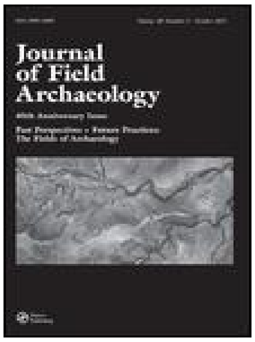

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The afterlife of earthen-core buildings: A taphonomic study of threatened and effaced architecture in Central Belize

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Buried architecture poses an interpretive challenge to field archaeologists the world over. The depositional sequence of the site must be reconstructed through excavation and stratigraphic analysis, and the various phases of construction and use that occurred in the past must be inferred. Effaced earthen-core architecture (e.g., architecture that was once faced with a masonry outer layer that is no longer present) constitutes a heightened challenge in this regard, as events and layers are not always clearly distinguishable, an interpretive difficulty that can be compounded when such architecture is threatened and decay accelerated by modern-day land use activities such as bulldozing and plowing. The case study presented here focuses on an ancient Maya E-Group architectural configuration—a triangular arrangement of structures that served to commemorate astronomical events, among other functions—that is being degraded through repetitive plowing. The significance of this site in regard to Maya archaeology is undeniable, as it was used and reused over a period of at least eight centuries. The site warranted a salvage-based approach designed to gather maximal quantities and types of data when only a minimal amount of time, labor, and funding was available. The procedure presented here was developed for a specific example of endangered, earthen-core Maya architecture in Belize; however, it is applicable to any archaeological project that faces similar obstacles in examining and documenting architecture before it is either eroded or intentionally destroyed.

Keywords: effaced architecture, salvage archaeology, systematic surface collection, Maya Lowlands, Belize, E-Group, persistent places

Introduction

In 2011, the ancient Maya site of Hats Kaab was surveyed and mapped as part of ongoing research undertaken by the Belize River East Archaeological (BREA) Project, which encompasses a ca. 6000 sq km area of the central Belize River watershed (Harrison-Buck 2011, 2013) (FIG. 1). The site of Hats Kaab has been rigorously cultivated over the last 10 years, and its mounds (i.e., human-constructed and/or occupied topographic rises) are highly effaced due to associated bulldozing, clearing, and repeated plowing. Herein, the effects of this ongoing post-depositional disturbance and implications for site preservation and interpretation are considered. We then describe the research strategy devised for Hats Kaab that involved mapping, systematic surface collection, test excavations, and material culture analyses.

What remains of Hats Kaab today is a large western mound flanked by three smaller eastern mounds. Despite a general lack of surviving masonry architecture, the assemblage is strongly reminiscent of astronomically oriented E-Group monuments found at Uaxactun and other early sites in the Maya Lowlands, such as Ceibal, Cival, El Palmar, and Tikal to name a few Preclassic examples (Doyle 2012; Estrada-Belli 2011; Laporte and Fialko 1993; Ricketson and Ricketson 1937; T. Inomata, personal communication 2012), and is considered part of the same category of architectural arrangements or complexes (Runggaldier *et al.* 2013; Brouwer Burg *et al.* 2014a) (FIG. 2). Along with complexes from other sites in the upper Belize Valley (e.g., Baking Pot, Cahal Pech, and Pacbitun), Hats Kaab exhibits some architectural variation and contains associated evidence of mortuary and caching rituals, which has prompted some scholars to suggest these complexes "likely did not function like typical E-Groups" (Awe 2008: 162 citing Aimers 1998: 22–39). Instead, the complexes are referred to as "In-line Triadic Eastern Shrines," interpreted as ancestor shrines rather than strictly astronomical observatories (Awe 2008: 162).

Regardless of the typological classification of Hats Kaab's architecture, it appears that the site served as

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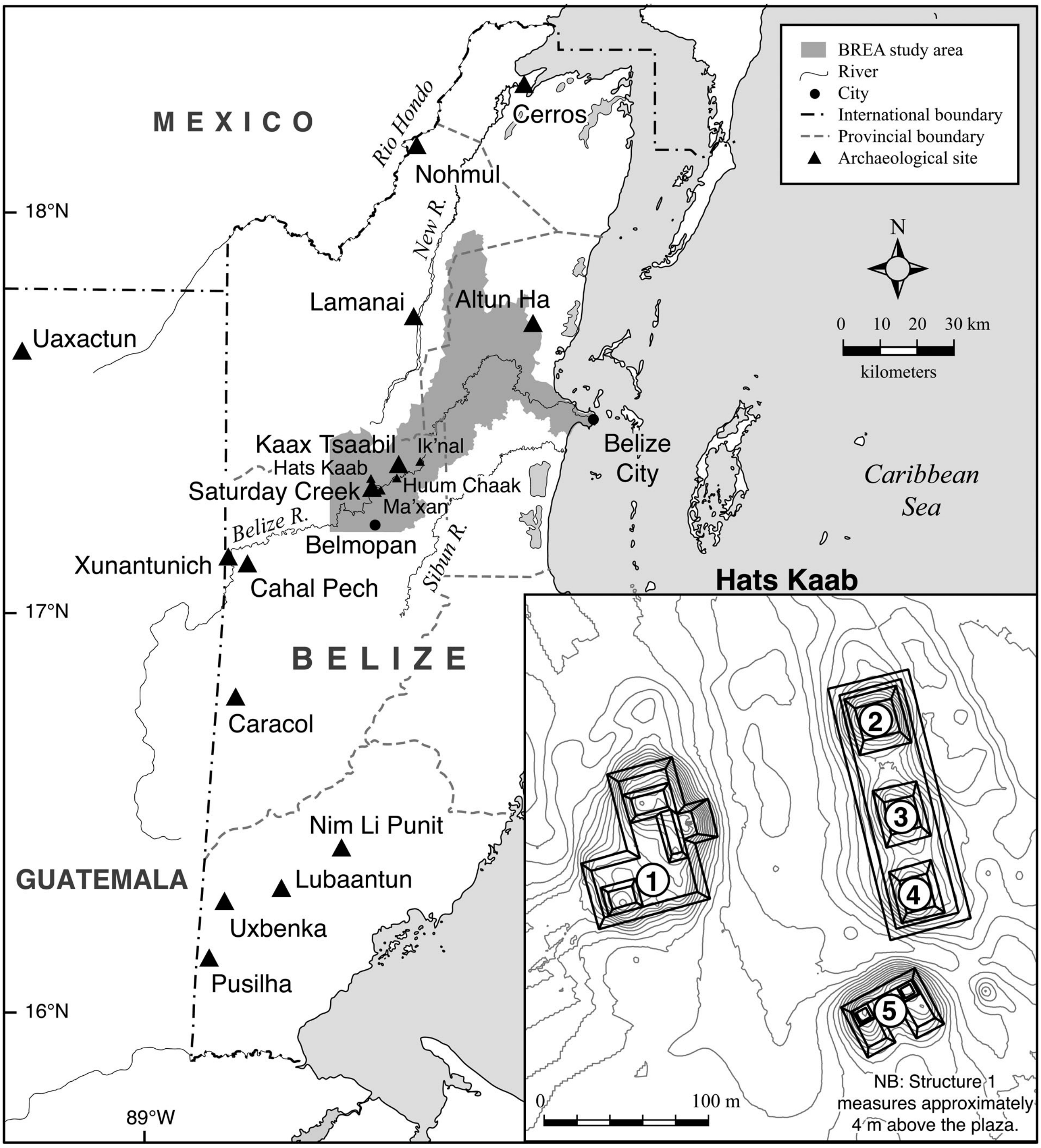

Figure 1 Overview map of Belize with some of the sites mentioned in the text. Inset shows topographic map of the Hats Kaab site with hypothesized rectifications of ancient structures.

a persistent place in the landscape, located along the shortest overland route between the Belize and New Rivers drainages and marking an important crossroads in the central Belize Valley (Brouwer Burg *et al.* 2014a). The site's long occupation history began in the Late Preclassic period (c. 400 B.C.–A.D. 250) and continued until abandonment in the Late-to-Terminal Classic period (c. A.D. 600–900), with some indication of Postclassic visitation (after c. A.D. 900). We believe the site was a "place of remembrance" (a la Stanton and Magnoni 2008): it remained a meaningful place in the minds and attitudes of the ancient Maya who settled the area in the eight centuries after its original construction and preserved its distinctive triangular arrangement.

Below, we describe methodological concerns that arose during fieldwork at Hats Kaab due to environmental change from ongoing and rapidly accelerating agricultural development that is causing widespread destruction of archaeological contexts. The discovery of the site is discussed, along with the results of research undertaken on this highly effaced earthen configuration in the context of severe post-depositional disturbances. To conclude, we examine Hats Kaab's role as a special purpose architectural complex in the Maya Lowlands, based on its

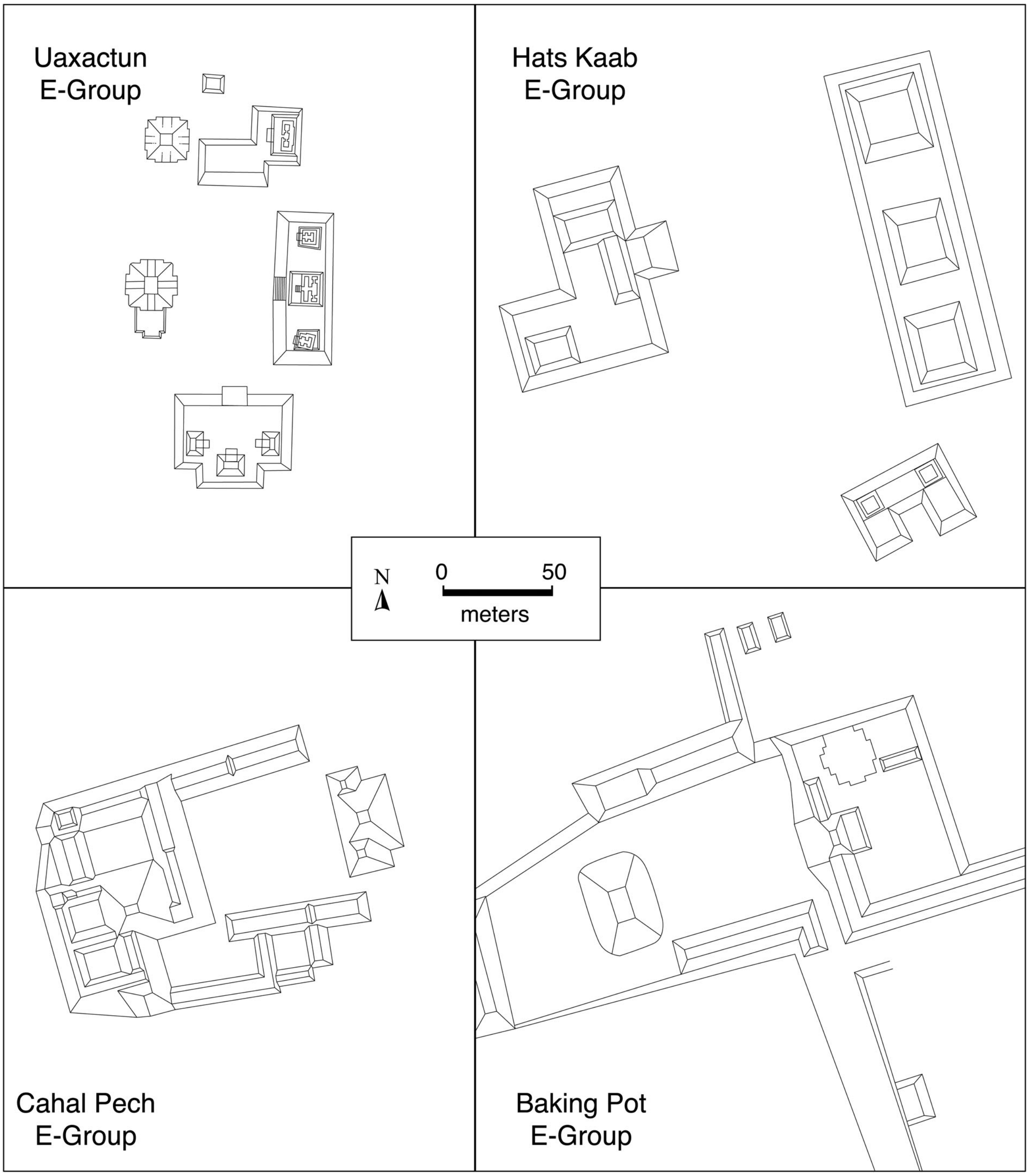

Figure 2 **The Uaxactun E-Group type site and other E-Groups mentioned in the text.**

architectural configuration, crossroad location, and persistence in the landscape.

Rapid Destruction of Central Belize Valley Sites

For many years now, archaeological sites have been systematically affected or erased as a result of scaled-up agricultural expansion and subsequent destructive practices (many illegal) with little intervention by the scholarly archaeological or governmental community. In the past, similar destruction took place but on a much smaller scale; today this destruction is highly mechanized, involving complex machinery that impacts topsoil to greater depths (c. 20 cm), covers larger swaths of land at a faster rate using bulldozing and other leveling implements, and clears forests using a highly destructive method known as 'chaining'. These methods have been observed in and around the area of Hats Kaab, concurrent with BREA project investigations over the last three years. Sites are being affected more rapidly than we can investigate—or in some cases—document them. Salvage research at Hats Kaab involved simultaneous use of several traditional archaeological methods to facilitate maximal data collection in minimal time and with a limited workforce (i.e., students and workmen). Swift investigation of the site was further motivated by the possibility that Hats Kaab represents a unique, disembedded category of E-Group, one surrounded only by small residential house mounds rather than monumental urban architecture.

The plight of the Hats Kaab site—with its poorly preserved, primarily earthen-core architecture and its imperiled status of being completely obliterated by modern agricultural activity—highlights the fact that many other culturally and historically important locales are also undergoing systematic destruction and the irrecoverable loss of cultural data on the ancient Maya. While the BREA project did not begin as a salvage operation, work at Hats Kaab and elsewhere in the permit area has underscored the importance of rescue efforts and led to a partial restructuring of research goals (Brouwer Burg *et al.* 2014a; Harrison-Buck 2011, 2013). Fifteen years ago, Hats Kaab was invisible to archaeologists working nearby due to heavy forest coverage (Saturday Creek lies less than 2 km away; see Lucero 1999 and 2002). Had the BREA project begun in this area just a few years from now, the entire complex of Hats Kaab may have gone undetected due to the incessant bulldozing and plowing currently obliterating structures and sites. Similar salvage efforts should be prioritized by all archaeological projects working in regions affected by new agricultural expansion and experiencing similar rapid environmental change.

To gather maximal data on the Hats Kaab complex and confront limitations imposed by past and recent post-depositional processes, a research program involving concurrent survey and mapping, systematic surface collection, test excavations, and material culture analysis was executed in 2012. This approach was not the result of sequential decision-making, but occurred as a methodological feedback procedure in which field components happened simultaneously. For example, excavation and systematic surface collection were undertaken concurrently such that surface collection offset deficient artifact quantities recovered during excavation. In this manner, limitations and drawbacks of certain procedures were apprehended during active research and new directions were charted to better target our research goals. In addition, GIS analysis of artifact location was used to quantify the extent and direction of plow drag, and to evaluate comparability of surface material provenience with that of excavated assemblages. In this manner, three concurrent methods enhanced the value and efficiency of data collection during a limited research window.

Today, Hats Kaab is annually planted with sorghum or corn. According to Mennonite and other local farmers in this part of the central Belize River Valley, the site was cleared of bush a decade ago and the height of the western mound was reduced by several meters. Bush clearing here is a lengthy and disturbing process for the upper soil profile. Forest growth is burned during the dry season (from January through mid-May), which removes light undergrowth and weakens larger woody trees and shrubs. Some weeks later, bulldozers drag a giant chain over the terrain, bringing down nearly all growth left standing after the burning event (FIG. 3). Finally, a heavy-duty mulcher is driven over the ground, dicing and crushing remaining plant debris, tree stumps, and limestone. A recent news brief from Belizean periodical *The Reporter Newspaper* notes that these mulchers "can churn a nine-foot wide strip into ground ready for planting at a speed of 7 km/hour" (The Reporter Newspaper, May 4, 2013). This report also announced the planned clearance of 7000

Figure 3 Lowland broadleaved forest after a burning event (a); resulting baked clay material on ground surface (b).

acres of land in preparation for a new sugar cane processing center just east of Hats Kaab in the Cayo District.

In 2014, ensuing field reconnaissance documented the increased extent of on-going agricultural destruction for cane production. Of course, such environmental destruction greatly hampers research on ancient Maya cultural landscapes. However, it can be instructive in some ways: clearing activities revealed over 20 undocumented mounds with visible artifact scatters, part of two previously undocumented sites. Additionally, many newly cleared and elevated features were found that lacked cultural material altogether. Thus, although population density is presumed to have been high in the lowlands during much of the Late Preclassic and Classic periods, not every natural rise in the landscape was utilized, suggesting that specific natural and/or cultural features of a topographic rise were required for occupation. Determining what those features were is critical for salvage efforts and will be a primary focus of future field and GIS-based research.

Archaeological sites like Hats Kaab are greatly impacted by clearing and cultivating, as cultural layers generally lie at or near modern ground levels. Most sites exposed in this manner sustain intense structural damage during mulching and plowing, processes that displace and churn up architectural and artifactual material. The plow zone here extends to about 20 cm below surface; any exposed limestone building material is fragmented and removed off mound by hand to facilitate the use of mechanized agricultural equipment. With each successive plow artifacts are jumbled together and standing architecture is progressively demolished. This destructive process began some five years before investigations at Hats Kaab and we project that at the current rate of cultivation, the mounds will be invisible in five or so years. These observations indicate that once land is transformed in this way, there is a limited window of 10–15 years for archaeological discovery, documentation, and investigation. Despite such massive destruction, our study demonstrates that many data can still be recovered from what remains (albeit out of context) in the plow zone, and what still lies in situ below.

Seasonal plowing will soon flatten the three eastern mounds at Hats Kaab (FIG. 10), obscuring the cohesive nature of the architectural complex that is apparent today. In ten years, only the western mound will be visible, isolated and devoid of surrounding architecture. We can only imagine that many similar architectural assemblages, comprising various buildings and plazas, have undergone comparable fates, today appearing as isolated freestanding mounds in areas of high agricultural disturbance. This contextual issue underscores the importance of salvage archaeology in highly disturbed areas, and involves special research considerations for data recovery and archaeological interpretation. In the following sections, we present a detailed description of the field techniques employed to tackle these issues.

Concurrent Field Approaches

Survey and Mapping

Hats Kaab was identified in January 2011 and surveyed and mapped during the summer of 2011 (Murata 2011b) (FIG. 1). A Trimble GeoXH handheld GPS unit was used to establish base station point coordinates on top of the western mound, where a total station was set up and backsighted. Because the site lies in a plowed field, only two semi-permanent station base markers (i.e., rebar rods) were placed, and a temporary backsight was positioned 1.3 km to the northeast. The overall horizontal accuracy was 25 cm; vertical accuracy was 1 m (Murata 2011b: 51). Although accuracy could be improved in the future by "tying in" the base station and backsight points to proximate survey markers, these values were deemed sufficient to construct a relatively accurate topographic base map of the area.

As described above, the three, north-south aligned eastern mounds (Structures 2–4) positioned opposite a larger western mound (Structure 1) and adjacent to a southern mound (Structure 5) were recognized as a potential E-Group arrangement (see FIG. 1). Additional mounds may have existed north of the complex although construction of a farm access road and drainage ditch (ca. 3 m wide by 5 m deep) have destroyed any trace of subsurface structures. An aerial drone survey of the area, along with subsequent photographic processing, revealed subtle topographic changes and color patterning that represent small settlement mounds to the northeast of Hats Kaab and currently invisible by other methods of reconnaissance (Willis and Walker 2015). Further research will be necessary to determine the nature of the spatiotemporal relationship between the Hats Kaab E-Group arrangement and these settlement mounds.

Systematic Surface Collection

Although excavations yielded very low artifact counts, a high number of diagnostic artifacts were recovered from the surface at Hats Kaab. We were concerned, however, about post-depositional disturbance to the context and location of the surface assemblage. Thus, systematic surface collection was used to increase artifact database size, and monitor and quantify directionality and intensity of disturbance. Although it is standard practice in many parts of the world to conduct pedestrian surface collection before excavation, this strategy is not commonplace in

Belize although settlement detection-driven survey is prevalent (Johnston 2002: 27).

Three goals drove the systematic survey: to examine how much erosion of underlying structures and contextual disruption of artifacts has occurred; to collect a more representative assemblage of artifacts; and to investigate the range of artifact types present and their spatial distribution. Survey results clarified whether artifacts found on the surface should be associated with the architectural complex, or if they derived from later depositional sequences (see below).

A young sorghum crop had been sowed at the time of surface collection; thus, we used the existing row spacing (approximately one meter) for constructing a surficial grid (216 × 250 m in area) (FIG. 4). A

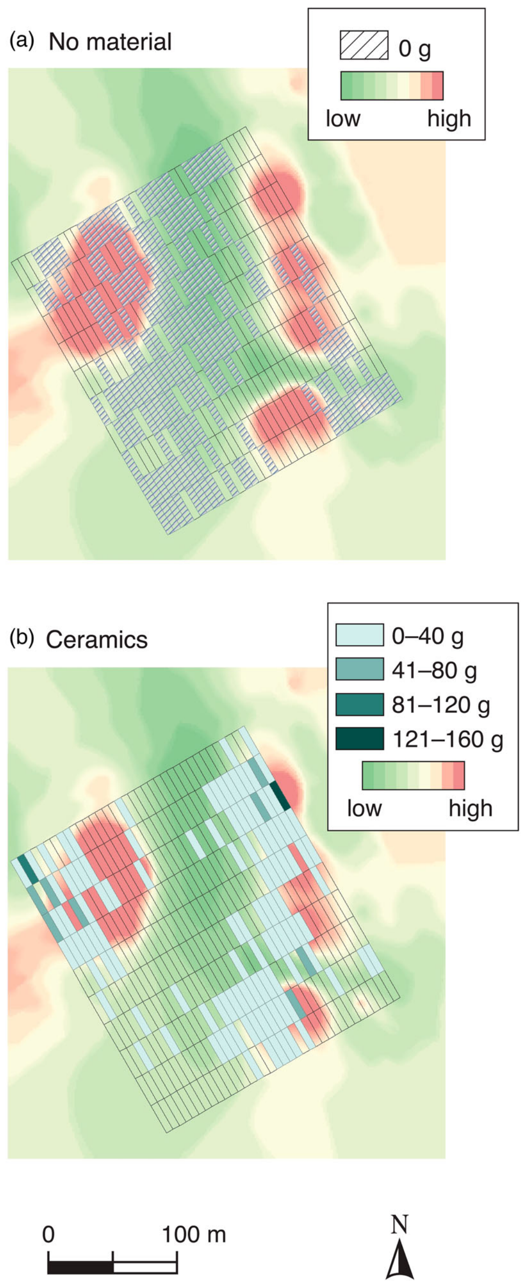

Figure 4 Results of systematic surface collection: distribution of grid cells with no material (a) and ceramics (b).

northeast corner GPS coordinate anchored the grid. Walking lines were set up every six m for a total westward projection of 216 m (or 36 walked rows), facilitating collection of artifacts from both eastern and western structures; walked rows were divided tenfold into 25 m segments for a total southward projection of 250 m, facilitating collection of artifacts from northernmost and southernmost mounds. Overall, 360 grid units were surveyed measuring 6 × 25 m, of which a 1 × 25 m swath of ground surface was systematically inspected and all artifacts collected.

During surface collection, project staff and students walked the first sorghum row in each grid cell. In total, three-and-a-half surface collection passes were made over three days, requiring 10 workers per pass. Each pass involved about 60 minutes in set-up time (demarcating rows and grid cells with flagging pins), and 30 minutes in walking time. All artifacts visible on the surface were collected in Tyvek bags with a unique identifier for each grid cell (i.e., the row [1–36] and segment [1–10] numbers). These artifacts were then washed, sorted, counted, and weighed in the lab. A relational database was built and linked to a GIS that allowed for spatial querying of surface materials, their location, and total weights and counts (see FIGS. 4–6).

Analysis of systematic surface collection data reveals that the associative relationship between artifacts and mounds is largely preserved, albeit with minor lateral drag of artifacts due to repeated plowing (one to five m depending on artifact weight) (FIGS. 4–6). For this reason, we assume the data reflect real associations and can be assessed for distributional characteristics. As would be expected for undisturbed areas, sectors with no archaeological material tend to fall off-mound (81% of 177 'no material' cells), mostly within the plaza (FIG. 4). However, there are also some grid cells that fall partially or directly on-mound that yield no material (19% of 177 'no material' cells), especially on Structure 1. We suspect this is related to intentional clearing/cleaning of the structure during use or to post-depositional processes since abandonment. Also notable is that the western half of the grid has more 'no material' cells, perhaps reflecting the larger portion of open plaza there.

The analysis indicates that even after ten years of plowing, the highest densities of artifacts occur on, or very near, mound structures (FIGS. 4–6). This includes ceramics, chipped stone tools, debitage, and groundstone (discussed below). Some movement of artifacts away from the mounds by the same degree and direction has transpired, likely related to recent clearing and plowing activities although the pattern is less marked than expected. Other interesting observations include the clustering of chipped stone tools

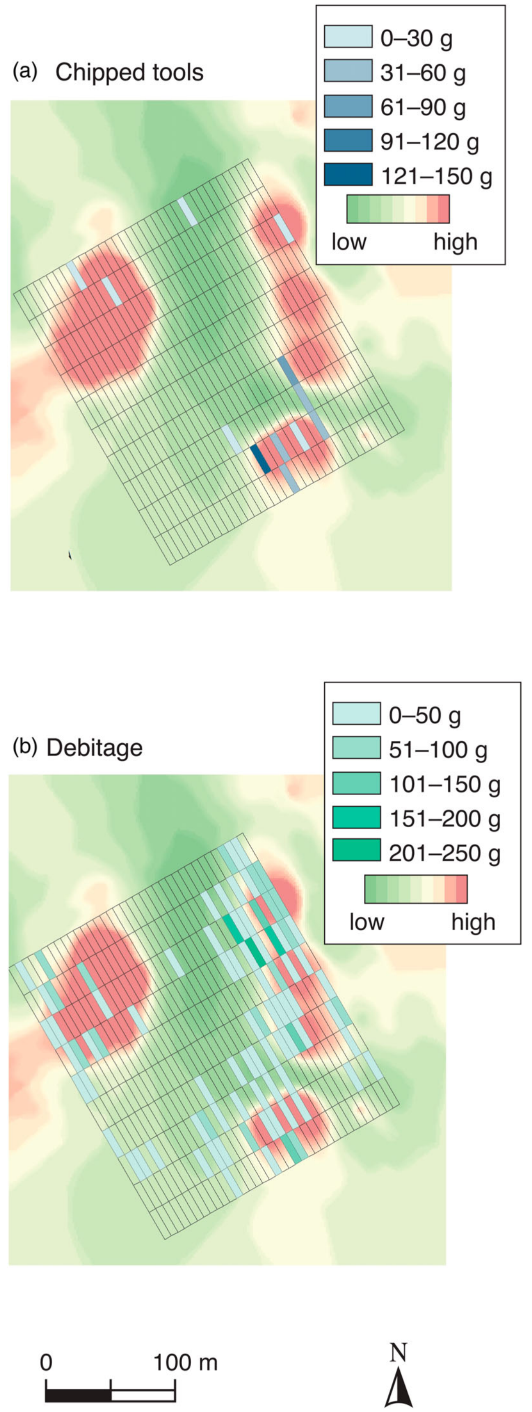

Figure 5 Results of systematic surface collection: distribution of chipped tools (a) and debitage (b).

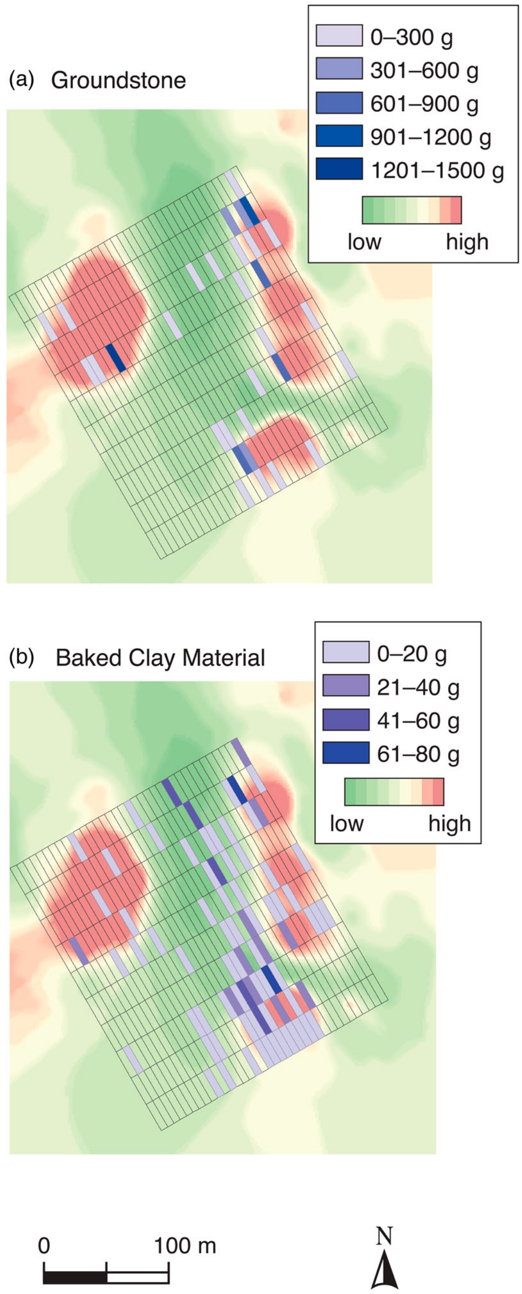

Figure 6 Results of systematic surface collection: distribution of groundstone (a) and baked clay material (b).

in the area around Structures 4 and 5, and the even scatter of debitage and groundstone over all mounds.

There is one exception to the trend of artifacts falling on-mound: the distribution of baked clay material (henceforth BCM), which tend to fall off-mound. We use the term "baked clay" and not "fired clay" in keeping with similar materials already in the published literature (Murata 2011a). This occurrence is likely due to the ongoing destructive agricultural practices. A large concentration of BCM was found north of Structure 5, but a NE-SW trending line is also visible extending through the plaza. Typically, when lumps of baked clay are found they are often assumed to represent the remains of a perishable wattle and daub building. Yet, based on a number of observations, we concluded that the linear feature of BCM at Hats Kaab is not representative of prehistoric Maya behavior, but is rather the result of recent clearing processes.

Such field clearing involves consolidating and burning brush in linear piles, and was observed during the May–June 2012 field season (FIG. 3). Brush burning simultaneously heats and hardens underlying clayey soils, resulting in the inadvertent creation of material that appears similar to ancient daub, which has been recovered from sub-plow zone sediments at Hats Kaab and is expected to erode out on the surface. The primary distinguishing feature between daub and non-daub BCM is a lack of stick impressions on the recently created BCM although this distinction can be very difficult to identify. Thus, we refrain from making an interpretive distinction between ancient daub (part of perishable wattle and daub structures) and clayey soils that have been recently heated during agricultural clearance. However, the spatial distribution of BCM does not match that of other patterned, co-occurring artifacts visible on the surface, suggesting that the distribution of BCM is not directly associated with ancient behavior.

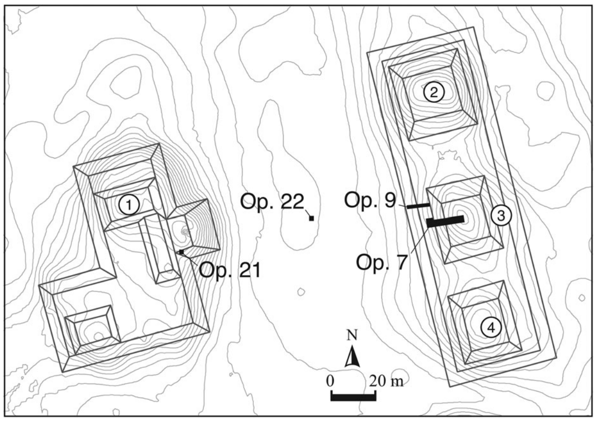

Figure 7 Location of excavation operations undertaken at Hats Kaab (7, 9, 21, and 22).

Excavations

Four excavations were undertaken at Hats Kaab during two non-consecutive years: in 2012, two trenches were excavated on Structure 3 to establish chronology and construction/occupation sequences (FIG. 7). In 2014, two additional areas were excavated: a trench on Structure 1 was placed to gain insight on construction phases and whether such phases could be correlated with those established in earlier excavations on Structure 3; another small trench on the plaza floor revealed the depth of anthropogenic fill. Here we briefly describe the results of these excavations.

At Structure 3, a number of primarily earthen stratigraphic layers were sufficiently preserved to allow interpretation of the construction sequence. Subsequent excavations on Structure 1 yielded analogous layers (both in depth and composition), revealing broad horizontal continuity and suggesting that the platforms were constructed simultaneously. The earliest identified phase (Phase 3) underlies an occupation layer and consists of a large concentration of sherds and charcoal that superseded initial building (FIG. 8). Carbon samples were extracted from this layer on Structure 3 for dating (TABLE 1). In addition to the carbon samples, ceramic analysis of sherds from this layer were undertaken to estimate the approximate date of initial use, which predates the construction of plaster surfaces on both Structures 1 and 3 (Phase 2). The plastered surfaces seem to have been edged by terraced wall stones. The most recent phase (Phase 1) involves a thick superseding layer of construction fill, which served to enlarge and heighten the original platforms, and perhaps supported perishable buildings that have now been obliterated by aggressive mechanized farming. Two additional periods of remodeling were undertaken during Phase 1 at Structure 3, representing the repair of heavily worn areas.

To investigate the subsurface stratigraphy and get a better sense of the site's chronology and spatial configuration, we excavated four units (Operations 7, 9, 21, and 22) (see FIG. 7) and detailed the stratigraphy in our project reports (Brouwer Burg and Runggaldier 2015; Runggaldier and Brouwer Burg 2013). Operation 7 (12×2 m) was located on the plaza-facing side of Structure 3. Operation 9 (14×1 m) was placed 10 m northwest of Structure 3, but still on the shared eastern platform. Operation 21 (3×1 m) was located in the southeast corner of Structure 1. Operation 22 (1×1 m) was located in the plaza, approximately halfway between Structures 1 and 3.

A primary objective of this research was to identify the degree of dispersal and destruction of masonry and earthen building materials, cultural features, and artifacts on account of recent agricultural disturbance. Another goal was to isolate and excavate stratified deposits preserved below the plow zone. Artifacts, ecofacts, and cultural features in these layers were used to further our chronological understanding of the site's construction, as well as the different phases and types of use. We also aimed to recover undisturbed architectural features (earthen-core or masonry/rubble construction) as a way to reconstruct the type and approximate size of the structures and surrounding plaza. Further, we sought to determine if the eastern mounds at Hats Kaab contained any ritual deposits, such as burials or caches, as other verified E-Groups (such as Caracol, Ceibal, Cival, Tikal, and Uaxactun) often contain similar deposits along the central axis of eastern structures or in plazas (Chase and Chase 1995; Estrada-Belli 2011; Laporte and Fialko 1993; Ricketson and Ricketson 1937).

Operation 7 was placed along the medial axis of Structure 3 and was divided into five 3×2 m squares. Approximately 20 cm below surface, two courses of roughly cut large stones were found in Square A (FIG. 8A). As digging progressed, an additional course buried by a remodeling episode was found, indicating that multiple phases of construction and refurbishment occurred on the front of Structure 3. The remaining strata, excavated following natural layers, appear to be clay-rich fill used in platform mound construction. Changes in soil color and texture indicate that the platform was built in various stages by basket-load construction, with lenses of darker topsoil overlaid by lighter sediments that formed an earthen core surfaced with stones that have mostly been removed off-field.

Excavation in the westernmost portion of Square A (adjoining the three-course high platform wall) revealed asynchronous and intrusive circular cuts into the platform surface. These cuts have been interpreted as refurbishments made on a heavily trafficked access point to the mound apex. Another discrete underlying platform surface was found belonging to an earlier phase of construction. In sum, three main phases of construction were identified at the central eastern structure of Hats Kaab: Phases 1, 2, and 3 (youngest to oldest) (FIG. 8B).

Operation 9 was placed 10 m northwest of Operation 7 following the same alignment. The primary goal of this trench was to expose the extended platform retaining wall fronting Structure 3. A total station was used to project the angle of the platform wall in Operation 7 (approximately 12° west of north) and Operation 9 was set up 10 m to the north (FIG. 7). Although no large wall stones were recovered in Square A of Operation 9, a concentration of marly limestone was found at the interface of plow zone and undisturbed strata, in the projected location of the wall. The limestone inclusions were found in an otherwise clay-rich sterile matrix, suggesting that the limestone represents the highly eroded edge of the platform wall found in Operation 7, which has subsequently been fragmented and removed during preparation for cultivation (FIG. 8C).

Also found in Operation 9 were four contemporaneous postholes, perhaps the remains of perishable structures located on either side of the central axis staircase. Alternatively, it is possible that the westernmost three postholes were part of a freestanding configuration of solar observation poles. A similar arrangement of such poles was found directly west of the east central structure at Cival, surrounding a Preclassic stela (Estrada-Belli 2011: 81), and has also been suggested in the case of a posthole associated with solar tracking at the Quincunx Group near Blue Creek (Zaro and Lohse 2005). Further, an articulated human skeleton was found buried in a flexed position at the base of Structure 3, just below a prepared surface. On top of this surface was an intact vessel placed in front of the lowest stair riser (Square G). We interpret this vessel as a cache offering, a practice that has been documented at established E-Groups (e.g., Cival; Estrada-Belli 2011) and typically placed along the central axis of the middle building on eastern platforms. Radiocarbon dating indicates that the prepared surface predates the phases identified in Operation 7, supporting our inference that this location is more eroded than the area along the central axis of Structure 3. Time and weather prevented full excavation of the burial; however, its

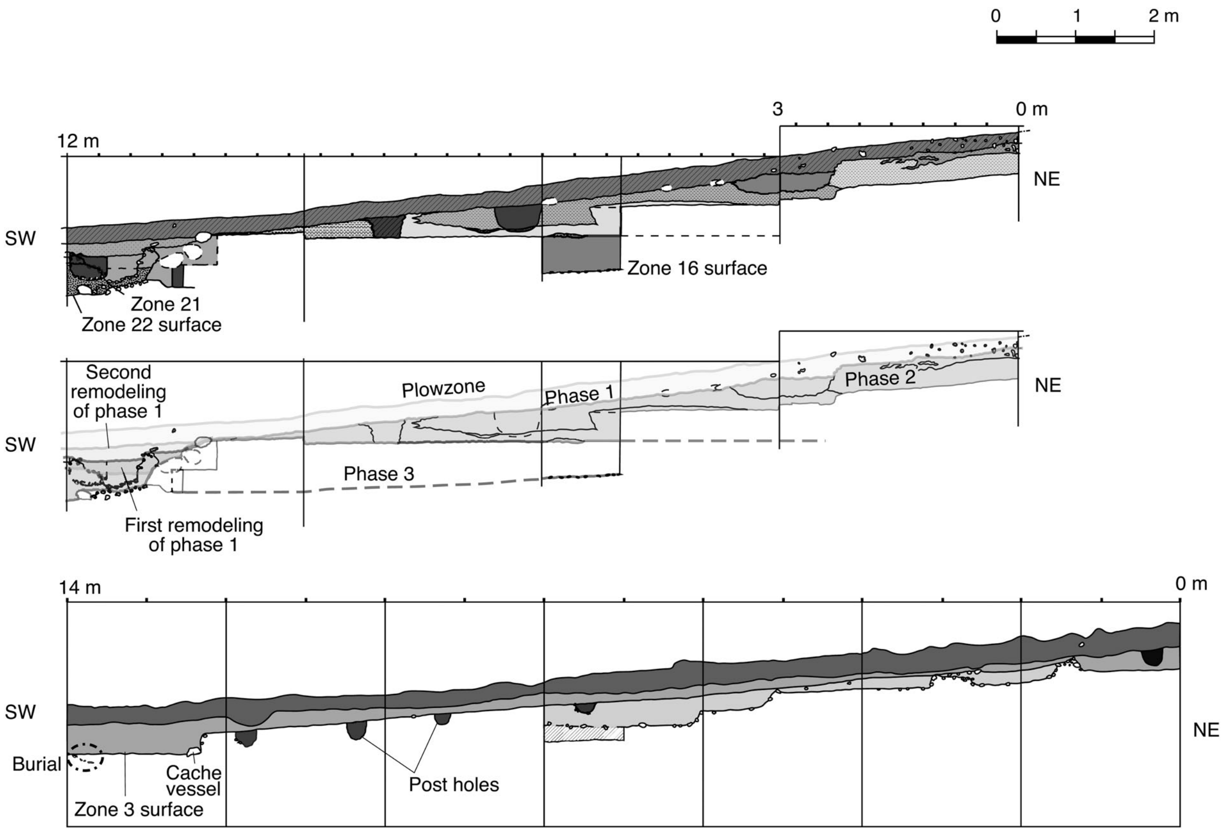

Figure 8 Operations 7 profile (a) and phases (b); Operation 9 profile (c).

presence conforms to similar ceremonial burial practices carried out at other E-Group eastern shrines (e.g., Caracol, Tikal, etc.) (Chase and Chase 1995; Laporte and Fialko 1993).

On Structure 1, we placed an L-shaped 3 × 1 m trench roughly in the juncture between what has been rectified as a south-facing staircase and a southern platform (Operation 21) (Brouwer Burg and Runggaldier 2015) (FIG. 7). The goal of excavation was to elucidate the structure's age and construction sequence. A few wall stones were uncovered, probably part of an effaced earthen-core southern façade subsequently stripped of facing stones. Covering the remains of the wall, a southward projecting earthen terrace was encountered consisting of Late Preclassic fill, human skeletal remains in primary context, animal bone and *Pomacea* shell, and a dense concentration of ceramics indicative of a midden. The Late Preclassic terrace was overlain by roughly 50 cm of basket-load construction that also contained a number of sherds diagnostic of that period. The terrace fill and superseding basket-load strata in Operation 21 bear a strong resemblance to the stratigraphic profile of both Operations 7 and 9 at Structure 3, and are located at roughly the same depth below ground level in the same sequence. For this reason, we believe that both Structure 1 and the eastern platform structures were constructed and refurbished in complex-wide building episodes. While little was recovered in terms of masonry architecture, both the projecting terrace and basket-load layer would have been faced with stone masonry that has since been robbed or removed, either in antiquity or in recent times due to agricultural destruction, resulting in a sequence of effaced earthen-core architectural phases.

Operation 22 was placed in the plaza, roughly equidistant from the terrace edges of Structures 1 and 3 (Brouwer Burg and Runggaldier 2015) (FIG. 7). The goal was to determine the depth of anthropogenic material and recover the sequence of floors in the plaza. However, seasonal waterlogging of the low-lying plaza has eroded all evidence of plaster surfaces, so our estimates are based solely on the presence of ceramic materials. At the end of excavation, the 1 × 1 m unit had reached a depth of 2 m below current surface although sterile soil had yet to be encountered. This suggests that a large amount of clayey soil was transported from the river floodplain to construct the plaza at Hats Kaab, which is one of the largest on record for known E-Groups (16,245 sq m) (Runggladier *et al.* 2013). Accordingly, a significant amount of labor must also have been invested in plaza preparation and construction.

Material Culture Analyses

Material culture analyses aimed to elucidate site chronology and the nature of this arrangement as an E-Group—a non-residential, special purpose solar commemoration site for public gatherings. Ceramic type-variety investigation, lithic identification and production analysis, radiocarbon assays, GIS studies, and solar observations were used to obtain a fuller understanding of building construction and use episodes at Hats Kaab.

Both excavated and surface collected artifacts were considered, as most sherds were highly eroded and fragmentary (most <1 cm in size, average weight per sherd is 3 g) due primarily to the churning and slicing actions of recent agricultural processes that impacted the plow zone. In addition, the soil itself was not conducive to preservation of more friable artifacts (such as pottery sherds), being of high clay content and therefore prone to the retention of water and saturation of the matrix, resulting in poorly preserved ceramics below the plow zone as well. Sherds with any diagnostic features (e.g., preserved slip or surface treatment, rim or base shape) were selected for analysis, which resulted in around 50 sherds of the 2806 sherds recovered (1.8% of the total assemblage). Even though ceramics from the excavations appeared numerous, they were too small and poorly preserved for any diagnostic identification, so that the majority of our analyzed ceramics came from the surface collection.

Most of the Hats Kaab ceramic assemblage comprises Sierra Group sherds with several varieties represented. Overall, the ceramics reveal a lack of Terminal Classic material, which is well represented at most of the surrounding sites in the area, such as the nearby site of Saturday Creek (Lucero 1999, 2002). Instead, the predominance of Sierra Group sherds in the assemblage indicates that the site was used mainly in the Late and Terminal Preclassic. Evidence of polychrome ceramics was restricted to the surface collections on the western mound (Structure 1), supporting our interpretation that reuse and possible remodeling of the site was undertaken long after the initial construction of this group, perhaps during the Classic period as indicated by the ceramics. However, we did not recover any polychromes or ceramics datable to the Classic period from excavations on the eastern side of Structure 1.

Both surface collection and excavation yielded lithics, including groundstone, chipped tools, debitage, and obsidian (TABLE 2). Although Hats Kaab is one of the smallest sites in terms of surface area that has been investigated by the BREA project, it has yielded more groundstone fragments than any other excavated site or surveyed site in our research area (n = 63; total weight = 21.9 kg; total average weight = 348 g). Most groundstone was collected on mound, and all mounds yielded large and heavy fragments, although a concentration was found on Structure 1 (FIG. 5A). Of the forms

Table 1 Radiocarbon Dates from Hats Kaab (NSF-Arizona AMS Laboratory).

Sample number	Sample derivation	Phase association	d ^{13}C	F	^{14}C age B.P.	Calibrated date in calendar years	Calibrated age ranges (1δ, 2δ)*
1. AA100291	Op. 7, Sq. C, Z. 16	Use surface, top of Phase 3	−27.3	0.7845 ± 0.0038	1,949 ± 39	A.D. 1 (± 39)	A.D. 3 – A.D. 85; B.C. 39 – A.D. 127
2. AA100287	Op. 7, Sq. A, Z. 22	Construction of Phase 2	−25.9	0.78060 ± 0.0050	1,989 ± 52	39 B.C. (± 52)	B.C. 44 – A.D. 66; B.C. 112 – A.D. 126
3. AA100288	Op. 9, Sq. G, Z. 3	Vessel offering associated with burial	−27.0	0.7599 ± 0.0039	2,206 ± 41	256 B.C. (± 41)	B.C. 260–204; B.C. 384–178

recovered, there were 19 metate and 17 mano fragments. Groundstone with discernible raw material was largely granitic in composition (ca. 82%); only one fragment was non-granitic: a quartzite hammerstone. The high concentration of granite groundstone is significant in comparison to other Late Preclassic sites in Belize where limestone is often the more commonly chosen parent material (T. Tibbits, personal communication 2014), likely related to the site's relative proximity to the major sources of granite in Belize, the Maya Mountains. Additionally, the majority of the granite displayed a pinkish coloring (64%), a defining characteristic of granite from this source. Regardless, different granitic plumes exist in the Maya Mountains and recent analysis of groundstone from all BREA sites indicates that granite was sourced from varying locations within the mountain range over time. Groundstone from Hats Kaab appears to derive most commonly from the Mountain Pine Ridge outcrop (Whelan and Tibbits 2015).

The overabundance of groundstone—an artifact category generally associated with domestic activities, such as the preparation of maize for consumption—at a site presumed to be associated with civic-ceremonial functions is intriguing and implicates further activities (feasting, marketing, or trading). Based on the arrangement of the mounds, excavations, and our observations on the summer solstice of 2012, the evidence supports our contention that Hats Kaab was used for more than just the observance of astronomical events implied by the function of E-Groups, and also included accommodation of large groups of people who needed to bring their own grinding equipment, possibly for maize preparation and perhaps to be used for food and/or maize beer (or *chicha*) preparation in feasting events. According to Hayden (1998: 15–86) the 'archaeological indicators' of feasting include permanent storage facilities for both food and ritual accouterments; large cleared areas and/or public architecture to facilitate the gathering of people, consumption of food, and performance of ceremonies and rites; the tools and features used in the preparation of the feast foods (e.g., manos and metates, cooking and serving vessels, hearths); and any paraphernalia associated with the particular events. For the Maya area, some feasting examples have demonstrated a large quantity of discarded ceramics (LeCount 2001). Two characteristics possibly indicating feasting appear at Hats Kaab (i.e., a large cleared area and tools involved in special substance preparation). The presence of large amounts of groundstone at Hats Kaab suggests that ceremonial food preparation occurred, which will be further tested both in the field and laboratory.

We know from ethnohistoric accounts that elites as well as commoners often engaged in feasting in Mesoamerica, often associated with celebrations of life-cycle events and veneration of ancestors (Brown 2001: 368). In the architectural space of E-Groups, perhaps celebrations might also have included the commemoration of solar calendar stations as they correlate with agricultural cycles, so that planting or harvest festivals may have warranted gatherings with feasting components. In certain archaeological contexts, grinding stones are linked to gendered tasks (Ebeling and Rowan 2004). Further, for Mesoamerican cultural traditions, both archaeological and ethnohistoric data suggest that the users of groundstone tools were women, as these objects are connected with gender-specific tasks involving the domestic realm (Brown 2001; but cf. Bruhns 1991). It seems unlikely that women would have traveled by themselves to the site and thus we envision that entire families, hamlets, and villages could periodically convene on the site of Hats Kaab for communal gatherings both secular and sacred in nature.

With large communal gatherings, it seems logical that food and perhaps chicha would be prepared, and this activity might be recorded in the elevated presence of groundstone tools, although we can only speculate about the scale of food preparation. Food production requires residue testing, but analyses might also reveal other activities such as preparation of ritual paraphernalia. Thus far, preliminary elemental analysis of both the groundstone and surrounding soil reveal unexpected elevated levels of mercury on the surface of many of the groundstone specimen, but not in the surrounding soil. The ore of mercury is cinnabar, a reddish mineral that has long been used by Mesoamerican cultures in burial rituals (Bell *et al.* 2003; Healy and Blainey 2011). It seems plausible that some of the groundstone fragments from Hats Kaab were used in the preparation of cinnabar powder (T. Tibbits, personal communication 2014). Further groundstone residue and soil chemistry analysis will explore materials processed and other elements such as phosphorus to test the hypothesis of food processing implements in a public ceremonial context. Additionally, use-wear studies of the groundstone may prove instructive, as manos and metates reserved for special purposes (such as feasts) are assumed to exhibit minimal use wear in comparison to such utensils used in daily food grinding by a household (Brown 2001: 377). In sum, the enormous size of Hats Kaab's plaza might indicate that the site periodically facilitated feasting activities and associated integration of the surrounding farming communities into a larger social identity (see Dietler and Hayden 2001).

Chipped tools were in the minority, represented by only 19 pieces (out of 602 total lithics). Of these pieces, three yielded diagnostic information: two stemmed macroblades, of possible Late Preclassic age (for similar see Hester and Shafer 1994: Fig. 17, Fig. 23); and one very large (c. 75 cm long) bifacially worked chert eccentric (FIG. 9). Similar large eccentrics have been found at Altar de Sacrificios (Willey and Olson 1972); Caracol (Chase and Chase 1995); Colha (Dockall and Shafer 1993; Potter 1994); Lamanai (Meadows 2001); and San Jose (Thompson 1939). Scholars have speculated that large eccentrics functioned as symbols marking the importance of reciprocal gift exchange between various Maya centers, as well as the status accrued by different political leaders and offices (Barrett *et al.* 2011; Meadows 2001). In this manner, other organic symbolic material may have been tied to large eccentrics that were then used as ritual regalia (e.g., staff bars) by elites and priests performing ceremonies (A. Chase, personal communication 2013). In addition to their uses in the profane realm, these eccentrics have also been shown in sacred and mythological scenes, such as in vessel codices that depict crossed eccentrics, sky bands, and star glyphs in the same register (Barrett *et al.* 2011: 25).

The amount of debitage from Hats Kaab indicates that at least some preparation and production of stone tools was undertaken on site, primarily on mound (see FIG. 5B). A large quantity of small chert chips were recovered, the average piece weighing only 12.3 g. A total of 12 cores were recovered, most of which were expended. This suggests that chert (not locally available in large quantities) was brought to the site from distant outcrops, worked, and discarded upon expenditure. Those cores that were not expended were likely curated and removed by visitors to the site (Parry and Kelly 1987). The large eccentric (approximately 9 kg) was most certainly quarried and carried over a long distance to reach Hats Kaab. We believe that based on its color, this artifact derived from the lithic bearing sites of northeastern Belize, a distance of some 60–80 km (e.g., in the vicinity of Altun Ha) Barrett *et al.* 2011: 16; Barrett 2011: 60).

Obsidian was also recovered from the Hats Kaab site, primarily from Structures 2–5. A noticeable lack of obsidian was found on Structure 1, but whether this pattern reflects actual intentional behavior in the past or is due instead to differential preservation and post-depositional disturbances is unclear. The majority of the obsidian assemblage (61%) recovered from Hats Kaab involved small bladelets measuring three-to-four cm in length and 0.5–1.0 cm in width. Most of these bladelets displayed evidence of use-nicking, indicating that these objects were used for more than just ceremonial bloodletting activities. In addition, retouch was visible on eleven pieces (24%), suggesting this raw material was in high demand and conservation practices were in order. A few polyhedral cores were found (seven of 120 pieces; 5.8% of assemblage), suggesting either that minimal obsidian production occurred there, or that only exhausted cores were left at the site. Most obsidian was derived from the plowzone layer and the concentrations decreased dramatically with depth.

To determine the age and length of occupation of the site, three charcoal samples were subjected to Accelerated Mass Spectrometry (NSF-Arizona AMS Laboratory numbers AA1000287, AA1000288, AA100291; see TABLE 1). Sample 1 (CAL A.D. 1 ± 39; AA100291) from Operation 7, Square C, Zone 16 was associated with a surface scatter of sherds belonging to Phase 3, the first identifiable phase of occupation at Structure 3 (FIG. 7B). Sample 2 (39 CAL B.C. ± 52; AA100287) from Operation 7, Square A, Zone 22 was associated with the second phase of occupation (Phase 2). The radiocarbon dates indicate that Zones 16 and 22 were roughly contemporaneous, or constructed during the same generation in the Late

Table 2 Types of Lithic Artifacts Recovered from Hats Kaab.

	Groundstone		Chipped Tools		Debitage		Obsidian	
	Count (n)	Weight (g)	Count (n)	Weight (g)	Count (n)	Weight (g)	Count (n)	Weight (g)
Surface Collection	63	21900.4	19	9713.7	410	5508.3	114	128.1

Preclassic (first century B.C. to first century A.D.). These layers mark an early phase of Late Preclassic construction at the Hats Kaab site, and are in accordance with the variety of Late Preclassic ceramic types found during excavation and surface collection (i.e., Sierra Red, Polvero Black, Flor Cream, and Sapote Striated). Initial construction and use of the site in the Late Preclassic period aligns the use of this site with many other substantial E-Groups elsewhere in Belize and in the Petén (e.g., Ceibal, Cival, El Mirador, Güiro/Wakna, Nakbe, Pacbitun, Tikal, Uaxactun; Chase 1983; Chase and Chase 1995; Coe 1965: 23; Conlon and Powis 2004; Estrada-Belli 2011; Hansen 1998; Laporte and Fialko 1995; Ricketson and Ricketson 1937; T. Inomata, personal communication 2012).

Sample 3 (256 CAL B.C. ± 41; AA100288) from Operation 9, Square G, Zone 3 came from directly below an inverted vessel associated with the human mandible. While we expected this sample to correlate with Phases 3 or 2 in Operation 7, it appears to be considerably older, by about 200 years and falls in the early Late Preclassic (fourth and third century B.C.). Sample 3 may represent the earliest construction of the Hats Kaab structures, which were expanded and renovated some 200 years later, reflected in the Sample 1 and 2 dates.

Multiscalar GIS analysis was undertaken for both site-based and regional investigation of settlement patterns in relation to topographic and ecological features (Brouwer Burg *et al.* 2014a). As stated earlier, the results of this analysis indicate that the area of Hats Kaab was a point of convergence for several routes connecting different parts of Belize. Our proposal of this location as a crossroads connecting two important river drainages via an overland route, lends support to our interpretation of the region as significant for markets and trading, additionally bolstered by the overabundance of non-local groundstone material.

Additionally, summer solstice observations were undertaken on June 20, 2012 as part of the analysis of the astronomical significance of this architectural configuration (FIG. 10). Discussion of these observations and the role of Hats Kaab as an E-Group were presented in preliminary work and constitute part of an ongoing separate study (Runggaldier *et al.* 2013). At the summer solstice in Belize, the sun rises at 24 degrees north of true east on a flat horizon (i.e., not obscured by large urban architecture nor by forest, which we assume was the case for the agricultural surrounds of Hats Kaab at the time of habitation). When viewed from the center of Structure 1, the sun emerges from directly behind Structure 2, the northernmost building on the eastern platform. Although the winter solstice has not been observed at Hats Kaab on account of cloudy weather, we have calculated that the angle at which the sun should rise coincides with the line linking the centers of Structures 1 and 4. Thus, we conclude that while tracking of astronomical occurrences may not have been the only function of this architectural arrangement, these solar calendar events were an important feature of the observable world that was recorded and memorialized in the layout of the complex, imbuing it with agricultural calendric significance relevant to the structuring and timing of community gatherings.

Each line of evidence investigated above provided insight on a number of the key questions concerning the site of Hats Kaab. Chronologically, ceramic analysis and radiocarbon dating were paramount in solidifying the Late Preclassic age of the site. Terminal Classic sherds on the surface of Structure 1 indicate the complex was also used periodically in later periods, although its basic shape was retained and extensive rebuilding or repurposing appears to have been avoided. Drone survey revealed an absence of residential construction on the mounds or within the limits of the architectural arrangement, and the overabundance of groundstone suggests that large quantities of maize and/or other substances were ground at certain times, perhaps as part of feasting activities with both secular and sacred import. While few large vessels were recovered from the eastern platform, the midden assemblage from Structure 1 provides a tantalizing suggestion that butchering, cooking, and serving took place. The presence of an articulated, flexed burial at the base of Structure 3 and the presence of obsidian bladelets from the east side of the complex suggests that in addition to feasting, ritual activities were also carried out.

Interpretations: Special Purpose Architectural Complex, Persistent Place, and Crossroads Location

Despite the effaced nature of the Hats Kaab site, we were still able to gather significant data from our field research. Initially, we chose to focus on this particular location within the larger research area because the configuration of mounds seemed to create an arrangement that has been identified in many parts of the Maya realm as an architectural type known as the E-Group. Allowing for variations in layout and debates over the accuracy of their astronomical functions, in general E-Groups have been shown to have meaningful astronomical arrangements in terms of summer and winter solstices and may have been used for tracking time (Aimers and Rice 2006; Ashmore 1991; Aveni 2003; Blom 1924; Cohodas 1985; Doyle 2012; Rice 2007; Ricketson and Ricketson 1937; Ruppert 1977 [1940]). Special purpose architectural complexes like E-Groups create built environments that become lasting components of the landscape.

The possible ties to observations of the solar path in relation to an agricultural lifestyle would have made these types of architectural complexes significant to many over a long period of time. In addition, the crossroads location of the site would have resonated with greater numbers of people than just those in the surrounding settlements.

E-Group architecture is usually found within the bounds of the site core or acropolis and associated artifactual and structural evidence indicates that these areas were not used for residential purposes (e.g., plazas were kept clear and only small quantities of utilitarian objects are found). The site of Hats Kaab was also not used for residential purposes (see artifact analysis section above) and served instead as a special purpose architectural complex, with some civic-ceremonial importance linked to observation of solar paths at this location, which we interpret as an E-Group rather than inline triadic eastern shrines, given our direct field observations during the summer solstice, combined with other supporting lines of evidence (Runggaldier *et al.* 2013). Additionally, part of this special purpose function of the Hats Kaab site may have been related to its role as a persistent place in the larger landscape, which we believe is linked to patterns of human movement through this strategic location on an overland route linking the New River to the Belize (Brouwer Burg *et al.* 2014a).

A *persistent place* is a space that was "used repeatedly during the long-term occupation of a region" (Schlanger 1992: 92) and need not be an archaeological site per se, but must represent (in some reconstructable way) the repeated convergence of specific human behavior(s) at a specific location in the landscape. Schlanger (1992: 97) outlines two, non-mutually exclusive characteristics of persistent places: They are positioned in locations that are well-suited to certain activities, and; they have distinguishing features that continue to draw return visitors. Regarding the first characteristic, these locations may be favorable in terms of the natural landscape (such as a cave for observance of sacred rites), or they may contain preexisting cultural features that make them amenable to continuation of the particular behavior (such as the material presence of offerings and votive deposits in otherwise non-descript natural landscapes). The second characteristic is related to the latter point according to which, as Schlanger points out, "features can create their own environment, both attracting reuse and reoccupation, and structuring the activities associated with those various occupations" (1992: 97). In this way, there is an important give-and-take between the location and its users: the persistent place in the landscape is marked by beneficial natural characteristics and/or is imbued with cultural characteristics, thereby encouraging people to return to these locations. Simultaneously, the act of returning reinforces the symbolic significance of the location in the mind of the returnees. We submit that geopolitical forces may also have been a factor driving people to the site, although we have yet to explore the implications of this driver in our investigations.

The reasons the site of Hats Kaab remained significant in the minds and habits of its users over many centuries is likely related to its physical location, the cultural meaning concretized by the site, and the lack of rebuilding despite the long occupation of the surrounding area. Physically, the site lies on a relic floodplain of the Belize River, approximately 1.5 km from the river itself, and 0.5 km from Colorado Lagoon and the Cut-and-Throwaway Creek drainage to the west. This broad, flat floodplain area appears to have been well suited to the construction of this site because of its proximity to durable clayey soils for production of platform substructures that would have lasted longer than other types of soils. The floodplain also appears to have been well suited for the siting of a very large enclosed plaza (measuring 16,587 sq m) that could hold sizable groups of people, and is considerably larger than most other known E-Groups (for comparisons with other E-Groups, see Runggaldier *et al.* 2013). The two most remarkable features of the Hats Kaab arrangement are its relative isolation compared with the urban character of other E-Groups, and the large size of its plaza. This latter aspect we attribute to the presence and traffic of large numbers of people through the area, and consider culturally significant in our interpretation of this locale as a crossroads location.

Hats Kaab is situated within a rich array of ecological zones that provide a variety of diverse resources: within a 15 km radius around the site, one can access lowland savanna and broad-leaved forest, shrubland, wetland, riparian zones, and rivers. If this radius is expanded to 30 km, access can be gained to submontane broad-leaved and pine forest, waterfalls in the northernmost reaches of the Maya Mountains, and more extensive savanna, wetland, freshwater lagoon, and inland mangrove biotopes to the north and west. Hats Kaab is strategically located midway between many resource rich areas and a number of important Maya cities. For example, the site lies between the coast and the large centers of Caracol, Xunantunich, and Cahal Pech; and between the Maya Mountains and a number of important centers in northern Belize (e.g., Lamanai, Cerros, Altun Ha, and Nohmul) and southern Belize (e.g., Xnaheb, Nim Li Punit, Uxbenka, Lubaantun, and Pusilha). We have proposed that the area around Hats Kaab may have constituted an important crossroads location for merchants, messengers, and travelers moving among these more urbanized areas, or along trade routes (Brouwer Burg *et al.* 2014a, 2014b; Harrison-Buck 2011; Harrison-Buck *et al.* 2013). In order to connect the river drainages of the Belize River (encompassing the Holmul, Mopan, and Macal) and New River (draining into Corozal Bay, where the Rio Hondo is the outlet of the Three Rivers Region), an overland route would have had to pass through our case study area.

These hypotheses have also been tested with a GIS-driven, least cost path (LCP) analysis. Such an analysis calculates a landscape matrix depicting the relative degree of difficulty (or resistance) encountered when moving through the environment. From this matrix, areas of least resistance are identified between specified beginning and end points, representing the routes that would have required the least amount of energy expenditure and therefore were likely pathways of movement (e.g., Atkinson *et al.* 2005; Collischonn and Pilar 2000; Douglas 1994; Lee and Stucky 1998; van Leusen 2002; Weber 2011). A number of LCP iterations were run to investigate the most likely routes linking the Hats Kaab area with regions to the north and south that also contain Late Preclassic occupations. As we have reported elsewhere (i.e., Brouwer Burg *et al.* 2014a), these analyses indicate that a least cost overland route from the Belize watershed linked the Hats Kaab region to the north passing over a lowland savanna corridor that separates the Western and New River Lagoons. Movement from the coast to the upriver sites like Xunantunich and Cahal Pech would have followed along the banks of the Belize River, passing through the Hats Kaab region. Finally, to access the Sibun watershed from the central Belize River, the most parsimonious route would have run from the eastern edge of the Hats Kaab area south next to Beaver Dam Creek (Brouwer Burg *et al.* 2014a). Overall, the area of Hats Kaab is revealed to be a crossroads location, where various overland routes converged, linking the interior with the coast and the north with the south.

Hats Kaab, located in an area between larger monumental sites, could be characterized as an "interstitial area" (McAnany 1986; Thompson 1939). Notably, most other well-known E-Groups are located within site cores, and are directly associated with civic-ceremonial and elite residential architectural forms. The Hats Kaab complex is unique in that it has no associated architecture on a similar scale, surrounded only by considerably smaller scattered house mounds and therefore, in the past it would have been isolated rather than embedded in a ceremonial core of other civic and ritual buildings, by comparison with other E-Groups. Despite extensive contemporary bulldozing, we know this isolation not to be the result of such activities because even the presence and location of recently flattened mounds appear as distinctive color patterning in the fine-grained 3D imagery of a drone-operated aerial survey (Willis and Walker 2015). We believe the Hats Kaab site may have been used as a nodal gathering point for farmers in the larger rural community, acting as a central ceremonial location within a dispersed settlement landscape (Brouwer Burg *et al.* 2014a; Runggaldier *et al.* 2013). In this sense, we suggest that the complex served an important function to define wider community identity and strengthen connections between communities (Yaeger and Canuto 2000), by providing a place of periodic congregation for the enactment of individual and communal activities and events.

Such gathering places embody Schlanger's (1992) second characteristic of persistent places: distinguishing features that continue to draw return visitors. These features occur at Hats Kaab in the distinctive architectural arrangement consisting of the western pyramidal mound and eastern platform capped by three structures (Structures 2–4). Despite active and repeated plowing of the site, the distinctive arrangement of these mounds is still noticeable to the human eye today (FIG. 10). In the past, the scale and physicality of this architectural configuration would have been even more conspicuous, especially in the cleared agriculture landscape, which became reforested only after terminal abandonment of the architectural structures. The significance of the site and its ideological underpinning as an E-Group whose "basic form and symbolic value" conveyed astronomical import (*sensu* Andrews 1995: 69), would have been visually imparted to individuals moving through the landscape, whether by river or over land.

People attach meaning to places, and these meanings are conditioned by the experiences of those people at those places. Meaning can be passed on to others, who may interweave their own experience of that place. Places may take on additional meaning when remembered years later, or when discussed orally, sometimes acquiring a mythical quality for those who do not have personal experience of the place. Clearly, the imbuing of places with meaning is a multifaceted, multidimensional phenomenon, which may be motivated by a number of conscious or unconscious factors. Due to its quality as a persistent place, we suggest that Hats Kaab took on multiple, intercalated levels of meaning, sometimes simultaneously as it progressed throughout its life cycle: from inception, to construction, use, termination, and finally, post-depositional processes following abandonment (see Ashmore 2009: 15; Robin 2011: 248).

Conclusions

From construction and usage indicators, and information derived from material culture analyses, we

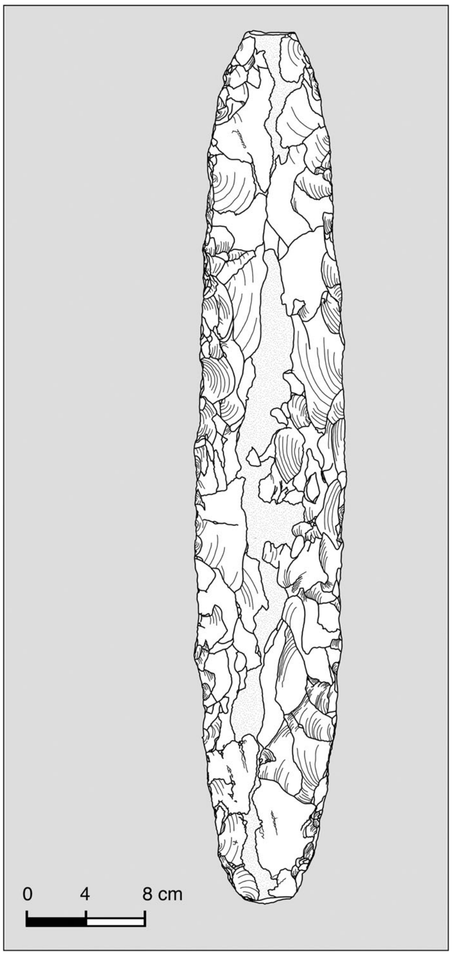

Figure 9 Chert Eccentric (75 cm in length).

have extrapolated a building sequence defined in Structure 3, and have applied it to the rest of the site to obtain a broad understanding of the site's main period of use. We should further note that masonry architecture was only minimally represented, stones having been robbed in antiquity or, in most cases, broken by plows and removed by farmers in recent times. The majority of the intact architecture consists of an earthen construction fill comprising basket-load stratigraphy, evidenced by intercalated lenses of differing soil color in the platform profile. As noted above, it is assumed that this clay rich soil was obtained from the local alluvial deposits of the surrounding floodplain.

Phase 3 has been dated to the early Late Preclassic, and it is likely that Phases 2 and 1 date to sometime in the Late-to-Terminal Preclassic, as indicated by the ceramic assemblage and radiocarbon dates. However, the ceramic assemblage from both surface and excavation also reveals evidence of occupation in the Classic Period, as well as in the Postclassic, which reaffirms our contention that the site remained a persistent place in the memory of people living in the surrounding catchment area, as well as travelers passing through the region. Further, while the evidence indicates that Hats Kaab was used over a long period of time, its spatial configuration was never radically changed, nor were any residential structures built within its footprint. It therefore seems that the site's ability to hold large numbers of people remained an important characteristic that was maintained over generations. The complex was memorialized, as other monumental structures often are, as a place to conduct community gatherings involving agricultural, lifecycle, and religious celebrations. Although the site may have been cleared on a small-scale for milpa agriculture, it appears to have been covered in jungle after abandonment in

Figure 10 Eastern platform mounds (left to right: Structures 2, 3, and 4) seen from the apex of Structure 1 at the summer solstice, June 21, 2012.

Prehispanic times until recently. Some 10–15 years ago, the site was cleared of mature-growth vegetation and prepared for agricultural purposes using modern machinery. This series of events (and many more that are now obscured to us) define the site's life history; each phase of construction, use, reuse, subsequent disuse, and now repurposing of the site had an important impact on the taphonomic configuration of the site as it appears today, and each phase deserves substantial consideration.

The life history of the Hats Kaab site is far different from the life history of a typical E-Group, or variant thereof, that are found in less disturbed environments, such as the forest-covered sites of the Petén. Hats Kaab, by contrast, has been heavily effaced in recent years, which presents specific challenges regarding both investigation of the site and its interpretation. The results of the surface collection discussed above are instructive in this regard, revealing that while many of the artifacts may not have moved very far from their original contexts, other materials (such as BCM) can be deceptive. It can be fairly assumed that BCM found on a mound associated with a site in a forested, undisturbed context represents traces of ancient activity, likely the remains of daub from perishable buildings. Conversely, BCM found on the ground surface in a disturbed context such as that at Hats Kaab requires more critical cross-examination with regard to its antiquity. This study demonstrates that such reconstructions of the distant past, the recent past, and the present are imperative in the face of ongoing destruction of the landscape; with a minimal amount of time and labor invested, fruitful results and useful interpretations can still be derived.

Despite its highly eroded condition today, we can say with certainty that Hats Kaab was occupied for a long period of time, from the Late Preclassic onward into the Classic period and perhaps intermittently visited as late as the Postclassic. The site's unique architectural configuration demonstrates its importance as a special purpose complex—the lack of residential structures associated with the Hats Kaab complex and the presence of implements suggesting possible communal behavior, such as feasting, attest to this claim. In addition, some activities at the site may also have been coordinated around the observance of cyclical movements of the sun, as indicated by the placement and orientation of the structures. This specialized architectural arrangement, consistent with other E-Groups and In-line Triadic Eastern Shrines, had ritual significance, perhaps as a solar shrine and/or public gathering place for astronomical commemoration events that could accommodate large numbers of people.

As Hats Kaab is located in a relatively isolated interstitial area between larger civic-ceremonial locations, yet is situated in proximity to a variety of resource rich ecosystems, we posit that it may have also functioned as a nexus within a larger network of regional movement and exchange of goods. This economic role is indicated by the presence of various non-local artifacts (e.g., obsidian, Colha chert, and groundstone from the Maya Mountains), and the location of the site along the intersection of two distinct pottery spheres, which one of us (Harrison-Buck 2010) has defined as the Ik'hubil and Sibun ceramic spheres. Further, the site is strategically located halfway between the Upper Belize Valley sites and the coast, and is between northern sites and the Maya Mountains, as well as points to the south. Hats Kaab could have functioned as a crossroads location, providing locals as well as travelers a place to observe and participate in important yearly events. As we have shown, a multicomponent field approach operating concurrently to inform feedback interpretation of the different lines of evidence, can provide productive outcomes even in challenging contexts or salvage-based approaches. While sites characterized by long cumulative palimpsests typically obscure the details of their life histories (see Bailey 2007), our approach revealed several important components of the Hats Kaab sequence. The unique architectural arrangement, special purpose function, and long lifecycle of the site identify it as a persistent anchoring point in the landscape over many generations. However, in its afterlife, this segment of Maya history and cultural heritage has taken on additional meanings, symbolizing the urgent threat currently damaging a large portion of the archaeological record in the central Belize River Valley. The degree of destruction caused by modern agricultural disturbances has reached heightened levels, discouraging investment in archaeological investigation of highly effaced sites. As a consequence, E-Groups, other uncommon architectural arrangements, and special purpose contexts, could be lost in the span of a short number of years. This study, while decrying the current destructive practices of economic development in the area, nonetheless exhorts archaeologists in Belize and in similar situations worldwide not to overlook sites that seem too damaged, as they may still have something of value to contribute to understandings of the ancient past.

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