3 EXPLORING CHANGES IN ACTIVITIES IN MAYA E-GROUPS: ARCHAEOLOGICAL AND GEOCHEMICAL ANALYSIS OF E-GROUP PLASTER FLOORS AT ACTUNCAN, BELIZE

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E-Groups were among the first monumental spaces constructed in Preclassic Maya centers and served as important venues for negotiating social interactions and political integration among newly settled peoples. The activities and beliefs associated with these ritual complexes were integral in shaping Preclassic societies and later reorganizing them in the Classic period. Because Preclassic E-Groups persisted on the landscape over long periods of time, understanding the structure of and changes in activities occurring within them becomes critical for understanding large-scale change in not only ideology, but also social and political practice. Geochemical analysis of occupation surfaces offers a means for supplementing data from punctuated archaeological remains with microscopic residues from recurring or cyclical ritual activity occurring within such complexes. In this chapter, we present archaeological and geochemical data from five sequential occupation surfaces from an E-Group complex at the site of Actuncan, Belize, spanning the Late and Terminal Preclassic Periods (300 BC-AD 250). Results indicate persistent use of food and drink in conjunction with intermittent symbolic deposits, which, though showing gradual shifts over time, did not give way to exclusionary displays of authority.

Introduction

Ritual served a vital function in the construction of both public and private spaces across the Maya Lowlands. We come to understand the role of ritual in the past through architectural elaborations, burials, and monuments, which demonstrate substantial labor and material investment. However, constructions of ritual buildings, caches, and monuments were often large-scale and intermittent, commemorating calendrical cycles or important events. Their presence in the archaeological record not only indicates gatherings and performances occurring in conjunction with such events, but also a myriad of other ritual practices known to occur from ethnographic and ethnohistoric accounts. However, these generally involve the use of perishable structures and goods, burning, prayer and processions, all of which are difficult to examine archaeologically. As ritual complexes, such as Preclassic E-Groups, persist on the landscape over long periods of time, the shifts in activities occurring within them become critical for understanding large scale change in not only ideology, but also social and political practice. In this paper, we use geochemical analysis to supplement archaeological data on ritual activity within the E-Group complex at the site of Actuncan, Belize.

E-Groups have a long history of investigation in the Maya archaeology. Their iconic form with an eastern range structure and western radial pyramid, first systematically examined at the site of Uaxactun, is ubiquitous throughout the Lowlands. Recent research demonstrates their connections to the origins of social complexity in the Maya Lowlands, ca. 1000 B.C. to 800 B.C. (Estrada-Belli 2011; Inomata et al. 2013; Freidel et al. 2017). Many are also linked to shifts in sociopolitical organization in the Classic period, as the ritual spaces were appropriated for political display in the form of carved monuments and royal burials (Freidel and Schele 1988; Aimers and Rice 2006). Although many aspects of the architecture and deposits found within them point to the ritual functions of E-Groups (e.g., Aveni and Hartung 1989; Aveni et al. 2003; Estrada-Belli 2012; Aoyama et al. 2017), little direct evidence of activity has been recovered from these complexes. Bridging the gap between foundational caches and royal burials using more direct proxies of recurring activities will allow researchers to more explicitly link the changing uses and meanings of this pervasive and important complex to sociopolitical shifts occurring at many sites across the Lowlands.

Geochemical analysis offers a means for supplementing understanding of punctuated archaeological remains with that of repetitive, or cyclical ritual activity occurring within such complexes. Over time, occupation surfaces accumulate trace amounts of chemicals from

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activities such as food processing, burning, and even storage of certain materials. With repetitive occurrence, these residues are more likely to preserve at detectable levels over long periods of time (Middleton and Price 1996). Multi-elemental characterization of floors allows us to examine the use of space even in the absence of artifacts. In this chapter, we present results from the geochemical analysis of five plaster floors form the Actuncan E-Group, in conjunction with architectural and artifact data. When taken together, these analytic techniques improve our detection and understanding of prehistoric activity, allowing us to address recurring performance within the complex and relate it to ideological and political shifts occurring in the Preclassic period.

Actuncan's E-Group in Context

Actuncan is a ridgetop site, located on the bank of the Mopan River, in western Belize (Figure 1). It was originally occupied around 1000 B.C. and abandoned in the Early Postclassic period (A.D. 1000-1250) (McGovern 2004; LeCount and Blitz 2001, 2012; LeCount and Keller 2011; LeCount 2013). Many of its key ceremonial and civic structures, including the triadic group of Actuncan South and the E-Group of Actuncan North, were established in the Preclassic period (Figure 2). These architectural features, as well as large stucco masks and a carved stela, suggest the adoption of divine kingship at the site during the Terminal Preclassic Period (100 B.C. - A.D. 300). In the Terminal Postclassic period (A.D. 780-1000), following the decline of Classic kingship in the Lowlands, local power at the site was re-centered through the construction of a new civic center and resignification of long-lived buildings (Mixter et al. 2014, LeCount et al. 2011, Simova et al. 2014).

The Preclassic E-Group, located on the northwest ridge of the Actuncan site core, was among the earliest structures established at the site. Comprised of an elongated eastern platform and western radial pyramid flanking a plaza, the E-Group remained in use into the Early Classic period (A.D. 300-600) and served as the site of ritual commemoration in the Late Classic (Donohue 2014). Current understandings of its construction and

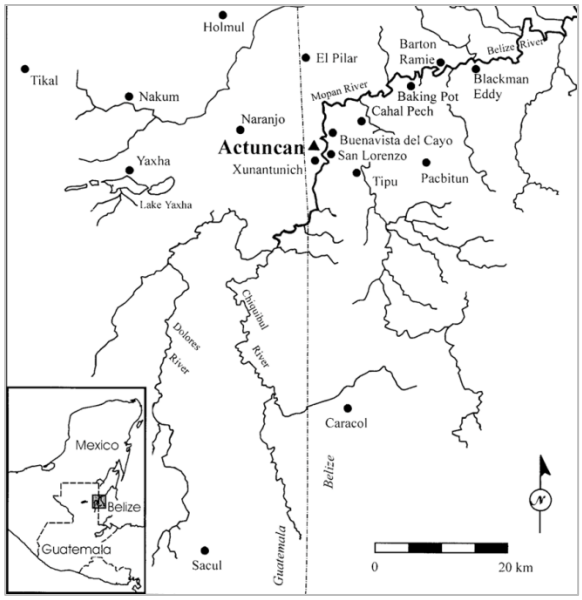

Figure 1. Location of Actuncan within the Eastern Maya Lowlands (LeCount 2004: Figure 1).

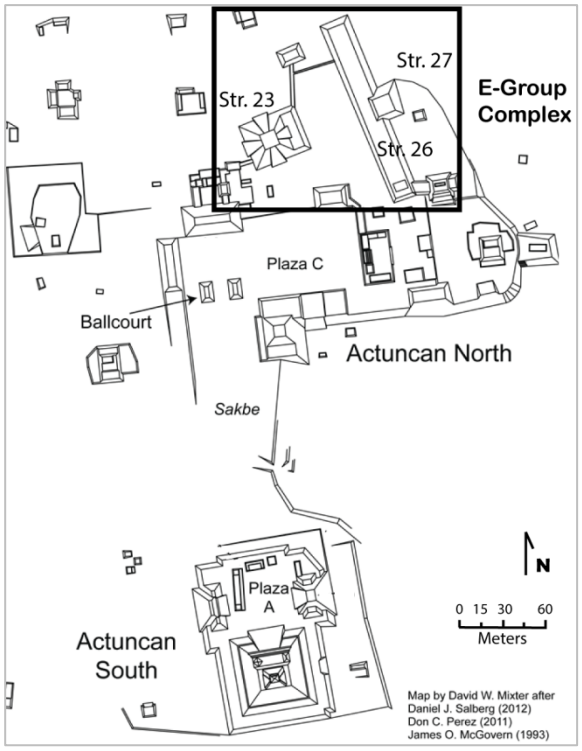

Figure 2. Map of Actuncan site core highlighting location of the E-Group complex.

occupation history closely align with interpretations of E-Groups as places of communal, integrative rituals (Chase and Chase 1995; Aimers and Rice 2006).

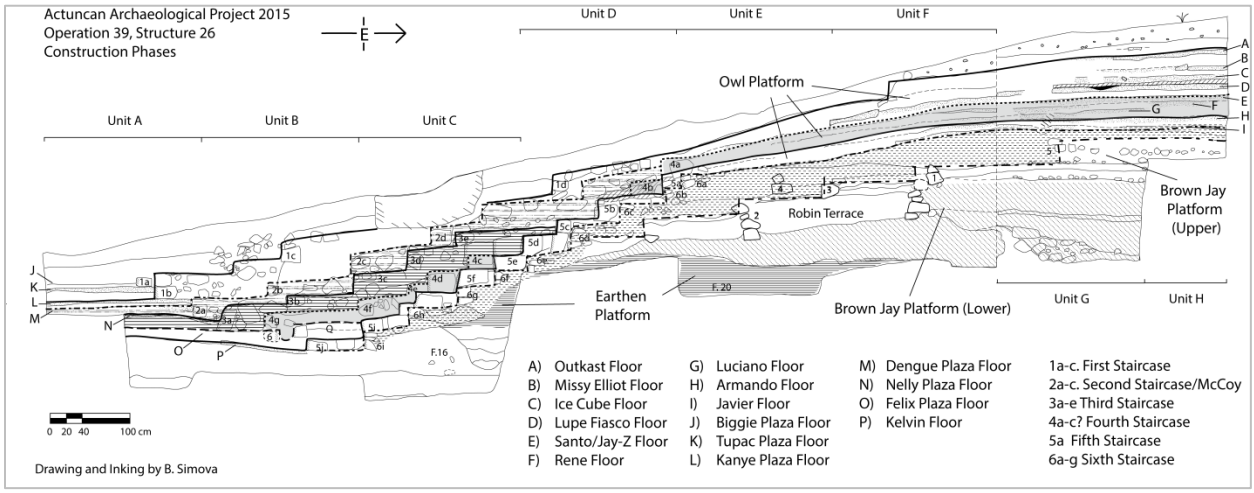

Figure 3. North Profile of Str. 26 with labeled construction phases and floors.

E-Groups have a long history of investigation in the Maya Lowlands. Early discussions of activities within E-Group largely focused on its functions as a solar observatory (Laporte and Fialko 1990, 1995; Aveni and Hartung 1989; Aveni et al. 2003). From these observations, the link was drawn to celebrations of agricultural cycles (Aimers 1993, Stanton and Fridel 2003). Recently, greater attention has been given to the early emergence of the complex, associating it with the Middle Preclassic to Late Preclassic transition (ca. 1000 – 800 B.C.) and the emergence of many markers of Maya social and political complexity. In this light, E-Groups have been discussed in relation to placemaking-activities, community-building, and new patterns in interregional interactions and sedentism (Estrada-Belli 2011, 2012; Inomata et al. 2015, 2017).

Both integrative and exclusionary practices appear central to the interpretation of these spaces. Their ability to unite dispersed populations (Estrada-Belli 2012) is often intertwined with the strategic manipulation of valuable materials and labor. Given Classic period patterns, it is not surprising that many scholars attribute activities of emerging elites to the early E-Groups (e.g., Aoyama et al. 2017; Rice 2015). Excavations within the eastern platform of Actuncan's E-group lend evidence to suggest a different trajectory, one where the communal liturgical functions persist throughout the history of the E-Group. In cases such as this, apparent similarities in Preclassic activities must be interrogated more closely to determine where critical differences alter the meanings and activities of the E-Group complex in the Classic period.

While there is a consensus E-Groups formed an important ritual space, critical to the creation of Preclassic communities, a clearer understanding of the specific nature of ritual activities that occurred within them is necessary. To supplement traditional archaeological evidence of ritual, and further understand the kinds of activities that occurred at Actuncan's E-Group and how they might have changed through time, we conducted geochemical analysis of five sequential occupation surfaces on the summit of the eastern range structure. But before moving into the chemical analysis, I will provide an overview of the construction history of the E-Group complex, based on two seasons of excavations into the eastern platform (Str. 26), its central shrine (Str. 27), and the western radial structure (Str. 23).

Construction Phases

Excavations in the Eastern platform revealed three distinct phases of construction, beginning with a Cunil Earthen platform (Str. 26-sub-2), a Late Preclassic clay and cobble platform (Str. 26-sub-1), named Brown Jay Platform, and a Terminal Preclassic masonry platform (Str. 26), named Owl Platform (Figure 3). A Bayesian model incorporating nine

radiocarbon dates, LeCount's ceramic seriation work, and the structure stratigraphy have provided a better understanding of the timing of these constructions (see LeCount et al. 2017). Mixter's work with Bayesian modeling has helped narrow down the dates of construction events on the range structure and additionally provided some interesting conclusions about the timing and pace of construction.

The most unusual aspect of the complex is the Earthen Mound, (Str 26-sub-2) below the range structure. It consists of about a half meter of redeposited clay with artifacts. We located a foundational cache of Cunil ceramics with remnants of burning within the mound, dating to ca. 1000 B.C. Given the limited exposure of the construction, we cannot ascertain the form of the mound, whether it was circular, pyramidal, or elongated like later versions of Structure 26. What it does indicate is an early occupation and significance of this ridgetop location to Middle Preclassic populations at the site.

The Cunil Earthen Mound was partially buried under a large cobble fill, which appears to have extended the ridgetop to the east prior to the next construction. The subsequent Late Preclassic Brown Jay Platform (Str. 26-sub-1) has a central platform constructed out of brown clay with occasional yellow clay lenses, fronted by small cobble walls (Figure 4). The platform was raised, a series of small terraces were added to its western façade, and unusual linear cobble features were constructed on its summit in the second phase of this construction. A potential third phase was likely also present, burying this architecture, but later constructions appear to have cut into its terraces, leaving only the brown clay with yellow lenses.

The subsequent Owl Platform (Str. 26) represents a substantial shift in architectural techniques and style occurring in the Terminal Preclassic period. It features six masonry staircase constructions and nine summit plaster floors, whose constructions span from about 200 B.C. to A.D. 260 based on constrained Bayesian modelled dates (LeCount et al. 2017). However, plaza modifications at the base of the structure continued into the Early Classic. During this time frame, we see shifts in the style of architecture and substantial reworking of the platform, particularly in the staircase. Rather

Figure 4. Central Platform of Brown Jay (Structure 26-sub-1-1st).

Figure 5. Central Staircase of Owl Platform (left: Str. 26-6th, right: Str. 26-4th).

than burying previous steps to expand the size of the structure and build fresh, sections of the existing staircases appear to be added on to, cut into, and even reused. In the earliest staircase, the stonework is consistent, making use of small dressed limestone blocks. Over time, stone size becomes variable and more, larger blocks begin to be incorporated into the construction (Figure 5). We also have some indication of a shift in the pace of construction of the summit floors. Using the difference function on the Bayseian model constructed in OxCal 4.2 (Bronk Ramsey 2009), Mixter indicates that 5 to 110 years passed between the construction of the first six summit floors, for an average of 1 to 22 years between floor constructions. In contrast, the last three summit floors were built over a period of 215 to 441 years, for an average of one floor built every 72 to 147 years. Our chemical analysis of activity areas is currently limited to five of the first six summit floors of the

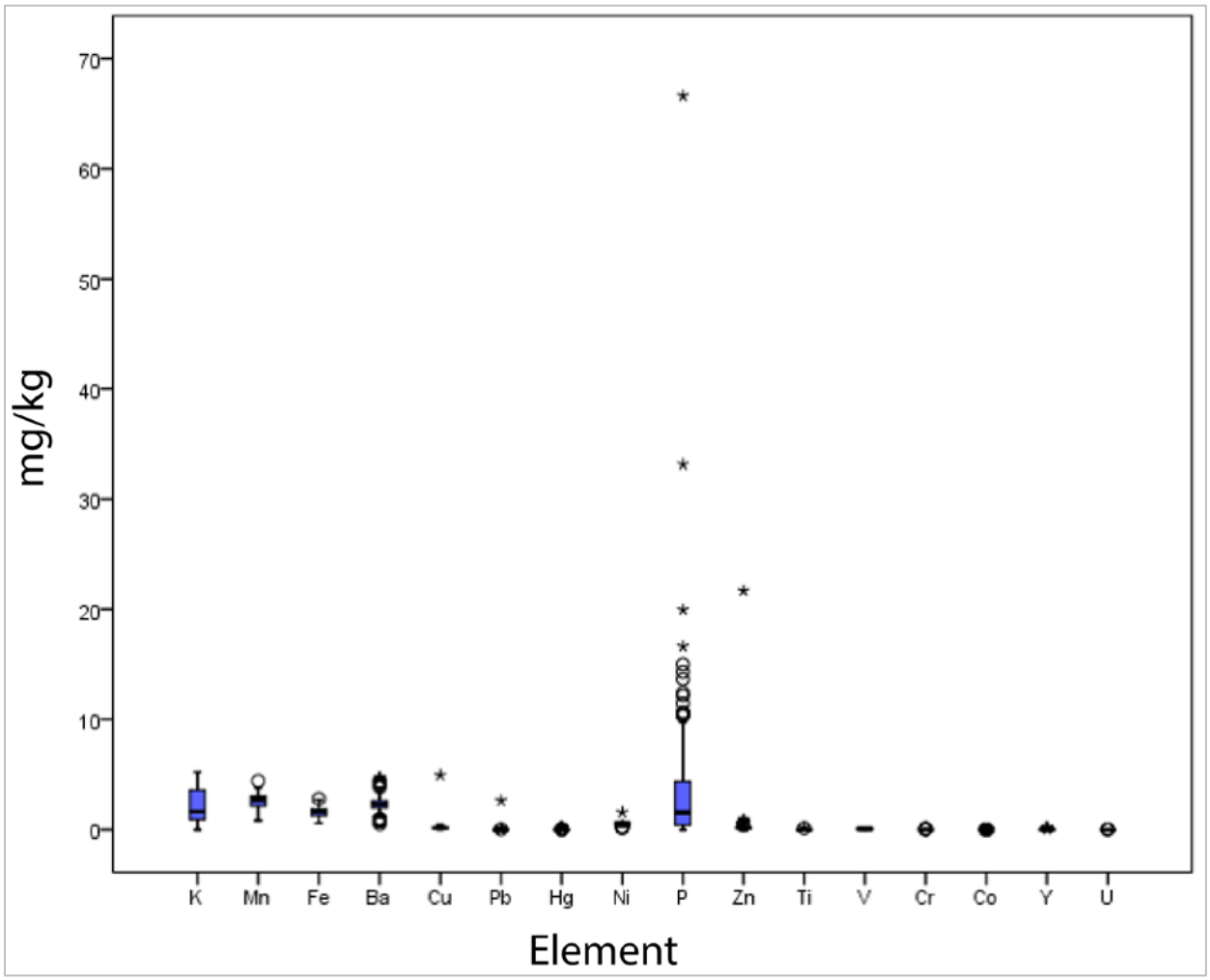

Figure 6. Boxplot comparing concentrations (mg/kg) of 16 elements from the Str. 26 Floors.

Terminal Preclassic Owl Platform, prior to the shift in pace of construction. Simova's 2017 excavations in the E-Group plaza worked to augment this sample size and provide a basis for understanding how different parts of the complex were used. For the time being, these five floors help us target an important period during which the complex was actively used and consistently modified.

Geochemical Analysis of Late Preclassic Floors Platform Floors

Multi-elemental analysis of inorganic residues preserved within constructed floors have been increasingly used to study activities within prehistoric settlements (Middleton and Price 1996; Wells et al. 2000; Terry et al. 2004; Hutson and Terry 2006; LeCount et al. 2016). Lime plaster, used to construct the platform floors of Structure 26, traps and preserves a variety of chemical compounds over very long periods, and so is ideal for studying chemical residues of ancient activities. For this study, we collected point samples along the exposed plaster surfaces in 50 cm intervals using a staggered lattice design (see Wells 2010). They were processed and analyzed using Inductively-Coupled Plasma Mass Spectrometry (ICP-MS) at the University of South Florida following protocols developed by Christian Wells. The calibrated concentrations of 21 elements were determined, and the data show less than five percent variation on the U.S. National Institute of Standards and Technology Certified Reference Material (NIST CRM) standards and internal quality control blanks. While we

collected data on 21 elements, we did not consider calcium (Ca), magnesium (Mg), strontium (Sr), and aluminum (Al), as variation among these elements represent the natural limestone-derived matrix. Surprisingly, the only element among the remaining 17 elements to show any anthropogenic variation was phosphorus (P) (Figure 6).

Geochemical and Archaeological Evidence of Prehistoric Activity

The architectural setting of the range structure, overall, suggests a limited set of activities should be present. For instance, generalized signatures from biological debris (e.g., skin and oils) and detritus from feet and clothing (Middleton and Price 1996) should not be present to the same degree as in a domestic area, such as a house patio. Food preparation, marked by manganese (Mn), potassium (K), sodium (Na), and Mg, is also unlikely to occur on the platform centerline. Occurrence of a delimited set of activities is well supported by the lack of anthropogenically enriched element concentrations, besides P. However, this signature also limits the range of ritual practices which could have occurred within the platform. For instance, lack of K, Mg, and Na, also suggest a lack of ritual burning in this location (Heidenreich et al. 1971, Middleton and Price 1996). This is not to say that fire, known to be an important component of ritual from epigraphic and ethnographic evidence is entirely absent, but could suggest that it is occurring in smaller manifestations, perhaps within censors, which are more easily contained and removed from the floors, or alternatively burning could be occurring within other areas of the complex, like the plaza. Additionally, the lack of iron (Fe) and other transitional metals (Ti, Ni, Cu, Zn), suggest that pigments such as hematite and ochre, which were important to ritual display and craft production, were also not present in sufficient quantities, if at all, to leave a signature.

Figure 7 presents results from the spatial analysis of P signatures across the sampled floors. Concentrations of P are expressed as parts per million, or mg element/kg matrix (mg/kg). The P signatures suggest the deposition of organic materials, which contain

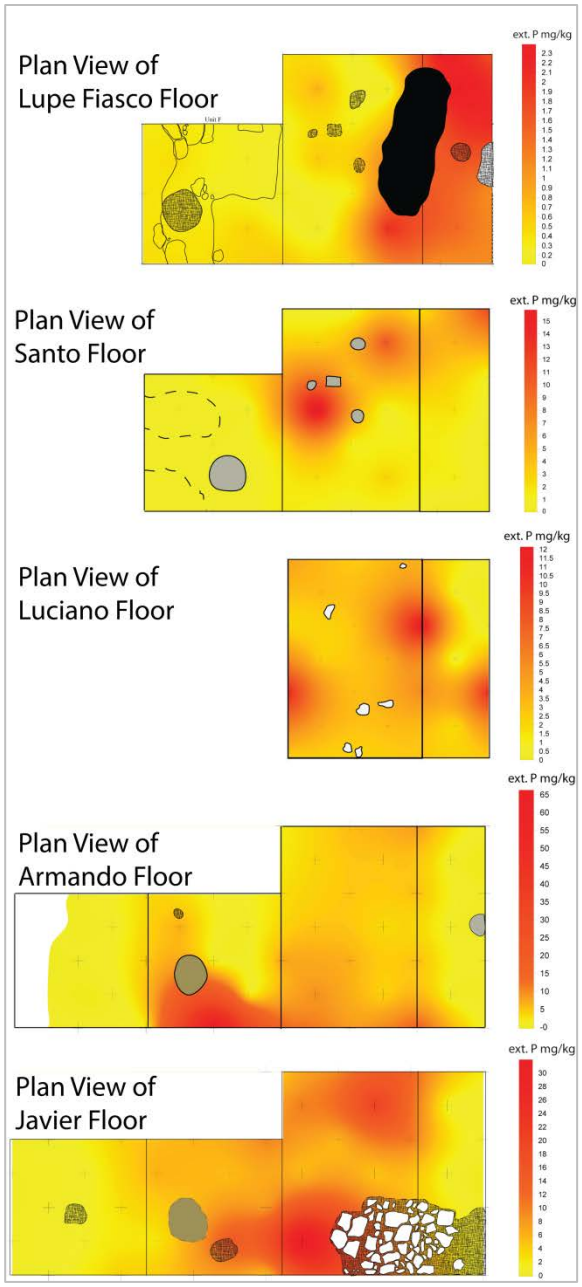

Figure 7. Kriged image map of the interpolated distribution of P across five floors from Str. 26. Floors are arranged in stratigraphic order.

phosphates. These findings are consistent with what we would expect to find if food and drink were present. The earliest constructed floors of the sample, Javier and Armando, had the highest concentration of P, with values as high as 32 and 65 mg/kg respectively. The last constructed floor, Lupe Fiasco, conversely, had the lowest concentration, with highest values under 3 mg/kg. The spatial distribution of P signatures

Figure 8. Artifacts recovered from features on Javier Floor (top left: Aguacate Orange Jar, top right: Old River Unslipped Jar, left: Striated dish).

varied from floor to floor, suggesting that vertical contamination between superimposed floors was unlikely.

The earliest plaster floor we analyzed, Javier Floor, was in use between 195 and 105 BC. During excavations, we exposed a roughly constructed pavement of stones, possibly a constructed altar feature, in the southeast portion of the trench. It was associated with a pile of jute, or freshwater snails often consumed by the Maya of this region, and a cached, striated brown dish (Figure 8). Additionally, a pit feature in the western portion of the floor yielded several large, fragmented jars, partially refit in the lab. The elevated P signature complements this emphasis on food and drink in the archaeological record and shows a broader dispersion of food-related activity across this area than we see in subsequent floors. This could be an indication of longer period of use of this floor or higher intensity of activity accompanying the initial construction of the Owl Platform.

On the next constructed floor, Armando Floor, we observed few archaeological indicators activity. Features outlined in Figure 7 show one small posthole and two bases of postholes from later constructions. Artifact indicators of activity in direct association with the floor are also lacking. However, the chemical signatures reveal substantial anthropogenic enrichment of the plaster floor. Armando Floor has the highest level of phosphorous among the sampled floors, suggesting there was continued emphasis on food and/or use of other organic materials in this phase of the E-Group. It can be difficult to determine spatial patterning from the limited exposure of all the floors, but activity here does appear concentrated to the south, aligning with the earlier stone pavement or altar. This suggests a persistent organization of activity within the architectural space.

In the next two floors, Luciano and Santo Floor, we see a similar lack of archaeological features and artifacts associated with the surfaces. In these two phases, the organic signatures persist in lower concentrations (12 and 15.5 mg/kg), but appear more spatially constrained. The “hotspots” of activity revealed in Figure 7 suggest more discreet deposition areas of organic material in comparison to earlier floors.

In the last sampled plaster floor, Lupe Fiasco Floor, we again have greater archaeological evidence of ritual activities, particularly with the placement of a burial on the structure. This floor was in use between 145 to 50 BC, with three additional floors constructed above it. Unlike Javier Floor, there were no in situ artifacts indicative of food or drink, however we exposed a number of postholes of varying sizes across its surface. Due to the limited lateral exposure of the excavations, we were unable to discern a clear pattern in the placement of the postholes, but suggest that they represent ritual activity occurring on the platform. In the nearby site of Xunantunich, Brown (2017) has identified similar clusters of postholes with remnants of wooden beams, suggesting that perishable scaffolds or altars were repeatedly erected in front of structures.

Discussion

Phosphorus, derived from phosphates in organic materials, has long been recognized as an indicator of human activity, but in many studies, correlates with increased concentrations of other elements, as well. The lack of other anthropogenically enriched concentrations of elements was also unique in comparison with previous geochemical studies in other contexts within Actuncan. As a point of comparison, Fulton’s (2015) dissertation work examining Terminal Classic Period residential areas in Actuncan North, found a variety of signatures suggesting generalized use of open spaces between house groups and heightened activity

surrounding houses. These domestic contexts demonstrated enriched levels in P, K, Mn, and Fe, among others. LeCount and colleagues (2016) work on an elite administrative structure also found a variety of signatures, but in more spatially discrete arrangements, pointing to specialized functions of the various rooms and shifts in their functions over time. Differences in the construction of floors and degree of weathering between interior and exterior spaces could partially contribute to these differences (see Middleton and Price 1996), but the pattern remains highly unusual.

Given existing perceptions of the E-Group as a special-function complex, perhaps we should be more surprised that any chemical signatures are present at all, rather than the platform presenting a clean stage for observations and periodic ritual performance or displays. However, it should be noted that while the strength of the signatures is not directly related to the duration and intensity of activity, they do tend to represent repetitive activity which is more likely to allow for the accumulation of inorganic elements in the plaster. Food and drink were and continue to be important components of many celebratory, ritual, and political gatherings.

The discrepancies in the signatures produced by food processing and consumption in domestic and public contexts observed here prompt us to more specifically examine the channels through which food was introduced into the archaeological record. In this vein, the differences in the early Javier and later Lupe Fiasco Floor are particularly interesting. Baysian modeling suggests that the two floors were in use over similarly long spans of time, yet Javier Floor demonstrated much higher concentrations of phosphate within its matrix. Several possibilities may explain this discrepancy, among them intensity of use and changing patterns in maintenance and use of space. Javier Floor was the first floor of the Owl Platform (Str. 26), inaugurating a new, distinct construction. As such, it may have borne greater activity, allowing for more accumulation of residues. Conversely, Lupe Fiasco Floor was the last in a relatively rapid set of modifications, after which floor constructions slowed greatly. Whereas Javier Floor may have been associated with a revitalization of the complex, Lupe Fiasco may have been associated with its declining role in the community. Another intriguing possibility is suggested by the increased presence of postholes, possibly indicative of perishable altars. Perhaps the weaker chemical signature is due to a greater reliance on constructed altars for the display of food and other offerings, which could then be more fully cleared away, but not without some spills and overflows. Continued excavations within the complex are needed to provide support for these scenarios, but in either scenario, important shifts in ritual and sociopolitical practice appear to be reflected in the archaeological and geochemical markers of activity within the E-Group.

Because there are many cultural and natural factors affecting site formation processes, we cannot fully rule out the possibility that any food consumption and offerings suggested by the P signatures were accompanied by other kinds of activities which left no residues or were quickly swept or washed away by rains. However, the lack of other signatures does suggest certain trends in the use of the structure when examined in relation to other archaeological, epigraphic and ethnographic data on Maya ritual.

Conclusions

Investigation of the eastern platform of Actuncan's E-Group demonstrate the utility of geochemical analysis in situating archaeological data from intermittent construction and special-purpose deposits within ongoing, repetitive activities. Through this approach, we are better able to identify potential shifts in practice that underlie broader ideological, social, and political change within the site.

The construction history of the platform demonstrates an early and persistent importance of this location within the site. The use of the E-Group arrangement further points to certain shared practices and ideologies among Lowland populations. However, shifts in architectural styles over time make it clear that the space was amenable to change as the needs and expectations of local populations changed. The nature of excavated features and caches within the platform further support a responsiveness to local sociopolitical dynamics. Although aspects

of the deposits, such as reference to water in jar and jute deposits are broadly shared with other E-Groups (Freidel et al. 2017), the overall nature of Late Preclassic ritual deposits breaks with patterns observed among other E-Groups whose functions become more intimately tied to the enactment of authority and divine kingship (e.g., Uaxactun and Tikal).

By examining the types and patterning of anthropogenic residues within the structure floors, we are not only learning more about the activities that took place within it, but also evaluating continuity and change at a different scale. In examining five floors from a single construction phase, we are able to detect subtle shifts in the use and meaning of one building, Structure 26, within the complex. The observed P signatures and lack of other elements suggest that food offerings, apart from consumption of food within feasts, were an important component of ritual within the E-Group complex. When we consider the setting on top of the platform, with the limited available space within a broader, open plaza, it does seem unlikely to have food consumption, or preparation, occurring within Structure 26. The lack of residues from pigments and crafting also suggest that ritual paraphernalia and elaborate costuming may not have figured in performance on the platform. However, it is possible that the nature of performance simply did not allow for these items to impact the chemistry of the plaster floors. Although these findings conform to expectations that the complex serves a limited, ritual function, they do indicate that the platforms served a broader purpose than solar and calendrical observations, prompting further awareness of the variability in activities that may have taken place within the complex.

In comparing the signatures across the five floors, we begin to see subtle changes in the way local populations engage with the platform. In the absence of in site features and artifacts, we are still able to relate earlier floors to more extensive activity, marked by higher phosphorus signatures, while later floors show a decline. Unfortunately, the soil chemistry in and of itself does not allow us to draw unequivocal conclusions about the nature of Late Preclassic ritual occurring on the eastern structure. The shifts we see could represent a declining importance of the complex, or merely a shift in the practical engagement with it, using perishable altars for instance. However, when used in conjunction with architectural and artifact data, continued analysis can elucidate the broader significance of these shifts and their relationship to developments across the site. Current research suggests that the E-Group complex was not significantly manipulated by elites or enlisted in political displays. The only burial found within Lupe Fiasco floor was modest, placed in an unlined pit without burial offerings. Cached vessels recovered so far are unassuming plainwares and although the chemical signatures indicate food and drink consumption, the only faunal remains recovered in substantial amounts were jute shells. This was not the place for conspicuous consumption, competitive displays, or exclusionary practice. Instead, we interpret it as a key location for the placement and display of communal offerings of food and drink, overlooking the banks of the Mopan, remaining visible and accessible to the broader community. The eastern platform of the E-Group represents a distinct space, which we will continue to examine in relation to the complex as a whole.

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