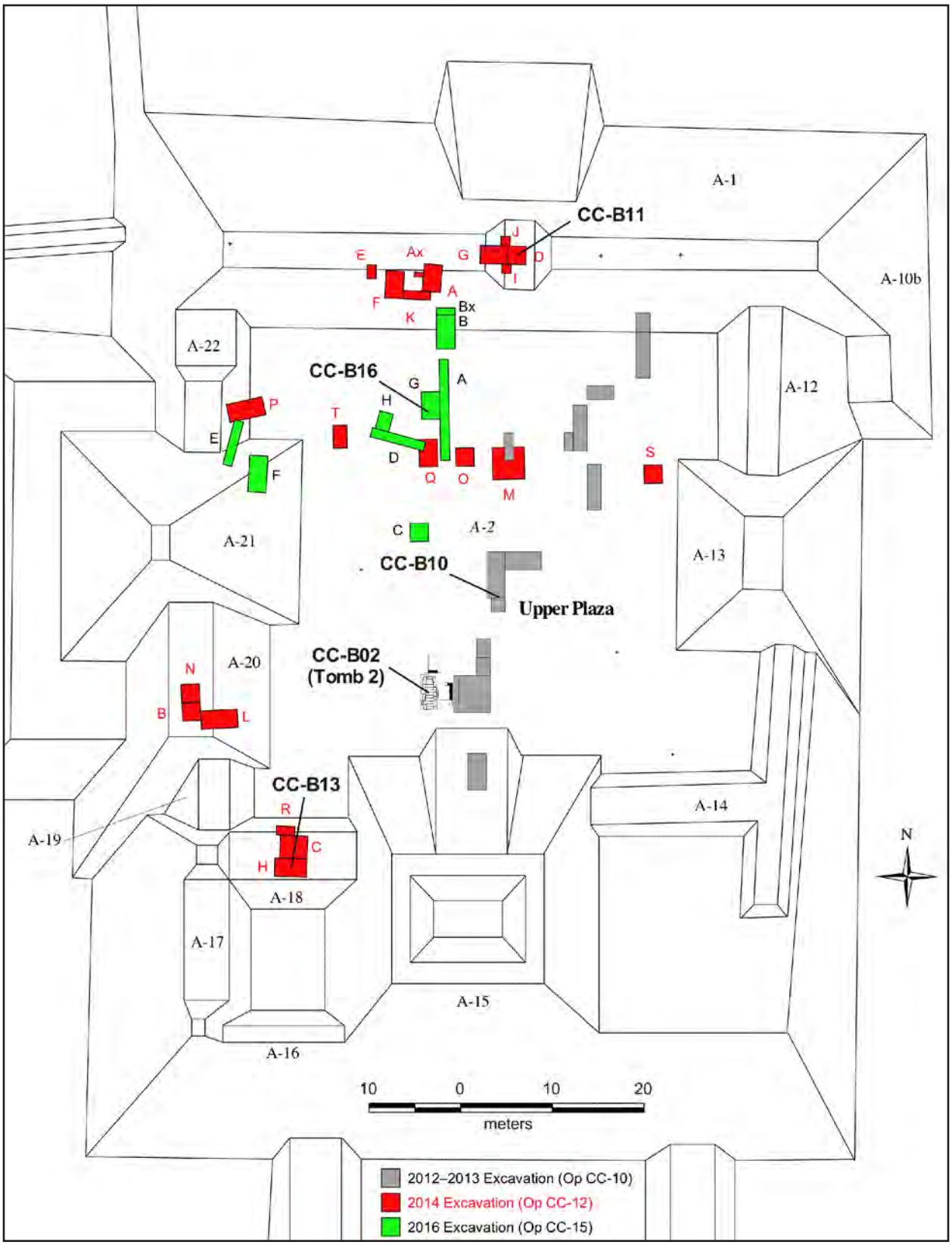

Figure 3.1. Map of the Upper Plaza showing the locations of Burials CC-B02, CC-B10, CC-B11, CC-B13, and CC-B16. For discussion of Burials CC-B11 and CC-B13 see Novotny et al. (2015).

south of these stones that the human remains were found (Kelley et al. 2013). The grave type is likely a simple pit, or possibly a simple cist if the stones were part of the grave architecture (Figure 3.2). The individual was interred with a piece of mica, ceramic sherds, lithic flakes, a mussel shell, and a spire-lopped jute. The excavators observed that the bone was extremely fragmented and brittle, although several of the teeth were well preserved. Domestic dog teeth were also recovered. The interment dates to the early Late Preclassic period.

Osteological Analysis

As noted in 2013, the skeletal material was extremely poorly preserved, and most of the elements were not identifiable. Identifiable elements included fragments of the thorax (ribs, vertebrae, and clavicle), a radius or ulna, and several hand phalanges. The dentition was moderately well preserved (see below). Three faunal bones were also identified in the lab, although the type of animal to which they belonged was unknown. It is possible they were associated with the dog teeth.

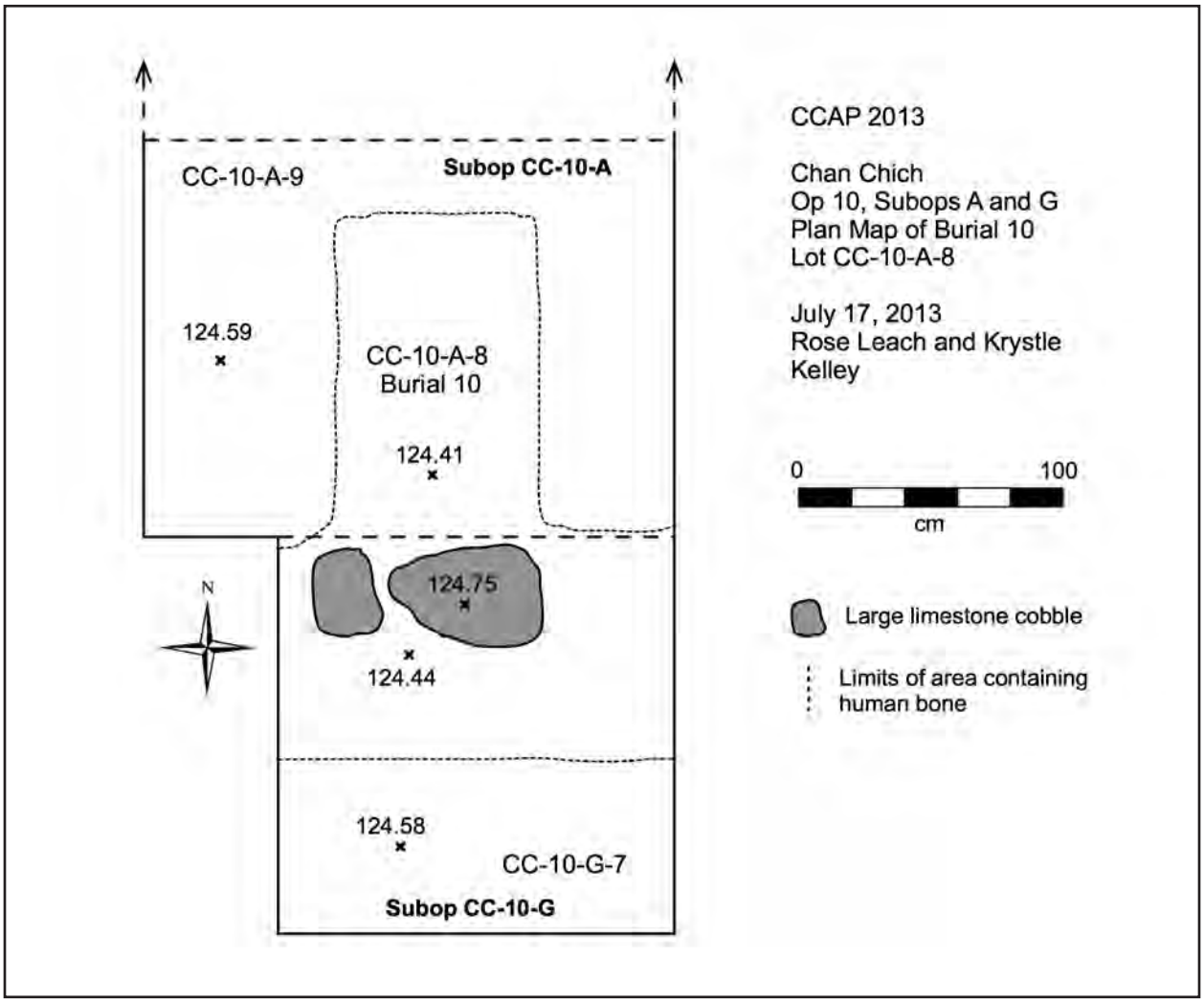

Figure 3.2. Plan map of Burial CC-B10 excavations (after Kelley et al. 2013:Figure 2.2).

Age and Sex

The skeletal remains were too poorly preserved to estimate age at death or sex. The development of the dentition indicates that the individual was an adult when they died. The teeth showed very minor attrition suggesting a young age at death.

Dentition

The enamel of the dentition was not well preserved and several of the teeth were broken at the root. However, eight teeth were present for analysis, and metric and non-metric data were collected (Table 3.1). The LI^2 was extremely shovel shaped, nearly barrel-shaped. The mandibular teeth recovered, with the exception of the molar, all had minor to moderate calculus on their lingual aspects.

Pathology and Trauma

No evidence of pathology or trauma was observable due to poor preservation.

Conclusion

The preservation of the bones was so poor that not much information could be collected. The interment consisted of a single, adult individual who was likely of a young age at death. The individual was placed in a simple pit or cist with several simple grave inclusions. The presence of 19 dog teeth that are not worked or drilled for suspension suggest that an animal was placed in the grave with the human individual. This burial, although little can be concluded from it, is nevertheless important because it is the oldest burial yet excavated at Chan Chich.

BURIAL CC-B15, LOTS CC-16-L-02 (ONE INDIVIDUAL)

Archaeological Context

Booher (this volume) encountered Burial CC-B15 at Norman's Temple complex in Structure C-2, a 5-m tall range building on the northern side of the courtyard (Figure 3.3). Burial CC-B15 was found within a large, interior bench. Three large cut stones marked the grave space within the bench fill, and two cut-stone blocks served as capstones. A single individual had been placed in a tightly flexed position on its right side with head orientated to the east (Figure 3.4). Several grave goods were recovered including a broken but complete ceramic vessel, a modified shell, a shell labret, and two obsidian fragments (Booher, this volume).

Osteological Analysis

The skeletal material was moderately well preserved. Approximately 75 percent of the skeleton was present for the analysis (Table 3.2). The skull was the least well preserved part of the skeleton, unfortunately, but the other diagnostic elements, such as both os coxae were preserved. The surfaces of the bones was only minorly eroded and showed root damage. The long bones were particularly well preserved, however most of the epiphyses were not so no measurements could be taken. All of the teeth were recovered and were well preserved, several were still in alveolar bone.

Table 3.1. Burial CC-B10 Dental Inventory

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					
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

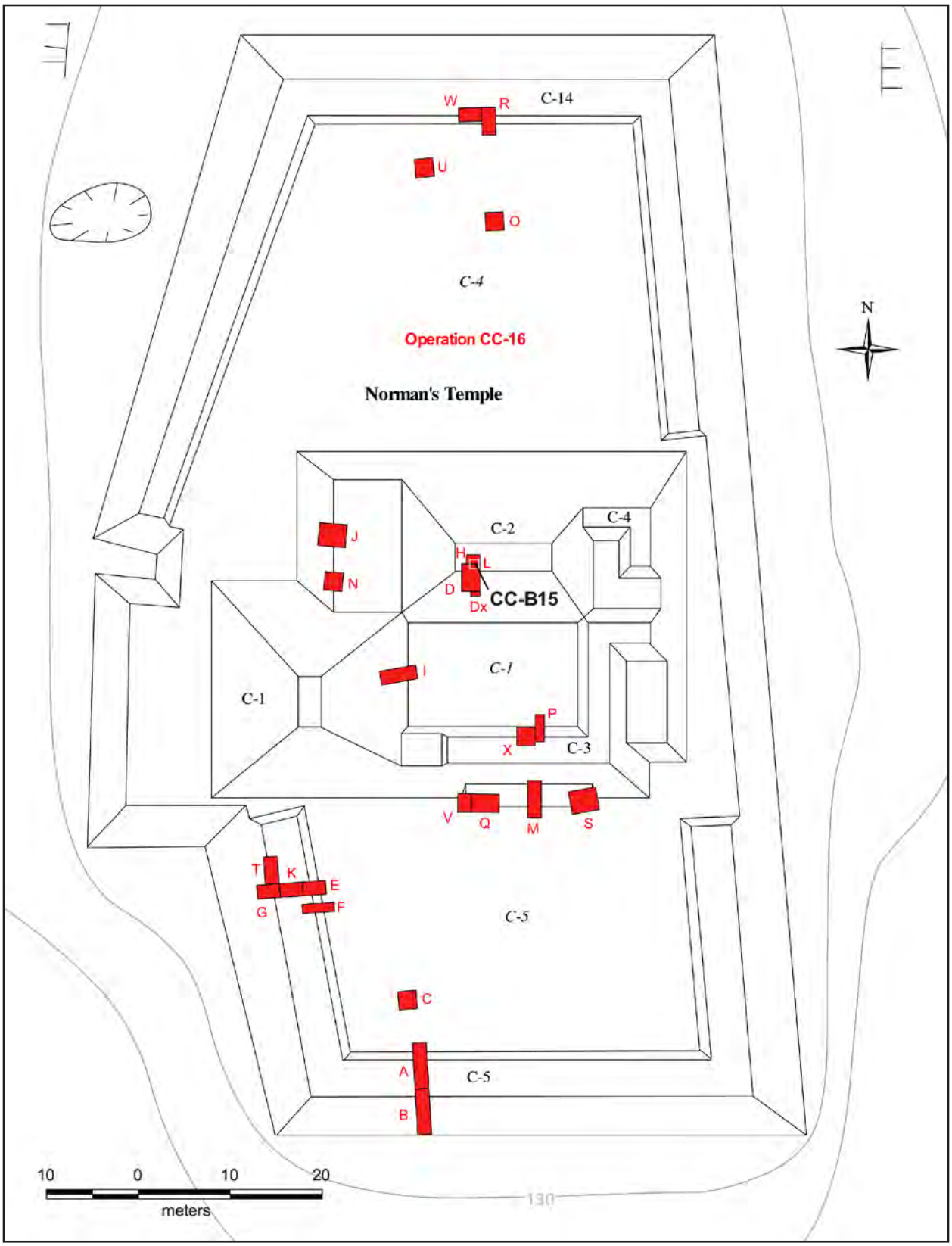

Figure 3.3. Map of Norman's Temple complex showing the location of Burial CC-B15.

Figure 3.4. Photograph of Burial CC-B15.

Table 3.2. Skeletal Inventory, Burial CC-B15

Element	Side	Completeness
Frontal	Left/Right	<25%
Parietal	Left/Right	<25%
Occipital	Left/Right	<25%
Temporal	Right	<25%
Sphenoid	Left/Right	
Zygomatic	Left	<25%
Maxilla	Left/Right	<25%
Palatine	Left/Right	
Mandible	Left	25%
	Right	<25%
Clavicle	Left	75%
	Right	50%
Scapula	Left	75%
	Right	50%
Patella	Left	100%
	Right	100%
Sacrum	-	<25%

Table 3.2. Continued

Element	Side	Completeness
Ilium	Left	75%
	Right	50%
Ischium	Left	100%
	Right	50%
Pubis	Left/Right	Unid
Acetabulum	Left	100%
	Right	100%
Auricular surface	Unid	25%
C1	-	75%
C2	-	100%
C7	-	Unid
T10	-	Unid
T11	-	Unid
T12	-	Unid
L1	-	Unid
L2	-	Unid
L3	-	Unid

Table 3.2. Continued

Element	Side	Completeness
L4	-	Unid
L5	-	Unid
C3-6	-	~50%
T1-T9	-	~50%
Manubrium	-	Unid
Sternal body	-	Unid
Rib 1		Unid
Rib 2		Unid
Rib 11		Unid
Rib 12		Unid
Rib 3-10		25%-50%
Humerus	Left	75%
	Right	100%
Radius	Left	100%
	Right	50%-75%
Ulna	Left	50%
	Right	75%
Femur	Left	<25%
	Right	75%
Tibia	Left	25%-50%
	Right	25%-50%
Fibula	Left	50%-75%
	Right	75%
Talus	Left	<25%
	Right	
Calcaneus	Left	25%
	Right	50%
Hands		
Carpals		3
Metacarpals		5
Hand phalanges		11
Feet		
Tarsals		3
Metatarsals		9
Pedal phalanges		13

Age and Sex

Preservation of key diagnostic elements allowed estimation of age at death and sex. Age at death was estimated using the auricular surface of the right ilium, skeletal and dental development, and dental attrition. The auricular surface was damaged on the inferior demiface and part of the superior demiface, but portions of it were still visible. The surface did not show many age related changes. In addition, the retroauricular surface and the apical area showed no activity.

Skeletal and dental development also indicate a young age at death. The epiphyseal line was visible on the iliac crest of the right ilium. The iliac crest fuses completely in males by 23 years. Epiphyseal lines also remained visible on several of vertebral rib ends. The third molars were fully formed, although dental wear was minor. Based on these indicators age at death is estimated to have been 20–24 years.

Diagnostic elements of the skull and pelvis were observable to estimate sex. While the skeleton appears to be gracile, generally speaking, the robusticity of secondary sex characteristics of the skull suggest that the individual was a male.

Dentition

The complete set of dentition was present from Burial CC-B15 (Table 3.3). All teeth were fully formed and none of them showed cultural modification. However, the enamel of many of the teeth was discolored. The discoloration was most pronounced on the mandibular teeth and appeared less severe on the maxillary anterior teeth, particularly from the left side. The discoloration was an orange-ish pink color, and extent of involvement included nearly the entire crown for all teeth (Figure 3.5). The teeth are also slightly translucent where the discoloration occurs. The cause of the discoloration is unknown at this time. The teeth do not show any pathologies.

Table 3.3. Burial CC-B15 Dental Inventory

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	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

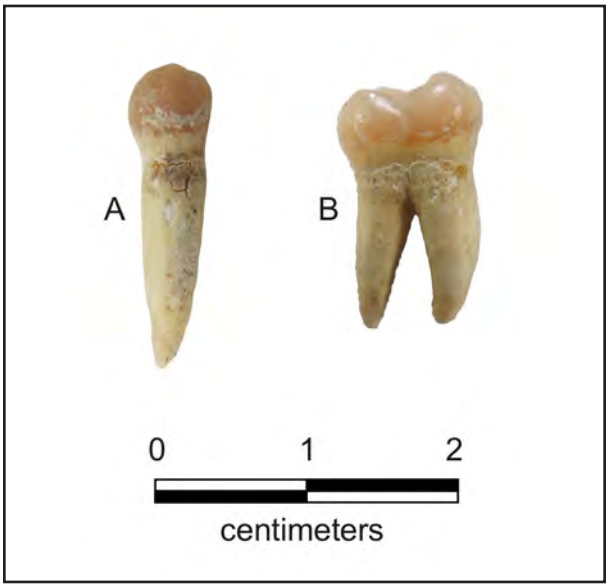

Figure 3.5. Burial CC-B15 dentition showing discoloration. A) RC_1; B) RM_1.

Pathology and Trauma

With the exception of the discoloration of the dentition, no pathologies or trauma were observed on the skeletal remains.

Conclusion

Burial CC-B15 consisted of the 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. A complete ceramic vessel was placed with the individual in the grave, in addition to small shell ornaments. The ceramic vessel suggests that the interment dates to the Late Classic period.

BURIAL CC-B16, LOT CC-15-G-11 (TWO INDIVIDUALS)

Burial CC-B16A

Archaeological Context

Burial CC-B16A was found during the course of 2016 excavations of the Upper Plaza at Chan Chich (see Figure 3.1). These excavations are part of the Chan Chich Dynastic Architecture Project (CCDAP), a three-year endeavor to track the evolution of kingship and architectural elaboration (Aquino and Houk 2015). The goal of CCDAP is to build an accurate and precise chronological sequence of architectural construction for the Upper Plaza and to link those data to broader sociopolitical changes (Aquino and Houk 2015). Previous excavations revealed a Middle Preclassic midden and a Terminal Preclassic tomb within the plaza (Robichaux 2000). Krystle Kelley's (2014; Kelley et al. 2012, 2013) thesis work further explored the stratigraphic sequence of the Upper Plaza, although there were discrepancies in the stratigraphy, which were then explored during the 2014 field season (Herndon et al. 2014). These excavations revealed the southern edge of a large, buried platform. Excavations in 2015 aimed to further explore this platform, to carry out further stratigraphic excavations to sample the floors for radiocarbon dating, and to refine the construction chronology of the buildings surrounding the Upper Plaza (Aquino and Houk 2015).

Burial CC-B16A was found within a simple cist in Subop CC-15-G. The bones were beneath two large limestone blocks and had been set within plaza floor fill of medium-sized limestone cobbles. Bones of the lower leg and

feet were exposed first and appeared articulated. As excavations followed the articulated leg, it was soon apparent that the grave consisted only of the articulated left leg, remains of the left and right feet, and an articulated right hand, which was approximately 50 cm to the east of the other elements (Figures 3.6 and 3.7). Size and development suggest that these bones all belonged to the same individual. The leg was in correct anatomical position and had become slightly disarticulated due to the uneven surface of stones on which it rested. The hand was on a flatter surface, possibly a plaster floor, and was also in correct anatomical position. The hand was also slightly disarticulated due to its placement around a small stone. It seems as though the body parts were fleshed when they were deposited and decomposed *in situ*.

Osteological Analysis

Table 3.4 lists the skeletal elements recovered from Burial CC-B16A. As is noted above, the excavations only discovered leg, feet, and hand bones.

Age and Sex

Age at death was estimated to have been adult based on skeletal development. Sex was indeterminate due to lack of diagnostic skeletal elements.

Dentition

No teeth were recovered from this burial.

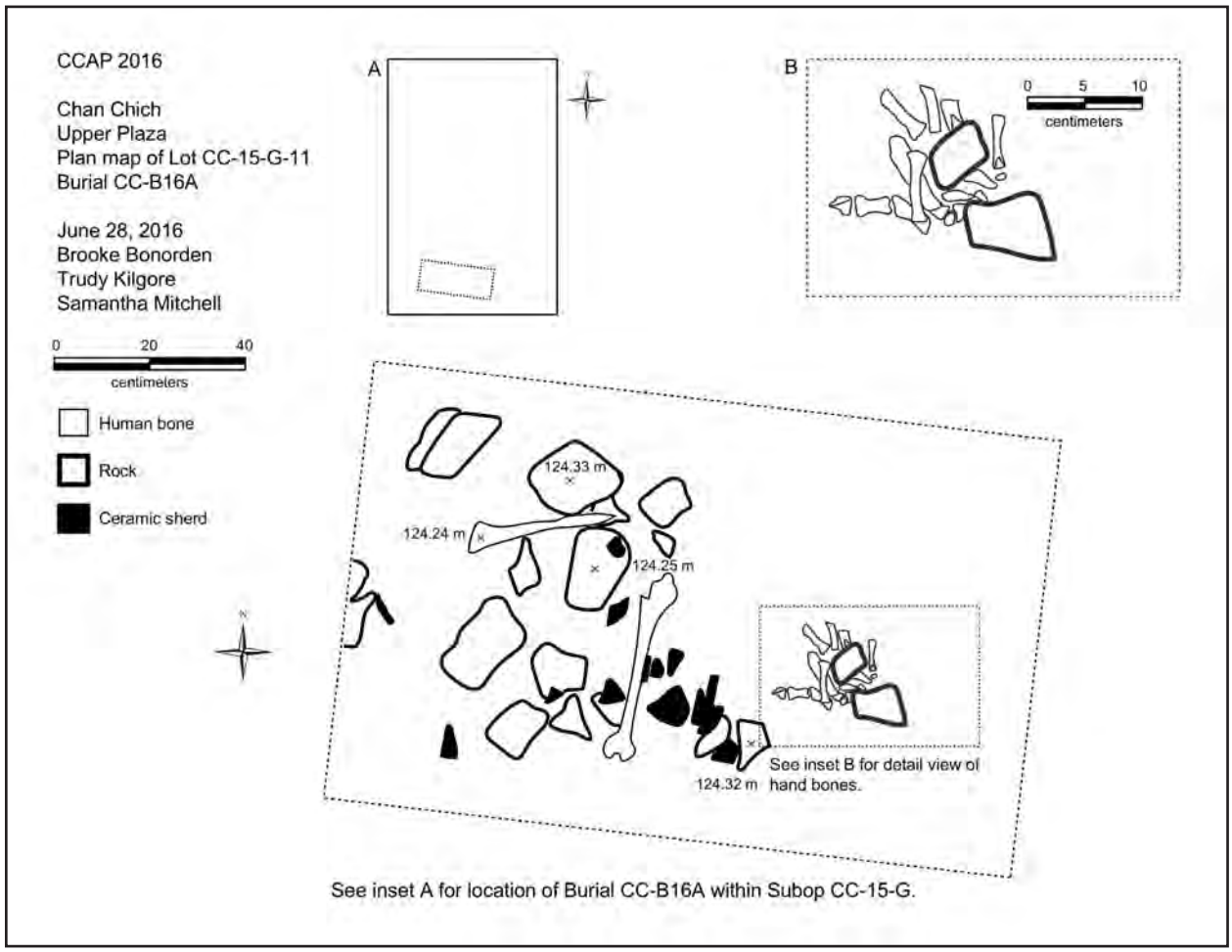

Figure 3.6. Plan drawing of CC-B16A, with inset of articulated hand (B).

Figure 3.6. Photograph of CC-B16A.

Pathology and Trauma

No pathology was observed on any of the skeletal elements. Preliminary analysis did not find any cutmarks on the isolated bones.

Conclusion

The remains considered part of CC-B16A consist of an articulated right leg, articulated right hand, and articulated left foot placed with plaza fill. No formal grave space or grave inclusions were identified. The feet and leg bones were articulated suggesting they were from the same individual. The right hand, although articulated, was isolated from the other remains. No skeletal elements of the right arm were recovered. It is likely that the hand is from the same individual as the leg and foot but with the current data it is impossible to tell. The degree of articulation of all elements suggests that they were fleshed when deposited and not disturbed during or after decomposition. Preliminary analysis did not reveal any cutmarks.

Table 3.4. Skeletal Inventory, Burial CC-16A

Element	Side	Completeness
Frontal	Left/Right	0%
Parietal	Left/Right	0%
Occipital	Left/Right	0%
Temporal	Right	0%
Sphenoid	Left/Right	0%
Zygomatic	Left	0%
Maxilla	Left/Right	0%
Palatine	Left/Right	0%
Mandible	Left	0%
	Right	0%
Clavicle	Left	0%
	Right	0%
Scapula	Left	0%
	Right	0%
Patella	Left	0%
	Right	0%
Sacrum	-	0%
Ilium	Left	0%
	Right	0%

Table 3.4. Continued

Ischium	Left	0%
	Right	0%
Pubis	Left/Right	0%
Acetabulum	Left	0%
	Right	0%
Auricular surface	Unid	0%
C1	-	0%
C2	-	0%
C7	-	0%
T10	-	0%
T11	-	0%
T12	-	0%
L1	-	0%
L2	-	0%
L3	-	0%
L4	-	0%
L5	-	0%
C3-6	-	0%
T1-T9	-	0%
Manubrium	-	0%
Sternal body	-	0%
Rib 1		0%
Rib 2		0%
Rib 11		0%
Rib 12		0%
Rib 3-10		0%
Humerus	Left	0%
	Right	0%
Radius	Left	0%
	Right	0%
Ulna	Left	0%
	Right	0%
Femur	Left	0%
	Right	75%
Tibia	Left	0%
	Right	75%
Fibula	Left	0%
	Right	75%
Talus	Left	0%
	Right	

Table 3.4. Continued

Calcaneus	Left	0%
	Right	0%
Hands		
Carpals		8
Metacarpals	Right	4
Hand phalanges		10
Feet		
Tarsals	Left	4
	Right	1
Metatarsals	Left	3
	Right	1
Pedal phalanges		2

Discovery of isolated human remains is not uncommon in the ancient Maya lowlands (Welsh 1988; Tiesler 2008; Berryman 2007). There are three behaviors that could have produced the disarticulated remains—human sacrifice, trophy taking, or ancestor veneration. All three practices involve the curation and manipulation of human skeletal remains, typically parts of the skull. Thus, they appear very similar in the archaeological record—headless bodies, isolated heads or other appendages, secondary burials, etc. (Tiesler 2008; Weiss-Krejci 2003). When the architectural context is taken into consideration, the remains from the Upper Plaza at Chan Chich are likely the result of human sacrifice and, possibly, the related activity of taking trophies from the sacrificial victim.

Drawing on ethnohistoric, iconographic, and archaeological data from throughout the Maya region, Berryman (2007:394) compiled a series of criteria for interpreting complex deposits of isolated human remains. She proposed that victims of sacrifice will be buried in highly visible public space with little to no grave preparation and no mortuary offerings. The remains are likely to have

evidence of dismemberment or decapitation, most convincingly indicated by the presence of cutmarks on the bones, and may be of a particular sex or age range (i.e., all young adult males). The deposit at Chan Chich meets most of these criteria—the grave space appears informal and is in a public location, there are no associated grave goods, and the remains are not articulated. Preliminary analysis did not show any evidence of cutmarks on the isolated hand.

Accounts of human sacrifice, and the fate of sacrificed bodies, come from 16th century Yucatan (Tozzer 1941). Following sacrifice, the mandible of the victim was kept as a trophy to be worn by the victor and the hands, feet, and skull would be given to priests (Berryman 2007:380). The rest of the body would be interred in a temple courtyard. It seems likely that the hand and leg are remnants of a sacrificial victim.

Isolated, articulated hands are not commonly recovered in the Maya lowlands. Preliminary research revealed one infant burial at the La Ventilla B apartment compound at Teotihuacan that contained two, articulated adult hands (Sempowski and Spence 1994). However, numerous caches of hand phalanges have been found at sites in southern Belize, particularly at Caracol (D. Chase and A. Chase 1996, 1998), and at sites in the Belize River Valley (Audet 2006; Cheetham 2004). Many of these phalanges have cutmarks, although not all do, and are generally considered trophies taken from skeletonized or decomposing bodies.

The enigmatic unit will continue to be excavated in 2017, which should reveal more information to explain the isolated, but articulated, body parts and their relationship to the articulated individual located only centimeters away, Burial CC-B16B. Additional contextual information should assist with our interpretation.

Burial CC-B16B

Burial CC-B16B was discovered in the south profile of Subop CC-15-G in the Upper Plaza during excavation of Burial CC-B16A. The remains were identified in the field as an articulated right arm (humerus, radius, ulna, and hand phalanges). The arm was only partially exposed before being backfilled *in situ* due to lack of time. The burial will be completely excavated in 2017.

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Results of the 2016 Excavations at Kaxil Uinic Village

Brooke Bonorden and Gertrude Kilgore

Excavations conducted by the Belize Estates Archaeological Survey Team (BEAST) as part of the 2016 season of the Chan Chich Archaeological Project (CCAP) concluded investigations of Kaxil Uinic (Figure 4.1), a San Pedro Maya village in northwestern Belize occupied during the Late Colonial period (ca. 1800–1900) and into the twentieth century. For the duration of this two-year project (see Bonorden 2016; Bonorden and Kilgore 2015), the senior author served as the operation director and the junior author as the suboperation (subop) director, supervising a crew of approximately six students and local workers each season. Fieldwork at the site took place over a period of 23 days between May

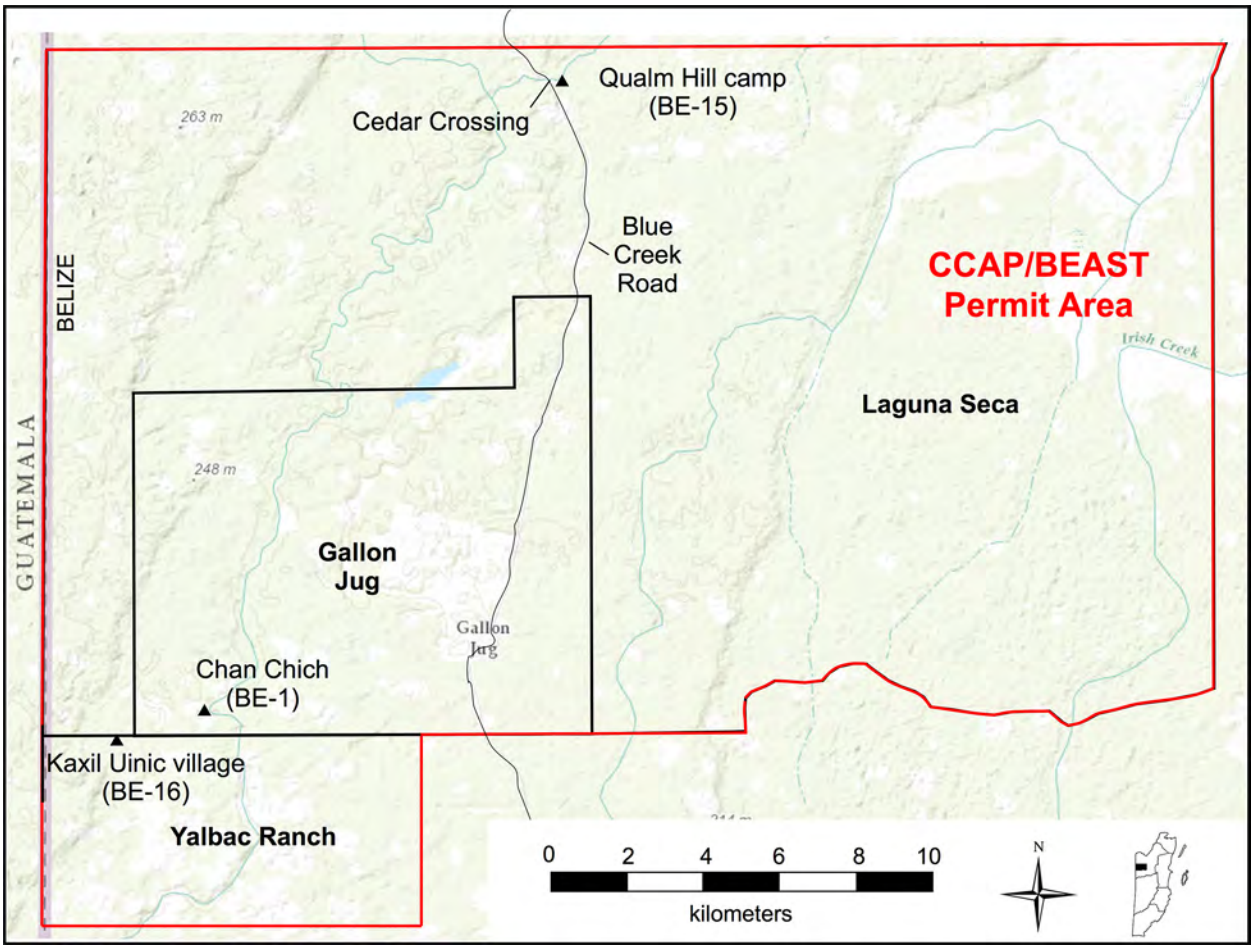

Figure 4.1. Map of the CCAP/BEAST permit area, indicating the location of Kaxil Uinic village.

Bonorden, Brooke, and Gertrude Kilgore
2016 Results of the 2016 Excavations at Kaxil Uinic Village. In *The 2016 Season of the Chan Chich Archaeological Project*, edited by Brett A. Houk, pp. 81–134. Papers of the Chan Chich Archaeological Project, Number 11. Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

21, 2016, and June 22, 2016, and the authors analyzed artifacts collected during that time from June 9, 2016, to July 5, 2016.

Located approximately 2 km from the western border between Belize and Guatemala (Houk 2012:32), Kaxil Uinic village was settled sometime after 1868 by a group of San Pedro Maya seeking refuge from the 1847–1901 Caste War in the Yucatán (Jones 1977:157). In 1931, the Belize Estate and Produce Company (BEC) forcibly relocated the village residents to San José Yalbac (Figure 4.2) over rumors that illegal *chicle* harvesting had taken place in the settlement (Houk 2012:35; Thompson 1963:6, 228). Bonorden (2016) and Bonorden and Kilgore (2015) present a more detailed description of the village based on archival documentation.

Historical sociologist Nigel Bolland (2003:112) characterizes the Maya-British relations in Belize as evolving through four phases of interaction: resistance by the Maya to the British logging enterprise (1788–1817), a period of diminished contact (1817–1847), a

Figure 4.2. San Pedro Maya villages and settlement clusters, including Kaxil Uinic village and San José Yalbac. Courtesy of Jason Yaeger.

phase of "periodic and violent military activity throughout the western and northern parts of the colony" (1847–1872), and "the consolidation of British jurisdiction over the Maya within Belize and the incorporation of these Maya into the colonial social structure" (1872–1900). The occupation of Kaxil Uinic spans Bolland's fourth phase of interactions. The goal of the 2016 investigations at the site therefore broadly focused on understanding the different ways the San Pedro Maya were involved in, subjected to, and/or resisted the colonial economic and social superstructure of the British colonial enterprise, as well as how these negotiations are reflected archaeologically.

PREVIOUS INVESTIGATIONS

Following its abandonment in 1931, Kaxil Uinic village was periodically re-occupied by small groups of *chicleros* and looters, but it was not rediscovered until the 1980s by Chan Chich Lodge staff when the resort opened. The staff maintained a trail formed by an old logging road to "Xaxe Venic" until the late 1990s (Figure 4.3), which passed by the prehistoric ruins of the same name (Houk 2012:36). The trail to Kaxil Uinic from Chan Chich Lodge became overgrown after it fell into disuse, but the path was recut in 2012 as CCAP crew members began excavations at the prehistoric ruins of Kaxil Uinic (Harris 2013:74). Upon successfully relocating the village, CCAP crew members recorded several historic artifact scatters associated with the site (Houk 2012:36).

In 2014, Sandrock and Willis (2014:127) assigned the site its own Belize Estate (BE) number (BE-16) based on the results of data collected by the CCAP in 2012. No formal excavations occurred at Kaxil Uinic village,

Figure 4.3. Location of Kaxil Uinic village in relation to Kaxil Uinic ruins and Chan Chich.

however, prior to the 2015 season of the CCAP and BEAST.

BEAST returned to Kaxil Uinic in 2015 to conduct a more intensive survey of the site and initial text excavations. Because archaeologist Sir J. Eric S. Thompson (1963:233) described Kaxil Uinic as a score of huts surrounding an *aguada* after his visit to the village in 1931, pedestrian survey of the site during the 2015 field season consequently focused on the area immediately surrounding the *aguada* to identify surface deposits. Surface finds representing dense artifact concentrations (such as middens) and architectural features (such as three-stone hearths or artificial mounds) were chosen as candidates for more extensive test units.

In just over two weeks of fieldwork, BEAST identified and sampled 36 surface scatters of historic artifacts at Kaxil Uinic and completed nine excavation units ranging in size from 1 x 2 m to 2 x 6 m. Artifacts visible on the ground surface and found in excavation units at the site included numerous glass bottles, small cosmetic jars, medicine bottles, metal cooking utensils, *chiclero* equipment (machetes, spurs, pots, etc.), imported metal corn grinders, a lantern, parts of a cart wheel, and more modern items (batteries, shoes, plastic bottles, etc.) likely associated with individuals who camped at the village site in the 1980s to loot nearby ancient Maya ruins. The surface inspection of the site also revealed seven three-stone rock clusters characteristic of hearths typically present in the center of historic Maya households (Bonorden 2016).

At the conclusion of the 2015 field season, it became apparent that no more than 25 percent of the site was thoroughly surveyed, and an even smaller percentage of the site was excavated. Therefore, the CCAP proposed that a second season of investigations occur at Kaxil Uinic village.

PROPOSED RESEARCH DESIGN AND METHODOLOGY

Very few Late Colonial period sites have been formally excavated in Belize, where archaeological investigations and research on historic sites is largely overshadowed by the abundance and allure of more "prominent" *ancient* Maya ruins found throughout the country. Additionally, a very limited amount of archival research covering the Caste War period has been done (Dornan 2004:1), making it one of the most understudied phases of Belizean history from an archaeological and historical standpoint. Despite such circumstances, the period represents an important and fascinating case study in cultural contact and the transformations of postcolonial identity.

As previously mentioned, Bolland (2003:112) divides British-Maya colonial relations in Belize into four phases, with the final period (1872-1900) described as the consolidation of British jurisdiction "over the Maya within Belize and the incorporation of these Maya into the colonial social structure." Virtually all knowledge of these phases of cultural contact comes from British colonial accounts, and such interpretations of events, actions, and motives undoubtedly reflect a politically and socially biased perspective of circumstances. The general goal of the 2016 investigations at Kaxil Uinic village, therefore, was to better interpret the nature of the social, political, and economic interactions that occurred at Kaxil Uinic based on more nuanced archaeological and archival interpretations. The overarching research questions that BEAST aimed to address were:

- How did Maya participation in the colonial economy change during this phase of colonial contact?
- Did the Maya maintain their traditional religion, or did they adopt colonial religious practices?

- Is Bolland's (2003) generalization of cultural contact corroborated or refuted by archaeological data from Kaxil Uinic village?

To address these questions, BEAST firstly proposed to conduct additional archival research on Kaxil Uinic village. In 2015, CCAP crew members combed the Belize Archives (BA) in Belmopan for primary source archival data on Kaxil Uinic with little success locating any relevant documents (Bonorden 2016:92). As a crown colony of England, it was reasoned that most official colonial correspondence regarding British Honduras, and by extension their interactions with the inhabitants of Kaxil Uinic, would be housed among the Public Records Office's archives in Kew, England. Furthermore, Methodist missionaries sent to British Honduras at the turn of the century maintained detailed records of their interactions with the "Indians" they were attempting to convert, and such accounts could potentially provide further insight into the daily lives of the San Pedro Maya that are absent from colonial administrative records. It was therefore deemed necessary to visit the Wesleyan Methodist Missionary Archives at the School of Oriental and African Studies in London, as well. Finally, British Honduras was under the jurisdiction of the Governor of Jamaica from the late 1600s until 1884, raising the possibility that additional archival records related to Kaxil Uinic might be housed at the Jamaica Archives and Records Department in Kingston, too. BEAST planned to send a graduate student researcher to London to visit the first two archives, splitting research time between the two repositories over a period of five days. For safety reasons, the CCAP Principal Investigator and a graduate student researcher would both go to Kingston to conduct archival research there over a period of two days. With additional archival information gleaned from these locales, BEAST anticipated that a more thorough examination of the nature of cultural contact between the San Pedro Maya and British during the Late Colonial period would become evident, and the subaltern colonial experience of the San Pedro Maya might be clarified further.

During preliminary testing of the site conducted in 2015, underbrush clearing was limited to areas opportunistically targeted for excavation due to presence of numerous tree falls and dense secondary growth as a result of the passage of Hurricane Richard through the area in 2010 (Houk 2012). The spatial distribution of artifact scatters and architectural features identified at that time therefore presented a sampling bias (Bonorden 2016:275), with surface scatters appearing in a linear pattern along the eastern and western sides of the *aguada* (Figure 4.4). At the conclusion of the 2015 season, it thus became apparent that crews had likely overlooked additional artifact concentrations and possibly architectural features because of poor ground visibility at the site. As a result, one of the primary goals of the 2016 season was to have workers conduct more thorough hand clearing of vegetation prior to excavations to improve surface visibility at Kaxil Uinic and facilitate the identification of additional artifact scatters at the site. The discovery of additional artifact scatters would enable crew members to better delineate the actual extent of the site. Surface Find (SF) numbers would be assigned to these scatters, and the location of each recorded with a GPS unit to document the perimeter of the village occupation area.

In 2015, 2-x-2-m excavation units centered on three-stone hearths were typically laid out over such features, yet this is far from encompassing the boundaries of a typical historic Maya household, which was approximately 5.4 x 3.7 m in size (Dornan 2004:109). In 2016, BEAST consequently aimed to document additional three-stone hearth clusters, which would allow crew members to open larger exposures

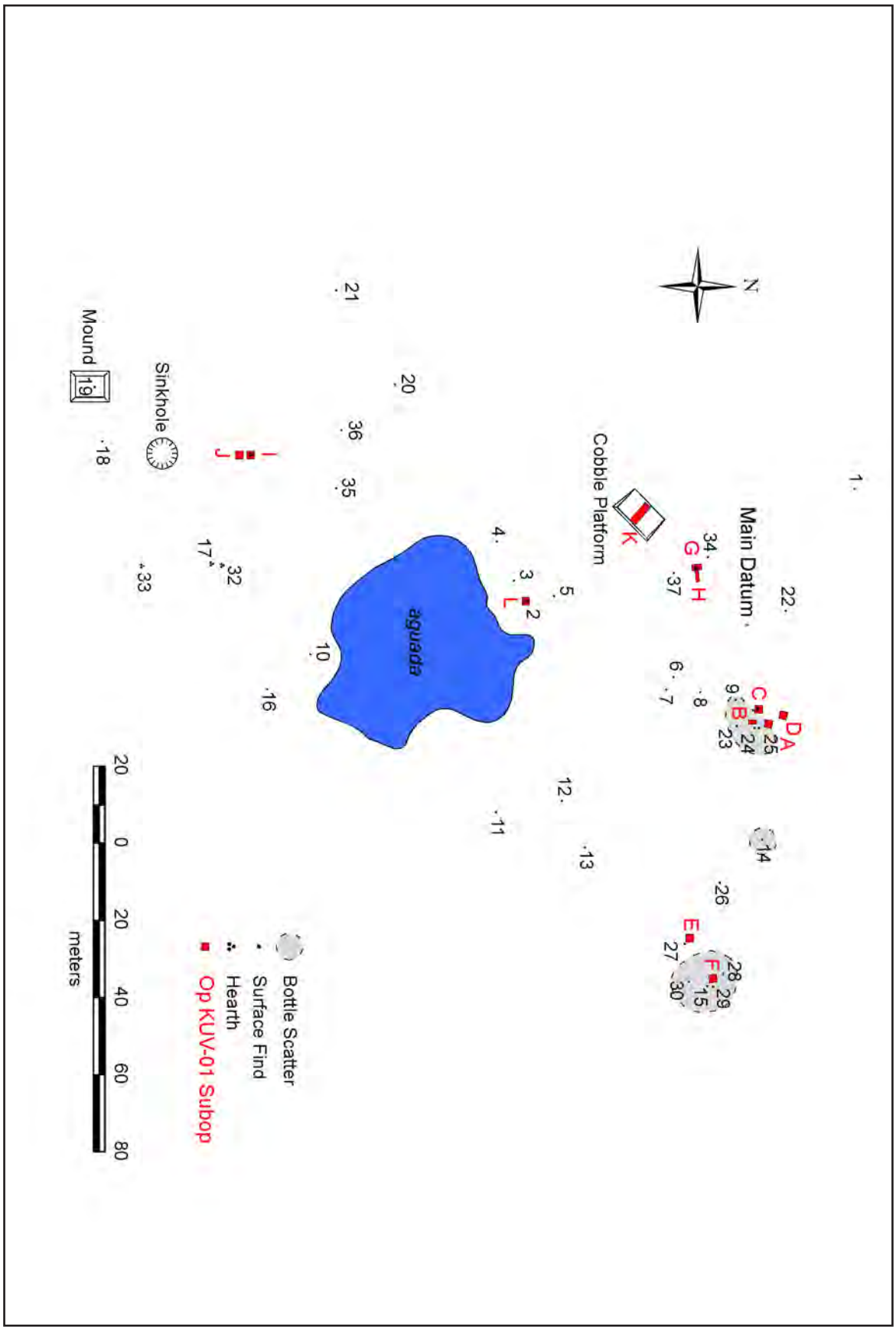

Figure 4.4. Map of surface finds included in Subop KUV-01 during the 2015 field season.

around the features to better sample the interiors of these Maya domestic structures and potentially identify rock alignments similar to those observed by Ng (2007) at the San Pedro Maya village of Holotunich. The number and distribution of hearths present could also indicate the number of households present at the site, and therefore the probable historic village population. BEAST aimed to sample four previously unknown three-stone hearths in 2016. For each one selected for excavation, crews would excavate two intersecting 6-x-1-m units oriented on cardinal directions, forming an "X" over the feature. This approach would create 2.5-x-2.5-m quadrants in each inter-cardinal direction. If one or both of these units were to encounter dense artifact deposits, likely activity areas, or household features, crews would excavate a 2.5-x-2.5-m unit in the appropriate quadrant(s). In all cases, the crews would screen the matrix from these units through ¼-inch mesh and excavate the units to 20 cm below the surface. The 2015 excavations at Kaxil Uinic terminated 10 cm below the ground surface, but Ng (2007:120) notes that historic features were encountered at Holotunich at lower depths. The 2016 excavations at Kaxil Uinic therefore proposed to probe deeper than the 2015 excavations (20 cm below the surface).

During the previous season of investigations at Kaxil Uinic, work centered on the excavation of large surface scatters of historic bottles (middens) and three-stone hearths, further attributing to the sampling bias of data collected from the site. To compensate for this circumstance, BEAST proposed to excavate control units in locations where cultural material was not present on the ground surface. As noted by Ng (2007:117), "in most areas of [Holotunich] some artifacts will be encountered, even if there is no surface artifact scatter or likely topographical characteristics." The operation director reasoned that establishing control units could potentially reveal artifacts crucial to understanding the transformation of postcolonial identity at Kaxil Uinic that might not be recovered otherwise. Crews therefore planned to excavate four 2-x-2-m control units (one in each cardinal direction radiating from the *aguada*) to depths of 20 cm below surface and screen all the excavated matrix through ¼-inch mesh.

The final goal of the 2016 excavations at Kaxil Uinic was to target one or more of the cobble mounds identified at the site in 2015. A trench test unit opened over one such mound (Subop KUV-01-K) revealed a comingling of historic whiteware ceramics with stone tools and faunal bone immediately below the ground surface (Bonorden and Kilgore 2015). At the conclusion of the 2015 field season, however, it was unclear if the mounds were historic constructions or ancient constructions with historic overprinting, as neither Dornan (2004) nor Ng (2007) note the discovery of any features similar to the "mounds" located at Kaxil Uinic at either San Pedro Siris or Holotunich. To further investigate the cobble mounds, crews planned to excavate shallow 3-x-3-m units on the summits of two mounds to look for artifacts left on the surface. Crews would then excavate 1-x-4-m trenches into the mounds to examine their construction methods and determine the ages of the mounds based on the types of artifacts recovered from their fill. For example, the operation director rationalized that metal or glass artifacts would indicate a historic construction date, while their absence may indicate a prehistoric age for the mounds. Again, the matrix from these trenches would be screened through ¼-inch mesh.

SURVEY SUMMARY

In 2015, a survey of Kaxil Uinic was conducted by staff members from Chan Chich Lodge who systematically walked the perimeter of the

aguada in a series of concentric circles radiating outward. Staff members used flagging tape to mark cultural material present on the ground surface. Surface find numbers were later assigned to these scatters, which were recorded using a GPS unit. Artifacts were subsequently collected from a large sample of these surface scatters. In 2016, however, the operation and subop directors chose to employ a different, more efficient survey strategy to ensure that all areas around the *aguada* were indeed inspected. Under the direction of Kevin Miller, workers from Chan Chich Lodge cut 60 m trails in each of the cardinal directions radiating outward from the *aguada*. These primary trails were then connected to one another to form four quadrants (Figure 4.5). Staff members used flagging tape to mark the location of cultural material present on the ground surface within these quadrants. In areas where there were dense concentrations of artifacts or other cultural features, workers conducted extensive clearing to expose a greater portion of the site.

Using the survey method outlined above, BEAST discovered a total of 30 previously unidentified artifact scatters at Kaxil Uinic. These scatters were each assigned a lot number within Subop KUV-01-SF, beginning with Lot KUV-01-SF-37 as a continuation of the 2015 numbering system. Table 4.1 lists the location of each lot within this subop as it was recorded with a GPS unit (Zone 16 Q, WGS 84 datum), as well as brief descriptions of the artifacts or features found in each lot. Artifacts collected from this subop are described in greater detail in the "Artifact Analysis" section of this chapter.

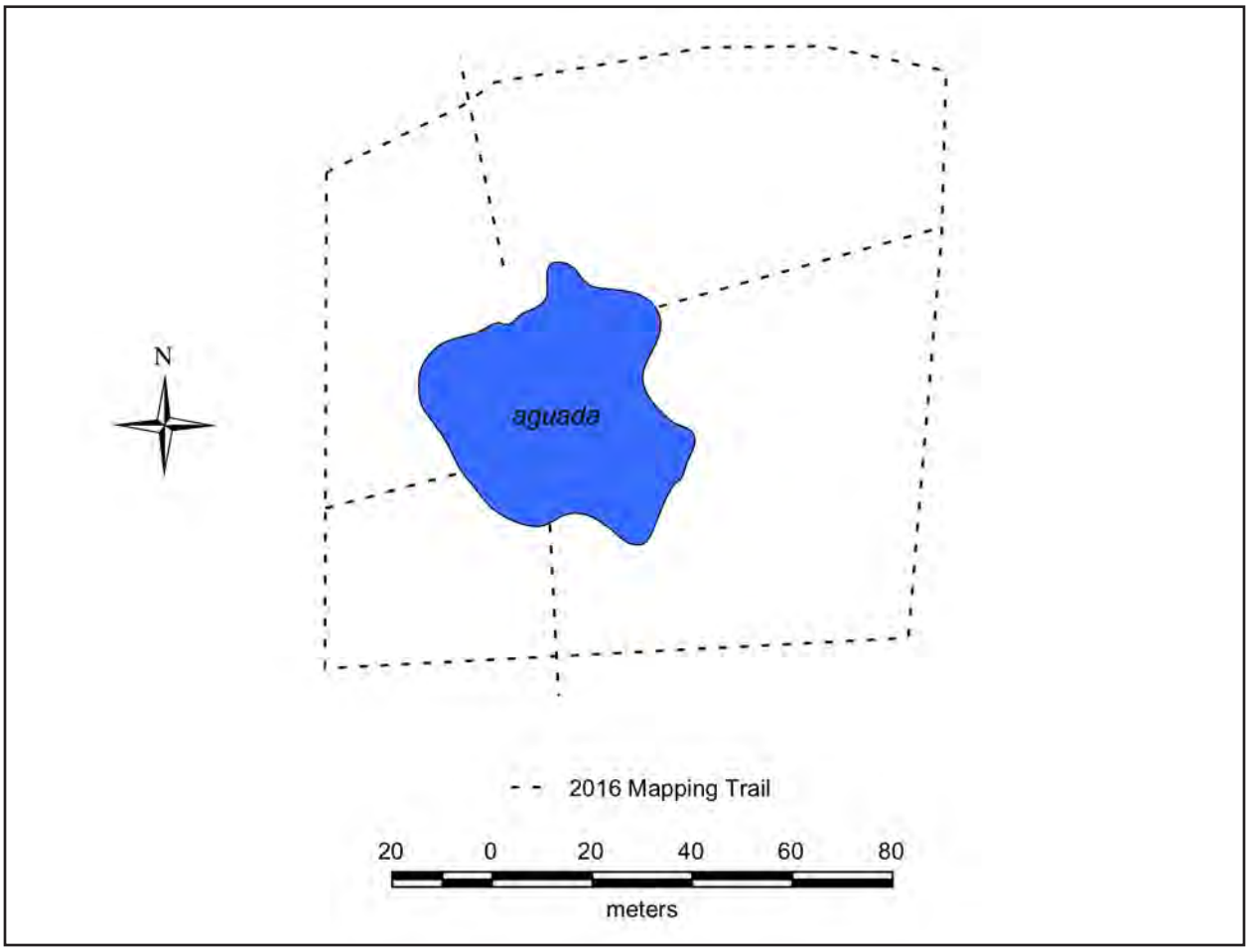

Figure 4.5. The 2016 Kaxil Uinic village survey transects.

Table 4.1. GPS Coordinates of Surface Finds Identified During Survey at Kaxil Uinic Village and Brief Artifact/Feature Descriptions

Year	Lot KUV-01-	Easting	Northing	Description
2015	SF-01	273432	1940188	Bottle scatter, machete handle on trail cut to site
2015	SF-02	273461	1940103	Three-stone hearth, jar
2015	SF-03	273456	1940100	Bottle scatter
2015	SF-04	273446	1940095	Bottle, metal food grinder
2015	SF-05	273460	1940110	Bottle glass
2015	SF-06	273481	1940141	Bottle scatter, metal plate
2015	SF-07	273484	1940139	Bottle scatter, metal pot, metal cups
2015	SF-08	273485	1940148	Metal food grinder
2015	SF-09	273487	1940157	Bottle scatter, machete blade
2015	SF-10	273475	1940047	Isolated bottle
2015	SF-11	273516	1940095	Lantern glass, bottle
2015	SF-12	273513	1940112	Metal cup
2015	SF-13	273525	1940118	Isolated bottle
2015	SF-14	273523	1940164	Bottle scatter, lantern base, metal pot
2015	SF-15	273561	1940151	Bottle scatter, metal pot
2015	SF-16	273484	1940036	Metal wheel hubs, bottle
2015	SF-17	273452	1940022	Three-stone hearth with metal pot on top
2015	SF-18	273420	1939993	Colonial ceramics, metal fragment, glass shard
2015	SF-19	273406	1939991	Local ceramics, metate fragment on top of mound
2015	SF-20	273405	1940069	Concrete boundary marker
2015	SF-21	273381	1940054	Bottle scatter, metal cups and bowls
2015	SF-22	273464	1940170	Bottle scatter surrounding Subop KUV-01-A
2015	SF-23	273454	1940164 (approximate)	Bottle scatter surrounding Subop KUV-01-B
2015	SF-24	273494	1940162	Bottle scatter surrounding Subop KUV-01-D
2015	SF-25	273494	1940163	Bottle scatter surrounding Subop KUV-01-C
2015	SF-26	273534	1940153	Bottle scatter
2015	SF-27	273550	1940144	Isolated bottle
2015	SF-28	273558	1940154	Isolated bottle
2015	SF-29	273561	1940150	Bottle scatter surrounding Subop KUV-01-F
2015	SF-30	273560	1940145	Isolated bottle
2015	SF-31	273454	1940141	Isolated jar
2015	SF-32	273452	1940024	Three-stone hearth with metal pot on top, chiclero spur, modern trash
2015	SF-33	273453	1940004	Three-stone hearth with metal pot on top
2015	SF-34	273450	1940150	Bottle scatter surrounding Subop KUV-01-G
2015	SF-35	273432	1940054	Isolated bottle
2015	SF-36	273417	1940055	Bottle scatter

Table 4.1. GPS Coordinates of Surface Finds Identified During Survey at Kaxil Uinic Village and Brief Artifact/Feature Descriptions (continued)

Year	Lot KUV-01-	Easting	Northing	Description
2016	SF-37	273559	1940120	Structures 1 and 2, bottle scatters around bases of mounds, chicle pot fragment on top of Structure 1
2016	SF-38	273540 (approximate)	1940066 (approximate)	Isolated metal pot
2016	SF-39	273502	1939988	Isolated sauce bottle
2016	SF-40	273468	1939994	Hearth feature with screw-cap jars
2016	SF-41	273500	1939988	Three-stone hearth with metal food grinder nearby
2016	SF-42	273487	1940015	Bottle scatter
2016	SF-43	273512	1940036	Isolated jar
2016	SF-44	273541	1940042	Metal bucket
2016	SF-45	273540	1940042 (approx)	Metal bowl
2016	SF-46	273539	1940042 (approx)	Bottle scatter, local ceramics, debitage, mano
2016	SF-47	273455	1940007	Rock cluster
2016	SF-48	273458	1940010	Rock cluster with bottle scatter nearby
2016	SF-49	273461	1940006	Rock cluster
2016	SF-50	273464	1940019	Two cut stones, jar
2016	SF-51	273465	1940013	Large cut stone
2016	SF-52	273543	1940142	Wine tonic bottle and ceramic cup
2016	SF-53	273549	1940156	Metal buckets, bottle, pot lid, machete, metal pan
2016	SF-54	273533	1940169	Isolated bottle at base of Structure 3
2016	SF-55	273484	1940165	Groundstone scatter
2016	SF-56	273482	1940163	Three metal food grinders
2016	SF-57	273479	1940138	Isolated metal food grinder
2016	SF-58	273478	1940132	Isolated bottle
2016	SF-59	273500	1940137	Milk glass jar
2016	SF-60	273512	1940142	Metal food grinder
2016	SF-61	273501	1940167	Metal food grinder, metal bucket, possible metal pot fragment
2016	SF-62	273479	1940172	Bottle scatter
2016	SF-63	273457	1940002	Three-stone hearth, chicle pot fragment, possible barrel hoop
2016	SF-64	273473	1940015	Bottle scatter
2016	SF-65	273455	1940029	Structure 6
2016	SF-66	273479	1940163	Two metate fragments

The distribution of surface scatters identified during survey at Kaxil Uinic village in both 2015 and 2016 is illustrated in Figure 4.6, as well as the locations of excavation units, features, and structures at the site. Although we assumed at the conclusion of the 2015 season that the spatial

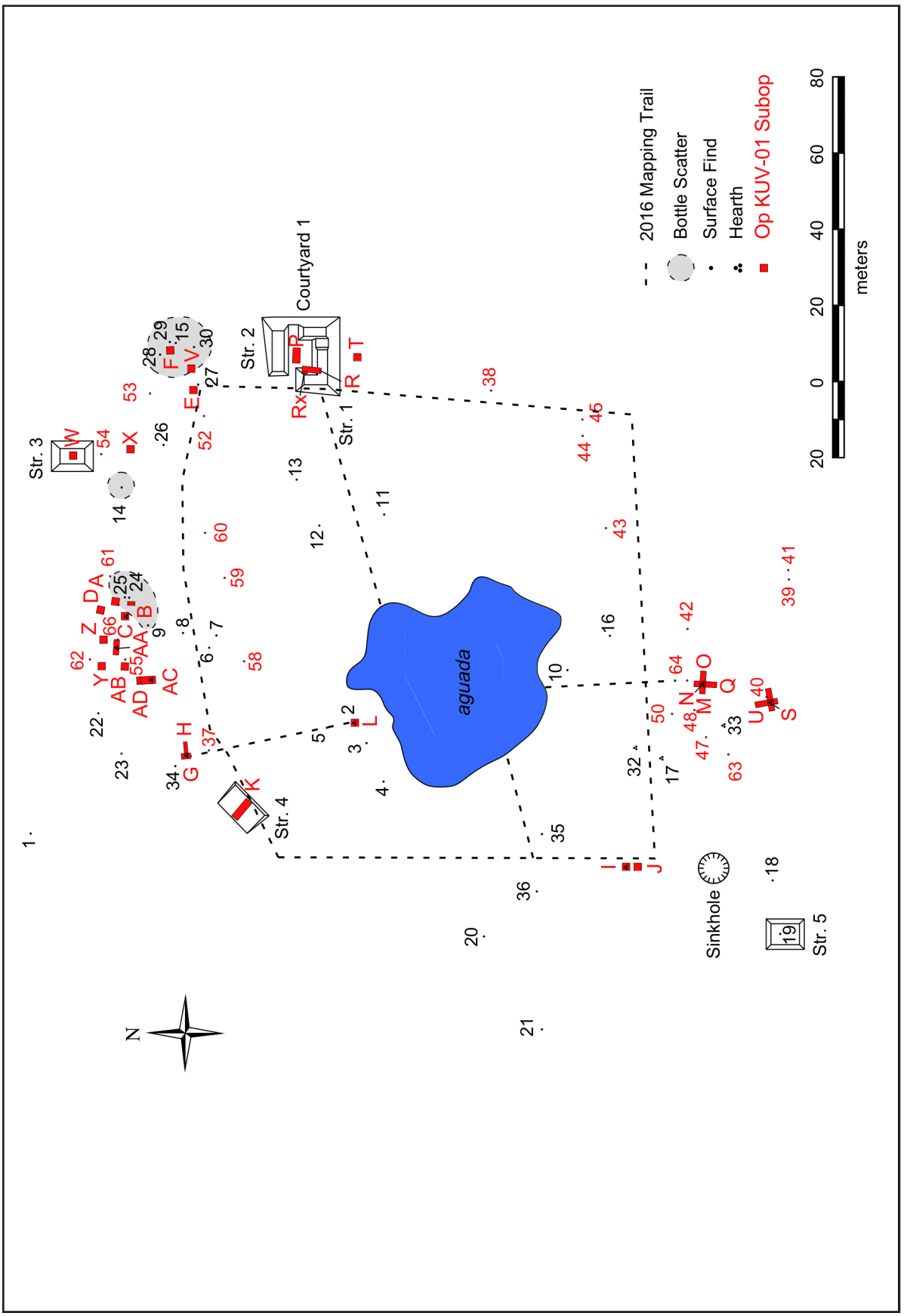

Figure 4.6. Map of surface finds, features, structures, and excavation units included in Op KUV-01.

distribution of artifact scatters and architectural features identified at that time presented a sampling bias due to limited ground visibility, the 2016 survey results similarly indicate that surface scatters of artifacts at the site are more densely concentrated along the northeastern and southwestern sides of the *aguada*. These authors speculate that perhaps the less densely occupied areas northwest and southeast of the *aguada* were used as *milpa* farmland. It should be noted, however, that the overprinting of the historic village by later looters as noted in 2015 (Bonorden 2016:271) is concentrated south of the *aguada*, particularly in the area near Lots KUV-01-SF-40, -47, -48, -50, -63 and -64. Modern items noted near these lots included plastic bucket lids, plastic bags, coffee jars, Dak meat cans, a plastic hulled shotgun shell, cloth, rope, and a car battery lid. Although the looters targeted the nearby Kaxil Uinic ruins, they likely chose to camp at the historic village site due to its proximity to the *aguada*.

Three additional three-stone hearths and one multi-stone hearth feature were identified at Kaxil Uinic (Lots KUV-01-SF-40, -41, and -63, and Subop KUV-01-AA) during the 2016 season, bringing the total number of hearths discovered at the site to 10. Historical accounts indicate that these constructions were central to typical Caste War Maya households (Rugeley 2001:105). Methodist missionary Richard Fletcher, who visited Maya villages near Corozal between 1854 and 1880, described his encounters with the Caste War Maya in a letter (reprinted in Rugeley 2001) written to the Wesleyan home office in London in 1867. Fletcher states that "the size of most [houses was] about 6 yards by 4 yards," communally constructed from hardwood posts planted in the ground (Rugeley 2001:105). Fletcher describes these houses as having rounded ends and square, thatched roofs made of palm leaves (Rugeley 2001:105). The inhabitants of these single-room houses, Fletcher observes, 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). Hearth features such as those described by Fletcher were encountered during excavations at the historic village of Tikal, where the hearth stones appeared to be masonry stones robbed from prehistoric structures (Moholy-Nagy 2012:8; Palka 2005:154). Although the three-stone hearths at Kaxil Uinic do not contain recycled masonry stones, Palka's (2005:156) assertion that closely clustered hearths at Tikal likely represent family units may also apply to the features at Kaxil Uinic. As illustrated in Figure 4.6, hearth features at the site are concentrated due north and south of the *aguada*, possibly representing two distinct family clusters. These features are discussed in greater detail in the "Excavation Summary" portion of this chapter, however, where the antiquity of several are brought into question.

Four previously unidentified mounds were also discovered during the 2016 survey, and Structure numbers (Structures 1, 2, 3, and 6) were subsequently assigned to these constructions as well as those identified in 2015 (Structures 4 and 5). Structures 1 and 2 were found in the vicinity of Subops KUV-01-E, -F, and -V northeast of the *aguada* and together form Courtyard 1. Structure 1 is a crudely C-shaped building about 1.25 m tall, measuring approximately 20 x 11 m at its longest and widest extents (Figure 4.7). Structure 2 is a rectangular building north of Structure 1 measuring roughly 15 x 5 m and 1–1.25 m tall. Structures 1 and 2 enclose Courtyard 1, where several historic bottles were visible on the ground surface. These buildings are oriented in the cardinal directions.

Structure 3 is located northwest of Subops KUV-01-E, -F, and -V. This isolated rectangular building is also oriented in the cardinal directions, measuring approximately 14 x 20 m. The structure is roughly 2 m tall.

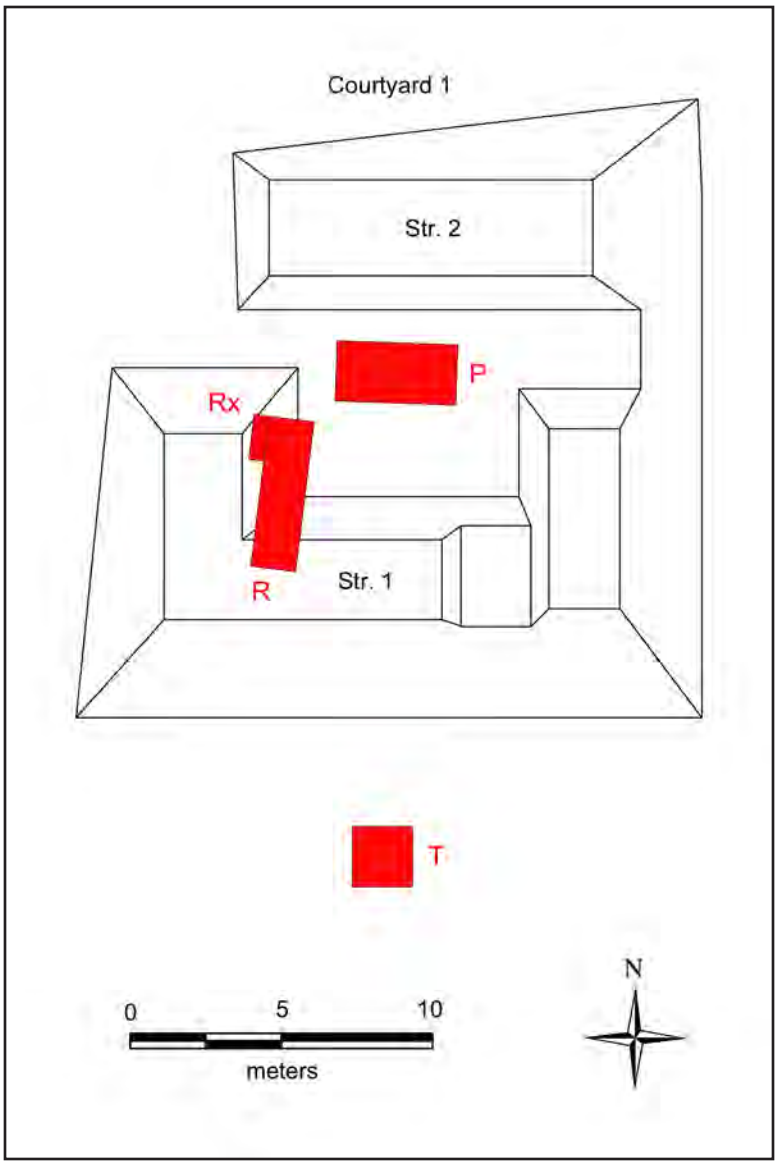

Figure 4.7. Plan Map of Structures 1 and 2 at Kaxil Uinic village with suboperations indicated.

An isolated bottle was visible on the eastern slope of Structure 3, with a larger, midden-like concentration of historic artifacts present at the base of the structure on its south side.

Structure 6 (Lot KUV-01-SF-65) is located on the southwestern side of the *aguada* near Lots KUV-01-SF-17 and -32. This rectangular structure is approximately 7 x 8 m in size and 2.5 m tall. No historical artifacts were observed in the vicinity of the mound, so it is likely that this building, like Structure 5, represents a previously unidentified prehistoric mound. Although Structures 1, 2, 3, and 4 are located within the most densely occupied areas of the historic village settlement, these buildings are most likely prehistoric structures that were reoccupied or utilized historically. The results of test excavations on these structures are discussed in the "Excavation Summary" portion of this chapter.

EXCAVATION SUMMARY

This section describes the individual excavation units opened at Kaxil Uinic during the 2016 season, grouped by proximity. A total of 18 new excavation units was established at the site, with each unit designated as its own subop. Following the proposed research methodology presented above, the operation director selected areas with structures or features visible on the ground surface for excavation, as well as areas with no surface artifacts for the excavation of randomly placed control units. Table 4.2 details the size of each subop and a brief description of what was recovered during the course of excavations. Artifacts collected from each subop are described in greater detail in the "Artifact Analysis" section of this chapter. Each subop, unless otherwise stated, consisted of the collection of surface finds within the unit and excavation of the first 20 cm below the ground surface.

Subops KUV-01-M, -N, -O, and -Q

Subops KUV-01-M, -N, -O, and -Q were part of a set trenches forming a 6-x-1.5-m T-shape placed over a three-stone hearth located south

Table 4.2. Summary of Excavations from Op KUV-01

Year	Subop KUV-01-	Size (m)	Description
2015	A	2 x 2	Bottles, faunal bone, debitage, mano, tin can, local ceramics
2015	B	1 x 2	Metal cups, faunal bone, debitage, glass, local ceramics, whiteware, coin
2015	C	2 x 2	Three-stone hearth, faunal bone, glass, metal grinder crank, metate, obsidian, local ceramics, whiteware
2015	D	2 x 2	Bottles, faunal bone, shell, debitage, metal cup, metal pot, chain link, nails, local ceramics
2015	E	2 x 2	Metate, faunal bone, debitage, glass, shotgun shell, knife, local ceramics, whiteware
2015	F	2 x 2	Bottles, faunal bone, debitage, shell, local ceramics, whiteware
2015	G	1.5 x 2.5	Three-stone hearth, faunal bone, debitage, shell, local ceramics, whiteware, obsidian, clay pipe, nail, shotgun shells
2015	H	1 x 3	Faunal bone, debitage, shell, glass, decorative glass bead
2015	I	2 x 2	Faunal bone, debitage, shell, glass, local ceramics, whiteware, obsidian, clay pipe, shotgun shell
2015	J	2.5 x 2	Faunal bone, debitage, glass, local ceramics, whiteware, tin can, clay pipe, shotgun shell
2015	K	2 x 6	Faunal bone, bifaces, uniface, debitage, cores, metate, glass, local ceramics, whiteware
2015	L	2 x 2	Three-stone hearth, modern trash, faunal bone, glass, local ceramics, metal fragments
2016	M	1.5 x 1.56	Modern trash, faunal bone, core, debitage, glass, local ceramics, machete fragment, whiteware
2016	N	1 x 1.5	Three-stone hearth, modern trash, faunal bone, glass
2016	O	1.5 x 3	Modern trash, faunal bone, debitage, glass, metal fragments, whiteware
2016	P	2 x 4	Bottles, faunal bone, debitage, biface, local ceramics, whiteware, metal fragments, shotgun shell, hair comb, bone button
2016	Q	1.5 x 3	Unexcavated, metal food grinder collected as SF-41
2016	R	1.5 x 5	Local ceramics, debitage, metal fragments, faunal bone, cores, bifaces, metate fragment, two exterior structure walls, preserved plaster floor, Tinaja Red jar, conch shell scoop
2016	Rx	1.5 x .25	Extension of Subop KU-01-R to expose eastern face of North-South wall, no artifacts collected from this subop
2016	S	1.5 x 1.4	Multi-stone hearth, modern trash, faunal bone, glass, local ceramics, metal fragments, Ursula
2016	T	2 x 2	Faunal bone, glass, debitage, local ceramics, chicle pot fragment, hammerstone
2016	U	1.5 x 3.38	Modern trash, faunal bone, bifaces, debitage, glass, playing marble, local ceramics, whiteware, sub-floor ballast stones in Lot KUV-01-U-02
2016	V	2 x 2	Faunal bone, glass, debitage, shotgun shells, shell button, clay pipe, stone ball, bead, brooch, nails, local ceramics, whiteware
2016	W	2 x 2	Glass, local ceramics, debitage, faunal bone, plaster floor

Table 4.2. Summary of Excavations from Op KUV-01 (continued)

Year	Subop KUV-01-	Size (m)	Description
2016	X	2 x 2	Faunal bone, glass, debitage, shotgun shells, religious pendant, local ceramics, whiteware
2016	Y	2 x 2	Concentration of cobbles, faunal bone, debitage, scraper, cores, bifaces, metate fragments, mano, obsidian arrow point base, ochre, chicle pot fragment, nails, glass, local ceramics
2016	Z	2 x 2	Faunal bone, glass, debitage, local ceramics, local clay pipe, metal fragments, whiteware
2016	AA	1.5 x 4	Three-stone hearth, faunal bone, glass, file, chicle pot fragments, nails, knives, machete blades, debitage, mano, metate fragments, local ceramics, whiteware
2016	AB	2 x 2	Faunal bone, glass, debitage, nails, chiclero spurs, local ceramics, whiteware
2016	AC	2 x 4	Circular rock alignment, faunal bone, glass, axe head, nails, barrel hoop, food grinder crank, shotgun stock, debitage, metate, local ceramics, clay pipe fragment, whiteware
2016	AD	2 x 1	Knife, machete, faunal bone, whiteware, glass, debitage, local ceramics

of the *aguada* (originally identified as KUV-01-SF-41). For reasons discussed below, the northernmost portion of the trench (measuring 1.5 x 1.5 m) and Subop KUV-01-Q were not excavated.

Subop KUV-01-M was a 1.5-x-1.56-m excavation unit forming the westernmost subop of the east-west trench. A large, flat rock measuring 66 x 42 cm was present on the ground surface of this unit, although no artifacts were visible. Despite the discovery of sparsely concentrated historic artifacts within the topsoil, the presence of a nylon rope and plastic 5-gallon bucket lid in the same context leads one to question the integrity of deposits within the subop. Upon encountering similar conditions in Subops KUV-01-N and -O, the operation and suboperation directors decided to refocus efforts elsewhere, consequently excavating only one lot in Subop KUV-01-M.

Subop KUV-01-N was a 1-x-1.5-m unit forming the central section of the T-shaped trenches. The three-stone hearth feature present within this subop contained stones ranging in size from 72 x 30 cm to 18 x 21 cm (Figure 4.8). Like Subop KUV-01-M, modern trash led excavators to question the integrity of artifact deposits within this unit. A plastic bag was found immediately under the largest rock forming the three-stone hearth, implying that the feature is either an entirely modern construction or contains stones robbed from a historic hearth but reused/moved by looters in the 1980s. In either case, the operation and suboperation directors decided to abandon further excavation of this suboperation and refocus crewmember efforts on areas of the site demonstrating greater integrity.

Subop KUV-01-O was a 1.5-x-3-m unit forming the easternmost subop of the east-west arm of the T-shaped trench. Like Subops KUV-01-M and -N, Lot KUV-01-O-01 contained a mixture of historic artifacts and modern trash. Like Subops KUV-01-M and KUV-01-N, Subop KUV-01-O was closed upon completing excavations of the first lot to refocus efforts on

Figure 4.8. Three-stone hearth present in Subop KUV-01-N.

areas of the site demonstrating a greater level of integrity.

Subop KUV-01-Q was a 1.5-x-3-m unit forming the southernmost portion of the north-south arm of the T-shaped trench. Like Subop KUV-01-M, a large, flat rock was visible on the ground surface of this unit, measuring 45cm x 30 cm. A "Moctezuma"-brand food grinder was recovered from the surface of this subop as Lot KUV-01-SF-41. Advertised in the 1920 edition of the *Farm Implement News Buyer's Guide* (Farm Implement News Company 1920:151), it appears that Moctezuma grinders were marketed as hand-powered grinding mills to produce tortillas. Although it is uncertain precisely when the specimen recovered from this subop was manufactured, it likely dates to the historic occupation of the site. Later looters may have reused or repurposed the tool, as only the funnel was present (and not the turning mechanism). Although this unit was designated as Subop KUV-01-Q, no lots were actually excavated. After plan mapping the stone visible on the surface and noting the level of disturbance in Subops KUV-01-M, -N, and –O, the operation and suboperation directors chose not proceed any farther with investigations at Subop KUV-01-Q.

Subops KUV-01-S and -U

Subops KUV-01-S and -U were part of a set of trenches forming a 6-x-1.5-m T-shape placed over a hearth feature (originally designated as KUV-01-SF-40) located south of the *aguada* and the hearth identified as Lot KUV-01-SF-41. No artifacts associated with this feature were collected as part of Lot KUV-01-SF-40. For reasons discussed below, the eastern, western, and southernmost portions of these trenches were not excavated, and therefore did not receive subop designations.

Subop KUV-01-S was a 1.5-x-1.4-m unit forming the central portion of the cross-trenches. A hearth feature visible on the ground surface contained five stones ranging in size from 12 x 8 cm to 30 x 16 cm (Figure 4.9). Three of the stones were arranged in a semi-circular formation, while the two largest stones were set apart to form an overall triangular shape. Like the previously described subops, Lot KUV-01-S-01 contained a mixture of historic artifacts and modern trash. Due to the compromised integrity and questionable antiquity of this hearth feature, only one lot was excavated in this subop.

Subop KUV-01-U was a 1.5-x-3.38-m unit forming the northernmost portion of the north-south arm of the cross trench placed over the hearth feature identified as KUV-01-SF-40. Lot KUV-01-U-01 constituted the first 10cm below the ground surface, which excavators characterized as 10YR2/1 black clay. Like Subop KUV-01-S, Lot KUV-01-U-01 contained a blend of historic artifacts and modern looter trash. Modern items recovered from this lot included a plastic shotgun shell hull, cloth, nylon rope, a "cat's eye" marble, and a cloth doll lovingly adopted as the CCAP mascot (Figure 4.10). Artifacts found within the same context as this trash included multiple machete fragments, debitage, a patent medicine bottle, perfume bottle, locally-produced ceramic sherds, faunal bone, two whiteware sherds, and two bifaces. A concentration of cobbles was noted in the northwestern portion of this unit approximately 10 cm below the ground surface, so a second lot was excavated to 20 cm below the surface in the southern half of the unit to determine if the cobbles extended farther. Lot KUV-01-U-02 revealed, however, that the cobble surface identified in the northern half of the unit did not persist into the southern portion of the subop. Similarly characterized

Figure 4.9. Hearth feature located in Subop KUV-01-S.

Figure 4.10. A cloth doll found in Subop KUV-01-U, named Ursula by CCAP staff.

as 10YR2/1 black clay loam, Lot KUV-01-U-02 was very sterile. Artifacts recovered from this subop included a handful of faunal bone, debitage, metal fragments, and locally-produced ceramic sherds, as well as numerous glass shards and a single whiteware shard. The authors of this chapter therefore theorize that the cobble concentration present in the northern half of the subop represents ballast stones for a prepared surface that extends northward beyond the boundaries of Subop KUV-01-U. The discovery of historic artifacts in Lot KUV-01-U-02, which was below the depth of these stones, indicates that the surface was a historic construction. Again, it is evident that later looters reoccupied this area and possibly reused/moved the hearth stones found in Subop KUV-01-S.

Subops KUV-01-P, -R, and -T

Subops KUV-01-P, -R, and -T were a series of units located northeast of the *aguada*. These subops were excavated to test Structures 1 and 2 to determine if the mounds were prehistoric or historic in age. If they proved to be prehistoric, the excavations were designed to look for possible evidence of historic reuse/interaction with these prehistoric constructions.

Subop KUV-01-P was a 2-x-4-m unit placed in the center of Courtyard 1 between Structures 1 and 2. The results of excavations within this subop are detailed in Table 4.3. Lot KUV-01-P-01 consisted of a surface collection of several glass bottles visible on the ground surface within the bounds of the subop, including a patent medicine bottle and beer bottle. Lot KUV-01-P-02 constituted the first 10 cm of topsoil, which the excavators described as 10YR2/1 black clay loam. Large chunks of limestone present immediately below the surface in this subop most likely represent collapse debris from Structures 1 and 2 that sloughed off the slopes of these buildings into the central depression formed by Courtyard 1. Artifacts recovered from Lot KUV-01-P-02 included debitage, patent medicine bottles, beverage bottles, a Florida Water bottle, hair tonic bottles, a bucket hinge, a piece of rebar, a tin can, a shotgun shell, faunal bone, a shell hair comb, and a whiteware sherd. Lot KUV-01-P-03 consisted of excavations 10–20 cm below the ground surface. Excavators noted that this lot, characterized as 10YR3/2 very dark grayish brown loam, contained numerous chunks of burned limestone that became more compacted at the base of the lot. Artifacts recovered from Lot KUV-01-P-03 included a bottle stopper, patent medicine bottle, locally-produced ceramic sherds, faunal bone, tin cans, debitage, and a bone button. Lot KUV-01-P-04 constituted the excavation of a 2-x-2-m area in the westernmost portion of the original subop. Excavators aimed to probe the pebble

Table 4.3. Summary of Subop KUV-01-P Excavations

Lot KUV-01-P-	Size (m)	Description	Matrix	Spec. #s
01	2 x 4	Surface collection	Humus	Patent medicine bottle – KUV1982-01; Beer bottle – KUV1983-02
02	2 x 4	First 10 cm of topsoil	10YR2/1 black clay	Patent medicine bottles – KUV1964-01 and KUV1967-02; Hair tonic bottles – KUV1967-03 and -04; Shotgun shell – KUV1965-08; Florida water bottle – KUV1967-01; Shell hair comb – KUV1968-01
03	2 x 4	10–20 cm below surface, collapse debris	10YR3/2 very dark grayish brown loam	Bottle stopper – KUV2025-01; Patent medicine bottle – KUV2025-04; Tin cans – KUV2028-03 and -04; Bone button – KUV2045-01
04	2 x 2	Pebble limestone concentration, collapse debris	10YR5/1 gray loam	Whiteware sherd – KUV2054-01
05	1 x 2	Floor, discernible in profile	10YR6/1 gray clay loam	Obsidian blade – KUV 2427-01
06	1 x 1	Sub-floor fill	10YR6/1 gray clay loam	Biface – KUV 2421-01
07	1 x 1	Sub-floor fill	10YR5/1 gray loam	Local ceramic sherds – KUV 2195

limestone concentration encountered at the base of Lot KUV-01-P-03 to determine if the anomaly was a prepared surface. This lot, which contained relatively few artifacts (a handful of locally-produced ceramics, debitage, whiteware, a single glass shard, and bone), was likely a continuation of the collapse debris encountered in Lot KUV-01-P-03. Described as 10YR5/1 gray loam, Lot KUV-01-P-04 was terminated upon the discovery of a lighter gray surface in the subop. Lot KUV-01-P-05 consisted of a 1-x-2-m area along the western wall of the original subop. Characterized as 10YR6/1 gray clay loam, this surface was likely a floor, considering that it contained considerably less chunks of limestone than previous lots. Several large locally-produced ceramic sherds, a single piece of debitage, and an obsidian blade fragment were found within the matrix of this surface, suggesting that it was constructed prehistorically. In order to confirm this assertion, Lot KUV-01-P-06 consisted of the excavation of a 1-x-1-m area in the northwest corner of the original unit to expose the sub-floor fill associated with the surface encountered in Lot KUV-01-P-05. Described as 10YR6/1 gray clay loam, Lot KUV-01-P-06 included a mix of gravel-sized stones and locally-produced ceramic sherds. The lack of historic artifacts associated with the construction of this floor further indicates that Courtyard 1 was constructed in prehistoric times and the area was later reoccupied by the San Pedro Maya. A thin laurel-leaf biface was found in this lot. Similarly, Lot KUV-01-P-07 contained a continuation of the subfloor fill encountered in Lot KUV-01-P-06, terminating at bedrock, 73 cm below the modern surface of the courtyard. The matrix within this lot was characterized as 10YR5/1 gray loam,

containing large bedrock spalls, and only five ceramic sherds.

Subop KUV-01-R was a 1.5-x-5-m trench placed on the western end of Structure 1 directly south of Subop KUV-01-P in Courtyard 1. Capturing the courtyard-facing corner of the two exterior walls, this subop sought to determine if the structure was constructed historically or prehistorically. We excavated the unit according to changes in stratigraphy and architectural features, identifying six lots of topsoil (KUV-01-R-01), collapse debris (KUV-01-R-02), walls (KUV-01-R-03 and KUV-01-R-04), a concentration of ceramics from a broken vessel (KUV-01-R-05), and a fairly well preserved plaster floor (KUV-01-R-06). The tops of both walls, which meet to form a corner in southeast corner of the unit, were visible in the topsoil at the southern end of the unit near the summit of the mound (Figure 4.11). To expose more of the north-south running wall, the subop director opened Subop KUV-01-Rx, an 1.5-x-.25-m extension adjacent to the eastern wall of Subop KUV-01-R.

Lot KUV-01-R-03, the wall running east/west on Structure 1, was remarkably well preserved with up to seven courses (1.2 m) high of uniformly cut stones and chinking stones that gradually increase in size towards the base before terminating in a 10-cm tall protruding footer (Figure 4.12). The western face of the eastern wall in Lots KUV-01-R-04 and KUV-01-Rx-01 was preserved up to three courses (0.5 m high) in the majority of the subop and extension with a similar protruding footer, fewer chinking stones, and slightly larger cut stones than found in Lot KUV-01-R-03. Lot KUV-01-R-04 may have had a 1.55-m wide in-filled opening evidenced by thresholds visible in profile and plaster rolling up onto the footer and underneath the smaller fill stones (see Figures 4.11 and 4.12). The horizontal

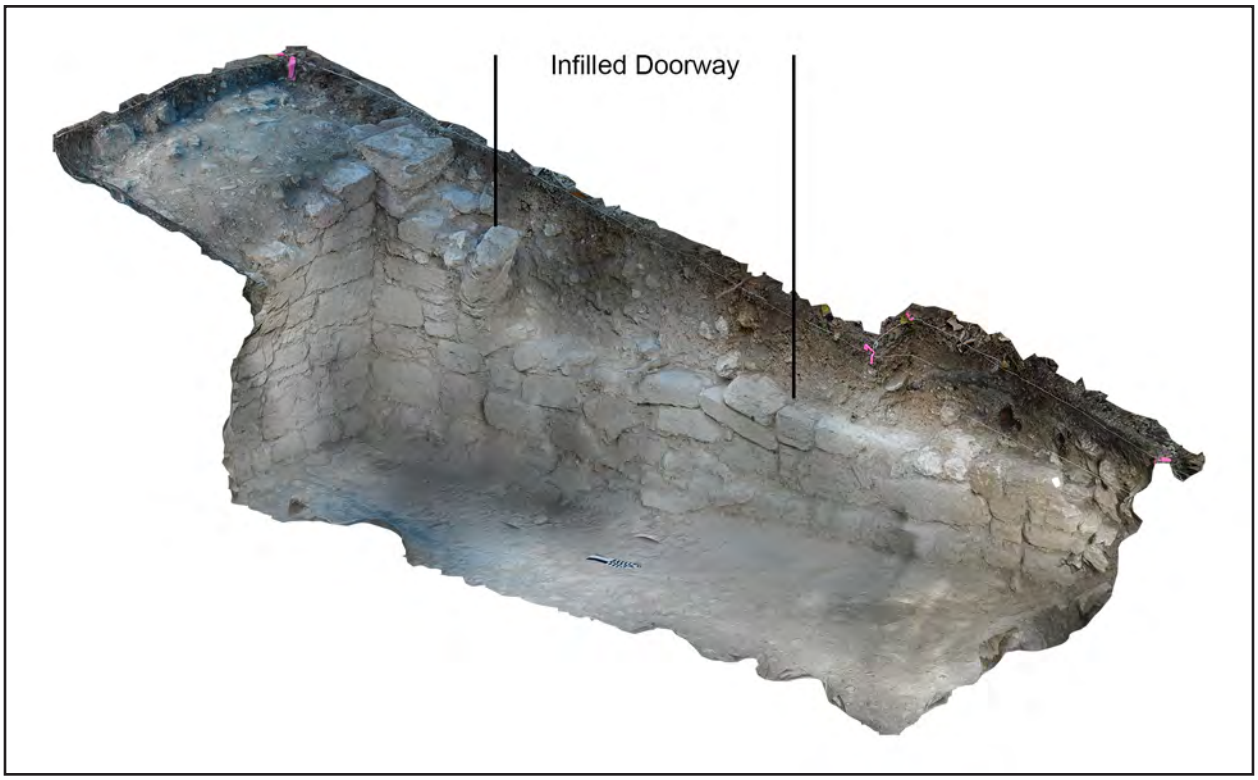

Figure 4.11. Perspective orthophoto of Subops KUV-01-R and KUV-01-Rx with infilled doorway marked. View to the southwest.

extent of Lot KUV-01-R-04 is not evident in the southern end of subop past the point where it abuts Lot KUV-01-R-03. The fragments of an overturned Tinaja Red ceramic jar and an associated fragment of a conch shell scoop at the base of Lot KUV-01-R-03 were excavated as a separate lot (Lot KUV-01-R-05). Although a couple of historic metal artifacts were recovered from the topsoil, the majority of artifacts found in this subop were prehistoric, indicating that the structure was constructed prehistorically.

Figure 4.12. Photograph of wall (Lot KUV-01-R-03) and footer. View to the southwest. Note the apparent infilled doorway on the right, with plaster rolling up from the floor and under the cut stones filling the doorway, and the broken ceramic vessel *in situ* on the floor.

Subop KUV-01-T was a 2-x-2-m unit placed at the base of the collapse on the southern side of Structure 1. The purpose of this subop was to look for a historic midden associated with the reuse of the prehistoric mounds. Lot KUV-01-T-01 consisted of the first 10 cm below the ground surface. Described as 10YR2/1 clay loam, Lot KUV-01-T-01 contained some smaller limestone collapse debris and was relatively devoid of cultural material. Artifacts recovered from this lot included a single piece of debitage, a bone, a glass shard, two locally-produced ceramic sherds, and a *chicle* pot fragment. Lot KUV-01-T-02 was excavated to a depth of 20 cm below the ground surface. Excavators encountered some burned limestone collapse debris in this lot, describing the matrix as 10YR2/1 black clay. Again, the matrix was relatively sterile, with Lot KUV-01-T-02 containing only a handful of locally-produced ceramic sherds, debitage, and a single hammerstone.

Subop KUV-01-V

Subop KUV-01-V was an isolated excavation unit placed northeast of the *aguada* in close proximity to Subops KUV-01-E and -F as a control unit. The location of this 2-x-2-m subop was chosen based on the lack of surface artifacts visible in the immediate area but proximity to the dense artifact scatter identified as Lots KUV-01-SF-28, -29, and -30. Lot KUV-

01-V-01 therefore constituted the first 10 cm of topsoil within the subop. Although no features were encountered in this lot, a variety of artifacts was recovered, including numerous beverage bottles, a tin can, a shotgun shell, an obsidian blade fragment, debitage, faunal bone, a shell button, and tobacco pipe fragments. The matrix within Lot KUV-01-V-01 was 10YR2/1 black clay. Lot KUV-01-V-02 was subsequently excavated to a depth of 20 cm below the ground surface. This lot, described as 10YR2/1 black clay loam, produced an abundance of historical artifacts, including a cobalt blue cosmetic bottle, a polished stone ball, tobacco pipe stem, a plastic bead, debitage, numerous nails, tin cans, shotgun shells, a brooch, whiteware, faunal bone, an obsidian blade fragment, locally-produced ceramics, and a drinking glass fragment. Owing to the richness and variety of cultural material recovered from Lot KUV-01-V-02, a 1-x-1-m section in the northwest corner of Subop KUV-01-V was excavated to a depth of 3 0cm below the ground surface as Lot KUV-01-V-03 to determine the maximum depth of historical artifacts deposited at the site. Described as 10YR2/1 black clay, Lot KUV-01-V-03 was strikingly sterile in comparison to Lot KUV-01-V-02. Artifacts recovered from Lot KUV-01-V-03 included locally-produced ceramic sherds, faunal bone, a single sherd of whiteware, a single shard of glass, and debitage. Based on the findings of this subop, it appears that most historic artifacts at the site are present within the first 20 cm of topsoil.

Subops KUV-01-W and -X

Subops KUV-01-W and -X were located north of the *aguada* on and near Structure 3. The locations for these subops were chosen to determine the age and function of the structure.

Subop KUV-01-W was a 2-x-2-m unit placed on the summit of Structure 3. No artifacts were visible on the ground surface of this area, so Lot KUV-01-W-01 consisted of the humus/topsoil. The matrix within this lot was described as 10YR3/3 dark brown loam. Artifacts recovered from the topsoil included faunal bone, debitage, and shards from a broken amber-colored bottle. When apparent collapse debris was encountered, Lot KUV-01-W-01 was closed and Lot KUV-01-W-02 opened. Lot KUV-01-W-02 contained large limestone rocks determined to be collapse debris. The matrix within the lot was characterized as 10YR7/2 light gray sandy loam. Artifacts recovered from this lot included debitage, faunal bone, locally-produced ceramic sherds, and glass shards. The glass shards are most likely from the same bottle encountered in Lot KUV-01-W-01, and their small size in Lot KUV-01-W-02 implies that their presence is the result of bioturbation. Lot KUV-01-W-02 was closed when a thin, burned plaster surface was encountered approximately 20cm below the ground surface. The burned floor, assigned Lot KUV-01-W-03, was only 1 cm thick and predominantly present in the northern half of the unit. Described as 10YR5/1 light gray, the floor had a crackled appearance and was spread over rock cobbles. Lot KUV-01-W-04 was subsequently excavated as a 1-x-2-m area in the northern half of the subop to examine the subfloor fill and determine if the feature was constructed prehistorically or historically. Described as 10YR7/2 light gray loam, only locally-produced ceramic sherds were recovered from the matrix associated with the subfloor fill 40 cm below the ground surface, indicating that the feature was a prehistoric building. The discovery of the amber-colored bottle shards in Lot KUV-01-W-01, however, implies that the mound was revisited in historic times, considering that the manufacture date range of the bottle is 1830–1885 based on its applied finish.

Subop KUV-01-X was a 2-x-2-m unit placed near the base of Structure 3 on its south side. This area was chosen for excavation due to

the overwhelming presence of historic bottle glass visible on the ground surface, possibly associated with Lot KUV-01-SF-14. Lot KUV-01-X-01 consisted of a surface collection of artifacts within the perimeter of the unit, which included a beverage bottle, debitage, and glass shards. Lot KUV-01-X-02 consequently included the first 10 cm of topsoil. Described as 10YR2/1 black clay, Lot KUV-01-X-02 did not contain any features. A wide variety of artifacts was recovered from this lot, however, including shotgun shells, a religious pendant, faunal bone, bottle glass, debitage, locally-produced ceramics, and whiteware sherds. Observing that the majority of these artifacts were recovered within the first 5 cm of topsoil, crewmembers decided to only excavate one lot in this subop.

Subops KUV-01-Y, -Z, -AA, and -AB

Subops KUV-01-Y, -Z, -AA, and -AB were located north of the *aguada* near Subops KUV-01-A, -B, -C, and -D. The locations of these subops were chosen based on the high density of cultural material visible on the ground surface.

Subop KUV-01-Y was a 2-x-2-m unit placed over a small cobble platform northwest of Subop KUV-01-Z to determine if the cobbles were the base to a structure. Lot KUV-01-Y-01 consisted of the first 10 cm of topsoil. After the density of the cobbles greatly reduced towards the bottom of the first lot, Lot KUV-01-Y-02 continued to explore the vertical extent of the cobbles before stopping at a possibly gravelly surface. The considerable amounts of fire-cracked rock, burned limestone, chert cobbles, debitage, and lithic tools discovered alongside historic glass and metal indicate that this may have a trash midden during the historic occupation of Kaxil Uinic village.

Subop KUV-01-Z was a 2-x-2-m control unit, placed in an area with no surface artifacts visible but in close proximity to a dense surface scatter. Lot KUV-01-Z-01 consisted of the first 10 cm of topsoil within the unit. Described as 10YR2/1 black clay, no features were present within this subop. Artifacts collected from Lot KUV-01-Z-01 included a large volume of locally-produced ceramic sherds, a handful of glass shards and whiteware sherds, metal fragments, an obsidian blade fragment, faunal bone, and a fragment from a locally-produced clay pipe. Lot KUV-01-Z-02 was excavated to a depth of 20 cm below the ground surface, described by excavators as 10YR4/1 dark gray clay. Pea-gravel sized limestone chunks were consistently spread across the base of the unit in a similar pattern to the limestone floors identified in nearby Subops KUV-01-A and -B (Bonorden 2016:281). Artifacts collected in association with this surface included numerous locally-produced ceramic sherds, debitage, and two obsidian blade fragments. The lack of historical artifacts associated with this floor does not necessarily indicate that it was prehistorically constructed, however. Moholy-Nagy (2012:2) notes that a historic account of Tikal produced by a Franciscan priest mentions that the floors of the Maya houses were "whitened inside with plaster," implying that the surfaces encountered at Kaxil Uinic are actually indicative of San Pedro Maya houses. Such an assertion is further corroborated by the presence of several three-stone hearths in the immediate vicinity of Subop KUV-01-Z (see Figure 4.6).

Subop KUV-01-AA was a 1.5-x-4-m trench placed over a three-stone hearth. Hearth stones in this feature ranged in size from 30 x 15 cm to 12 x 10 cm. Lot KUV-01-AA-01 consisted of the first 10 cm of topsoil within the subop, which excavators described as 10YR2/1 black clay loam. Two plastic buttons were found in the humus of this subop, but no other distinctly modern items were recovered. A concentration of charcoal and bone was noted near the

hearth feature in the center of the unit, and a machete file was present in the center of the hearth. A large quantity of wire-drawn nails was distinctly concentrated along the southern wall of the excavation unit, possibly indicating the presence of a structure. The manufacture date range of wire-drawn nails spans from the 1830s to present-day (Nelson 1968). Other artifacts recovered from Lot KUV-01-AA-01 included *chicle* pot fragments, whiteware sherds, debitage, faunal bone, glass shards, two metate fragments, and a mano. Lot KUV-01-AA-02 was excavated to a depth of 20 cm below the ground surface, which excavators characterized as 10YR4/1 dark gray clay. Like Subop KUV-01-Z-01, a compacted limestone surface was encountered at the base of Lot KUV-01-AA-02. Considering that these two subops were placed within 5 m of one another, it is possible that the surface identified in Lot KUV-01-AA-02 is a continuation of the same surface present in Lot KUV-01-Z-02. Locally-produced ceramic sherds and debitage were recovered from this lot, but as with Lot KUV-01-Z-02, this does not necessarily indicate that the surface is prehistoric.

Subop KUV-01-AB was a 2-x-2-m control unit placed west of Subop KUV-01-AA and south of Subop KUV-01-Y. This area was chosen for excavation due to the lack of surface artifacts in the immediate area but presence of surface materials and features in the vicinity. Lot KUV-01-AB-01 constituted the first 10 cm of topsoil within the unit, which excavators described as 10YR2/1 black clay loam. Although no features were identified in this subop, a pair of *chiclero* spurs was found along the north wall of the unit. Other artifacts recovered in Lot KUV-01-AB-01 included debitage, faunal bone, nails, two obsidian blade fragments, locally-produced ceramic sherds, and glass shards. Lot KUV-01-AB-02 was excavated to a depth of 20 cm below the ground surface and contained a 10YR4/1 dark gray clay matrix. Like Subops KUV-01-Z and -AA, a concentration of limestone pebbles at the base of this lot is indicative of a prepared surface (though only present in the western half of the unit). Artifacts recovered from Lot KUV-01-AB-02 included a single glass shard, debitage, locally-produced ceramics, and an obsidian blade fragment. Again, the lack of historical artifacts associated with the limestone surface in these subops is perplexing, suggesting that the floor was perhaps swept clean prior to the vacancy of the associated structure.

Subops KUV-01-AC and -AD

Subops KUV-01-AC and -AD were placed due north of the *aguada*, south of Subop KUV-01-Y. The locations for these units were chosen based on the presence of an unusual rock alignment visible on the ground surface (within the bounds of Subop KUV-01-AC). Subop KUV-01-AD was subsequently established to expose a concentration of artifacts encountered along the north wall of Subop KUV-01-AC, which is discussed below in greater detail.

Subop KUV-01-AC was a 2-x-4-m trench placed over a semi-circular arrangement of stones visible on the ground surface (Figure 4.13). The stones constituting this feature ranged in size from 20 x 20 cm to 8 x 16 cm. Lot KUV-01-AC-01 consisted of the first 10 cm of topsoil within the unit, and due to time constraints was the only lot excavated within this unit. Excavators characterized the soil matrix as 10YR2/1 black clay, noting that burned limestone chunks were dispersed randomly throughout. An abundance of artifacts was concentrated along the northern wall of the excavation unit, including a shotgun stock, machete fragment, large locally-produced ceramics, an axe head, and a clay pipe fragment. Other artifacts recovered from Lot KUV-01-AC-01 included whiteware sherds, debitage, an obsidian blade and chunk, a perfume bottle,

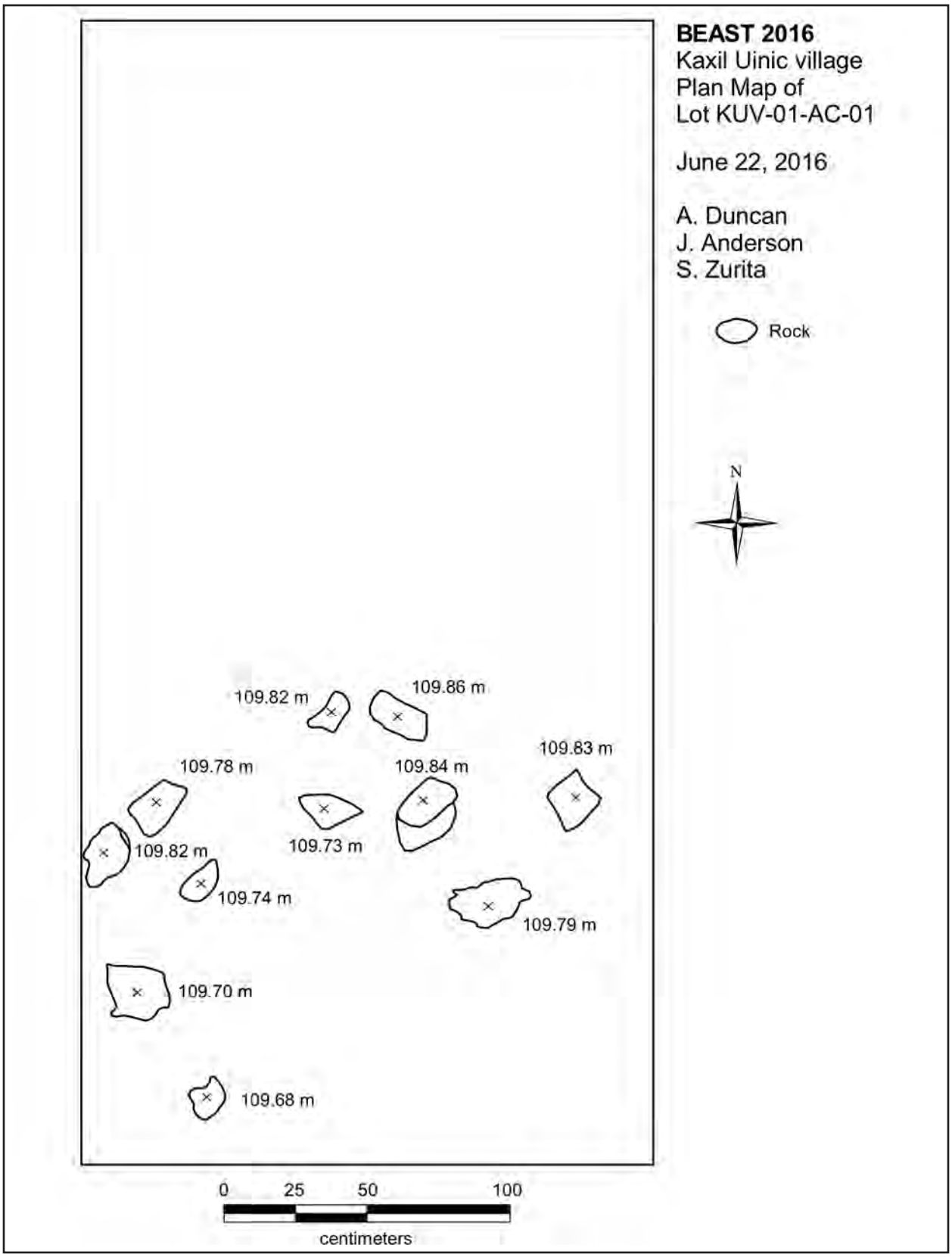

Figure 4.13. Plan map of Lot KUV-01-AC-01.

nails, a bone button, a corn grinder crank, and a small barrel hoop. Excavators also noted that charcoal and a metate fragment were present between the stones forming the feature present in the center of the unit, but the function of the stone feature remains uncertain. The discovery of numerous cutting implements in close association to the *chiclero* spurs in Subop KUV-01-AB seems to corroborate Sir J. Eric S. Thompson's (1963:6, 228) account that upon his arrival to Belize in 1931, he was forced to change his plans to excavate at Kaxil Uinic ruin, as BEC had forcibly moved the village's inhabitants to San José Yalbac over rumors that illegal *chicle* harvesting had taken place in the settlement. Thompson (1963:233-234) states that the village was well situated to smuggle *chicle* into Guatemala without paying export taxes and had been a smuggler's hangout for many years. *Chicle*, a gum procured by "bleeding" the latex of the sapodilla tree with a machete, became a major export in the 1880s with the development of a large-scale chewing gum manufacturing business in the United States (Waddell 1981:22). The industry was short-lived however, as the introduction of synthetic substitutes reduced the profitability of the *chicle* trade after World War II. The residents of the village had probably turned to wage labor as *chicleros* to participate in the cash economy of British Honduras so that they could pay rent to BEC (see Thompson 1963:230).

Subop KUV-01-AD was opened to investigate two machetes and a bucket handle found half outside of Subop KUV-01-AC. Despite the two machetes and bucket handle recovered, the 2-x-1-m unit adjacent to the northern unit wall of Subop KUV-01-AC was only excavated one 10-cm lot due to the relative lack of artifacts.

ARTIFACT ANALYSIS

Due to Belizean restrictions on artifact exportation, a total of 3,053 artifacts was processed, cataloged, and analyzed over a three-week period in the field laboratory at Chan Chich Lodge by the authors of this chapter and Samantha Mitchell, the lab director. A modified version of the catalog system used by the CCAP for prehistoric sites was adapted to suit historic artifacts. Under this system, artifacts are organized by material type, followed by industry (function), form, and subform. Artifacts were not primarily categorized by functional classifications, given that a single object could be used for multiple purposes over time, and that the functional classifications assigned to objects might reflect erroneous cultural assumptions made by the analyzers that are inappropriate for the study group (Ng 2007:154–155). Following the analytical methodology outlined by Ng (2007:155) for analysis at the San Pedro Maya village of Holotunich, artifacts from Kaxil Uinic were primarily organized by material type and then further divided by their original functions (as intended by their manufacturers) when appropriate and or/identifiable.

Since relatively few features were identified at Kaxil Uinic, the material culture recovered from the site is vital to understanding how the San Pedro Maya constructed their identities within the British colonial system. The main categories by which artifacts were organized included glass, ceramics, metal, shell, faunal bone, lithics, and miscellaneous. Table 4.4 summarizes the artifacts collected from Kaxil Uinic village within these categorical distinctions. Lots within each subop were combined to reconstitute the various strata (topsoil, collapse debris, etc.) encountered within each excavation unit over two field seasons. Surface find lots were also combined for this analysis, although Table 4.5 shows the distribution of material types within excavation

Table 4.4. Site-Wide Percentages of Material Types by Count

Subop or Lot KUV-01-	Glass (n=1,070)	Ceramic (n=1,370)	Metal (n=993)	Shell (n=14)	Faunal (n=343)	Lithic (n=1,527)	Misc. (n=3)	All Material Types (n=5,320)
A	3.26	0.73	1.80	0.00	1.46	2.88	0.00	2.11
B	2.23	0.51	0.70	0.00	5.85	4.45	0.00	2.37
C	5.97	1.31	15.21	0.00	0.29	6.55	0.00	6.28
D	1.95	1.61	8.96	14.29	0.29	2.16	0.00	3.16
E	0.28	0.15	5.14	0.00	9.65	4.45	0.00	2.95
F	5.60	2.48	2.62	7.14	2.05	0.59	66.67	2.61
G	5.05	2.19	7.45	0.00	1.75	14.93	0.00	7.37
H	4.48	0.00	0.81	28.58	0.88	4.72	0.00	2.54
I	0.94	0.44	2.52	7.14	0.88	1.77	0.00	1.33
J	0.37	1.02	0.60	0.00	2.63	5.24	0.00	2.12
K	2.05	12.41	0.81	0.00	6.73	9.43	0.00	6.90
L	0.28	0.51	2.52	0.00	3.22	0.00	0.00	0.86
M	1.03	0.29	0.40	0.00	1.17	1.05	0.00	0.73
N	0.19	0.00	0.00	0.00	2.92	0.00	0.00	0.23
O	0.09	0.66	0.50	0.00	0.58	0.46	0.00	0.45
P-01, -02	6.06	0.07	4.93	14.29	3.51	0.26	0.00	2.50
P-03, -04	2.34	2.63	4.23	0.00	2.05	1.38	0.00	2.48
P-05	0.00	4.38	0.00	0.00	0.00	0.13	0.00	1.17
P-06, -07	0.00	3.43	0.00	0.00	0.00	0.06	0.00	0.90
Q	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
R-01	0.00	0.22	0.30	0.00	0.00	0.26	0.00	0.19
R-02	0.00	1.82	0.00	0.00	2.05	0.72	0.00	0.81
R-05	0.00	6.93	0.00	7.14	0.00	0.06	0.00	1.82
S	0.37	0.29	0.00	0.00	2.63	0.00	0.00	0.32
T	0.37	0.73	0.10	0.00	0.29	0.39	0.00	0.41
U	14.38	0.80	4.63	0.00	32.75	2.82	0.00	6.88
V	6.36	1.68	6.95	7.14	5.56	5.50	33.33	4.98
W-01, -02	9.44	0.29	0.00	0.00	1.46	0.79	0.00	2.29
W-04	0.00	3.65	0.00	0.00	0.00	0.00	0.00	0.94
X	7.10	2.12	2.52	0.00	0.58	5.44	0.00	4.04
Y	0.84	4.31	8.16	0.00	1.76	4.52	0.00	4.21
Z	0.19	12.41	0.91	0.00	0.29	3.67	0.00	4.47
AA	1.03	15.26	2.82	0.00	4.39	5.70	0.00	6.58
AB	0.37	6.93	7.96	7.14	1.46	6.02	0.00	5.19
AC	3.08	6.35	2.62	7.14	0.29	2.49	0.00	3.50
AD	1.68	1.24	1.01	0.00	0.58	0.79	0.00	1.11
SF	12.62	0.15	2.82	0.00	0.00	0.32	0.00	3.20
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Table 4.5. Percentages of Material Types by Count within Excavation Units

Subop or Lot KUV-01-	Glass (n=935)	Ceramic (n=1,368)	Metal (n=965)	Shell (n=14)	Faunal (n=343)	Lithic (n=1,522)	Misc. (n=3)	All Material Types (n=5,150)
A	3.74	0.73	1.88	0.0	1.46	2.89	0.0	2.18
B	2.57	0.51	0.73	0.0	5.85	4.47	0.0	2.45
C	6.84	1.32	15.65	0.0	0.29	6.57	0.0	6.49
D	2.25	1.61	9.22	14.29	0.29	2.17	0.0	3.26
E	0.32	0.15	5.28	0.0	9.65	4.47	0.0	3.05
F	6.42	2.49	2.69	7.14	2.05	0.59	66.67	2.70
G	5.78	2.19	7.67	0.0	1.75	14.98	0.0	7.61
H	5.13	0.0	0.83	28.58	0.88	4.73	0.0	2.62
I	0.96	0.44	2.59	7.14	0.88	1.77	0.0	1.38
J	0.43	1.02	0.62	0.0	2.63	5.26	0.0	2.19
K	2.35	12.41	0.83	0.0	6.73	9.46	0.0	7.13
L	0.32	0.51	2.59	0.0	3.22	0.0	0.0	0.89
M	1.18	0.29	0.41	0.0	1.17	1.05	0.0	0.76
N	0.21	0.0	0.0	0.0	2.92	0.0	0.0	0.23
O	0.11	0.66	0.52	0.0	0.58	0.46	0.0	0.47
P-01, 02	6.95	0.07	5.08	14.29	3.51	0.26	0.0	2.58
P-03, -04	2.67	2.63	4.35	0.0	2.05	1.38	0.0	2.56
P-05	0.0	4.39	0.0	0.0	0.0	0.13	0.0	1.20
P-06, -07	0.0	3.44	0.0	0.0	0.0	0.07	0.0	0.93
Q	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R-01	0.0	0.22	0.31	0.0	0.0	0.26	0.0	0.19
R-02	0.0	1.83	0.0	0.0	2.05	0.72	0.0	0.83
R-05	0.0	6.93	0.0	7.14	0.0	0.07	0.0	1.88
S	0.43	0.29	0.0	0.0	2.63	0.0	0.0	0.33
T	0.43	0.73	0.10	0.0	0.29	0.39	0.0	0.43
U	16.47	0.80	4.77	0.0	32.75	2.83	0.0	7.11
V	7.27	1.68	7.15	7.14	5.56	5.42	33.33	5.15
W-01, -02	10.80	0.29	0.0	0.0	1.46	0.79	0.0	2.37
W-04	0.0	3.65	0.0	0.0	0.0	0.0	0.0	0.97
X	8.13	2.12	2.59	0.0	0.58	5.45	0.0	4.17
Y	0.96	4.31	8.39	0.0	1.76	4.53	0.0	4.35
Z	0.21	12.42	0.93	0.0	0.29	3.68	0.0	4.62
AA	1.18	15.28	2.90	0.0	4.39	5.72	0.0	6.80
AB	0.43	6.94	8.19	7.14	1.46	6.04	0.0	5.36
AC	3.53	6.36	2.69	7.1	0.29	2.50	0.0	3.61
AD	1.93	1.29	1.04	0.0	0.58	0.79	0.0	1.15
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

units only to better visualize the data (as opposed to Table 4.4, where percentages are more heavily weighted towards surface collections). It should be noted that debitage from Lot KUV-01-Z-01 was not catalogued/analyzed during the 2016 field season; these data are therefore absent from the following analyses and calculations. Five specimens of glass from Lot KUV-01-O-01 were also misplaced during the 2016 field season, and these data are absent from the following analyses and calculations as well.

As evidenced by Tables 4.4 and 4.5, the largest overall percentages of artifacts at Kaxil Uinic village came from Subops KUV-01-G, -K, and -U, while the fewest numbers of artifacts were recovered from Subops KUV-01-N, and -S and Lot KUV-01-R-01. Subop KUV-01-G was placed over an area containing a three-stone hearth, so it is not surprising that this presumably residential setting contained a large percentage of cultural material. The high percentage of artifacts present within Subop KUV-01-K could be attributed to its size (2 x 6 m), or the fact that an abundance of lithic tools and locally-produced ceramics were used as construction fill for the platform present within the unit. Numerous glass shards from a shattered coffee jar found in Subop KUV-01-U likely skewed the data to appear as if this excavation unit contained numerous artifacts, but in reality most items recovered from this subop belonged to the same vessel. Subops KUV-N and -S were located in areas presumed to have been disturbed by more recent looters, *chicleros*, or loggers in the area, and the lack of colonial-period artifacts both above and below the ground in these locales implies that perhaps the three-stone hearths present within these excavation units are more modern constructions. Lot KUV-01-R-01 contained relatively few historic artifacts despite the fact that the unit was placed on Structure 1, indicating that either artifacts tumbled down the slope of the building over time or that the San Pedro Maya did not deposit cultural material on top of this prehistoric construction.

The following subsections discuss the analysis of artifacts recovered from Kaxil Uinic by material type, providing a general description of the artifact distribution, and when possible, minimum number of vessels/minimum number of objects (MNV/MNO) counts and average artifact weights from each subop. Noteworthy artifacts are also described in greater detail within these subsections.

Glass

As evidenced by Table 4.4, glass artifacts were the most abundant material type present on the surface of the site (indicated by Subop KUV-01-SF). Glass artifacts were also the easiest objects to date in terms of production date ranges. Resources used to analyze glass bottles and other objects recovered from Kaxil Uinic village included Lindsey's (2015) Bureau of Land Management/ Society for Historical Archaeology Historic Glass Bottle Identification and Information website, Polak's (2007) *Bottles Field Guide* to values and identification, Baldwin's (1973) *Collector's Guide to Patent and Proprietary Medicine Bottles of the Nineteenth Century*, and the Parks Canada Glass Glossary (Jones and Sullivan 1989).

Of the 1,070 glass pieces and complete vessels collected from Kaxil Uinic, the majority were found in Subops KUV-01-P, -U, -V, -W, and -X. The high percentages of glass artifacts in Subops KUV-01-U and -W may be contributed to singular glass bottles that had each shattered into numerous pieces. Conversely, Subops KUV-01-P, -V, and -X were placed in areas where an abundance of glass artifacts was visible on the ground surface, possibly representing midden contexts.

Beverage, patent medicine, and cosmetic bottles dominated the glass assemblage at Kaxil Uinic. Although Subops KUV-01-A, -F, and -G contained small percentages of the glass collected from Kaxil Uinic, the MNV/MNO from these subops is relatively high (Table 4.6). Subops KUV-01-U, -W, and -X, meanwhile, accounted for high percentages of the glass assemblage by shard count, but the MNV/MNO for these subops is relatively low. The MNV/MNO was determined by the number of rim or finish counts present in the glass assemblage. For units containing glass shards that lacked these diagnostic features, the MNV/MNO is listed as "0," although shards were present.

Table 4.6. Glass Overview

Subop or Lot KUV-01-	% Site Distribution (n= 1,070)	Mean Artifact Weight (g)	MNO/ MNV
A	3.26	138.7	11
B	2.23	16.5	1
C	5.97	10.2	6
D	1.95	67.0	3
E	.28	2.3	1
F	5.60	91.1	17
G	5.05	92.3	10
H	4.48	5.5	5
I	0.94	8.1	0
J	0.37	1.25	0
K	2.05	2.6	0
L	0.28	9.0	0
M	1.03	17.5	1
N	0.19	14.5	1
O	0.09	80.0	1
P-01, -02	6.06	36.0	10
P-03, -04	2.34	13.5	3
S	0.37	4.0	0
T	0.37	0.8	0
U	14.38	4.5	5
V	6.36	6.9	8
W-01, -02	9.44	2.6	0
X	7.10	16.8	2
Y	0.84	65.9	2
Z	0.19	14.5	0
AA	1.03	11.8	2
AB	0.37	1.5	0
AC	3.08	9.6	1
AD	1.68	2.6	0
SF	12.62	262.4	91
Total	100.00	56.5 (Overall Mean Weight)	181

Unidentifiable shards accounted for 32.7 percent of the glass assemblage, constituting 350 out of the 1,070 total pieces. Identifiable glass objects include wine, champagne, liquor, soda, and beer bottles; patent medicine or other pharmaceutical bottles; condiment bottles; lighting devices; cosmetic and perfume or cologne bottles and jars; bottles with unidentifiable primary contents; a marble; and a decorative glass ornament. Identification of these items is limited to their initial functions/contents, which complicates analysis, as the possibility of a substantial time lag between the manufacture of a bottle and its disposal arises, as well as discrepancies regarding potential trade networks and consumer behaviors (Busch 1987:67, 77). Church and colleagues (2011:187–188) and Dornan (2004:112), for example, note that bottle reuse among the San Pedro Maya likely occurred, and Kray et al. (2017) further assert that bottles found at the village of San Pedro Sirís could have been obtained from nearby logging camps and repurposed as containers for local products, for trade, or as a raw material to produce other tools.

Although the possibility of bottle reuse at Kaxil Uinic exists, identification of bottles for this analysis is limited to their initial functions. None of the glass shards recovered from Kaxil Uinic village exhibit evidence of modification like the dark green bottle bases recovered from San Pedro Sirís, which were retouched to create

scrapers (Church et al. 2011:188), or the glass arrow points observed by Palka (2005:205) at historic Lacondon Maya settlements. Table 4.7 therefore details the discernible forms, though not necessarily functions, of vessels present within the Kaxil Uinic glass assemblage. In this case, the MNV/MNO includes both vessels and fragments from each subop whose form was recognizable, either by the object's shape or a visible brand name.

Beverage bottles (including wine, champagne, liquor, soda, beer, juice, etc.) represent the largest vessel count of the glass assemblage. Thirty-two of these bottles are beer bottles, which were commonly dark green or amber in color and exhibit crown finishes and export shapes. It is important to note that these features often overlap with other bottle types, however, so it is possible that some "beer" bottles may have been misidentified in the absence of distinct labeling. According to Polak (2007:64–65), glass beer bottles were not widely produced until after 1865, and green glass beer bottles were common from that point until 1930, when amber glass gained popularity. The beer bottles identified among the Kaxil Uinic glass assemblage, which are more commonly amber in color and whose manufacture date ranges span the transitional period of green-to-amber glass popularity, reflect these trends.

Table 4.7. Glass Vessel and Item Types

Object	MNO/ MNV
Beverage (alcoholic and soda)	98
Bottle/jar (unidentified contents)	82
Bottle stopper	9
Condiment bottle/food container	6
Household/decorative glass	2
Hygiene/cosmetic/grooming	25
Lamp or lantern part	1
Pharmaceutical/patent medicine bottles	43
Tableware	1
Total	267

Of the thirty-two bottles identified as originally containing beer, five display brewery names on the bottle body. These breweries included: Independent Brewing Co. of Pittsburgh (produced by American Bottle Co.), C. H. Evans & Sons Ale (Produced by American Bottle Co.), Eichler New York Registered, Jacob Ruppert Brewer New York, and Ballentine's Breweries Newark, New Jersey. Three bottles were further identified as malt extracts based on the bottle shapes, which had short to moderate body widths and relatively long necks, giving the bottles "squatty" appearances.

Only two bottles were definitively identified as champagne bottles based on their finishes, which were flat bands of glass wrapped around the outer circumference of the upper bottle necks, and push-up bases. One bottle, which was olive green in color, displayed no heel or base markings, although it was evidently machine-made. The other, which exhibited a flaky gold patina, had an applied finish.

Nine bottles were categorized as wine bottles because of their dark green color, push-up bases, long necks, and rounded shoulders. Two of these bottles included brand names on either the body or base. These brands were Hall's Wine Tonic and Crispin-Koto kola wine. Though termed a "wine," Hall's Wine Tonic was marketed as a treatment for influenza (*The Speaker*, 12 March 1898:i). Kola wine was also sold as a wine tonic, and likely marketed for the same purpose. These products, though labeled as "wine," are therefore actually more akin to patent medicines, which claimed to cure ailments without requiring a prescription for purchase. One wine bottle lacking a brand name exhibited a maker's mark on its base, which read "Seager Evans & Co, Limited."

Five bottles were classified as liquor bottles in this analysis. One bottle in this category has "1/5 GAL" printed on the heel, indicative of a "fifth" of liquor. Other bottles attributed to this

category exhibit brandy and mineral finishes indicative of liquor contents.

Eight soda bottles were identified based on their aqua color, crown cap finishes, and champagne or export shapes. No markings demonstrating the brand names of these sodas are present on the bottles, although four exhibit heel marks (5, 4, 4, and 7). Additionally, one soda bottle has a maker's mark, indicating that the bottle was produced by either Jeanette Glass Co. or Jefferis Glass Co. ("J" in a triangle).

Six condiment or food container bottles were collected from Kaxil Uinic. These include three "sauce" bottles with geometric designs and "D&M 2 1/2" printed on their bases (2 1/2 possibly indicated their total volume in ounces). According to Olivia Ng (2007:169), bottles fitting this description were identified as pepper sauce bottles by the Museum of Belize in Belize City. A small clear bottle labeled "Royal Flavoring Extract" with a crown symbol printed on one face was also found at the site. No maker's mark is present on this bottle, however two coffee jars labeled "13 P (in a triangle) Nescafe 76" and "0 P (in a triangle) 78 Nescafe" on their bases were also recovered from the site. These coffee jars could potentially date anywhere from 1938 to present day (Nestlé 2013) and may possibly represent looter trash.

Nine bottle stoppers (eight aqua and one clear) were also recovered from the site. Each exhibits a flat top with a tapered cylindrical shank, which is commonly used on club sauce bottles (Ng 2007:171). No distinctive markings are present on any of the stoppers, which would have fit into cork sheaths.

Forty-three patent medicine and/or pharmaceutical bottles were identified in the glass assemblage from Kaxil Uinic, although it should be noted that patent hair and skin tonics are categorized with cosmetic bottles, as they are related to one's appearance. Markings identified on those bottles included in the patent/pharmaceutical bottle category are: Perry Davis Pain Killer, Vegetable; Barry's Pain Relief; C. H. Wintersmith Louisville, KY U.S.A. (manufactured by Industrial Glass Co.); Mc Elree's Wine of Cardui, The Woman's Tonic, Chattanooga; Elliman's Embrocation; Kepler Wellcome Chemical Company; Liebig's Malt Tonic; The Name St. Joseph's Assures Purity; Scott's Emulsion Trade Mark Cod Liver Oil with Lime & Soda; and Gifford & Co. Liniment.

Additional patent medicine or pharmaceutical bottles lacking brand names include three bottles with volume markings. These bottles exhibit three sides of a hexagon, with the back half of the bottle curved in an ovoid form. The right side of the bottles' front faces are marked with lines indicative of cubic cm increments (20, 40, 60, and 80 cc), while the left sides are marked with lines in half-ounce increments (1, 2, and 3 oz.). The bottle shoulders have "3 iii" printed on them. Another clear, partial bottle contains the words "…Medco Ltd… .w Orleans" on its body and appears to have been rectangular in shape. It is possible this fragmented bottle contained Royaline Oil.

Fifteen Jamaica Ginger Extract bottles with varying base markings were also recovered. Two other clear rectangular bottles include the words "Made in the U.S.A." and "2 oz" on their narrower sides. These bottles were manufactured by the Diamond Glass Co., and their finishes have an unusual series of semi-circles protruding outward from the bottle.

Twenty-five containers in the glass assemblage originally contained cosmetic products. Among these are two clear Robert A. Chesebrough Vaseline jars and two cobalt blue VapoRub jars, which each exhibit an external thread finish. One of these jars has "VapoRub 62" printed on its base, and its metal lid is still attached.

Thirteen aqua Barry's Tricopherous hair tonic bottles were also recovered. This hair tonic supposedly unclogged hair follicles and stimulated the scalp, and staff members from Chan Chich Lodge mentioned that they had used the product in recent years (Leticia Martinez, personal communication, 2015).

Perfume and/or cologne bottles categorized as cosmetic glass vessels include four Florida water bottles. One aqua bottle fragment reads " …de Florida…d Superior," while another aqua bottle fragment has "Druggi…ew York" printed on the shards. It is assumed that the latter is a fragment bottle that read "Florida Water Murray & Lanman Druggists New York." Two other bottles of Florida Water produced by Murry & Lanman were recovered from the site. Both men and women used Florida Water, not only as a perfume or cologne, but also as cordials, stimulants, or breath fresheners (Sullivan 1994:84). Other perfume/cologne bottles recovered from the site included one product produced by E. Coudray Paris. The house of Coudray became the official supplier to the British Court in 1837, implying that the bottle was either a symbol of status or simply reused after its primary contents were consumed (Fragrantica 2016). Additionally, a bottle produced by J. Grossmith & Son Perfumers of London was found.

Other glass objects identified in the Kaxil Uinic glass assemblage include one lantern glass bulb, as well as a small black decorative crystal that likely hung from a lamp. Missionary Juan Bautista Aguilar (Rugeley 2001:126) described the presence of "medicine men" among the Caste War Maya, who used a crystal "talisman" to cure diseases, but there is no indication that the crystal recovered from Kaxil Uinic was used in such a manner. The lantern glass bulb fits a metal base found in a distinctly different part of the site (collected as part of Lot KUV-01-SF-14), although the bulb may have originally been paired with another, undiscovered lantern base. According to Ng (2007:196), lanterns are generally associated with outdoor activities, although that does not preclude the possibility of indoor use. A "cat's eye" marble recovered from the site is likely associated with looters who later inhabited the area, considering that it was found in association with a cloth doll and the manufacture date range of this style of marble typically post-dates 1940 (Lauren Sullivan, personal communication, 2016). A single drinking glass was also found at the site.

The manufacture date range of glass artifacts collected from Kaxil Uinic village is presented in Figure 4.14. Following the method outlined by Ng (2007:203), the given manufacture date range of all identifiable glass materials was divided into five-year intervals to consider how many artifacts could have been manufactured within a specific five-year interval. Objects with long manufacture date ranges appear in many of the intervals depicted. Spikes in production are evident in Figure 4.14. Machine made bottles proved to be problematic in this endeavor, as those lacking maker marks or other labeling could potentially date anywhere from 1905 to present day. For this reason, bottles with such broad production ranges were excluded from consideration in this graphic, though this decision may have skewed the data presented.

Two peaks in production are visible in Figure 4.14: one including 1880 to 1885, and the other including 1905 to 1910. Although the cause of these peaks is uncertain, the majority of glass recovered from the site was broadly produced between 1880 and 1930, which precisely corresponds with historical documentation of the site's occupation (Jones 1977). According to Ng (2007:91), 70 percent of Belize's trade was with the United States by 1920, with ships running regularly from New Orleans to Belize City. The dominance of American-made products at Kaxil Uinic reflects this fact.

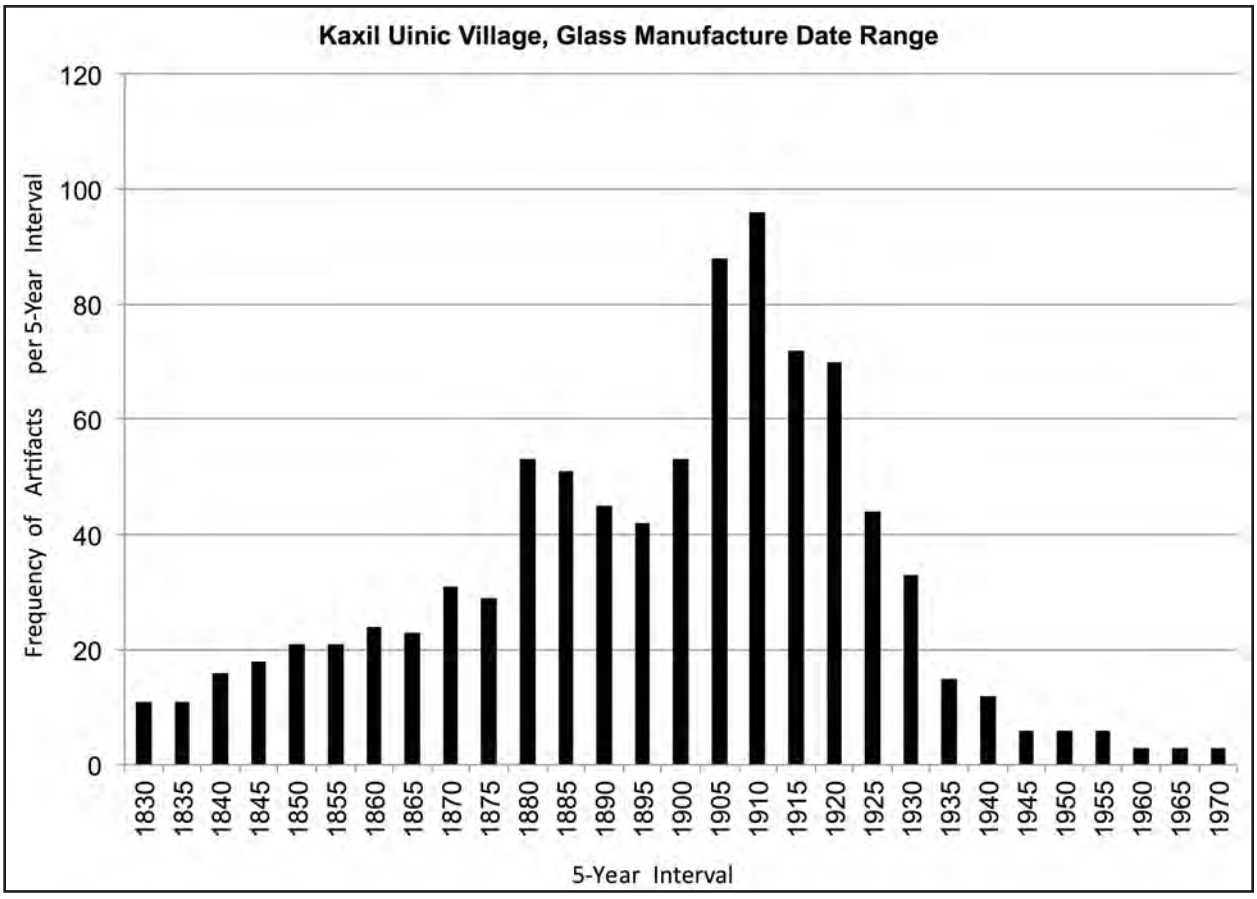

Figure 4.14. Manufacture date range of glass artifacts recovered from Kaxil Uinic village.

Ceramics

A total of 1,370 ceramic artifacts was collected from Kaxil Uinic, mostly in the form of vessel sherds. Vessel sherds recovered from the site were from both locally-produced "Maya" vessels (coarse earthenware) and imported objects from Europe, the United States, or Mexico (mainly whiteware). Unlike glass bottles, ceramic sherds were hardly present on the surface of the site. Of the 1,370 ceramic sherds recovered from Kaxil Uinic, 1,256 were locally produced, and 114 were imported. Due to techniques employed during artifact analysis, weights of locally-produced sherds were not recorded, and mean artifact weights for each subop were therefore not calculable. Table 4.8 illustrates the distribution of ceramics within the site.

It should be noted that ceramic sherds were generally too small in size to identify the vessel or object type, and the MNV/MNO was not calculable due to the lack of any diagnostic vessel features (i.e., 50 percent or more of a vessel rim). Subops KUV-01-K, -Z, and -AA contained the largest percentage of ceramic material collected from Kaxil Uinic, while Subops KUV-01-E, -M, -P (Lots -01 and -02), -R (Lot -01), -S, -W (Lots -01 and -02), and -SF were relatively devoid of ceramic material. The high percentage of ceramics from Subop KUV-01-K can be attributed to the size of the unit (2 x 6 m), while Subops KUV-01-Z and -AA were placed in a domestic activity area within the site. It should also be noted that Subops placed over prehistoric structures (KUV-01-P, -R, and -W) contained relatively few historic ceramics, while Subops KUV-01-G and -H, which were

Table 4.8. Ceramic Overview

Subop or Lot KUV-01-	% Total Site Distribution (n=1,370)	% Site Distribution Locally-Produced (n=1,256)	% Site Distribution Imported (n=114)
A	0.73	0.80	0.00
B	0.51	0.48	0.88
C	1.31	1.19	2.63
D	1.61	1.59	1.75
E	0.15	0.08	0.88
F	2.48	1.12	15.79
G	2.19	1.12	14.04
I	0.44	0.08	4.39
J	1.02	0.80	3.51
K	12.41	12.10	15.95
L	0.51	0.56	0.00
M	0.29	0.08	2.63
O	0.66	0.00	7.89
P-01, -02	0.07	0.00	0.88
P-03, -04	2.63	1.99	0.88
P-05	4.38	4.78	0.00
P-06, -07	3.43	3.74	0.00
R-01	0.22	0.24	0.00
R-02	1.82	1.99	0.00
R-05	6.93	7.56	0.00
S	0.29	0.32	0.00
T	0.73	0.80	0.00
U	0.80	0.64	2.63
V	1.68	1.04	8.77
W-01, -02	0.29	0.32	0.00
W-04	3.65	3.98	0.00
X	2.12	1.99	3.51
Y	4.31	4.70	0.00
Z	12.41	13.38	1.75
AA	15.26	17.17	3.51
AB	6.93	7.48	0.88
AC	6.35	6.53	4.39
AD	1.24	1.27	0.88
SF	0.15	0.08	0.88
Total	100.0	100.0	100.0

placed over a three-stone hearth, contained a high percentage of imported ceramics.

Identifiable vessel types include jars, bowls or basins, plates, cups, saucers, pipes, and a bottle; yet these forms could have again been used for multiple functions and in various contexts. For this analysis, however, identification of vessel function was limited to the manufacturer's intended use for the object form. Descriptions of the ceramic vessel types observed at Kaxil Uinic are detailed in Table 4.9, though again the MNV/MNO was not calculable due to the small sizes of the sherds.

The locally-produced ceramic sherds identified in the assemblage generally come from jars, bowls, or basins. The fact that only one imported ceramic bowl was identified in the assemblage is surprising, considering that bowls were crucial to the soup-based diet of historic Maya populations (Ng 2007:235). This discrepancy may reflect the circumstance that hardly any imported vessel forms are discernable in the Kaxil Uinic ceramic assemblage due to sherd sizes, or may alternately be explained by descriptions of Maya groups using hollowed out gourds as food containers (Rugeley 2001). The inhabitants of Kaxil

Table 4.9. Ceramic Vessel and Item Types

Object	Sherds
Bottles	1
Bowls	2
Clay tobacco pipes	7
Cups and mugs	5
Jars	2
Locally-produced censer bowl	1
Locally-produced jars, bowls, or basins	1,206
Plates	3
Saucers	2
Total	1,229

Uinic may have also preferred metal serving vessels over ceramic ones (Bonorden 2016).

Seven fragments of clay tobacco pipes were recovered from the site, though no junctures between the stems and bowls are present among these fragments to assign an MNI (see Ng 2007:213). It appears that all of the pipe fragments except one are produced from white kaolin clay, as evidenced by their low-plasticity (see Ng 2007:213). Though no maker's marks are visible on the kaolin pipes, their bore diameters are 6/64 (n=2) and 7/64. Although bore diameters provide some utility in dating clay pipes produced in England from 1590 to 1800 (Binford 1961), it is unclear whether such calculations are applicable to later sites like Kaxil Uinic. The fragment of a locally-produced clay pipe (Spec. # KUV 2367-03) was also recovered from the site (Figure 4.15). It is unclear whether this pipe was manufactured historically or prehistorically.

Identification of imported ceramic vessels was limited due to the lack of consistency in naming ceramic wares during the nineteenth century (Ng 2007:218), as well as the small amount of decoration visible on each sherd to determine its motif. Table 4.10 summarizes the distribution of imported ceramic vessel sherds by decoration. Decoration types were determined using the Jefferson Patterson Park & Museum Post-Colonial Ceramics webpage for comparative identification (Samford and Miller 2002). Manufacture date ranges for various ceramic designs were further refined using the Delaware Department of Transportation's Identification Manual (Brown and Bewick 1982). Due to the small sizes of ceramic sherds in the assemblage, it is unknown how many of the "undecorated" sherds are actually from vessels with sparse decorative patterns. Despite this limited utility in determining an MNV count for the assemblage, decoration frequencies may provide some information about popularity, use, and style preference.

The most common types of decoration on imported ceramic sherds are dipped annular and hand painted wares, followed by transfer whiteware. Dipped annular wares in the assemblage display light blue solid fields with

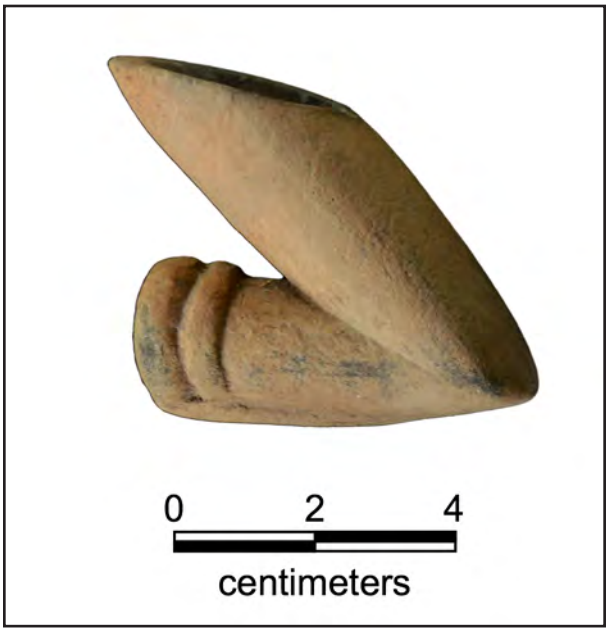

Figure 4.15. Locally-produced clay pipe (Spec. # KUV 2367-03).

Table 4.10. Imported Ceramic Sherds by Decoration Style

Decoration	Sherds
Coarse earthenware	2
Dipped annular whiteware	19
Flow blue whiteware	2
Hand painted whiteware	19
Ironstone	7
Majolica – unknown	2
Miscellaneous	4
Pearlware	1
Printed underglaze earthenware	1
Sponged whiteware	6
Stenciled lusterware	2
Stoneware	1
Transfer Whiteware	11
Whiteware – undecorated/unknown	28
Total	105

light blue or brown stripes near the rims. Hand-painted wares commonly exhibit polychromatic floral designs. Sponged whiteware sherds recovered from the site have pink floral designs from cut sponges. Considering the occupation span of Kaxil Uinic village (ca. 1880–1931), it is likely that the transferware sherds identified in the ceramic assemblage were produced during the Revival phase of transfer print wares, which occurred from about 1870 to 1900 (Ng 2007:221). Interestingly, two sherds from a majolica ceramic vessel (with the same design) likely produced in Mexico were found in Subops KUV-01-K and -AA. The discovery of a lip of to a stoneware bottle is also noteworthy.

Dating locally-produced ceramics proved problematic because of the continuity in styles from the Postclassic (ca. AD 950–1539) through the colonial period (ca. 1540 onward). Locally-produced ceramic sherds recovered from Kaxil Uinic include Chilar Fluted, Achote Black, Cayo Unslipped, Tinaja Red, striated types, Belize River Valley Paste, and Subin Red types, which date to the Late Classic period (ca. AD 600 to 800) and are likely associated with the prehistoric occupation in the area. Due to this broad range in production, locally-produced ceramic sherds were not considered when attempting to date the ceramic assemblage. However, based on the presence of Postclassic types in the assemblage, project ceramicists Fred Valdez and Lauren Sullivan designated a new Postclassic ceramic complex called Vireo for Chan Chich and Kaxil Uinic (Houk 2015:12).

Almost all dateable imported ceramic sherds in the assemblage were produced from roughly 1830 to 1900, with a peak manufacturing range of 1840 to 1890 (Figure 4.16). The sharp drop off in production date range after 1900 is likely due to how ceramics were grouped during analysis, but the generally earlier manufacture date range for ceramics versus glass at Kaxil Uinic may be attributed to the fact that glass containers were discarded shortly after consumption of the contents, while ceramic vessels were intended for longer periods of use and likely curated objects. The relatively older manufacture date range of ceramic vessels at the site could also reflect the ability (or lack thereof) of the San Pedro Maya to acquire newer imported vessels from colonial markets. The peak production range of this material type therefore somewhat predates the known occupation date range of the site.

Metal

Although 993 metal artifacts were recovered from Kaxil Uinic, most are in the form of unidentifiable metal flakes. Ng (2007:250) states that metal artifacts are particularly vulnerable to decomposition in humid settings compared to other material types, as is the case in Belize, providing an explanation for the overwhelming presence of corroded metal fragments at Kaxil Uinic. As detailed in Table 4.11, only 137 objects or complete parts to larger objects are identifiable in the metal assemblage. The largest and most complete metal objects were generally found in surface collections, although Subops KUV-01-C, -D, and -Y contained the largest counts of metal artifacts among all suboperations. Interestingly, all of these subops were associated with the residential area north of the *aguada*, and one of the units contained a three-stone hearth (Subop KUV-01-C). Due to time constraints during analysis, no consistent effort was made to determine the various metal types (cast iron, brass, lead, copper, tin, etc.) present within the assemblage. Few metal artifacts in the assemblage are dateable, so no chart of the manufacture date ranges is included in this analysis.

As illustrated in Table 4.12, metal artifacts used for construction (nails, screws, etc.) are the most abundant forms identified in the metal assemblage, and most appear to date to the

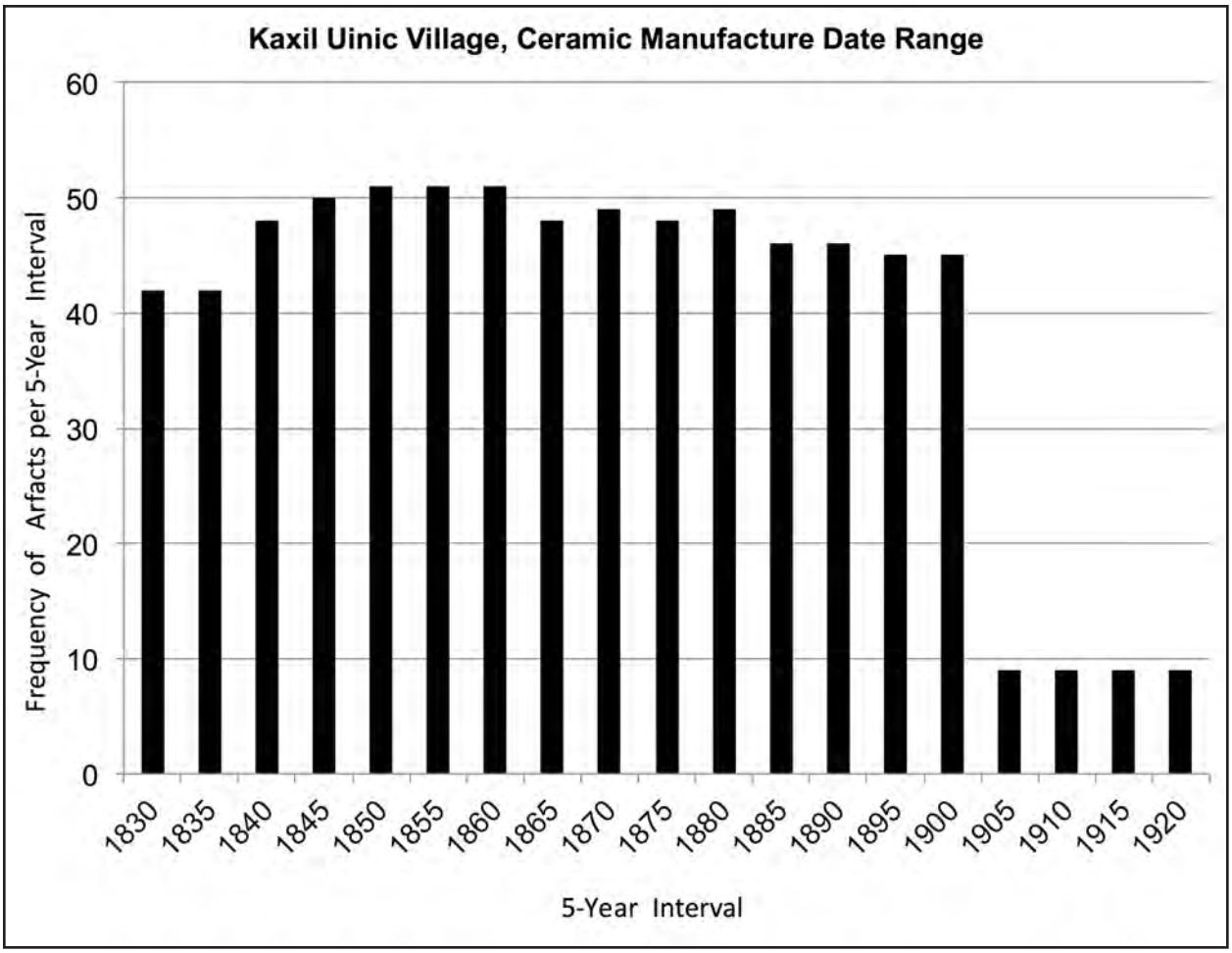

Figure 4.16. Manufacture date range of imported ceramic artifacts.

nineteenth century. Nails were found in Subops KUV-01-B, -C, -D, -G, -V, -Y, -AA, -AB, and -AC, which were all associated with residential components or middens at the site, however, ethnohistoric accounts recount that they were unnecessary in traditional construction methods for Maya houses (Rugeley 2001). Perhaps then, the San Pedro Maya adopted nails in traditional building methods out of convenience. The lack of any flat glass recovered from Kaxil Uinic, which could potentially represent window glass, further indicates that residential structures in the village were constructed in the traditional styles described in ethnohistoric accounts (Rugeley 2001). These nails could have also been used to hang items within a household, such as the hammocks the San Pedro Maya typically slept in.

Cutting tools (i.e., machetes, scissors, knives, axes, etc.), *chiclero* items, gun parts and ammunition, and food service items were also abundant in the metal assemblage. Shotgun shell headstamps identified in the metal assemblage at Kaxil Uinic included Winchester New Rival 16 and 20 gauge (produced from 1897–1929) and a Dominion Cartridge Company of Canada 20-gauge shotgun shell (produced from 1907–1945). Additionally, a single Union Metallic Cartridge Company .44-40 bullet casing (produced from 1886–1912) and shotgun stock (of indeterminate age) were also found. The shotgun shells may be interpreted as evidence of hunting wild game, while machetes may have been used to cut bush surrounding the village, for *chiclero* activities, or to farm (Rugeley 2001:108). Alternatively, the relative lack of

Table 4.11. Metal Overview

Subop or Lot KUV-01-	% Site Distribution (n=993)	Mean Artifact Weight (g)	MNV/ MNO
A	1.80	8.80	1
B	0.70	65.40	3
C	15.21	8.40	8
D	8.96	41.80	13
E	5.14	4.80	4
F	2.62	1.50	0
G	7.45	3.10	5
H	0.81	10.90	1
I	2.52	1.70	1
J	0.60	40.80	3
K	0.81	27.60	3
L	2.52	1.40	0
M	0.40	3.25	0
O	0.50	10.00	0
P-01, -02	4.93	5.20	3
P-03, -04	4.23	1.00	0
R-01	0.30	0.70	0
T	0.10	850.0	1
U	4.63	2.80	5
V	6.95	1.60	14
X	2.52	1.60	4
Y	8.16	17.20	10
Z	0.91	7.80	1
AA	2.82	48.70	18
AB	7.96	25.50	5
AC	2.62	211.70	8
AD	1.01	144.30	4
SF	2.82	1,069.20	22
Total	100.00	50.10	137

arms or ammunition recovered from Kaxil Uinic could also reflect the decreasing ability of the San Pedro Maya to acquire firearms from the British after the Battle of San Pedro, or the fact that firearms were not as desirable among the Maya for hunting game because they were easily destroyed by the jungle humidity and scared away wild game after one shot (Palka 2005:198).

Table 4.12. Metal Vessel and Item Types

Object	Artifacts
Bucket	1
Cans (storage)	13
Chain links	5
Chamber pot	1
Chiclero	10
Construction (nails, screws, etc.)	40
Currency	1
Cutting (machetes, scissors, etc.)	10
Food preparation	11
Food service	10
Gun parts and ammunition	15
Hardware parts	8
Lantern/lamp part	1
Personal hygiene	1
Personal adornment	2
Transportation	2
Total	131

According to Fletcher (Rugeley 2001:108), Caste War Maya villagers farmed using a "cutlass and axe." Several machetes recovered from Kaxil Uinic could have been used for this endeavor, but only one felling axe and a file were found at the site. Alternatively, stone tools may have been used for this traditional endeavor, and there is ample evidence of lithic tool production at Kaxil Uinic in the form of debitage, cores, and bifaces.

Metal food service items appear to have been present at Kaxil Uinic in larger quantities than ceramic ones as indicated by the identifiable vessel forms collected from the site, which is surprising considering the poor preservation of metal artifacts. Cans presumably used for food storage were also abundant in the metal assemblage, although their original contents remain unknown. Can shapes range from rectangular to round, with a few winding keys

present. Other metal artifacts included in this category are: a bottle cap, the lid for an external thread jar, a salt and pepper shaker-style lid, and an additional cap fragment.

Food preparation items recovered from Kaxil Uinic include pots, pans, and grinders. The pots are cast iron tripod pots with rounded lids and small, triangular handles. In addition to the grinder recovered in 2015 (see Bonorden and Kilgore [2015] for artifact description), brand names present on grinders found in 2016 included "Stauffer Eshleman & Co LTD New Orleans LA, Moctezuma" and "Corona Corn Mill Landers Frary & Clark New Britain, USA." Although the manufacture date ranges of these grinders remains unclear, the latter appears in advertisements dating to the early 1900s. These grinders were possibly adopted in place of, or in conjunction with, metates to prepare traditional Maya foods.

Chicle pots would have been used to boil *chicle* to its desired thickness, and their presence at Kaxil Uinic is consistent with descriptions of *chiclero* activities at the site by Thompson (1963) in 1931, and a likely continuation of their presence in the area until the 1940s. *Chicleros* were gum tappers who extracted resin from sapodilla trees for export to the United States for use in commercialized chewing gum (Konrad 1995:97). The large tripod pots exhibit external horizontal ribbing, flared rims, and triangular handles. Two pot fragments from the site are labeled "Cannon," likely produced by the Cannon Iron Foundry, which was known for manufacturing three legged pots used to boil palm oil in west Africa, paralleling the use of "metal cauldrons" for field processing of *chicle* in Belize (Konrad 1995:98). The Cannon Foundry was originally established as the Edward & Stephen Sheldon & Co. Ltd in 1826 in Staffordshire, England, producing cast iron hollowware for colonial markets (Black Country Society 1987:8, 11). In 1884, the company changed its name to the Cannon Hollowware Co. Ltd (Black Country Society 1987:8). In 1900, the company name was again altered, this time to The Cannon Iron Foundries Ltd (Black Country Society 1987:9). The use of either "Cannon" name therefore dates securely to the occupation span of Kaxil Uinic. Additionally a pair of *chiclero* spurs was also found in Subop KUV-01-AB. According to Konrad (1995:100), a *chiclero* would pass a rope around his waist and the trunk of the tree he intended to climb, leaning back against the rope and using the iron spurs attached to his boots to make his way up the trunk, tapping the tree's resin with a machete as he climbed. Unable to determine the manufacture date range for these items, we cannot irrefutably attribute them to the San Pedro Maya occupation of the site. They likely predate 1950, though, because the introduction of synthetic substitutes for sapodilla gum decreased the market demand for this export after World War II (Waddell 1981:22).

Other metal items of note recovered from the site included a small brooch (Figure 4.17) and possibly a rosary or other type of religious pendant depicting a Catholic saint (Figure 4.18). While the brooch serves as further evidence of the presence of women at Kaxil Uinic, the religious pendant indicates that the San Pedro

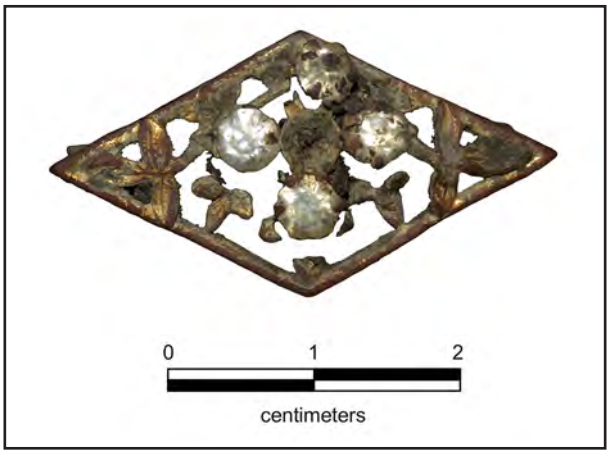

Figure 4.17. Brooch recovered from Subop KUV-01-V (Spec. # KUV2149-24).

Figure 4.18. Religious pendant recovered from Subop KUV-01-X (Spec. # KUV2230-13).

Maya in the village did indeed practice some form of Catholicism.

Shell

Only 14 shell fragments were recovered from the excavations at Kaxil Uinic village, with identifiable types including freshwater bivalves and conch. Land snails were observed during the course of excavations, but not collected. The distribution of shell artifacts at Kaxil Uinic village is illustrated in Table 4.13.

Considering the proximity of the site to the *aguada*, the presence of these shells within Subops KUV-01-D, -F, -H, -I, -AB, and -AC is not surprising. The majority of the shell fragments were concentrated in Subop KUV-01-H (n=4), which was the cross-trench over a three-stone hearth. Bivalves were likely procured for consumption by the San Pedro Maya in the case of Subop KUV-01-H, as the shell fragments were found in denser concentrations between the stones forming the hearth feature. Considering their scarcity in other suboperations, such as Subops KUV-01-AB (n=1) and -AC (n=1) from the 2016 season, it is possible that some shell fragments were part of the naturally occurring landscape. According to Moholy-Nagy (1978:70) and Ng (2007:284-285), the Maya consumed freshwater snails in ancient times as well, which were used in soups, roasted, or ground to create lime for maize processing or pottery temper. Unlike the 2015 season, three modified shell artifacts were recovered from the site in 2016.

A decorative hair comb (Spec. # KUV1968-01) was found in Lot KUV-01-P-02, identified by three remaining comb teeth and the one-sided scroll design present on the solid zone (Figure 4.19). According to White (2005:104, 107), "some combs are gendered artifacts since women wore decorative combs as fashionable elements of dress," becoming "more elaborate elements of fancy garb" at the end of the eighteenth century and into the nineteenth century. Despite such connotations, decorative hair combs could be purchased at general stores for relatively inexpensive prices

Table 4.13. Shell Overview

Subop or Lot KUV-01-	% Site Distribution (n=14)	Mean Artifact Weight (g)	Minimum Number of Objects
D	14.29	Unknown	0
F	7.14	2	0
H	28.58	6	0
I	7.14	1	0
P-02	14.29	3	1
R-05	7.14	24	1
V	7.14	1	1
AB	7.14	1	0
AC	7.14	1	0
Total	100.00	3 (Overall Average Weight)	3

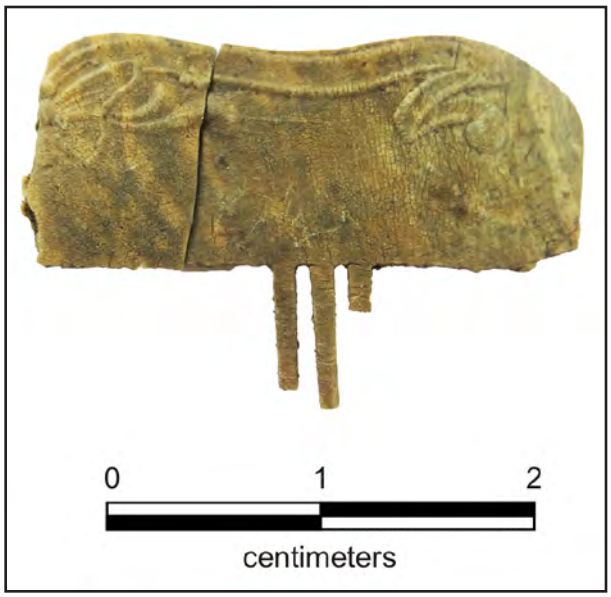

Figure 4.19. Shell comb recovered from Subop KUV-01-P (Spec. # KUV1968-01).

and therefore do not have any implications for actual wealth accumulation, but were often perceived as indicators of status (White 2005:110). According to both Methodist Missionary Fletcher (Rugeley 2001:107) and archaeologist Thomas Gann (1918:19), Caste War Maya women wore cotton *huipils* (loose, short-sleeved blouses) embroidered with floral designs and *piiks* (skirts reaching between the knee and ankle), and either went barefoot or wore loose slippers. Shawls were occasionally worn as headscarves, which Fletcher (Rugeley 2001:107) speculates was an adaptation from contact with the Spanish. Gann (1918:19) indicates that local embroidery was rapidly replaced by cotton manufactured in England and the United States, which had colors and designs stamped into it. Gann (1918:19) also observes that women began wearing imported high-heeled shoes. Based on these accounts, it is not inconceivable that women at Kaxil Uinic similarly adopted hair combs into their wardrobe, possibly as a symbol of status. Prior to the discovery of this hair comb, the single line of evidence for the presence of women within the village was the discovery of a menstrual pain relief bottle in the 2015 field season (Bonorden 2016:372).

A two-hole shell button was recovered from Lot KUV-01-V-01, measuring 1.08 cm in diameter. Based on its relatively small size, the button was likely a shirt or dress button (see White 2005:56). Shell buttons were manufactured across the British colonies (White 2005:71).

A final modified shell artifact recovered from Lot KUV-01-R-05 appears to be a modified conch shell scoop (Figure 4.20). Found on top of a plaster floor in Structure 1, this artifact is associated with the prehistoric component of the site.

Bone

The distribution of faunal remains found at Kaxil Uinic village is summarized in Table 4.14, but does not include the shell artifacts previously discussed. During a one-day consultation, Lori Phillips analyzed the portion of the faunal assemblage that had been processed by the CCAP lab prior to July 1, 2016. Some specimens from certain subops

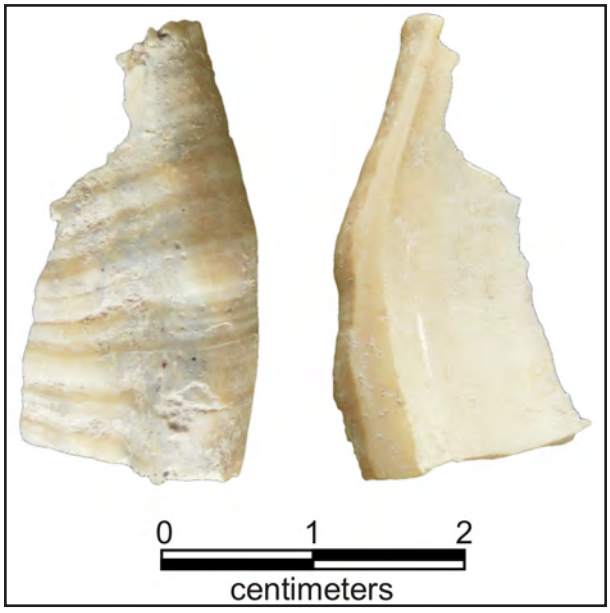

Figure 4.20. Shell scoop found in Subop KUV-01-R (Spec. # KUV2192-01).

Table 4.14. Bone Overview

Subop or Lot KUV-01-	% Site Distribution (n=343)
A	1.46
B	5.85
C	0.29
D	0.29
E	9.65
F	2.05
G	1.75
H	0.88
I	0.88
J	2.63
K	6.73
L	3.22
M	1.17
N	2.92
O	0.58
P-01, -02	3.51
P-03, -04	2.05
R-02	2.05
S	2.63
T	0.29
U	32.75
V	5.56
W-01, -02	1.46
X	0.58
Y	1.76
Z	0.29
AA	4.39
AB	1.46
AC	0.29
AD	0.58
Total	100.00

therefore remain unanalyzed, so mean artifact weights and Minimum Number of Individuals (MNI) calculations are excluded from the table.

The majority of faunal remains recovered from the site was found in Subops KUV-01-B, -E, -K, -U, -V, and -AA. Curiously, of these units, only Subop KUV-01-AA contained a three-stone hearth, which may indicate some sort of behavioral/spatial patterning at Kaxil Uinic. Historical descriptions (Rugeley 2001:107) of Maya domestic spaces state that "the floor ground [was] seldom swept, and pigs, dogs, and fowls [were] allowed to go out at pleasure. Firewood, old bottles, stones, gourds, corn bags, corn sticks, [were] all in confusion." Though these animals were free to roam in domestic areas, archaeological evidence suggests that butchering/discard occurred elsewhere. It is also worth noting that the overwhelming density of faunal material present in Subop KUV-01-U may be due to the fact that these faunal remains are more recent. The area around Subop KUV-01-U was littered with looter trash, so it is possible that these later occupants deposited faunal bones recovered from this subop, which are consequently better preserved than faunal material from the historical occupation of the site. Table 4.15 provides a more in-depth description of the faunal remains collected from the site as described by Lori Phillips.

The presence of pig and bird bone in the faunal assemblage is reminiscent of William Miller's (1887:422) observation that the inhabitants of Kaxil Uinic raised pigs and fowls, but the peccary, deer, and turtle indicate a continued reliance on hunting traditional animals. Freshwater turtles could also be cooked into a soup (Ng 2007:290). The discovery of a horse molar in the collapse debris of Structure 1 (Lot KUV-01-R-02) further indicates that the prehistoric building was revisited in historic times. Similar to observations made by Ng (2007:291) regarding the presence of large mammal bones at Holotunich, it is possible that such faunal remains are related to the transportation of logs from the area after BEC forcibly removed the San Pedro Maya. During the 2015 season, crewmembers located two cart wheel hubs near the *aguada* that may have been part of an apparatus used to transport lumber in the area after the San Pedro Maya were moved

Table 4.15. Faunal Types Observed at Kaxil Uinic Village

Lot KUV-01-	Description	Element	Comments	*n*
A-01	Peccary	Mandible	Fragments.	5
B-02	Mammal	Cranial Elements	Ten pieces, with some refits, of a cranial bone. Likely a medium to large mammal. Meningial grooves internally.	10
B-02	Large Mammal	Mandible	Two pieces refit for one. Portion of the ascending ramus of a large mammal.	2
B-02	Medium Mammal	Long Bone	One piece of shaft fragment of a long bone. No ID marks.	1
B-02	UID Mammal	UID	Three fragments of mammal bone. Small and no ID marks.	3
B-02	Deer	Molars	Two molars from deer. Molar 1 and 2.	2
B-02	Pig	Canine	One lower canine. Likely modern pig due to cross section and curvature.	1
B-02	Bird	Humerus	One humerus shaft of a large bird, possibly turkey or crax.	1
C-01	UID Mammal	UID	One piece of long bone, possibly distal radius.	1
D-02	Mammal	Canine	One piece of canine, missing the root. Possibly upper canine of peccary due to anterior wear facet.	1
E-02	Pig (Peccary?)	Mandible	Pieces refit for one mandible. Possibly Tayassu due to generally less robust size of M3 when compared to M3 from KUV1638. Molars 1-3, Premolar 3-4 retained. Adult due to presence of Molar 3 but not very old because occlusal wear is minimal.	33
F-02	Turtle (River)	Carapace	Three Pieces refit for one. Thick carapace. One side burnt.	3
F-02	Pig (modern)	3rd Molar	One element. Wider at labial end and tapers as it moves distally. Part of cranial bone still attached to roots. Occlusal surface is worn but no dentine is visible, so adult but not very old.	1
F-02	Bird (Small)	Tibiotarsus	One piece. Distal end of a tibiotarsus. Very thin and small, so a small bird possibly water fowl?	1
F-02	UID Mammal	UID	Two fragmented pieces of likely mammal bone. No ID features, modifications, or burning.	2
G-01	Large Mammal	UID	One piece of large cortical bone with medullary cavity, so possibly a long bone. No ID features.	1
G-01	Medium Mammal	Femur	One shaft fragment of a medium mammal femur, possibly dog?	1
G-01	UID Mammal	UID Fragments	Two fragments of cortical bone with medullary cavity so possibly long bone fragments. No ID features.	2
G-01	Small Mammal	Long Bone	One piece of small mammal long bone shaft fragment, burnt. No ID features.	1

Table 4.15. Faunal Types Observed at Kaxil Uinic Village (continued)

Lot KUV-01-	Description	Element	Comments	*n*
G-01	Micromammal	Humerus	One piece of the distal end of a micromammal (mouse?) humerus	1
H-01	Unknown	Unknown	Unanalyzed	3
I-01	Unknown	Unknown	Unanalyzed	3
J-02	Unknown	Unknown	Unanalyzed	9
K-01	Turtle	Shell	Fragments	23
L-01	Unknown	Unknown	Unanalyzed	11
M-01	Large Mammal	Long Bone	Fragments	2
M-01	Large Mammal	Premolar		1
M-01	Bird	UID		1
N-01	Medium-Large Mammal	Long Bone	Fragments	3
N-01	Bird	Ulna		1
N-01	Bird	Sternum		1
N-01	Bird	Sacrum		1
N-01	Peccary	Mandible	Three molars present	1
N-01	Possible Domestic Pig	Molar		1
N-01	Possible Domestic Pig	Canine and Incisor		2
O-01	Large Mammal	Long Bone	Fragment	1
O-01	Possible Domestic Pig	Molar		1
P-02	Large Mammal	Ulna		5
P-02	Large Mammal	Sacrum		6
P-02	Large Mammal	Incisor		1
P-03	Deer	Molar		1
P-03	UID			4
P-04	UID			1
P-04	Peccary	Molar		1
R-02	Small-Medium Mammal	Metatarsal/ Metacarpal	Fragment	1
R-02	Horse	Molar		1
R-02	Large Mammal	Vertebra		1
R-02	Deer	Tibia		1
R-02	Deer	Metatarsals		3
S-01	Bird	Tibiotarsus		1
S-01	Bird	Humerus		1
S-01	Bird	Sacrum/ Vertebra		3
S-01	UID			2

Table 4.15. Faunal Types Observed at Kaxil Uinic Village (continued)

Lot KUV-01-	Description	Element	Comments	*n*
S-01	Possible Domestic Pig	Molar		1
S-01	Possible Domestic Pig	Hip	Fragment	1
T-01	Unknown	Unknown	Unanalyzed	1
U-01	Bird	UID		5
U-01	Armadillo	Band	Fragments	17
U-01	River Turtle	Carapace		2
U-01	Small-Medium Mammal	Radius		1
U-01	Medium-Large Mammal	Tibia		1
U-01	Small-Medium Mammal	Ulna		1
U-01	Small Mammal	Distal Tibia		1
U-01	Small-Medium Mammal	Metatarsal/ Metacarpal		1
U-01	UID			78
U-02	Medium Mammal	Crania	Fragments	5
V-01	Large Mammal	Mandible	Premolar and canine intact	7
V-02	Large Mammal	Long Bone	Fragments	10
V-03	Armadillo	Shell/Band	Fragments	2
W-01	River Turtle	Carapace		2
W-02	River Turtle	Carapace		3
X-02	Unknown	Unknown	Unanalyzed	2
Y-01	UID			1
Y-01	Medium-Large Mammal	Long Bone	Fragments	2
Y-01	Large Mammal	Distal Tibia Epiphysis		1
Y-02	Large Mammal	UID		1
Y-02	Medium-Large Mammal	Long Bone	Fragment	1
Z-01	Medium-Large Mammal	Long Bone	Fragment	1
AA-01	Small-Medium Mammal	Long Bone	Fragments	15
AB-01	Medium-Large Mammal	Long Bone	Fragments	5
AD-01	Unknown	Unknown	Unanalyzed	2

from the village in 1931, or as part of a mule train used in the extraction process of *chicle* (see Konrad 1995:98), further supporting the theory that large mammal bones at the site may have been related to commercial transportation. According to Witschey (2016:156), the ancient Maya also used turtle and armadillo shells to make bowls or instruments, so it is possible that the remains recovered from Kaxil Uinic were utilized for purposes other than consumption.

Two bone buttons were also recovered from Lots KUV-01-P-03 (Figure 4.21) and KUV-

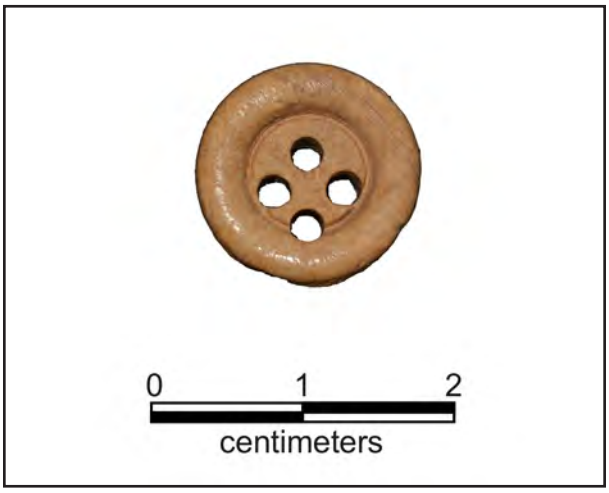

Figure 4.21. Bone button recovered from Lot KUV-01-P-03 (Spec. # KUV2045-01).

01-AC-01. These four-hole buttons have diameters of 1.43 cm and 1.45 cm respectively, demonstrating a somewhat uniform size. These fasteners were probably produced locally.

Lithics

The distribution of lithic artifacts from Kaxil Uinic is illustrated in Table 4.16. As is the case with locally-produced ceramics, it is difficult to assign lithic artifacts to the historic occupation at the site with any confidence due the fact that many of these artifacts are likely prehistoric in age. Due to time constraints, not all lithic artifacts were analyzed during the 2016 season of the CCAP, and mean artifact weights are therefore excluded from this table. Lithic artifacts were concentrated most densely in Subops KUV-01-C, -G, -K, and -AB. The high percentages of artifacts in Subop KUV-

Table 4.16. Lithics Overview

Subop or Lot KUV-01-	% Site Distribution (n=1,527)
A	2.88
B	4.45
C	6.55
D	2.16
E	4.45
F	0.59
G	14.93
H	4.72
I	1.77
J	5.24
K	9.43
M	1.05
O	0.46
P-01, -02	0.26
P-03, -04	1.38
P-05, -06	0.13
P-07	0.06
R-01	0.26
R-02	0.72
R-05	0.06
T	0.39
U	2.82
V	5.50
W-01, -02	0.79
X	5.44
Y	4.52
Z	3.67
AA	5.70
AB	6.02
AC	2.49
AD	0.79
SF	0.32
Total	100.00

01-K may be attributed to its size (2 x 6 m) and the use of exhausted cores to construct the platform over which the subop was placed. Subops KUV-01-C and -G contained three-stone hearths, indicating that these subops represent a domestic component of the site, while Subop KUV-01-AB was placed in close proximity to two rock features (the three-stone hearth in Subop KUV-01-AA and the semi-circular rock feature in Subop KUV-01-AC), implying that the subop was placed in a domestic component of the site as well. Lithic artifacts were primarily produced from chert, chalcedony, limestone, granite, and obsidian.

Lithic artifacts found at Kaxil Uinic include debitage, metates, manos, cores, bifaces, obsidian blades, obsidian chunks, an arrow point, and other chert tools (Table 4.17). A polished stone ball of unknown function and piece of ochre were also recovered from the site.

Flakes associated with lithic tool production (i.e., debitage) are the most common form of lithic artifact type recovered from Kaxil Uinic. Flakes are primarily made of chert, but quartztite and chalcedony are also observed among the pieces of debitage. Multiple flakes exhibit evidence of burning.

Table 4.17. Lithic Artifacts at Kaxil Uinic Village by Form

Description	Artifacts
Arrow Point	1
Biface	14
Core	24
Debitage	1,437
Hammerstone	3
Mano	4
Metate	16
Obsidian Chunk	2
Obsidian Blade	16
Ochre	1
Polished Stone	1
Scraper	3
Utilized Flake	1
Unanalyzed Lithic Tools	3
Total	1,510

Cores were concentrated in Subops KUV-01-K and -Y, used as construction fill for the platforms within these units. One core was recovered from Subop KUV-01-B, three from Subop KUV-01-M, and three from Subop KUV-01-R. Cores recovered from the site are either multidirectional, unidirectional, or bifacial, and made of chalcedony or chert.

Similarly, bifaces were also concentrated in Subops KUV-01-K and -Y in greater numbers than any other subops, possibly representing a trend in platform construction/activity areas. Bifaces were also recovered from Subops KUV-01-B, -P, -R, and -U in smaller numbers. Bifaces are oval-shaped or general utility tools with the exception of a thin, laurel-leaf biface from Lot KUV-01-P-06. All bifaces are made from either chert or chalcedony.

Although numerous obisidian blade fragments were recovered from Kaxil Uinic, there does not appear to be any distinct patterning in their distribution, as they were found in numerous excavation units across the site. Hammerstones and scrapers were more densely concentrated in Subop KUV-01-Y, where the proximal fragment of a side-notched obsidian arrow point was also found (Figure 4.22). Metate fragments were dispersed across the site, but most notably in Subops KUV-01-Y and -AA. Metate forms include basin-shaped, and slab produced from granite, limestone, sandstone, and quartzite. Manos are plano-convex or square in shape, manufactured from limestone and granite (see Kilgore, this volume). These groundstone artifacts appear to have been utilized contemporaneously with historic artifacts found within each subop for similar purposes (such as grinders).

Figure 4.22. Side-notched obsidian arrow point recovered from Subop KUV-01-Y (Spec. # KUV2417-02). Note, the lines visible in the artifact are from graph paper behind the arrow point.

Miscellaneous

Three miscellaneous artifacts were found in Subop KUV-01-F during the 2015 season. These items included an object of unknown material type with a coarse gold metallic patina (probably a glass shard) and a nickel cadmium battery. The battery generally dates from 1893 to 1909. A small green bead on a thin piece of wire (possibly from a necklace or bracelet) was recovered from Lot KUV-01-V-02. The bead is probably made from Bakelite, an early plastic resin popular in costume jewelry from the 1920s to 1940s (Collectors Weekly 2007).

DISCUSSION AND CONCLUSIONS

The overarching research questions for the 2016 season at Kaxil Uinic were to address how Maya participation in the colonial economy changed during the late colonial period (ca. 1872–1900), if the Maya maintained their traditional religion or adopted aspects of colonial religious practices, and if the Maya were indeed incorporated into the colonial social and economic superstructure of the British enterprise in Belize. Based on the results of our research and excavations, it appears that colonial legislation prohibited the San Pedro Maya from owning land in Belize, and so the villagers actually paid rent to the BEC for use of their land (FM, Telegram, September 15, 1930). The residents thus turned to wage labor as *chicleros* to participate in the cash economy of British Honduras so that they could pay rent to BEC, yet it appears that they might have only done so long enough to acquire the required cash for their immediate needs (see Rugeley 2001:172); a revelation that further underscores their effort to maintain economic autonomy in the face of external pressure. The features and artifacts (three-stone hearths, nails, spurs, pots, etc.) found in association with Subops KUV-01-C, -D, -Z, -AA, -AB, -AC, and -AD suggest that *chicle* production was concentrated within the residential areas of the site.

Since *chiclero* work left the San Pedro Maya with less time to pursue traditional endeavors, such as pottery making, farming, weaving, etc., many locally-produced items appear to have been replaced by English and/or American substitutes at Kaxil Uinic, including food serving/preparation vessels, hand mills, and machetes. As noted by Ng (2007:28), however, "the incorporation of European goods does not simply equate with an embrace of European values," or "incorporation" into the capitalist colonialist social structure of British Honduras as described by Bolland (2003:111). At Kaxil Uinic, it appears that most of the items purchased from colonial merchants were used in the perpetuation of local practices (just more efficiently), namely foodways, which were markedly different from the customs of other groups in the colony (Church et al. 2011:188). Unable to dedicate time to the production of local goods, the residents of Kaxil Uinic chose to selectively participate in the colonial economy of British Honduras as it suited their needs (Yaeger et al. 2004:110), but the predominance of cheaper enamelware vessels

at the site in comparison to the large number of imported ceramic vessels at other, earlier San Pedro Maya villages indicates that the ability to purchase the latter may have diminished somewhat in the latter years of the late colonial period.

The San Pedro Maya were not, however, fully integrated into the British colonial economy. Conversely, they strategically interacted with logging firms, *chicleros*, and the colonial administration in order to gain access to imported goods and cash necessary to maintain their social, political, and economic autonomy. As noted by Ng (2007), the San Pedro Maya made such decisions both individually and communally, in ways sometimes inconsistent with the beliefs of their larger group, in order to survive. The archaeological record at Kaxil Uinic therefore reflects a focus on short-term gains versus long-term benefits or consequences, appearing contradictory at first glance. San Pedro Maya identity was thus strategically and opportunistically negotiated throughout the late colonial period to adapt to the ever-changing sociopolitical climate in British Honduras.

As for observations on whether the Maya maintained their traditional religion or did adopted colonial religious practices, archaeological evidence again presents a slightly contradictory narrative. On one hand, the discovery of historic *incensario* fragments at the base of a stela associated with the prehistoric ruins of Kaxil Uinic (Structure 3) suggests that some sort of colonial monument veneration was carried out by the inhabitants of the historic village. On the other hand, the discovery of a religious pendant at the base of a prehistoric building within the perimeter of the village allows for some speculation as to the influence of Spanish Catholicism among the San Pedro Maya. Miller and Farriss (1979:239) theorize that the Maya likely accepted Christianity on their own terms, not as a totally new religion, but as a new development or twist to what they already believed, as the concept of resurrection was not unknown to Maya cosmology. It is therefore likely that the inhabitants of Kaxil Uinic village did not think of themselves as incorporating new elements of Catholicism so much as practicing their traditional religion with new objects and symbols borrowed from Christianity along previously-established lines.

A final perplexing observation of the archaeological evidence recovered from Kaxil Uinic is the general lack of correlation between artifacts and activity areas. Historical accounts illustrate that "the floor ground [in San Pedro Maya homes was] seldom swept, and pigs, dogs, and fowls [were] allowed to go out at pleasure. Firewood, old bottles, stones, gourds, corn bags, corn sticks, [were] all in confusion" (Rugeley 2001:107). The distribution of artifacts recovered from the site support such descriptions, as the only definitive correlations made during the course of excavations related to artifact density rather than artifact variety. Areas containing prehistoric features or occupied by later looters had markedly lower historic artifact densities than historic middens or residential areas. The artifact differences between areas within the historic component of the site, however, was negligible.

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Landscape-Level Mapping with Drones at Wamil and Laguna Seca

Mark D. Willis

We have been flying Unmanned Aerial Vehicles (UAVs), also known as drones, to map archaeological sites in Belize for several years (Harrison-Buck et al. 2015, 2016; Sandrock and Willis 2014). However, 2016 was the first year the UAVs were regulated by the Belizean government, and we were among the first to navigate these new rules. UAVs are regulated by Department of Civil Aviation. Obtaining as permit was a fairly simple affair that involved an application prior to entering the country and $30 BZ fee due upon arrival. Among other rules, the permit requires that the UAV be flown 200 feet or less above ground level and within Visual Line-of-Sight (VLOS). The main objective of our project was to safely work within these guidelines while using the UAVs to map two large areas of interest in the Belize Estates Archaeological Survey Team's (BEAST) permit area. The first area is located at Gallon Jug and encompasses approximately 14 km2 of mostly cleared and open pasture. We called this area the Wamil Study Area (WSA) based on the topographic map's label for the pasture (Figure 5.1). In contrast to WSA, the second project area is centered on the long and narrow Laguna Seca hydrological feature about 6 km north of Gallon Jug. Appropriately enough, we referred to this as the Laguna Seca Study Area (LSSA) (see Figure 5.1).

EQUIPMENT USED

Drones

Two fixed-wing Skywalker UAVs were used for this project. The Skywalker drone is made of foam, has a wingspan of about 1.8 m, and is battery powered using an electric motor for propulsion. The Skywalker looks similar to a small airplane. Each drone was furnished with a PixHawk autopilot for autonomous flight. The Skywalker can carry up to 6 kg and has a flight time of about 1.5 hours under optimal conditions. The payload area was modified to have a trapdoor that a camera was mounted into. This allowed for a camera to be sealed and protected inside the drone during launching and landing, but, with the trapdoor to open, allowed for photo acquisition during flight.

Cameras

Visual Spectrum

A Samsung NX2000 was the camera used for all mapping within the WSA. This inexpensive camera has a 20.3 Mb resolution sensor and can be outfitted with different, interchangeable lens. This camera was used to create an extremely high-resolution photomosaic of the WSA. This Google Earth-like imagery can be explored and analyzed in any Geographic Information System (GIS).

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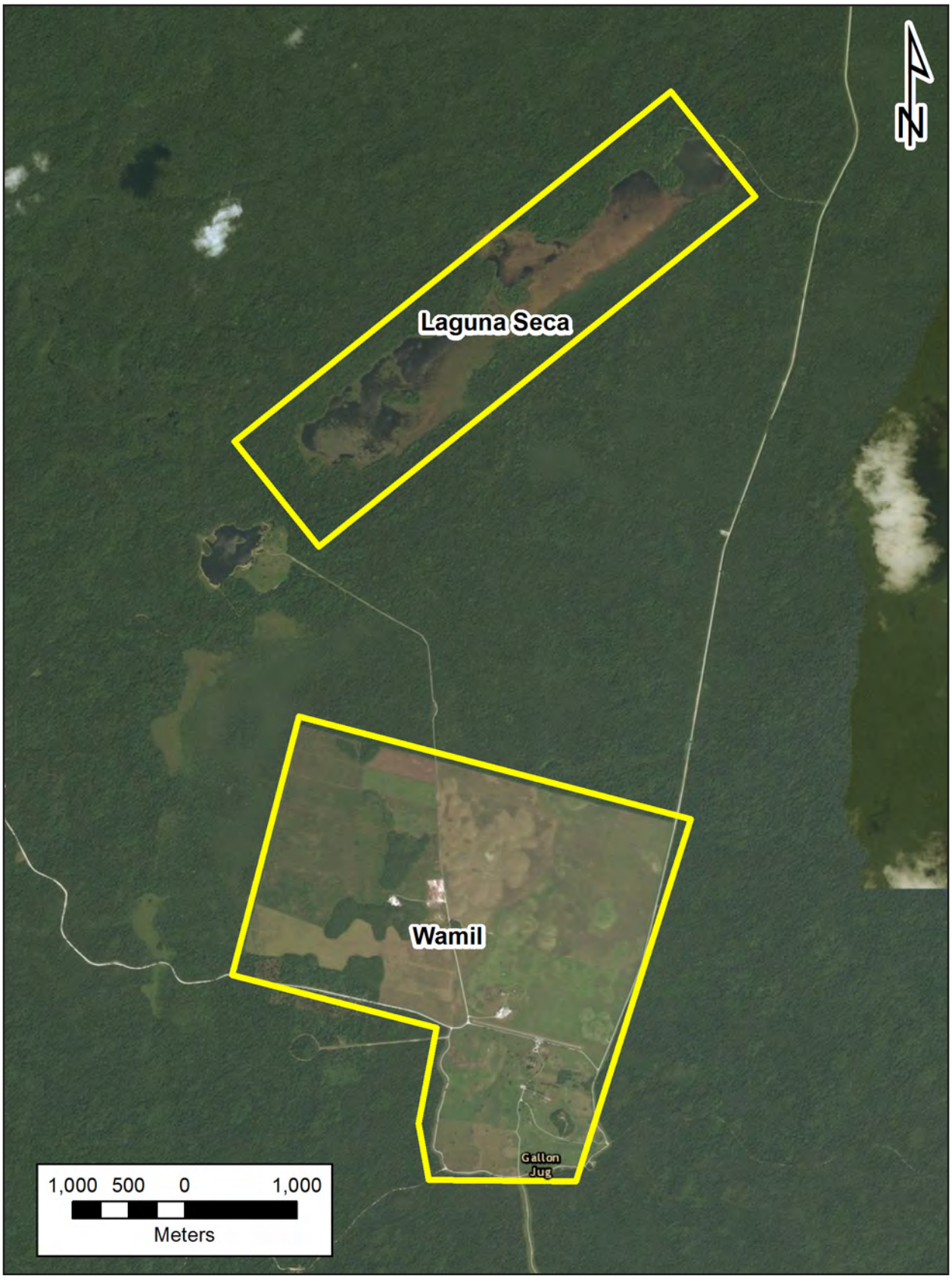

Figure 5.1. Wamil and Laguna Seca study areas.

NIR

In addition to the standard visual spectrum camera, we used a Multispek Near-Infra Red (NIR) digital camera. The Multispek has a somewhat low resolution of 8 Mb but has a special modified sensor that allows for it to record light in the NIR wavelength. This wavelength can help identify areas of stressed or particularly verdant vegetation that may not be visible to the human eye. As we flew the drones at the end of the dry season, the point of using this camera was to identify possible prehistoric structural patterns that may be more evident when the jungle was stressed for moisture. The NIR camera was used only at the LSSA. Similar to the Samsung NX2000 mentioned above, the resultant data gathered by the Multispek can be mosaicked and imported into a GIS.

Data from both cameras were also processed using Agisoft's Photoscan software to produce extremely high resolution Digital Terrain Models (DTM). Photoscan uses Structure from Motion (SfM) technology to determine the three-dimensional shape of the ground based on comparisons between multiple overlapping photographs. This technology has been discussed in depth in Willis et al. (2016).

METHODOLOGY

Prior to field activities, several photography missions were planned using the open source Mission Planner software. This software provides an interface that allows the user to draw a series of polygons to define photo survey areas. The software then plans the most efficient flight needed to photograph the area using a series of overlapping and parallel flight transects. This plan is saved as a flight mission. Once in the field, the drone is assembled and the missions are loaded into the drone's autopilot system. The camera is placed into the drone. The drone is then launched by physically throwing the machine into the air. Once aloft, the autopilot takes command of the aircraft and begins flying the mission and taking photographs. During this process, the aircraft is monitored both visually and electronically. The drone can be called home or flown manually, should the need to override the autopilot arise. With a mission complete, the drone lands itself, the remote pilot retrieves it and downloads the photographs, adds fresh batteries and then the drone is ready for another mission.

At the end of the day, all telemetry data are retrieved from the drone. The telemetry information is merged with digital photographs to provide GPS locations for each photo. Having the GPS locations for the photos allows the imagery to be georeferenced within the SfM software.

FOLLIES

Every drone will at some point crash. It is just a fact of the current state of the technology. For us, the crash happened on the very first flight of the Skywalker drone. The weather was nice and winds perfect for a good day of aerial photography. The drone was inspected, tested, and appeared to be functioning properly. After loading the camera and uploading the first mission, the drone was launched. It flew perfectly for about 120 seconds but, after making a 180-degree turn and flying for another 200 m, the vehicle suddenly plunged from the air. It spiraled into the ground at top speed. On impact the battery powering the drone slammed through the fuselage and the digital camera. This caused the battery to ignite and the drone to melt into a pile of goo and burnt electronics (Figure 5.2). The drone and camera were completely destroyed. This amounted to losing about $5,500 US in equipment. Since that was the only drone we had, a return trip to the States was made, a new drone and camera were purchased and brought back into Belize

Figure 5.2. The smoldering remains of the drone after crash.

to finish the project. The cause of the crash was never determined.

RESULTS

Wamil Study Area

Nearly 14 km^2 of area were mapped at the pastures in and around the WSA (Figure 5.3). The area was once covered by jungle and was cleared for logging and the creation of the Gallon Jug community and related enterprises. Today the area is clear of most tall vegetation, dotted with a few hills, and covered in grasses. The exceptions to this is western part of the project area which is a coffee plantation and a few scattered "islands" of remnant jungle. With so much of the WSA free of tall vegetation, creating a high-resolution elevation model of the area's ground surface was possible. We accomplished this by flying many missions over the area with a standard digital camera pointed straight down from the drone, capturing a total of 4,336 photos. These were processed in SfM software to produce a DTM with a ground resolution of 20 cm (Figure 5.4). In comparison, the best publicly available elevation data for this area has a resolution of about 30 m. Having the custom elevation data from the drone allows for much finer details of the ground's topography to be seen.

Within the data several prehistoric structures are visible but it must be said that many of these are obvious to an observer on the ground (Figure 5.5). We had hoped that the data would reveal ephemeral remnants of structures in the area like those identified at Saturday Creek (Harrison-Buck et al. 2016), but either they do not exist, clearing of the pastures erased their presence, or the grasses present in the area are tall enough to obscure their existence in the data. It would be worthwhile to remap portions of WSA should the grasses be burned off or mown for comparison.

In terms of historic cultural resources, the data clearly show the bed of the old railroad that once connected Gallon Jug to Hillbank, on the New River Lagoon. The railroad, built by the Belize Estate and Produce Company, was used to haul cut logs from Gallon Jug to the southern end of the lagoon; from there the logs were floated to the Caribbean and then to Belize City (Alan Jeal, personal communication, 2016). The railroad bed is clearly visible, snaking its way across the southern end of the WSA (Figure 5.6).

Laguna Seca Study Area

Laguna Seca is a low wet area located about 6 km north of Gallon Jug. A series of missions was flown over Laguna Seca with a Multispek NIR camera to identify potential prehistoric archaeological structures, agricultural fields, and canals (Figure 5.7). The mapping covered an area of 6 km northeast/southwest and 0.8 km

Figure 5.3. Imagery gathered at Wamil study area.

northwest/southeast and involved 1,428 photos. From the NIR imagery a normalized difference vegetation index (NDVI) was created (Figure 5.8). NDVI helps show the relative amount of green leafy vegetation that is present in an area.

After careful inspection, one linear anomaly stands out in the NDVI data. It is present in a wet area in the northern part of the Laguna Seca feature and is approximately 250 m long. In Figure 5.9, the top image is in the normal visual spectrum and has no identifiable anomaly, while the bottom image is NDVI and shows a long north/south linear features. The anomaly was initially thought to represent a prehistoric canal or a *sacbe* extending south from the prehistoric site of Laguna Seca (BE-6), but because it is so straight and runs in north-south we thought it might be a modern feature. After communicating with Alan Jeal (personal communication, 2016), it is apparent that the feature is the property line between

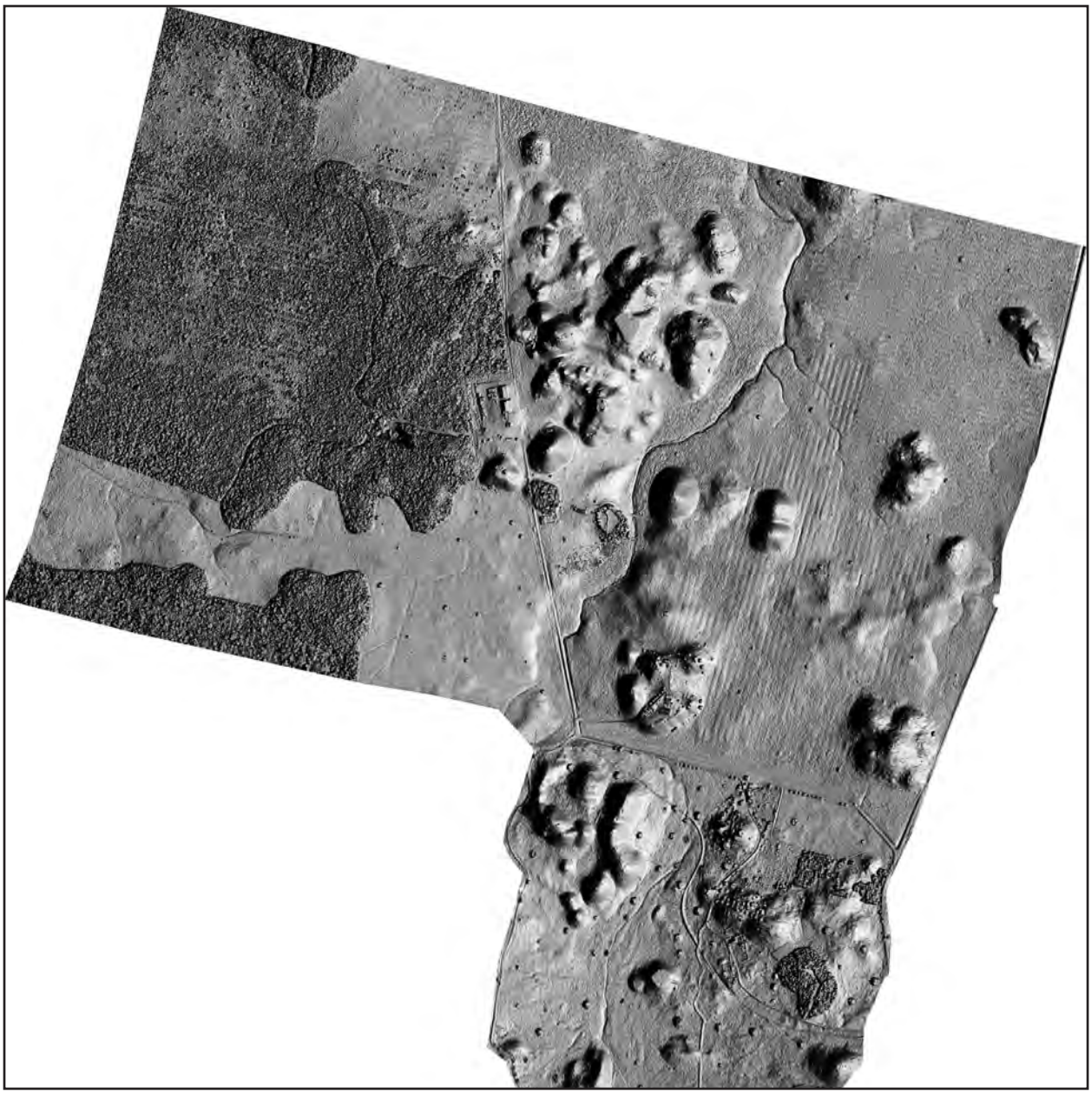

Figure 5.4. Digital Terrain Model of Wamil Study area.

Laguna Seca Ranch and Gallon Jug Ranch. Other shorter anomalies were noted but were not very convincing to be prehistoric or of non-natural origin.

LESSON LEARNED AND FUTURE POTENTIAL

The major lesson learned, from a drone operator's perspective, is to always bring a spare drone when working in a remote area. Time and money could have been saved had a second drone been available after the initial crash. From an archaeological perspective the use of drones for mapping large areas has huge potential in Belize and beyond. In the case of the WSA we were able to map a large area quickly, and prehistoric structures are visible in the data. The process allowed us to create a

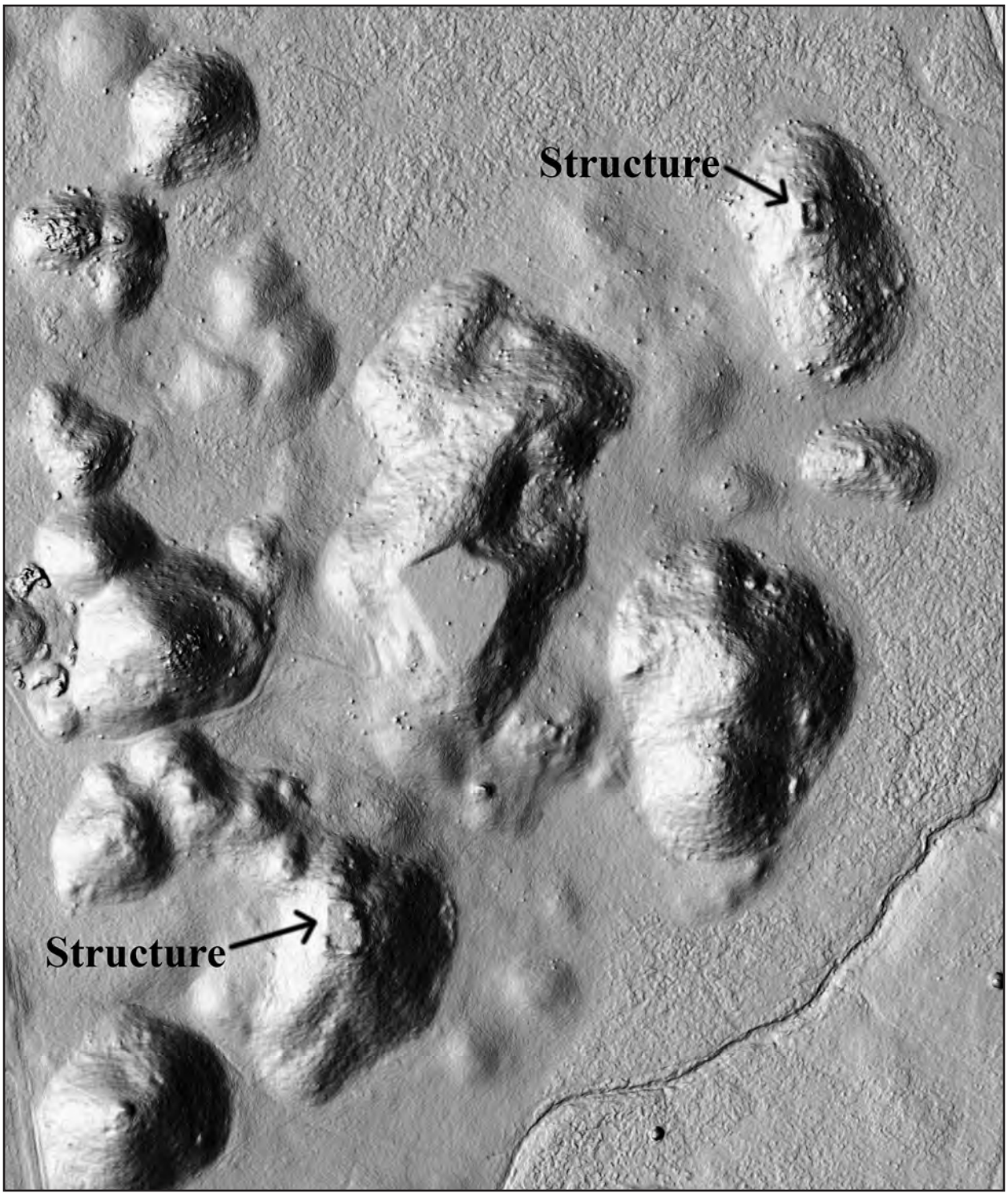

Figure 5.5. Detail of north central portion of digital terrain model showing potential archaeological structures (courtyards).

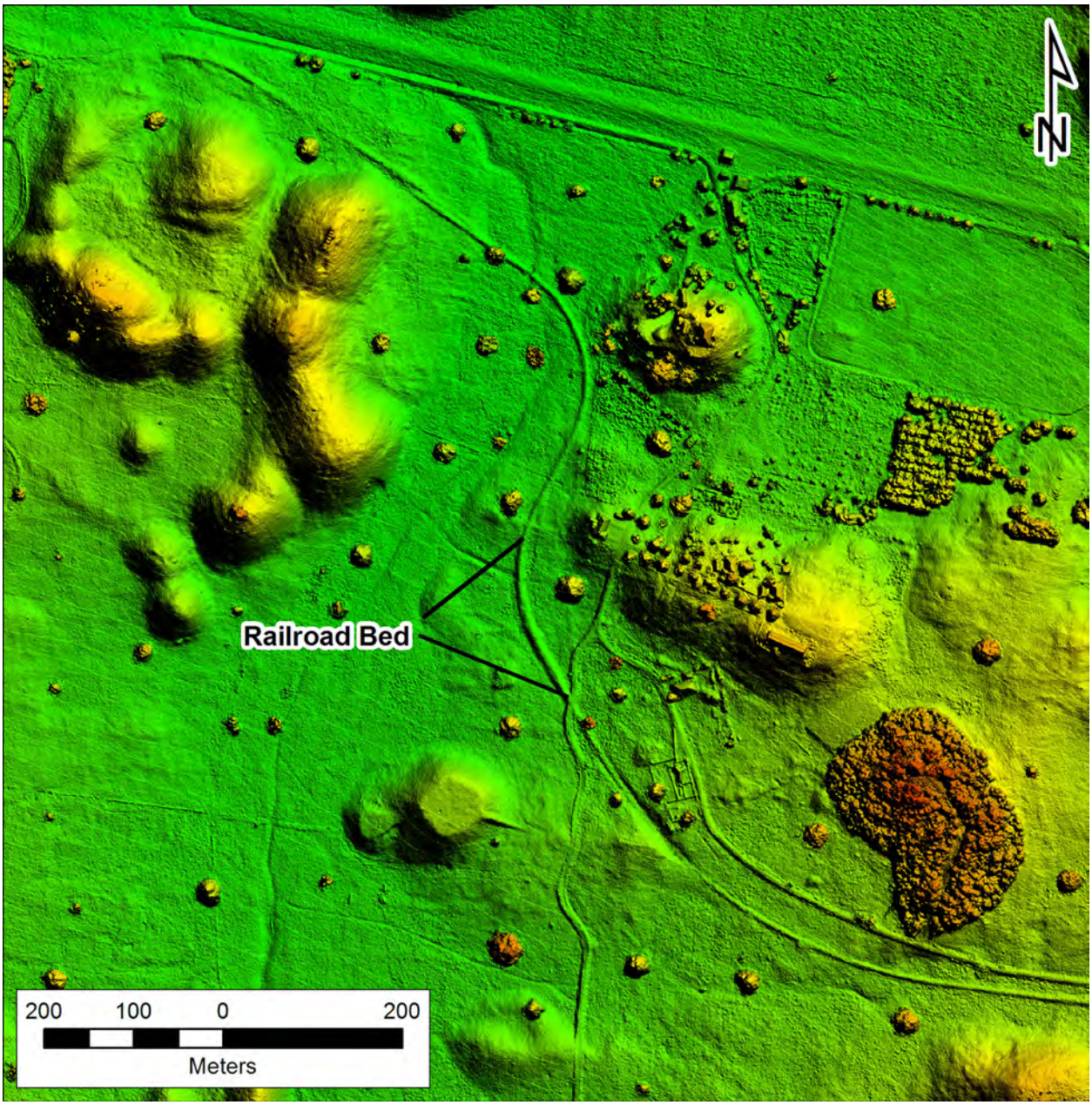

Figure 5.6 Historic railroad bed in the DTM data.

high-resolution 3D map of area that can help guide future work in the area.

The NIR data collected at Laguna Seca was less interesting in some ways but did identify an anomaly that was not visible in the normal visual spectrum. Unfortunately, the anomaly is a modern survey line marking the boundary between two properties.

Future drone research should be focused on mapping large expanses of jungle in and around Chan Chich and Gallon Jug. Without affordable LiDAR options, photogrammetry still allows for the vegetation canopy to be mapped very accurately. It is likely that the changes in canopy height as it relates to the ground level may still allow for larger Mayan structures to identified. In other words, the height of the vegetation should reflect the height of the ground beneath

Figure 5.7. NIR imagery at Laguna Seca.

it in many cases. While theoretical, this approach may be the most beneficial use of the technology at Gallon Jug and Chan Chich in the near future. This sort of data may also have ancillary benefits to biologists and foresters in the sustainable management of the resources in the area. Furthermore, the use of NIR imagery on the canopy might reveal differences in vegetation growing on mounds versus vegetation growing on natural ground surface. Similar research, using NASA's Airborne Synthetic Aperture Radar, successfully identified structures in northeastern Guatemala based on vegetation color and reflectivity. The researchers concluded that "the lack of moisture and nutritional elements inside the

ruins kept some plant species at bay, while others were discolored or killed off altogether as disintegrating plaster changed the chemical content of the soil around each structure" (Roy 2006). While this method would not result in useable site maps, it could be used to identify the location of previously unknown structures or sites in unsurveyed areas.

Figure 5.8. NDVI imagery at Laguna Seca.

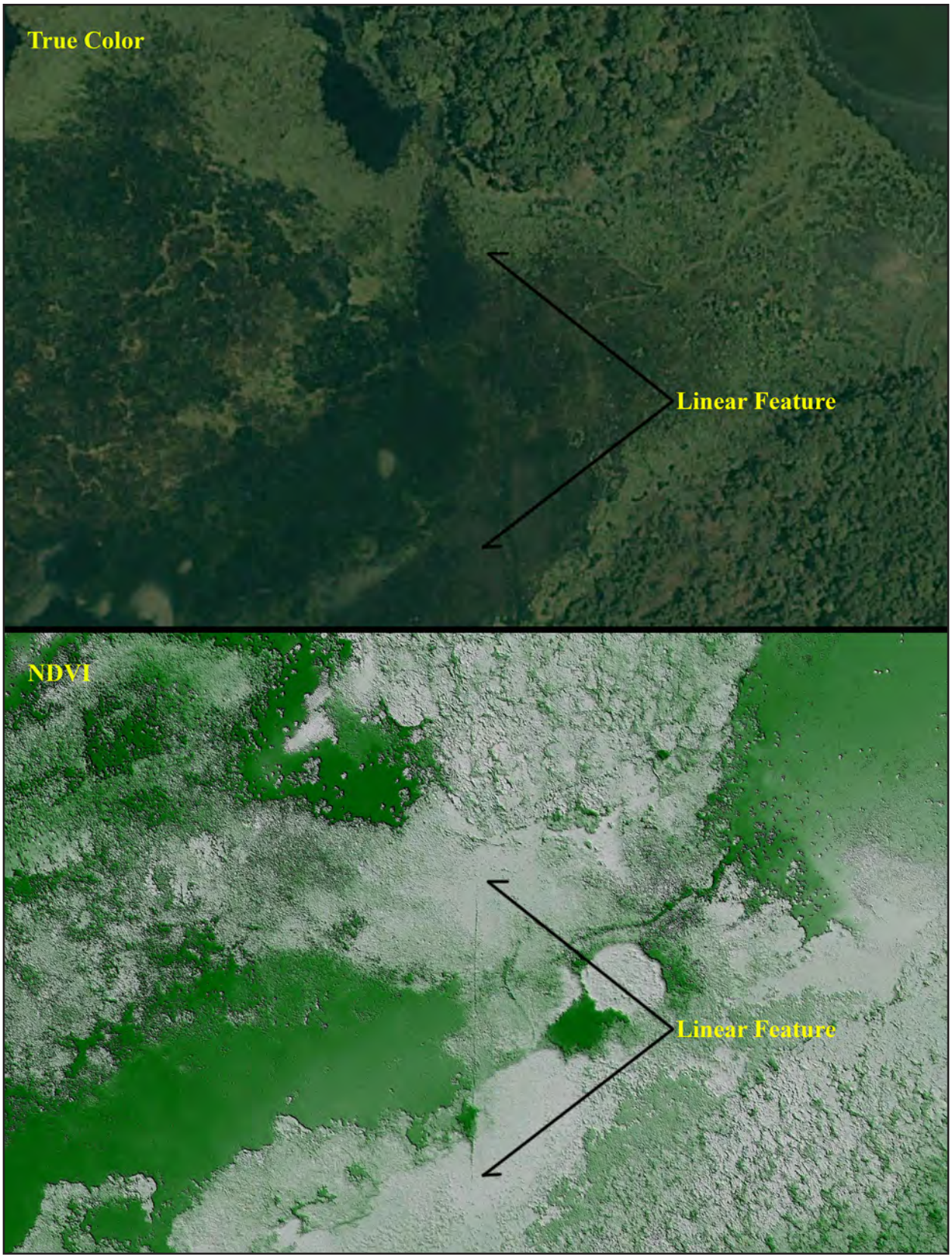

Figure 5.9. Linear anomaly in Laguna Seca invisible in the visual spectrum (top) but clearly identifiable in the custom NDVI data (bottom).

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An Update on Ground Stone Artifacts from the Chan Chich Archaeological Project and the Belize Estates Archaeological Survey Team

Gertrude Kilgore

Artifacts from the ground stone industry represent 130 items collected by the Chan Chich Archaeological Project (CCAP) and Belize Estates Archaeological Survey Team (BEAST) since 2012. The ground stone industry consists of any stone items that are either manufactured using abrasion, pecking, or polish techniques, or used for grinding, polishing, percussion, or abrasion (Adams 2002). Following the method established by Payson Sheets (1978) at Chalchuapa, only objects that exhibit polish from use, as is common with some manos and metates, are included in this category. However, not all ground stone artifacts must exhibit polish from use to fit the categorical definition. Due to differences in their polishing technologies, other artifacts with intentionally smoothed surfaces are classified under the "polished stone" industry (Garber 1989).

Since the previous report chapter on ground stone artifacts collected by the CCAP was published (Glaab and Valdez 2000), archaeological investigations in the region have expanded geographically, temporally, and thematically. Over the past six seasons, CCAP continued examinations of the Upper Plaza (Operations [Ops] CC-10, CC-12, and CC-15) and Norman's Temple complex (Op CC-16), and explored Structure A-5 (Op CC-11), the Back Plaza (Op CC-13), and processional architecture (Op CC-14) associated with the Eastern and Western Causeways (Houk, Project Lists, this volume). These seven operations recovered 107 ground stone artifacts. Since its inception in 2013, BEAST conducted research on the surrounding ancient and historic sites in the permit area. The four BEAST operations collected 23 ancient and historic ground stone artifacts in three of the sites investigated (Kaxil Uinic, Kaxil Uinic Village, and Qualm Hill Camp). In total, these six field seasons yielded an additional 130 ground stone artifacts, including some new forms and subforms.

These 130 objects fall into seven descriptive or functional categories, called "forms" (Table 6.1). Seventy-two are metate fragments. With nine complete specimens and 42 fragments, manos represent 51 artifacts. Spindle whorls and stone disks each have two complete specimens respectively. The bark beater, hammerstone, and spheroid forms each have one complete specimen. The criteria for the classification of each artifact into these categories are explained in greater detail later in this chapter.

Using comparative data from other sites located in the Maya lowlands and references to recent developments in the study of ground stone artifacts, the purpose of this chapter is to update documented information on material types, forms, and subforms of ground stone

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Table 6.1. Provenience Data for All Ground Stone Artifacts Found by CCAP and BEAST from 2012–2016 Arranged by Site and Lot

Spec. #	Lot*	Lot Type	Form	Subform	Raw Material
CC0121-01	CC-10-C-8	Floor	Spheroid	---	Limestone
CC0076-01	CC-10-E-2	Construction Fill	Stone Disk	---	Limestone
CC0290-01	CC-11-B-2	Collapse Debris	Metate	Slab	Granite
CC0283-01	CC-11-SF-1	Surface Find	Metate	Slab	Granite
CC0379-01	CC-11-SF-5	Surface Find	Metate	Slab	Granite
CC0435-01	CC-11-SF-7	Surface Find	Metate	Slab	Granite
CC0764-01	CC-12-L-01	Topsoil	Mano	Unknown	Quartzite
CC0605-01	CC-13-A-02	Collapse Debris	Metate	Basin	Granite
CC0685-01	CC-13-J-02	Collapse Debris	Mano	Circular	Granite
CC0678-01	CC-13-J-03	Problematic Deposit	Metate	Basin	Granite
CC0679-01	CC-13-J-03	Problematic Deposit	Mano	Rectangular	Granite
CC0679-02	CC-13-J-03	Problematic Deposit	Mano	Rectangular	Granite
CC0679-03	CC-13-J-03	Problematic Deposit	Mano	Rectangular	Granite
CC0679-04	CC-13-J-03	Problematic Deposit	Mano	Rectangular	Granite
CC0758-01	CC-13-M-03	Problematic Deposit	Mano	Rectangular	Granite
CC0758-02	CC-13-M-03	Problematic Deposit	Mano	Rectangular	Limestone
CC0758-03	CC-13-M-03	Problematic Deposit	Mano	Rectangular	Granite
CC0758-04	CC-13-M-03	Problematic Deposit	Mano	Rectangular	Granite
CC0758-05	CC-13-M-03	Problematic Deposit	Mano	Rectangular	Quartzite
CC0758-06	CC-13-M-03	Problematic Deposit	Mano	Rectangular	Limestone
CC0759-01	CC-13-M-03	Problematic Deposit	Metate	Basin	Granite
CC0759-02	CC-13-M-03	Problematic Deposit	Metate	Basin	Limestone
CC0871-01	CC-13-N-01	Topsoil	Mano	Rectangular	Granite
CC0924-01	CC-14-D-02	Collapse Debris	Metate	Basin	Unknown
CC1377-01	CC-14-H-06	Collapse Debris	Spindle Whorl	Domed	Sandstone
CC0923-01	CC-14-I-01	Topsoil	Metate	Basin	Granite
CC0923-02	CC-14-I-01	Topsoil	Metate	Basin	Granite
CC0923-03	CC-14-I-01	Topsoil	Metate	Basin	Granite
CC1125-01	CC-14-J-06	Floor artifacts	Metate	Basin	Granite
CC1083-02	CC-14-K-01	Topsoil	Metate	Other	Schist
CC1083-03	CC-14-K-01	Topsoil	Metate	Unknown	Schist
CC1116-02	CC-14-K-02	Floor	Metate	Basin	Unknown Igneous
CC1116-03	CC-14-K-02	Floor	Mano	Unknown	Unknown Igneous
CC1113-01	CC-14-L-02	Collapse Debris	Mano	Plano-convex	Limestone
CC1102-01	CC-14-L-02	Collapse Debris	Mano	Square	Granite
CC1422-01	CC-14-Q-02	Collapse Debris	Mano	Oval	Granite

Table 6.1. Provenience Data for All Ground Stone Artifacts (continued)

Spec. #	Lot*	Lot Type	Form	Subform	Raw Material
CC1413-01	CC-14-Q-03	Construction Fill	Mano	Square	Granite
CC1413-02	CC-14-Q-03	Construction Fill	Mano	Square	Granite
CC1275-01	CC-14-S-06	Artifact Deposit	Metate	Basin	Granite
CC1275-02	CC-14-S-06	Artifact Deposit	Metate	Unknown	Schist
CC1275-03	CC-14-S-06	Artifact Deposit	Metate	Unknown	Granite
CC1278-01	CC-14-S-06	Artifact deposit	Metate	Basin	Granite
CC1278-02	CC-14-S-06	Artifact deposit	Metate	Basin	Schist
CC1278-03	CC-14-S-06	Artifact deposit	Metate	Other	Schist
CC1278-04	CC-14-S-06	Artifact deposit	Metate	Basin	Unknown Igneous
CC1641-01	CC-14-SF-01	Surface Find	Metate	Basin	Granite
CC1328-01	CC-14-T-02	Collapse Debris	Mano	Square	Granite
CC1406-01	CC-14-V-02	Collapse Debris	Metate	Basin	Granite
CC1425-01	CC-14-V-03	Artifact Deposit	Metate	Basin	Granite
CC1425-02	CC-14-V-03	Artifact Deposit	Metate	Basin	Granite
CC1425-03	CC-14-V-03	Artifact Deposit	Metate	Basin	Granite
CC1425-04	CC-14-V-03	Artifact Deposit	Metate	Basin	Schist
CC1425-05	CC-14-V-03	Artifact Deposit	Metate	Basin	Granite
CC1425-06	CC-14-V-03	Artifact Deposit	Metate	Unknown	Granite
CC1425-07	CC-14-V-03	Artifact Deposit	Metate	Basin	Unknown Igneous
CC1425-08	CC-14-V-03	Artifact Deposit	Metate	Unknown	Schist
CC1460-01	CC-14-W-08	Collapse Debris	Metate	Unknown	Granite
CC1337-01	CC-14-Y-01	Topsoil	Metate	Legged	Unknown Igneous
CC1459-01	CC-14-AB-02	Collapse Debris	Mano	Square	Granite
CC1444-01	CC-14-AC-02	Collapse Debris	Mano	Plano-convex	Granite
CC1529-01	CC-14-AC-02	Collapse Debris	Metate	Basin	Unknown Igneous
CC1522-01	CC-14-AD-02	Collapse Debris	Mano	Rectangular	Limestone
CC1653-01	CC-14-AD-02	Collapse Debris	Mano	Rectangular	Granite
CC1690-01	CC-14-AD-02	Collapse Debris	Spindle Whorl	Domed	Limestone
CC1809-01	CC-14-AM-02	Collapse Debris	Mano	Square	Granite
CC1809-02	CC-14-AM-02	Collapse Debris	Mano	Rectangular	Granite
CC1806-03	CC-14-AM-03	Floor	Metate	Basin	Granite
CC1828-01	CC-14-AM-05	Construction Fill	Mano	Rectangular	Sandstone
CC1828-02	CC-14-AM-05	Construction Fill	Mano	Unknown	Limestone
CC1724-01	CC-14-AN-01	Topsoil	Metate	Basin	Granite
CC1724-02	CC-14-AN-01	Topsoil	Mano	Plano-convex	Granite

Table 6.1. Provenience Data for All Ground Stone Artifacts (continued)

Spec. #	Lot*	Lot Type	Form	Subform	Raw Material
CC1812-01	CC-14-AN-02	Collapse Debris	Mano	Square	Granite
CC1812-02	CC-14-AN-02	Collapse Debris	Metate	Basin	Granite
CC1812-03	CC-14-AN-02	Collapse Debris	Mano	Square	Granite
CC1784-01	CC-14-AN-02	Collapse Debris	Metate	Slab	Granite
CC1898-01	CC-14-AP-01	Topsoil	Stone Disk	---	Unknown
CC1858-01	CC-14-AP-02	Collapse Debris	Mano	Rectangular	Quartzite
CC1810-01	CC-14-AP-02	Collapse Debris	Metate	Basin	Granite
CC1839-01	CC-14-AP-04	Core Face	Metate	Basin	Granite
CC1710-01	CC-14-AR-01	Topsoil	Mano	Rectangular	Quartzite
CC1845-01	CC-14-AS-01	Topsoil	Mano	Square	Granite
CC1845-02	CC-14-AS-01	Topsoil	Mano	Square	Granite
CC1853-01	CC-14-AS-02	Collapse Debris	Mano	Square	Granite
CC1853-02	CC-14-AS-02	Collapse Debris	Metate	Basin	Granite
CC1853-03	CC-14-AS-02	Collapse Debris	Metate	Basin	Granite
CC1794-01	CC-14-AU-02	Collapse Debris	Metate	Basin	Granite
CC1779-01	CC-14-AU-04	Collapse Debris	Mano	Square	Granite
CC2518-01	CC-15-D-2	Construction Fill	Bark Beater	Oval	Limestone
CC2124-01	CC-16-F-06	Floor	Mano	Rectangular	Quartzite
CC2352-01	CC-16-G-02	Collapse Debris	Mano	Square	Limestone
CC2257-01	CC-16-I-04	Collapse Debris	Mano	Rectangular	Granite
CC2257-02	CC-16-I-04	Collapse Debris	Metate	Slab	Granite
CC2257-03	CC-16-I-04	Collapse Debris	Metate	Slab	Granite
CC2257-04	CC-16-I-04	Collapse Debris	Mano	Oval	Granite
CC2144-01	CC-16-J-02	Collapse Debris	Metate	Fragment	Granite
CC2168-01	CC-16-K-01	Topsoil	Hammerstone	---	Granite
CC2277-01	CC-16-N-01	Topsoil	Metate	Basin	Granite
CC2277-02	CC-16-N-01	Topsoil	Metate	Slab	Granite
CC2410-01	CC-16-N-02	Collapse Debris	Mano	Square	Granite
CC2410-02	CC-16-N-02	Collapse Debris	Metate	Basin	Granite
CC2396-01	CC-16-P-03	Problematic Deposit	Mano	Square	Granite
CC2396-02	CC-16-P-03	Problematic Deposit	Metate	Unknown	Granite
CC2379-01	CC-16-S-02	Collapse Debris	Metate	Basin	Granite
CC2485-01	CC-16-U-01	Topsoil/Floor	Mano	Plano-convex	Granite
CC2483-01	CC-16-X-02	Collapse Debris	Metate	Basin	Granite
CC2532-01	CC-16-X-03	Problematic Deposit	Mano	Rectangular	Granite
CC2532-02	CC-16-X-03	Problematic Deposit	Metate	Basin	Granite
KU0081-01	KU-1-SF-5	Surface Find	Mano	Rectangular	Granite
KUV1526-01	KUV-01-A-02	Topsoil	Mano	Plano-convex	Limestone

Table 6.1. Provenience Data for All Ground Stone Artifacts (continued)

Spec. #	Lot*	Lot Type	Form	Subform	Raw Material
KUV1788-01	KUV-01-C-01	Topsoil	Metate	Basin	Granite
KUV1693-01	KUV-01-E-01	Topsoil	Metate	Legged	Limestone
KUV1773-01	KUV-01-K-01	Topsoil	Metate	Unknown	Granite
KUV1773-02	KUV-01-K-01	Topsoil	Metate	Unknown	Sandstone
KUV2184-01	KUV-01-R-02	Collapse Debris	Metate	Basin	Granite
KUV2419-01	KUV-01-Y-01	Topsoil	Metate	Basin	Granite
KUV2419-02	KUV-01-Y-01	Topsoil	Metate	Basin	Granite
KUV2419-03	KUV-01-Y-01	Topsoil	Metate	Slab	Unknown
KUV2360-01	KUV-01-Y-02	Other	Metate	Basin	Granite
KUV2360-02	KUV-01-Y-02	Other	Mano	Plano-convex	Limestone
KUV2360-03	KUV-01-Y-02	Other	Metate	Basin	Granite
KUV2412-01	KUV-01-AA-01	Topsoil	Mano	Square	Granite
KUV2412-02	KUV-01-AA-01	Topsoil	Metate	Slab	Quartzite
KUV2412-03	KUV-01-AA-01	Topsoil	Metate	Basin	Granite
KUV2454-01	KUV-01-AC-01	Topsoil	Metate	Basin	Unknown
KUV2537-01	KUV-01-SF-46	Surface Find	Mano	Rectangular	Granite
KUV2430-01	KUV-01-SF-55	Surface Find	Metate	Basin	Granite
KUV2533-01	KUV-01-SF-66	Surface Find	Metate	Basin	Granite
KUV2533-02	KUV-01-SF-66	Surface Find	Metate	Basin	Granite
QHC1335-01	QHC-02-M-1	Topsoil	Mano	Plano-convex	Unknown
SF0608-01	SF-01-SF-01	Surface Find	Metate	Basin	Granite

*CC = Chan Chich, KU = Kaxil Uinic ruins, KUV = Kaxil Uinic village, QHC = Qualm Hill camp, SF = surface find

artifacts at Chan Chich and the surrounding sites and provide a field manual for the analysis of those artifacts (Garber 1989; Miamis and Harrison-Buck 2013; Sheets 1978; Tibbits 2016a, 2016b; Willey 1972, 1978). This chapter only describes the ground stone artifacts found during the 2012–2016 field seasons. For information on the artifacts found in the earlier seasons, refer to the chapter written by Rigden Glaab and Fred Valdez (2000). To make this chapter as accessible as possible, it is organized into three main parts: methods, analysis, and conclusions. The first part outlines a detailed procedure for the analysis of ground stone in the field laboratory. The second part presents the results of the analysis, beginning with detailed information on the raw material types observed in the ground stone assemblage. Providing a cross-section of the recovered ground stone artifacts, the second part also defines the common characteristics of all forms and subforms of the ground stone industry found by CCAP and BEAST. The last section offers areas of opportunity for more in-depth exploration of the nature of ground stone tool manufacture and use.

METHODS

Members of CCAP and BEAST staff analyze all ground stone artifacts in the field lab in Belize. After the artifacts have been washed,

left to dry on the screens, and cataloged by the lab director, the analyzer determines whether or not the object fits the definition of ground stone presented above. If the artifact is ground stone, it is given a unique specimen number and new artifact analysis form in the FileMaker database. Each ground stone artifact receives its own specimen number unless multiple fragments either (a) fit together and have the same form, subform, and material quality, demonstrating that they are fragments from the same object, or (b) are a large quantity of fragments of the same raw material that are too poorly preserved for analysis. Using the criteria outlined below, the analyzer must determine form, subform, and raw material type and quality along with any evidence of burning or battering. Next, the analyzer must measure the length, width, and thickness in centimeters and weigh the specimen in grams. If there are multiple fragments in the same specimen number, put the overall weight in the main measurements section of the form, and list the measurements for the two fragments individually in the comments section. In the comments section, the analyzer notes the level of use-wear polish, quality of shaping on the exterior, color of raw material, and any other unusual characteristics.

RESULTS OF ANALYSIS

Raw Material Types

The following section contextualizes the raw material types used for ground stone tools with a background on the geology of the Maya Lowlands and Chan Chich area (Figure 6.1). The area investigated by CCAP and BEAST lies on a limestone platform dating to the Eocene epoch (58–47 million years ago) in the

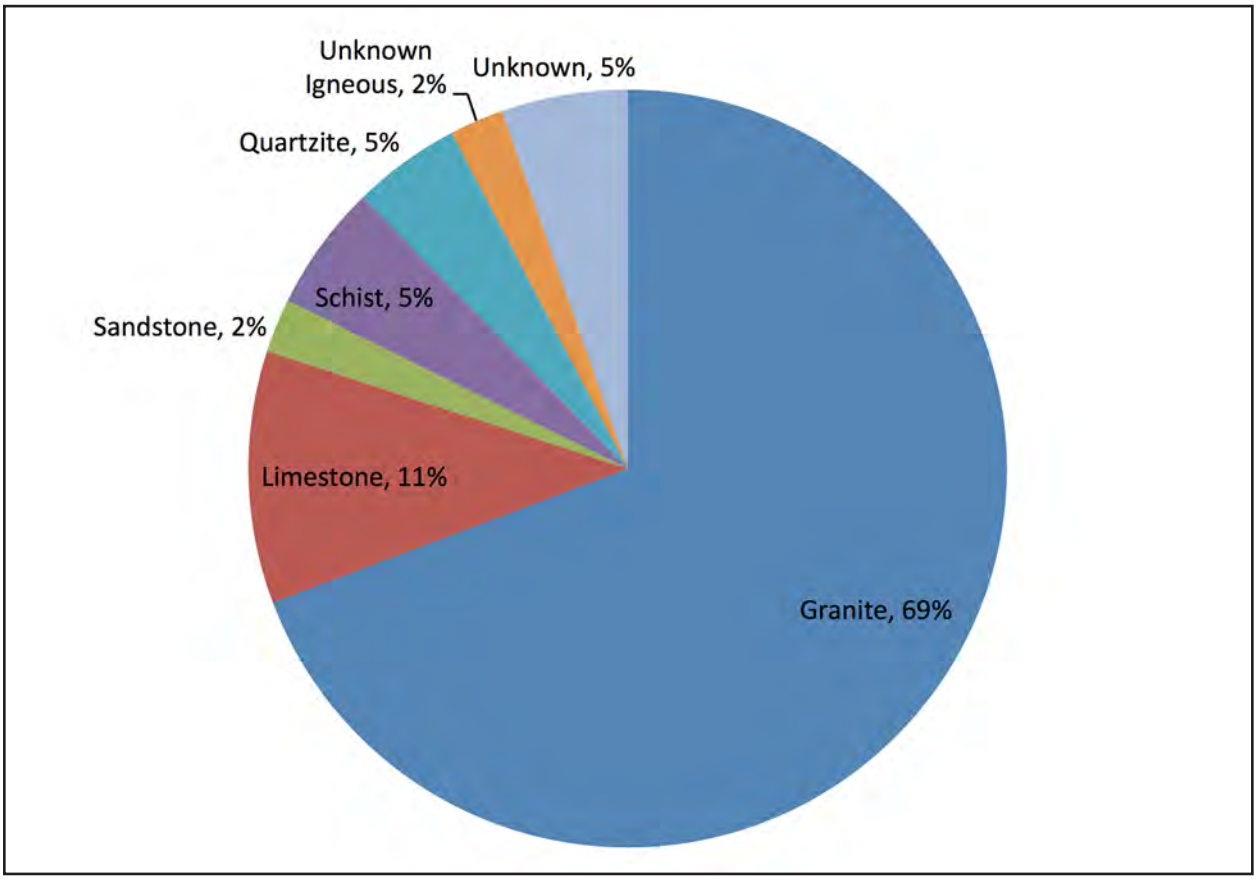

Figure 6.1. Percentages of raw materials represented in the CCAP/BEAST ground stone assemblage.

Three Rivers region of the Yucatán Peninsula. Erosion, slumping, and faulting formed various topographic elements in this karstic environment, including escarpments, uplands, and bajos (Brokaw and Mallory 1993).

Although it varies greatly, the selection of raw materials for the manufacture of ground stone tools heavily depends on the stones available either locally or through trade (Adams 1999; Drennan 1984). In addition to local limestone, the studied sites used large quantities of igneous, metamorphic, and other types of sedimentary rocks for their ground stone tools (see Figure 6.1). Without direct inspection by a qualified geologist, this list compiles data from descriptive comments in the literature written on the geology of Belize and the properties of the stone types most commonly found in the CCAP and BEAST areas (Dixon 1956; Graham 1987; Ward et al. 1985). Four main criteria help determine features important to understanding the function and use-wear patterns of ground stone tools: geological classification, fabric, texture, and mineral constituents (Adams et al. 2009).

Granite represents the largest percentage of raw material types used for ground stone tools at Chan Chich and surveyed areas. Due to the practical benefits of this hard, coarse-grained stone, 90 ground stone artifacts found by the CCAP and BEAST are granite (Figure 6.2). This igneous rock is not local to the Chan Chich area.

Tawny Tibbits's (2016c) recent work on geochemical sourcing of granite ground stone artifacts in Belize reinforces the assumption that the majority of granite comes from the Mountain Pine Ridge in southern Belize. However, Tibbits also demonstrated that the Hummingbird Ridge and Cockscomb Basin (Figure 6.3) also provided considerable amounts

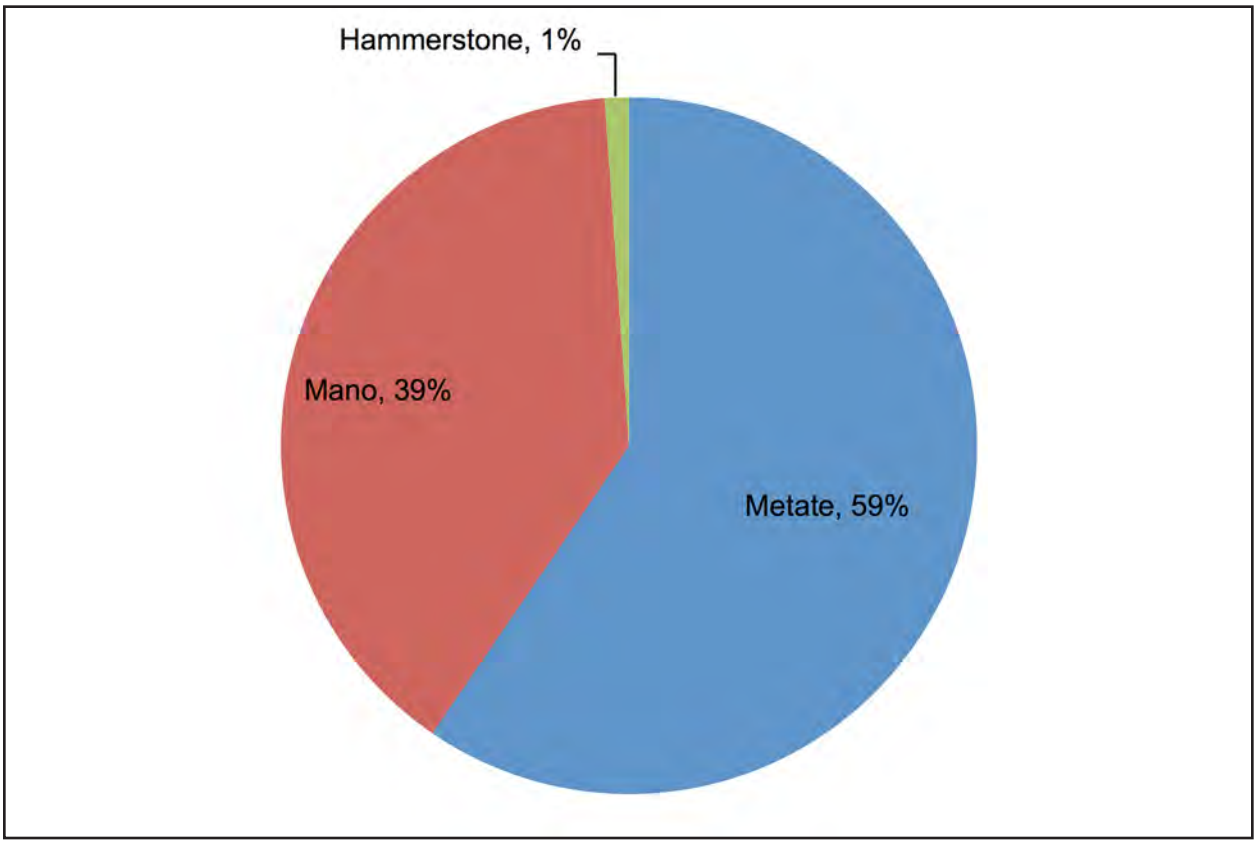

Figure 6.2. Percentages of forms of granite artifacts in the CCAP/BEAST ground stone assemblage.

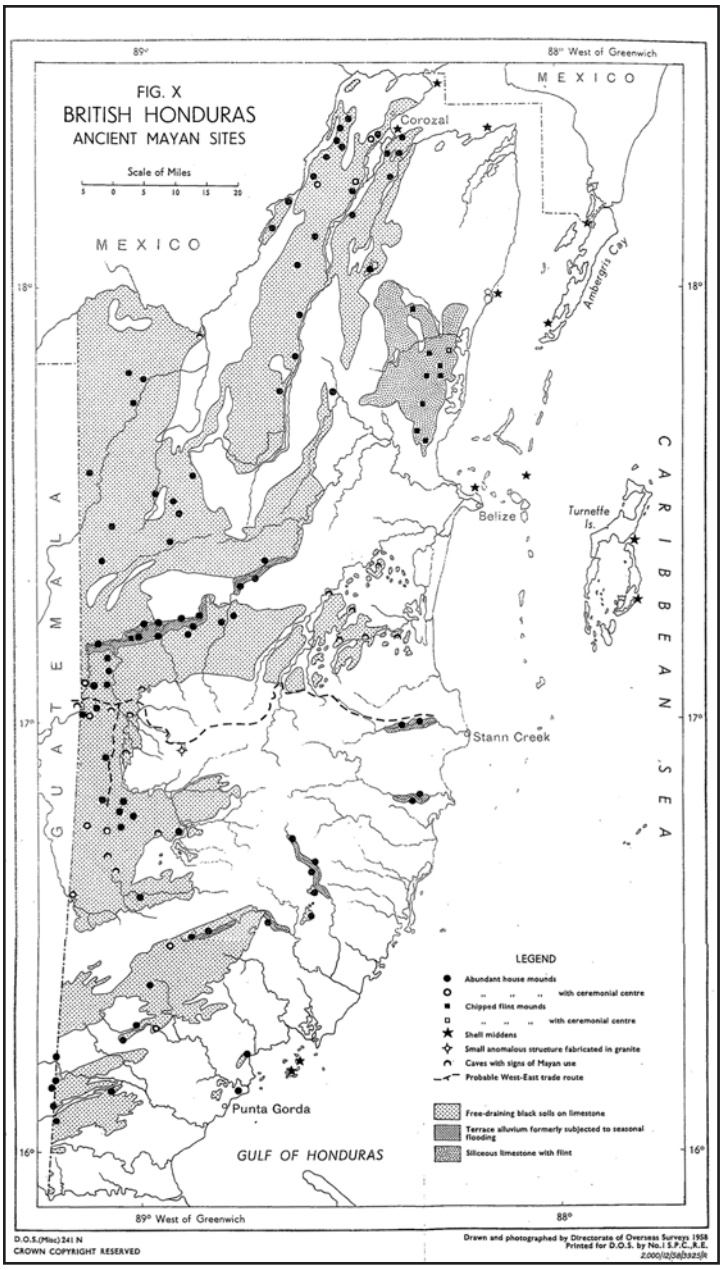

Figure 6.3. Map of geology and ancient Maya sites of British Honduras, adapted from Wright et al. (1959:Fig. X).

of granite for ground stone tools throughout the area. In the current ground stone record for the CCAP and BEAST, there are four main colors of granite commonly found: tan, pink, light gray, and dark gray.

Ground stone artifacts made from the local limestone are the second most common raw material type found by the CCAP and BEAST. Despite its relatively soft qualities, 14 specimens take advantage of the whitish sedimentary rock's geographical and morphological convenience (Figure 6.4). Pecking and grinding can easily shape limestone, and the raw material ranges from soft to hard, making it still useful for grinding technologies despite its softness relative to granite (Garber 1989). Objects made of sandstone, another type sedimentary rock not local to the area, found around Chan Chich exhibit similar properties to limestone, but are generally light tan in color. Only three ground stone specimens are classified as sandstone.

Two metamorphic rocks are represented in the archaeological evidence found by the CCAP and BEAST. The first, schist, is an opaque, dark gray hard stone that is medium to fine grained and has slaty cleavage. Its relatively hard properties and resistance to impact make it good for grinding. Seven ground stone artifacts are classified as schist. The second metamorphic rock is a crystalline and granular whitish stone called quartzite. Although it looks similar to a crystalline limestone, quartzite is among the hardest stones used for the manufacture of ground stone tools in the Maya lowlands (Garber 1989). Six ground stone artifacts from Chan Chich are manufactured from quartzite. Both of these types of stone are not local to the area, and probably come from the Maya Mountains.

CCAP and BEAST have two distinct categories for unknown raw materials. These two categories differentiate between stones that exhibit the hardness and visual properties of igneous rocks and those that are completely unidentifiable. Seven specimens are classified as unknown igneous. They show common

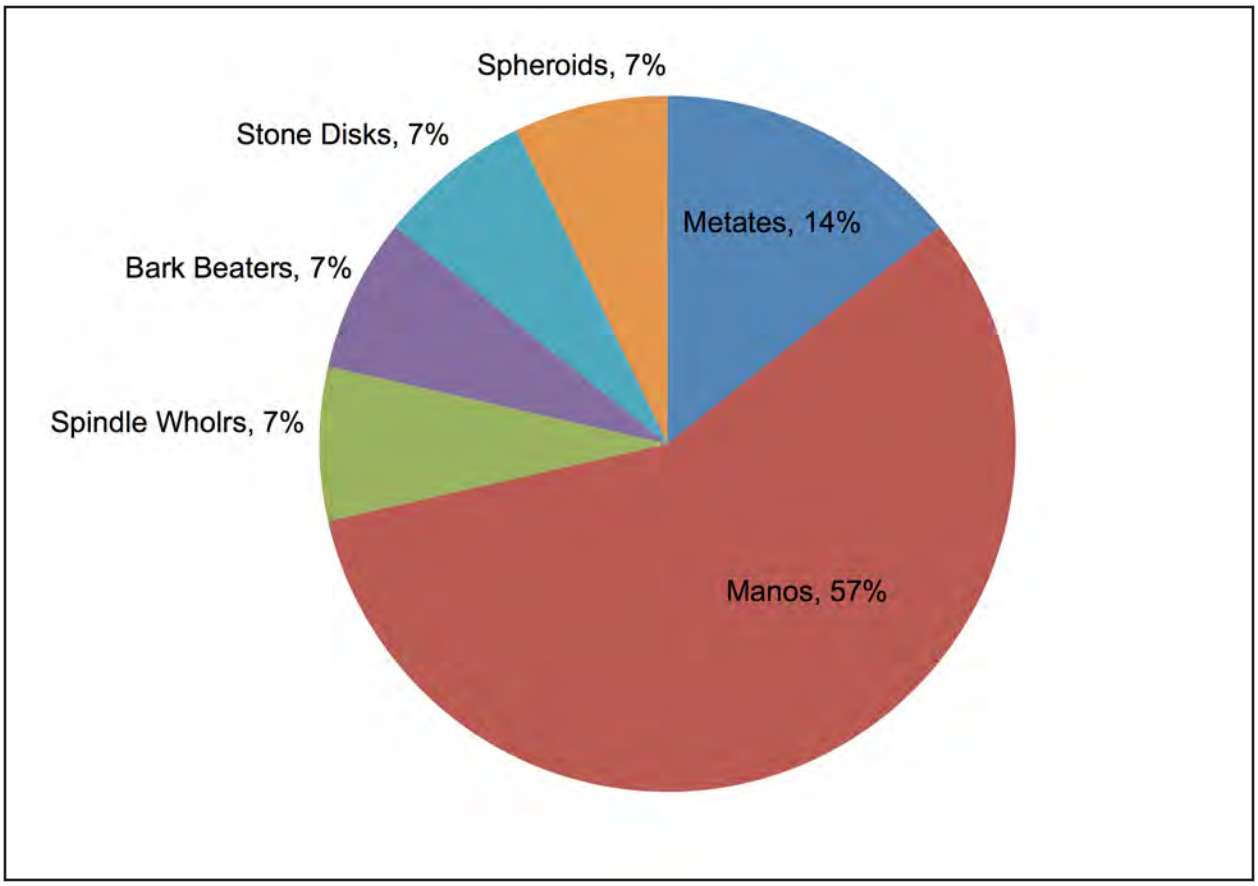

Figure 6.4. Percentages of forms of limestone artifacts in the CCAP/BEAST ground stone assemblage.

characteristics of igneous rocks without fitting the descriptions of igneous rocks provided above. Three artifacts are classified as unknown, meaning they are not apparently igneous and do not fit the descriptions for raw materials listed above. See Figure 6.5 for images of examples of these raw material types represented in the ground stone assemblage.

Forms

Metates

Metates are stone slabs used to grind, crush, or pound foodstuffs and sometimes pigments. All metates are netherstones, the stones upon which ingredients are ground or pulverized. With the mano as the handstone component, the metate acts as the stationary base for grinding maize, seeds, grasses, and other items. Together the mano and metate serve as one of the main tools associated with subsistence activity (Adams 1999, 2002; Biskowski 1997, 2008; Glaab and Valdez 2000). Manos are discussed in greater detail in the following section.

Since the 2012 field season, 72 metate fragments were recorded in the CCAP and BEAST collections (Table 6.2). Forty-eight of the 72 metate fragments are classified as basin-shaped metates according to descriptions from the previous chapter on Chan Chich ground stone artifacts (Glaab and Valdez 2000) and Cerros (Garber 1989). Basin, or turtle-back, metates are characterized by their circular or elliptical grinding surfaces with rounded bottom resting surface (Adams 2002). Their interior surfaces are concave, creating a basin-like "walls" on the edges of the metate visible in cross-section (Figure 6.6). The thickness of the walls and grinding surfaces, slope of the

Figure 6.5. Photographs of examples of raw material types represented in the ground stone assemblage.

basin, and roughness of the exterior surface vary greatly among the assemblage collected thus far. However, the grinding surfaces on all of the metate fragments found by the CCAP and BEAST are considerably polished due to repetitive use. Eleven of the basin metate fragments contained some evidence of burning, 12 exhibited signs of battering, and one was identified as having both evidence of burning and battering. The recorded amount of fragments with battering could be slightly inaccurate because that option was not added to the database until the 2015 season.

Although the vast majority of Chan Chich metates are basin-shaped, 12 specimens represent the slab and legged metate subforms. According to Garber (1989), slab metates must be straight and flat along at least one dimension but are commonly straight along two dimensions. Slab metates differ from their basin-shaped counterparts primarily in their lack of walls around the edges of the grinding

Table 6.2. Provenience and Metric Data for all Metates Found by CCAP and BEAST from 2012–2016 Organized by Lot

Spec. #	Lot*	Lot Type	L (cm)	W (cm)	Th (cm)	W (g)	Subform	Raw Material	Completeness
CC0290-01	CC-11-B-2	Collapse Debris	14.83	10.75	2.78	495	Slab	Granite	Unknown Fragment
CC0283-01	CC-11-SF-1	Other (Surface Find)	27.0	16.9	3.43	2300	Slab	Granite	Unknown Fragment
CC0379-01	CC-11-SF-5	Other (Surface Find)	13.59	9.01	3.04	522	Slab	Granite	Fragment
CC0435-01	CC-11-SF-7	Other (Surface Find)	22.0	15.5	6.88	2441	Slab	Granite	Unknown Fragment
CC0605-01	CC-13-A-02	Collapse Debris	17.86	12.15	2.72	949	Basin	Granite	Fragment
CC0678-01	CC-13-J-03	Problematic Deposit	19.47	15.46	4.51	3145	Basin	Granite	Fragment
CC0759-01	CC-13-M-03	Problematic Deposit	19.16	15.08	2.45	1784	Basin	Granite	Fragment
CC0759-02	CC-13-M-03	Problematic Deposit	21.17	17.59	3.11	4147	Basin	Limestone	Fragment
CC1529-01	CC-14-AC-02	Collapse Debris	11.67	4.29	3.82	248	Basin	Unknown Igneous	Medial Fragment
CC1806-03	CC-14-AM-03	Floor	14.5	14.9	3.0	860	Basin	Granite	Fragment
CC1724-01	CC-14-AN-01	Topsoil	9.5	8.6	1.8	270	Basin	Granite	Fragment
CC1812-02	CC-14-AN-02	Collapse Debris	11.4	9.5	2.2	464	Basin	Granite	Fragment
CC1784-01	CC-14-AN-02	Collapse Debris	9.66	5.68	4.42	322	Slab	Granite	Fragment
CC1810-01	CC-14-AP-02	Collapse Debris	14.2	9.9	1.7	380	Basin	Granite	Fragment
CC1839-01	CC-14-AP-04	Core Face	6.3	5.9	2.2	132	Basin	Granite	Fragment
CC1853-02	CC-14-AS-02	Collapse Debris	14.6	13.4	2.8	937	Basin	Granite	Fragment
CC1853-03	CC-14-AS-02	Collapse Debris	16.0	14.2	3.5	1095	Basin	Granite	Fragment
CC1794-01	CC-14-AU-02	Collapse Debris	11.1	11.3	2.5	653	Basin	Granite	Fragment
CC0924-01	CC-14-D-02	Collapse Debris	25.5	16.0	8.03	3664	Basin	Unknown	Medial Fragment
CC0923-01	CC-14-I-01	Topsoil	19.0	11.61	3.63	1567	Basin	Granite	Fragment
CC0923-02	CC-14-I-01	Topsoil	15.46	9.58	3.84	813	Basin	Granite	Fragment
CC0923-03	CC-14-I-01	Topsoil	14.05	10.24	3.69	672	Basin	Granite	Fragment
CC1125-01	CC-14-J-06	Floor artifacts	25.5	26.0	7.42	6750	Basin	Granite	Fragment
CC1083-02	CC-14-K-01	Topsoil	5.37	3.38	8.9	17	Other	Schist	Lateral Fragment
CC1083-03	CC-14-K-01	Topsoil	4.15	3.43	0.81	9	Unknown	Schist	Fragment

Table 6.2. Provenience and Metric Data for all Metates (continued)

Spec. #	Lot*	Lot Type	L (cm)	W (cm)	Th (cm)	W (g)	Subform	Raw Material	Completeness
CC1116-02	CC-14-K-02	Floor	8.28	5.91	3.23	168	Basin	Unknown Igneous	Proximal Fragment
CC1275-01	CC-14-S-06	Artifact Deposit	11.11	8.48	2.92	423	Basin	Granite	Fragment
CC1275-02	CC-14-S-06	Artifact Deposit	8.19	2.63	2.42	37	Basin	Granite	Fragment
CC1275-03	CC-14-S-06	Artifact Deposit	---	---	---	765	Unknown	Granite	Fragment
CC1278-01	CC-14-S-06	Artifact deposit	18.0	12.0	5.07	872	Basin	Schist	Fragment
CC1278-02	CC-14-S-06	Artifact deposit	12.12	10.38	2.38	357	Other	Schist	Fragment
CC1278-03	CC-14-S-06	Artifact deposit	7.34	6.47	1.39	54	Unknown	Schist	Fragment
CC1278-04	CC-14-S-06	Artifact deposit	10.0	7.65	3.7	224	Basin	Unknown Igneous	Fragment
CC1641-01	CC-14-SF-01	Other (Surface Find)	33.0	22.0	3.96	5500	Basin	Granite	Fragment
CC1406-01	CC-14-V-02	Collapse Debris	11.76	6.86	2.09	222	Basin	Granite	Fragment
CC1425-01	CC-14-V-03	Artifact Deposit	9.98	9.43	4.0	503	Basin	Granite	Unknown Fragment
CC1425-02	CC-14-V-03	Artifact Deposit	7.91	6.37	3.89	319	Basin	Granite	Fragment
CC1425-03	CC-14-V-03	Artifact Deposit	7.65	7.95	3.84	449	Basin	Granite	Fragment
CC1425-04	CC-14-V-03	Artifact Deposit	18.0	10.89	2.51	617	Basin	Granite	Fragment
CC1425-05	CC-14-V-03	Artifact Deposit	18.5	9.77	5.59	1229	Unknown	Granite	Fragment
CC1425-06	CC-14-V-03	Artifact Deposit	4.94	5.22	3.74	118	Basin	Schist	Fragment
CC1425-07	CC-14-V-03	Artifact Deposit	12.81	6.15	5.46	427	Basin	Unknown Igneous	Lateral Fragment
CC1425-08	CC-14-V-03	Artifact Deposit	---	---	---	28	Unknown	Schist	Fragment
CC1460-01	CC-14-W-08	Collapse Debris	16.0	11.2	2.9	231	Unknown	Granite	Fragment
CC1337-01	CC-14-Y-01	Topsoil	13.35	10.0	2.23	352	Legged	Unknown Igneous	Fragment
CC2257-02	CC-16-I-04	Collapse Debris	10.6	8.37	2.49	588	Slab	Granite	Fragment
CC2257-03	CC-16-I-04	Collapse Debris	---	---	---	703	Slab	Granite	Fragment
CC2144-01	CC-16-J-02	Collapse Debris	2.92	1.52	0.37	6	Fragment	Granite	Fragment

Table 6.2. Provenience and Metric Data for all Metates (continued)

Spec. #	Lot*	Lot Type	L (cm)	W (cm)	Th (cm)	W (g)	Subform	Raw Material	Completeness
CC2277-01	CC-16-N-01	Topsoil	11.99	5.1	4.18	222	Basin	Granite	Fragment
CC2277-02	CC-16-N-01	Topsoil	3.95	3.0	2.48	30	Slab	Granite	Fragment
CC2410-02	CC-16-N-02	Collapse Debris	16.7	9.85	4.66	1362	Basin	Granite	Unknown Fragment
CC2396-02	CC-16-P-03	Problematic Deposit	7.85	6.53	3.27	162	Unknown	Granite	Fragment
CC2379-01	CC-16-S-02	Collapse Debris	9.09	5.82	2.24	324	Basin	Granite	Fragment
CC2483-01	CC-16-X-02	Collapse Debris	27.0	15.46	6.5	3178	Basin	Granite	Fragment
CC2532-02	CC-16-X-03	Problematic Deposit	11.74	5.83	2.46	142	Basin	Granite	Fragment
KUV2412-02	KUV-01-AA-01	Topsoil	15.46	13.3	4.26	1211	Basin	Granite	Lateral Fragment
KUV2412-03	KUV-01-AA-01	Topsoil	13.07	11.62	2.65	716	Slab	Quartzite	Lateral Fragment
KUV2454-01	KUV-01-AC-01	Topsoil	11.37	11.16	5.65	689	Basin	Unknown	Lateral Fragment
KUV1788-01	KUV-01-C-01	Topsoil	---	---	---	1840	Basin	Granite	Fragment
KUV1693-01	KUV-01-E-01	Topsoil	29.0	31.3	6.7	8800	Legged	Limestone	Medial Fragment
KUV1773-01	KUV-01-K-01	Topsoil	3.2	3.4	2.4	36	Unknown	Granite	Lateral Fragment
KUV1773-02	KUV-01-K-01	Topsoil	3.2	2.1	2	27	Unknown	Sandstone	Lateral Fragment
KUV2184-01	KUV-01-R-02	Collapse Debris	17.8	6.72	4.92	348	Basin	Granite	Fragment
KUV2430-01	KUV-01-SF-55	Other (Surface Find)	18.6	12.7	8.3	2990	Basin	Granite	Medial Fragment
KUV2533-01	KUV-01-SF-66	Other (Surface Find)	20.0	10.55	5	1510	Basin	Granite	Lateral Fragment
KUV2533-02	KUV-01-SF-66	Other (Surface Find)	21.5	8.88	3.65	1204	Basin	Granite	Lateral Fragment
KUV2419-01	KUV-01-Y-01	Topsoil	---	---	---	574	Basin	Granite	Lateral Fragment
KUV2419-02	KUV-01-Y-01	Topsoil	---	---	---	874	Basin	Granite	Lateral Fragment
KUV2419-03	KUV-01-Y-01	Topsoil	9.26	9.19	4	462	Slab	Unknown	Medial Fragment
KUV2360-01	KUV-01-Y-02	Other	---	---	---	1019	Basin	Granite	Unknown Fragment
KUV2360-03	KUV-01-Y-02	Other	8.94	2.56	3.09	67	Basin	Granite	Unknown Fragment
SF0608-01	SF-01-SF-01	Other (Surface Find)	8.73	8.46	3.09	274	Basin	Granite	Fragment

*CC = Chan Chich, KU = Kaxil Uinic ruins, KUV = Kaxil Uinic village, QHC = Qualm Hill camp, SF = surface find

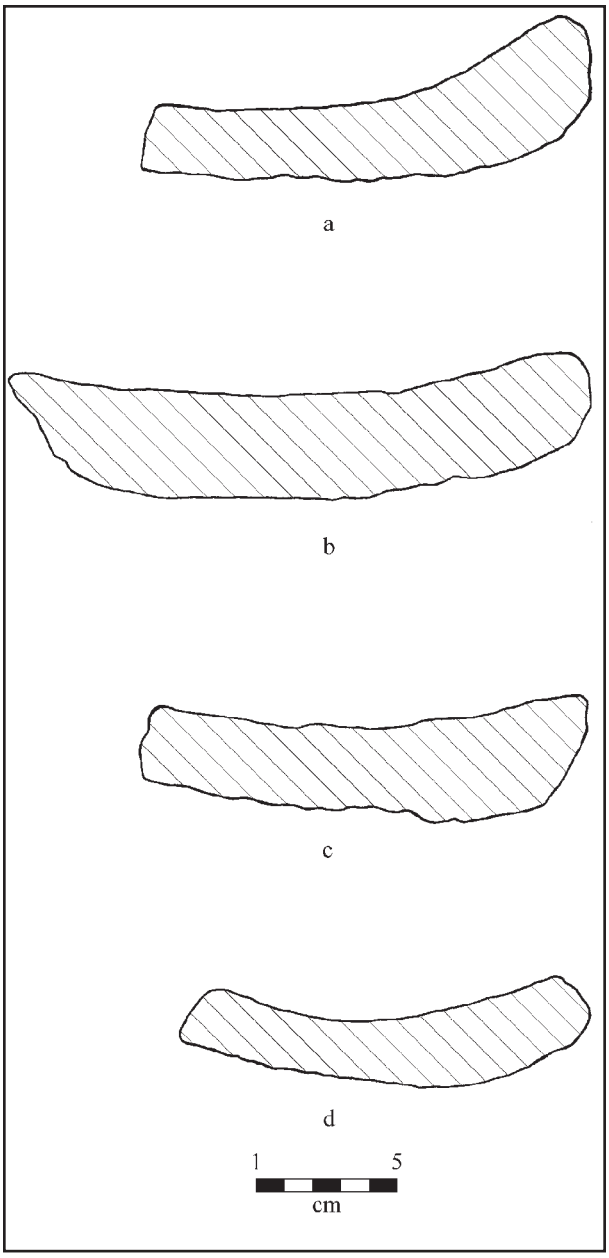

Figure 6.6. Cross-section drawings of basin metates found at Chan Chich, adapted from Glaab and Valdez (2000:Figure 10.1).

surface. Generally, the grinding surface is the straight and flat dimension on slab metates. Ten fragments exhibited the flat shape characteristic of the slab subform.

None of these fragments exhibited signs of burning, and only one was battered. Any metate, regardless of the shape of its grinding surface, with stone feet or legs attached to the exterior surface is classified as under the legged subform. Legged metates rarely survive in tact, but two examples of legged metate fragments were found at Chan Chich and Kaxil Uinic village. The example from Chan Chich has a relatively thin, basin-shaped grinding surface and rectangular legs. The large limestone legged metate found at the historic Kaxil Uinic village has a slab-shaped grinding surface with crosshatched pecking around the border and a robust triangular leg (Figure 6.7).

Twelve metate fragments were either too small or broken in a way that prevents classification. Ten of these are identified as unknown, and two are classified as other.

The small sample size and highly fragmentary nature of metates found prevent full understandings of the different types of shapes used at Chan Chich and the surrounding sites. Due to the lack of complete specimens, distinctions between legged and non-legged metates become more problematic. Some

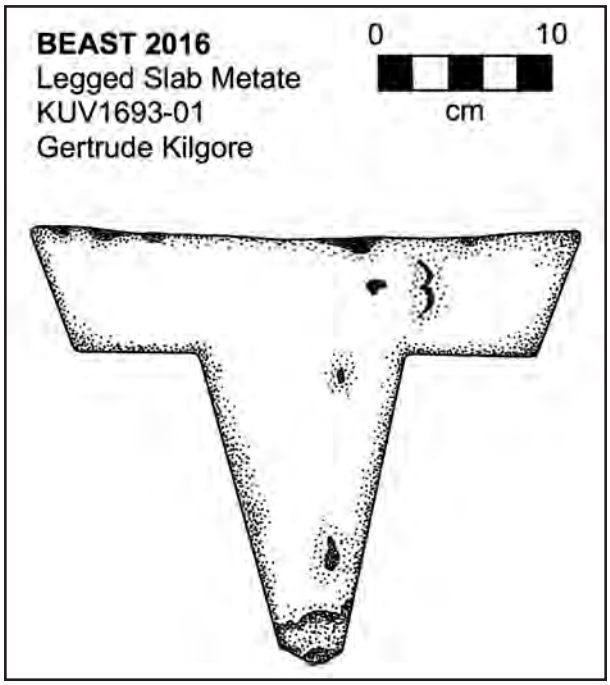

Figure 6.7. Cross-section drawing of legged slab metate (Spec. # KUV1693-01).

of the fragments identified as basin or slab-shaped could have been legged at one point. The following classifications differentiating between legged and non-legged are not necessarily valid, but, following Garber's (1989) lead, this distinction serves a descriptive purpose.

Manos

As described above, manos are hand-held tools used in conjunction with metates to grind, crush, or pound materials. These 51 manos are separated into six subforms that describe their general shape in cross-section (Figure 6.8). As exhibited in Table 6.3, they vary greatly in scale and form, but all have a cylindrical or prismatic shape and high polish on two or more surfaces from heavy use. Since the 2012 field season, CCAP and BEAST found 10 complete mano specimens and 41 fragments.

Generally, mano fragments provide the clearest cross-sections for classification into subforms. The subforms for manos are descriptively named according to the geometric shape roughly visible in cross-section. Subforms of manos collected by CCAP and BEAST include rectangular (16 fragments), square (14 fragments), plano-convex (five fragments), ovate (two fragments), and circular (one fragment). As depicted in Table 6.3, the metric data on the mano fragments varies greatly depending on the nature of fragmentation. Only one mano fragment possesses signs of burning, and evidence of battery is visible on six examples. In addition to those classified under the subforms, three mano fragments were either too small or broken in a way that prevents classification.

Although the majority of manos recovered were fragments, some complete specimens survive. Manos with rectangular cross-sections represent the subform with the greatest quantity of artifacts. The CCAP and BEAST field seasons recovered six complete rectangular manos with roughly similar widths and thicknesses and lengths ranging from 5 to 20.5 cm. Tapered ends are common amongst the rectangular subform examples found. The square manos represent two of the complete manos found. Although the cross-section of this subform differs only slightly from their rectangular counterparts, the overall form of square manos found at Chan Chich is much more sturdy than the tapered edges of the rectangular manos. The only two complete manos that exhibited signs of battery are classified under the square subform. None of the complete mano specimens show evidence of burning. The last complete mano is plano-convex in cross-section. Characterized by one flat edge surrounded by circular or ovate edges, this artifact (Spec. # CC1113-01) is unique in the fact that it is the most rounded complete mano that survives. However, the specimen is a more rectilinear version of the plano-convex subform.

Spindle Whorls

Spindle whorls are small, thin disks with a hole in the center for a spindle shaft. In textile production, they help facilitate the rotation of a spindle to process fibers. Jewelry makers also may have used spindle whorls to drill (Adams 2002). Two ground stone spindle whorls were found on the patio of Structure D-36 at Chan Chich (Figure 6.9). Both specimens are classified under the domed subform, which describes the domed dorsal side in contrast to the flat ventral side. One specimen is made from a light tan sandstone, and has a circumferential groove about 1 mm from the flat base. The second ground stone spindle whorl has a shallower dome and smooth surface. See Table 6.4 for the metric and provenience data for these two artifacts.

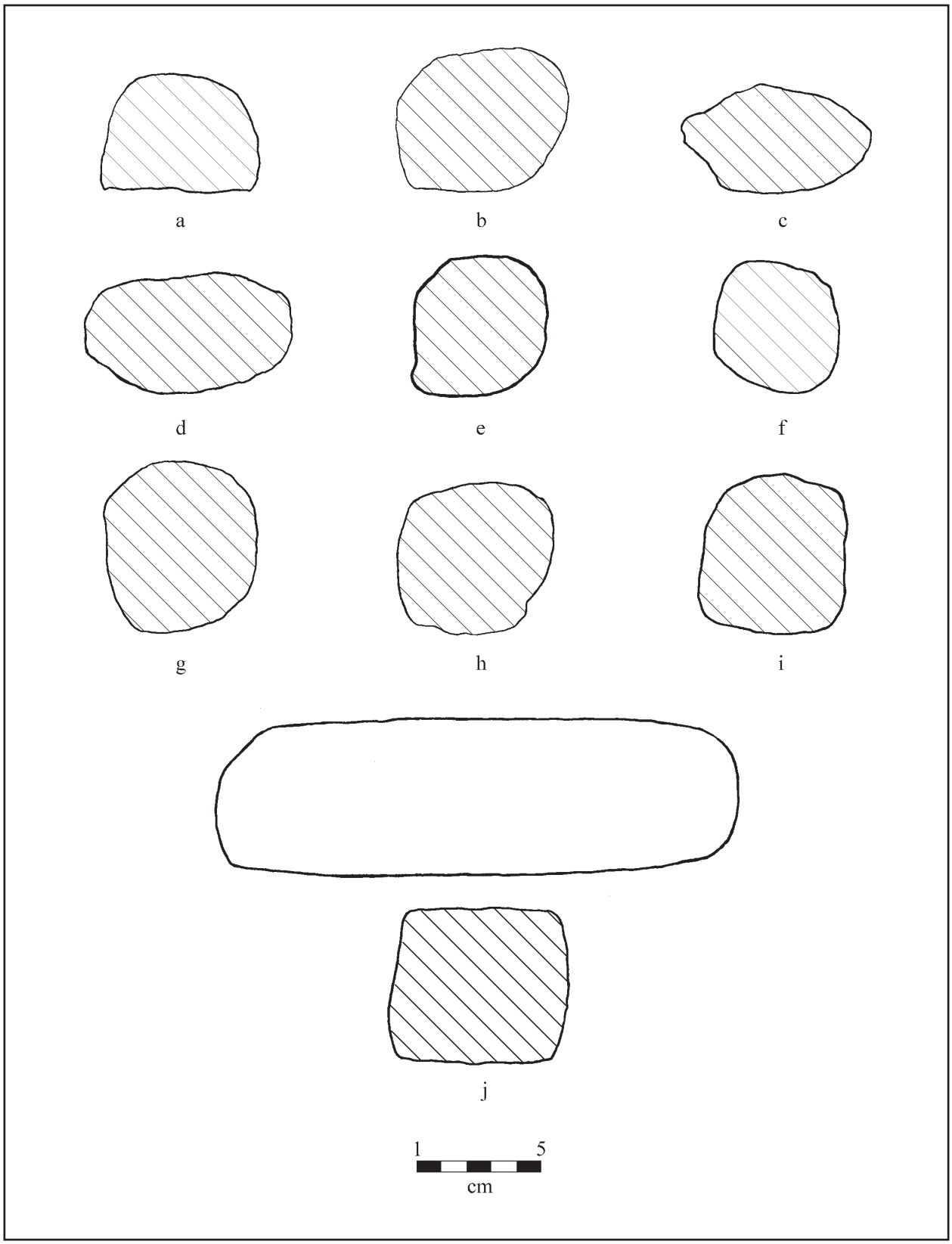

Figure 6.8. Cross-section drawings of manos found at Chan Chich, adapted from Glaab and Valdez (2000:Figure 10.2): a) plano-convex; b–d) ovate; e–h) round; i and j) square.

Table 6.3. Provenience and Metric Data for all Manos Found by CCAP and BEAST from 2012–2016 Organized by Lot

Spec. #	Lot*	Lot Type	L (cm)	W (cm)	Th (cm)	W (g)	Subform	Raw Material	Completeness
CC0764-01	CC-12-L-01	Topsoil	---	---	---	315	Unknown	Quartzite	Unknown
CC0685-01	CC-13-J-02	Collapse Debris	8.76	8.55	8.55	998	Circular	Granite	Unknown
CC0679-01	CC-13-J-03	Problematic Deposit	8.83	5.92	5.97	520	Rectangular	Granite	Unknown
CC0679-02	CC-13-J-03	Problematic Deposit	3.74	0.76	1.19	598	Rectangular	Granite	Unknown
CC0679-03	CC-13-J-03	Problematic Deposit	6.76	5.0	5.26	310	Rectangular	Granite	Unknown
CC0679-04	CC-13-J-03	Problematic Deposit	9.52	3.93	3.7	283	Rectangular	Granite	Unknown
CC0758-01	CC-13-M-03	Problematic Deposit	8.99	5.6	5.18	568	Rectangular	Granite	Unknown
CC0758-02	CC-13-M-03	Problematic Deposit	10.09	4.77	4.19	380	Rectangular	Limestone	Fragment
CC0758-03	CC-13-M-03	Problematic Deposit	10.1	5.27	5.41	523	Rectangular	Granite	Fragment
CC0758-04	CC-13-M-03	Problematic Deposit	14.8	6.79	4.08	694	Rectangular	Granite	Unknown
CC0758-05	CC-13-M-03	Problematic Deposit	14.11	6.5	4.22	648	Rectangular	Quartzite	Complete
CC0758-06	CC-13-M-03	Problematic Deposit	13.87	6.31	6.11	923	Rectangular	Limestone	Unknown
CC0871-01	CC-13-N-01	Topsoil	11.85	4.52	4.68	477	Rectangular	Granite	Fragment
CC1459-01	CC-14-AB-02	Collapse Debris	8.1	6.5	4.4	293	Square	Granite	Fragment
CC1444-01	CC-14-AC-02	Collapse Debris	14.1	6.24	3.94	644	Plano-convex	Granite	Fragment
CC1522-01	CC-14-AD-02	Collapse Debris	14.8	6.7	6.19	1028	Rectangular	Limestone	Fragment
CC1653-01	CC-14-AD-02	Collapse Debris	20.5	4.18	4.15	743	Rectangular	Granite	Complete
CC1809-02	CC-14-AM-02	Collapse Debris	14.7	5.2	4.8	645	Rectangular	Granite	Fragment
CC1809-01	CC-14-AM-02	Collapse Debris	12.2	6.1	6.4	920	Square	Granite	Complete
CC1828-01	CC-14-AM-05	Construction Fill	9.9	4.9	4.2	423	Rectangular	Sandstone	Complete
CC1828-02	CC-14-AM-05	Construction Fill	6.6	5.2	3.9	209	Unknown	Limestone	Fragment
CC1724-01	CC-14-AN-01	Topsoil	9.9	6.6	6.9	589	Plano-convex	Granite	Fragment
CC1812-01	CC-14-AN-02	Collapse Debris	6.0	4.6	4.6	231	Square	Granite	Fragment
CC1812-03	CC-14-AN-02	Collapse Debris	10.8	5.8	5.9	692	Square	Granite	Fragment
CC1858-01	CC-14-AP-02	Collapse Debris	7.1	6.5	3.8	285	Rectangular	Quartzite	Fragment
CC1710-01	CC-14-AR-01	Topsoil	3.9	4.3	2.9	78	Rectangular	Quartzite	Fragment

Table 6.3. Provenience and Metric Data for all Manos (continued)

Spec. #	Lot*	Lot Type	L (cm)	W (cm)	Th (cm)	W (g)	Subform	Raw Material	Completeness
CC1845-01	CC-14-AS-01	Topsoil	10.5	4.6	4.6	430	Square	Granite	Fragment
CC1845-02	CC-14-AS-01	Topsoil	7.7	4.4	4.4	178	Square	Granite	Fragment
CC1853-01	CC-14-AS-02	Collapse Debris	9.9	4.5	4.6	391	Square	Granite	Fragment
CC1779-01	CC-14-AU-04	Collapse Debris	25.0	4.9	4.9	1083	Square	Granite	Complete
CC1116-03	CC-14-K-02	Floor	4.96	3.18	2.56	59	Unknown	Unknown Igneous	Unknown Fragment
CC1113-01	CC-14-L-02	Collapse Debris	8.6	7.82	4.61	523	Plano-convex	Limestone	Complete
CC1102-01	CC-14-L-02	Collapse Debris	14.27	4.36	4.1	475	Square	Granite	Medial Fragment
CC1422-01	CC-14-Q-02	Collapse Debris	15.34	5.82	4.66	740	Oval	Granite	Complete
CC1413-01	CC-14-Q-03	Construction Fill	8.65	4.65	4.74	315	Square	Granite	Medial Fragment
CC1413-02	CC-14-Q-03	Construction Fill	8.15	6.77	6.3	600	Square	Granite	Fragment
CC1328-01	CC-14-T-02	Collapse Debris	6.97	4.51	4.41	202	Square	Granite	Fragment
CC2124-01	CC-16-F-06	Floor	5.0	4.96	4.92	210	Rectangular	Quartzite	Complete
CC2352-01	CC-16-G-02	Collapse Debris	5.01	3.83	4.15	156	Square	Limestone	Distal Fragment
CC2257-04	CC-16-I-04	Collapse Debris	11.42	6.82	6.07	507	Oval	Granite	Distal Fragment
CC2257-01	CC-16-I-04	Collapse Debris	18.22	4.92	2.18	444	Rectangular	Granite	Distal Fragment
CC2410-01	CC-16-N-02	Collapse Debris	9.71	5.59	5.57	590	Square	Granite	Distal Fragment
CC2396-01	CC-16-P-03	Problematic Deposit	11.01	5.48	5.05	625	Square	Granite	Complete
CC2485-01	CC-16-U-01	Topsoil/Floor	5.94	7.87	5.44	354	Plano-convex	Granite	Fragment
CC2532-01	CC-16-X-03	Problematic Deposit	6.45	5.61	4.61	849	Rectangular	Granite	Distal Fragment
KU0081-01	KU-1-SF-05	Other (Surface Find)	11.34	6.65	6.32	819	Rectangular	Granite	Complete
KUV1256-01	KUV-01-A-02	Topsoil	4.8	4.0	3.3	128	Plano-convex	Limestone	Medial Fragment
KUV2412-01	KUV-01-AA-01	Topsoil	4.77	5.53	5.61	291	Square	Granite	Distal Fragment
KUV2537-01	KUV-01-SF-46	Other (Surface Find)	9.3	5.63	4.97	450	Rectangular	Granite	Medial Fragment
KUV2360-02	KUV-01-Y-02	Other	11.43	6.32	5.53	706	Plano-convex	Limestone	Distal Fragment
QHC1335-01	QHC-02-M-1	Topsoil	7.21	6.06	4.81	406	Plano-convex	Unknown	Proximal Fragment

*CC = Chan Chich, KU = Kaxil Uinic ruins, KUV = Kaxil Uinic village, QHC = Qualm Hill camp, SF = surface find

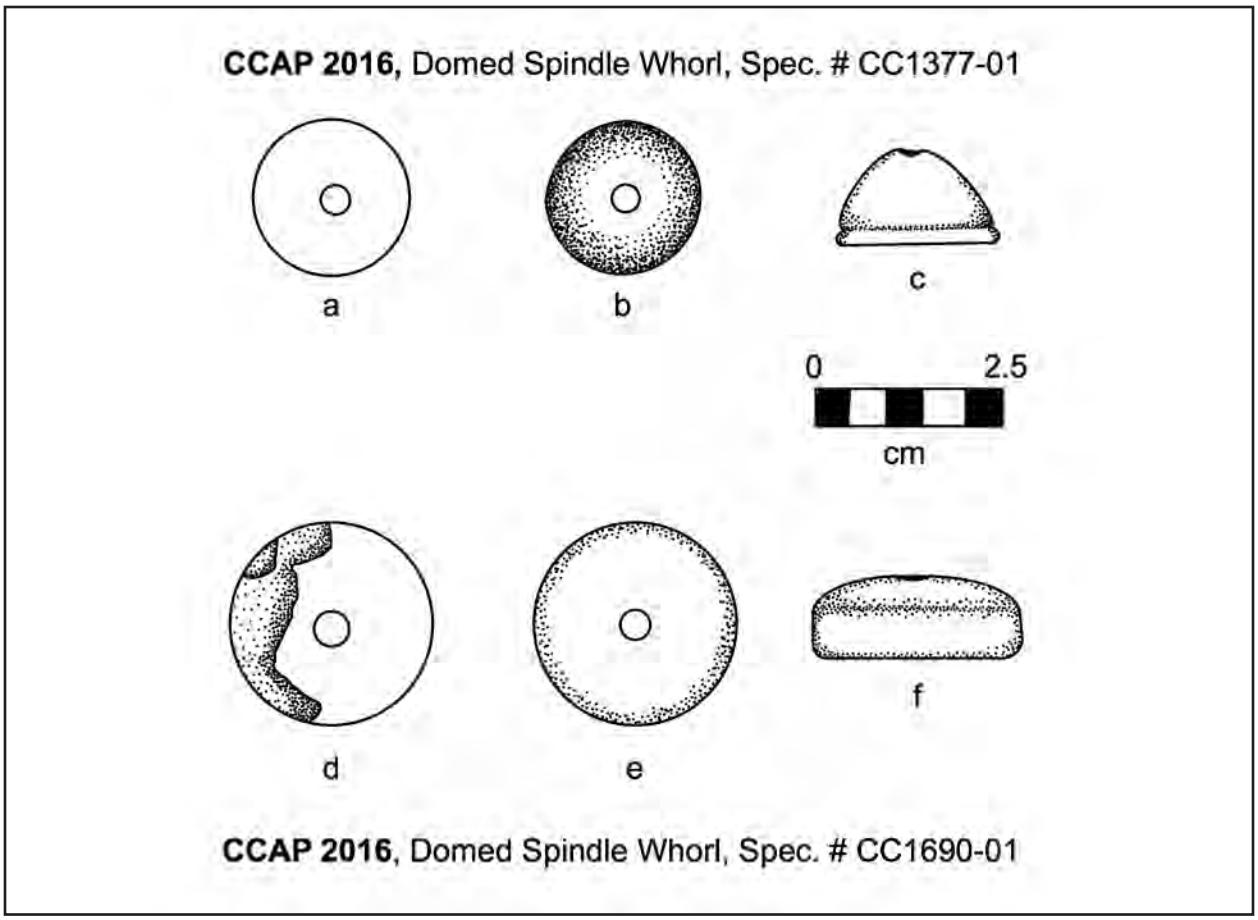

Figure 6.9. Drawings of two spindle whorls found at Chan Chich: a–c) Spec. # CC1377-01; d–f) Spec. # CC1690-01). a) ventral view; b) dorsal view; c) lateral view; d) ventral view; e) dorsal view; f) lateral view. Illustrations by Gertrude Kilgore.

Table 6.4. Provenience and Metric Data for all Stone Spindle Whorls Found by CCAP and BEAST from 2012–2016

Spec. #	Lot*	Lot Type	L (cm)	W (cm)	Th (cm)	W (g)	Subform*	Raw Material
CC1377-01	CC-14-H-06	Collapse Debris	2.57	2.57	1.46	15.0	Domed	Sandstone
CC1690-01	CC-14-AD-02	Collapse Debris	3.2	3.2	1.0	23.4	Domed	Limestone

*Both specimens are complete and both were found at Chan Chich.

Stone Disks

The category of stone disks encompasses any ground but unpolished stone that has a general disk shape (Adams 2002). Two complete ground stone artifacts found at Chan Chich fit this description. Although their true function is unknown, many scholars have postulated theories on how these limestone disks could have been used (Adams 2002; Andresen 1986; Freidel et al. 1991; Willey 1972). As noted in the provenience and metric data in Table 6.5, the examples found at Chan Chich range from about 1.9 to 6.5 cm in diameter, and were found in the Upper Plaza and near Structure D-48. Drawing on ethnographic as well as archaeological evidence, the two prevailing theories for stone disks of similar size to the one found in the Upper Plaza postulate that they

Table 6.5. Provenience and Metric Data for all Stone Disks Found by CCAP and BEAST from 2012–2016

Spec. #	Lot*	Lot Type	L (cm)	W (cm)	Th (cm)	W (g)	Raw Material
CC0076-01	CC-10-E-2	Construction Fill	6.59	6.47	2.57	124	Limestone
CC1989-01	CC-14-AP-01	Topsoil	1.9	1.5	0.1	2.3	Unknown

*Both specimens are complete and both were found at Chan Chich.

functioned as either pot-lids or end plugs for beehives (Andresen 1986; Freidel et al. 1991; Garber 1989; Willey 1972). Due to its small size, the specimen found near Structure D-48 was more likely a gaming piece (Adams 2002). Neither specimen has evidence for battering or burning.

Bark Beater

Bark beaters are pounding implements with flat, grooved faces for altering bark into parchment (Hammond 2006). CCAP and BEAST found only one additional bark beater during the past six field seasons; Glaab and Valdez (2000:121) report one other from the 1990s. Fortunately, the one new artifact (CC2518-01) is a complete oval bark beater with a circumferential groove and parallel striations that differ in width between the dorsal and ventral sides (Figure 6.10). The limestone object measures 10.36 cm long, 6.09 cm wide, and 4.66 cm thick, and weighs 589 g. The circumferential groove around the edges and proximal end would have probably held the handle (Hammond 2006). Variation in the spacing of the striations on the two flat sides probably indicates multiple functions. The wider spacing of grooves suggests coarser processing, and side with the narrower striations produces a more refined result (Glaab and Valdez 2000).

Hammerstone

Generally, the hammerstone form encompasses any modified rock selected for use as a percussion tool to strike, chip, or smash other items (Adams 2002). Hammerstones made from chert, chalcedony, or other raw materials that can be chipped stone are classified as "battered stone" and do not fall within the scope of this chapter. Only one ground stone hammerstone was found at Chan Chich. It is a relatively compact circular granite hammerstone with one flat face measuring 7.38 cm in diameter and a domed tool surface that is 4.45 cm thick. The selection of hard granite combined with the rounded striking surface suggests its use in activities requiring broader and shallower impact (Adams 2002).

Spheroid

The spheroid subform encompasses any ground stone artifacts deliberately shaped into a sphere. As this subform can represent a wide range of different objects, the function of spherical ground stone artifacts is unknown. Chan Chich has only one example of a spheroid specimen (CC0121-01). The small limestone sphere found on a floor surface in the Upper Plaza has one face that is flatter than the others and some polish, indicating use. It measures 3.5 cm in diameter, and weighs 59 g. The function is unknown.

DISCUSSION AND CONCLUSIONS

While the form and subform classification system mentioned above offers thorough descriptions of the shapes of artifacts, form does not necessarily mean function (Adams 2002). The functions of the forms given above provide general patterns of use for those basic shapes, but do not account for the whole life history

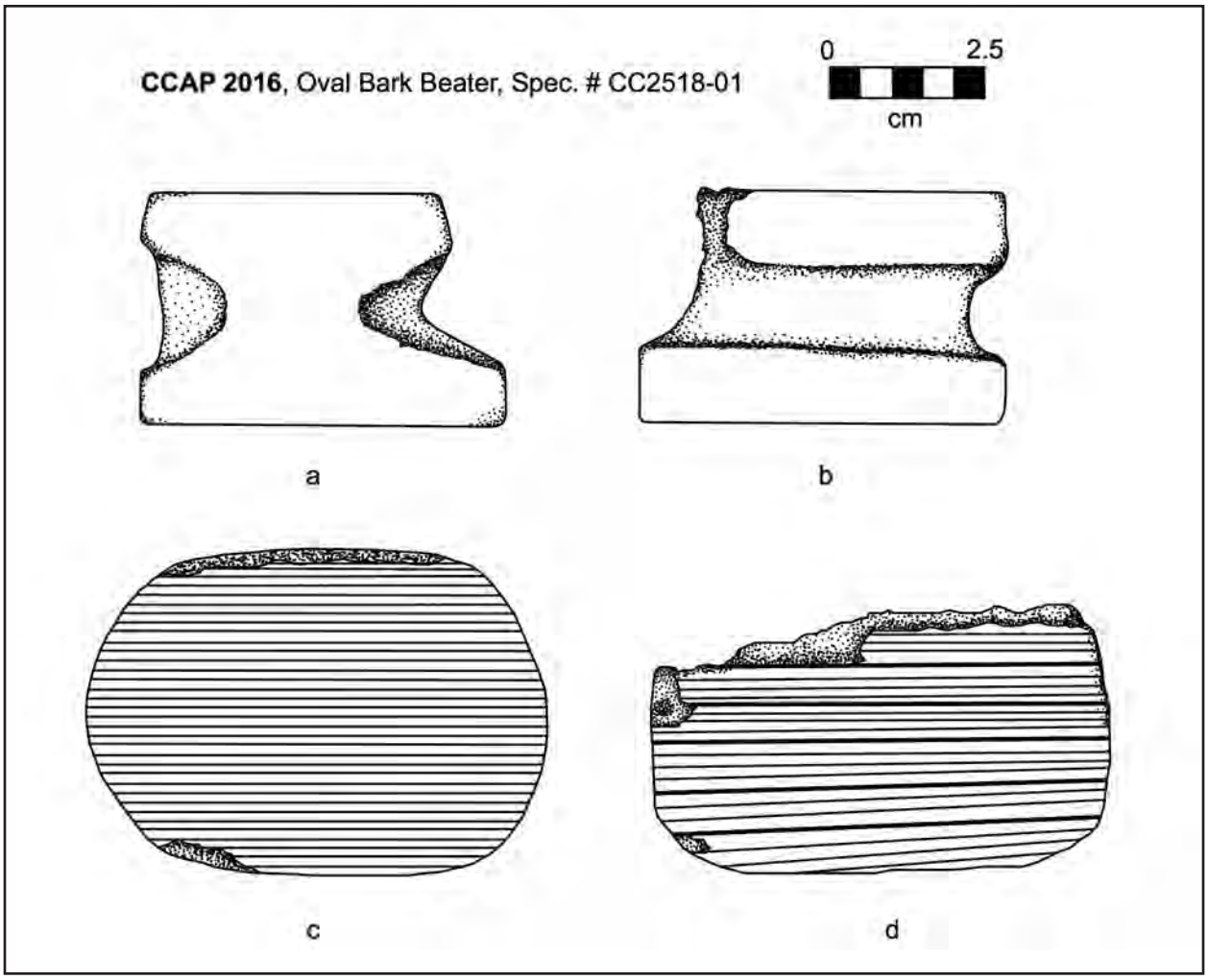

Figure 6.10. Drawings of the bark beater found at Chan Chich (Spec. # CC22518-01): a) distal view; b) proximal view; c) ventral view; d) dorsal view. Illustrations by Gertrude Kilgore.

of the object. Ground stone artifacts can go through one or more of five stages throughout their life history. The five stages include manufacture, primary utilization, secondary utilization, recycling, and discard (Dubreuil and Savage 2014:142–143). Macroscopic use-wear analysis in the field laboratory can offer greater insight into the primary and secondary utilization stages of the life histories of ground stone artifacts.

Although higher magnification offers more precise observation, certain aspects of use-wear are visible by the naked eye. The first step in macroscopic use-wear analysis is identifying the working part or parts of a tool. For most ground stone tools, this is evidenced by polish caused by repetitive use. Next, one must determine the modes of grasping the tool through analysis of any evidence of grooves for handles or the bare hand. The third step, identifying the resting surfaces, helps to fully understand the utilization of the tool by acknowledging the passive parts of the tool to complement the active (Dubreuil and Savage 2014).

Finally, macroscopic use-wear analysis can classify tool motions according to the three criteria outlined by Leroi-Gourham (1971). The first type of tool motion describes the application of force to the tool, including abrasion,

thrusting percussion, indirect percussion, or combined abrasion and percussion. Analyzing the direction of force, perpendicular, oblique, or a combination of both, is the second form of tool motion. The last classification of tool motion involves the type of contact, linear for sharp edges, punctiform for points, or diffused for surfaces (Leroi-Gourham 1971). These three types of motion provide information on the kinetic forces in action during the use of ground stone tools. The battering component of the CCAP and BEAST database offers an outlet for these observations in a simplified form.

The analysis of these additional 130 ground stone artifacts found at Chan Chich and the surrounding sites drastically improved understandings of the prehistoric and historic ground stone industries at Chan Chich and surrounding area. The use of non-local raw materials demonstrates the inhabitants' access to long distance exchange with the Maya Mountains region. The combination of subsistence tools (manos and metates) with other functional artifacts (bark beater, spindle whorls, hammerstone) offers a more fully developed picture of activity in both ancient and historic contexts.

Distribution patterns for the ground stone artifacts are difficult to accurately determine. All of the objects discussed above were found in contexts ranging from historic to ancient, ritual to domestic, and architectural to non-architectural. The significant rise in manos and metates found between the last interim report chapter on ground stone artifacts and this one could be attributed to the increase in excavations of domestic spaces, specifically the Back Plaza and Courtyard D-1. However, the other forms of ground stone artifacts occur in quantities that are too small to track distribution patterns.

Observations on these ground stone artifacts and the presentation of methods for more in-depth use-wear analysis offer potential for the reconstruction of related activities at the various sites. Due to the small sample size, minimal attempts to reconstruct such activities were made in this chapter. However, the information provided should be helpful for future studies involving ground stone artifacts or their related activities.

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The Chan Chich Archaeological Project: 1996 to 2016 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 7.1 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 4 m high including structure and substructure or basal platform, that are not within 1 km of another recorded site BE site.

Table 7.1. 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

Houk, Brett A. (compiler)
2016 The Chan Chich Archaeological Project: 1996 to 2016 Project Lists. In *The 2016 Season of the Chan Chich Archaeological Project*, edited by Brett A. Houk, pp. 171–188. Papers of the Chan Chich Archaeological Project, Number 11. Department of Sociology, Anthropology, and Social Work, Texas Tech University, Lubbock.

In addition to prehistoric sites, a number of historic sites are present in and near the BEAST survey area. Table 7.2 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 7.2. 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 7.3 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.

Table 7.3. 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

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 7.4 lists the operations that have been assigned through the 2015 season.

Table 7.4. 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)
CC-02	1999	Excavations at the Upper Plaza including summits of Structures A-1 and A-13	X–AK	Robichaux (2000)

Table 7.4. List of Operations Opened by CCAP and BEAST (continued)

Op	Season	Definitions	Subops	Source(s)
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 (2016); Booher et al. (2015); Booher and Houk (2016); Booher and Nettleton (2014); Houk et al. (2015)
CC-15	2016	Excavations at the Upper Plaza, Chan Chich Dynastic Architecture Project. The 2015 season focused on chronology building and the northern part of the plaza.	A–F (plus Bx)	Booher et al. (2016); Houk (this volume)
CC-16	2016	Excavations at Norman's Temple complex.	A–X (plus Dx)	Booher (this volume); Booher et al. (2016)
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)
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, this volume); Booher et al. (2016); Houk (2012); Houk and Bonorden (2015); Houk et al. (2015)

Table 7.4. List of Operations Opened by CCAP and BEAST (continued)

Op	Season	Definitions	Subops	Source(s)
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, and 16 burials. Table 7.5 lists the burials thus far recorded, and Table 7.6 lists the tombs documented at the site, including a looted tomb first recorded by Guderjan (1991). Table 7.7 includes the single cache entry in the list of special deposits.

Table 7.5. 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
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)

Table 7.5. List of Burials (continued)

Burial #	Season	Provenience	Context	Source(s)
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 (this volume); Novotny et al. (this volume)
CC-B16	2016	CC-15-G-11	Early Classic?; primary interment of two individuals designated Burials CC-B16A and CC-B16B. Grave appears to be a simple cist in subfloor fill, but context is not completely understood. Burial CC-B16A consisted of an articulated left leg, remains of the left and right feet, and an articulated right hand, which was approximately 50 cm to the east of the other elements. Burial CC-B16B was only partially exposed near the southern edge of the unit. The remains were identified in the field as an articulated right arm (humerus, radius, ulna, and hand phalanges). They were left *in situ* and backfilled for excavation in 2017.	Houk (this volume); Novotny et al. (this volume)

Table 7.6. List of Tombs

Tomb #	Season	Provenience	Location	Source(s)
1	--	Structure C-31	Looted tomb referred to as the King's Tomb; Late Classic (?)	Guderjan (1991)
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)

Table 7.7. 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 7.8 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 7.8. 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)
4	Gallon Jug	Stela 1	Main plaza	Very small stela that may not actually be a monument, only 45 cm high	Sandrock (2013)

Table 7.8. Recorded Stone Monuments in CCAP/BEAST Permit Area (continued)

BE #	Site	Monument	Location	Description	Source(s)
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)

RADIOCARBON DATES

Table 7.9 presents the results of radiocarbon samples run by the project from 2012 to 2015. Table 7.10 presents the calibrated age ranges and isotope data for those same samples. Table 7.11 presents the results of samples from the 2016 season.

Table 7.9. 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 7.9. 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 7.10. 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 7.11. Charcoal Samples Processed from the 2016 Season

Lot CC-*	Sample CC-	Context	14C Age (BP)	+/-	Calibrated age (AD/BC)	% under curve	2σ Age Range
15-C-4	15-S04	embedded on compacted dirt stratum (below terminal plaza plaster floor fill)	1835	20	AD 128–236	95.4	**AD 128–236**
15-C-5	15-S19	associated with surface of Lot 15-C-5 plaster floor	1840	20	AD 125–238	95.4	**AD 125–238**
15-C-7	15-S07	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-C-8	15-S23	associated with Lot 15-C-8 plaster floor	2295	30	406–354 BC	75.1	**406–231 BC**
					291–231 BC	20.3	
15-C-10	15-S34	embedded in ballast of Lot CC-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-C-11	15-S39	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-A-8	15-S16	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	

Table 7.11. Charcoal Samples Processed from the 2016 Season (continued)

Lot CC-*	Sample CC-	Context	14C Age (BP)	+/-	Calibrated age (AD/BC)	% under curve	2σ Age Range
15-A-15	15-S43	associated with earliest use of plaza above bedrock	2700	35	911–804 BC	95.4	**911–804 BC**
15-B-3	15-S05	associated with terminal use of Structure A-1	1275	20	AD 675–770	95.4	**AD 675–770**
15-G-4	15-S59	associated with intentional burning event	1895	25	55 BC–AD 175	91.8	**55 BC–AD 211**
					AD 191–211	3.6	
15-B-4	15-S45	embedded on surface of Lot 15-B-7; associated with use of earliest iteration of terminal plaza floor	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-B-4	15-S22	embedded in ballast; associated with construction of terminal plaza plaster floor (Lot 15-B-4)	2485	20	766–540 BC	95.4	**766–540 BC**
15-B-8	15-S29	associated with construction of terminal plaza floor	2595	45	841–736 BC	73.4	**841–547 BC**
					689–663 BC	5.4	
					648–547 BC	16.6	
15-B-10	15-S50	associated with intentional cutting event through Lot 15-B-9 plaster floor	2490	25	774–536 BC	95.1	**774–524 BC**
					525–524 BC	0.3	
15-B-11	15-S54	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-B-15	15-S51	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**
16-L-3	16-S01	associated with Burial B15 in final phase of Structure C-2	1165	35	771 AD–970	95.4	**AD 771–970**

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

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