Actuncan
Archaeological Project

Report of the eleventh season
2018

David W. Mixter and Lisa J. LeCount

The Actuncan Archaeological Project: Report of the 2018 Field Season

David W. Mixter
Department of Anthropology, Binghamton University

and

Lisa J. LeCount
Department of Anthropology, University of Alabama

Report submitted to the Belize Institute of Archaeology

April 2019

Acknowledgements

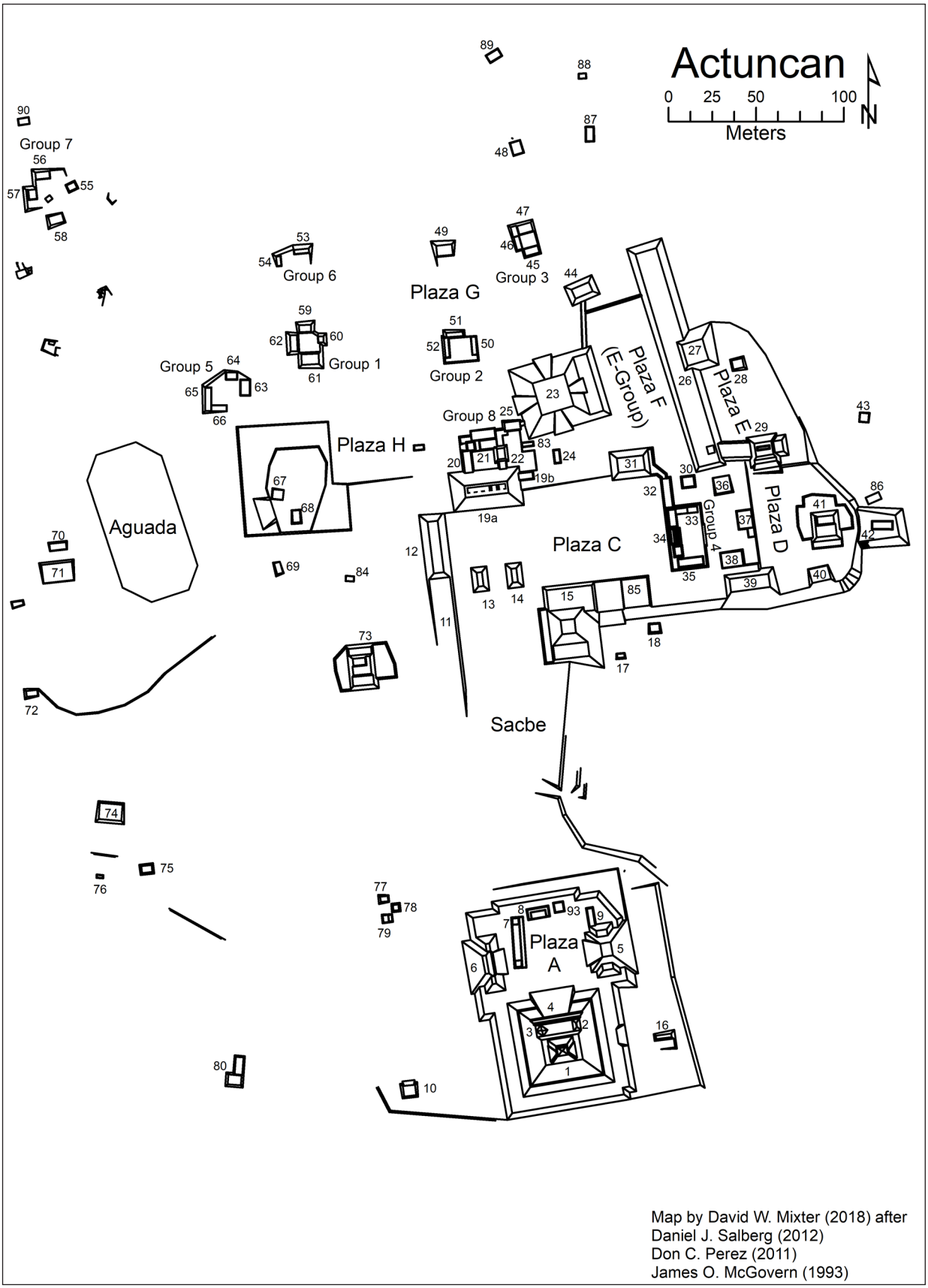
Lisa LeCount wishes to thank the University of Alabama's Department of Anthropology for providing logistical and financial support for the Actuncan Archaeological Project this summer. Theresa Heindel's research was self-fund, Borislava Simova's investigations were funded by the Tulane University's Department of Anthropology, and David Mixter's research was funded by private donors. We gratefully acknowledge this aid. Investigations took place through the permission and generous support of the director and associate directors of the Belize Institute of Archaeology (IA), particularly Dr. John Morris. We also wish to thank the staff of the IA, especially Melissa Badillo for her help with paperwork, and all the IA staff for organizing the BAS and publishing the RRBA.

Without fail, the Galvez and Juan families permitted us to excavate on their lands, and we appreciate their patience for any inconveniences that our work might have caused them. Azucena Galvez's hospitality and excellent food sustained us through the summer, and we thank her for all her hard work and good humor. The entire Galvez family--Chena, Linda, Alfonso, Ramon, Alfonso Jr., and Gwendolyn--provided us with more than just food and shelter, but truly a home away from home. Rudy Juan was a source of valuable information as always, and we want to thank him and Dominic Juan for their continued support of our project. We were assisted in our research by many dedicated individuals from San José de Succotz. The data presented in this report was the result of local excavators whose hard work, collaboration, and enthusiasm made this field season a success. Rene Uck was our foreman again this year, and he was outstanding in this difficult job. His expert knowledge of ancient Maya architecture and his long-years of experience in the field helped make excavations go very smoothly. *Excavators* included Elmer Cocom and Rafael Luna and *ayudantes* included Victor Cocom, Gerson Uck, and Rommel Uck. Clancy and Eudie Cocom helped in the laboratory washing and recording artifacts. Many of these men have worked on the project for years, and they are excellent people and crew.

We would like to thank the fine graduate students and colleagues whose collaboration makes the research project possible. During 2018, Bobbie Simova continued her research on Actuncan's E-Group, and Theresa Heidel completed laboratory analysis of materials recovered from the site's agricultural systems. During late March, 2019, David Mixter and Dr. Thomas Jamison scanned most of the original documentation from James McGovern's work at Actuncan from 1992-1994 under the auspices of the Xunantunich Archaeological Project. David would like to thank Dr. Richard Leventhal for access to his archives located in the Penn Museum at the University of Pennsylvania in Philadelphia and Tom for his aid. We greatly appreciate everyone's dedication to the success of the Actuncan Archaeological Project.

David Mixter, Binghamton and Lisa LeCount, Tuscaloosa

Table of Contents



Map by David W. Mixter (2018) after
Daniel J. Salberg (2012)
Don C. Perez (2011)
James O. McGovern (1993)

Chapter 1: Examining the Rise of Maya Kingship at Actuncan, Belize using Collective Action Theory[1]

Lisa J. LeCount (University of Alabama)

In this chapter, I summarize the major research questions and some of the results from the Actuncan Archaeological Project, which has been on-going since 2001. The project was initially designed to examine the ways Preclassic Maya leaders institutionalized political authority from the perspective of household archaeology, but has expanded to include excavation of civic architecture and remote sensing in open spaces. My research is informed by collective action theory, and the degree to which leaders engaged in exclusionary and inclusive practices over the site's 2000 years of occupation. Findings have not supported my original exclusive power hypothesis in which early rulers circumvented kin-based authority by out-competing and fragmenting established households. Instead, the small number of founding elite and commoner houses enjoyed socio-economic prosperity during the Terminal Preclassic period when kingship was institutionalized. The rise to regional authority was rapid at Actuncan, which was built by burying an earlier settlement and greatly expanding civic structures. This expansion was achieved through inclusive practices that mobilized hinterland populations' labor and loyalties. Later, however, Classic-period elites experienced boom-and-bust cycles of growth and abandonment, which I argue is the result of elite competition for exclusive power.

As with any collaborative project, the ideas and data I present in this chapter are a unique amalgamation of my own work and insights and data from others, and my views do not necessarily reflect those of all contributors of this project. Nevertheless, what is truly rewarding about collaborative research is the on-going dialogues over the collection and interpretation of data that lead to original ideas about the past.

Two Major Research Questions

Actuncan loomed large in my mind as an excellent case study to investigate the beginnings of Maya kingship after completing my dissertation project with the Xunantunich Archaeological Project that studied its collapse. In 2010 after two exploratory excavation seasons, I received a National Science Foundation grant that kicked off the current project. The grant proposal addressed two questions.

First, how was Maya leadership institutionalized as a political office? In other words, what strategies did Preclassic leaders use to solidify their political positions and create an institution that endured without them? This is the classic question of kingly legitimacy and a perennial question for researchers in the social sciences, especially for archaeologists of complex societies.

What Mayanists already know is that elite households emerged sometime in the Middle Preclassic period and monument building and art programs ramped up in the Late Preclassic period. This information placed the transition from achieved leadership to kingship sometime in the later part of the Preclassic period. By the Classic period, kingship was firmly held by dynasts or other hereditary elites. Some of these Classic kings, especially those in large capitals such as Tikal and Palenque, were called by the title *k'uhul ajawob*, lived in residential palaces, and headed royal courts. The question therefore boiled down to the following: if elite households vied for leadership positions during the Preclassic period, how did one household out-compete others for authority and institutionalize power into the hands of a single lineage? Was it through economic arrangements with households that consolidated their support; competitive feasting and other means that created indebtedness; exclusive

[1] This chapter was originally presented as a paper in the symposium "Charting the Long-term Development of the Ancient Maya Center of Actuncan, Belize" organized for the 83rd Annual Meeting of the Society for American Archaeology by David W. Mixter and Lisa J. LeCount, April 12, 2018.

trade relationship with distant trade partners that monopolized long-distance goods; control of ritual knowledge, performances, and paraphernalia; or military prowess?

The plan was to excavate households to document the distribution of utilitarian, wealth, and ritual items; to identify crafting activities; and to chart changes in household arrangements over time. Based on our initial testing of residential groups, I assumed that under the terminal stages of residential mounds, including the palace compound, there were earlier versions of family residences. By comparing the activities that took place in the ruler's residence with other elite and commoner households and how they changed through time, I could point to the ways the ruling lineage succeeded in consolidating power.

My second question was: to what degree did these emerging kings usurp household authority at Actuncan? I hypothesized that households participated differentially in the processes that consolidated power. Founding households with the best access to land, labor, and wealth had the most to lose with the institutionalization of kingship. As the emerging ruling family instigated strategies that limited the authority of others, some prosperous households would have seen their affluence decline, while others achieved wealth as political functionaries or allies. Therefore, winners and losers could be charted based on deviations from typical household developmental cycles during the Preclassic to Classic transition. In general, I assumed that social hierarchies would become more marked as power was consolidated into the hands of a few families. Little did I know that all of these hypotheses would be rejected, and that the reality of the situation was much different than I predicted.

A Brief History of the Site

After 14 seasons of field work by Jim McGovern of the Xunantunich Archaeological Project and myself, as the director of the Actuncan Archaeological Project (AAP), we now have a good understanding of how the site developed through time. McGovern (2004) excavated 44 test pits in 13 civic structures and AAP trenched or tested all visible households in the urban core, as well as six monumental buildings not tested by McGovern. In addition, AAP conducted archaeogeophysical surveys and ground-truthing excavations in Plaza H and the northern settlement zone. Although there are still buildings that have not been investigated and some which have been tested but remain poorly understood, it possible to reconstruct a history of the site developments.

Actuncan is situated on a ridge top overlooking the Mopan River Valley near the present day borders of Belize and Guatemala. The site is composed of two architectural groups linked by a wide causeway: Actuncan South, the Triadic Group centered on Plaza A, and Actuncan North, a set of civic monuments, elite residences, and a commoner settlement zone.

The site experienced three periods of growth: early (Terminal Early Preclassic to Late Preclassic phases from 1000 to 200 B.C.), middle (Terminal Preclassic phase from 200 B.C. to A.D. 300) and late (Terminal Classic phase from A.D. 780 to 900). Like a few other centers in this region of the upper Belize River valley, such as Cahal Pech, it occupied a prominent place on the landscape for two millennia. Its longevity is due to its hilltop position above the fertile Mopan river, the rich agriculture lands on top the river's gentle terraces, and, possibly, Clarissa Falls that required portage at this critical point along the trade route from the Caribbean to sites in the central Peten.

Early Occupation

Evidence for the earliest occupation is found on the eastern edge of Actuncan overlooking the Mopan

River. Excavations under Structure 41 revealed six plaza floors, the earliest of which is burnt marl (Mixter 2012). On this floor, a foundational deposit was found consisting of fragments of a Cunil-age colander and a large ceramic jar rim used as a brazier. Nearby, three courses of roughly-cut limestone blocks with soft marl mortar may have been the foundation for an early platform. The first public building has been found underneath the eastern platform of the formal E-group, where a plaza and platform were created by leveling and mounding the clay on the ridge top (Simova 2018; Simova and Mixter 2016; Simova et al. 2018). As of yet, however, no domestic structures have been found that date to this time; nor have we discovered any evidence of Middle Preclassic houses although McGovern found evidence of plaza constructions near the E-Group and we have substantial Jenny Creek diagnostics in fill. So, we assume people were living somewhere at the site, and houses could possibly be clustered underneath Plaza C based on what we know from Terry Powis's (Micheletti et al. 2018) investigations at Pacbitun.

To date, the earliest evidence of domestic platforms comes from three Late Preclassic structures under Group 1. Late Preclassic civic constructions include plaza construction (Plazas C and F) and the initial stages of Structures 19, 34, and 26. By far, the largest Late Preclassic structures are associated with the Triadic Group in Plaza A including Structures 1, 4, 5 and 6 (Figure 1.1). All evidence points to the fact that this early center was small, as was the population living on the hilltop.

Establishment of the Center

It is during the Terminal Preclassic period from 200 BC to AD 300 that Actuncan becomes a political center. Unlike nearby sites, Actuncan displays all the Preclassic hallmarks of early Maya civilization including a Triadic Group, a ballcourt, a formal "Cenote-style" E-group, and a carved stela. The eastern and southern structures of the Triadic Group (Structures 4 and 5) displayed polychrome painted masks (McGovern 2004: Figure 13). These monuments are considered archeological indicators of an *ajaw*, a term for a ruler identified in hieroglyphs and iconography. During this time, the site was home to a small group of founding elite and commoner families, who lived around the periphery of the civic core. Two elite families lived on the eastern edge of the site adjacent to the E-group, while one other elite family lived near the sacbe that connects the two parts of the site. The oldest commoner residential units (Groups 1, 5, and 7) were strategically positioned near the aguada. Groups 1 and 5 were less than 100 m from Structure 19, the central range structure. These families were responsible for the growth of the center and its rise to political prominence. Because developments that took place during this period are directly related to the research questions I presented earlier, I will discuss these in more details later.

Decline and Resurgence

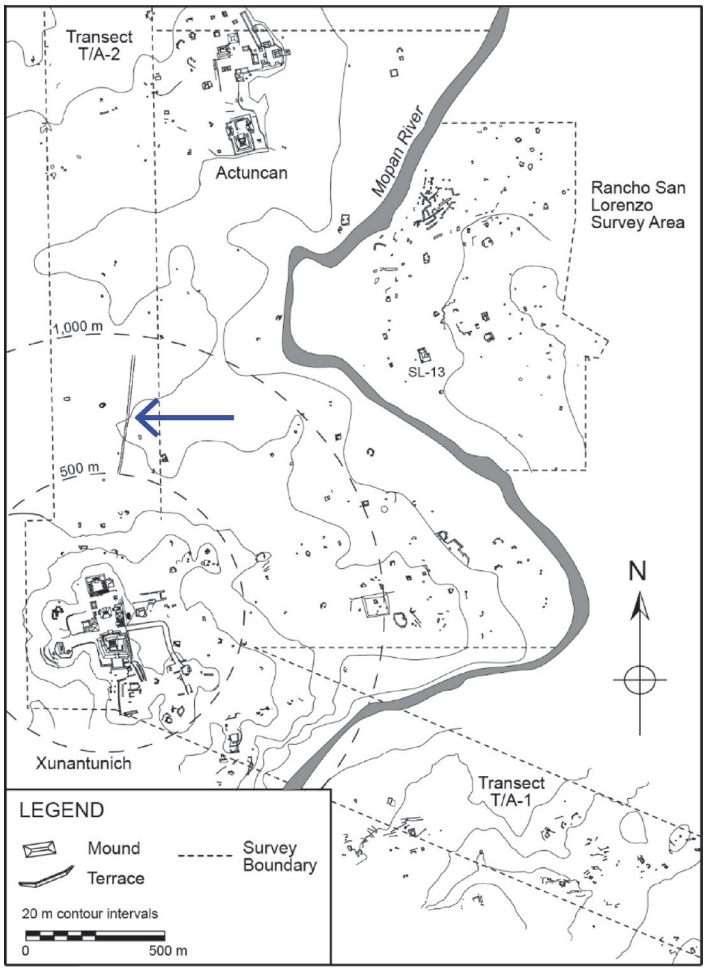
Civic building slows sometime around AD 200 and halts altogether around AD 400 when a range structure (Structure 34) was burnt and elite homes were terminated in what appears to have been a violent encounter. During the Early Classic period, the nearby site of Buenavista del Cayo replaced Actuncan as the local center of authority, while Xunantunich solidified control over sites as the provincial center of the Naranjo Kingdom in the Late Classic period. What is important to remember about Actuncan during the Late Classic period is the fact that it was a secondary center connected directly to Xunantunich by a causeway, the bits and pieces of which were found during the Xunantunich Settlement Survey (Figure 1.2). Actuncan's central range structure (Structure 19) was renovated and Group 8 was built to house vassal nobles or possibly to serve as a temporary residence for visiting officials. The old sectors of the Preclassic center were neglected, presumably because most of Actuncan's labor force was redirected to building projects at Xunantunich.

As Xunantunich's power began to wane in the 9th century, Actuncan embarked on a new round of civic

Time period	Middle Preclassic	Late Preclassic	Terminal Preclassic*	Early Classic	Late Classic I	Late Classic II	Terminal Classic	Source
Actuncan South								
Platform-Plaza A		3		1	1			McGovern 2004:114-117
Structure 1	*	1	1	1	1			McGovern 2004:123-124
Structure 4	*	1	2		1			McGovern 2004:117-122
Structure 5		2		1		1		McGovern 2004:125-129
Structure 6		4						McGovern 2004:129-131
Actuncan North								
Plaza C - in front of 19a		3		1		1		Jamison 2013
Plaza C Ball Court Alley	*	3			1		2	McGovern 2004:137-138, 178-180
Structure 12						1		McGovern 2004:133-134
Structure 13		2			1			McGovern 2004:137-138, 178-180
Structure 15	*	1	1	1?		1		McGovern 2004:131-133, 174
Structure 19a			3	1	1			Jamison 2013; McGovern 2004:134-136; Mixter et al. 2013
Plaza E	1							McGovern 2004:139
Plaza F	3	2	2	1	1?			Mixter and Craiker 2013
Structure 23		?	3+					Heindel 2016; LeCount, personal communication 2016
Structure 26	1?	5?	3?					Donohue 2014; LeCount 2015; Simova and Mixter 2016; LeCount and Simova, personal communication 2016
Structure 26a				4				McGovern 2004:139-142
Structure 27			2					Donohue 2014; LeCount 2015
Structure 31				1	1			McGovern 2004:142-145
Group 4				1			2	Mixter 2017
Elite Houses								
Structure 29			?	3		?	1	LeCount 2015; LeCount and Blitz 2005; Nordine 2014
Structure 41			2	1		1	1	LeCount 2015; LeCount and Blitz 2005; Mixter 2011, 2012
Structure 73			?	2	1*	2		Simova 2012, 2015; Simova et al. 2014

Figure 1.1. Number of construction phases by structure (adapted from Mixter 2016: Table 2.2).

building and ritual resignification of old monuments in its attempts to revitalize authority during the collapse of divine kingship at Xunantunich in the Terminal Classic period. A set of unimposing buildings positioned around an open-ended patio served as a council house at the eastern edge of Actuncan North (Mixter 2017). David Mixter's work at Actuncan South also found that new structures were built in front of the Triadic Group. These low platforms blocked access to the old Preclassic architecture and refocused attention on the eastern building (Structure 5) of the Triadic Group. Actuncan's revitalization was not long-lived and populations gradually dispersed in the Postclassic period sometime after A.D. 1000.



1.2. Map of region with arrow pointing to sacbe between Xunantunich and Actuncan (adapted from Yaeger 2000: Figure 4.2).

Social and Political Processes for the Rise of Divine Kingship at Actuncan

Now that I have sketched out in broad brush strokes the development of the site, let me to turn back to my two original questions about the processes that gave rise to divine kingship at Actuncan. First, how did a single Preclassic elite household out-compete others for authority and institutionalized power? The short answer to this question is: they didn't.

Actuncan became a political center through a process known as "creative destruction" that describes the formation of the *new* by the destruction of the *old*. This process is best seen in domestic architecture, where early buildings were buried using thick layers of sterile clay fills and new houses were built on top the fill. This act totally obscured the remains of early houses. Construction techniques also differed between the earlier Late Preclassic houses and those that came later. Late Preclassic house platforms were not constructed in any formulaic way. One platform found under the southern side of Group 1 was made of a course or two of colored stones and artifacts, and the platform was filled with yellow clay. Underneath the group's western edge, two other platforms were composed of cobble fill overlain with a marl surface. The Terminal Preclassic people on the other hand consistently built rectangular platforms using cut-stone masonry and cobble fill. The final piece of evidence for creative destruction is the fact that house orientations changed, indicating a whole-sale disjunction between people who occupied the Late Preclassic village and those that built the Terminal Preclassic center.

During the Terminal Preclassic, civic architecture was also greatly expanded. Major construction occurred at the Triadic Group, E-Group, Structure 19, and the ball court. Like households, the new civic core was re-oriented and laid out differently than earlier structures. The E-group, which was built sometime at

the onset of the Middle Preclassic period, is key to understanding the shift from a small village to a political center. Bobbie Simova calculated that the E-Group's eastern structure is oriented 17.5 degrees west of north, while the Terminal Preclassic site is 7 degrees west of north as measured from the Triadic Group down the ballcourt alley. According to Takeshi Inomata (2018), early E-Groups were built to reference astronomical bodies and major topographic points such as mountains and only later did their orientations shift to focus primarily on solar movements. At Actuncan, the E-Group's orientation appears to have been preserved over time. According to James Doyle (2017:91), this pattern of preserving the foot print of early E-Groups is found consistently across Maya sites. E-Groups continued to be used as ritual spaces for agricultural rituals and kingly burials well into the Early Classic, and the presence of Late Classic materials on summit surfaces suggest these spaces maintained ritual significance. However, other regal-ritual buildings began to appear in the Late Preclassic period, the most impressive of which were Triadic Groups. Further, site layouts began to exhibit planar geometry with a strong north-south axis (Doyle 2017). According to David Mixter (2017), the building of Actuncan's Triadic Group marked the introduction of divine kingship at the site around BCE 200. Rituals surrounding kingship emphasized ceremonial circuits that linked the Triadic Group to Structure 19, the largest and most central range structure at the site, via the ballcourt. While the E-Group was not destroyed in this transition (on the contrary, the building was formalized with masonry facades and multiple plastered floors), the site's civic plan and new orientation illustrates the formation of a new political center that eclipsed the small Late Preclassic village.

These findings have important implications for my hypotheses about the rise of Maya kingship at the site. First, founding families, both elite and common, came to live at Actuncan simultaneously, making elite claims to land and other rights based on first principles tenuous. Status differences were evident at the founding of the Terminal Preclassic site, a fact that is supported by the different residential arrangements of elite and commoner houses. Elites built houses on tall substructures that supported limestone-block masonry summit superstructures fronted with apron-moldings facades covered in stucco and painted red, similar to those in Petén. Commoners built patio-focused groups in which house platforms faced inward towards the patio. Given these data, there was no autochthonous development of social stratification at Actuncan from which to view processes pertaining to the rise of Maya divine kingship. On the contrary, the founding of the political center was based on social and political arrangements between people who either moved there together or coalesced there. While commoners might have relocated from nearby places, the style of elite houses suggests more distant locations for their origins.

Second, Terminal Preclassic leadership does not appear to have been concentrated into the hands of a single family. Tom Jamison's excavations into Structure 19 did not reveal any solid evidence for a Terminal Preclassic palace, like the one at nearby San Bartolo in Guatemala (Runggaldier 2009). Given that no Preclassic residential palace has been found at Actuncan, early leadership may have been heterarchically organized with the responsibilities for performing ritual ceremonies rotating across similarly ranked elite houses. It wasn't until the Late Classic period that Structure 19 was modified to serve as the location of local administrative activities.

Third, the center was founded by a ***very*** small group of people: at most 3 elite and 4 commoner families. Remote sensing in the most likely locations of buried structures (Plaza H and the Northern Settlement Zone) did not find additional housing dating to the Terminal Preclassic period (LeCount et al. 2019). The urban settlement therefore consisted of elites living on the eastern and southern edges of Plaza C near ritual buildings, while commoners settled near the aguada on the opposite side of the civic core.

How did a hand-full of families build such a large center, and what was the political relationship between

them? These queries bring me back to my second primary question: To what degree did emerging kings usurp household authority at Actuncan to consolidate power? Again, the short answer to this question is: they didn't. Elites did not wrestle authority away from powerful, pre-existing households; instead, I suggest that they negotiated with commoners to legitimate their authority. Whether elites and commoners moved to Actuncan together or coalesced there, there is no evidence that the founding of the site involved appropriating authority. While this must have happened elsewhere, at Actuncan all the evidence suggests that land was divvied up relatively equitably, civic buildings were accessible, and public goods such as the aguada were built to provide basic resources. Granted, elites controlled the best farm land situated on the gentle eastern slope of the site above the Mopan River valley flood plain. But commoners secured access to common property to build urban dwellings and to garden plots through land tenure arrangements that were put into place at the founding of the site (LeCount et al. 2019).

This realization leads me to utilize a collective action approach, which is a more fitting explanatory framework for the establishment of kingship at the site of Actuncan than an exclusive power hypothesis. Rich Blanton and Lane Fargher (2008) suggest that the nature of polity organization is the result of bargains struck between governing elites and non-ruling groups. These negotiations directly affect governing elites' decisions to invest in public goods and services, as well as their compliance with social contracts and obligations to households. Where social groups maintain considerable resources and authority, governing elites negotiate more equitably with them to retain their support, while the opposite is proposed when groups lack economic resources and/or social capital.

Informed by a collective action perspective, I suggest that Actuncan's elites recognized that the site's commoner families were key allies in promoting the newly established center to hinterland populations. This common interest was a possible motivation to negotiate access to public goods and services at the founding of the center. While rituals and other public spectacles may have gone a long way in integrating hinterland populations by embedding a sense of community identity, the day-to-day pragmatics of political regimes entailed solving disputes and engaging in community affairs. Well positioned commoner families, such as those living in Actuncan's Northern Settlement Zone, could have served as middle men who helped arrange covenants between ruling elites and hinterland people. During the Postclassic period, male heads of principal families, called *ah cuch cabob*, were "bearers of the land" or council members that adjudicated land claims over houselot or field plot boundaries within neighborhoods or communities (*cuchteel*) and assisted town leaders (*batabob*) with carrying out their administrative duties (McAnany 1995:91-92). While this formal position may not have been in place during the Preclassic period, it is highly likely that those people who Robin (Robin et al. 2015) calls "leading-families" were integral to strategies for drawing dispersed hinterland families into early centers for ritual and civic functions. Local leading families may have been especially important to newly-arrived elites who did not have connections with hinterland populations.

Group 1, the largest patio-focused group, may have acted as a Preclassic leading family for the Northern Settlement Zone. The group's well-built Preclassic crypt tombs cemented their claims to land rights in the western portion of the settlement. Further, Burials 1 and 4 contained highly-decorated pottery including two Aguacate Orange vessels (a Z-angled tetrapod dish and an "Old God" effigy chocolate pot) and a polished parrot effigy lid, and a shell pendent inscribed with the image of God N was found in the fill of the Early Classic patio. These data suggest that Group 1 had access to luxury goods, presumably through close connections with Actuncan elites.

Other urban households also had good access to non-local trade goods during the Terminal Preclassic period (Tables 1.1 and 1.2). All households had access to obsidian and shell; in fact, commoners have more obsidian and marine shell than elites (Figure 1.3). These data suggest that common families were

Table 1.1. Ratio of obsidian count/m3 of excavated matrix by house rank and time period.

	T. Preclassic & E. Classic				Late Classic				Terminal Classic				Total		
	#	m^3	ratio		#	m^3	ratio		#	m^3	ratio		#	m^3	ratio
Palace	5	02.97	1.68		36	22.14	1.62		43	14.45	2.98		84	39.56	2.12
Elite	77	62.91	1.22		81	31.69	2.56		178	55.52	3.21		336	150.12	2.24
Common	166	31.03	5.35		147	38.19	3.85		149	37.05	4.01		462	106.4	4.34
Total	248	96.91	2.56		264	92.02	2.87		370	107.15	3.45		882	296.08	2.98

Table 1.2. Ratio of marine shell count/m3 of excavated matrix by house rank and time period. Marine shell counts based on Friewald (2018).

	T. Preclassic & E. Classic				Late Classic				Terminal Classic				Total		
	#	m^3	ratio		#	m^3	ratio		#	m^3	ratio		#	m^3	ratio
Palace	0	02.97	0		0	22.14	0		2	14.45	0.14		2	39.56	0.05
Elite	26	62.91	0.41		1	31.69	0.03		10	55.52	0.18		37	150.12	0.25
Common	21	31.03	0.68		13	38.19	0.34		8	37.05	0.22		42	106.40	0.39
Total	47	96.91	0.49		14	92.02	0.15		20	107.15	0.19		81	296.08	0.27

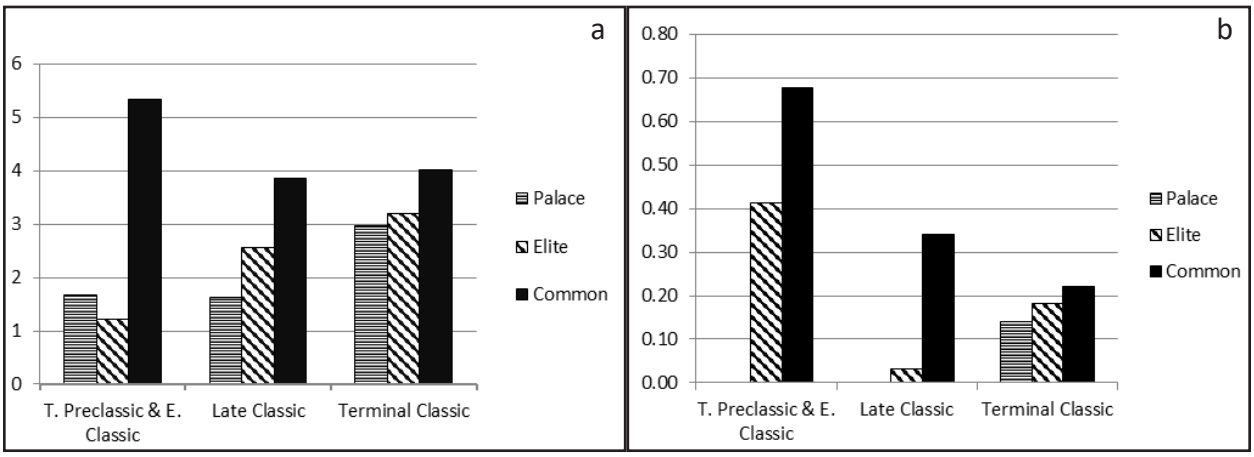


Figure 1.3. a) Ratio of obsidian count/m3 of excavated matrix by house rank and time period and b) ratio of marine shell count/m3 of excavated matrix by house rank and time period. Shell counts based on Friewald (2018).

producing craft items, although at a very low output. The same pattern is seen for the distribution of slate, a regional resource that was widely carved into utilitarian objects, ornaments, decorative slabs, and mirror backs. Elites may have facilitated access to these resources or promoted crafting among commoner families. They did not, however, regulate them heavy-handedly.

Conclusion

In conclusion, I would first like to say that deductive research, which starts with a model and tests hypotheses derived from it, does not always led to the confirmation of the model. Findings have not supported my original exclusive power hypotheses in which early rulers' circumvented kin-based authority by out-competing and fragmenting households. This might have happened elsewhere, but

it did not happen at Actuncan. Instead, the small number of founding elite and commoner families experienced socio-economic prosperity and engaged in a relatively high level of collective action during the Terminal Preclassic period when kingship was institutionalized. How these Terminal Preclassic families came to live at Actuncan is still unknown. They might have moved onto the hilltop by aggressively forcing out pre-existing villagers, or the site might have been vacant when they arrived. Regardless, Actuncan's rise to regional authority was rapid and from all the evidence we have, this expansion was achieved through inclusive practices that mobilized hinterland populations' labor and loyalties. Later, Classic period elites experienced boom-and-bust cycles of growth and abandonment, which, I argue, are the result of elite competition for exclusive power and lower levels of collective action.

Works Cited

Blanton, Richard E., and Lane F. Fargher
2008 *Collective Action in the Formation of Pre-modern States*. Springer, New York.

Doyle, James A.
2017 *Architecture and the Origins of Preclassic Maya Politics*. Cambridge University Press, UK.

Freiwald, Carolyn
2018 The Status of Marine Shell and Other Fauna at Actuncan. In *The Actuncan Archaeological Project: Report of the 2017 Field Season*, edited by David W. Mixter and Lisa J. LeCount, pp. 71–92. On file at the Belize Institute of Archaeology, Belmopan.

Inomata, Takeshi
2017 The Isthmian Origins of the E Group and its adoption in the Maya Lowlands. In *Maya E-Groups: Calendars, Astronomy, and Urbanism in the Early Lowlands*, edited by David A. Freidel, Arlen F. Chase, Anne S. Dowd, and Jerry Murdock, pp. 215-252. University Press of Florida, Gainesville.

LeCount, Lisa J., Chester Walker, John H. Blitz and Ted C. Nelson
2019 Land Tenure Systems at the Ancient Maya Site of Actuncan, Belize. *Latin American Antiquity*. DOI:10.1017/laq.2019.16.

McAnany, Patricia A.
1995 *Living with the Ancestors: Kinship and Kingship in Ancient Mayan Society*. Texas University Press, Austin.

McGovern, James O.
2004 *Monumental Ceremonial Architecture and Political Autonomy at the Ancient Maya City of Actuncan, Belize*. Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Los Angeles.

Micheletti, George J., Kaitlin E. Crow, and Terry G. Powis
2018 Expanding Sub-Plaza Explorations of Middle Preclassic Architecture at the Site of Pacbitun, Belize. *Research Reports in Belizean Archaeology* 15:17-26.

Mixter, David M.
2012 The 2011 Excavations on Structure 41. In *The Actuncan Archaeological Project: Report of the 2011 Field Season*, edited by Lisa J. LeCount and John H. Blitz, pp. 61-118. On file at the Belize Institute of Archaeology, Belmopan.
2016 *Surviving Collapse: Collective Memory and Political Reorganization at Actuncan, Belize*. Unpublished Ph.D. dissertation, Department of Anthropology, Washington University in St. Louis.
2017 Collective Remembering in Archaeology: A Relational Approach to Ancient Maya Memory. *Journal of Archaeological Method and Theory* 24(1):261-302.

Robin, Cynthia, Laura Kosakowsky, Angela Keller, and James Meierhoff
2015 Leaders, Farmers, and Crafters: The Relationship Between Leading Households and Households across the Chan Community. *Ancient Mesoamerica* 25(2): 371-387.

Runggaldier, Astrid
2009 *Memory and Materiality in Monumental Architecture: Construction and Reuse of a Late Preclassic Maya Palace at San Bartolo, Guatemala*. Ph.D. dissertation, Department of Archaeology, Boston University.

Simova, Borislava
2018 Ritual Spaces and Social Integration: Trench Excavations in E-Group Plaza, Plaza F. In *The Actuncan Archaeological Project: Report of the 2017 Field Season*, edited by David W. Mixter and Lisa J. LeCount, pp. 49–70. On file at the Belize Institute of Archaeology, Belmopan.

Simova, Borislava S., and David W. Mixter
2016 On-going Investigations at Structure 26 in Actuncan's E-Group. In *The Actuncan Archaeological Project: Report of the 2015 Field Season*, edited by Lisa J. LeCount and David W. Mixter, pp. 9–39. On file at the Belize Institute of Archaeology, Belmopan.

Simova, Borislava S., E. Christian Wells, David W. Mixter, and Lisa J. LeCount
2018 Exploring Changes in Activities in Maya E-Groups: Archaeological and Geochemical Analysis of E-Group Plaster Floors at Actuncan, Belize. *Research Reports in Belizean Archaeology* 15:27-38.

Yaeger, Jason
2000 *Changing Patterns of Social Organization: The Late and Terminal Classic Communities at San Lorenzo, Cayo District, Belize*. Unpublished Ph.D. dissertation, University of Pennsylvania, Philadelphia.

Chapter 2: On-going Excavations and Artifact Analysis of Possible Agricultural Features

Theresa Heindel (University of California, Riverside)

Research during the 2018 field season aimed to complete field and laboratory investigations of possible field systems, which form the basis for the author's doctoral dissertation. This research included analysis of lithic, ceramic, obsidian, ground stone, slate, quartz and shell artifacts recovered from Operations 14, 51, and 52. Artifact analyses were designed to evaluate the activities that took place within these hypothesized field systems, as well as to understand the water control technologies involved in their design. Additionally, a single 1 by 1.5 m test unit, 52C, was excavated in a cobble mound along the Mopan River to gather further data to test the hypothesized use of these mounds as orchards. This report begins with a brief description of previous excavations directed by the author to situate the context of analyzed materials and then continues with descriptions of the single excavation unit and of the analysis of each artifact class in turn.

Previous Excavations

During the 2017 field season, excavations took place in the western portion of Actuncan's northern settlement zone where previous surveys and excavations south of Group 7 had revealed a stone terrace made up of stone cobbles and limestone blocks (Heindel 2018). A magnetometer survey conducted by Walker (2012) revealed linear anomalies suggestive of additional walls and features connected to this terrace wall, possibly creating a larger agricultural plot system, and 2017 excavations of Operation 14 were focused on revealing these. A similar arrangement of surface features and anomaly signatures indicative of a buried agricultural plot system was found to the north and east of the first system, and in 2017 Operation 51 focused on delineating this second system of agricultural plots (Figure 2.1). A system of linked cobble (*chich*) mounds along the Mopan River below Actuncan has been known for years (VandenBosch 1992, 1993), but pedestrian mapping using a total station by Salberg (2012) and LiDAR imagery of the area (Chase et al. 2014) revealed the full extent and organization of this system. It is hypothesized to be an orchard based on earlier interpretations of cobble mounds by Sabloff and Tourtellot (1992) and Killion and colleagues (1989). Preliminary excavations in Operation 52 were conducted to further understand these constructions.

Cobble mounds are present at multiple ancient Maya archaeological sites, and based on analogy to modern Maya, they are proposed to have been used for agricultural purposes. Each agricultural system is composed of a collection of divided plots that may have been used for planting (Killion et al. 1989; Sabloff and Tourtellot 1992). These plots are defined by walls that may have acted as boundaries and created terraces, which protected the plots from large quantities of water draining downslope and possibly from the river during catastrophic floods. While excavations among the *chich* cobble mounds were limited, they led to the recovery of soil to be used for later botanical analysis. They also revealed a floor that indicates a possible habitation area between the mounds. Evidence for habitation within *chich* mounds to the southwest of Actuncan's system was also found by VandenBosch (1992, 1993).

Excavations were placed on visible surface architecture and then expanded as buried architecture was found. Units 14X through 14BA were located downslope and south of Group 7 (Figure 2.1) (Heindel 2018:15-18). Units 51A through 51T were located upslope and to the west of Operation 14 (Heindel 2018:27-28). Units 52A and 52B were located to the east of the site core, near the Mopan River (Heindel 2018:36). Operations 14 and 51 revealed two possible agricultural plot systems (Figures 2.2 and 2.3). Operation 52 provided an initial understanding of the stratigraphy on and between the *chich* mounds.

2018 Excavation: Excavation of a *Chich* Cobble Mound

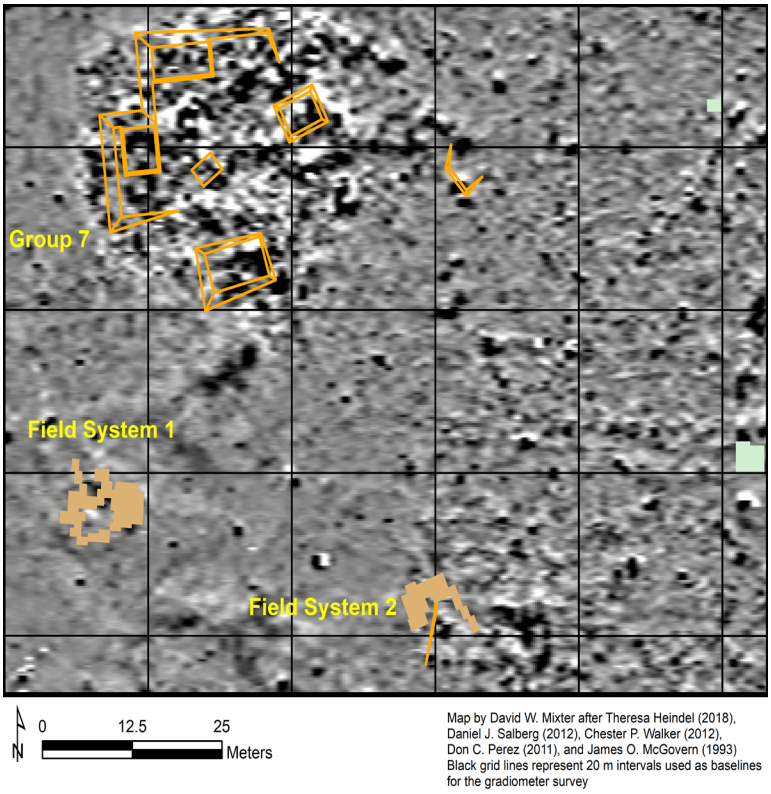


Figure 2.1. Operation 14 and Operation 51 area of excavation in the Northern Settlement Zone.

During 2017 and 2018, three test units were placed in various areas of the cobble mound area, including one on top of a mound (52C), one on the edge of a mound (52A), and one in the empty space between mounds (52B). Excavations were focused on revealing the stratigraphy of the three test units and collecting soil samples for future pollen and macrobotanical analysis. Excavated during 2017, Unit 52A, was placed on the western slope of what has been named Cobble Mound 1, and 52B was placed about a meter east of Cobble Mound 1. Unit 52A revealed a humus layer with cobbles, a sandy loam layer underneath with few artifacts or inclusions, and a darker sandy loam layer with more chert cobbles as well as some charcoal. 52B was placed close to Cobble Mound 1 in the space between it and other cobble mounds to examine the stratigraphy inside the space created by the cobble mounds. The unit consisted of a humus layer with few artifacts present. A floor, July Floor, constructed of many chert cobbles and artifacts was found below the humus. A layer of fill containing many artifacts was encountered below the floor. During the 2018 field season, Unit 52C was placed atop, and roughly in the middle of, Cobble Mound 2, which consisted mainly of lithic debitage and limestone and chert cobbles (Figure 2.4).

Unit 52C was a 1 (N-S) x 1.5 (E-W) m test unit in a purposefully selected *chich* cobble mound that featured a well-defined central mound. This unit was placed on center of the summit of Cobble Mound 2 to examine the stratigraphy and collect soil samples (Figure 2.5). The unit was composed of three lots (Figure 2.6). The first lot (52C1) was a 40 to 45 cm thick layer consisting of very dark grayish brown clay loam (10YR 3/2) with small to medium-sized chert and limestone cobbles (mostly between 10-20 cm in size). A large amount of lithic and ceramic artifacts were found as well as some jute. Excavations ended at a soil change. Lot 52C2 was 50 to 55 cm thick and consisted of dark brown clay loam (10YR 3/3) with small to medium-sized chert and limestone cobbles similar to those found in 52C1. Fewer artifacts, especially ceramics, were found in this lot, but there were more jute than in the previous lot. Lot 52C3 was 15 to 20 cm thick and consisted of brown sandy loam (10YR 5/3) with small to medium-sized chert and limestone cobbles, but the cobbles were smaller (5 to 10 cm) than those found in the lots above. Very few artifacts were found, but there was an increase in jute. This lot sits atop a sandier, more yellow (yellowish brown 10YR 5/6) soil with no cobbles. It was determined that this was a natural sediment layer and excavations were ended after 52C3. It is important to note that Preclassic cultural layers have been identified below natural flood deposits along the river (VandenBosch 1992).

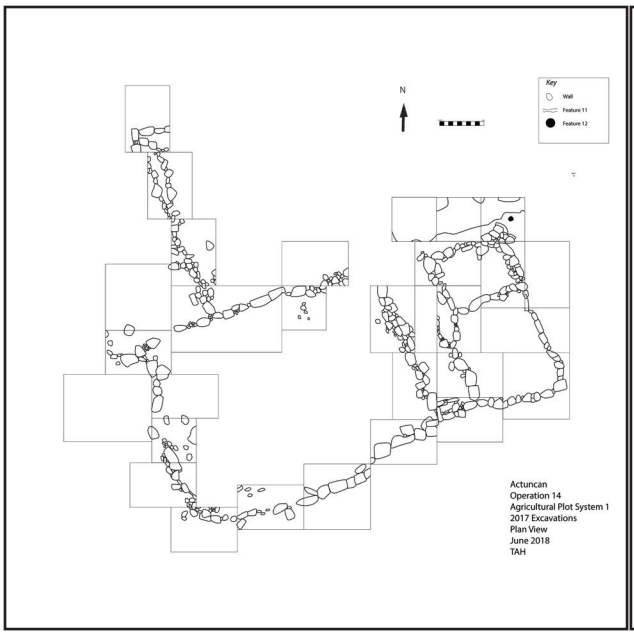


Figure 2.2. Operation 14 plan view (Heindel 2018: Figure 2.6).

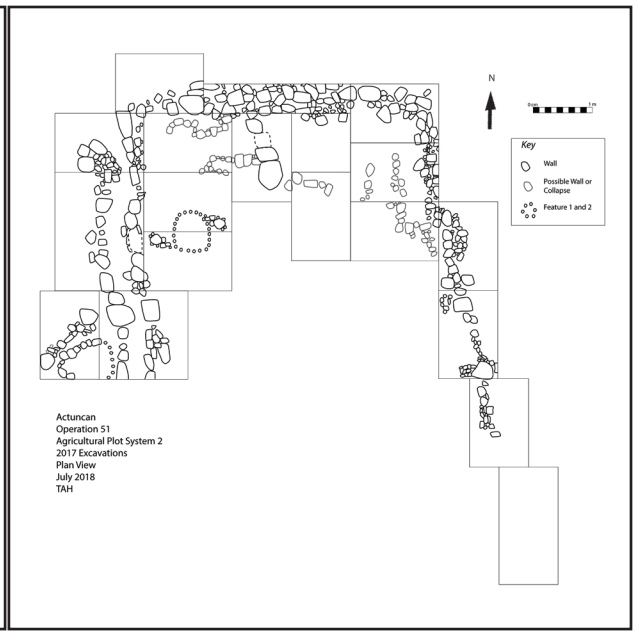


Figure 2.3. Operation 51 plan view (Heindel 2018: Figure 2.17).

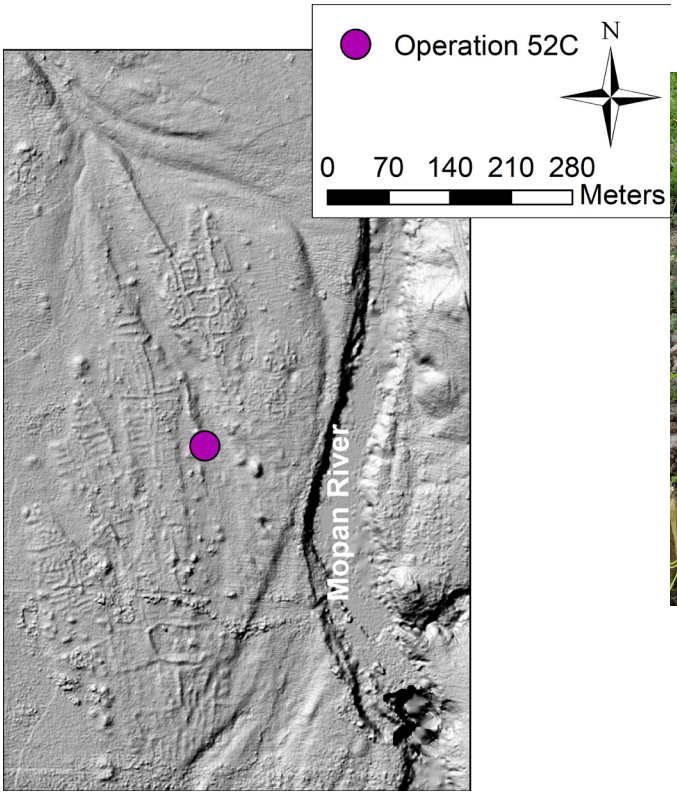


Figure 2.4. Location of Operation 52C among the *chich* mounds.

Figure 2.5. Operation 52C1: photograph of area of excavation.

A total of 15 soil samples were collected from 52C for macrobotanical and pollen analysis. Three 4L flotation samples (Samples 27, 29 and 30) and 12 pollen samples (Samples 31 to 42) were collected in 200 mL Whirl-Pak bags; in other words, from each lot, one flotation sample and four pollen samples were collected. Pollen samples were taken from all sidewalls in each of the three lots, starting from the bottom and moving upwards to avoid contamination. One C14 sample (Sample 28) was also collected from Lot 52C1. The unit was broken up into three analytical units, with each lot corresponding to one analytical unit (AU). AU1, containing 52C1, was named "Cobbles in Humus Layer" and was assigned a cultural context code of 120, meaning undisturbed surface. AU2, containing 52C2, was named "Cobbles below Humus Layer in Clay Loam" and was assigned a cultural context code of 200, meaning unknown context. AU3, containing 52C3, was named "Cobbles in Sandy Loam" and was assigned a cultural context code of 200 (again unknown context).

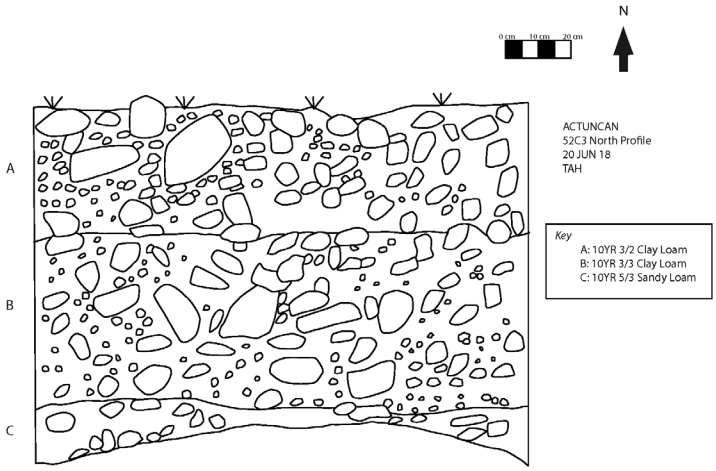


Figure 2.6. Operation 52C3 north sidewall profile.

Artifact Analysis of Operations 14, 51, and 52

This section describes artifact analysis undertaken during the sumer of 2018. Five different contexts will be discussed, including: 1) Agricultural Plot System 1 (Operation 14); 2) Agricultural Plot System 2 (Operation 51); 3) the terraforming feature (Operation 14); 4) the water channel system (Operation 14); and 5) the *Chich* cobble mound (Operation 52). Agricultural Plot Systems 1 and 2 refer to two groups of bounded plots hypothesized to be used for agricultural purposes. A series of walls delineate different plots in both systems (Figures 2.2 and 2.3), which contain a large density of redeposited domestic trash. Terraforming refers to anthropogenic manipulation of natural soils. At Actuncan, inhabitants utilized *yeso*—a white, soft gypsum-laden sediment—to create berms and channels that would allow for better water drainage and possibly collection along the slopes of the Northern Settlement Zone. Another form of water drainage improvement can be seen in a water channeling system, which consists of low walls built atop *yeso* that would aid in channeling water. Finally, the *chich* cobble mounds, as discussed above, refers to a series of linear mounds consisting of river cobbles and lithic debitage that are hypothesized to be used for agricultural purposes, particularly orchards.

The majority of the 2018 field season was focused on the analysis of artifact classes including lithic, ceramic, groundstone, slate, quartz, daub, plaster, faunal remains, and shell. The majority of artifacts were chipped stone lithics and ceramics. The main goal of analyzing artifacts from Agricultural Plot Systems 1 and 2 was to determine if the assemblages were from redeposited domestic trash or if these materials are, in fact, associated with *in situ* activities such as lithic production. The small and very low architecture present in the agricultural systems were likely not residences. Therefore, I suggest that the artifacts found in the plot are associated with domestic middens from nearby patio-focused groups. Household middens contain discarded, yet potentially valuable objects such as expedient and formal tools, manos and metates, flakes and sherds, and other materials. Because artifacts in middens have not been moved since their discard, they should be large in size and the assemblage should be indicative of

domestic activities. Domestic trash is often redeposited in field systems to provide fertilizer for plants under cultivation (Killion 1990, 1992). Artifacts produced from *in situ* activities such as lithic production are smaller in size as these areas are regularly swept and cleared of large debris, but microdebitage is difficult to sweep away and is usually not removed from its locus of production, thus remaining in its primary context. *In situ* contexts also contain a higher proportion of one type of artifact (e.g. only lithic debitage), whereas household middens contain a variety of artifacts (Moholy-Nagy 1990:271). If the assemblages of the agricultural plots are from redeposited domestic trash, then they will resemble household midden assemblages.

Many materials recovered from the agricultural plot systems came from the modern humus root zone, which is not a reliable location for the analysis of ancient activities. Therefore, artifact analysis focused on materials from lots below the humus and associated with architecture. These are the most secure context for evaluating the purpose of the agricultural systems. Few artifacts were found associated with the water channel system (Heindel 2017) and terraforming (Millar 2016) near the constructed agricultural plots. This absence indicates that these areas may have been sculpted from underlying clay sediments and used to guide water, a function that does not require added mulch in the form of domestic material seen in the agricultural plot systems. The *chich* cobble mounds are primarily made up of chert and limestone cobbles, which indicates that the mounds were likely constructed from locally available stones rather than from lithic production debris or redeposited domestic trash. Therefore, any artifacts or residues are likely directly associated with activities at the mounds.

As will be discussed further, lithic analysis was focused on reduction stage, which is a good indicator for determining if trash is the result of production, redeposited production trash, domestic midden, or redeposited domestic trash. Ceramic analysis focused on determining time period of manufacture using the type:variety method. My analysis indicates that the agricultural systems and *chich* cobbles mounds were built and used during the Late through Terminal Classic periods. Unfortunately, due to a lack of diagnostic sherds associated with the water channel system and episodes of terraforming, I could not date these features. Groundstone was analyzed based on type and material, slate was analyzed to determine if it was worked, quartz was analyzed based on basic production typologies and daub and plaster analyses focused on quantity and weight. The few faunal ecofacts found included one possible claw and six deciduous teeth. Shell was divided into two types, jute and marine shell, each of which was analyzed separately. The majority of shells were ridged or smooth jute. Broken tips and holes on jute were also recorded. These attributes provide evidence to determine whether the jute was used for food (Friewald 2018).

Lithic Analysis

The main goal of my analyses was to determine the reduction stage(s) present in lithic materials found in the field systems at Actuncan. It is hypothesized that redeposited domestic trash was used in areas of agricultural production to boost soil fertility. Lithic artifacts found in domestic trash consist of multiple stages of production represented by tools, resharpening flakes, and retouch flakes. In contrast, a lack of informal tools or expedient flakes, formal tools, and resharpening and retouch flakes is indicative of a lithic workshop or tool reduction trash as the majority of lithics found in tool production are almost exclusively debitage. Lithic assemblages have been broken up into five main groups based on the location of excavations dicussed above: Agricultural System 1, Agricultural System 2, the area of terraforming, the water channeling system, and the *chich* cobble mounds. While all five areas contained assemblages made up of reduction debitage, the lithic analysis shows that the agricultural systems as a whole contain a wide variety of debitage types, formal and informal tools, and resharpening and retouch flakes.

Lithic Production

The actual procurement of the raw material must be done before lithic reduction can take place. Raw material may be found in limestone deposits containing chert nodules or veins or may occur as redeposited cobbles in alluvial deposits or karst brecchias. A few large flakes or chunks with cortex on them will be knocked off these nodules in order to determine the quality of the material. If the material is deemed suitable for knapping, it is then reduced further during the first stage of reduction where the majority of the cortex is flaked off and a preform or core is created (Whittaker 1994:12). Hard hammer percussion with a hammerstone is implemented in this initial reduction stage. Usually, the general form of the tool or the core is made, and most of the decortication is done at the actual site of material procurement. This hard hammer percussion can, however, be carried over in time to the place where later reduction stages take place. The hard hammer flakes produced during this first stage are usually thicker and chunkier with large bulbs of percussion than those in later production stages. They also tend to be covered in 25% or more cortex on their dorsal side and, as a result of being in the earlier stages of lithic reduction and thus having some of the first flakes knocked off, they also have fewer flake scars (Patten 1999). Second stage lithic reduction is usually characterized by the use of soft hammer percussion for thinning. This reduction is done away from the site of procurement and requires more skill with a hard hammer than first stage reduction. Flakes from this stage are relatively thinner with diffuse bulbs of percussion, little to no cortex, and have multiple flake scars. If a flake tool is being manufactured, then the second stage will actually be pressure flaking, which results in very small flakes and flake fragments (Whittaker 1994:195). For this analysis, stage three of lithic reduction includes retouching and final thinning of the tool. At this point, few if any flakes should have cortex on them and, usually, all flakes would be categorized as soft hammer or biface thinning flakes. Retouching along the edges would also be done at this stage to make the final edge both strong and sharp (Whittaker 1994:152). After a tool is finished, it can be used and resharpened multiple times before its final discard. Flakes taken off in the hopes of resharpening a tool are characterized by use wear along arrises, or the raised ridges between flake scars resulting from reduction, on the dorsal surface.

Lithic Analysis Methods

Due to the focus on reduction stage, a flake typology that specifically addressed reduction sequences was utilized, including the identification of cortex, platform preparation, hammer type, number of flake scars, and evidence of use-wear. Categorization of debitage type was undertaken because different reduction stages contain different types of debitage besides flakes.

Cortex percentage was categorized into groups as follows: 0%, 1-25%, 26-50%, 51-75%, 75-99% and 100%. Flake scars were counted as 0, 1 to 2, and 3 or more. Hammer type was divided into soft and hard hammer categories. Soft hammer percussion is characterized by a lipped platform and diffuse bulb of percussion while hard hammer flakes have a large bulb of percussion and no lipped platform. In addition, if a platform was multi-faceted or had visible grinding along the edges, the flake was labeled as having platform preparation. If the flake was chipped and thus had no platform or bulb, it was referred to it as a “flake fragment,” and no information was given on platform preparation or hammer type. Due to the number of flake fragments, cortex percentage for flake fragments is defined as 0%, 1 to 50%, 51 to 99%, and 100%, though more specific cortex percentages were collected in the original analyses. These categories are combined due to the broken nature of flake fragments where more nuanced cortex percentages may not reflect the overall cortex percentage of the whole flake. Those flakes and flake fragments that showed evidence of worked edges, such as pressure flaking or use-wear on edges, were labeled as “expedient tools.”

Other types of lithic artifacts included microdebitage, nodules, shatter, chunks, cores, and preforms. Microdebitage was characterized as lithic debitage that passed through a 6.35 mm (1/4 inch) screen.

Microdebitage is, by definition, very small debitage and, as such, is too small to contain identifiable flake attributes. Due to the small number of microdebitage in the collected assemblages, it was possible to take a count of microdebitage. Nodules were characterized as "rock" if they appear to have had only a flake or two knocked off. According to VandenBosch's (1999) definition, a core has four or more flakes removed, so nodules are not categorized as cores. Nodules are often discarded after a flake or two was taken off. Shatter is characterized as angular fragments that do not have flake characteristics (flake scars, platforms, etc.), but still appear to be part of tool production. Shatter is often found in early stage production, but can be seen in later stages of production as well. Chunks, on the other hand, are almost exclusively found in early stage tool production. Like shatter, chunks have no identifiable flake features, but are larger and often more circular in nature, with usually less than 24.5 cm (1 inch) circumference, with multiple flat surfaces than tested and discarded nodules. As stated above, cores are defined as having four or more flakes removed, either in a multidirectional or tabular manner, with a clear and large platform on one or both ends. Preforms are categorized as pieces of stone knapped into the general shape of what the tool will look like.

Material type was also collected, and categories included chert, chalcedony, siliceous limestone, and limestone. Dolomitic limestone is available in the geographic region, but none was found in the assemblages. Chert is a hard, dense microstyaline or cryptocryalline sedimentary rock, consisting of small interlocking crystals of quartz (Kooyman 2000: 28). Due to its predictable conchoidal fracture, it is an ideal material for flintknapping. Chalcedony is a type of fine chert that is translucent when examined under a strong light source and tends to be easier to flintknap. Siliceous limestone is hardened limestone and has the look of limestone. Limestone flakes are much rarer, due to the softness of the material, but there is evidence of limestone general utility bifaces, and, while uncommon, limestone flakes were found in the assemblages.

Informal tools are referred to as expedient tools, which are flakes or flake fragments that have been removed from a parent piece or core for use. These flakes were not turned into a specific tool shape. They are recognizable based on indications of use visible along their worked edges, generally produced through pressure flaking or general use (VandenBosch 1999:119.). These types of tools are often used in domestic settings for basic cutting and scrapping due to the ease with which these simple tools can be made.

Formal tools have a morphology that is definable in reference to various established tool types, such as bifaces and unifaces, and are produced by removing a series of flakes to create a particular desired form. Formal tool types found in the Maya lowlands include unifaces, general utility bifaces, thin bifaces, chisels, burins, scrapers, macroblades, drills, and gravers. Unifaces are tools that have only been worked on one surface and generally take scraper-like forms. General Utility Bifaces (simply named bifaces in tables) are characterized by evidence of flake removal on both sides and are particularly thick with less attention to detailed workmanship. Thin bifaces have similar characteristics to General Utility Bifaces but rarely have cortex and are generally 2 cm or less in thickness. Bifaces have a myriad of uses, but hafting is common, which is evident in a long flake taken off the proximal, medial side of one surface. Chisels are distinctive for their long narrow outline and thick diamond shaped cross section. Often, abrasion has blurred or completely erased flake scars on their surfaces. A burin is similar to a chisel but is unifacially worked leading to a triangular cross section. A scraper is a unifacially-shaped flake characterized by visible polish on its dorsal surface and edges, as opposed to an expedient flake, which only has use-wear on its edges. A macroblade is a thick tool shaped like a prismatic blade, and a drill is categorized as such based on its pointed end. Gravers are a type of drill that can be made from blades or flakes and can be identified by their pointed ends shaped by steep, unifacial retouching. Gravers are different from "proper drills" because the drill-like portion is curved (VandenBosch 1999:316-317).

Results

Operation 14: Agricultural System 1 Lithic Analysis. The vast majority (94.7%) of flake debitage was categorized as chert, while chalcedony made up only 3.7% of flaked materials (Table 2.A.1). Analysis of flakes focused on 1) cortex percentage, 2) number of flake scars, 3) hammer type, and 4) presence of platform preparation. Table 2.A.2 charts lithic flakes by reduction stage based on these attributes. The highest percentage of flakes (51.5%) are classified as second stage flakes, followed by hard hammer flakes with three or more flake scars, no platform preparation, and between 0% and 50% cortex present. Table 2.A.3 charts lithic flakes by individual attribute. In this analysis, a large proportion of flakes (24.4%) is also categorized as third stage flakes produced by a hard hammer, identified by three or more flake scars, no platform preparation, and between 0% and 50% cortex present. Based on the frequencies of these flake types, it is unlikely that the assemblage is the result of early or late stage production. Early stage production would include flakes with much more cortex, and late stage production (particularly biface thinning) would include more soft hammer flakes with very little cortex.

There is much more attribute variation for flake fragments (Tables 2.A.4 and 2.A.5). While the largest proportion (28.5%) of flake fragments have no cortex and three or more flake scars, there are also many (12.8%) flake fragments that have 76-99% cortex and 1 to 2 flake scars and that have 1 to 25% cortex with three or more flake scars (13.4%). Without all the attributes present on flakes, it is not possible to determine production stage exactly, but the variation does suggest that there is more than one production stage present in the assemblage.

There is also a large amount of variation in chipped stone debitage types (microdebitage, flake fragment, blade, nodule, chunk, shatter, resharp, retouch, expedient, core, preform) and formal tool types (biface, thin biface, chisel, graver, scraper, macro-blade, burin, and drill) found in the assemblage (Tables 2.A.6 and 2.A.7). While the majority (75%) of the assemblage consists of flake and flake fragment debitage, there are also a variety of formal and informal tools. Cores are present as are preforms of future bifaces. The tools present include: fourteen general utility bifaces, a thin biface, two chisels, two gravers, one scraper, one macroblade, two burins, and one drill. Five blades and twenty expedient flakes were also found, with the majority containing evidence of usewear.

The number and variety of formal and informal tools indicate that the assemblage is redeposited domestic trash because all of these tools would be used in a domestic setting as opposed to a lithic workshop, which would produce midden with different contents. The small percentage of microdebitage (6.1%) compared to macrodebitage provides evidence that lithic reduction activity did not occur at the location of the agricultural system. Trash redeposition tends to contain larger debitage because small pieces of debitage are less likely to be transported from location to another. Evidence of resharpening and retouch flakes also indicate that the assemblage represents more than just lithic reduction—evidence of reuse is also present in the assemblage.

Operation 51: Agricultural System 2 Lithic Analysis. Similar to Agricultural System 1, the majority of the lithic assemblage found in Agricultural System 2 is made up of chert debitage (87.2%), but chalcedony and siliceous limestone flakes are also present (Table 2.A.10). Also similarly, the majority (54%) of flakes are from second stage production, though third stage production is also well represented (36%) (Table 2.A.8). More specifically, the largest portion (23.1%) of flakes in this assemblage have less than 50% cortex, three or more flake scars, and were produced with a hard hammer with no platform preparation, a combination indicative of second stage reduction (Table 2.A.9). However, there is also a large proportion of third stage flakes with no cortex and three or more flake scars that were created by a hard hammer with no platform preparation. The flake fragments present in the assemblage suggest later

stage production with the largest amount of the flake fragments (36.1%) showing no cortex and three or more flake scars (Table 2.A.11). The majority of flake fragments (84.6%) are categorized as chert, with some chalcedony, limestone, and siliceous limestone also present (Table 2.A.12).

The majority (72.2%) of debitage in the assemblage fall under the flake and flake fragment categories, but other types of debitage include microdebitage, nodules, chunks, shatter, cores, preforms, general utility bifaces, gravers, drills, expedient flakes, resharpening flakes, and retouch flakes (Tables 2.A.13 and 2.A.14). Microdebitage, nodules, chunks, and shatter, which together make up 25.6% of the assemblage, fall under the category of production debris with flakes and flake fragments, indicating that the majority of the assemblage is the result of informal production at the household level. The presence of formal and informal tools, as well as resharpening and retouch flakes, also indicates that the redeposited trash found in Agricultural System 2 was not just the result of reduction activity, which would consist of only flakes and flake fragments. As discussed above, the variety of debitage type is more indicative of domestic trash. The lithic assemblage recovered from Agricultural System 2, then, is similar to that recovered from Agricultural System 1.

Operation 14: Terraforming Features Lithic Analysis. A low density of artifacts was found in Units 14K and 14M in comparison to Agricultural Systems 1 and 2, but the presence of 196 lithic artifacts suggests some redeposition of trash in these areas. The majority of flakes were the result of second (40%) and third (41.2%) stage reduction (Table 2.A.15), with the highest percentages represented by flakes with no cortex, three or more flake scars, and hard hammer production with no platform preparation (20.6%) and flakes with less than 50% cortex, three or more flake scars, and hard hammer production with no platform preparation (32.5%) (Table 2.A.16). Flake fragments point towards third stage production, with 33.8% of flake fragments categorized as having no cortex and three or more flake scars (Table 2.A.17). Material types included only chert and chalcedony with no evidence of siliceous limestone or limestone (Tables 2.A.18 and 2.A.19). Production debris such as microdebitage (5.1%), chunks (2%), and shatter (4.6%) are also present as are three utilized formal tools: a general utility biface, a chisel, and a drill (Table 2.A.20). The presence of formal tools suggests the lithic assemblage may have been the product of redeposited domestic trash.

Operation 14: Water Channel Lithic Analyses. Like the test units that encountered other types of terraforming, the water channel deposits exhibit a low density of lithic artifacts in comparison to the agricultural systems. Similarly, this material appears to be redeposited trash. A total of 711 lithic artifacts were collected. Both second (41.8%) and third (45.5%) stage production (Table 2.A.21) are present in the assemblage, with the highest percentage of flakes (29.1%) categorized as having 0% cortex and three or more flake scars created through hard hammer percussion with no platform preparation (Table 2.A.22). While chalcedony, limestone, and siliceous limestone flakes are present, they only make up 7.2% of the assemblage (Table 2.A.23). The majority of flake fragments are also chert (Table 2.A.24), and the largest portion of flake fragments (31.3%) are categorized as having 0% cortex and three or more flake scars (Table 2.A.25). No formal or informal tools were found in the assemblage, nor were there any resharpening or retouched flakes or flake fragments (Tables 2.A.26 and 2.A.27). As such, the assemblage can be categorized as containing all production debris, with the majority of lithics being flakes and flake fragments. Microdebitage, nodules, chunks, and shatter are also present, with shatter making up a large portion of non-flake and non-flake fragment debitage at 22.1% of the assemblage. As a result, it is unlikely that the lithics found in the test units were from redeposited domestic trash.

Operation 52: Chich Cobble Mounds Lithic Analyses. Chich mounds found along the Mopan River floodplain were created by piling cobbles, and as such, they consist mainly of lithic material. Care therefore was taken to separate human modified materials including microdebitage, flakes and flake

fragments, formal and informal tools, and resharpening flakes from ecofacts. Three test units were placed in various areas of the cobble mound area, including one on top of a mound (52C), one on the edge of a mound (52A), and one in the empty space between mounds (52B).

In a combined analysis of all three units, the majority of debitage (82.6% of flakes and 83.7% of flake fragments) was categorized as chert, and all formal and informal tools are made of chert (Tables 2.A.28 and 2.A.29). These three units also contained mainly second (35.7% total) and third stage (52.1% total) reduction flakes (Table 2.A.30), although 52A (75.9%) and 52B (56.8%) contained mostly third stage flakes (Table 2.A.31), while 52C contained a larger proportion (53.7%) of second stage flakes (Table 2.A.32). The largest proportion of flake fragments in 52A (48.6%) 52B (23.9%) and 52C (25.9%) had 0% cortex and three or more flake scars, but variation was still present (Tables 2.A.33, 2.A.34, and 2.A.35). All test units contained microdebitage (8.6% of the total assemblage), nodules (.2%), chunks (5.3%), and shatter (5.6%), as well as flakes (28.5%) and flake fragments (48.8%), pointing to the presence of multiple reduction stages (Tables 2.A.36 and 2.A.37). Formal tools were also present in all three test units including a uniface, a general utility biface, two thin bifaces, a chisel, a graver, a drill, and two macroblades. There was variation in the type of tools found in each test unit. Expedient flake tools were only found in 52A and 52B, and only one resharpening flake was found in 52C. Out of the total 1647 lithic artifacts, the majority (98.6%) of artifacts were the result of reduction (microdebitage, flakes and flake fragments, cores, preforms, nodules, chunks and shatter). Formal tools only making up 0.5% of the assemblage, and utilized and resharpening flakes consisted of 0.9% the assemblage. These findings indicate that redeposited domestic trash was probably not used in the creation of the cobble mounds because household middens contain a larger variety of debitage types.

Ceramic Analysis

Ceramic analyses were performed to provide chronological determinations. Type:variety and attribute analysis, following LeCount's (1996) dissertation work at Xunantunich, was utilized do determine the time period each diagnostic sherd was likely produced. Due to the water inundation in the targeted excavation areas, large portions of the assemblages were identified as too eroded to be analyzed for chronological attributes. Rim and body sherds that could be diagnostically identified were described along five major criteria: paste/temper composition, surface treatment, formal aspects, decorative techniques, and decorative motif (LeCount 1996:131). Based on my analyses, the diagnostic ceramics recovered from the agricultural systems and cobble mounds come from Late Classic I, Late Classic II and Terminal Classic time periods. Due to the eroded nature of sherds recovered from the terraforming and water channel systems, no temporal designations could be gleaned from the few sherds that were found.

Late Classic ceramics are chronologically differentiated by Gifford (1976:225) into two complexes—Tiger Run and Spanish Lookout, with Spanish Lookout further divided into early and late facet. As noted by LeCount (1996:129), however, the low frequency of late facet Spanish Lookout (Terminal Classic) ceramics at Barton Ramie did not allow Gifford to clearly separate that phase into early and late facets. As a result, while my Late Classic ceramic identification relies heavily on Gifford's descriptions of the Spanish Lookout Complex from Barton Ramie, Terminal Classic identification follows LeCount's Xunantunich Terminal Classic typology.

Ceramic Analysis Methods: Type-Varieties

Ceramics belonging to the Chial ceramic group were the only Late Classic type found in all of the ceramic assemblages. An opaque carbonate ware, the Chial Group contains a fine textured paste, with paste color ranging from red to reddish yellow to an occasional brown, though the majority of ceramics falling into the Chial Group have a reddish yellow paste. In addition to its distinctive color, the Chial Group is

also known for its many small white carbonate inclusions. Undecorated Chial sherds were found in the assemblages in addition to Chial bowls (LeCount 1996:395).

Belize Red Group is a member of British Honduras Ware that dates to the Late and Terminal Classic periods. It is identified by a polished red slip applied to an ash-tempered paste, with a gritty, often highly weathered surface. While paste colors have a wide range, most Belize Red ceramics found in the assemblages contained a yellow or reddish yellow paste (LeCount 1996:395). Belize Red varieties included undecorated Belize Red, Belize Red Incised, and Belize Red Punctated, with both jars and bowl forms present. San Lorenzo Black is identified by its highly polished black slip on ashware, and dates to the Terminal Classic period. Like Belize Red, this type falls under the category of ash ware with an ash-tempered past and a gritty, often highly weathered surface. Found as sherds, San Lorenzo Black was not well-represented in the assemblages. The Chunhuitz Ceramic Group, categorized as a Vincacous Tawny Ware, is also identified by ash-tempered paste. Dating to the Late and Terminal Classic period, it is identified by its orange slip, and is often found highly weathered (LeCount 1996:398). Chunhuitz Group body sherds and bowl forms were found.

The Macaw Bank Group, dating to the Late Classic II period, is best identified by a reddish-brown surface containing reflective particles of gold mica or biotite and quartz, as well as a reddish brown paste and a temper consisting of granitic material and occasionally mica. The reflective nature of Macaw Bank makes it easily identifiable, and its surface treatment can be plain or have punctated dots, lines, or appliques (LeCount 1996:370). Undecorated Macaw Bank body sherds were present in the assemblages, as well as Macaw Bank Applique, Macaw Bank Punctated, and Macaw Bank Scalloped varieties. Macaw Bank jar rims were present.

Mt. Maloney Black is the most well-represented type found in the assemblages. Identified as a Pine Ridge Carbonate Ware, it is distinctive for its matte black slip applied to a calcite tempered paste. The black slip is found on both the interior and exterior of open and closed forms. Mt. Maloney Black dates from the Late Classic I through the Terminal Classic, but differences in rim angle point to more specific time periods of manufacture. The most abundant and easily recognizable form is the incurving bowl. The earliest bowls, found in the Late Classic I period, have vertical lips which are rounded along the top and bottom face. Over time, lips begin to bevel upward, with Late Classic II bowls lips exhibiting elaborated edged and grooved faces. The upward bevel of the lip ends in the Terminal Classic period, when lips are square and oriented horizontally to the rim orifice (LeCount 1996:391). The large presence of Mt. Maloney Black and its distinctive bowl and lip forms allowed for a more nuanced chronology for the assemblages. Mt. Maloney black body sherds were abundant along with jar and Late Classic I through Terminal Classic bowl rims.

Like Mt. Maloney Black, the Dolphin Head Group falls under Pine Ridge Carbonate Ware. It is identified by a velvety red slip applied to a calcite tempered red-borwn paste. Dolphin Head Red is restricted mainly to the Late Classic II period, and Dolphin Head body sherds as well as jar and bowl rims were found in the assemblages. Vaca Falls, another carbonite ware, is similarly red, but dates to the Terminal Classic period. It is characterized by a soft, friable, irregular textured, red to reddish-brown paste and a soft red slip (LeCount 1996:372-373). Vaca Falls body sherds, as well as jars and bowls, were found.

Alexander Type jars, dating to the Late and Terminal Classic period, are categorized by tall, constricted and open neck jars (LeCount 1996:369) made of Uaxactun Unslipped Ware and falling in the Cayo Ceramic Group. Alexander Type is identified by very large, thick-walled, medium brown or tan jars with medium brown or tan paste and coarse texture (Gifford 1976: 283). Alexander Type Pie Crust variety rims in particular are identifiable by a piecrust decoration and flaring rim. Alexander sherds and jars were the

least represented type in the assemblages.

Operation 14: Agricultural System 1 ceramics
A total of 23,165 ceramic sherds were found in Agricultural System 1, with 5169 diagnostic sherds. The majority of sherds were too eroded to be diagnostic. This state of preservation is unsurprising because the area of excavation is on a steep slope that is frequently eroded by water running off the ridgetop. All diagnostic sherds were categorized as general Late to Terminal Classic or general Late Classic, or if more specific attributes were present as Late Classic I, Late Classic II, or Terminal Classic. Diagnostic body sherds fall under the Chial, Meditation Black, Mt. Maloney Black, Belize Red, Belize Red Incised, Belize Red Punctated, Macaw Bank, Macaw Bank Applique, Macaw Bank Punctated, Macaw Bank Scalloped, San Lorenzo Black, Dolphin Head, Vaca Falls, and Chunhuitz types and varieties. Rim sherds included Chial bowls, Belize Red bowls, Belize Red jars, Mt. Maloney Black bowls, Mt. Maloney Black jars, Dolphin Head bowls, Dolphin Head jars, San Lorenzo Black jars, Chunhuitz bowls, Vaca Falls bowls, Vaca Falls jars, Alexander jars, and an Alexander Pie Crust jar (Table 2.A.38). Both humus and general occupation layers contained a variety of sherds dating from Late Classic I through the Terminal Classic periods (Table 2.A.39).

Operation 51: Agricultural System 2 Ceramics
A total of 8188 ceramic sherds were found in Agricultural System 2, with 1669 diagnostic sherds including 149 rim sherds. Like Agricultural System 1, the majority of sherds were too eroded to be diagnostic. All diagnostic sherds were categorized as general Late to Terminal Classic, general Late Classic, Late Classic I, Late Classic II, or Terminal Classic (Table 2.A.40). Diagnostic body sherds fall under the Chial, Mediation Black, Mt. Maloney Black, Belize Red, Macaw Bank, Macaw Bank Applique, Macaw Bank Punctated, San Lorenzo Black, Dolphin Head, Vaca Falls, and Chunhuitz types and varieties. Rim sherds included Chial bowls, Belize Red bowls, Mt. Maloney Black bowls, Mt. Maloney Black jars, Meditation Black jars, Macaw Bank jars, Dolphin Head jars, Dolphin Head bowls, San Lorenzo Black jars, Vaca Falls bowls, Vaca Falls jars, and an Alexander jar (Table 2.A.41). Both humus and general occupation layers contained a combination of sherds dating from the Late Classic to Terminal Classic though, as expected, more Terminal Classic sherds were found in the upper humus layer.

Operation 14: Terraforming and Water Channel System Ceramics
The ceramics found in both the water channel and terraforming areas were highly eroded, particularly below the humus layer, and it was not possible to assign types to any sherds in these assemblages. A total of 433 sherds were found in test units associated with terraforming. The majority were found in the humus and subsequent occupation layer rather than in the area around the terraforming feature itself (Table 2.A.42). This was also the case with the test pits associated with the water channel feature in which 2293 sherds were recovered (Table 2.A.43).

Operation 52: Chich Cobble Mounds Ceramics
A total of 1218 ceramic sherds where found in the cobble mound area, with 233 diagnostic sherds. The cobble mounds are located along the floodplain of the Mopan River, and a previous predictive ArcGIS model created by Borislava Simova has shown the area was particularly prone to flooding in the past. Therefore, it is unsurprising that a large number of sherds were too eroded to be diagnostic. All diagnostic sherds were categorized as general Late to Terminal Classic, Late Classic I, Late Classic II, or Terminal Classic (Table 2.A.44). Diagnostic body sherds fall under the Meditation Black, Mt. Maloney Black, Belize Red, Macaw Bank, San Lorenzo Black, San Lorenzo Black Incised, Dolphin Head, Vaca Falls, and Chunhuitz types and varieties. Rim sherds included: Belize Red bowls, Mt. Maloney bowls, Mt. Maloney jars, Dolphin Head jars, Alexander jars, and an Alexander Pie Crust jar (Table 2.A.45). It should be noted that only four out of 232 diagnostic sherds (1.7%) were categorized as Late Classic I, therefore it

is likely that there was little occupation during the Late Classic I time period.

Obsidian

Obsidian sourcing was based on visual attributes including refracted color, reflected color, translucency/opacity, sharp/diffused light, inclusions, and luster/texture of surface following Braswell et al. (2000). Previous Actuncan obsidian analysis by Shults (2012) found that obsidian artifacts in many Actuncan assemblages came from the El Chayal and Ixtepeque sources, with the majority (81.4%) from El Chayal. Like this study, her analysis was also based on visual inspection of color and texture. El Chayal's refracted color tends to have a medium gray with milky or waxy appearance, with a reflected color of medium gray to black. El Chayal obsidian has frequent but small, dark gray or black banding, which is wide and somewhat irregular. It also has dusty inclusions. Ixtepeque's refracted color is usually dark brown, with a reflected color of black or medium gray. It is of medium luster, and diffused light has an appearance similar to frosted glass. There are usually no inclusions, but banding (typically milky gray to black) is common. Bands are narrow, straight, and parallel. Ixtepeque obsidian mostly contains medium translucency, but banded portions are opaque, and it often has a high luster with sharp refracted light (Braswell et al. 2000:272). Most obsidian from all assemblages was categorized as medial portions of blades and prismatic blades (Tables 2.A.46, 2.A.47, and 2.A.48).

It is interesting to note that out of the nine prismatic blades plus one categorized as a simple blade (i.e. only two flake scars), the majority are not worked or utilized. All were found in Lot 51G2, an area of occupation outside the Agricultural Plot System 2 boundary, although the southern sidewall of the unit contained part of Orthanc Wall. Very few artifacts were found in this area, and the blades were found near to each other in the northeast corner of unit, where the lot was only 5 to 10 cm thick. All blades were from El Chayal. The purpose of the possible obsidian cache is unclear.

Groundstone

Groundstone artifacts include *manos*, *metates*, hammerstones, bark beaters, curtain weights, and pecked and worked stone. *Manos* and *metates* in the assemblages are primarily made of granite, though one broken *metate* found in the space between *chich* cobble mounds (Op. 52B) is made of quartzite. *Manos* and *metates* are used in household contexts, and thus are indicative of redeposited domestic trash. One *metate* fragment and three *mano* fragments were found in Agricultural Plot System 1 (Table 2.A.49), and one *mano* fragment was found in Agricultural Plot System 2 (Table 2.A.50). Seven pieces of a broken *metate* were found in the *chich* cobble mound from 52B2 (Table 2.A.51), which was likely a domestic area due to the assemblage resembling domestic trash as opposed to the high proportion of lithics in 52A and 52C. All hammerstones were made of limestone and were determined to be hammerstones based on use wear along the edge of the hammerstone. Two hammerstones were found in the assemblage, both in Agricultural Plot System 2, along with one piece of worked stone and two pieces of pecked stone, which were collected from Agricultural System 1. In addition, two bark beaters and one curtain weight were found in Agricultural Plot System 1 (Table 2.A.49).

Slate and Quartz

Slate and quartz artifacts were not particularly prevalent in any of the assemblages. Slate pieces found in all assemblages were categorized as fragments aside from one worked oval piece and a piece featuring an inscribed geometric design. The oval fragment was located with large pottery sherds and charcoal

at the bottom of the Feature 2 Pit in Lot 51S1 while the slate with geometric designs was located in Lot 51T1, which consisted of humus, redeposited domestic fill, and wall collapse. Sixteen pieces of slate were found in Agricultural Plot System 1, fourteen in Agricultural System 2, and one in the Water Channel System (Tables 2.A.52, 2.A.53, and 2.A.54). No slate was found in the Terraformed area or in the *Chich* Cobble Mound. Quartz artifacts were separated into flake fragments, chunks, and nodules based on chipped stone categories. The majority of quartz recovered were chunks. Nine pieces of quartz were found in Agricultural Plot System 1, four in Agricultural Plot System 2, two in the Terraformed Feature area, and two in the *Chich* Cobble Mound (Tables 2.A.55, 2.A.56, 2.A.57, and 2.A.58). No quartz artifacts were found in the Water Channel System.

Daub and Plaster

Daub is often utilized in house construction, and its presence can point to in situ construction or the use of redeposited domestic trash. Daub was counted and weighed by lot. The largest amount of quantity of daub was found in both agricultural plot systems (Tables 2.A.59 and 2.A.60), pointing to the presence of domestic trash in this area. However, a high density of daub was found in units associated with the platform found in Agricultural System 1 (making up 20.1% of total daub in the Operation). As the platform is hypothesized to have been used as a field house (*champa*), this is to be expected. Two pieces of plaster were also found in Agricultural Plot System 2 (Table 2.A.61).

Faunal Remains and Shell

Shell was differentiated between marine shell, ridged jute (*Pachychilus glaphyrurs*), and smooth jute (*Pachycilus indorum*). Jute is a common riverine snail consumed by both ancient and contemporary populations in the Maya lowlands (Halperin et al. 2003). Many jute are found with the tips broken off or with holes drilled along the center—two methods used to extract the flesh for consumption (Healy et al. 1990). For jute, I collected data on whether the shell was intact and if it had a broken tip, a hole in the middle, or a broken tip and hole. Marine shell was recorded as a separate category and was not identified by species. The largest density of jute was found in the cobble mounds, but it may be that the presence of jute in this area was due to the gathering of jute near the mouths of nearby tributaries and not the result of mass consumption. The majority (94.4%) of jute in the cobble mounds have a broken tip, however, which is indicative of preparation for consumption.

Jute, two marine shells, and a cave pearl were found in Agricultural Plot System 1. One shell fragment carved into the shape of a star, possibly a pendant for decorating clothing, was found within Agricultural Plot System 1 (14AP1) (Tables 2.A.62 and 2.A.63). Marine shell was not found in Agricultural Plot System 2, but the assemblage did contain seven jute (Table 2.A.64). The largest number of marine shell fragments—23 in total—were found in the Water Channel System. Marine shell was found in all units except 14N, but the largest quantity came in the form of nine shell beads in Lot 14S3, which I categorized as fill right above the buried walls that form the channel (Table 2.A.64). No marine shell was found in the *Chich* Cobble Mound but, as stated above, the assemblage did contain a large quantity of jute (Table 2.A.66). The shell beads in the Water Channel System were found along with six deciduous teeth, although the number and age of the child(ren) was not determined. The purpose of the teeth and beads is unclear, and it is unknown if the teeth came from a child whose soft bones disintegrated in the acidic soil or if the teeth and beads came from a cache that only originally contained teeth. Due to the placement of the shell beads and teeth in a water channel system, they may be the result of a water offering. A possible animal claw was also found in Agricultural Plot System 1 (Table 2.A.67).

Conclusions

Artifact analysis of materials from Agricultural Plot Systems 1 and 2 revealed evidence for a large amount of redeposited domestic trash. The majority of lithic flakes in Agricultural Plot System 1 were classified as second stage reduction flakes, data that lend evidence to suggest that the assemblage was not the result of early or late stage production. Variation in lithic types was also significant. Formal tools such as bifaces, chisels, gravers, scrapers, macroblades, burins, and drills in addition to expedient tools and flake blades were present. The lithic assemblage in Agricultural Plot System 2 was comparable to that of the first plot system discovered. The majority of flakes were from the second stage production. Formal and informal tools were also encountered. Both plot systems dated to between the Late and Terminal Classic periods, although Agricultural Plot System 2 contained a larger proportion of Late Classic II sherds. *Mano* and *metate* fragments and daub, indicative of domestic activity, were found in both agricultural plot systems. These finds provide further support for the presence of redeposited domestic trash in the plot systems.

Fewer artifacts were found in the terraforming and water channel areas due to the difference in the volume of excavation, as well as function. Flakes from the second and third stages of reduction were predominant in both areas, with a low percentage of first stage flakes. Three formal tools were found in the terraforming test units, and tools were also present in the water channel system. Diagnostic sherds were not encountered in these two contexts.

Continued excavations in the *chich* cobble mound area have further revealed the depositional history of the area. This season's excavations focused on the top of the cobble mounds, which had not been excavated previously. While the majority of stone found in the *chich* cobble mounds took the form of river cobbles, the mounds were also created with lithics including a range of second and third stage reduction flakes. Very few formal tools were found, however, indicating that debitage was preferred for the building of the mounds. It is also possible that this material derives from redeposited lithic production areas near the river where cobbles are abundant. Based on ceramic analysis, the majority of sherds date to between the Late Classic and Terminal Classic periods. A broken *metate* was also found in the open area between the cobble mounds, along with a larger amount of ceramics, which indicates domestic activity. Future analyses of soil samples will reveal more information regarding the possible agricultural purposes of the *chich* cobble mounds.

Analytical Units

The following are the individual analytical units defined in Unit 52C (Figure 2.7):

Cobbles in Humus Layer on Cobble Mound 2 – AU6. Lots Excavated: 52C1. This analytical unit consisted of a 10YR 3/2 very dark grayish brown clay loam with small to medium-sized chert and limestone cobbles (mostly between 10 to 20 cm in size). About 40 to 45 cm thick, this layer contained a large quantity of lithics and ceramics and a few jute.

Cobbles in Clay Loam below Humus Layer on Cobble Mound 2 – AU7. Lots Excavated: 52C2. This analytical unit was comprised of small to medium-sized chert and limestone cobbles (10 to 20 cm in size) in 10YR 3.3 dark brown clay loam. About 50 to 55 cm thick, this layer contained many fewer artifacts than the layer above it, but more jute.

Cobbles in Sandy Loam on Cobble Mound 2 – AU8. Lots Excavated: 52C3. This analytical unit consisted of a 10YR 5/3 brown sandy loam with small to medium-sized limestone and chert cobbles (5 to 20 cm in

size), but with more smaller cobbles and fewer artifacts than the layers above it. A large number of jute were found in this analytical unit, which sits above a sandier, more yellow (10YR 5/6 yellowish brown) sediment with no cobbles. Excavations did not continue into this lower sediment.

Table 2.1. Operation 52C analytical units.

AU Number	Analytical Unit Name	Lots
6	Cobbles in Humus Layer on Cobble Mound 2	52C1
7	Cobbles in Clay Loam below Humus Layer on Cobble Mound 2	52C2
8	Cobbles in Sandy Loam on Cobble Mound 2	52C3

Acknowledgements:
I would like to thank Dr. Lisa LeCount, first and foremost, for her help with artifact analysis and ceramic analysis in particular, as well as for giving me the opportunity to work at such a great site. I would also like to thank Dr. David Mixter for his aid in excavations and mapping, and Dr. BrieAnna Langlie who worked hard to help me export soil samples. Bobbie Simova has also always provided constant encouragement throughout my fieldwork and analysis. I would like to thank Dr. Carolyn Friewald for her support and expertise. A big thanks to Dr. Jason Yaeger for being there for me while working on artifact analysis, and to Kelvin Requena and Gwen Galvez for keeping me company and fairly sane. I also want to thank my amazing excavators Elmer Cocom and Romell Uck—thank you for dealing with so many cobbles**.** And of course, my thanks to Azucena Galvez for her hospitality, fantastic food, and for taking care of me like a mother through the 2018 field season.

Works Cited

Braswell, Geoffrey E., John E. Clark, Kazuo Aoyama, Heather I. McKillop and Michael D. Glascock
2000 Determining the Geological Provenance of Obsidian Artifacts from the Maya Region: A Test of the Efficacy of Visual Sourcing. *Latin American Antiquity* 11(3):269-282.

Chase, Arlen F., Diane Z. Chase, Jamie J. Awe, John F. Weishampel, Gyles Iannone, Holley Moyes, Jason Yaeger, Kathryn Brown, Ramesh L. Shrestha, William E. Carter and Juan Fernandez Diaz
2014 Ancient Maya Regional Settlement and Inter-Site Analysis: The 2013 West-Central Belize LiDAR Survey. *Remote Sensing* 6:8671-8695.

Freiwald, Carolyn
2018 The Status of Marine Shell and Other Fauna at Actuncan. In *Actuncan Early Classic Maya Project: Report of the Tenth Season*, edited by David W. Mixter and Lisa J. LeCount, pp. 71-92. On file at the Belize Institute of Archaeology, Belmopan.

Gifford, James C.
1976 *Prehistoric Pottery Analysis and the Ceramics of Barton Ramie in the Belize Valley*. Memoirs of the Peabody Museum of Archaeology and Ethnology, Harvard University 18. Peabody Museum of Archaeology and Ethnology, Harvard University, Cambridge: Massachusetts.

Heindel, Theresa
2017 Investigating Agricultural Strategies: On-going Operation 14 Excavations. In *Actuncan Early Classic Maya Project: Report of the Ninth Season*, edited by Lisa J. LeCount and David W. Mixter, pp. 13-26. On file at the Belize Institute of Archaeology, Belmopan.
2018 Investigating Agricultural Plot Systems and Chich Cobble Mounds: Operation 51 and 52, and On-going Operation 14 Excavations. In *Actuncan Early Classic Maya Project: Report of the Tenth Season*, edited by David W. Mixter and Lisa J. LeCount, pp. 11-48. On file at the Belize Institute of

Archaeology, Belmopan.
Halperin, Christina T., Sergio Garza, Keith M. Prufer and James E. Brady
2003 Caves and Ancient Maya Ritual Use of Jute. *Latin American Antiquity* 13(2):207-219.
Healy, Paul F., Kitty Emery, and Lori E. Wright
1990 Ancient and Modern Maya Exploitation of the Jute Snail (Pachychilus). *Latin American Antiquity* 1(2):170-183.
Killion, Thomas W.
1990 Cultivation Intensity and Residential Site Structure: An Ethnographic Examination of Peasant Agriculture in the Sierra de los los Tuxtlas, Veracruz, Mexico. *Latin American Antiquity* 1:191-215.
1990 Intensive Surface Collection of Residential Clusters at Terminal Classic Sayil, Yucatan, Mexico. *Journal of Field Archaeology* 16:274-294.
1992 Residential Ethnoarchaeology and Ancient Site Structure: Contemporary Farming and Prehistoric Settlement Agriculture at Matacapan, Veracruz, Mexico. In *Gardens of Prehistory: The Archaeology of Settlement Agriculture in Greater Mesoamerica*, edited by Thomas W. Killion, pp. 119-149. The University of Alabama Press, Tuscaloosa.
Kooyman, Brian P.
2000 *Understanding Stone Tools and Archaeological Sites*. University of Calgary Press: Calgary.
LeCount, Lisa J.
1996 Feasting, Gifting, and Displaying Wealth among the Late and Terminal Classic Lowland Maya. Unpublished Ph.D. Dissertation, University of California-Los Angeles.
Millar, Jane E.
2016 Ground Truthing Magnetic Anomalies at Actuncan: The Second Season. In *Actuncan Early Classic Maya Project: Report of the Eighth Season*, edited by Lisa J. LeCount and David W. Mixter, pp. 52-68. On file at the Belize Institute of Archaeology, Belmopan.
Moholy-Nagy, Hattula
1990 Misidentification of Mesoamerican Lithic Workshops. *Latin American Antiquity* 1(3):268-279.
Odell, George H.
2004 *Lithic Analysis*. Kluwer Academic/Plenum Publishers: New York.
Patten, Bruce
1999 *Old Tools – New Eyes: A Primal Primer of Flintknapping*. Stone Dagger Publications, Denver.
Sabloff, Jeremy A., and Gair Tourtellot
1992 Beyond Temples and Palaces: Recent Settlement Pattern Research at the Ancient Maya City of Sayil (1983-1985). In *New Theories on the Ancient Maya*, edited by Elin C. Danien and Robert J. Sharer, pp. 155-160. University Museum, University of Pennsylvania Philadelphia.
Salberg, Daniel J.
2012 Mapping Actuncan During the 2011 Season. In *Actuncan Early Classic Maya Project: Report of the Fourth Season*, edited by Lisa J. LeCount and John H. Blitz, pp. 25-32. On file at the Belize Institute of Archaeology, Belmopan.
Shults, Sara C.
2012 Uncovering Ancient Maya Exchange Networks: Using the Distributional Approach to Interpreting Obsidian Exchange at Actuncan, Belize. Unpublished M.A. Thesis, University of Alabama, Tuscaloosa.
VandenBosch, Jon C.
1992 Excavation of Rubble Mound Features in the Periphery. In *Xunantunich Archaeological Project: 1992 Field Season*, edited by Richard M. Leventhal, pp. 84-109. On file at the Belize Institute of Archaeology, Belmopan.
1993 Investigations of San Lorenzo's Linear and Cobble Mounds. In *Xunantunich Archaeological Project, 1993 Field Report*, edited by Richard M. Leventhal, pp. 148-171. On file at the Belize Institute of Archaeology, Belmopan.
1999 Lithic Economy and Household Interdependence among the Late Classic Maya of Belize.

Unpublished Ph.D. Dissertation, University of Pittsburgh.
Walker, Chester P.
2012 Geophysical Survey at the Actuncan Site. In *Actuncan Early Classic Maya Project: Report of the Fourth Season*, edited by Lisa J. LeCount and John H. Blitz, pp. 161-171. On file at the Belize Institute of Archaeology, Belmopan.
Whittaker, John C.
1994 *Flintknapping: Making and Understanding Stone Tools*. University of Texas Press, Austin.

Appendix 2.A

Table 2.A.1. Operation 14 – Agricultural Plot System 1: lithic flakes by material type

Material	Total	Percentage
Chert	1567	94.7%
Chalcedony	62	3.7%
Limestone	2	0.1%
Siliceous Limestone	22	1.3%

Table 2.A.2. Operation 14 – Agricultural Plot System 1: lithic flakes by reduction stage

Stage	Total	Percentage
First	175	10.6%
Second	853	51.5%
Third	625	37.8%

Table 2.A.3. Operation 14 – Agricultural Plot System 1: lithic flakes by attribute

Cortex %	Scars	Hammer Type	Preparation	Stage	Total	Percentage
0%	1-2	Soft	Y	Third	2	0.1%
0%	1-2	Soft	N	Second	10	0.6%
0%	1-2	Hard	Y	Second	6	0.4%
0%	1-2	Hard	N	Second	46	2.8%
0%	3+	Soft	Y	Third	64	3.8%
0%	3+	Soft	N	Third	85	5.1%
0%	3+	Hard	Y	Third	47	2.8%
0%	3+	Hard	N	Third	404	24.4%
<50%	0	Hard	N	First	7	0.4%
<50%	1-2	Soft	Y	Second	4	0.2%
<50%	1-2	Soft	N	Second	14	0.8%
<50%	1-2	Hard	Y	Second	5	0.3%
<50%	1-2	Hard	N	Second	122	7.4%
<50%	3+	Soft	Y	Third	23	1.4%
<50%	3+	Soft	N	Second	60	3.6%
<50%	3+	Hard	Y	Second	44	2.7%
<50%	3+	Hard	N	Second	426	25.7%
>50%	1-2	Soft	Y	First	2	0.1%
>50%	1-2	Soft	N	First	8	0.5%
>50%	1-2	Hard	Y	First	6	0.4%
>50%	1-2	Hard	N	First	112	6.8%
>50%	3+	Soft	Y	Second	7	0.4%
>50%	3+	Soft	N	Second	9	0.5%
>50%	3+	Hard	Y	Second	8	0.5%
>50%	3+	Hard	N	Second	81	4.9%
100%	0	Soft	Y	First	1	0.1%
100%	0	Soft	N	First	5	0.3%
100%	0	Hard	Y	First	2	0.1%
100%	0	Hard	N	First	34	2.1%
				Total	1655	100%

Table 2.A.4. Operation 14 – Agricultural Plot System 1: lithic flake fragments by material type

Material	Total	Percentage
Chert	3675	94.3%
Chalcedony	139	3.6%
Limestone	11	0.3%
Siliceous Limestone	71	1.8%

Table 2.A.5. Operation 14 – Agricultural Plot System 1: lithic flake fragments by attribute

Cortex %	Scars	Total	Percentage
100%	0	4	0.1%
0%	1-2	378	9.7%
1-25%	1-2	219	5.6%
26-50%	1-2	311	8.0%
51-75%	1-2	255	6.5%
76-99%	1-2	498	12.8%
0%	3+	1109	28.5%
1-25%	3+	521	13.4%
26-50%	3+	376	9.7%
51-75%	3+	141	3.6%
76-99%	3+	84	2.2%
	Total	3896	100.0%

Table 2.A.6. Operation 14 – Agricultural Plot System 1: lithic types – debitage

	Microdebitage	Flake	Fragment	Blade	Nodule	Chunk	Shatter	Resharp	Retouch	Expedient	Core	Preform
Total	462	3896	1754	5	32	234	1031	13	12	20	46	4
% of Total	6.1%	51.7%	23.3%	0.1%	0.4%	3.1%	13.7%	0.3%	0.2%	0.2%	0.6%	0.1%

Table 2.A.7. Operation 14 – Agricultural Plot System 1: lithic types – formal tools

	Biface	Thin Biface	Chisel	Graver	Scraper	Macro-blade	Burin	Drill	Total
Total	14	1	2	2	1	1	2	1	7533
% of Total	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%

Table 2.A.8. Operation 51 – Agricultural Plot System 2: lithic flakes by reduction stage

Stage	Total	Percentage
First	84	10%
Second	454	54%
Third	303	36%

Table 2.A.9. Operation 51 – Agricultural Plot System 2: lithic flakes by attribute

Cortex %	Scars	Hammer Type	Preparation	Stage	Total	Percentage
0%	1-2	Soft	Y	Third	1	0.1%
0%	1-2	Soft	N	Second	10	1.2%
0%	1-2	Hard	Y	Second	4	0.5%
0%	1-2	Hard	N	Second	25	2.9%
0%	3+	Soft	Y	Third	26	3.0%
0%	3+	Soft	N	Third	75	8.8%
0%	3+	Hard	Y	Third	28	3.3%
0%	3+	Hard	N	Third	161	18.9%
<50%	1-2	Soft	Y	Second	7	0.8%
<50%	1-2	Soft	N	Second	11	1.3%
<50%	1-2	Hard	Y	Second	7	0.8%
<50%	1-2	Hard	N	Second	55	6.4%
<50%	3+	Soft	Y	Third	19	2.2%
<50%	3+	Soft	N	Second	60	7.0%
<50%	3+	Hard	Y	Second	35	4.1%
<50%	3+	Hard	N	Second	197	23.1%
>50%	1-2	Soft	Y	First	4	0.5%
>50%	1-2	Soft	N	First	9	1.1%
>50%	1-2	Hard	N	First	40	4.7%
>50%	3+	Soft	N	Second	3	3.5%
>50%	3+	Hard	Y	Second	7	0.8%
>50%	3+	Hard	N	Second	39	4.6%
100%	0	Soft	N	First	5	0.6%
100%	0	Hard	N	First	26	3.0%
				Total	854	100%

Table 2.A.10. Operation 51 – Agricultural Plot System 2: lithic flakes by material type

Material	Total	Percentage
Chert	745	87.2%
Chalcedony	97	11.4%
S. Limestone	12	1.4%

Table 2.A.11. Operation 51 – Agricultural Plot System 2: lithic flakes by attribute

Cortex	Scars	Total	Percentage
0%	1-2	105	8.5%
1-25%	1-2	65	5.3%
26-50%	1-2	105	8.5%
51-75%	1-2	74	6.0%
76-99%	1-2	99	8.0%
0%	3+	444	36.1%
1-25%	3+	167	13.6%
26-50%	3+	115	9.3%
51-75%	3+	47	3.8%
76-99%	3+	9	0.7%
	Total	1231	100.0%

Table 2.A.12. Operation 51 – Agricultural Plot System 2: lithic flake fragments by material type

Material	Total	Percentage
Chert	1043	84.6%
Chalcedony	137	11.8%
Limestone	16	1.8%
Siliceous Limestone	22	1.8%

Table 2.A.13. Operation 51 – Agricultural Plot System 2: lithic types - debitage

	Microdebitage	Flake	Fragment	Nodule	Chunk	Shatter	Expedient	Resharp	Retouch	Core	Preform
Total	146	854	1231	3	44	546	6	12	10	15	7
% of Total	5.1%	29.6%	42.6%	0.1%	1.5%	18.9%	0.2%	0.4%	0.3%	0.5%	0.2%

Table 2.A.14. Operation 51 – Agricultural Plot System 2: lithic types – formal tools

	Biface	Graver	Drill	Total
Total	4	1	10	2889
% of Total	0.1%	0.0%	0.3%	100.0%

Table 2.A.15. Operation 14 – Terraforming: lithic flakes by reduction stage

Stage	Total	Percentage
First	3	8.8%
Second	17	40.0%
Third	14	41.2%

Table 2.A.16. Operation 14 – Terraforming: lithic flakes by attribute

Cortex	Scars	Hammer	Preparation	Stage	Total	Percentage
0%	1-2	Hard	N	Second	2	5.9%
0%	3+	Soft	Y	Third	3	8.8%
0%	3+	Hard	Y	Third	3	8.8%
0%	3+	Hard	N	Third	7	20.6%
<50%	1-2	Hard	N	Second	1	2.9%
<50%	3+	Soft	Y	Third	1	2.9%
<50%	3+	Soft	N	Second	1	2.9%
<50%	3+	Hard	Y	Second	1	2.9%
<50%	3+	Hard	N	Second	11	32.5%
>50%	1-2	Hard	N	First	2	5.9%
>50%	3+	Hard	N	Second	1	2.9%
100%	0	Soft	N	First	1	2.9%
				Total	34	100%

Table 2.A.17. Operation 14 – Terraforming: lithic flake fragments by attribute

Cortex	Scars	Total	Percentage
0%	1-2	7	5.1%
1-25%	1-2	7	5.1%
26-50%	1-2	12	8.8%
51-75%	1-2	5	3.7%
75-99%	1-2	19	14.0%
0%	3+	46	33.8%
1-25%	3+	17	12.5%
26-50%	3+	15	11.0%
51-75%	3+	7	5.1%
75-99%	3+	1	0.7%
	Total	136	100.0%

Table 2.A.18. Operation 14 – Terraforming: lithic flakes by material type

Material Type	Total	Percentage
Chert	30	88.2%
Chalcedony	4	11.8%

Table 2.A.19. Operation 14 – Terraforming: lithic flake fragments by material type

Material Type	Total	Percentage
Chert	131	96.3%
Chalcedony	5	3.7%

Table 2.A.20. Operation 14 – Terraforming: lithic types

	Microdebitage	Flake	Fragment	Biface	Chisel	Drill	Chunk	Shatter	Total
Total	10	34	136	1	1	1	4	9	196
% of Total	5.1%	17.3%	69.4%	0.5%	0.5%	0.5%	2.0%	4.6%	100.0%

Table 2.A.21. Operation 14 – Water Channel System: lithic flakes by reduction stage

Stage	Total	Percentage
First	14	12.7%
Second	46	41.8%
Third	50	45.5%

Table 2.A.22. Operation 14 – Water Channel System: lithic flakes by attribute

Cortex	Scars	Hammer	Preparation	Stage	Total	Percentage
0%	1-2	Soft	Y	Third	1	0.9%
0%	1-2	Soft	N	Second	1	0.9%
0%	1-2	Hard	Y	Second	2	1.8%
0%	1-2	Hard	N	Second	5	4.5%
0%	3+	Soft	Y	Third	6	5.5%
0%	3+	Soft	N	Third	4	3.6%
0%	3+	Hard	Y	Third	3	2.7%
0%	3+	Hard	N	Third	32	29.1%
<50%	1-2	Soft	N	Second	1	0.9%
<50%	1-2	Hard	Y	Second	1	0.9%
<50%	1-2	Hard	N	Second	11	10.0%
<50%	3+	Soft	Y	Third	1	0.9%
<50%	3+	Soft	N	Second	5	4.5%
<50%	3+	Hard	Y	Second	1	0.9%
<50%	3+	Hard	N	Second	12	10.9%
>50%	1-2	Soft	N	First	1	0.9%
>50%	1-2	Hard	N	First	7	6.4%
>50%	3+	Hard	Y	Second	1	0.9%
>50%	3+	Hard	N	Second	2	1.8%
100%	0	Soft	Y	First	1	0.9%
100%	0	Hard	N	First	4	3.6%
				Total	110	100.0%

Table 2.A.23. Operation 14 – Water Channel System: lithic flakes by material type

Material Type	Total	Percentage
Chert	102	2.8%
Chalcedony	2	1.8%
Limestone	2	1.8%
Siliceous Limestone	4	3.6%

Table 2.A.24. Operation 14 – Water Channel System: lithic flake fragments by material type

Material Type	Total	Percentage
Chert	390	94.7%
Chalcedony	4	1.0%
Limestone	9	2.2%
Siliceous Limestone	8	1.9%

Table 2.A.25. Operation 14 – Water Channel System: lithic flake fragments by attribute

Cortex	Scars	Total	Percentage
0%	1-2	50	12.1%
1-25%	1-2	27	6.6%
26-50%	1-2	33	8.0%
51-75%	1-2	27	6.6%
75-99%	1-2	56	13.6%
0%	3+	142	34.5%
1-25%	3+	36	8.7%
26-50%	3+	34	8.3%
51-75%	3+	4	1.0%
75-99%	3+	1	0.2%
	Total	412	100%

Table 2.A.26. Operation 14 – Water Channel System: lithic types – debitage

	Microdebitage	Flake	Fragment	Nodule	Chunk	Shatter	Resharp	Expedient	Core	Preform
Total	141	470	804	3	87	93	1	13	22	4
% of Total	8.6%	28.5%	48.8%	0.2%	5.3%	5.6%	.1%	0.8%	1.3%	0.2%

Table 2.A.27. Operation 14 – Water Channel System: lithic types – formal tools

	Uniface	Biface	Thin Biface	Chisel	Graver	Drill	Macroblade	Total
Total	1	1	2	1	1	1	2	1647
% of Total	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	100.0%

Table 2.A.28. Operation 52 – Chich Cobble Mound: lithic flakes by material type

Material	Total	Percentage
Chert	388	82.6%
Chalcedony	75	16.0%
Limestone	3	0.6%
Siliceous Limestone	4	0.8%

Table 2.A.29. Operation 52 – Chich Cobble Mounds: lithic flakes fragments by material type

Material	Total	Percentage
Chert	673	83.7%
Chalcedony	71	8.8%
Limestone	44	5.5%
Siliceous Limestone	16	2.0%

Table 2.A.30: Operation 52A – Chich Cobble Mounds: lithic flakes by reduction stage

Stage	Total	Percentage
First	10	5.9%
Second	31	18.2%
Third	129	75.9%

Table 2.A.31. Operation 52B – Chich Cobble Mounds: lithic flakes by reduction stage

Stage	Total	Percentage
First	13	13.7%
Second	27	28.4%
Third	54	56.8%

Table 2.A.32. Operation 52C – Chich Cobble Mounds: lithic flakes by reduction stage

Stage	Total	Percentage
First	33	16.1%
Second	110	53.7%
Third	62	30.2%

Table 2.A.33. Operation 52A – Chich Cobble Mounds: lithic flake fragment by attribute

Cortex	Scars	Total	Percentage
100%	0	6	5.5%
0%	1-2	9	8.3%
1-25%	1-2	1	0.9%
26-50%	1-2	4	3.7%
51-75%	1-2	3	2.8%
76-99%	1-2	7	6.4%
0%	3+	53	48.6%
1-25%	3+	12	11.0%
26-50%	3+	7	6.4%
51-75%	3+	3	2.8%
76-99%	3+	4	3.7%
	Total	109	100.0%

Table 2.A.34. Operation 52B – Chich Cobble Mounds: lithic flake fragment by attribute

Cortex	Scars	Total	Percentage
100%	0	3	1.9%
0%	1-2	15	9.7%
1-25%	1-2	2	1.3%
26-50%	1-2	5	3.2%
51-75%	1-2	10	6.5%
76-99%	1-2	26	16.8%
0%	3+	37	23.9%
1-25%	3+	26	16.8%
26-50%	3+	15	9.7%
51-75%	3+	11	7.1%
76-99%	3+	5	3.2%
	Total	155	100.0%

Table 2.A.35. Operation 52C – Chich Cobble Mounds: lithic flake fragment by attribute

Cortex	Scars	Total	Percentage
0%	1-2	56	10.4%
1-25%	1-2	25	4.6%
26-50%	1-2	67	12.4%
51-75%	1-2	56	10.4%
76-99%	1-2	64	11.9%
0%	3+	140	26.0%
1-25%	3+	58	10.7%
26-50%	3+	58	10.7%
51-75%	3+	13	2.4%
76-99%	3+	3	0.6%
	Total	540	100.0%

Table 2.A.36. Operation 52 – Chich Cobble Mound: lithic types – debitage

	Microdebitage	Flake	Fragment	Nodule	Chunk	Shatter	Resharp	Expedient	Core	Preform
Total	141	470	804	3	87	93	1	13	22	4
% of Total	8.6%	28.5%	48.8%	0.2%	5.3%	5.6%	0.1%	0.8%	1.3%	0.2%

Table 2.A.37. Operation 52 – Chich Cobble Mound: lithic types – formal tools

	Uniface	Biface	Thin Biface	Chisel	Drill	Graver	Macroblade	Total
Total	1	1	2	1	1	1	2	1647
% of Total	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	100.0%

Table 2.A.38. Operation 14 – Agricultural Plot System 1: sherd time periods

Time Period	Number of Diagnostics	% of Diagnostic Total
LC-TC	2685	51.9%
LC	186	3.6%
LC1	134	2.6%
LC2	1715	33.2%
TC	449	8.7%
Total	5169	100%

Table 2.A.39. Operation 14 – Agricultural Plot System 1: sherd types

Type:Variety	Number of Diagnostics	% of Diagnostic Total
Chial	186	3.6%
Meditation Black	633	12.2%
Mount Maloney Black	2020	39.1%
Belize Red	388	7.5%
Macaw Bank	968	18.7%
San Lorenzo Black	436	8.4%
Dolphin Head Red	89	1.7%
Vaca Falls Red	120	2.3%
Chunhuitz	297	5.7%
Alexander	32	0.6%
Total	5169	100%

Table 2.A.40. Operation 51 – Agricultural Plot System 2: sherd time periods

Time Period	Number of Diagnostic	% of Diagnostic Total
LC-TC	607	36.5%
LC	5	0.3%
LC1	19	0.8%
LC2	589	47.2%
TC	449	15.3%
Total	1669	100%

Table 2.A.41. Operation 51 – Agricultural Plot System 2: sherd types

Type:Variety	Number of Diagnostics	% of Diagnostic Total
Chial	5	0.3%
Meditation Black	240	14.4%
Mount Maloney Black	257	15.4%
Belize Red	146	8.7%
Macaw Bank	717	43.0%
San Lorenzo Black	24	1.4%
Dolphin Head Red	84	5.0%
Vaca Falls Red	54	3.2%
Chunhuitz	141	8.4%
Alexander	1	0.1%
Total	1669	100%

Table 2.A.42. Operation 14 – Terraforming: ceramic sherds

Op/Subop/Lot	Total Sherds	Weight (g)
14K1	42	203
14K2	75	313
14K4	58	335
14M1	102	530
14M2	111	367
14M3	31	248
14M7	14	45
Total	433	2041

Table 2.A.43. Operation 14 – Water Channel System: ceramic sherds

Op/Subop/Lot	Total Sherds	Weight (g)
14N1	359	1107
14N2	52	233
14N3	24	100
14P1	382	1367
14P2	235	805
14P3	163	356
14P4	13	70
14P5	6	18
14P6	2	37
14P7	7	29
14S1	355	1300
14S2	223	798
14S3	35	199
14S4	2	6
14V1	289	1198
14V2	179	745
14V3	8	46
14V4	67	310
Total	2293	8724

Table 2.A.44. Operation 52 – Chich Cobble Mounds: sherd time periods

Time Period	Number of Diagnostics	% of Diagnostic Total
LC-TC	135	58.2%
LC1	4	1.7%
LC2	65	28.0%
TC	28	12.1%
Total	233	100%

Table 2.A.45. Operation 52 – Chich Cobble Mounds: sherd types

Type:Variety	Number of Diagnostics	% of Diagnostic Total
Chial	0	0.0%
Meditation Black	11	4.7%
Mount Maloney Black	129	55.4%
Belize Red	12	5.2%
Macaw Bank	32	13.7%
San Lorenzo Black	9	3.9%
Dolphin Head Red	8	3.4%
Vaca Falls Red	3	1.3%
Chunhuitz	21	9.0%
Alexander	8	3.4%
Total	233	100%

Table 2.A.46. Operation 14 – Agricultural Plot System 1: obsidian by source and worked/utilized

Source	Total	% of Total	Worked	% Worked of Total	Utilized	% Utilized of Total
Itxtepeque	13	26%	5	38.5%	2	15.4%
El Chayal	37	74%	4	10.8%	9	10.8%
Total	50	100%	9	18.0%	11	22.0%

Table 2.A.47. Operation 51 – Agricultural Plot System 2: obsidian by source and worked/utilized

Source	Total	% of Total	Worked	% Worked of Total	Utilized	% Utilized of Total
Itxtepeque	6	12%	0	0.0%	0	0.0%
El Chayal	44	88%	11	100.0%	3	100.0%
Total	50	100%	11	22.0%	3	6.0%

Table 2.A.48. Operation 52 – Chich Cobble Mounds: obsidian worked/utilized

Source	Total	Worked	% Worked of Total	Utilized	% Utilized of Total
E Chayal	14	2	14.3%	0	0.0%

Table 2.A.49. Operation 14 – Agricultural Plot System 1: groundstone

Op/Subop/Lot	Total	Weight (g)	Material	Type	Utilized
14U1	1	321	Basalt	Metate Fragment	Yes
14U1	1	71	Basalt	Mano Fragment	Yes
14W1	1	71	Limestone	Bark Beater	Yes
14Y1	1	3517	Limestone	Pecked Stone	Yes
14Y1	1	352	Basalt	Mano Fragment	Yes
14Y1	1	2517	Limestone	Curtain Weight	Yes
14AF1	1	187	Limestone	Pecked Stone	Yes
14AK1	1	254	Limestone	Bark Beater	Yes
14AM2	1	415	Basalt	Mano Fragment	Yes
Total	10	7705			

Table 2.A.50. Operation 51 – Agricultural Plot System 2: groundstone

Op/Subop/Lot	Total	Weight (g)	Material	Type	Utilized
51A1	1	164	Limestone	Hammerstone	Yes
51C2	1	159	Limestone	Hammerstone	Yes
51F2	1	143	Quartzite	Unknown	Yes
51R1	1	788	Quartzite	Mano Fragment	Yes
51S1	1	51	Limestone	Worked Stone	Yes
Total	5	1305			

Table 2.A.51. Operation 52 – Chich Cobble Mounds: groundstone

Op/Subop/Lot	Total	Weight (g)	Material	Type	Utilized
52B2	7	2494	Quartzite	Metate Fragments	Yes

Table 2.A.52. Operation 14 – Agricultural Plot System 1: slate

Op/Subop/Lot	Total	Weight
14Q1	1	32
14Q1	1	37
14R1	1	22
14U1	1	18
14X1	1	1
14Y11	1	14
14AE1	1	12
14AG1	1	8
14AI1	1	12
14AM1	1	16
14AO1	1	11
14AQ1	1	1
14AS2	1	17
14AW1	1	1
14BA1	1	26
14BA1	1	15
Total	16	243

Table 2.A.53. Operation 51 – Agricultural Plot System 2: slate

Op/Subop/Lot	Total	Weight	Type	Worked
51A1	1	4	Fragment	No
51B1	1	7	Fragment	No
51B2	1	22	Fragment	No
51C1	1	8	Fragment	No
51F1	1	17	Fragment	No
51F1	1	22	Fragment	No
51G1	1	2	Fragment	No
51I1	1	1	Fragment	No
51L1	1	5	Fragment	No
51L1	1	7	Fragment	No
51M1	1	14	Fragment	No
51S1	1	1	Oval	Yes
51T1	1	12	Decorated	Yes
Total	13	122		

Table 2.A.54. Operation 14 – Water Channel System: slate

Op/Subop/Lot	Total	Weight	Type	Worked
14V1	1	3	Fragment	No

Table 2.A.55. Operation 14: Agricultural Plot System 1: quartz

Op/Subop/Lot	Total	Weight	Type
14U1	1	91	Nodule
14Y1	1	1	Flake fragment
14AF1	1	10	Flake fragment
14AI1	1	9	Chunk
14AI1	1	12	Chunk
14AM2	1	2	Chunk
14AO1	1	9	Chunk
14AQ2	1	1	Flake fragment
14AY1	1	47	Chunk
Total	9	182	

Table 2.A.56. Operation 51 – Agricultural Plot System 2: quartz

Op/Subop/Lot	Total	Weight	Type
51F1	1	16	Chunk
51F2	1	15	Chunk
51L1	1	4	Chunk
51Q1	1	40	Chunk
Total	4	75	

Table 2.A.57. Operation 14 – Terraforming: quartz

Op/Subop/Lot	Total	Weight	Type
14K2	1	8	Flake Fragment
14M1	1	10	Chunk
Total	2	18	

Table 2.A.58. Operation 52 – Chich Cobble Mounds: quartz

Op/Subop/Lot	Total	Weight	Type
52A2	1	6	Nodule
52B1	1	2	Nodule
Total	2	8	

Table 2.A.59. Operation 14 – Agricultural Plot System 1: daub

Op/Subop/Lot	Total	Weight (g)
14Q1	26	370.2
14Q2	6	60.4
14Q3	1	15.2
14R1	2	12.2
14R2	3	37.7
14T1	4	18.6
14T2	2	5.9
14U1	6	107.5
14W1	6	36.3
14W2	2	7.7
14X1	20	169.8
14Y1	34	490.4
14Z1	5	59
14AA1	14	148.8
14AB1	7	236.3
14AC1	5	43.4
14AC2	1	8.1
14AE1	6	69.2
14AF1	6	89.6
14AG1	14	53.5
14AH1	3	20.2
14AI1	10	43.4
14AI2	4	21.7
14AK1	2	20.8
14AL1	1	4.3
14AL3	1	4.2
14AM1	5	69.7
14AM2	18	49.5
14AN1	2	20
14AO1	9	77.2
14AP1	3	23.5
14AP2	5	33.7
14AQ1	9	26.8
14AQ2	11	56.9
14AR1	11	62.9
14AS1	1	7.6
14AT1	4	28.4
14AU1	1	5.6
14AU2	1	7.1
14AV1	5	181.4
14AW1	2	16.8
14AX1	7	161.4
14AY1	12	89
14AZ1	5	39.3
14BA1	2	24.1
Total	304	3135.3

Table 2.A.60. Operation 51 – Agricultural Plot System 2: daub

Op/Subop/Lot	Total	Weight (g)
51A1	4	36.4
51B1	11	64.1
51B2	5	57.1
51C1	32	140.8
51C2	4	38.7
51D1	3	37.4
51E1	4	79.2
51E1	1	3.9
51F1	23	152.3
51G1	20	73.2
51G1	4	31.1
51H1	9	63.6
51I1	5	23.4
51I1	3	16.5
51J1	2	8.6
51K1	2	9.4
51K2	1	18.9
51L1	3	13
51M1	10	58.3
51N1	1	7.7
51N2	1	3.9
51O1	15	67.4
51P1	3	71.2
51P2	3	69.7
51Q1	5	45.4
51R1	10	91.3
51S1	3	19.7
51T1	2	10
Total	189	1312.2

Table 2.A.61. Operation 51 – Agricultural Plot System 2: plaster

Op/Subop/Lot	Total	Weight (g)
51Q1	1	31.4
51T1	1	28.2
Total	2	59.6

Table 2.A.62. Operation 14 – Agricultural Plot System 1: shell type total

Shell Type	Type Total	Weight (g)
Marine Shell	2	9.4
Cave Pearl	1	4.7
Pachychilus glaphyrus (ridged jute)	17	86
Pachychilus indiorum (smooth jute)	20	85
Total	45	185.1

Table 2.A.63. Operation 14 – Agricultural Plot System 1: jute type total

Jute Type	Total	Broken Tip and/or Hole Present Total	% Broken Tip and/or Hole Present of Total
Pachychilus glaphyrus **(ridged jute)**	17	13	76.5%
Pachychilus indiorum **(smooth jute)**	20	13	65.0%
Total	37	26	70.2%

Table 2.A.64. Operation 51 – Agricultural Plot System 2: jute type total

Jute Type	Total	Weight (g)	Broken Tip and/or Hole Present Total	% Broken Tip and/or Hole Present of Total
Pachychilus glaphyrus **(ridged jute)**	5	49.7	4	80.0%
Pachychilus indiorum **(smooth jute)**	2	7.9	1	50.0%
Total	7	57.6	5	71.4%

Table 2.A.65. Operation 14 – Water Channel: shell type

Op/Subop/Lot	Shell Type	Total	Weight	Comments
14P1	Marine Shell	3	2.3	
14P2	Marine Shell	2	7.1	
14P3	Marine Shell	1	0.8	
14S1	Marine Shell	1	1.9	
14S3	Marine Shell	9	1.2	shell beads
14V1	Marine Shell	4	1.6	
14V4	Marine Shell	3	0.9	
	Total	23	15.8	

Table 2.A.66. Operation 52 – Chich Cobble Mounds: shell type total

Jute Type	Total	Weight	Broken Tip Total	% Broken Tip	Hole Present Total	%Hole Present
Pachychilus glaphyrus **(ridged jute)**	2	13.2	1	0%	0	0.00%
Pachychilus indiorum **(smooth jute)**	111	546.6	108	97.30%	3	2.80%
Total	113	559.8	109	96.40%	3	2.80%

Table 2.A.67. Operation 14 – Agricultural Plot System 1 and Water Channel: faunal

Op/SubOp/Lot	Context	Total	Weight (g)	Comments
14AF1	Agricultural Plot System 1	1	0.7	claw
14S3	Water Channel	9	1.2	shell beads

Chapter 3: Construction of Ritual Spaces: Continued excavations in the E-Group Plaza, Plaza F

Borislava S. Simova (Tulane University)

During the 2018 season, I conducted excavations in Plaza F to investigate the role of early constructed ritual spaces in developing communities during the Early to Middle Preclassic periods (1100-400 BC). My dissertation research focuses on Actuncan's E-Group (Figure 3.1), a ritual space defined by a western radial pyramid and an elongated eastern structure surrounding an open plaza. The past two seasons of excavations defined the construction history and activity spaces within the plaza through the identification of floor constructions, low platforms, and features. Analysis of recovered artifacts and soil chemistry samples from the plaza will further point to the types and spatial organization of activities occurring within the E-Group. By examining the development of the complex and the types of activities occurring within it over time, this research investigates the role of early constructed spaces in generating and formalizing new forms of social interaction within emergent communities.

My research builds on an extensive literature on E-Groups in the Maya Lowlands. Recent excavations at sites such as Ceibal and Cival in Guatemala have confirmed that these complexes were often the first construction projects to define an archaeologically visible community (Inomata et al. 2013, 2015; Estrada-Belli 2011, 2012). The size, consistent layout, and widespread presence of E-Groups point to the presence of large-scale labor organization and broad interregional interactions. Actuncan's E-Group may represent an early example of this architectural layout, thus offering an important context for the study of the development of local community and social complexity.

Researchers working on early E-Groups have largely focused on their ceremonial functions. Some of the earliest interpretations of E-Group function included possible uses as solar observatories (Laporte and Fialko 1990, 1995; Aveni and Hartung 1989; Aveni et al. 2003) or as settings for agricultural ritual (Chase and Chase 1995; Aimers and Rice 2006). Estrada-Belli (2012) and Aoyama and colleagues (2017) interpret ceremonial caches within the earliest reported E-Groups as evidence of placemaking activities and exclusionary practices, respectively. Although the open architectural space is largely perceived as serving integrative gathering functions for communities, the ceremonial deposits continue to be interpreted as the product of strategic actions undertaken by emerging elites (e.g., Inomata et al. 2013; Rice 2015). This incongruity in interpretation may be resolved through a more direct focus on the activities associated with these spaces.

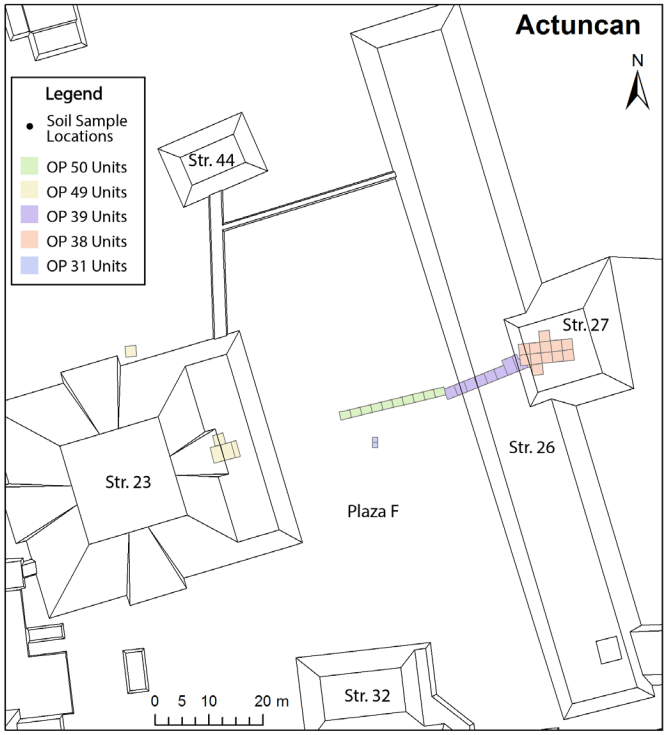


Figure 3.1. Map of the Actuncan E-Group indicating locations of past and current excavations.

In 2018, continued excavations within the E-Group plaza, Plaza F, focused on refining the architectural sequence of floors and identifying activity occurring within the broad space between the structures. We reopened the 20 m by 1.5 m Operation 50

trench in Plaza F initiated during the 2017 field season (Figure 3.1). The plaza is defined by the elongated platform of Structure 26 to the east and the Structure 23 pyramid to the west. Previous excavations by Donohue (2014) and Simova and Mixter (2016) at the base of the eastern structure indicated that six constructed plaza floors were present, while a test pit toward the center of the plaza by Craiker (Mixter and Craiker 2013) uncovered eight surfaces. In my 2017 Operation 50 excavations, I identified nine surfaces, which were well correlated with eight of the nine test excavation floors (Simova 2018). Excavations in 2018 continued to expose these surfaces through the length of the trench, with the goal of resolving incongruities in floor identifications and collecting ceramics and radiocarbon samples for chronology building, both to be analyzed at a later date. These excavations uncovered two low platforms constructed at different times within the plaza near the base of Structure 26. The identification of these platforms accounts for the previously-recognized underrepresentation of plaza floors at the base of the structure.

The eastern face of the first platform, Structure F-sub-1 (Blue Plaza Wall), was identified in the 2017 excavations. While I did not find dressed-stone faces for the second platform, Structure F-sub-2, differences in the fill and floor sequence and the presence of four ritual features discussed below lead me to argue for the presence of a distinct structure that was likely partially dismantled during later plaza construction activities. I identified five construction phases within the Structure F-sub-2 platform; however its full extent is not well understood due to disturbances along its western edge and incomplete excavations in the adjoining Operation 39 trench. The ceremonial deposits within Structure F-sub-2 appear to coincide with modifications of the platform.

An additional goal of the excavation was to identify activities occurring within the plaza through the documentation of caches and the collection of soil chemistry samples. At the end of the 2017 season, we had encountered a ceremonial deposit of serving vessels (AU20-Feature 7). During the 2018 excavations, we located an additional ceremonial cache (AU32-Feature 9) and two burials (Burial 20, Burial 21). These features were all deposited within the F-sub-2 plaza platform and date to the Late to Terminal Preclassic periods. I began reconstruction of the recovered vessels in order to understand the activities leading to their deposition. Based on their position within the plaza construction sequence, these ceremonial features indicate a chronological shift in the activities occurring within the complex, with greater emphasis on ritual deposition beginning in the Terminal Preclassic period.

Previous Excavations

Various researchers including me have previously investigated multiple components of the E-Group complex over four seasons prior to 2018. In the 2012 summer season, Craiker supervised the Operation 31 test excavations and posthole sampling in Plaza F as part of Keller's plaza investigation program (Keller and Craiker 2012; Craiker 2013; Mixter and Craiker 2013). This project incorporated test excavations and extensive, expedient sampling of the terminal plaza to investigate activities occurring within these public spaces. Operation 31 consisted of two contiguous 1 by 1 m units (A and Q), one of which was excavated to sterile soil (Figure 3.1). Following test excavations, the depth of the terminal plaza floor was determined, and samples were collected in a 5 m grid using a clamshell posthole digger with 19 cm average diameter. A total of 104 postholes were placed and sampled. Mixter's analysis of artifact density suggests a greater concentration of activity near the structures and in the northern area of the plaza (see Mixter and Craiker 2013: Figure 7.4). Within the scope of this research, Plaza F samples point to a lower density of activity than Plaza C located to the south, as is expected for a space with a restricted, ritual function.

The 2013 excavations focused on the eastern structures of the E-Group, beginning with excavation in

the central platform (Structure 27, Operation 38) and continuing west in Operation 39 along the central axis of the Structure 26 platform (Donohue 2014). Excavations were conducted in contiguous 2 m by 2 m units aimed at determining the structures' construction histories and locating activity areas on the structures' summits. A total of 13 units were placed in the central platform. They identified steps on the plaza-facing, western façade of Structure 27, as well as two to three possible terraces, similar to architectural patterns reported from Holmul, Guatemala (Estrada-Belli 2009). An altar, Operation 38 Feature 3, was identified on the structure summit, dating to the Terminal Preclassic period. Deeper excavations in Unit E found evidence of an earlier structure phase marked by Ludacris Floor and several lower distinct fill levels, which may mark earlier structure phases.

The Operation 39 excavations in Structure 26 spanned a 2 m by 16 m axial trench placed on its western façade (Figure 3.1). These excavations initially exposed four platform floors, two staircases, and five plaza floors at the base of the structure. A number of ritual deposits were identified in these excavations, including Burial 18 in the Terminal Preclassic Lupe Fiasco Floor and a deposit of eight chert eccentrics in the structure collapse above the location of the burial.

In 2015, excavations continued on Structure 26's axial trench and new excavations were initiated into Structure 23 (Figure 3.1). Simova and Mixter (2016) reopened the Operation 39 trench into Structure 26, extending two of the summit units to allow for deeper excavations to proceed into the structure. Heindel (2016) began Operation 49, investigating the construction history of Structure 23.

Structure 26 consists of six construction phases defined by six staircase constructions and nine summit floors and collectively referred to as Owl platform. Below this dressed-stone and lime plaster construction, we identified two earlier constructions, Structure 26-sub-1 and Structure 26-sub-2. The former structure, referred to as Brown Jay Platform, consists of a central clay platform constructed in at least two phases with a cobble façade and low dirt and cobble terraces. The lower Structure 26-sub-2, an Earthen platform, was identified under a cobble fill that augmented the size of the ridgetop prior to the construction of Brown Jay platform. It is poorly understood at this point but appears to be a clay mound with a foundational deposit of Cunil ceramics.

In the course of these excavations, we collected soil chemistry samples from several plaster floors. The samples were processed by Dr. E. Christian Wells at the University of South Florida. Results demonstrate relatively clean floors. Phosphorus was the only element found in quantities exceeding natural concentrations in the matrix. The floors each had a unique residue pattern, showing slight shifts in organization of activity within them; however, a general pattern of organic residues, likely from food and drink, persists through time (Simova et al. 2018).

Heindel's (2016) excavations targeted the eastern terrace of Structure 23 to locate the plaza-facing staircase in Units A, B, D, and E. An additional unit, Unit C, was placed on the north side of the structure to determine if outset, radial staircases are present, consistent with E-Group structures reported from Tikal and Uaxactun (Laporte and Fialko 1995). This final unit was poorly placed and neither confirmed nor denied the presence of radial staircases.

Excavations in the eastern façade identified two buried construction phases (23-2nd and 23-3rd) with dressed limestone staircases and plaster floors. Unfortunately, the terminal staircase had completely collapsed or been purposefully dismantled. The first staircase identified, that of 23-2nd, consisted of five steps and a rounded stairblock, which likely marks the structure centerline. The earlier 23-3rd structure featured six steps with heavily eroded plaster suggesting intensive use of the staircase. Two floors identified below the second staircase suggest that earlier building phases had a different arrangement,

with broader steps or terraces.

Plaza excavations in 2017 focused on the Operation 50 plaza trench. One goal of the excavation was to locate foundational caches, believed to be associated with the center of the plaza. I hypothesized that activities involving the production of crafts or preparation and consumption of food would have clustered near the building while displays of ritual offerings may have been more centrally located in the plaza. This trend was documented in a microartifact analysis of the terminal plaza floor, showing greater density of activity near the Plaza F structures (Mixter and Craiker 2012). Units I and J, near the center of the plaza were excavated down to a buried A-horizon. While no foundational caches were located, this work allowed us to document and sample the floors of the plaza center. It further confirmed the sequence of floors identified in Craiker's test excavations with few modifications (Simova 2018). Instead of central foundational caches, we excavated an extensive ceramic cache, containing at least six dishes and bowls, near the base of Structure 26. While these deposits do not match foundational caching practices from E-Groups elsewhere in the Maya world (e.g., Estrada-Belli 2011: Figure 4.7; Aoyama et al. 2017), these finds provided evidence for ritual consumption and deposition near the structure. I was able to build on these data during the 2018 season.

Another goal focused on documenting activity areas within the plaza. My ongoing research adopts soil chemistry analysis, a technique largely utilized in archaeology for the study of domestic and economic activities, to examine the use of the E-Group plaza. Multi-elemental profiles derived from samples from occupation surfaces of the plaza and structures will be used to identify activities such as burning, food production and consumption, and craft production (Barba and Manzanilla 1987; Middleton and Price 1996; Terry et al. 2004; Wells et al. 2000; Wells 2004). Clay and plaster surfaces can trap and preserve a variety of chemical compounds over very long periods and are ideal for studying chemical residues of repetitive activities, which are more likely to allow for the accumulation of inorganic elements over time. Using soil chemistry, I plan to identify patterns in the use of the structures and plaza. The types and spatial patterning of these activities will offer insights into the relationships people had with early ceremonial spaces and into how these constructed spaces relate to later architectural elaboration and social organization at the site. Previous research on floor surfaces from Structure 26, the eastern range of the E-Group at Actuncan, provides promising results (Simova et al. 2018).

Methods

This season, we reopened the Operation 50 trench that transects the center of Plaza F and resumed excavation within the ten previously defined 2 m by 1.5 m units (Figure 3.1). Since Units I and J, on the western end of the 20 m long trench, were more extensively excavated in the 2017 season, we reopened only enough of these units to expose the full floor sequence in profile and focused our efforts on the remaining 16 m of the trench.

Excavations proceeded following established AAP procedures. Units were excavated in natural, rather than arbitrary, lots, and soils were screened through a 6.35 mm (¼ inch) mesh screen. Ceramics over 12.7 mm (½ inch) in size and all lithics collected from the screen were washed, cataloged, and stored.

All ten units were previously excavated down to the last well-preserved plaster floor, named *Lum*[iii] *Floor*, to establish a baseline count for the floors (Figure 3.2). This provided a guide for reopening and continuing excavations.

Throughout the excavations, I also collected 290 soil chemistry samples from successive floors of Plaza F, to be analyzed in the future along with 305 previously collected samples. Samples were collected with a

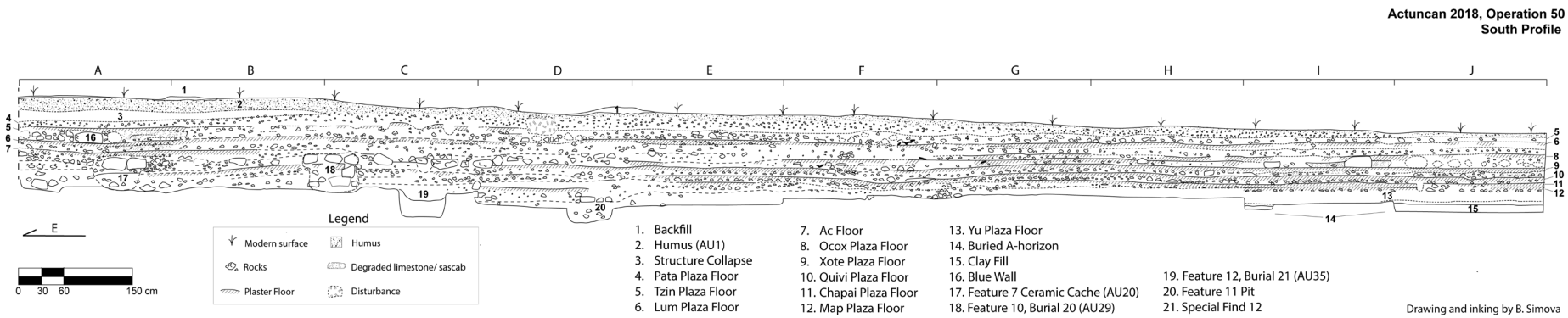


Figure 3.2. West profile of the Operation 50 trench in Plaza F.

clean trowel, rinsed using demineralized water. The section of floor was gently scraped prior to collection to remove loose debris from excavations. Approximately 100 mL of soil were collected in Whirl-Pak bags. Floors were sampled in a staggered grid pattern. We closely followed the grid while collecting samples except in cases where offsetting the sample location a few centimeters could ensure that we collected plaster from a well-preserve patch of floor rather than an eroded section. For very eroded floors, collection preceded as normal, gathering soil as well as plaster.

I collected six samples per 2 m by 1.5 m unit to ensure as full coverage as possible; however, the grid is arranged in such a way that I can sub-sample each unit depending on future resource availability. Samples were photographed next to collection areas and brought back to the lab where they could dry in a controlled setting before being sealed and stored.

Construction of the E-Group Plaza

During the 2018 excavations, we continued exposing the previously identified constructed surfaces in Plaza F (Figure 3.2). We worked from west to east, moving toward Structure 26. One of the more interesting discoveries of the season was a low platform, Structure F-sub-2, at the base of Structure 26 containing a number of ritual deposits, including the Feature 7 Cache identified in 2017 and two human burials. This platform had a cobble retaining wall facing to the west and appears to have been modified at least five times.

Exposing more of the floors allowed me to refine correlations between plaza floor identifications from the Operation 31 test pits near the center of the plaza, the Operation 39 excavations at the base of Structure 26, and my own initial work within the Operation 50 trench (See Simova 2018: Table 1). I now believe there are only eight distinct plaza floors, corresponding to seven of the floors identified in Operation 31. The three upper floors in the sequence, *Pata*[1], *Tzin*[2], and *Lum*[3], extend from Structure 26 to the plaza center. The terminal *Pata Plaza Floor* is only preserved under Structure 26 collapse and was not recognized in the test excavations, however *Tzin* and *Lum* floors were identified as *Pluto* and *Eeyore* floors respectively. The fourth floor identified in the test excavations as *Bambi* and in my 2017 excavations as *4th Plaza Floor* was likely only a feature of the fill, with some errant plaster fragments, as it could not be found in this season's excavations. The earliest five floors, named *Cinderella*, *Mickey*, *Simba*, *Aladdin*, and *Pinocchio* in the test excavations correlate well with *Ocox*[4], *Xote*[5], *Quivi*[6], *Chapai*[7], and *Map*[8] plaza floors. These early floors currently cannot be correlated with floors at the base of Structure 26 because of the presence of architectural features between them.

In addition to these plaza floors, at least two plaza platforms were identified in Operation 50. The later platform, Structure F-sub-1, was excavated in 2017 as analytical units titled *Blue Plaza Wall* and *Tupac Fill with Sascab*. It was constructed on top of *Lum Plaza Floor* and covered over by the construction of *Tzin Plaza Floor*. The second, earlier platform, Structure F-sub-2, was initially constructed on the level clay of *Yu Plaza Floor* and modified at least five time. Its construction and renovations are marked by a series of ritual deposits, discussed below. The western façades of the platform phases were not clearly visible in excavations, suggesting they were dismantled in antiquity prior to the construction of subsequent plaza surfaces. The eastern façades are likely located in the westernmost units of Operation 39. Because the westernmost units of Operation 39 were not excavated to the same depth as the Operation 50 units, uncovered surfaces at the base of Structure 26 could not be reliably correlated with the five surfaces of Structure F-sub-2 or plaza floors. The surfaces identified in Operation 39 could either relate to Structure F-sub-2, comprising elongated basal "steps" in front of Structure 26, or could be narrow plaza surfaces between the Structures 26 and F-sub-2.

The penultimate plaza floor, *Tzin Plaza Floor,* consisted of a shallow cobble fill underlying a partially eroded plaster surface. The elevation and thickness of the floor and depth and size of the fill are consistent with those of *Pluto Floor* (Operation 31). The plaster of *Tzin Plaza Floor* is well preserved in the four eastern units and shows episodes of replastering. Two shallow pits (Features 1 and 2) were cut into the floor, as was a 17 cm deep posthole (Feature 3) that was later plastered over.

Within the fill of *Tzin*, we encountered a single-course, dressed limestone wall named *Blue Plaza Wall*, built on *Lum Plaza Floor* and associated with a sascab fill directly behind it. The wall faces east, toward Structure 26 and the fill extends about 6 m to the west. Since no west-facing wall was found, the *Blue Plaza Wall* and fill were initially interpreted as features of *Tzin* fill rather than a platform constructed on the earlier *Lum Plaza Floor* (Simova 2018). However, given the presence of an earlier platform beneath *Lum Plaster Floor*, I now believe that this was a low platform (Structure F-sub-1) within the plaza and that its western face was destroyed prior to the construction of the penultimate *Tzin Plaza Floor*.

The third plaza floor, *Lum Plaza Floor*[iii] had a relatively well-preserved plaster surface, which we were able to follow from the base of Structure 26 though the center of the plaza where it is more deteriorated. We identified one shallow circular pit (Feature 5 in Unit E) and two postholes (Features 4 and 6 in Units I and G respectively) in this floor. No notable cultural material was recovered from them. *Lum Plaza Floor* concealed the Structure F-sub-2 platform and established an even plaza surface at the base of Structure 26. This surface was regularly patched and replastered, resulting in a thick, uneven surface.

The fourth plaza floor identified by Craiker as *Bambi* (Operation 31) and as *4th Plaza Floor* in my previous excavations is now interpreted as a ballast underlying the thick, reworked plaster of *Lum Plaza Floor*. It could not be consistently distinguished to the east of Unit G where the fill below *Lum Plaza Floor* becomes deeper with larger stone inclusions.

The next plaza floor, *Ocox Plaza Floor*[iv] , has a deteriorated plaster surface and distinct cobble fill. The pebbly ballast of the floor overlays a dense, pavement-like deposit of cobbles forming the floor fill. This is similar to the later construction of *Tzin Plaza Floor*. The position of this floor and its thicker fill are consistent with *Cinderella Floor* (Operation 31). This floor could be traced from the west edge of the trench to the west edge of Unit D. In Unit D, we encounter larger rocks suggesting some disturbance perhaps associated with the edge of the plaza platforms. Because of this disturbed zone, the *Ocox Plaza Floor* and modifications of the Structure F-Sub-2 platform could not be reliably placed in stratigraphic sequence.

The Structure F-sub-2-1st platform is defined by the *Ac Floor*[9] , first identified at the base of Structure 26. This floor originates at the lowest step of the penultimate staircase of Structure 26. Given this articulation, either the Structure F-sub-2 platform was extended to form a broad basal step at the base of Structure 26, or the last step of the staircase instead formed the east facing edge of Structure F-sub-2, creating a small drain between the structures.

The west face of the platform was likely located in Unit C or the eastern edge of Unit D. Unfortunately, the location of the platform edge was likely destroyed by the later reentry of Burial 21. Its relationship to the plaza floors was unclear, however it was likely associated with the *Ocox Plaza Floor*. The construction of this phase of the platform was preceded with the placement of a ceramic cache (AU20, Feature 7) and the placement of Burial 20 into the earlier platform surface.

The Structure F-sub-2-2nd platform has little preserved plaster. What little remains is mostly beneath

the stones of a retaining wall within Structure F-sub-2-1st. Its edge was likely located along the east end of Unit D. The collapsed stones from Structure F-sub-2-2nd overlie the *Xote Plaza Floor*[v] (AU23), indicating that it was constructed on this surface. The *Xote*[v] *Plaza Floor* is the top floor in a sequence of well-preserved early floors. Portions of this floor appeared gray and flaky, suggesting burning. Given its position, I believe the floor is the same as *Mickey Floor*, but Craiker (Mixter and Craiker 2013) encountered a sherd ballast and layer of clay under this floor, which was not present in my excavations. Given the limited dimensions of her excavations, Craiker's findings may represent a feature within the floor.

The subsequent floor, *Quivi*[vi] *Plaza Floor*, consists of thick plaster floor with thin ballast constructed directly on a previous floor. The plaster shows evidence of burning. This floor corresponds to *Simba Floor* (Operation 31). This floor was not well preserved into Unit D, complicating association with the various iterations of Structure F-sub-2 modifications.

The three earliest phases of Structure F-sub-2 excavated during the 2018 season (F-sub-2-3rd, 4th, and 5th) consist of shallow deposits of cobble and yellowish-brown clay loam, separated by degraded plaster surfaces. In the earliest identified phase, F-sub-2-5th, the platform likely extended from the eastern edge of unit A to the western edge of Unit C. This was indicated by a change in the fill in Unit A and a line of undressed stones, forming a wall, between Units C and D. The F-sub-2-4th construction expanded the platform further to the east, beyond the scope of existing excavations, but appears to have maintained the western edge. Disturbances in Unit C caused by the reentry of Burial 21 made it difficult to associate these platform phases with plaza floors.

The next floor, *Chapai Plaza Floor*[vii], was easily distinguished in the center of the plaza by a dark gray, extensively burned surface. The matrix of this floor was yellowish and friable. Consistent with *Aladdin Floor* (Operation 39), this floor is constructed directly on top of the next floor. It terminates at the edge of Structure F-sub-2-5th in Unit D.

The earliest plaster floor, *Map Plaza Floor*[viii] is constructed on a clay surface. Its position and appearance are consistent with *Pinocchio Floor* (Operation 31). This floor is similarly soft in texture and worn down, suggesting a long period of use. A small accumulation of chunky fired clay, likely daub, was recovered from the floor's surface, indicating that perishable structures may have been present in the plaza near Units I and J. The floor had a coarse ballast constructed out of medium sized (4 to 10 cm in diameter) chert and limestone cobbles. In most units, the ballast and floor are constructed directly on leveled clay. However, in Units D through F, the floor rested on a deeper fill consisting of a clay loam mixed with some marl.

The clay below the *Map Plaza Floor* appears to have been a prepared surface in its own right. The lack of sizable cobbles in the clay set it apart from later construction fills. The *Feature 11 Pit* (AU38), which contained carbon, undressed cobbles, and a marine shell, is dug into this context. This *Yu Plaza Surface* (AU27) covers a shallow (up to 5 cm in depth) deposit of darker clay with small cobbles strewn over the surface, which we interpret as a buried A-horizon (AU28). Although this shallow deposit was likely naturally formed, it is very level, suggesting that the clay below was prepared as an occupation surface that was exposed long enough to allow for soil development to occur. The 2018 excavations did not reach this context to confirm if this stratigraphy extended across the entirety of Operation 50.

Analytical Units

This section includes all analytical units defined in Operation 50. Analytical unit descriptions from the

2017 excavation report were updated to reflect continued excavations. Lots excavated in the 2018 season are indicated in bold.

AU1- Humus. Lots excavated: A1, B1, C1, D1, E1, F1, G1, H1. The humus consists of a dark, 10YR 2/2, clay loam with small to medium sized stone inclusions. This context was fully excavated in 2017 throughout the Operation 50 trench. It appears more thickly accumulated in Units A, B, and C, near the base of the structure whereas, toward the center of the plaza in Units H, I, and J, it was nearly indistinguishable from the terminal plaza surface. This open area may have been more prone to deflation, caused by wind erosion, or to trampling by grazing cows. Some evidence of posts erected by archaeologists or from the 2012 rapid sampling of the plaza using a posthole digger was encountered in this context. The visibility of these posts varied, but some were clearly seen in Units D, F, and I.

Unrecorded feature: A 14 cm wide post was identified in the eastern section of Unit I as a dark depression. Because it was initially believed to be a remnant from the 2012 season and excavation did not produce any artifacts, I did not assign a lot or feature number to it. The posthole is 50 cm deep, penetrating through *Lum Plaza Floor* (AU16), and maintaining a consistent width throughout. It was probably a modern post.

AU2- Collapse. Lots excavated: A2, B2. Collapse material from Structure 26, consisting of small, undressed limestone inclusions in a 10YR 4/3 clay loam matrix, was present only in Units A and B near the base of the eastern platform. The matrix of the collapse was lighter in color than the above humus and the ballast of the terminal plaza floor directly below.

AU3- Pata Plaza Floor. Lots Excavated: A3, B3, C2, D2, F2, G2, H2, I1, J1. The terminal floor consisted of only a pebbly ballast with any plaster likely eroded due to exposure to the elements. The pebbles of the ballast are generally small, 1 to 6 cm in diameter. The clay loam matrix is 10YR 4/2 through most units, grading into a darker brown toward the center of the plaza, where the floor is nearly indistinguishable from the humus. In Units I and J, lots in this AU were initially collected as humus, due to its dark soil texture, but examination of the profile suggest that these lots are part of the terminal floor. In Units F and I, the ballast contained more common artifacts, suggesting redeposited domestic trash.

Soil chemistry samples were collected along this remnant of the occupation surface as comparative material for lower samples. However, due to their proximity to the surface, the samples are likely to show extensive contamination from the modern usage of the site for cattle pasture.

This floor failed to correlate with the Operation 31 named floors. Given the Operation 31 units' location near the center of the plaza, the terminal floor and humus were likely eroded, making the penultimate floor the first one that could be clearly identified.

AU4- Mixed Context. Lots excavated: E4, I2, J2. These lots combined material from the pebbly ballast of *Pata Plaza Floor* (AU3) and fill of *Tzin* floor (AU9), which presented here as only a handful of larger stones, rather than the densely packed stone fill encountered in other units. In Units I and J, it was assumed that we were excavating through the terminal floor ballast after removing a thin layer of dark soil from the surface, but in evaluating the profile, it became evident that the terminal ballast began at the surface. What we observed to be a ballast with small to medium sized inclusions may represent deflation and admixture of the fill below both *Pata* and *Tzin* floors.

AU5- Tzin Floor Patch. Lot excavated: A4. This context is a small lot consisting only of a plaster patch over *Tzin Floor* (AU9). It was removed to allow for sampling over the contiguous surface, but comparative

samples were also collected from it. We identified two shallow pits (AU7 and AU8) below the patch.

AU6- Feature 3 Posthole. Lot excavated: B5. This feature consists of a 15 cm wide, 17 cm deep posthole in *Tzin Floor*. The posthole narrows toward the base and terminates at the 4th plaster floor. The fill of the posthole is a 10YR 5/3 clay loam with small (1 to 6 cm) limestone and chert pebbles. Small lithics and daub were recovered from it. I suspect that it was patched, since we encountered small bits of plaster above it.

AU7- Feature 1 Pit. Lot excavated: A5. An oval, shallow pit cut into *Tzin Floor*. It measures 42 cm by 34 cm and is 7 cm deep. Its matrix is a 10YR 5/3 loam with few small inclusions and sparse artifacts. Given their shallowness, Features 1 and 2 were likely cut into the floor, possibly for the purpose of placing a post, but encountered larger fill below and were replastered instead.

AU8- Feature 2 Pit. Lot excavated: A6. An oval, shallow pit cut into *Tzin Floor*. It measures 62 cm by 34 cm and is 4 cm deep. Its matrix is a 10YR 5/3 loam with few small inclusions and sparse artifacts. It appears that Features 1 and 2 were cut into the floor, possibly for the purpose of placing a post, but encountered larger fill below and were replastered.

AU9- Tzin[ii] *Plaza Floor.* Lots excavated: A7, B4, C3, C4, D3. *Tzin Floor* is most likely the first plaza floor encountered by Craiker (Mixter and Craiker 2013) as the ballast of *Pata Floor* was nearly indistinguishable from the humus in the center of the plaza. Craiker named the floor *Pluto Floor*. This was the last fully excavated plaza floor in Operation 50 during the 2017 season.

The plaster surface of *Tzin Floor* appeared preserved only in Units A, B, C, and D. In Units A, B, and C, the floor additionally appeared to have been patched or resurfaced. In Unit C, the plaster was poorly preserved and was identified only along the southern edge of the unit. By Unit D, there was no remnant of polished surface and only small patches of plaster in the eastern half of the unit. Interestingly, the secondary sascab fill (AU11) was only identified in these sections as well, but there was no clear demarcation, such as a wall, between the sascab and cobble fills. In Unit A, the cobble and sascab fills were separated by a single course wall (AU12, Blue Plaza Wall). Its dressed limestone and chert stones faced to the east, toward Structure 26.

AU10- Tzin Cobble Fill. Lots excavated: A8, D5, F3, G3, H3. This analytical unit was a cobble fill that defined *Tzin Plaza Floor* in Units E, F, G, H, I, J, and parts of Units A and D. It was not well differentiated during excavation in all units, however, and was excavated as a mixed context (AU4). The fill generally consists of densely packed stones, ranging in size from 3 to 20 cm, in a sparse 10YR 4/2 clay loam matrix. In the western units, the floor was recognized only by the cobble fill, as the plaster had eroded. This fill was not encountered in the western sections of Unit A, Units B and C, and eastern sections of Unit D. Given the consistency in their appearance, I believe the cobble fill excavated as lot A8 directly to the east of the low wall is the same context as the cobble fill in the western units.

AU12- Blue Plaza Wall (Structure F-sub-1). Lots excavated: A9, A10. We uncovered a single course wall with dressed stones and large cobbles in Unit A. The wall faces to the east, toward Structure 26. This AU consists larger stones than the remaining platform fill (AU11).

No west facing wall was found. It is possible that this was a narrow platform within the plaza, whose western face was destroyed, or that it is much larger and has a western face on the other side of the plaza. Based on the presence of a distinct fill (AU11) directly west of the wall, which was not encountered in the remained of the trench, I suspect it was a narrow, approximately 6 m wide, platform.

AU11- Structure F-sub-1 Fill[10]*.* Lots excavated: B6, C5, D4. In Units B, C, and portions of D, *Tzin Floor* appeared to overlay thin sascab layers, which were initially interpreted as floor resurfacing. However, as no flat, polished surfaces could be distinguished, this was likely floor fill. The sascab fill is more yellowish-white than the above plaster. And is intermixed with a 10YR 5/3 clay loam with small to medium (up to 20 cm) inclusions. In Units B and C, a few of the limestone inclusions appeared burned, but did not form an arrangement. The sascab is not as plentiful or perhaps more deteriorated in Unit C and appears to be related to the low wall in Unit A. This fill ends in Unit D, where it appears more intermixed with the cobble fill of AU10. If, as with Blue Plaza Wall, this fill represented a platform constructed on *Lum Plaza Floor*, its western face may have been destroyed prior to the construction of *Tzin Plaza Floor*.

AU13- Feature 5 Pit. Lots excavated: E3. This is a roughly circular pit in *Lum*[iii] *Floor*, located along the eastern edge of Unit E. The pit measures 22 cm wide and 12 cm deep. It does not penetrate beyond the fill of *Lum Plaza Floor*. Only a small sherd and two lithic fragments were recovered in this feature.

AU14- Feature 6 Posthole. Lot excavated: G4. This is a round posthole or pit in *Lum Plaza Floor*, located in the northeast corner of Unit G. Its construction appears to have damaged the plaster around it. Its fill consists of a dark (10YR 4/2), loose, clay loam. The feature measures 36 cm in diameter at the floor level and narrows to a 32 by 20 cm oval toward the base. The hole is approximately 29 cm deep, penetrating though the 4th Plaza Floor.

AU15- Feature 4 Posthole. Lot excavated: I4. This is a narrow posthole on *Lum Plaza Floor*, located in the northeast corner of Unit I. Only one jute was recovered in its 10YR 4/2 loam fill. The posthole measures 8 cm in diameter and is 8 cm deep.

AU16- Lum Plaza Floor and Fill. Lots excavated: A11, **B7**, C6, **D6,** E4, E5, **F4**, G6, **H4**, **H5**, I3, J3. *Lum Plaza Floor* was the third plaza surface to be exposed through all the Operation 50 units. It likely corresponds to Craiker's *Eeyore Floor*. The floor is relatively well preserved, even toward the center of the plaza. We completed excavations of this floor in Units B, D, F, and H during the 2018 season.

The floor and thin deposit of fill beneath were removed together for the most part. This fill consists of a light, 10YR 6/3, clay loam with small undressed limestone rocks. Two carbon samples (Samples 274 and 275) were collected in this context. In Units C, D and E, the floor plaster was thinner, with small to medium inclusions showing through. The fill was a slightly darker 10YR 5/3 clay loam with small to medium inclusions, which gave way to a larger fill excavated as a separate context. In Units E, F, H and I, the floor appeared to have been replastered. This was marked by a thicker deposit of plaster in Units E and F. Here, layers of plaster lacked clear separation that would indicate separate floors, but these layers flaked away evenly during excavation creating level surfaces that may indicate replastering events.

AU17- Large Floor Fill. Lot excavated: C7, **C8, C9, E6, E7**. This lot consists of a fill containing larger stone inclusions (up to 30 cm). The stones appear to be associated with the Structure F-sub-2 plaza platform, perhaps placed to bury it and raise the level of the plaza. Some of the fill stones show evidence of burning. We did not identify well preserved floor surfaces above this fill layer, as we did in the adjacent Unit D, possibly due to the coarseness of the fill material. I suspect that this deposit covered the front of the low plaza platform, Structure F-sub-2, during construction of the *Lum Plaza Floor*. At the base of the deposit, there were traces of preserved surface along the western edge of Unit C.

AU18- Structure F-sub-2-1st *(Fever Floor and Fill)*. Lot excavated: A12, **B8, B9, B10**. Previously identified as the fourth plaza floor, the Fever Floor, now named *Ac Floor,* is understood as the surface of a low, 8

m wide platform extending from the basal step of McCoy Staircase to the center of Unit C. Its surface, *Ac Floor,* is better preserved in Units A and B than at the base of Structure 26. It measured 3 to 8 cm in depth and had extensive eroded sections where cobble showed though. In the southeast corner of Unit B there is a thick section of floor suggesting resurfacing or patching. Larger undressed stones (approximately 30 cm in length) are arranged into construction bins. One line of stones extends across Units A and B, veering to the south past the unit line. The *Feature 7* (AU20) ceramic cache was located under this construction bin wall. A perpendicular line of stones lines the western edge of Unit B.

AU19- Pebbly Fill (previously Fever Floor B). Lots excavated: **D7**, **D8**, **D9, D10,** I5, J4. This analytical unit was previously interpreted as a floor consisting of only a pebbly ballast without preserved plaster. It consists of small (1 to 6 cm) limestone and chert inclusions in a 10YR 5/2 clay loam matrix. However, we could not trace this context as distinct from the above *Lum Plaza Floor* beyond Units I and J. Rather, it appeared to be the fill of the floor instead of a distinct floor. In Unit D, the floor fill was larger, with cobbles ranging in size from 6 to 25 cm. We encountered mano and metate fragments in this context, possibly related to the burial of the Structure F-sub-2 platform below.

I had previously related this context to the *Bambi Floor* identified in the 2012 season (Mixter and Craiker 2013). I now suspect that *Bambi Floor* is also a feature of the *Lum Plaza Floor* fill.

AU20- Feature 7 Ceramic Cache. Lots Excavated: A13, A14, A15, A16, A17. Feature 7 consists of a circular pit with broken ceramics. It is located below a line of stones identified along the southern edge of Unit A. Stones appeared to form a wall, facing to the south. We removed three of the stones to more fully expose the deposit and to prevent them from falling onto the ceramics. The matrix of the pit was lighter in color than the surrounding fill. It consisted of a gravely 10YR 5/6 clay loam that lacked stone inclusions.

The deposit contained many large fragments of ceramic, some nearly complete serving vessels. They were removed in several lots with drawings and photos taken between each lot to facilitate reconstruction of the fragile vessels. The preservation of the ceramic was so poor that many of the pieces felt soft and crumbled easily. The last vessel in the feature, at 142 cm below datum 1, was a complete z-angle bowl. We measured the bowl *in situ*, since the poor preservation of the clay made it unlikely to come out without breaking. It is 30 cm in diameter and 11 cm in height. Two flotation samples, one from above and one just below the bowl, as well as soil chemistry samples were taken from this context.

Figure 3.3. Reconstructed Aguacate Orange z-angle bowl from the Feature 7 ceramic cache excavated in the 2017 season.

During the 2018 season, I was able to reconstruct the Aguacate Orange z-angle bowl (Figure 3.3) found at the base of the cache. It was complete, with large fragments found two lots above the base of the pit, but not all sherds could be securely reattached. One sherd from this bowl had some preserved slip. A large rim fragment of a second, nearly identical z-angle bowl was also reconstructed. These vessels had a distinct, finer paste

than the remaining ceramics in the cache. I identified one additional complete bowl and reconstructed eight large rim fragments. The complete bowl is unslipped and has a narrow, flat base. The sides are outslanted with a direct rim and rounded lip. The surface is partially smoothed. I was unable to complete analysis and measurements on the deposit during the 2018 season.

AU29- Burial 20 (Feature 10). Lots excavated: **C13, C15, C16, C17**. This burial was placed in the Structure F-sub-2-2nd platform (Figure 3.4). Although the burial is located between Units B and C, all excavated lots were attributed to Unit C to prevent a division of artifacts. The burial was unlined and covered by nondescript cobbles. The individual was interred face down with their head placed to the south. The face was turned slightly to the west although the skull could have turned after deposition. The body extends to the north. The hands were gathered below the pelvis. The legs are bent at the knees, with the lower long bones extending alongside the upper long bones, to the west of the body. The knees appear to have been wedged around a large stone, indicating that the platform was not extensively prepared for the interment, but rather that the burial postdated the platform construction.

The individual was interred with an Usulután bowl (Special Find 5) (Figure 3.5) placed below the cranium, a wide-mouth jar (Special Find 6) placed to the west of the torso, and a plate (Special Find 7) placed to the west of the pelvis. Deteriorated shell ornaments (Special Find 4 and 8) were recovered near the cranium to the northeast of the mandible. The ceramic vessels were collected in foil with excavation dirt for future residue analysis.

Figure 3.4. Cobbles delineating Burial 20, located in the F-sub-2-2nd plaza platform (left) and Burial 20 interment with offerings (right).

The Usulután bowl is red with black and red wavy designs created using resist techniques. The bowl has small nubbin feet as does the Special Find 6 pot. The pot has a recurved rim. It is red with some black fire clouding. The Special Find 7 plate is red with no apparent decorative features.

Figure 3.5. Fragment of the Special Find 5 Usulután bowl from Burial 20.

AU30- Structure F-sub-2-2nd. Lots excavated: **A18, B11**. This context appears to be a platform surface; although we only encountered remnants of polished plaster below the retaining wall cobbles of the Structure F-sub-2-1st platform. The edge of the platform is located along the east edge of Unit D. Soil is a 10YR 5/3 clay loam with small (1 to 10 cm) cobble inclusions. The Feature 7 ceramic cache was likely partially cut into this surface, yet the deposit was not well contained within the floor. Evidence for this association includes ceramics directly below the cobble retaining wall and sherds scattered near the pit in the above lot (lot A12). The deposit seems to have been buried by the construction of Structure F-sub-2-1st. Burial 20 (AU29- Feature 10) was also interred into the west edge of this platform. The platform surface to the west of the burial was not preserved and discoloration in the soil suggested disturbance. This could indicate that the earlier Burial 21 (AU35- Feature 12) was reentered after the termination of this phase of the platform.

AU31- Structure F-sub-2-3rd. Lots Excavated: **A19**. This platform floor was distinguished by a small patch of deteriorated plaster preserved in the southwest corner of the unit, but small limestone pebbles and powdery remnants of plaster throughout the unit indicated a deteriorated surface. The fill appeared grayer in context (10YR 5/6) and consisted of a clay loam. The inclusions were small (1 to 6 cm) rocks. The fill immediately below the floor is more yellow in color and fairly loose. Below this platform surface, we encountered the Feature 9 ceramic cache (AU32).

AU32- Feature 9 Cache. Lots excavated: **A20**. We excavated the cache in the northwest corner of Unit A, in Lot 20, discussed below. It consists of three plates stacked directly on top of one another. Each plate was collected as a separate bag within the lot (Bags 2, 3, 4). The feature appears to have been cut into the surface of Structure F-sub-2-4th and the plates nested within the dense cobble fill (Figure 3.6). The plates are approximately 40 cm in diameter. About half of each vessel was preserved in excavation dirt for future sampling. The plate at the base of the cache was the most poorly preserved, with extremely friable texture. It appears to have been extensively burned. The two plates above it, though softened and friable, are in better condition.

Figure 3.6. Stacked plates from the Feature 9 ceramic cache.

AU33- Structure F-sub-2-4th. Lots excavated: **A20**. This modification of the F-sub-2 platform is distinguished by bits of plaster, indicating a deteriorated surface, but no clear preserved polished surface. The fill of the platform consists of a dense layer of cobbles in a light, 10YR 5/6 clay loam matrix. The Feature 9 cache (AU32) was placed into the surface of this structure.

AU34- Structure F-sub-2-5th. Lots excavated: **A21, A22, A23,**

B12. The surface of the platform construction was mainly preserved in the northern section of the unit. The fill consists of a yellow-brown (10YR 5/6) clay loam with small to large cobbles (5 to 50 cm). Some of the matrix in the southwest corner of the unit had a grayer (10YR 5/3) appearance, but the fill was otherwise indistinguishable from the rest of the platform. We recovered two greenstone beads (Special Finds 10 and 13) and three radiocarbon samples from this context (Samples 612, 615, 616).

Below the last excavated lot, we encountered large cobbles (one up to 50 cm), creating a boundary between the yellow-brown fill of the platform and a darker, more clay-rich fill of the initial plaza construction. This may mark the eastern edge of the initial Structure F-sub-2-5th construction. The platform was then likely built on top of the *Yu Plaza Surface,* and the *Map Plaza Floor* built to abut the platform edge.

AU35- Burial 21 (Feature 12): Lots excavated: **C19**. This is a crypt burial that was reentered in antiquity. The crypt was dug through the early phases of the Structure F-sub-2 platform into the dark brown clay of the *Yu Plaza Surface.* It was lined with large, flat stones along the sides and at the top but not at the base (Figure 3.7). I could not securely associate the placement of the burial with the Structure F-sub-2 modifications because of a disturbance in its vicinity, likely caused by the later reentry into the crypt. I suspect the burial is associated with Structure F-sub-2-3rd or earlier iterations of the platform.

Figure 3.7. Capstone of the Burial 21 crypt (above) and recovered remains and offerings (below).

The remains within the crypt were limited to a skull and leg long bones. Although the crypt stones to the south, at the head of the individual, were collapsed and disturbed, the skull was well-preserved. It was likely placed on top of a flanged Sierra bowl (Special Find 15) along with a shell and jade necklace (Special Find 14) (Figure 3.8). The bowl is tipped to the north and both the skull and necklace beads were recovered at its edge. Another vessel (Special Find 16) was deposited at the northern end of the crypt, west of the long bones. Some bone fragments, possibly from a foot, were recovered at the rim of the vessel.

The Special Find 15 vessel is a Sierra Red bowl with medial flange. The flange is scalloped, and the bowl interior has one incised line below the rim. The Special Find 16 vessel is a reddish orange pot with constricted orifice. It is extensively crushed from the weight of displaced crypt stones

above it. The necklace (Special Find 14) consists of 26 shell beads and 19 jade beads. All are cylindrical in form and the shell beads are shorter in length than the jade beads. One large (5.27 cm, 12.4 g) jade bead likely formed the centerpiece of the necklace. The rest of the arrangement of the beads could not be determined from excavations, as the necklace appears to have been displaced from an original position inside the Special Find 15 vessel or was deposited in a pile.

The flanged bowl and pot were collected in foil, allowed to dry, and stored unwashed to allow for future residue testing. Based on the late date of the flanged vessel, arrangement of the crypt stones, and the difference in preservation between the skeletal remains and vessels on the north and south ends of the burial, I believe the skull and bowl were added to the crypt during a reentry event.

AU36- Feature 8 Posthole. Lots excavated: H6. This context is an 18 cm wide, 20 cm deep posthole near the south edge of Unit H, dug into the *Ocox Plaza Floor*. We recovered two ceramic sherds and a carbon sample from this context.

Figure 3.8. Shell and jade beads from the Special Find 14 necklace recovered in Burial 21 pictured *in situ* (above) and following processing (below).

AU21- Ocox[iv] *Plaza Floor.* Lots excavated: **D11**, **E8**, G7, G8, **H7**, **H8**, I6, J5. The *Ocox Floor* surface consisted of a layer of deteriorated plaster, lacking a preserved polished surface. In Unit H, a ridge in the plaster indicated it had been patched in antiquity. The Feature 8 posthole was dug into this surface. It is located closer to the south edge of the unit, which provides another indication that the trench alignment is slightly off centerline, particularly as we move further west. The floor ballast had a light gray matrix with limestone inclusions of various sizes. We excavated it down to a dense deposit of cobbles in Units H, I and J, initially thought to be a feature, but found to be part of a cobble fill, similar to that found in *Tzin Floor* (AU10).

In Unit D, the floor was covered by a shallow (3 to 4 cm) layer of soil with marl. In Unit G, the floor has a thicker plaster, initially thought to represent multiple floors, but this does not seem to be the case. This floor likely corresponds to Cinderella floor (Mixter and Craiker 2013).

AU22- Ocox[iv] *Floor Fill.* Lots excavated: **G9**, **H9**, I7, J6. This analytical unit consists of a single, pavement-like layer of cobbles deposited over a plaster surface. The cobbles range in size from 1 to 40 cm and are covered by a sparse, 10YR 5/3 clay loam. Perhaps they were deposited to combat subsidence in the center of the plaza prior to the construction of the *Ocox Plaza Floor*. The fill cobbles in Unit D were not as densely packed as in Units I and J, and the context had sparse artifacts compared to Unit G.

AU39- F-sub-2 Mixed Context. Lots excavated: **C11, C12, C14, C18.** This context represents a section of the Structure F-sub-2 platform located to the west of Burial 20 and above Burial 21. This area shows

evidence of disturbance, with a more clay-rich soil through the center of the unit. Small fragments of eroded plaster were present at the top of this context in the northeast and southwest corners of the unit but were not of the same quality as the platform floor in the adjacent lot D12. Below these lots, we encountered larger stones along the west end of the unit that may indicate the location of the west edge of the early phases of the Structure F-sub-2 platform.

The soil is a yellow brown (10YR 6/6) clay loam similar to that encountered in Brown Jay Platform (Structure 26-sub-1), and the disturbance is a 10YR 4/3 clay loam. The edge of the platform was constructed out of loosely assembled, large (up to 40 cm), undressed stones. The alignment is incomplete with stones along the south edge of the unit missing or removed in antiquity (see Burial 21 description).

AU23- Xote[v] *Plaza Floor and Fill*. Lots excavated: **E9**, **E10**, **H10**, I8, I9, J7. This plaza floor consists of a relatively well-preserved thick plaster (5 cm). Its fill is shallow with small to medium chert and limestone rocks (1 to 20 cm). In Unit E, the fill contains more marl, which made it difficult to clear the surface of the previous plaza floor.

In Unit I, there is a patch of plaster along the east edge that sloped upward like a ramp. This patch was excavated as lot I8 because we thought it marked a feature, but it did not. It may correspond to the marl deposited in the fill in Unit H, which contained a greater density of artifacts. Along the north section of Unit I, there was also a roughly rectangular area with degraded gray plaster that may indicate heavy burning.

I believe the *Xote Plaza Floor* corresponds to *Mickey Floor* identified by Craiker (Mixter and Craiker 2013). However, Craiker encountered a sherd ballast below *Mickey Floor* with a thin layer of brown clay underneath. Perhaps this was only an isolated section of the plaza floor, but it is nonetheless notable.

AU24- Quivi[vi] *Plaza Floor.* Lots excavated: **D12**, **E11**, **G10**, **H11**, I10, J8. The plaster (10YR 8/3) of the *Quivi Floor* had a soft texture, though some polished surfaces remained in Unit H. In Units I and J, the floor showed evidence of burning with gray clouding that lacked clear spatial definition. In Units D and C, the floor is more deteriorated and difficult to trace, but it may continue through Unit C. The floor was constructed directly on a heavily burned previous floor. It does have a small limestone pebble ballast. We found a circular posthole on this surface in the central north section of Unit I. It measured 10 cm in diameter and 7 cm deep and lacked artifacts.

Craiker (Mixter and Craiker 2013) noted that the corresponding *Simba Floor* may have been constructed out of a clay and plaster mixture, which is consistent with my observations of the softer plaster consistency of this floor. During our excavations, I noted that the freshly scraped surface was brown in color but turned grayish-white when dry.

AU25-Chapai[vii] *Plaza Floor and Fill*. Lots excavated: **D13, E12, E13, E14, F12, G11**, **H12**, I11, J9. This analytical unit is a thin plaster floor, with soft, yellowish plaster (10YR 7/6, 6/2). It appears to have been extensively burned and has a soft, degraded texture in Unit J. However, in Unit I, the burning is not as intense, and more remnants of polished surface remain. In Unit H, a small strip of preserved polished surface was also blackened, while much of the rest of the unit had a soft, gray matrix, suggesting tamped sediments.

The fill beneath this floor is thin, without many stones for a ballast. Inclusions consist of small to medium (5 to 20 cm) chert and undressed limestone cobbles. Some larger stones encountered in the northeast

corner of Unit J appear to be part of the *Map Plaza Floor* (AU26) showing through in an eroded section. The floor terminates at the edge of F-sub-2-5th in Unit D. There, the plaster is 10YR 8/2 and 6/3 in color.

AU26- Map[viii] *Plaza Floor*. Lots excavated: **D14, D15**, **D16**, **G12, G13, H13,** I12, J10. This analytical unit was the earliest plaza floor constructed using plaster. This floor is most likely the same as *Pinocchio Floor* (Mixter and Craiker 2013) and similar to *Felix Floor* at the base of Structure 26 (Simova and Mixter 2016) because it is constructed on a clay fill like those previously documented floors. The floor had fairly large ballast constructed out of medium sized (4 to 10 cm) chert and limestone cobbles. The floor was better preserved in the southwest corner of Unit J. In some places the floor had eroded, revealing the cobbles and clay deposit underneath. In the northeast corner of Unit J, we recovered large fragments of clunky, fired clay, likely daub, on top of the floor. In Unit G and H, this floor was distinguished from the floor directly above by a whiter plaster color (10YR 7/2). However, it lacked a polished surface, and the stones of the ballast showed through.

Figure 3.9. The excavated Feature 11 pit shown in relation to F-sub-2 platform edge (above) and the cobbles demarcating the top of the pit prior to excavation (below).

AU37- Map Floor Fill. Lots excavated: **D17, D19, D20**, **E15,** F13. This context is located at the base of the Structure F-Sub-2 platform. It extends from the platform edge in Unit D to approximately the center of Unit F. Its fill consists of brown clay loam (10YR 4/3) with sparse, small, chert and undressed limestone inclusions. In Unit D, the fill contains a higher amount of jute than in Unit E. This deposit appears to have buried the *Yu Plaza Surface*.

AU38 - Feature 11 Pit. Lots Excavated: **D18**. This feature was marked by a concentration of undressed limestone cobbles along the south edge of the unit at the base of lot D17 (Figure 3.9). The soil is slightly darker (10YR 4/2) than the surrounding Brown Clay (AU27) and contains more carbon that is scattered throughout. We piece-plotted and collected seven radiocarbon samples in this context (Samples 606, 607, 608, 610, 611, 613, 614). There are limestone and chert cobble inclusions in the matrix, and we encountered more frequent lithic fragments. At the base of this possible pit, we recovered a marine shell (Special Find 10).

AU27- Yu Plaza Surface[11]. Lots excavated: **D21, E16, F14**, **G14**, **H14,** I13, J11, J12. This analytical unit consists of a mottled brown (10YR 4/3) clay with small (1 to 3 cm) undressed limestone inclusions and some small limestone flecks throughout. In the southeast corner of Unit G and southwest corner of Unit F, there was an accumulation of larger cobbles (up to 15 cm), suggesting an infilled sunken area of the

plaza. In Unit F, we encountered a small concentration of bone, carbon, and a greenstone celt fragment (Special Find 12) near the south edge of the unit. This deposit was not defined clearly but may relate to the cobble concentration.

There was an accumulation of small stones toward the base of the lot in Units I and J which appeared to mark the transition to a clay fill underneath. The larger limestone chunks encountered were concentrated in the northeast section of Unit J and the east section of Unit I. One carbon sample was recovered in Unit J (Sample 276). This may be a buried A-horizon, developed over an early prepared surface and later covered over by the brown clay of *Yu Plaza Surface*, perhaps to create an elevated plaza surface. Due to its shallowness, the likely A-horizon was not excavated as a separate lot in Units I and J. It was not exposed in the remaining units during the 2018 season.

AU28- Clay with Artifacts. Lots excavated: I14, J13. This analytical unit represents the deepest excavated section of the Operation 50 trench in the 2017 season, up to 172 cm below Datum 2. The clay is brown, 10YR 3/2, with very small (0 to 1 cm) undressed limestone inclusions. We continued to encounter small ceramics and lithics, suggesting this was an anthropogenic deposit. I suspect it represents the earliest prepared surface of the E-Group. Although we did not reach sterile clay, comparison with the Operation 31 profile suggest we are within 10 to 15 cm of sterile deposits.

Conclusions

Although the artifacts and soil chemistry samples have yet to be analyzed, my excavations in Operation 50 document the construction and ritual use of Plaza F. Previously, I suggested that the plaza construction demonstrates two shifts that parallel Structure 26's development (Simova 2018). The platforms seem to reflect this as well, with the F-sub-2 platform phases resembling the clay and cobble construction of the Brown Jay platform and the F-sub-1 dressed stone construction resembling the Owl platform of Structure 26.

The series of ritual deposits marking the later phases of the F-sub-2 platform further signal a shift in the uses of the E-Group plaza. With the exception of the foundational deposit of Cunil ceramics, we only recovered ritual deposits from the Late Preclassic and later occupations of the Owl Platform. The increase in ritual practices resulting in cache and burial deposits could represent a temporal marker, linking the termination of the F-sub-2 platform and construction of Owl Platform of Structure 26. Further analysis will be necessary to confirm this relationship.

Acknowledgements:
The plaza excavations were funded by the Tulane Department of Anthropology Graduate Student Fund. I would like to thank our foreman, Rene Uck, for assuring we had talented and cautious excavators and well-trained excavation assistants for this short season. As always, our teams of excavators and assistants from San José Soccotz were critical in making this work possible, and I am eternally grateful to them. I am also grateful for Dr. David Mixter's guidance in the field. Finally, this work would not have been possible without Dr. Lisa LeCount. She continues to provide critical logistical support and sage advice to guide my research.

Notes

[1] Previously identified as Biggie Plaza Floor (Donohue 2014, Simova and Mixter 2016, Simova 2018)
[2] Previously identified as Tupac Plaza Floor (Donohue 2014, Simova and Mixter 2016, Simova 2018)

[3] Previously identified as Kanye Plaza Floor (Donohue 2014, Simova and Mixter 2016, Simova 2018)
[4] Previously identified as 5th Plaza Floor (Simova 2018)
[5] Previously identified as 6th Plaza Floor (Simova 2018)
[6] Previously identified as 7th Plaza Floor (Simova 2018)
[7] Previously identified as 8th Plaza Floor (Simova 2018)
[8] Previously identified as 9th Plaza Floor (Simova 2018)
[9] Previously identified as Fever Plaza Floor (Donohue 2014, Simova and Mixter 2016, Simova 2018)
[10] Previously *Tupac Fill with Sascab* (Simova 2018)
[11] Previously *Brown Clay* (Simova 2018)

Works Cited

Aimers, James J., and Prudence M. Rice
2006 Astronomy, Ritual, and the Interpretation of Maya "E-Group" Architectural Assemblages. *Ancient Mesoamerica* 17(01):79–96.

Aoyama, Kazuo, Takeshi Inomata, Flory Pinzón, and Juan Manuel Palomo
2017 Polished Greenstone Celt Caches from Ceibal: The Development of Maya Public Rituals. *Antiquity* 91(357):701–717.

Aveni, Anthony F., Anne S. Dowd, and Benjamin Vining
2003 Maya Calendar Reform? Evidence from Orientations of Specialized Architectural Assemblages. *Latin American Antiquity* 14(2):159–178.

Aveni, Anthony F., and Horst Hartung
1989 Uaxactun, Guatemala, Group E and Similar Assemblages: An Archaeoastronomical Reconsideration. In *World Archaeoastronomy*, edited by Anthony F. Aveni, pp. 441–461. Cambridge University Press, Cambridge.

Barba, Luis, and Linda Manzanilla
1987 Estudio de Areas de Actividad. In *Cobe, Quintana Roo: Analysis de Dos Unidades Habitacionales Mayas*, edited by Linda Manzanilla, pp. 69–115. Serie Antropologica 82. Instituto de Investigaciones Antropologicas, Universidad Nacional Autonoma de Mexico, Mexico City.

Chase, Arlen F., and Diane Z. Chase
1995 External Impetus, Internal Synthesis, and Standardization: E-Group Assemblages and the Crystallization of Classic Maya Society in the Southern Lowlands. In *The Emergence of Maya Civilization: The Transition from the Preclassic to the Early Classic*, edited by Nikolai Grube. Acta Mesoamericana 8. Verlag Anton Saurwein.

Craiker, Krystal
2013 Things that Fall Through the Screen: Microartifact Analysis of the West Plaza of Actuncan. In *The Actuncan Archaeological Project: Report of the 2012 Field Season*, edited by Lisa J. LeCount, pp. 145–154. On file at the Belize Institute of Archaeology, Belmopan.

Donohue, Luke
2014 Excavations at Structure 26 and 27 in Actuncan's E-Group. In *The Actuncan Archaeological Project: Report of the 2013 Field Season*, edited by Lisa J. LeCount, pp. 131–150. Report submitted to the Belize Institute of Archaeology, Belmopan, Belize.

Estrada-Belli, Francisco
2009 *Investigaciones Arqueologicas en la Region de Holmul, Peten: Holmul y Hamontun. Informe Preliminar de la Temporada 2009.*
2011 *The First Maya Civilization: Ritual and Power Before the Classic Period*. Routledge, London.
2012 Early Civilization in the Maya Lowlands, Monumentality, and Place Making: A View from the Holmul Region. In *Early New World Monumentality*, edited by Richard L. Burger and Robert M.

Rosenswig, pp. 198–227. University Press of Florida, Gainesville.
Heindel, Theresa
2016 Initial Excavations at Structure 26 in Actuncan's E-Group. In *The Actuncan Archaeological Project: Report of the 2015 Field Season*, edited by Lisa J. LeCount and David W. Mixter, pp. 40–51. On file at the Belize Institute of Archaeology, Belmopan.
Inomata, Takeshi, Jessica MacLellan, and Melissa Burham
2015 The Construction of Public and Domestic Spheres in the Preclassic Maya Lowlands: Public and Domestic Spheres in the Maya Lowlands. *American Anthropologist* 117(3):519–534.
Inomata, Takeshi, Daniela Triadan, Kazuo Aoyama, Victor Castillo, and Hitoshi Yonenobu
2013 Early Ceremonial Constructions at Ceibal, Guatemala, and the Origins of Lowland Maya Civilization. *Science* 340:467–471.
Keller, Angela H., and Krystal Craiker
2012 Reconstructing Everyday Practices in Maya Civic Centers: Preliminary Testing at Actuncan's West Plaza. In *The Actuncan Archaeological Project: Report of the 2011 Field Season*, edited by Lisa J. LeCount and John Blitz, pp. 187–202. On file at the Belize Institute of Archaeology, Belmopan.
Laporte, Juan Pedro, and Vilma Fialko
1990 New Perspectives on Old Problems: Dynastic References for the Early Classic at Tikal. In *Vision and Revision in Maya Studies*, edited by Flora S. Clancy and Peter D. Harrison, pp. 33–66. University of New Mexico Press, Albuquerque.
1995 Un Reencuentro con Mundo Perdido, Tikal, Guatemala. *Ancient Mesoamerica* 6:41–94.
Middleton, William T., and Barbara J. Price
1996 Identification of Activity Areas by Multi-Elemental Characterization of Sediments from Modern and Archaeological House Floors Using Inductively Coupled Plasma-Atomic Emission Spectroscopy. *Journal of Archaeological Science* 23:673–687.
Mixter, David W., and Krystal Craiker
2013 Sampling and Excavations in Plaza C and F. In *The Actuncan Archaeological Project: Report of the 2012 Field Seasons*, edited by Lisa J. LeCount, pp. 119–130. On file at the Belize Institute of Archaeology, Belmopan.
Rice, Prudence M.
2015 Middle Preclassic Interregional Interaction and the Maya Lowlands. *Journal of Archaeological Research* 23(1):1–47.
Simova, Borislava S.
2018 Ritual Spaces and Social Integration: Trench Excavations in E-Group Plaza, Plaza F. In *The Actuncan Archaeological Project: Report of the 2017 Field Season*, edited by David W. Mixter and Lisa J. LeCount, pp. 49–70. On file at the Belize Institute of Archaeology, Belmopan.
Simova, Borislava S., and David W. Mixter
2016 On-going Investigations at Structure 26 in Actuncan's E-Group. In *The Actuncan Archaeological Project: Report of the 2015 Field Season*, edited by Lisa J. LeCount and David W. Mixter, pp. 9–39. On file at the Belize Institute of Archaeology, Belmopan.
Simova, Borislava, E. Christian Wells, David W. Mixter, and Lisa LeCount
2018 Exploring Changes in Activities in Maya E-Groups: Archaeological and Geochemical Analysis of E-Group Plaster Floors at Actuncan, Belize. *Research Reports in Belizean Archaeology* 15:27–37.
Terry, Richard E., Fabian G. Fernandez, Jacob Parnell, and Takeshi Inomata
2004 The Story in the Floors: Chemical Signatures of Ancient and Modern Maya Activities at Aguateca, Guatemala. *Journal of Archaeological Science* 31:1237–1250.
Wells, E. Christian
2004 Investigating Activity Patterns in Prehispanic Plazas: Weak Acid-Extraction ICP–AES Analysis of Anthrosols at Classic Period El Coyote, Northwestern Honduras. *Archaeometry* 46(1):67–84.
Wells, E. Christian, Richard E. Terry, J. Jacob Parnell, Perry J. Hardin, Mark W. Jackson, and Stephen D.

Houston
2000 Chemical Analyses of Ancient Anthrosols in Residential Areas at Piedras Negras, Guatemala. *Journal of Archaeological Science* 27(5):449–462.

Appendix 3.A.

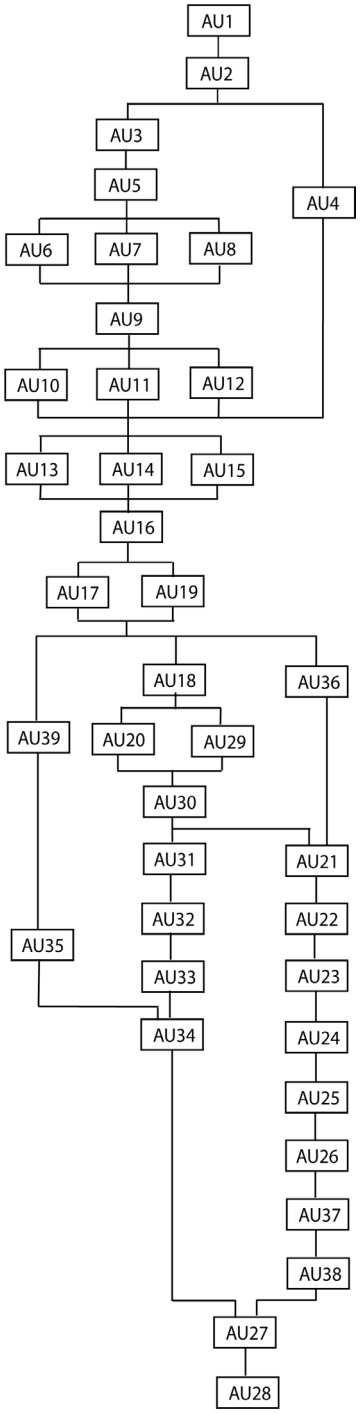


Figure 3.A.1. Operation 50 Harris Matrix.

Table 3.A.1. Operation 50 analytical units.

AU	AU Name	Lots
1	*Humus*	A1, B1, C1, D1, E1, F1, G1, H1
2	*Collapse*	A2, B2
3	*Pata Plaza Floor*	A3, B3, C2, D2, F2, G2, H2, I1, J1
4	*Mixed Context*	E4, I2, J2
5	*Tzin Floor Patch*	A4
6	*Feature 3 Posthole*	B5
7	*Feature 1 Pit*	A5
8	*Feature 2 Pit*	A6
9	*Tzin Plaza Floor*	A7, B4, C3, C4, D3
10	*Tzin Cobble Fill*	A8, D5, F3, G3, H3
11	*F-sub-1 Fill*	B6, C5, D4
12	*Blue Plaza Wall (F-sub-1)*	A9, A10
13	*Feature 5 Pit*	E3
14	*Feature 6 Posthole*	G4
15	*Feature 4 Posthole*	I4
16	*Lum Plaza Floor and Fill*	A11, C6, E4, E5, G6, I3, J3
17	*Large Floor Fill*	C7
18	*Structure F-sub-2-1st*	A12
19	*Pebbly Fill*	I5, J4
20	*Feature 7 Ceramic Cache*	A13, A14, A15, A16, A17
21	*Ocox Plaza Floor*	I6, J5
22	*Ocox Plaza Floor Fill*	I7, J6
23	*Xote Plaza Floor and Fill*	I8, I9, J7
24	*Quivi Plaza Floor*	I10, J8
25	*Chapai Floor and Fill*	I11, J9
26	*Map Plaza Floor*	I12, J10
27	*Brown Clay*	I13, J11, J12
28	*Clay with Artifacts*	I14, J13
29	*Burial 20 (Feature 10)*	C13, C15, C16, C17
30	*Structure F-sub-2-2nd*	A18, B11
31	*Structure F-sub-2-3rd*	A19
32	*Feature 9 Cache*	
33	*Structure F-sub-2-4th*	A20
34	*Structure F-sub-2-5th*	A21, A22, A23, B12
35	*Burial 21 (Feature 12)*	C19
36	*Feature 8 Posthole*	H6
37	*Map Floor Fill*	D17, D19, D20, E15, F13
38	*Feature 11 Pit*	D18
39	*Structure F-sub-2 Mixed Context*	C11, C12, C14, C18

Appendix 3.B.

Table 3.B.1. Plaza Floor Names

Cholti Maya Term	Definition (Boot 2004)	Previous Floor Referents
Pata	Guava	Biggie Plaza Floor (Donohue 2014, Simova and Mixter 2016, Simova 2018)
Tzin	Yucca	Tupac Plaza Floor (Donohue 2014, Simova and Mixter 2016, Simova 2018), Pluto Plaza Floor (Mixter and Craiker 2013)
Lum	Jocote	Kanye Plaza Floor (Donohue 2014, Simova and Mixter 2016, Simova 2018), Eeyore Plaza Floor (Mixter and Craiker 2013)
Ocox	Mushroom	5th Plaza Floor (Simova 2018), Cinderella Plaza Floor (Mixter and Craiker 2013)
Xote	Rosa de milpa	6th Plaza Floor (Simova 2018), Mickey Plaza Floor (Mixter and Craiker 2013)
Quivi	Achiote	7th Plaza Floor (Simova 2018), Simba Plaza Floor (Mixter and Craiker 2013)
Chapai	Papaya flower	8th Plaza Floor (Simova 2018), Aladdin Plaza Floor (Mixter and Craiker 2013)
Map	Coyol fruit	9th Plaza Floor (Simova 2018), Pinocchio Plaza Floor (Mixter and Craiker 2013)
Ac	Grass	Fever Plaza Floor (Donohue 2014, Simova and Mixter 2016, Simova 2018)
Yu	Coyol tree	Brown Clay (Simova 2018)

Chapter 4: Examining Looter's Trenches in Plaza A

David W. Mixter (Binghamton University)

The triadic arrangement of pyramids located around Plaza A in Actuncan South is one of two primary centers of ritual activity in Actuncan's site core (Figure 4.1). Current data indicate that Triadic Temple Groups emerge in the Late Preclassic period (Szymański 2014; Velásquez Fergusson 2014), and their spread seems to be associated with the rise of the Late Preclassic version of Maya divine kingship and the influence of the massive Preclassic centers located Central Karstic Uplands (Doyle 2017; Estrada-Belli 2011; Freidel et al. 2017; Freidel 2018; Hansen 1998; Saturno et al. 2018). The spread of Triadic Temple Groups is also associated with the spread of figural portraiture on carved stone monuments in the Maya Lowlands and monumental polychrome painted plaster masks depicting supernatural creatures and deities. Gaining a better understanding of this complex of architectural and artistic programs is critical to understanding the spread of the hegemonic ideology of Late Preclassic Maya kingship and the interrelationship between sites that adopted this form of leadership.

Research at Actuncan South was initiated by James McGovern (1992, 1993, 1994, 2004) as part of the Xunantunich Archaeological Project (XAP) from 1992 to 1994. McGovern documented looters' trenches in Structures 1, 4, 5, and 6 and dug several test excavations into the center of Plaza A as part of his volumetric analysis of Actuncan's construction. Although he identified looters' trenches in Structures 2 and 3, these were not documented. Through his research, McGovern documented a long history of construction at Plaza A that dates back to at least the Late Preclassic period. He argued that the earliest deposits he encountered were Middle Preclassic, but this was not confirmed by radiocarbon dates or associated ceramics. His test excavations never reached sterile deposits, indicating that earlier materials may exist below the depth he reached. Recent research by Simova and me (LeCount et al. 2017; Mixter 2012; Simova and Mixter 2016; Simova 2018) has identified deposits dating to c. 1000 B.C. in Actuncan North. Further excavations are needed to determine if similarly early deposits exist below Plaza A.

McGovern's research also provided important evidence for the construction of monumental art programs within Plaza A. In looters' trenches to the left of the balustrades of Structures 4 and 5, McGovern (1992, 1994) identified evidence of monumental stucco masks on buried facades that had been partially cut through by the looters' work. He also identified a carved Preclassic stela in the southwest quadrant of Plaza A (Fahsen and Grube 2005; McGovern 1992). These art programs indicate that Late Preclassic Actuncan was participating in the broader shifts in political ideology happening across the Maya Lowlands at the time.

Licit and illicit excavations have continued within Actuncan South since McGovern's work in the 1990s. During the 2013 field season under the auspices of the Actuncan Archaeological Project (AAP), I (Mixter and Langlie 2014; Mixter 2016:263-289) initiated excavations into Structures 7, 8, and 9, located in Plaza A, to evaluate their association with Actuncan's Terminal Classic period occupation. As hypothesized, these structures were built during the Terminal Classic period as evidenced by ceramic diagnostics; however, these excavation efforts also continued into the plaza fills below these late structures and provided AAP with independent profiles of plaza construction. Like McGovern's test excavations, our research did not reach sterile levels because of the depth of deposits and the nature of construction fill. Then, during the summer of 2015, AAP observed new looting activity within Plaza A that had taken place between the summers of 2014 and 2015. This renewed looting activity included the extension of the primary looters' tunnel in Structure 4 to a length of 32 m, the excavation of two new looters' trenches into the southern wing of Structure 5, and continued excavation below AAP's Operation 41 excavation into Structure 7(LeCount personal communication, 2015). Each of these illicit excavations has revealed

stratigraphy penetrating earlier levels of construction in Plaza A.

Research during the 2018 field season began a program of producing new, primary documentation of all extant looter's tunnels at Actuncan. This season, I focused on drawing and describing the new looters' trenches and tunnels excavated in 2015 and assessing the state of conservation of all previously-identified looters' trenches at Actuncan South. Table 4.A.1 provides a list of all known looter's trenches at Actuncan.

This chapter focuses primarily on Looters' Trenches 2, 12, 13, and 14.[1] The primary task was to produce profiles of these trenches. I followed standard profiling methodology. The looter's trenches were cleaned so that the stratigraphy was evident, then the profile was measured from fixed baselines and drawn on metric graph paper. The looter's trenches were also photographed to the extent possible given the lack of adequate lighting in looter's tunnels. Future research will aim to undertake better photography in order to create three dimensional models of the tunnels.

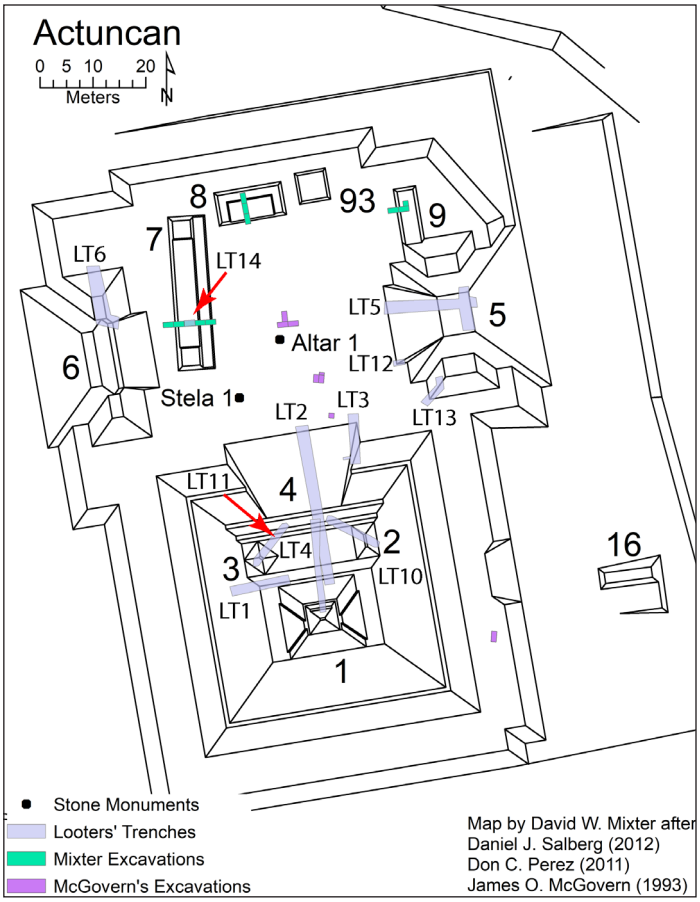


Figure 4.1. Map of Actuncan South showing the location of Looters' Trenches.

The collection of these data serves three purposes. First, these data will salvage what information can be gleaned from the looters' excavations. Second, they will provide an anchor for framing future research questions and grant writing related to early monumental construction and the introduction of divine leadership at Actuncan (Mixter 2018). Finally, this documentation will inform us about the stability of the structures within Actuncan South to inform future conservation efforts and research methodologies.

Looters' Trench 2

Looters' Trench 2 (LT2) is located on the centerline of Structure 4, which it enters above plaza level from the north and slowly slopes down towards the central mass of the largest platform of the Triadic Temple Group. The looters began by expanding the entrance to a previous looters' trench dug in the 1970s into the central staircase. They then continued by excavating a tunnel between 1.5 and 2 m in height in most places. In total, the trench and tunnel measure 37.6 m in length. More than three additional meters of looter's overburden now extend north from the building, and it too was trenched to maintain a flat path to provide access to the tunnel. The large mass of material removed from LT2 has built up in front of the central staircase such that the trench enters above plaza level. The latest plaza floor identified in the excavations was approximately 1 m below the tunnel entrance, although the later plaza floors associated

[1] From here on, all looter's trenches and tunnels will be referred to using an LT referent. So, Looters' Trench 1 will be LT1.

with the terminal construction phases outside the building were probably higher. At its deepest point, the tunnel is 3.5 m below the base of its entrance.

LT2 was originally documented by McGovern (1992, 2004) in 1992. At the time, the tunnel only extended 11 m with lateral excavations extending from its end to the east and west. During 2014–2015 looting, looters continued excavations, digging the tunnel to its current length of approximately 29 m inside the building with an additional 8.6 m of open trench on the building's north side. Additionally, McGovern (1994, 2004) documented LT3, an 11 m long looters' tunnel that ran into the building from north to south through Structure 4's western balustrade. Correlating profiles from LT2 and LT3, McGovern identified 5 versions of the staircase, of which the latest three are associated with a sequence of plaza floors. Only the floors associated with Staircase 3 were identified in my documentation. The later floors seem to now be covered by looters' backdirt from their work in 2015. In LT3, McGovern also discovered evidence of modelled stucco and terrace facades, indicating some complexity to the structure's decoration along the staircase's flanks. LT3 was backfilled by XAP and was not re-inspected for this report as a result.

My documentation of LT2 shows that Structure 4 was a truly massive construction that was built up over time (Figure 4.2). In total, 11 construction events were identified and divided into three episodes. The earliest version was only identified as a simple plaster floor surface located approximately 3.4 m below the tunnel entrance. This floor (Floor D) was at the lowest point of the looters' excavation and was likely an early version of Structure 4 or of the platform that Structure 4 was built on. Of course, other interpretations are possible given the limited exposure. I then identified 10 sequential staircases, which include five later versions documented by McGovern. The earlier five staircases, Staircases 6 to 10, were identified deep within the tunnel and each expanded the building's footprint by between 1.5 and 2 m. Importantly, there is a 9.1 m thick deposit between Staircases 5 and 6, indicating a large construction episode. This particularly large construction may have provided space for the *in situ* burial of a Preclassic building from the phase associated with Structure 6. Staircase 4 directly replaces Staircase 5, with its stones placed directly on the earlier staircase's treads. This is a construction technique that is common elsewhere at Actuncan, especially within the staircase of Structure 26, the eastern building of Actuncan's E-Group (Donohue 2014; Simova and Mixter 2016). Staircase 3 then extends the front of Structure 4 1.6 m further to the north. Staircase 2 adds 2.8 m to the northern extent, and Staircase 1 adds another 3.4 m to the front of the structure.

In general, LT2 provides us with cross-sections of several versions of Structure 4's central staircase. Each of these are partial views of the construction sequence that are entirely dependent on the direction the looters took. Figure 4.2 is a profile drawing that incorporates a composite view of my observations of these buildings. This composite approach is necessary because the looters excavated several side tunnels perpendicular to the primary tunnel. None of these are particularly long, but some provide additional information about strata not evident in the primary tunnel. The locations of the side tunnels to the east are noted on the profile. There are four major side tunnels. The first is a shallow side tunnel that only extended 130 cm near the tunnel entrance. It was filled with stones removed from deeper within the main tunnel. The second is the tunnel noted by McGovern at the deepest point of the main tunnel prior to 2015. This tunnel extends to the west and is therefore not noted on the profile drawing. The entrance to this tunnel is filled with cobble fill removed by the looters from deeper in the main tunnel. Its depth is unknown because it is entirely blocked. The third and fourth side tunnels form a cross near the deepest part of the main tunnel. Side tunnel 3 extends 2.5 m to the east. In parallel, the forth side tunnel extends to the west. The western side tunnel provides critical information, including the location of the earliest identified platform surface, Floor D. The cross-sections in Figure 4.2 provide the best current understanding of these building phases. Interpretations are provided in the descriptions below.

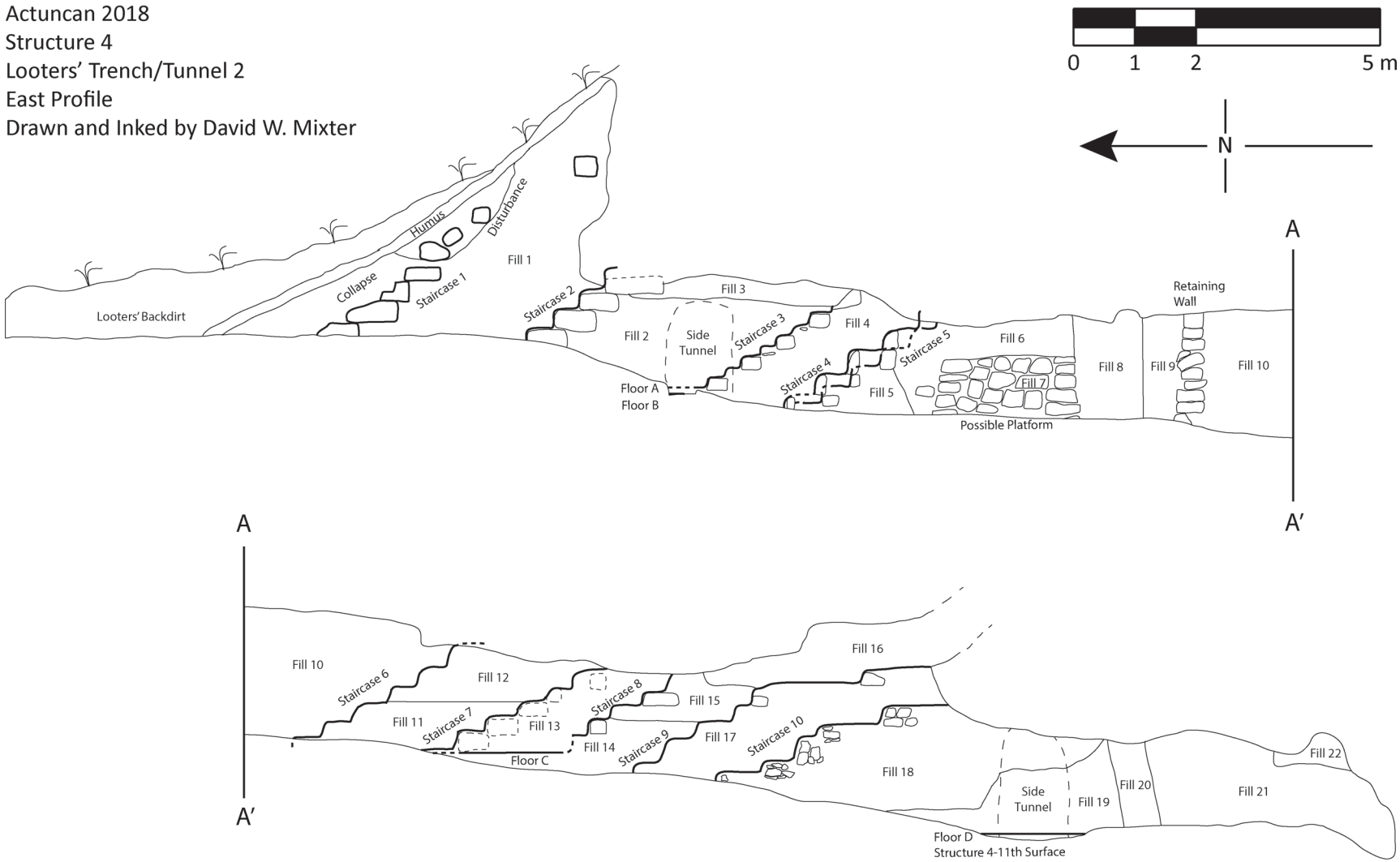


Figure 4.2. Profile of Looters' Trench 2 located on the centerline of Structure 4.

Profile Descriptions
The descriptions below align with those identified in the excavation profile. The name of each strata is followed by a brief description. Munsell readings were not collected for LT2 due to time constraints and the low light conditions in the tunnel where most recording took place.

1) *Looters' Backdirt*. This stratum consists of backdirt containing large construction fill stones measuring up to 40 cm to a side. These boulders are a mix of limestone rubble, cut limestones, and chert river cobbles. This backdirt sits on the original A-horizon that existed prior to the looting that took place in the 1970s.

2) *Humus*. This stratum is a dark brown layer of humus containing degraded limestone bits fallen or washed from above. The humus appears to be the product of *in situ* soil development.

3) *Collapse*. A thick layer of collapse sits between the humus and Staircase 1. This stratum consists of large to medium sized limestone blocks measuring 40 to 50 cm long and other bits that have fallen off the building. A large tree fall was also identified in a portion of this stratum, which has substantially disturbed the center of the trench profile. This disturbance has pulled several stair treads and risers from Staircase 1 out of place.

4) *Staircase 1 and Fill 1*. Staircase 1 is the final version of the Structure 4 staircase. Based on comparisons to McGovern's profile (2004:189), 2 to 3 additional steps are likely buried below the current level of the looters' fill. The staircase is better preserved on the east side of the trench than the west side. Stairs were only found at the base of the trench and near its top where an additional stair was found in profile. It is likely that four steps are missing in between, disturbed in part by the tree fall mentioned above. These stairs are constructed of massive limestone blocks measuring up to 80 m long that partially overlap forming 40 cm long stair treads.

Fill 1 consists of tightly packed, large roughly-cut limestone blocks between Staircases 1 and 2. These blocks are set in a dense grey matrix.

5) *Staircase 2 and Fills 2 and 3*. Staircase 2 is Structure 4's well preserved penultimate staircase. These stairs are made of large cut limestone blocks covered with nicely rounded plaster surfaces. These limestone blocks are quite regular in size and up to 65 cm long. The blocks are placed in an overlapping fashion and then plastered over to create rounded stairs. Based on McGovern's (2004:189) drawing, I believe that these stairs rest on his Plaza Floor 2. Fills 2 and 3 both consist of large limestone rubble that are within a dense grey matrix. They are distinguished by a change in fill color. Fill 2 is darker than Fill 3. The division between these two colors could represent a floor of some kind, but more likely it is simply a division within a single fill episode. The roughly-cut limestone blocks within the fill are often 15 cm tall and 30 cm long.

6) *Staircase 3 and Fill 4*. Staircase 3 is located behind Fills 3 and 4. Eight of Staircase 3's steps, plus a low half step, were documented. Based on my documentation, every other step of Staircase 3 seems to have been backed by a limestone block. Intervening steps were supported by smaller bits of limestone. These blocks are only 30 cm long and are covered by a thin layer of plaster used to create smooth curved stair edges. This staircase is directly associated with two plaster plaza floors (Floors A and B in my nomenclature). I think that Plaza Floor B likely lines up with McGovern's (2004:189) Plaza Floor 2. The top step of Staircase 3 is oddly shaped and may be a modelled decoration, a stair block outset, or partially destroyed. Fill 3 consists of limestone inclusions within a compacted clay sediment. The roughly

cut limestone block inclusions are up to 45 by 15 cm in size and are regularly spaced. The matrix is tempered with small limestone bits.

7) *Staircase 4*. Staircase 4 was built directly over Staircase 5, resulting in the partial dismantlement of individual stairs in Staircase 5. This staircase is quite well preserved. Vertically-set stones resting on the treads of Staircase 5 support the risers of Staircase 4. These are then covered by a thick layer of plaster to create rounded stair edges.

8) *Staircase 5 and Fill 5*. Staircase 5 is composed of well-rounded stairs located directly below Staircase 4. The exact construction of this staircase is difficult to determine as it was partially dismantled during the construction of Staircase 4, but vertically-set and rectangularly-cut limestone blocks seem to support the stair risers. The fill directly below Staircase 5 is a dry-laid mix of limestone and chert cobbles layered between wet-laid plaster strata that secure the dry-laid layers together. In other words, the fill is composed of horizontally laminated layers of large dry-laid fill and consolidated plaster. Also, this fill includes some dried clay chunks.

9) *Fill 6.* Fill 6 is a fill of limestone blocks within a compact light grey sediment.

10) *Fill* 7. Fill 7 was recognized by both a change in matrix, to a darker brown/black dried clay, and a change in inclusions. Fill 7 consists of regularly stacked cut limestone blocks. Inspection of voids in the profile wall shows that these blocks form a flat surface facing east, into the wall. The profile seems to document the backside of this feature. The stones are very nice and form a boundary between dry-laid fill to the east and the stickier Fill 6. Because the stones form a flat surface, they may be the edge of a buried platform that the looters' tunnel passes through. Alternatively, these stones may form a very nicely constructed retaining wall or terrace of some kind.

11) *Fill 8*. Fill 8 is dry-laid fill with some consolidated lime and sticky clay pockets. This fill also contains pockets of burning. This fill layer butts up against a formal retaining wall of stacked limestone blocks to the south.

12) *Fill 9*. Fill 9 consists of stacked, roughly squared-off limestone blocks in a dense matrix of dried clay sediments. Fill 9 is likely a construction pen erected as part of the expansion of Structure 4 from Staircase 6 to Staircase 5.

13) *Fill 10*. Fill 10 is made up of large, stacked roughly cut limestone blocks in a dense clay matrix. Limestone blocks range in shape from 40 by 12 cm rectangles to 20 by 15 rectangles to huge roughly cut stones over 50 cm long.

14) *Staircase 6 and Fill 11*. Staircase 6 is a well-preserved plaster staircase with 11 cm of plaster covering each stair. The stair risers are 25 cm thick layers of plaster supported by stacks of roughly cut limestone blocks. Fill 11 was constructed in layers. A dry-laid fill with big (average of 30 cm) chert cobbles rests on Staircase 7. This is topped by a dense clay fill and a small (10 cm in diameter) stone ballast, on which Staircase 6 was built. Below this, the fill layer of river cobbles is up to 80 cm thick in places.

15) *Fill 12*. Fill 12 is below Staircase 6 and consists of a compact dried clay fill located above the dry-laid chert cobbles of Fill 11. This fill has a blocky texture and contains several layers of lime or eroded limestone blocks under a brown clay fill with limestone inclusions.

16) *Staircase 7 and Fill 13*. Staircase 7 was a nicely formed and plastered staircase. The grey color of

the plaster surface indicates that the entire surface of the stair exposed in the trench was burned prior to burial. The surface of the staircase appears to be a bit beaten up by the dry-laid fill of Fill 11 placed on the staircase. Each stair consists of a thick layer of plaster, approximately 40 cm thick. It is likely that a soft limestone block anchored each stair, but the limestone and plaster have a similar consistency and seem to have eroded together. At the top of the tunnel, the plaster surface above the uppermost visible stair levels off, likely into a low platform. This upper floor is anchored by a small pebble ballast. Below these stairs, Fill 13 consists of a layer of large chert cobbles over Staircase 8.

17) *Floor C, Staircase 8, and Fill 14*. Beneath Fill 13, I encountered Floor C, a heavily burned floor that extends to the north from the base of Staircase 8. It terminates at the back of the lowest visible step in Staircase 7, which suggests this floor was destroyed in the construction of Staircase 7. Staircase 8 is a well-preserved plastered and burned staircase. Bits of charcoal are evident on some steps in profile, suggesting that future collections for radiocarbon dating may be fruitful. Cut limestone blocks anchor alternating steps. The remaining steps were created from thick layers of packed sascab. Beneath Staircase 8 and Floor C, Fill 14 is composed of large chert cobbles within a matrix of packed sascab. The fill stones are up to 40 cm in diameter. Directly above Staircase 9, the sascab is not present, and, instead, the fill is dry-laid.

18) *Fill 15*. Fill 15 is located between Staircases 8 and 9 and is layered above Fill 14. Fill 15 is a layer of packed sascab in colors varying from white pink. The sascab is densely packed with small stone inclusions that are less than 3 cm in diameter.

19) *Fill 16*. This stratum is composed of a loose cobble fill that extends above the primary looters' tunnel. The looters seem to have disturbed this cobble fill, causing a partial collapse. I was unable to map the furthest extent of this fill due to its height and instability. The fill stones are 5 to 20 cm in diameter. This fill unit rests on a layer of white, packed sascab located between Fills 15 and 16. It also rests in places on Staircase 9 and its associated surfaces.

20) *Staircase 9 and Fill 17*. Staircase 9 has a plastered and polished staircase. Each stair was likely backed by a soft limestone rock, but these are difficult to see because they have the same texture as the surrounding plaster. Like Staircases 7 and 8, this staircase was burned. At the top of the stairs, the staircase levels out onto a platform surface that is continues for 180 cm. At that point, a single step leads to a higher platform surface, which continues for 110 cm to the south until it hits the descending tunnel ceiling. These platform surfaces are also burned. Fill 17, located below Staircase 9 consists of packed sascab containing small (less than 3 cm in diameter) stone temper. This stratum rests on Staircase 10.

21) *Staircase 10 and Fill 18*. Staircase 10 was built of burned and packed sascab. The stairs are recognizable from the stacked chert cobbles used to create the core of each step. The stair surfaces are difficult to recognize but seem to be burned. The steps in Staircase 10 are not consistently sized. At the top of the staircase, an elongated step (1 m long) seems to lead up to the surface of the platform fronted by Staircase 10. A 1 m length of this platform is evident in the looters' tunnel before it runs into the tunnel's ceiling. Fill 18 is composed of packed sascab with inclusions less than 3 cm in diameter. It is not clear that the surface of Staircase 10 is proper plaster. It may be constructed using a simple packed sascab technology.

22) *Fill 19*. In this stratum, the sascab matrix is densely filled with large (up to 30 cm in diameter) chert cobble inclusions. In the side tunnel to the east, this fill grades into finely layered sediments. The plaster surface of the earliest platform was evident beneath Fill 19 in the western side tunnel. This floor is the earliest of 11 identified construction phases of Structure 4 identified in LT2. This floor may be a

plaza floor or a platform surface. It is impossible to know based on the current exposures.

23) *Fill 20*. Fill 20 appears to be a construction pen of large, loose, and dry-laid chert cobbles. The cobbles are large, up to 40 cm in diameter.

24) *Fill 21*. This stratum consists of packed sascab fill that grades from layers of white to layers of pink sascab, providing some insight into labor regimes. This fill contains some midsize cobbles between 20 and 30 cm in diameter.

25) *Fill 22*. This stratum is a denser fill layer of cobbles packed in sascab. Looser, dry-laid chert cobble fill is evident at the top of the tunnel.

Looters' Trench 12

Looters' Trench 12 is an excavation pit measuring approximately 230 by 100 cm located along the western façade of Structure 5. As originally described by McGovern (1994), Structure 5 is a 8 m tall pyramid located on the eastern edge of Plaza A. The pyramid has been largely gutted by the 18 m long LT5 that enters the western façade along the northern edge of the west-facing central staircase. That trench cut through the northern balustrade of the terminal staircase, revealing the stairs in the southern profile and two architectural terraces in the northern profile. McGovern's (2004:195-196) documentation of LT5 points to at least two major construction phases and up to 5 renovations of the central staircase. A few retaining walls along the terraces may point to later and intermediate construction phases. His documentation also identified preserved architectural masks along the terrace faces of both major construction phases. He also identified 7 separate plaza floors, some of which were renovations of each other.

Though much smaller in size, LT12 parallels LT5 in its location along the central staircase's southern balustrade. This looter's trench straddles the balustrade of the terminal staircase, such that the terminal staircase (McGovern's Staircase 1) is evident in the north profile and the balustrade is evident in the southeast corner of the excavation unit (Figure 4.3). The looters' trench is oriented just north of the staircase's alignment, so the balustrade appears in cross-section within the east profile. These same stones appear in the south profile, reflecting how the balustrade angled from the excavated space into the south profile. These architectural features all seem to derive from the terminal phase of staircase construction.

The looters' excavations also encountered four plaster plaza floors and one additional possible floor. These floors have been named as best as possible to match McGovern's nomenclature. Three of these floors were directly associated with the terminal staircase construction. The terminal plaza floor, Plaza Floor 1a, was only recognized based on a thin layer of small, 3 to 5 cm diameter, ballast stones. Collapse from the terminal building rests on this level. This plaza floor represents an effort to raise the level of the plaza by 8 to 10 cm above Plaza Floor 1b. Plaza Floor 1b was a well-preserved plaster floor consisting of a 4 cm thick layer of plaster embedded into an underlying ballast. Both Plaza Floors 1a and 1b terminate in the lowest stair. Plaza Floor 1b is likely the equivalent of McGovern's Plaza Floor 1 seen in his profiles of LT5 (McGovern 2004:195-196).

The terminal stairs were constructed directly on top of Plaza Floor 2, which seems to have been constructed as a thick layer of wet-laid lime. Strangely, the floor surface seems to have been disrupted in the southeast corner of LT12, though the lime continues below the balustrade. Evidence from the south profile suggests that the surface may have been reshaped when the staircase was constructed to run up

the front of the balustrade, forming a smooth transition from staircase to summit surface. This floor is most likely the equivalent of McGovern's Plaza Floor 2, which ran under Staircase 1 to the front edge of his Staircase 4 and the base of the terminal masks. A cut stone resting on Plaza Floor 2 in the northeast corner of the excavation unit may be the front step of an earlier staircase, either McGovern's Staircase 2A or 3A, but this is not certain.

Located directly below Plaza Floor 2, Plaza Floor 3 appeared only as a thin line within the wet laid lime fill. The thinness of the floor suggests it was the polished surface of an earlier surface, and that Plaza Floors 2 and 3 were constructed using similar technologies. In McGovern's chronology, Plaza Floor 2 is the latest of a series of renovations that slightly raised the plaza surface, but are associated with dramatic volumes of construction. He identified a total of seven plaza surfaces (Plaza Floors 2, 3, 4a, 4b, 5a, 5b, and 6 in his nomenclature) where I identified only Plaza Floors 2 and 3 within the same plaster thickness.

Approximately 55 cm beneath Plaza Floor 3, is an additional possible plaza floor fragment that may have been identified in the north profile on top of a layer of wet laid fill. If this is a plaza floor, it may be the equivalent of McGovern's Plaza Floor 7, which is associated with the penultimate surface of his Platform-Plaza Edge 2, the penultimate version of the Plaza A platform that existed prior to the earliest construction phase of Structure 5.

The section below contains detailed descriptions of all strata identified in the looters' trench profile (Figure 4.3).

Profile Descriptions
The descriptions below align with those identified in the excavation profile. The name of each strata is followed by a Munsell color reading and then a brief description.

1) *Humus*. 10YR 3/2. This layer is the darker zone of modern soil development. The matrix includes some collapsed stones from Structure 5. This layer slopes downward from east to west following the pitch of the building.

2) *Collapse*. 10YR 5/2 to 10YR 6/2. This stratum contains architectural collapse and sheet wash. It is noticeably lighter in color than the humus with a more grey than brown hue. The soil matrix contains large collapsed construction stones that rest on Floor 1a and the remains of Structure 5's terminal staircase.

3) *Fill 1*. 10YR 7/1 to 10YR 8/1. This stratum is the fill of Structure 5's terminal staircase and balustrade. The few remaining steps were cut limestone blocks, while the staircase was filled with large uncut limestone rubble that was likely wet-laid based on the evident interstitial lime plaster. The stones in this fill are quite large. A typical stone measured 20 by 10 cm. Fill 1 mostly sits on Floor 3, except in the east profile where Floor 3 is not evident.

Two clearly evident stairs from the terminal staircase were identified with an interval of 90 cm between risers. Each stair was likely approximately 30 cm high. A third stair is likely located at the southeast edge of LT12. Additionally, several stones from the staircase's southern balustrade were encountered within Fill 1. Eight to nine courses of stone forming the balustrade façade were encountered for a total height of 103 cm above Plaza Floor 2 and 126 cm above Plaza Floor 3. This wall appears to face south. A basal molding resting on Floor 3 may have been evident during that construction phase.

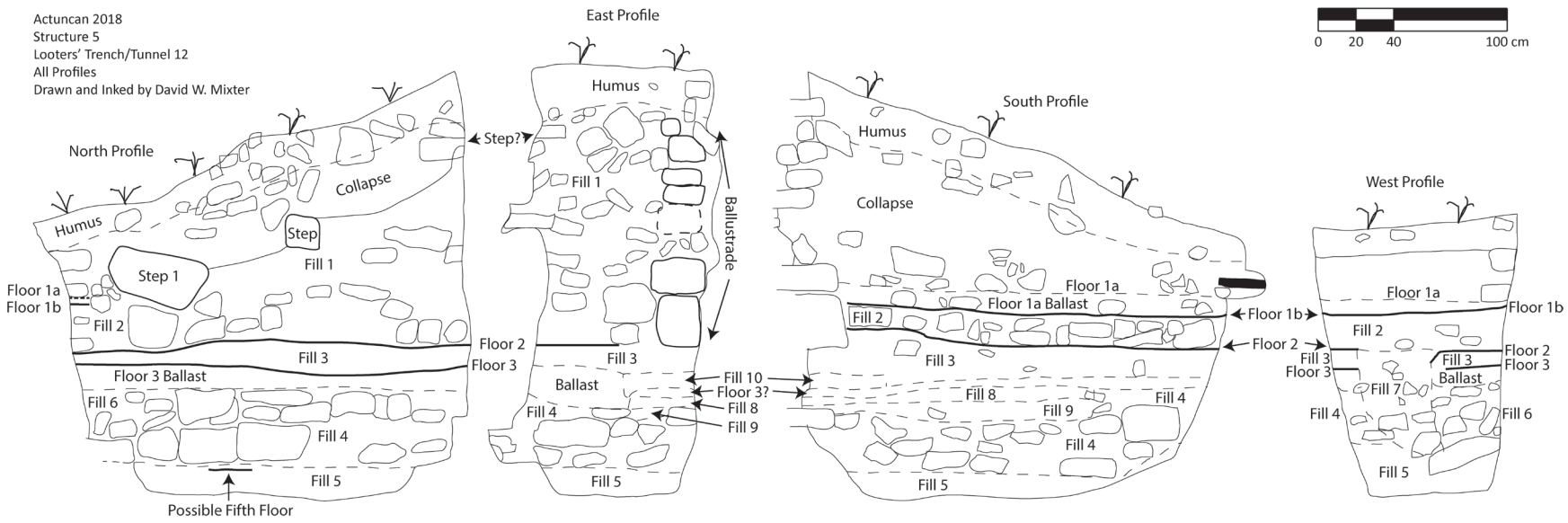


Figure 4.3. Profile of Looters' Trench 12 located on along the south ballustrade of Structure 5.

4) *Plaza Floor 1a and Ballast*. 10YR 5/2. Floor 1a is the eroded terminal plaza floor. It is evident about 8 cm above Floor 1b and was identified between a layer of ballast below and the collapse above it that sits on the level of Plaza Floor 1a. The floor runs from the lowest step of Staircase 1 in the northern profile to the balustrade in the trench's southeast corner. The stones in the ballast beneath the floor are 3 to 5 cm with a few a bit larger, up to 12 cm.

5) *Plaza Floor 1b and Fill 2*. 10YR 7/1. Plaza Floor 1b is a preserved polished plastered floor, which ends at the lowest stair and the balustrade. The floor is likely 17 cm thick and made of plaster with a small stone ballast above a large fill, all within a wet-laid lime matrix. Larger fill stones are up to 15 cm in size. The stones in Fill 2 are smaller to the west and larger under the later architecture. This fill ends at stones that may form a basal molding around the balustrade and stones that may form a step from an earlier staircase resting on Plaza Floor 2 in the northeast corner of LT12.

6) *Plaza Floor 2 and Fill 3*. 10YR 9.5/2. Plaza Floor 2 is a well-preserved floor that encircles most of the trench, except a confusing area located in the southeast corner of the excavation unit. There, the floor may terminate at the balustrade. The floor is also missing in the west profile where a natural disruption seems to have penetrated it. Where preserved, Plaza Floor 2 is a thick plaster floor from 20 to 36 cm thick. This thickness subsumes Plaza Floor 3, which appears as only a thin line in an otherwise-undifferentiated plaster. Fill 3 is plaster mixed with 1 to 3 cm ballast and likely composed the bulk of Floor 2.

7) *Plaza Floor 3 and Ballast* 7.5YR 9.5/1. This is a continuation of a fill similar to Plaza Floor 2 and Fill 3. A thin discolored line points to the presence of an intermediate floor that existed here at one point. Plaza Floor 3 is evident based on a renewed area of plaster with few large inclusions about 13 cm below Plaza Floor 2. Otherwise, the matrix is very similar to that of the floor above.

8) *Fill 10*. No Munsell reading, dry-laid fill. This is a looser area of stone fill located in the trench's SE corner. This fill is similar in composition to a 1 to 5 cm thick ballast layer, but is not plastered. Perhaps this is the remains of a floor that was destroyed in other parts of LT12.

9) *Fill 7*. 10YR 6/2. This is a possible disturbed area in the western edge of the trench. Plaza Floors 2 and 3 were not detectable here, but otherwise the fill looks similar to the surrounding strata. Stones are 1 to 10 cm in diameter, but with a brown rather than plaster matrix. This disturbance is likely from natural processes; however, based on the lack of destruction to Plaza Floor 1b and Fill 2, this disturbance may be ancient.

10) *Fill 8*. No Munsell reading, dry-laid fill. This is a loose, dry-laid fill or ballast located in the SE corner of the trench, similar to Fill 10. The stones are 3 to 10 cm in diameter. This fill is under a plaster layer, which may be Plaza Floor 3. This fill rests on another layer of consolidated plaster (Fill 9), which is above Fill 4.

11) *Fill 9*. 10YR 7/3. Fill 9 is a zone of consolidated plaster below Fill 8. This might be a floor, but I cannot follow it beyond the southeast corner of LT12. It has a level surface located in southeast corner of the excavation unit and is about 4 cm thick. This stratum is likely heavy clay based on the platy structure of the matrix.

12) *Fill 4*. 10YR 9.5/2. This stratum is a large boulder fill consolidated by wet-laid plaster. The inclusions are a mix of chert and limestone. Stones are 15 to 40 cm in size. In the northwest corner, the matrix is a more brownish sediment rather than a plaster. This differently colored area is Fill 6.

13) *Fill 6*. 10YR 4/2. This fill layer is at same level as Fill 4. It contains some large stones, but has a browner matrix than Fill 4.

14) *Possible Fifth Floor and Fill 5*. 7.5YR 9.5/2. A possible fifth floor was identified in the northern profile at the boundary between Fills 4 and 5, though this may just be a smooth impression made in the lime fill by a stone. Fill 5 is a denser wet-laid layer of lime with fewer, mostly limestone inclusions. Fill 5 is the lowest stratum reached by the looters.

Looters' Trench 13

Looters' Trench 13 is an L-shaped trench that transforms into a tunnel located on the southern wing of Structure 5. Structures 5 and 6, located respectively on the east and west sides of Plaza A, have a similar form. Each of these structures is anchored by a central pyramidal structure flanked by lower wings protruding from the north and south edges of the central structure. These wings have lower summits than the central structure, and it is not clear if they are contemporaneous with the central construction. McGovern's (2004:130) analysis of ceramics from LT6, located in Structure 6's northern wing, indicates a Late or Terminal Preclassic construction date for that wing. The southern wing of Structure 5 is 9.5 m wide, 5 m high, and extends 3.5 m from the central structure. The LT13 trench enters the southwest corner of Structure 5's southern wing diagonally at an angle of 52°E of mag N. This angle is important to understand when viewing the drawn north profile (Figure 4.4), which is based on a line oriented at that angle. At the end of the tunnel, LT13 takes a sharp left turn where the looters followed a preserved early platform wall encountered in their excavation. Only the north profile was drawn due to the size and complexity of this looters' trench and the parallel nature of the stratigraphy along the north and south profiles.

Inspection of LT13's profile provided more information about buried plaza floors than the structure, and, given this fact, it does appear as though the southern wing was constructed in a single episode. However, I did not identify any evidence of renovations to match the multiple construction phases of Structure 5's central structure identified by McGovern in LT5. Additionally, the trench appears to have entered at the corner of the building, so architectural features located in the north profile likely faced west, while features in the south profile likely faced south, forming the end of the southern wing. My best current guess is that the structure's façade was formed by two or three low terraces that connected the plaza to the platform surface. Only one terrace face was easily identified in the north profile.

Beneath Structure 5, a series of six plaza floors were identified, as well as an early platform facade that likely predates the construction of Structure 5's central structure. The early platform edge was plastered over and connected to a plaza floor. The façade was constructed of large, well-cut limestone blocks and is battered at a 12.5°angle. Because of this early platform edge, I may be able to correlate my sequence of plaza floors to those identified by McGovern in LT5. It is likely that this platform edge is the same as McGovern's Platform-Plaza Edge 2 (McGovern 2004:Figure 14), although this is uncertain. For now, absent absolute elevations, I will number and describe the plaza floors identified in LT13 based on my observations alone. The earliest plaster floor (Plaza Floor 6) abuts the masonry platform edge and wraps around the upper corner of the masonry platform, creating a continuous surface with the plaster on the facade of the platform edge. Plaza Floor 5 also does not extend to the furthest eastern edge of the tunnel. It terminates at a change in the underlying fill associated with the transition from Fill 2 to Fill 3 (see profile descriptions below). This may indicate that this floor was associated with an architectural feature destroyed during the construction of Plaza Floor 4. Each of the four later floors, Plaza Floors 1 to 4, can be seen as continuous surfaces running along the entire length of the trench below Structure

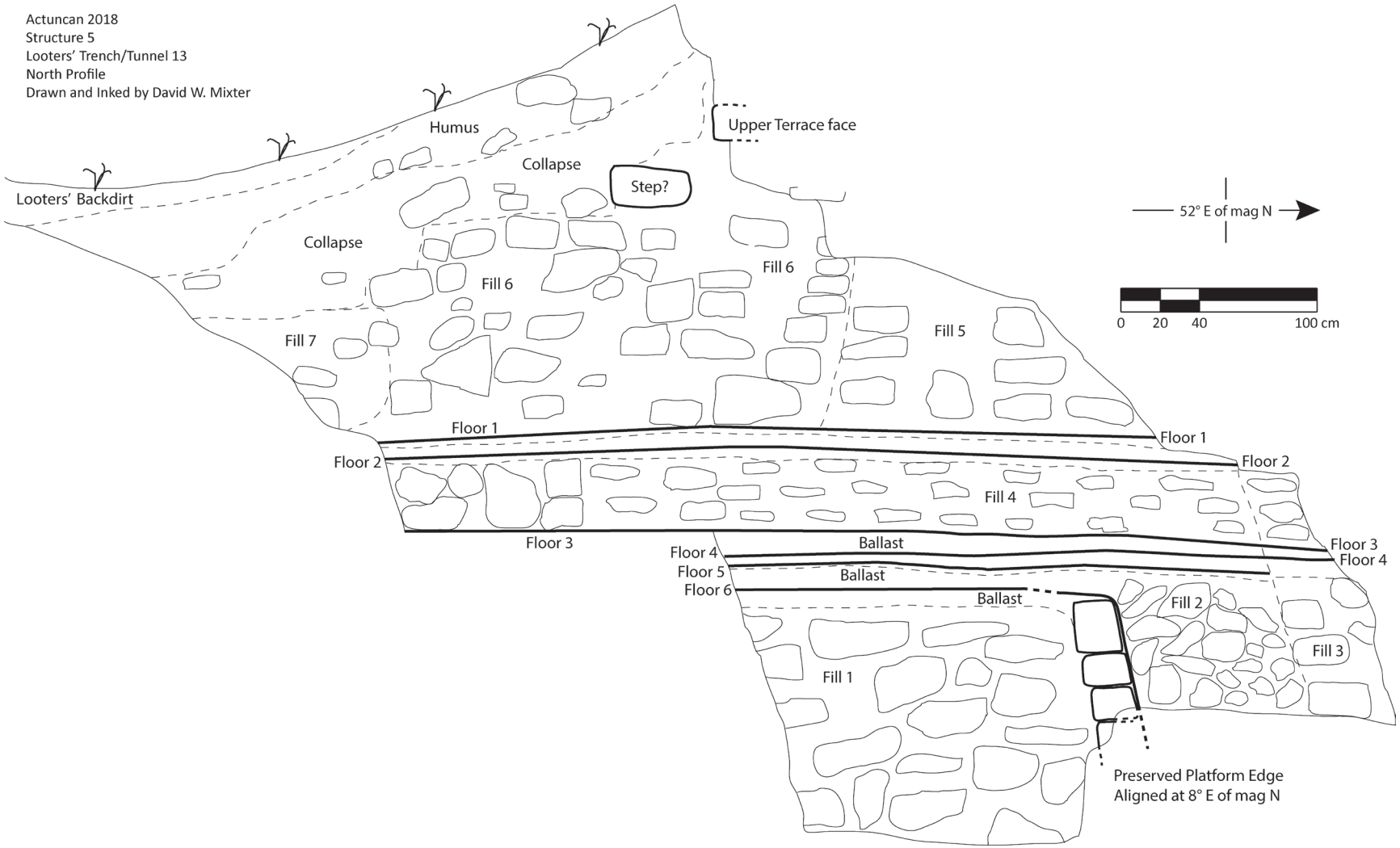


Figure 4.4. Profile of Looters' Trench 13 located on the south wing of Structure 5.

5's southern wing. None of them are associated with architecture, although Plaza Floor 1 served as the foundation for the southern wing's construction. It is likely that this is not the terminal version of the plaza floor. Later versions likely could be encountered in excavations further west of LT13's limits. My best guess is that Plaza Floors 1 and 2 from LT13 correspond to Plaza Floors 1b and 2 seen in the LT5 and LT12 profiles, described above.

Profile Descriptions
The descriptions below align with those identified in the excavation profile. The name of each strata is followed by a Munsell color reading and then a brief description.

1) *Humus*. 10YR 3/2. This layer is the dark zone of modern soil development located below looters' backdirt in the western part of the excavation unit.

2) *Looters' Backdirt*. 10YR 6/2. Identified by its mottled and mixed appearance, this sediment overlays the humus in the western edge of the excavation.

3) *Collapse*. 10YR 5/3 to 10YR 7/3. This stratum consists of collapsed material from the façade of Structure 5. It consists of a mix of large to medium-sized stones and dense clay loam matrix. The variation in color grades from top to bottom reflecting the on-going soil development in this B-horizon. The boundary between collapse and structure fill (Fills 6 and 7) is not clear. As a result, it is difficult to tell what the exterior of the building originally looked like.

4) *Fill 7*. 7.5YR 9.5/1. This fill layer is composed of a thick layer of wet-laid plaster with just a few stones. This layer may be the inside edge of a floor or architectural feature, perhaps the interior of a basal molding facing west. The location of the western edge of LT13 makes a determination difficult.

5) *Fill 6*. 10YR 8/1. This fill layer consists of larger uncut limestone chunks within a silty matrix. This is the fill of the terminal construction phase, and likely the fill of the terraces. The line between Fills 5 and 6 may mark the division between the central core of the Structure 5 wing, defined by a retaining wall, and the more finely crafted shapes of the outer terraces.

6) *Fill 5*. 10YR 6/2. This stratum is composed of a dense, dried-out clay-rich fill. Large similarly-sized uncut limestone chunks are carefully stacked at regular intervals within the matrix. Additionally, many small limestone chunks form orderly rows, likely associated with construction bins. This fill is the central fill of Structure 5's south wing. It is contained by a retaining wall of stacked roughly-cut limestone blocks near the modern entrance to the tunnel.

7) *Floor 1 and Ballast*. No Munsell reading, dry-laid ballast. Floor 1 is a well-preserved plaster floor composed of 5 to 6 cm of plaster located on the surface of a dry-laid chert cobble ballast that included broken limestone bits that are 2 to 5 cm in diameter. This was likely the plaza floor on which the southern wing of Structure 5 was constructed.

8) *Floor 2 and Ballast*. No Munsell reading, dry-laid ballast. This floor is directly below the ballast of Floor 1. The floor consists of 3 to 4 cm of plaster on a dry-laid river cobble ballast with stones measuring 2 to 8 cm in diameter. This floor is present in all parts of the trench and tunnel excavated to this depth.

9) *Fill 4*. 10YR 2/1. This stratum consists of uncut limestone fill stones laid flat in 3 regular rows set within a dense black clay matrix containing very small limestone inclusions. The stones are very large, up to 30 cm long. This seems to be a plaza fill below Plaza Floor 2.

10) *Floor 3 and Ballast*. No Munsell reading, dry-laid ballast. Floor 3 is a 3 to 5 cm thick plaster floor resting on a dry-laid fill. At the western end of the tunnel, the floor becomes denser, and the ballast is wet-laid rather than dry-laid. This ballast rests on Floor 4.

11) *Floor 4 and Ballast*. 7.5YR 9.5/1. This is the lowest plaza floor found in all parts of the trench/ tunnel. Floor 4 is a 4 to 7 cm thick wet-laid plaster. In contrast to the later floors, Floor 4 was not laid on a cobble ballast. Rather, a few flat stones up to 10 cm long are embedded in the plaster layer itself. The floor rests on Floor 5 in the western section of the trench and on Fill 3 to the east.

12) *Fill 3*. 10YR7/4. This fill is located only in the east end of the tunnel. It is a densely packed stratum of brown matrix with large limestone inclusions up to 30 cm in diameter. These inclusions are regularly spaced through the matrix, though not as neatly as in Fill 4. It is contained by a retaining wall of sorts that separates this fill from Fill 2. This fill is capped by Floor 4. Floor 5 does not continue far to the east and terminates at the retaining wall.

13) *Floor 5 and Ballast*. 7.5YR 9.5/2 and N 9.5/1. Floor 5 is a pinkish floor that runs from the western edge of the trench to the retaining wall that separate Fills 2 and 3. The floor consists of 3 layers: an upper pinkish layer that is polished plaster and 2 to 4 cm thick, a middle layer of white sascab that appears to be gritty, and a lower dry-laid ballast of 2 to 10 cm diameter stones. Floor 5 terminates at the retaining wall that separates Fills 2 and 3. At the north end of the tunnel, this floor continues over a layer of consolidated laminations of different colors of clay and plaster. It also runs over the destroyed bits of the platform wall found in this area (see below).

14) *Fill 2*. No Munsell reading, dry-laid fill. My understanding of Fill 2 was gleaned by looking at the south profile. It is made up of large, dry-laid chert cobbles up to 55 cm in size. Additionally, a small 1 to 5 cm ballast was identified at the top of this layer, under Floor 5. The looters followed this loose fill to the north, creating an auxiliary tunnel. This path was likely chosen because this loose fill is easy to remove. There is no indication that they found deposits that would cause them to turn north. This fill is packed against the face of the early platform described above, located west of the fill. A 2 m long segment of this wall is preserved in the auxiliary tunnel. Further to the north, the wall is broken. It must have been broken in antiquity based on the abrupt change from in the fill from the finished wall to a disorganized fill beyond. This breakage is also associated with a change in fill from loose cobbles to layers of consolidated fill in different colors. This platform destruction was done before the construction of Floors 1 to 5, which cover Fill 2, the broken platform edge, and the mottled fill further north.

15) *Floor 6 and Ballast*. No Munsell reading, dry-laid ballast. Floor 6 is the plaster plaza floor associated with the early platform façade. The plaster runs up the wall face and corners to form a flat floor that runs across the plaza. The ballast under the floor is 2 to 10 cm in diameter.

16) *Fill 1*. 10YR 5/2. Fill 1 is the earliest exposed fill stratum, located behind the platform edge and below Floor 6. It is composed of a very dense clay-rich matrix with flattened uncut limestone slabs laid in rough alignments. The stones are up to 30 cm in diameter. This fill is very similar in composition to Fill 5.

Looters' Trench 14

During the 2013 field season, excavations led by BrieAnna Langlie and I (Mixter and Langlie 2014) targeted low structures within Plaza A to test if they were constructed during the Terminal Classic period. In particular, Operation 41 targeted Structure 7, a long, linear building running roughly north

to south along the western side of the plaza. Analysis of pottery from Operation 41 determined that Structure 7 was Terminal Classic in date. Additionally, in a 1 m by 2 m portion of this 1 m by 10 m trench, penetrating excavations tested the underlying plaza floor, known as Peony Floor, to determine its date of construction. Initial ceramic determinations indicated that the final plaza surface was constructed during the Late Classic I ceramic phase and that this floor rested on Early Classic fill. These excavations terminated at the Camellia Floor in a restricted 1 m by 1 m space. Prior to the 2015 field season, the looters working in Plaza A removed our backfill from this deep portion of Operation 41 and continued digging directly down 96 cm below Camellia Floor within the rough width our excavation unit. They did expand the excavation approximately 20 cm to the west and approximately 90 cm to the east of our deepest excavation pit. Their excavations uncovered several distinct fill deposits and one additional earlier plaza floor, Lilac Floor. The profile (Figure 4.5) and strata descriptions below only focus on excavations at or below Peony Floor. Full descriptions of higher strata can be found in the report on the 2013 field season and my doctoral dissertation (Mixter and Langlie 2014; Mixter 2016).

Profile Descriptions

The descriptions below align with those identified in the excavation profile. The name of each strata is followed by a Munsell color reading and then a brief description.

1) *Peony Floor and Ballast*. 10YR 7/2. This is a thick plaster floor about 20 cm thick located directly under Structure 7. Peony floor has a thin layer of polished plaster approximately 1 cm thick above a thick layer of small stone ballast embedded in a wet-laid plaster. The stone ballast inclusions are 2 to 7 cm in diameter. This stratum rests on a large stone fill, Fill 1. This is the equivalent of Operation 41, Analytical Unit 14.

2) *Fill 1*. 10YR 6/1. This stratum is a large stone fill embedded in grey-brown sediment. The stones are largely limestone. The matrix is silty and packed with small limestone bits that are less than 1 cm in diameter. This fill rests on Camellia Floor. This is the equivalent of Operation 41, Analytical Unit 13.

3) *Camellia Floor and Ballast*. No Munsell reading, dry-laid ballast. Camellia Floor is a 3 cm thick layer of polished plaster poured over a 10 cm thick dry-laid stone ballast. The small stones that compose this ballast are 1 to 7 cm in diameter and are mostly limestone chunks. The only matrix between these ballast stones is some plaster that has dripped down from Camellia Floor above. This ballast rests on Fill 2.

4) *Fill 2*. 7.5YR 9.5/1. The dry-laid ballast under Camellia Floor rests on a wet-laid plaster fill with larger stone inclusions between 6 and 20 cm in diameter. The matrix of this plaza fill is pure plaster, and stone inclusions are mostly limestone chunks.

5) *Fill 3*. No Munsell reading, dry-laid fill. This stratum consists of dry-laid stone fill. The stones are 2 to 16 cm in diameter and are sorted so that the smallest stones are on top to create a stable base for Fill 2. The stones are a mix of limestone and chert.

6) *Lilac Floor and Ballast*. No Munsell reading, dry-laid ballast. Lilac Floor is a 5 to 10 cm thick plaster floor with a well-polished surface. The floor's plaster rests on a dry-laid limestone and chert cobble ballast. The ballast stones are 1 to 25 cm in diameter, though most are on the smaller end of that range.

7) *Fill 4*. 10YR 6/6. This stratum is a dense, thick, orange-brown clay fill containing large chert and limestone inclusions that are up to 26 cm long. The clay matrix also contains many small limestone flecks

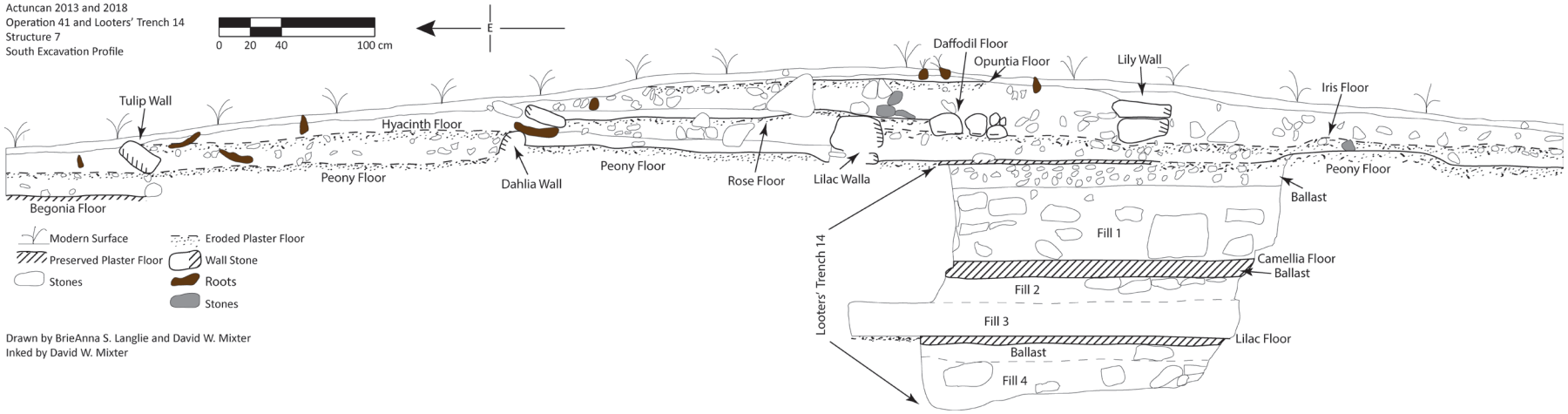


Figure 4.5. Profile of Operation 41 and Looters' Trench 14 located across Structure 7. After Mixter and Langlie 2014: Figure 3.3.

that are less than 1 cm in diameter. This fill resembles the clay often found in early strata under Actuncan North, especially beneath Plaza F and Structure 41 (Mixter 2012; Simova et al. 2018).

Conclusions

This chapter provides a report on ongoing efforts to document the looters' trenches located around Plaza A. The most significant finding was the documentation of 11 separate construction phases of Structure 4, far more than the 5 phases previously known. This quantity of renovations speaks to the importance and longevity of Actuncan as an early ritual and political center. These provide us data to build hypotheses regarding the arrangement of early architecture within Actuncan South that will guide future research. Future research aims to collect radiocarbon samples from these strata to create a Bayesian modelled chronology of the construction phases. Additionally, this research increases our understanding of Structure 5's architecture by locating the southern balustrade and determining that the southern wing of the building likely had only a single construction phase. Finally, research in Looter's Trench 14 under Structure 7 revealed an early plaza floor that had not previously been documented by the Actuncan Archaeological Project.

Works Cited

Donohue, Luke
2014 Excavations at Structures 26 and 27 in Actuncan's E-Group. In *Actuncan Early Classic Maya Project: Report of the Sixth Season*, edited by Lisa J. LeCount, pp. 131-153. On file at the Belize Institute of Archaeology, Belmopan.

Doyle, James A.
2017 *Architecture and the Origins of Preclassic Maya Politics*. Cambridge University Press, Cambridge.

Estrada-Belli, Francisco
2011 *The First Maya Civilization: Ritual and Power before the Classic Period*. Routledge, New York.

Fahsen, Federico, and Nikolai Grube
2005 The Origins of Maya Writing. In *Lords of Creation: The Origins of Sacred Maya Kingship*, edited by Viginia M. Fields and Dorie Reents-Budet, pp. 75-79. Los Angeles County Museum of Art and Scala Publishers, Los Angeles and London.

Freidel, David A.
2018 Maya and the Idea of Empire. In *Pathways to Complexity: A View from the Maya Lowlands*, edited by M. Kathryn Brown and George J. Bey, III, pp. 363-386. University Press of Florida, Gainesville.

Freidel, David A., Arlen F. Chase, Anne S. Dowd, and Jerry Murdock (editors)
2017 *Maya E Groups: Calendars, Astronomy, and Urbanism in the Early Lowlands*. University Press of Florida, Gainesville.

Gann, Thomas W. F.
1925 *Mystery Cities: Exploration and Adventure in Lubaantun*. Charles Scribner's Sons, New York.

Hansen, Richard D.
1998 Continuity and Disjunction: The Pre-Classic Antecedents of Classic Maya Architecture. In *Function and Meaning in Classic Maya Architecture*, edited by Stephen D. Houston, pp. 49-122. Dumbarton Oaks Research Library and Collection, Washington, D.C.

LeCount, Lisa J., John H. Blitz, and Rebecca Scopa Kelso
2005 *Actuncan Early Classic Project: Report of the Second Season*. On file at the Belize Institute of Archaeology, Belmopan.

LeCount, Lisa J., David W. Mixter, and Borislava S. Simova
2017 Preliminary Thoughts on Ceramic and Radiocarbon Data from Actuncan's E-Group Excavations. In

Actuncan Early Classic Maya Project: Report of the Ninth Season, edited by Lisa J. LeCount, pp. 27-48. On file at the Belize Institute of Archaeology, Belmopan.

McGovern, James O.

1992 1992 Study of Actuncan (Cahal Xux). In *Xunantunich Archaeological Project: 1992 Field Season*, edited by Richard M. Leventhal, pp. 74-83. On file at the Belize Institute of Archaeology, Belmopan.

1993 Survey and Excavation at Actuncan. In *Xunantunich Archaeological Project: 1993 Field Season*, edited by Richard M. Leventhal, pp. 100-127. On file at the Belize Institute of Archaeology, Belmopan.

1994 Actuncan, Belize: The 1994 Excavation Season. In *Xunantunich Archaeological Project: 1994 Field Season*, edited by Richard M. Leventhal and Wendy Ashmore, pp. 108-122. On file at the Belize Institute of Archaeology, Belmopan.

2004 Monumental Ceremonial Architecture and Political Autonomy at the Ancient Maya City of Actuncan, Belize. Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Los Angeles.

Mixter, David W.

2012 The 2011 Excavations at Structures 40 and 41. In *Actuncan Early Classic Maya Project: Report of the Fourth Season*, edited by Lisa J. LeCount and John H. Blitz, pp. 61-138. On file at the Belize Institute of Archaeology, Belmopan.

2016 Surviving Collapse: Collective Memory and Political Reorganization at Actuncan, Belize. Unpublished Ph.D. dissertation, Department of Anthropology, Washington University, St. Louis, Missouri.

2018 The 2017 Field Season and Future Research Directions at Actuncan. In *Actuncan Early Classic Maya Project: Report of the Tenth Season*, edited by David W. Mixter and Lisa J. LeCount, pp. 1-10. On file at the Belize Institute of Archaeology, Belmopan.

Mixter, David W., and Carolyn Freiwald

2013 Excavations at Group 8. In *Actuncan Early Classic Maya Project: Report of the Fifth Season*, edited by Lisa J. LeCount, pp. 35-79. On file at the Belize Institute of Archaeology, Belmopan.

Mixter, David W., and BrieAnna S. Langlie

2014 The 2013 Excavations in Plaza A. In *Actuncan Early Classic Maya Project: Report of the Sixth Season*, edited by Lisa J. LeCount, pp. 27-47. On file at the Belize Institute of Archaeology, Belmopan.

Saturno, William A., Franco D. Rossi, and Boris Beltrán

2018 Changing Stages: Royal Legitimacy and the Architectural Development of the Pinturas Complex at San Bartolo, Guatemala. In *Pathways to Complexity: A View from the Maya Lowlands*, edited by M. Kathryn Brown and George J. Bey, III, pp. 315-335. University Press of Florida, Gainesville.

Simova, Borislava S.

2018 Ritual Spaces and Social Integration: Trench Excavations in E-Group Plaza, Plaza F. In *Actuncan Archaeological Project: Report of the Tenth Season*, edited by David W. Mixter and Lisa J. LeCount, pp. 49-69. On file at the Belize Institute of Archaeology, Belmopan.

Simova, Borislava S., and David W. Mixter

2016 On-Going Excavations at Structure 26 in Actuncan's E-Group. In *Actuncan Archaeological Project: Report of the Eight Season*, edited by Lisa J. LeCount and David W. Mixter, pp. 9-39. On file at the Belize Institute of Archaeology, Belmopan.

Simova, Borislava S., E. Christian Wells, David W. Mixter, and Lisa J. LeCount

2018 Exploring Changes in Activities in Maya E-Groups: Archaeological and Geochemical Analysis of E-Group Plaster Floors at Actuncan, Belize. *Research Reports in Belizean Archaeology* 15:27-37.

Szymański, Jan

2014 Between Death and Divinity: Rethinking the Significance of Triadic Groups in Ancient Maya Culture. *Estudios de Cultura Maya* 44:119-166.

Velásquez Fergusson, Laura

2014 El Patrón Triádico En El Contexto Urbano E Ideológico De Los Antiguos Asentamientos Mayas. *Estudios de Cultura Maya* 43:11-40.

Appendix 4.A.

Table 4.A.1. Inventory looters' trenches/tunnels identified at Actuncan.

Inventory Number	Structure numbers	Location	References	Conservation Notes
LT1	1 and 4	West side, slot trench penetrating to the east.	McGovern 1992, 1994, 2004	
LT2	4	On centerline of north side at base of staircase. Tunnel heading south.	McGovern 1992, 1994, 2004	
LT3	4	Cuts through eastern balustrade of central staircase.	McGovern 1992, 1994, 2004	Backfilled.
LT4	1 and 4	Centerline at Structure 4 summit. Tunnel heads beneath Structure 1.	McGovern 1992, 1994, 2004	Partially backfilled.
LT5	5	Trench through north balustrade and much of the structure's center.	McGovern 1992, 1994, 2004	
LT6	6	Trench into north end of structure running South.	McGovern 1992, 1994, 2004	
LT7	12	Trench into west side of the structure, near the southern end.	McGovern 1994, 2004	
LT8	20	Excavated into the edge of ongoing scientific excavations in 2004	LeCount et al. 2005	Backfilled.
LT9	22	Pit in center of mound. Excavated around in Spring 2012	Mixter and Freiwald 2013	Backfilled.
LT10	2	Diagonal trench running NW to SE	McGovern 1992, 2004	
LT11	3	Diagonal trench running NE to SW	McGovern 1992, 2004	
LT12	5	Pit located along South Balustrade		
LT13	5	Trench and tunnel running east located along the south end of the structure		
LT14	7	East-west oriented trench located along southern end of structure. Re-excavation and continuation of AAP Operation 41.		
LT15	4	Trench into west side of structure.	McGovern 1992	
LT16	6	Summit excavation. Has a crater-like shape and is likely the remains of Thomas Gann's excavations	Gann 1925:88; McGovern 1992	
LT17	15	Summit excavation. Has a crater-like shape and may be the remains of a Thomas Gann excavation	McGovern 1993	