

Chapter 2
A Temple over Time

Stephen Houston,
Sarah Newman,
Edwin Román,
and Nicholas Carter



Figure 2.1. Summit of the F8-1 pyramid with remains of the final construction phase, Str. F8-1-1^a. Photo: Arturo Godoy.



Figure 2.2. The F8-1 pyramid in 2013.

Str. F8-1 consisted of several different episodes of building, all visible in excavation profiles and plans (Figures 2.1 to 2.4). Some were major investments, resulting in entirely new structures. Others involved little more than the construction of outsets, refurbished stairways, or raised floor levels and added berms. The major phases are designated by the ordinal and “Sub” system used in Maya archaeology. Thus, Strs. F8-1-1st and F8-1-2nd represent the final two buildings. The topmost, 1st, is an elevated and expanded version of 2nd, with much the same floor plan and, perhaps, a shared set of basal terraces. Ruined from the Early Classic period on, 1st was never rebuilt; its tumbled masonry and stucco sculpture lay close to present-day humus. The building just underneath 1st and 2nd had a more complex plan. Not one, but two separate areas were roofed. Because of the discontinuity with 1st and 2nd, these earlier structures received a “Sub” label implying, by Mayanist convention, a very different layout from that which came after. The logic of latest-to-earliest labeling means that the later of the two buildings is Sub.1A and, despite their more imposing

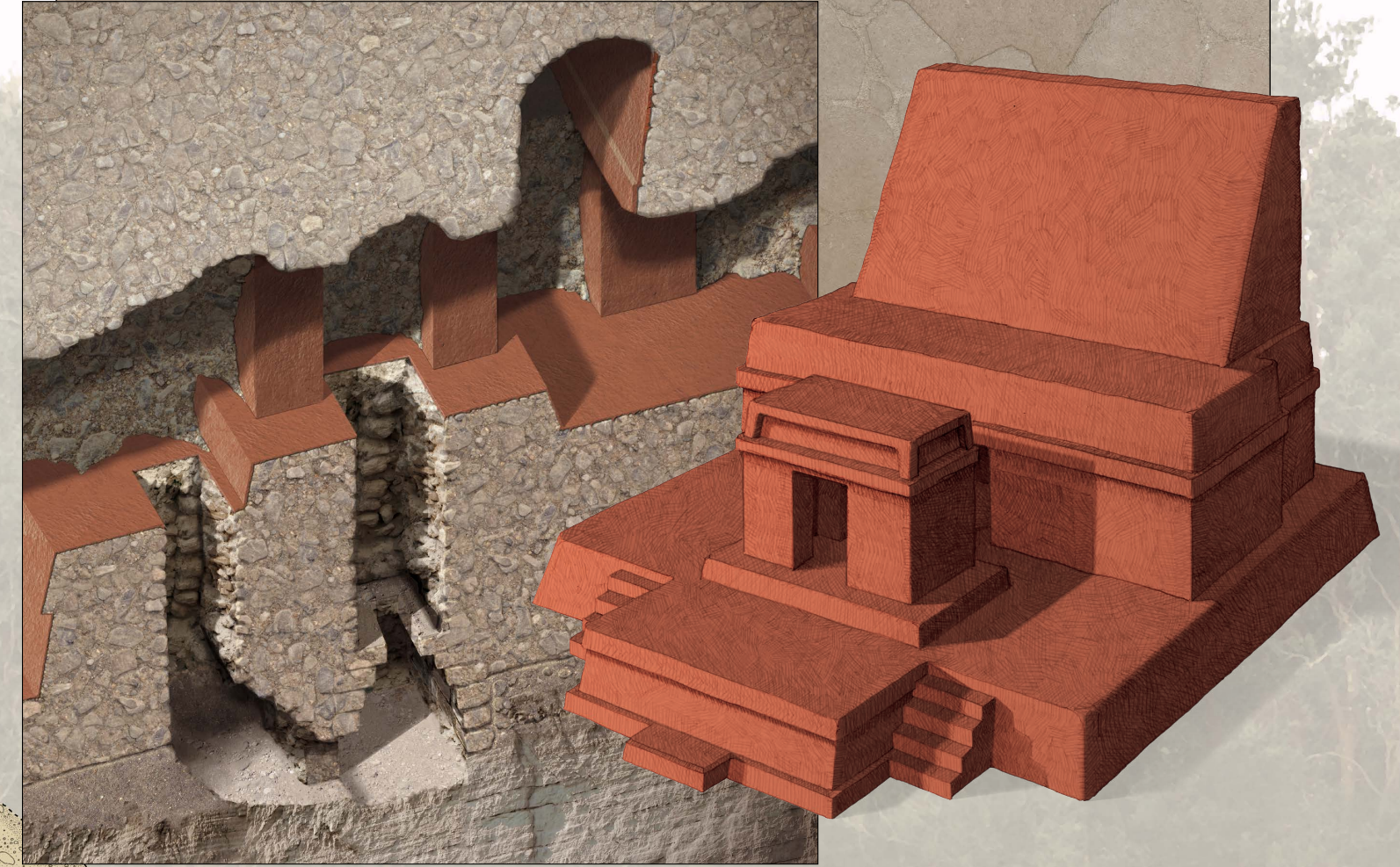
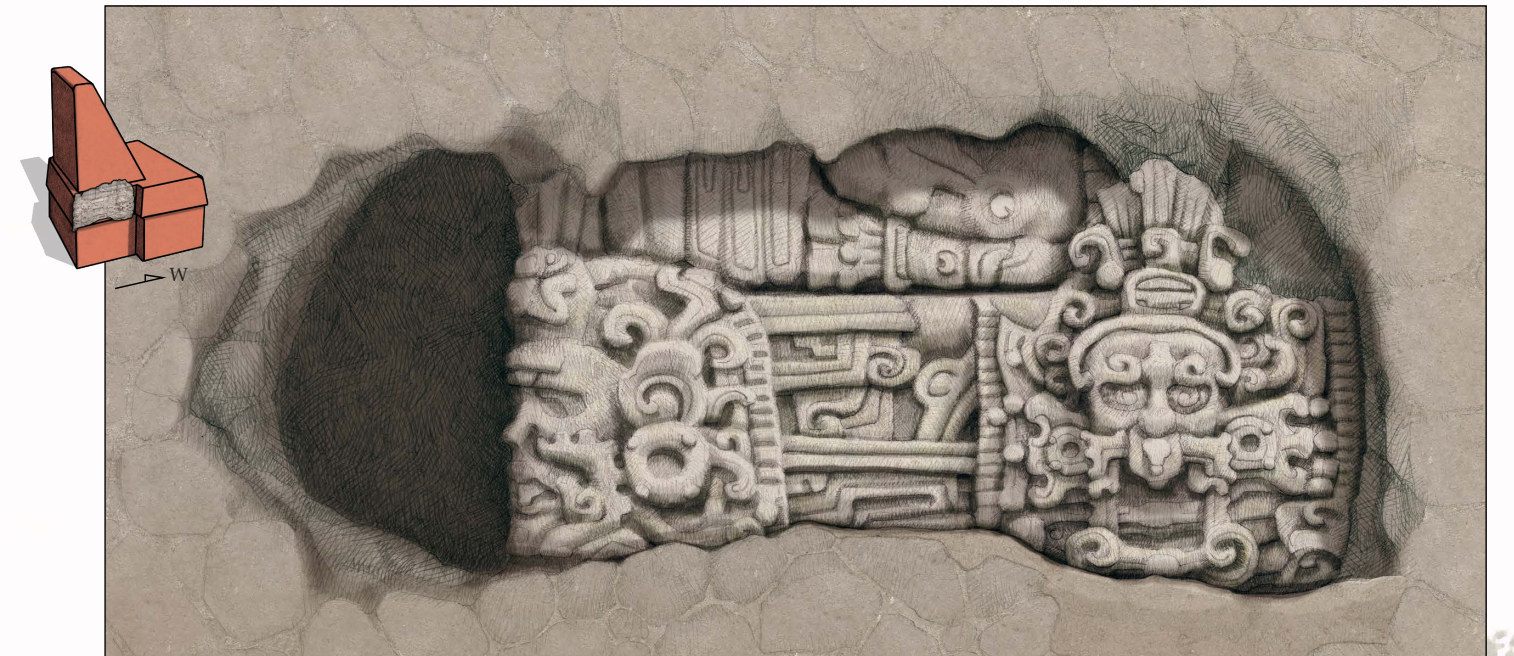


Figure 2.3. (facing page) The iterations of Str. F8-1 still visible in the southern excavation profile: Str. F8-1-1st, the “Upper Temple” (pink); F8-1-Sub.1A, the “Shrine” (yellow); F8-1-Sub.1B, the frontal chamber of the “Temple of the Night Sun” (orange); F8-1-Sub.1C, the rear chamber and roofcomb of the “Temple of the Night Sun” (red); and possible remains of F8-1-Sub.2, the “Red Temple” (far left, tan color); superimposed are combined profiles of excavations within Str. F8-1 from the 2009, 2010, 2011, and 2012 field seasons (original excavation drawings by Nicholas Carter, Anabella Coronado, Thomas Garrison, Yeny Gutiérrez, Stephen Houston, Zachary Hruby, and Sarah Newman; combined figure: Thomas Garrison); (this page, top) stucco sculpture on the north face of the northeast corner of Structure F8-1-Sub.1C, as revealed by excavation; (this page, bottom left) cut on axis through the Temple of the Night Sun showing excavation pits leading down to the burial chamber; (this page, bottom right) volumetric model of the Temple of the Night Sun complex.

Legend F8-1 South Profile

Phase		
Adosado	F8-1-1st	Fill
Bench	F8-1-2nd floor	Fill deposit with lidded ceramic vessels
Berm	F8-1-Sub. 1	Jamb reinforcement
Burial 9	F8-1-Sub. 1 floor	Plaza leveling
Collapse	F8-1-Sub. 1A	Conjectured tomb
Column Altar 1	F8-1-Sub. 1B	Remodel
Column Altar 2	F8-1-Sub. 1C	Unknown structure (possibly F8-1-Sub. 2)

size and elaborate stucco modeling, the two distinct phases of the earlier are Sub.1B and Sub.1C. Lowest of all was Str. F8-1-Sub.2, the most enigmatic in the sequence. This building consisted of red-painted stone, often harder and more rectangular or carefully shaped than elsewhere in Str. F8-1; the stone was also covered on one or two sides by a simple, thin covering of stucco that contrasted strongly with the embellishments of later buildings. At some point, just prior to the construction of Sub.1B

and Sub.1C, masons dismantled Str. F8-1-Sub.2. Signs of burning, especially a notable darkening of its paint, hint that its ending may have been violent or intense.

These labels offer a precise nomenclature for the individual buildings that make up Str. F8-1. They also suffer from alphanumeric clutter. For this reason, a more descriptive and evocative set of labels is used here. The “Upper Temple” corresponds to Str. F8-1-1st, the “Middle Temple” to Str. F8-1-2nd, and

the “Shrine” to Str. F8-1-Sub.1A. The “Temple of the Night Sun” is comprised of two structures, Str. F8-1-Sub.1B (the frontal chamber) and Str. F8-1-Sub.1C (the rear chamber and roofcomb), while the “Red Temple” corresponds to Str. F8-1-Sub.2, the lowermost, dismantled building. The stratigraphy is partly explained in annual reports by the project (e.g., Román and Newman 2011), but some details have come to light in recent excavations or need further clarification or integration.

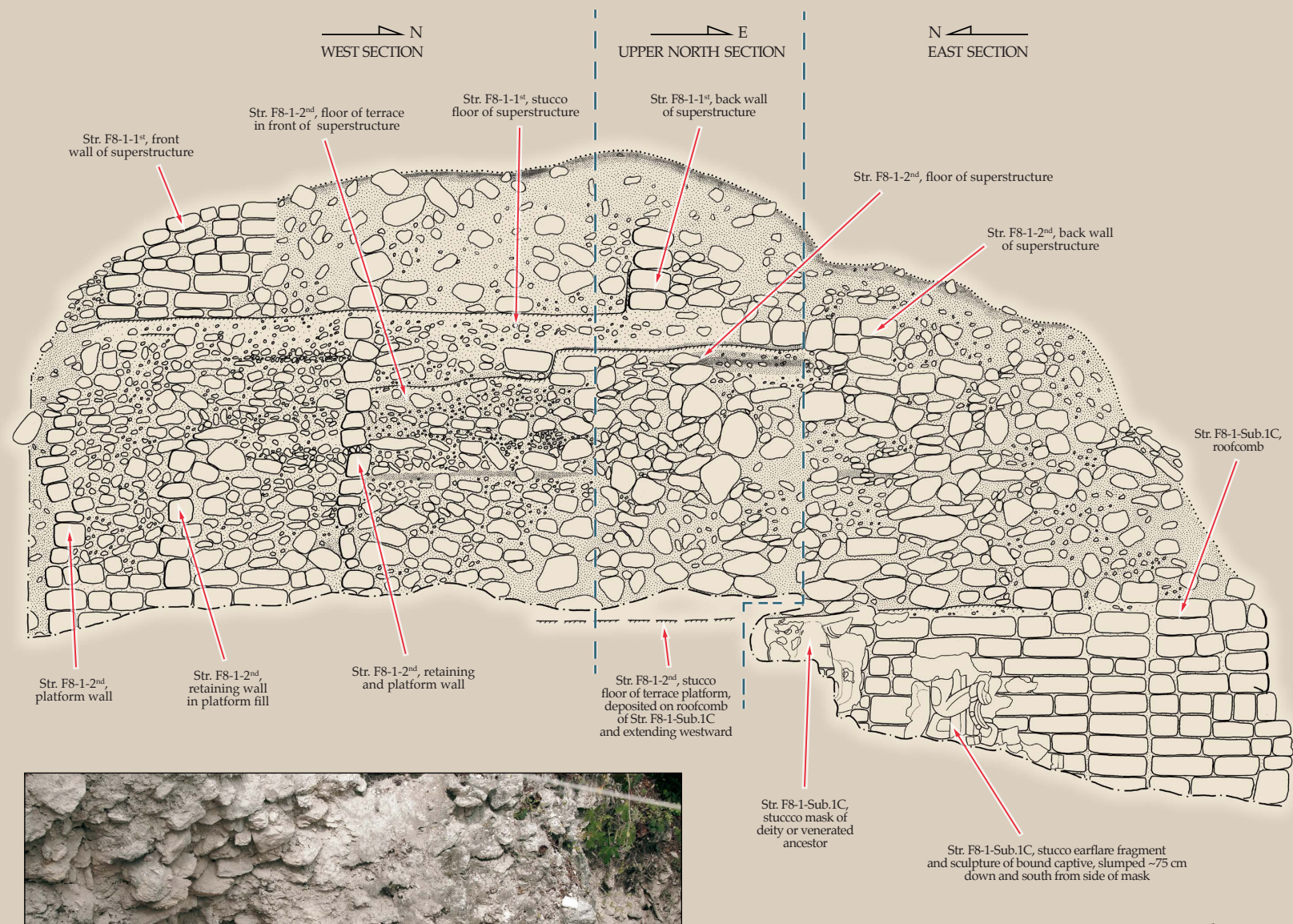
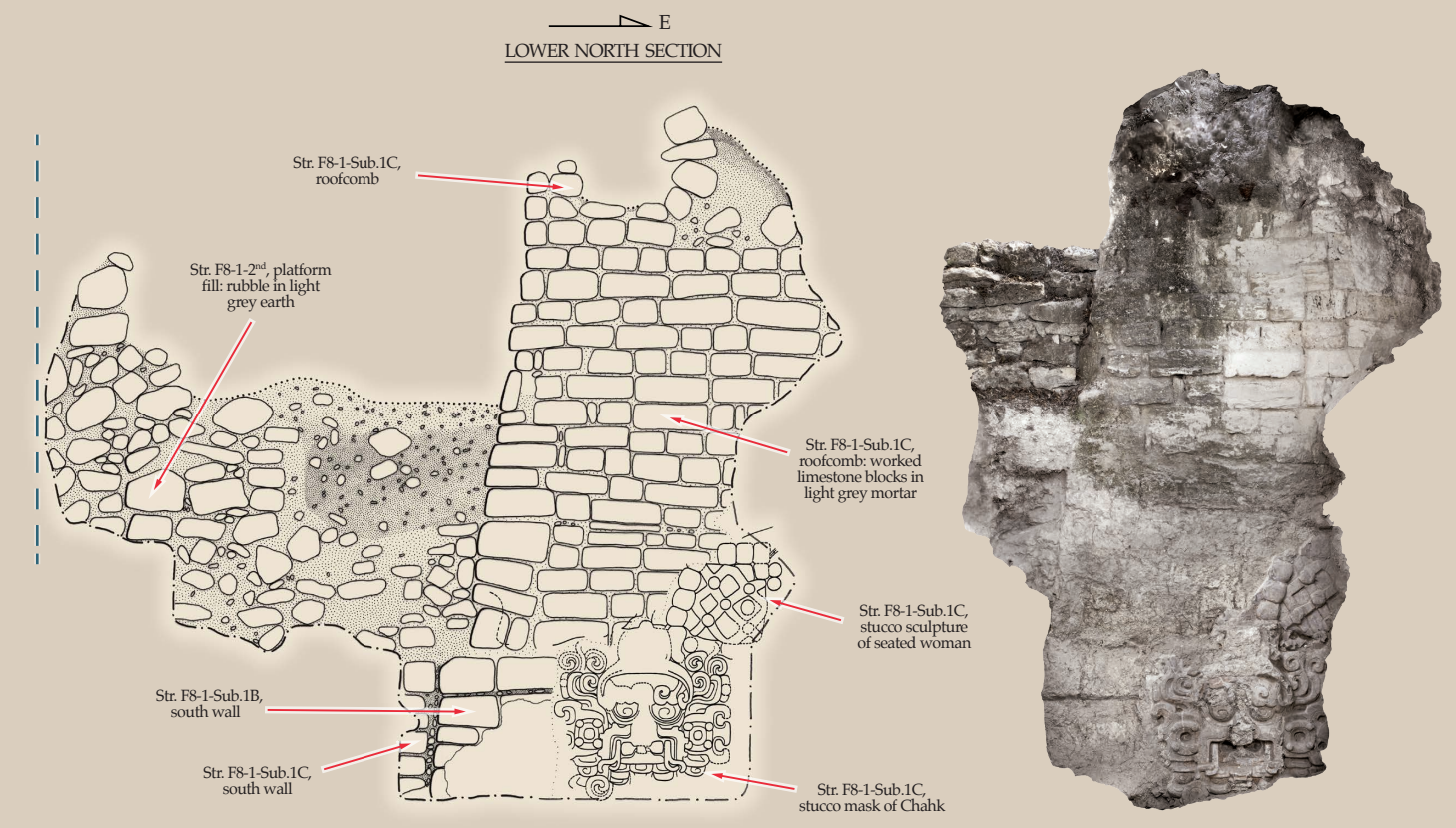


Figure 2.4. Excavation profile from cleaned looters’ trench, southern side of Str. F8-1, with architectural elements of Str. F8-1-Sub.1C, F8-1-1st, and F8-1-2nd. Seen in the drawing and in the photograph at left are remains of modeled stucco from the roofcomb of Sub.1C, the “Temple of the Night Sun.” The stucco mask of Chahk, at the far right of the drawing and in adjacent views, is from the southern façade of Sub.1C (see Chapter 5). Drawing: Nicholas Carter; photos Arturo Godoy and Edwin Román; photogrammetry Katie Simon, CAST.





Documenting the Modeled Stucco Sculpture

The tight fit of the Diablo tunnels made conventional imaging difficult. A team from the Center for Advanced Spatial Technologies (CAST), University of Arkansas, came to the rescue with novel photogrammetric techniques. Led by Katie Simon, with assistance from Kevin Fisher, Vance Green, Lauren Lipiello, and Alexa Rubinstein, they first experimented with a Breuckmann SmartSCAN HE, a white-light, fringe-protection photogrammetric

scanner. For unknown reasons, the equipment failed. The team then collected images with a Canon 5 camera linked to strobe and flash. Photographs were taken with at least 60% overlap in vertical and horizontal dimensions. Two or more images shot from different angles allowed, after processing with Agisoft PhotoScan, the creation of a point cloud. Further massaging derived a surface (or mesh) from the point cloud, onto which textures could be mapped (Figure 2.5).



Figure 2.5. Documented remains of modeled stucco on the four sides of the "Temple of the Night Sun" (see Chapter 5). Photogrammetry: Katie Simon, CAST.

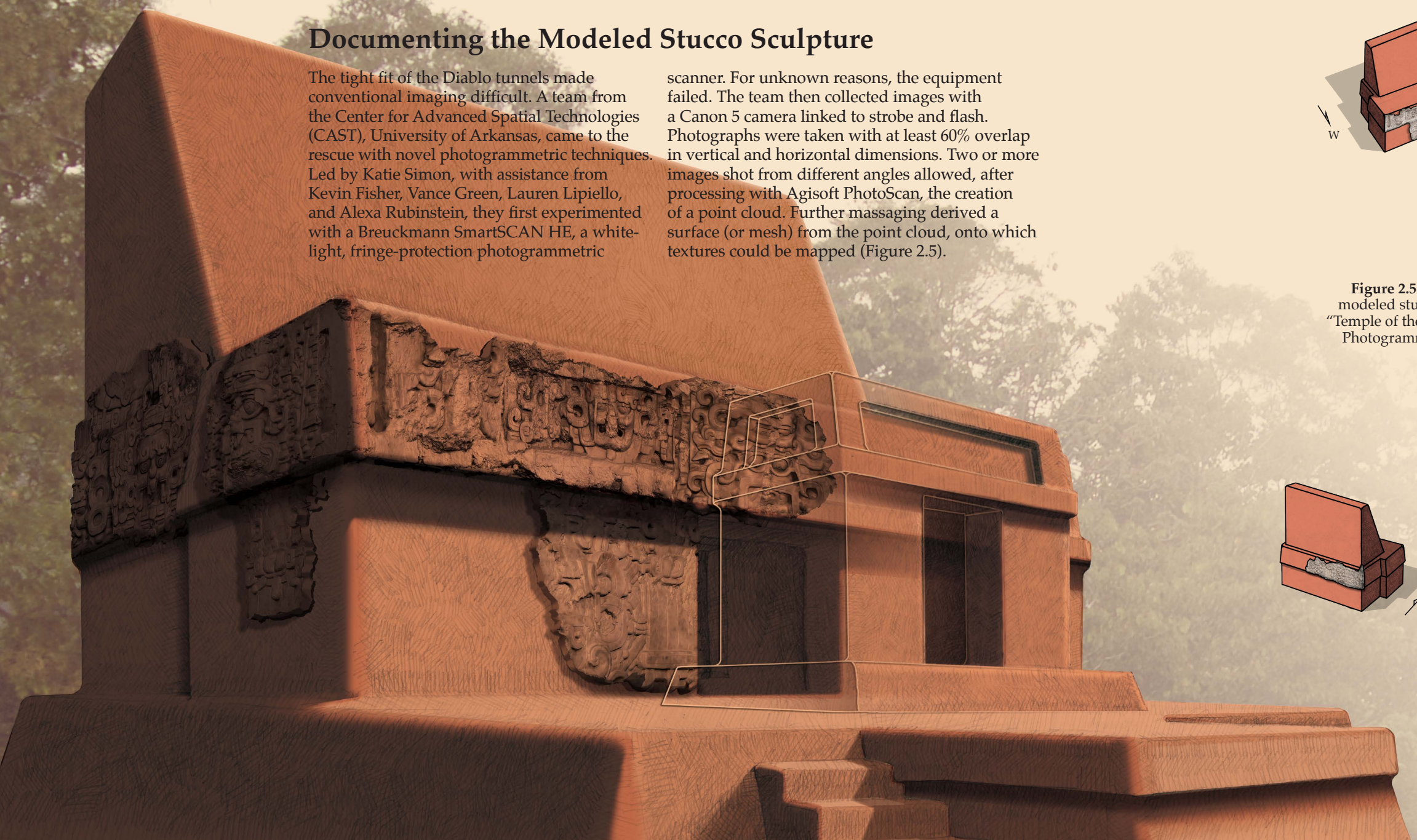




Figure 2.6. Blocks from Str. F8-1-Sub.2 (the Red Temple) plastered over and reused in the construction of Burial 9's chamber walls. Photo: Stephen Houston.

**Phase 1:
The Red Temple (Str. F8-1-Sub.2)**

The Red Temple is poorly understood. No signs of its plan or layout survive—in fact, it may not have even existed in the immediate vicinity of Str. F8-1. What does endure is a set of blocks with consistent size and finish. A few preserve an angle or batter, indicating that the Temple was not simply a vertical building with flat roof. The small number of attested stones hints, too, that the Temple could not have been very large. Several stones found their way into the walls of the tomb, where they were plastered over (Figure 2.6). One block was positioned in the western wall, some 25 cm above the floor; another appears another 25 cm or so above that stone, though farther to the south. After sealing, when the tomb experienced structural problems, several of the reused slabs from the Red Temple dislodged from the wall,

one landing on Sector B4 where it struck and tilted Vessel 2.

Most stone used in later constructions of Str. F8-1 was relatively soft. Almost chalky and crumbly in texture, it took whatever strength it had from generous overlays of stucco. Not so the Red Temple. Its rock was harder, elongated and slab-like, with little stucco save for a preparatory layer for a highly burnished coating of paint. The variant masonry, so different from subsequent phases, suggests that the Red Temple was built some decades before the rest of the pyramid. This accords with finds of Late Preclassic and “Tzakol 1” sherds in parts of the El Diablo complex, as well as early buildings in the Plaza, such as Str. F8-18 (see “Ceramics from El Diablo Fill,” below). Later red hues on Str. F8-1's stucco tend to be more orange, with similar levels of saturation but a lighter appearance than the Red

Temple. In contrast, the Red Temple's blocks display an almost burgundy-red finish, at times darkened nearly to black. The only explanation for this range of color would be the general or topical application of flame. Whether this burning took place at the time of dismantling or some time before is difficult to say, although the former is more likely; a similar episode of burning affected both chambers of the Temple of the Night Sun prior to its encasement in later building phases. The Red Temple could not easily have survived such damage.

As will be seen below, stratigraphy confirms that the space for Burial 9 was constructed in two phases. One phase created the tomb chamber, another vaulted and sealed it. Blocks from the Red Temple appear in both. Two stacked courses, facing east, occur as neatly positioned fill to the west of a column-shaped mortuary altar,

a stuccoed sculpture in use while the tomb was open (see below). The Red Temple might have been built generations earlier, but in all likelihood only a short span elapsed between the initial construction of the tomb and its closing. The material reserved from the Red Temple might have been convenient, close at hand, pre-cut, and ready-to-use. It might also have held some special property that the builders sought to confer on the tomb. A counterpart may be found in the early platform (Str. M7-1-Sub.1-1st) in the East Group, which was also colored red and decorated with stucco. Painted blocks from this structure were similarly reused for some of the capstones along the vaulted passage leading to Burial 16 (see Chapter 1).

There is another enigma, not yet resolvable on present evidence. A building came to light in Op. EZ 5B-3-6, a pit just under the union between the final stairway of Str. F8-1 and the plaza in front (see Figure 2.3). Partly destroyed, it was surrounded by ceramics, albeit in relatively small quantity, from the initial years of the Early Classic period (see “Ceramics from El Diablo Fill,” below). Stratigraphy indicates that this building, on rough alignment with the Temple of the Night Sun and the Shrine, was buried fairly late, when masons brought the platform of the Shrine (Str. F8-1-Sub.1A) up to the level of the El Diablo plaza. The problem, however, is that the evidence from ceramics points to an early interment, even before the construction of the tomb. A possible explanation is that the early ceramics came from reused fill or were misdated, meaning that another, fairly late building existed concurrently with the Shrine and the Temple of the Night Sun. Alternatively, the ceramics are correctly interpreted and the buried, now-destroyed building in EZ 5B-3-6 might be the remains of what was once the Red Temple. It had a stairway, purely conjectural at this point, dropping down to the west, towards the level fronting the tomb and its enclosing platform. The only way to test these possibilities is to connect the interior excavation tunnel in Str. F8-1 with the structure found in EZ 5B-3-6. Unfortunately, that dig would be dangerous; the surface is too close, and the fill likely to be loose.

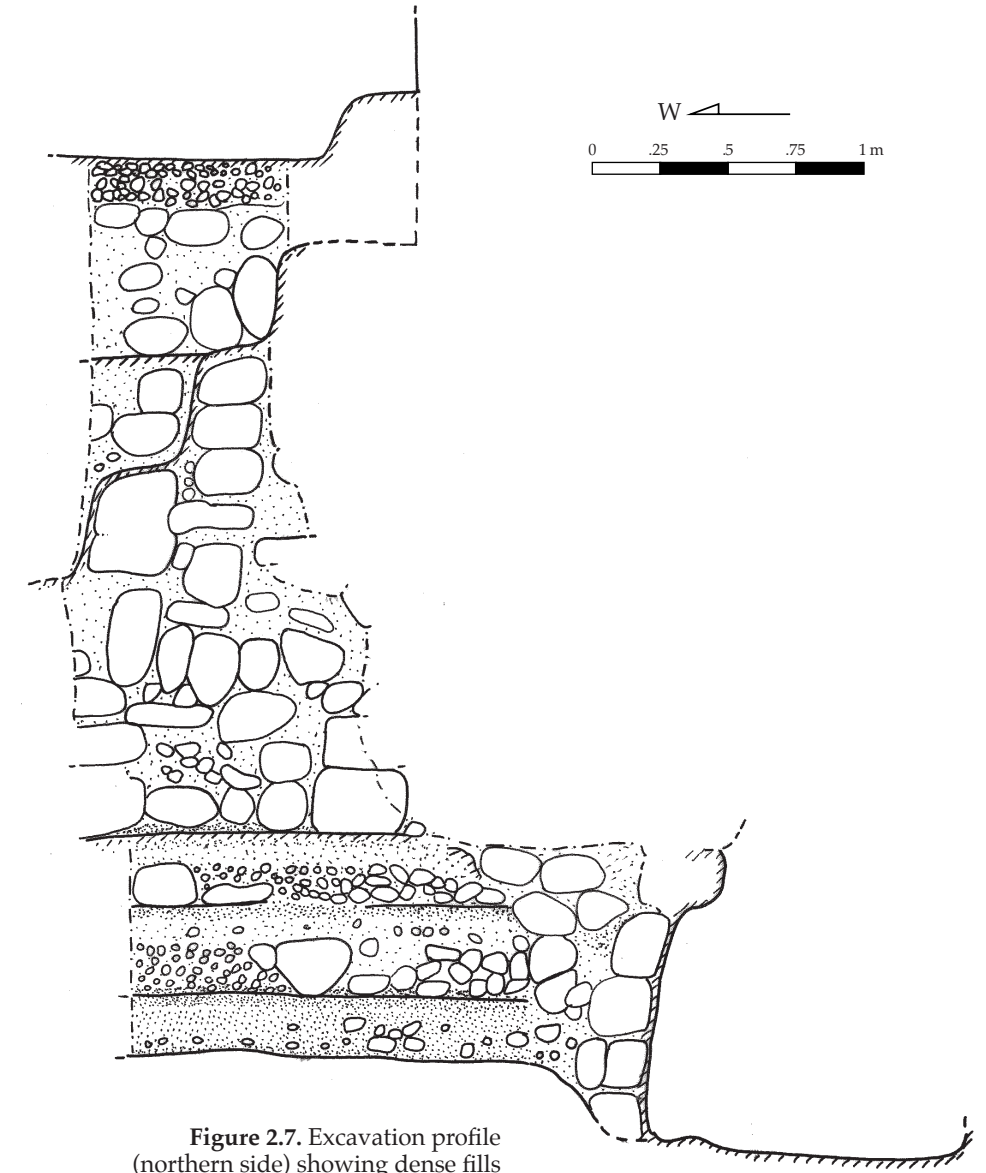


Figure 2.7. Excavation profile (northern side) showing dense fills atop bedrock to west of tomb chamber. Drawing: Stephen Houston.

**Phase 2:
The Open Tomb and Column Altar**

The phase of Str. F8-1 after the Red Temple was both subtractive and additive. The ancient masons' first task was to scrape away a dark, dense layer of earth to reveal the limestone bedrock below. Sulfurous and full of organics, this layer probably came from early levels of occupation at El Diablo or was taken from *bajo* deposits down the hill (such fills were evidently prized at El Zotz for their solidity, occurring in the site's largest pyramid, Str. L7-11, as well as various

other monumental structures). The layer might have correlated with the Red Temple and, barely visible in one profile, a faint floor a few cm above bedrock (Figure 2.7). The masons then cut a rectangular depression into the exposed bedrock. This surface would become the floor of the tomb, later smoothed with tamped earth and plaster. Linear slots around this depression served to fix blocks for the tomb's walls. The chamber itself, measuring 3.12 m along its north-south axis and 1.25 m wide along its east-west axis, on a heading of 340° (magnetic 339°, true north if corrected for declination), was formed of shaped limestone blocks and mortar. Initially masons laid down five courses



Figure 2.8. Caches 5, 6, and 8 visible in their arrangement about a crude stone altar, immediately to west of Burial 9. Photo: Arturo Godoy.

of stone, establishing the rectangular footprint of the tomb while leaving the enclosed space accessible from above. The uppermost course cantilevered slightly over the opening, its “lip” or top surface covered entirely with 2 to 3 cm of stucco.

A complex offering surrounding a crudely worked stone altar was placed just outside the western wall of the tomb (Figure 2.8). This dated to the time of tomb construction, most likely following the erection of its walls. The offering and its constituents may correspond to poorly preserved floors, visible in

the excavation profile, suggesting a process of successive interment and covering with provisional levels of fill above each deposit. The stone altar was accompanied by a series of five caches, four composed of two small bowls placed lip to lip—Caches 4 (EZ 5B-28-15; Figure 2.9), 5 (EZ 5B-28-18; Figure 2.10), 6 (EZ 5B-28-19; Figure 2.11), and 7 (EZ 5B-28-16; Figure 2.12), and one unpaired bowl, sitting upright—Cache 8 (EZ 5B-28-20; Figure 2.13). All of these were small examples of Aguila Orange, outflaring-side cache vessels, as described by T. Patrick

Culbert (1993:Fig. 103) for deposits at Tikal. To judge from their uniform finish and shape, the vessels were made by the same potters, probably at close to the same time: notably, this batch of pots also included vessels reserved for interment *after* the closing of the tomb (see below). Most of the cache vessels held human phalanges, with some containing teeth or obsidian as well (see Chapter 4). Cache 4 enclosed two human hand phalanges (an intermediate and distal), which appear to come from a single finger of an adult individual and show evidence of exposure to heat.



Figure 2.9. (top left) Reconstructed superior vessel (4A) of Cache 4; (top right) reconstructed inferior vessel (4B) of Cache 4; (bottom) Cache 4 prior to excavation. Photos: Jorge Pérez de Lara and Arturo Godoy.



Figure 2.10. (left) Cache 5 prior to excavation; (right) reconstructed inferior vessel (5B) of Cache 5. Photos: Arturo Godoy and Jorge Pérez de Lara.



Figure 2.11. (top left) Reconstructed superior vessel (6A) of Cache 6; (bottom left) reconstructed inferior vessel (6B) of Cache 6; (above) Cache 6 prior to excavation. Photos: Jorge Pérez de Lara and Arturo Godoy.

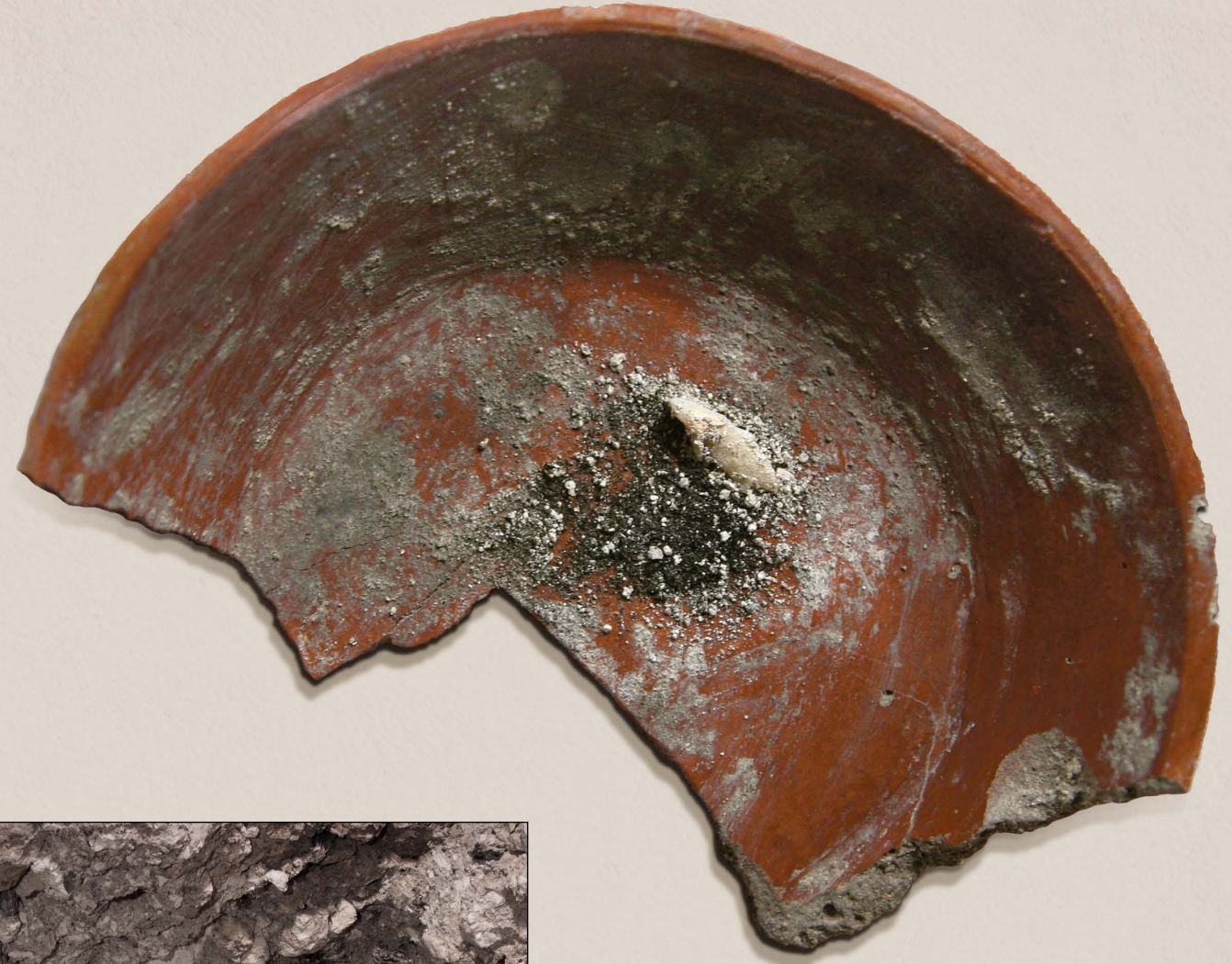


Figure 2.12. (left) Cache 7 prior to excavation; (above) close-up of tooth found within Cache 7 (after on-site laboratory excavation of Vessel 7B); (below) reconstructed superior vessel (7A) of Cache 7. Photos: Arturo Godoy, Stephen Houston, and Jorge Pérez de Lara.



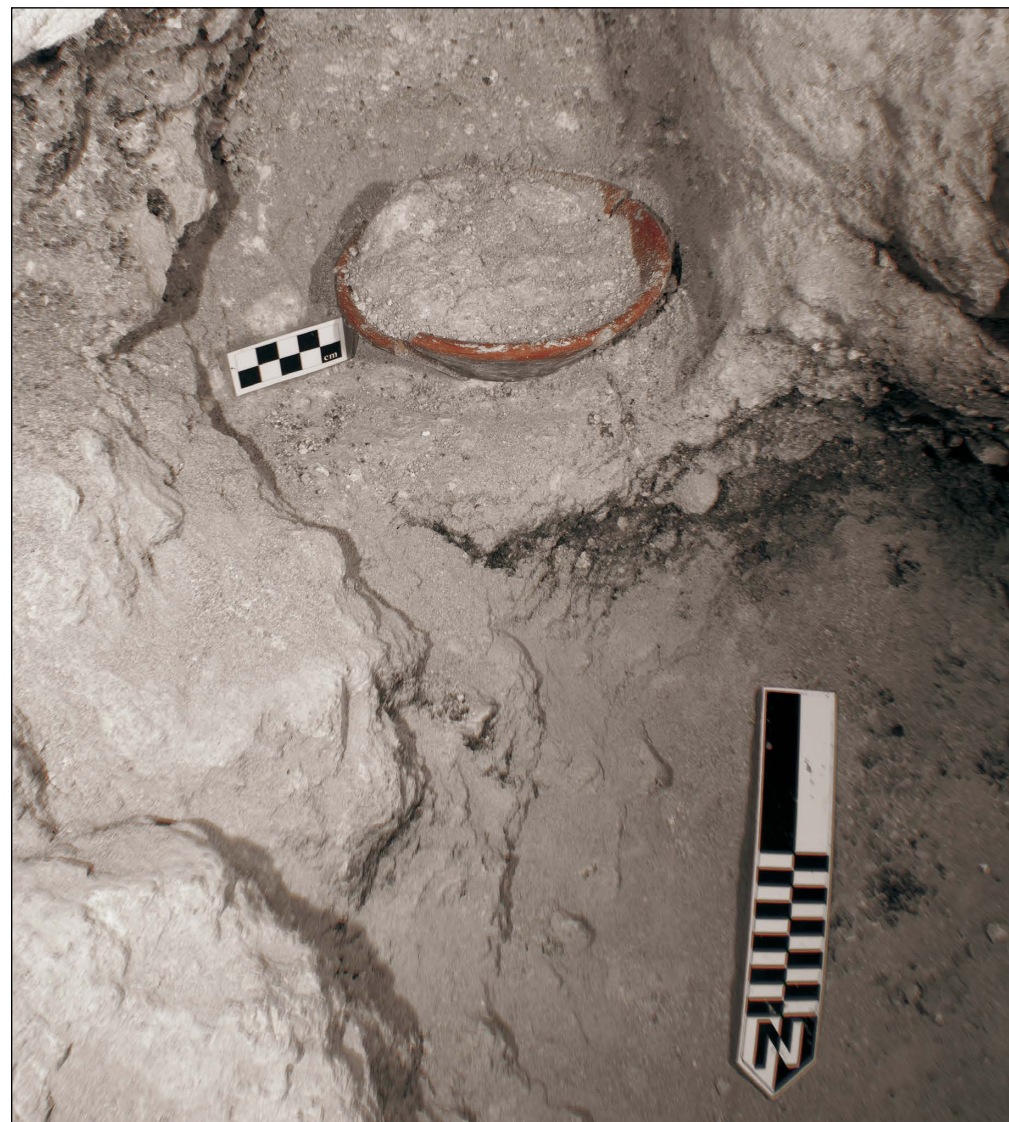


Figure 2.13. (top) Reconstructed vessel from Cache 8; (bottom) Cache 8 prior to excavation. Photos: Jorge Pérez de Lara and Arturo Godoy.

Cache 5, which featured two slightly larger and deeper vessels in comparison to the other caches, held six hand phalanges, also most likely from a single adult individual (one proximal phalanx, three intermediate phalanges, and two distal phalanges), one adult mandibular incisor, and a complete obsidian blade. Cache 6 had three human hand phalanges (one intermediate phalanx, one distal phalanx, and one phalanx too fragmented to be identified), all of which are adult (again, most likely from a single individual) and show evidence of discoloration from heat exposure and remains of a blackened substance that, in burning, adhered to the bone. Within its paired bowls, Cache 7 consisted of a single mandibular incisor, while Cache 8 housed two intermediate hand phalanges.

The altar and cache vessels were found either within or just above the dark, organic matrix that had been removed to level the bedrock and construct the tomb chamber. The exact placements and spatial relationships of the stone altar and accompanying cache vessels are difficult to reconstruct because of their natural settling within fill levels. It seems likely that Caches 4, 5, 6, and 8 may initially have been placed in a quadripartite arrangement below the stone altar, which then served as a cap for the caches. Cache 7 corresponds to a later fill episode as the construction of the tomb continued. It is quite possible that other lip-to-lip caches existed around the tomb, along the western axis and in other quadrants as well. Moreover, the stuccoed column altar erected in front of the tomb (discussed below) closely mirrors the orientation and location of this lower, much rougher altar.

The fill levels containing the caches and altar reached to the height of the tomb's walls, at the fifth course of stone, before they were covered with a well-preserved floor of thick stucco. The floor not only covered the dense, dark fill and arrangement of cached offerings, but further extended across the wall of the tomb, lipping over the interior edge and its cantilevered stones. The recovery of nests built by a species of potter wasp, which took its nest material from the moist mud covering the interior

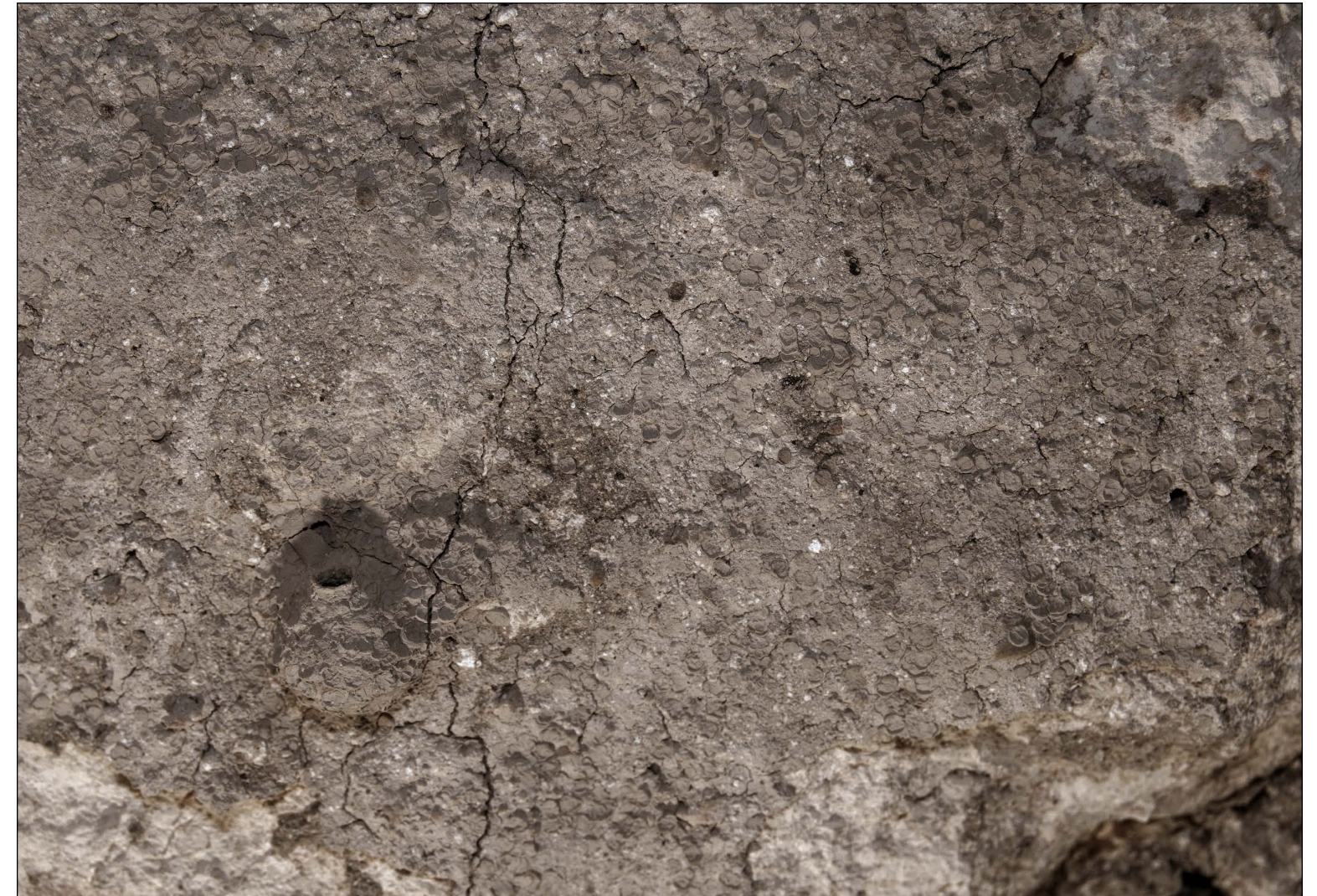


Figure 2.14. Potter wasp nests. Photo: Arturo Godoy.

walls of the tomb chamber, suggests that the floor remained in use while the tomb was still open (Figure 2.14). This allowed the mud and mortar to solidify, permitting time, too, for rituals of burning and the assembly of mortuary furniture (see Matthews and González 2004:Figs. 2-5). The high volume of wasp nests found within the tomb at El Diablo indicates "a reasonable inference of the onset of the rainy season," when such insects swarm. Nonetheless, potter wasps nest asynchronously throughout the year in tropical environments and even mid-dry season cannot be ruled out (James M. Carpenter, personal communication, 2010). The nests and surface remains of such activity cluster toward the southern end of the tomb. This is the area that would have been most exposed during the months from May through July, according to solar angle

calculators adjusted to the latitude of the Peten. Potter wasps tend to be more active in daytime, which might favor a summer date for the construction of the nests. The period it takes to build and provision a nest varies according to weather and distance to building material, but the average is two days (James M. Carpenter, personal communication, 2010). The evidence is inconclusive, yet there is a credible chance that the tomb was built and left open for some days in the early months of the local rainy season. A tempting, though unconfirmable date would be the summer solstice, thematically consistent with the solar iconography that envelops the Temple of the Night Sun. This is also when viewers, observing the sun rise from behind the Temple, would have seen a precise solar alignment with the "bat cave" (a collapsed sink-hole) on the

Buenavista Escarpment.

Atop this floor and immediately to the west of the open tomb chamber was a column-shaped altar measuring about one meter in height (Figure 2.15). The entire altar was a modeled stucco mask facing west, away from the tomb and toward the plaza. Somewhat crude in execution and partly defaced before its eventual burial, the mask was not detected during initial excavations because of tight spacing within the narrow vertical shaft accessing the tomb and the complex stratigraphy of Str. F8-1's inner layers. Its presence became clear only during later cleaning and documentation. Extending to the south, the mask displayed a large eye orbit (now largely destroyed), along with a mouth and protruding snout. Further excavations around the column altar confirmed that it was a freestanding

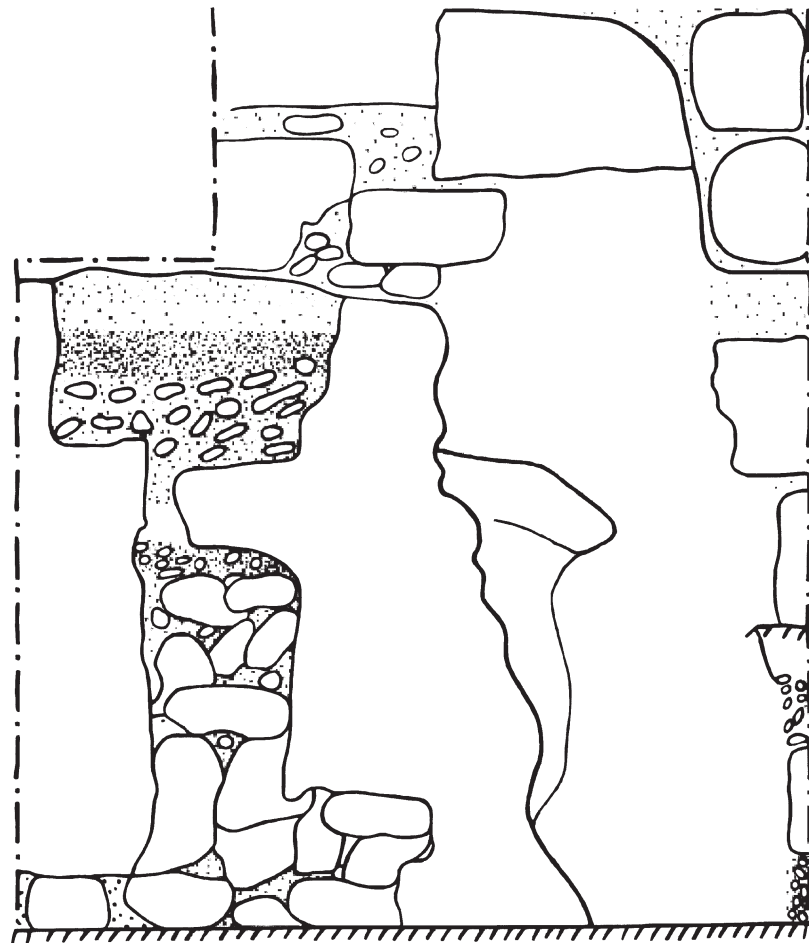


Figure 2.15. Column-shaped altar with modeled stucco mask, facing to the west and erected atop the floor leading away from the open tomb chamber. Burned residues atop the altar suggest it may have played a role in preparing offerings for the tomb behind it. Drawing: Boris Beltrán.



Figure 2.16. Flake scars left by masons on chamber stones. Photo: Arturo Godoy.

feature. Shaped by creating a cylinder of dressed stone, it was then packed with loose stone and earth fill before being plastered. At the center atop the altar a resinous and waxy deposit (approximately 1 cm thick) attests to residues of burning activities, most likely of copal incense. This evidence suggests that such rituals formed an integral part of the creation, exposure, filling, and later interment of the royal tomb directly behind the altar. Moreover, several of the vessels within the tomb and their contents show signs of heat exposure—some are severely cracked and blackened—including two basal-flange bowls with gutter spouts, each paired with a hollow, globular vessel (Vessels 3 and 14), two pitchers with gutter spouts and pedestal bases (Vessels 4 and 7), and a wide-mouth jar with a tall neck and small handles (Vessel 8), as well as six subadult skeletons found within large lip-to-lip cache vessels along the north-south axis of the chamber (Vessels 2, 11, 12, 13, 16, and 23). The burned objects and offerings contained within the tomb raise the intriguing possibility that these items were heated atop the column altar, making it a key location for ritual processing and preparations surrounding the interment. Both the column altar and the tomb opening were buried simultaneously, to be incorporated into the subsequent phase of Str. F8-1.

**Phase 3:
Filling and Sealing of the Tomb; Construction of the Rear Chamber of the Temple of the Night Sun and Shrine Platform (Str. F8-1-Sub.1C)**

To seal the tomb, masons laid the final two courses of the vault. These stones were not as even as the slabs below and must have needed additional shaping. A mason standing in the empty tomb—a filled chamber would not have provided sufficient space—struck horizontal or glancing blows with a chert axe, its “bite” about 5 cm in width (Figure 2.16). The flake scars of the axe left parallel marks in the soft stone, generally with a slight downward tilt to the right. A grey mud plaster packs and beds the stone, a technique also used in the construction of a fourth-century AD royal tomb at nearby Bejucal. The gaps between the two courses were filled and smeared with the same mud plaster, though in more vertical streaks, leaving impressions of grouped fingers. The mud disappears towards the southern end of the tomb. Almost certainly this was where those filling the tomb exited the chamber, leaving no one living to complete the daubing. The vault’s capstones were some 10 cm thick, the widest ones situated near the center of the vault. Most skewed off the perpendicular, crossing at a more easterly angle (Figure 2.17). The reasons for this are unclear. Perhaps the arrangement was thought to lend greater strength to the vault or maybe the slanting, more easterly heading conferred some symbolic benefit. The act of leaving open and then

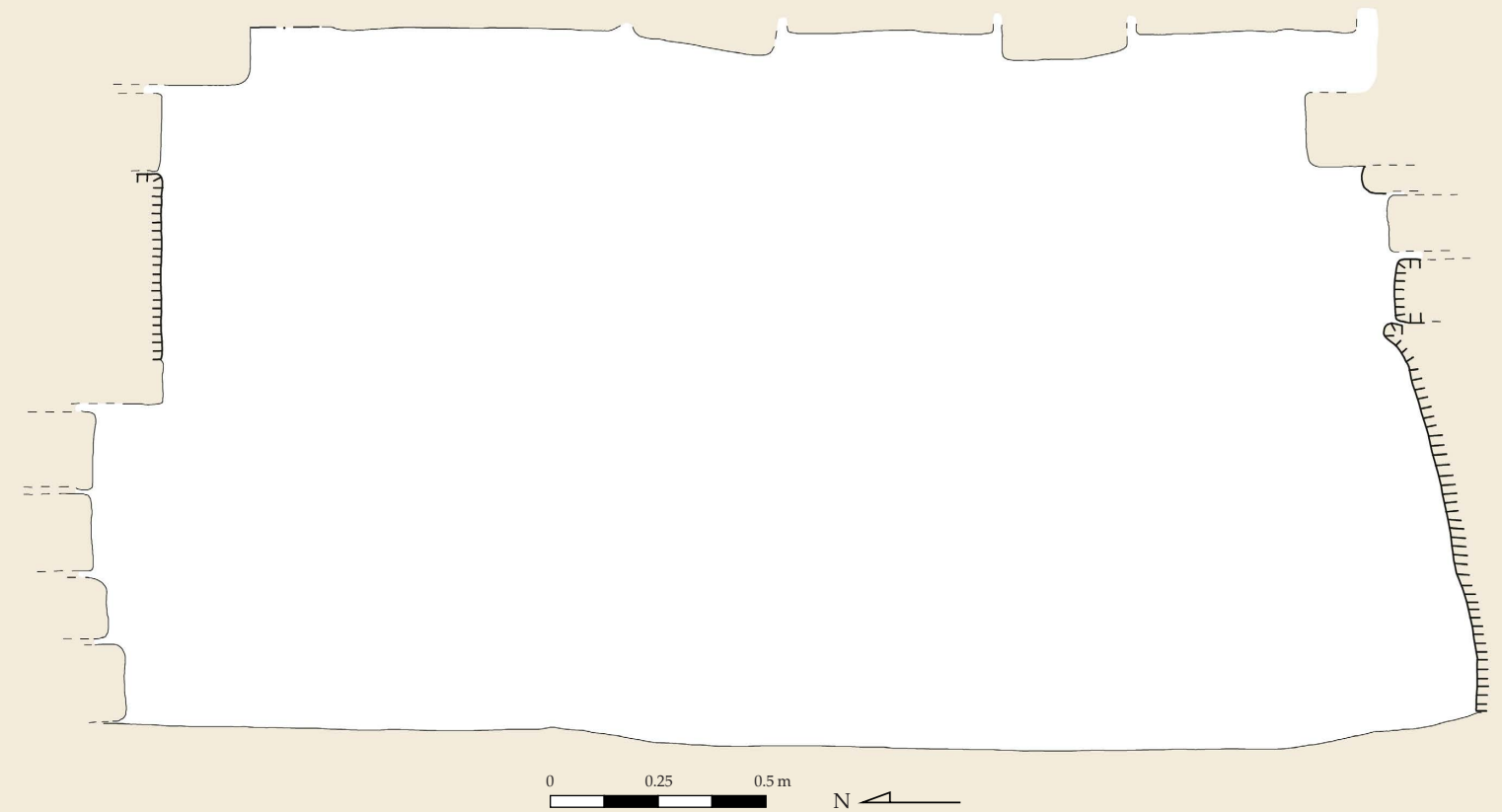
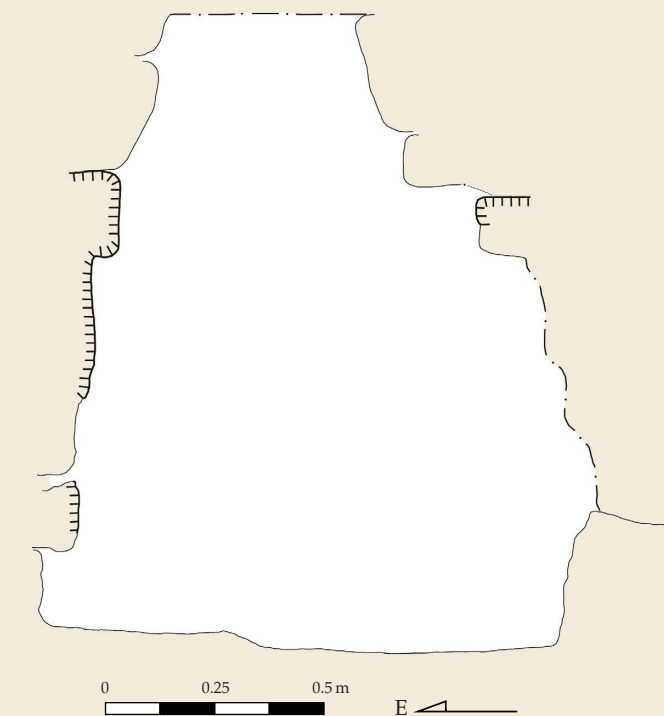


Figure 2.17. (above) East-west profile across tomb, from datum near tunnel entrance; (below left) north-south profile across mid-line of tomb; (below right) capstones to Burial 9’s vault skewed slightly from a perpendicular angle to the tomb’s walls before being filled and covered with mud plaster. Drawings: Sarah Newman; photo: Arturo Godoy.



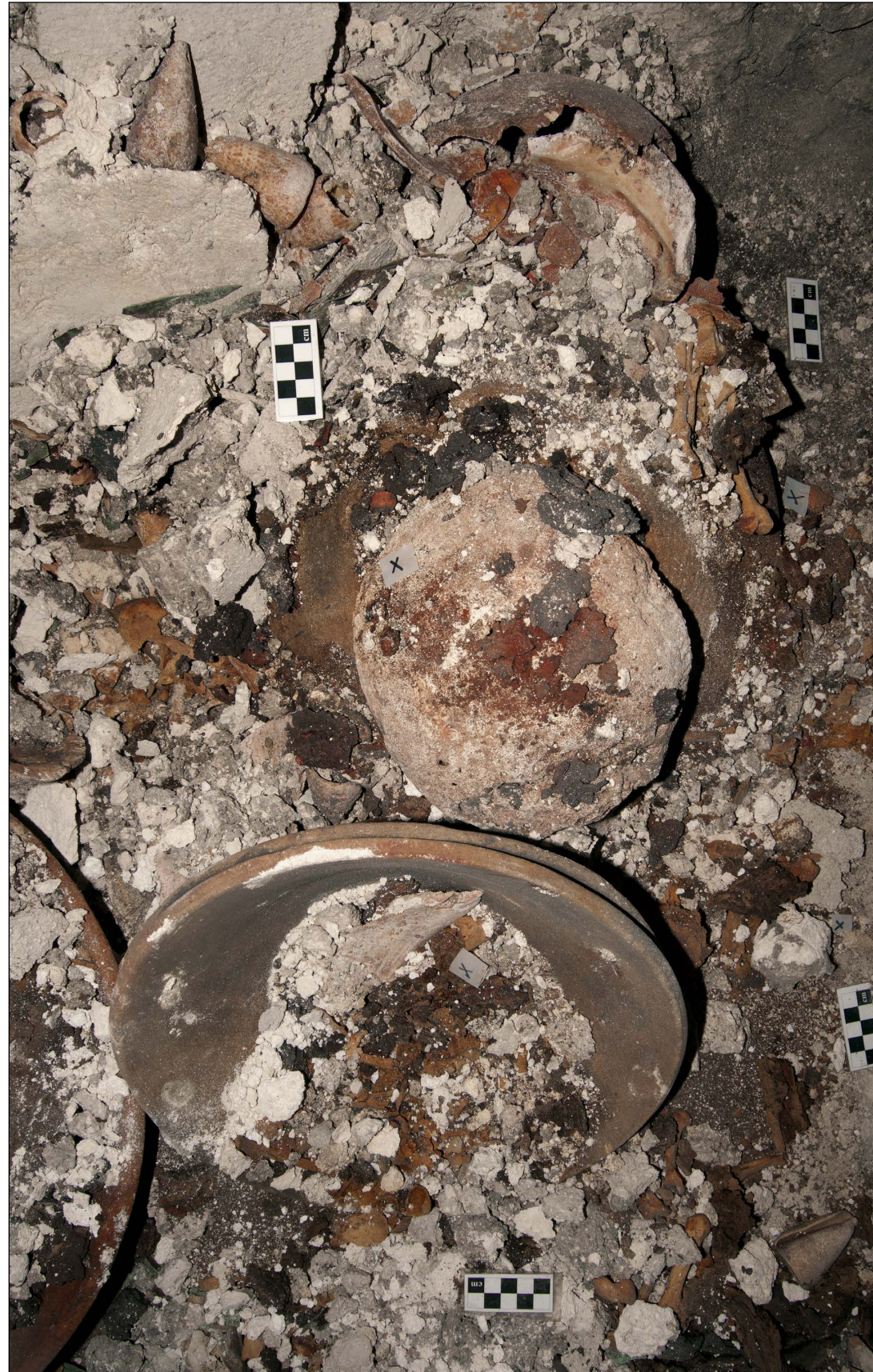


Figure 2.18. Offerings within Burial 9 showing sequential placement, with the rims of certain vessels overlapping others, as shown by Vessels 12 (covered by *Spondylus* shell facing down) and 13 (the pair of stacked vessels). Photo: Arturo Godoy.

closing a hole does accord with a trope attested in Classic Maya inscriptions. At an important Period Ending, Copan Stela A (glyphs H10-G12) celebrates the world directions along with holy lords linked to them. Its text mentions HA-'o-ba pa-sa no-ma WAY-ya ma-ka no-ma WAY-ya, *ha'o'b pasnoom way maknoom way*, "those, the hole-openers, the hole-closers." The concept of covering (*mak*) chambers and caches with capstones appears also at Caracol, Ek' Balam, and Machaquila, over the full gamut of the Late Classic period (e.g., Chase and Chase 1987:Fig. 37; Graham 1967:Figs. 47, 53, 55, 57, 59; Lacadena 2004:Figs. 6, 7, 8, 11, 13, 14, 16). In all discernible cases, such rituals involved royalty. This surely applied to the El Diablo tomb as well.

The offerings and occupants of the tomb were placed sequentially, moving from north-to-south and west-to-east in sequential lines and layers of objects. This pattern was especially evident in the positions of certain ceramics. Vessel 10, a small *olla* with a vertical neck and strongly everted rim, was placed before the far larger Vessel 11, just to the east. The same holds true for Vessel 12, its top adorned with a face-down *Spondylus* shell; its positioning preceded that of Vessel 13, which rested immediately to the east (Figure 2.18). By the time all the offerings were placed, the floor of the tomb was almost entirely covered by artifacts (Figure 2.19). These occurred in three north-to-south lines (see Figure 3.1, page 86). The western line had, in sequence, a serving bowl (Vessel 1), a lip-to-lip pair of cache vessels containing the remains of an infant (Vessel 12), then three more serving vessels with lids (Vessels 15, 17, and 19). The middle line consisted of lip-to-lip or doubled ceramics with human offerings (Vessels 2, 11, 13, 16, 23) and a large *olla* for liquids (Vessel 21). The eastern

Figure 2.19. Floor of the tomb chamber of Burial 9. Photo: Arturo Godoy.



line included smaller serving vessels (Vessels 3, 4, 7, 8, 9, 14), including two spouted bowls covered by layers of textiles that appear to have been employed to preserve the moist heat of their contents. This line consisted of several stuccoed and painted wooden vessels, at least one with feet in the shape of peccary snouts and a water-bird lid; an open ring-shaped pot-stand supported one of the vessels, a polychrome ceramic lid covered another. Such delicate, perishable vessels arc around the main body, from the top center of the tomb, down the eastern side, with a dense layer of probable stacked vessels, all perishable, atop Vessel 22. The eastern line ended with two now-decayed wooden cylindrical drinking vessels, one with slab feet, and a second bowl resting on peccary-snout supports. The final ceramics in this arrangement were three more serving vessels with lids (Vessels 18, 20, 22).

A peculiarity of some zoomorphic vessels in the tomb is their deliberate inversion. At interment, some of the lids appear to have been deliberately shifted from their correct orientation (Figures 2.20 and 2.21). The monkey head on Vessel 1 lay skewed 189° from the body of the creature underneath. The same pattern held for the mythic turtle on the lid of Vessel 17, also reversed with respect to the designs on the bowl below. One such find could be coincidence. Two advertise an intention to arrange the zoomorphs in a way that violated and subverted the overall depiction, a head now hovering over a tail, a belly or chest underneath a back. The heads on zoomorphic or anthropomorphic ceramic lids in the tomb generally face towards the east, albeit with more northerly and southerly dispositions in some examples.

Another striking feature of the ceramic assemblage in the tomb is that several vessels and their lids are mismatches. The base of Vessel 15 is larger than its lid, making for an awkward, sunken fit. Vessel 23's incongruity is more extreme. Its two lip-to-lip vessels include a base that has a slight medial flange



Figure 2.20. Lids of Vessels 1 (top) and 17 (bottom), found in positions that reversed their zoomorphic heads with respect to their bases, inverting the intended designs of the vessels. Photos: Arturo Godoy.

paired with an upper bowl of entirely different shape, more in keeping with the smooth, slightly outflaring bowls used in the tomb's other caches. Curiously, the medial-flanged bowl is far older than most other objects in the tomb, based not only on its form and surface treatment, but also its paste composition and chemical signature, matching those of Late

Preclassic vessels at El Palmar (Ronald Bishop, personal communication, 2012). In the case of Vessel 23, the discrepancies between lid and bowl led to weaknesses when the one was placed atop the other. Stones tumbling from the unstable chamber wall contributed to severe breakage of several other vessels (Vessels 1, 12, 18, 22), but this was particularly



Figure 2.21. Vessels 1 (top) and 17 (bottom), restored in the laboratory with their designs as intended. Photos: Jorge Pérez de Lara.

catastrophic with Vessel 23, the upper portion of which splintered into several dozen fragments. A few bowls exhibit obvious wear on their rims, such as the incised blackwares (Vessels 15 and 17). Although only the lip-to-lip cache vessels appear to have been commissioned for the tomb, other vessels followed consistent themes: the solar howler monkeys depicted on both Vessels 1 and 18 play on comparable, cosmic motifs.

The human remains within lip-to-lip bowls (Vessels 2, 11, 12, 13, 16, and 23) composed most of the middle line in the tomb, six in a row, and one, Vessel 12, at a right angle to the east of Vessel 13, the central ceramic in the line. A full description of the remains appears elsewhere (see Chapter 4), but there is unmistakable patterning (see Figure 4.3, page 183): skulls of children occupy Vessels 11 (Skeleton C) and 16 (Skeleton F) and the full bodies of infants appear in alternation—Vessels 2 (Skeleton B), 12 (Skeleton D), 13 (Skeleton E), and 23 (Skeleton G). One seemed to be too large for its receptacle. This body, Skeleton E in Vessel 13, probably hung over its edge; the two vessels intended for lip-to-lip positioning were simply stacked, the body draped over the uppermost. Close study by Andrew Scherer indicates that the single skulls faced east, except Skeleton B, as was true for the whole bodies. The heads to the east recall, by far analogy, an ethnographic account from the coastal Mixteca of Mexico: “La cabeza del niño difunto se orienta hacia el lado donde nace el sol” (“the head of the deceased child is oriented towards the side where the sun is born”; López Castro and Ruiz Medrano 2010:51). That the line of vessels with bodies as offerings corresponds approximately to the area occupied by the presumed king cannot be a coincidence.

The skeletal remains of the tomb's main occupant were found either above or interspersed among artifacts, suggesting that the body had originally been placed in an elevated position above the array of grave furniture. Powdered wooden remains intermingled with the skeletal remains and above the artifacts on the floor of the tomb confirm that the body was likely placed on an elevated wooden funerary bier, a widespread practice observed across the Maya area,



Figure 2.22. Fragment of wooden bier, or *teem*, coated with a layer of thin stucco, painted green. Photo: Arturo Godoy.

especially in the Early Classic period (Fitzsimmons 2009:188-193; Peirera and Michelet 2004:338-346). Long fragments of thin stucco, painted green, show evidence of wood grain on their undersides where they covered the bier (Figure 2.22). The bier itself is probably a long, low throne that the Classic Maya labeled a *teem* (Robertson et al. 2007:7, 29, 36). Described as a “funerary bed,” in “formal equivalence” to benches for the living (Peirera and Michelet 2004:Fig. 9), these were in all likelihood acquired in life. The spouse of Ruler 3, Yo’nal Ahk, at Piedras Negras, Guatemala, received one when her husband celebrated 25 years on the throne; their daughter, highlighted at the same time, had also managed to survive the rigors of early childhood (Piedras Negras Stela 3, glyph E3; the gift may imply the woman’s appointment as possible regent). Another

teem, its everted legs reproducing those of an animal, came to light in Burial 195 at Tikal (Moholy-Nagy 2008:65-66, Fig. 231). Dating to the early years of the Late Classic, it was 35 cm tall and 1.02 m long, approximately the length of a *teem* represented under the mortuary bundle of a queen on Piedras Negras Stela 40.

The *teem* in the El Diablo tomb was about twice the length of the Piedras Negras example and some 50 cm in height, to judge from the minimum dimensions necessary to accommodate the vessels below. Royal tombs at Río Azul, Guatemala, all of Early Classic date, show evidence of footings for *teem* (Hall 1989:73; Orrego Corzo 1987:Figs. 14, 15), as perhaps does a crypt at Comalcalco (Blom and La Farge 1926:Fig. 97). Alternatively, as in Río Azul Tomb 19, the wooden bench of Burial 9 may have resembled an open

lattice of lashed boards (Hall 1989:Fig. 70). Whatever its precise shape—the finish on the El Diablo *teem* was far finer than the examples from Río Azul—the wooden support was introduced into the tomb on its side, without the body. There was insufficient room in the small opening for a more graceful, level entrance. The ruler’s body probably experienced the same indignity when introduced to the chamber.

Several artifacts found among the grave goods on the floor of the bier with the deceased. These included a large obsidian blade, a dancer’s belt composed of *Conus* and *Spondylus* shells and a necklace of smaller shell beads worn by the occupant, a jade bead (originally placed within the mouth of the deceased; Ruz Lhuillier 1968:459), jade discs, celts, plaques, and masks,



Figure 2.23. Distribution of objects within the tomb, especially the *Conus* and *Spondylus* shells scattered above rock fall. Photo: Arturo Godoy.

and possibly a feline pelt, as suggested by the recovery of a distal phalanx of ocelot (*Leopardus pardalis*) size. The presence of the phalanx hints that the ruler went to the grave with a feline kilt or cape, much like those depicted in Rooms 1 and 2 in the Bonampak murals, Chiapas, Mexico (Miller and Brittenham 2013:Fig. 111). A second possibility, attested on several Late Classic vessels (e.g., K555, K2796 at Mayavase.com), is that the pelt covered the *teem*.

Following the placement of the final capstone to seal the tomb, a series of large, rectangular stones were arranged above. These were first laid in courses of elongated, near-trapezoidal slabs oriented north-south. Packed with hard plaster, the stones were buttressed at about one meter above the vault with rectangular slabs (ca. 50 cm x 20 cm) that ran east-west. The shifting orientations distributed the mass of the platform constructed above the tomb, preventing collapse into the chamber below. Although the builders clearly intended to seal and protect the tomb from water and the great weight about to be placed on it, that goal was not entirely successful. With the inevitable decay of the wooden bier inside the tomb, the royal body collapsed and its mortuary attire scattered, in a roughly north to south alignment along the western side of the tomb. Moisture concentrated in lateral flows approximately 50 cm above the tomb floor. This weakened the walls and contributed to a shearing of stone, particularly along the eastern edge of the funerary chamber. Some objects, particularly the *Conus* and *Spondylus* shells, were found distributed in a tumultuous mix above stones collapsed from the tomb walls (Figure 2.23). Presumably then, the walls had fallen before the decay of the bier. Since the wood is unlikely to have lasted long, the internal upheaval of the tomb might have



Figure 2.24. Small, triangular cavity above the tomb's vault may have served as a "psychoduct," enabling contact with the deceased below. Photo: Stephen Houston.



Figure 2.25. (left) Superior vessel (Cache Vessel 1A) of the first pair of vessels within Cache 1; (right) inferior vessel of the same pair. Photos: Jorge Pérez de Lara.



Figure 2.26. Set of Vessels 1A and 1B of Cache 1 prior to excavation. Photo: Arturo Godoy.

taken place only a century or two after the burial of the ruler.

Some ten courses of stone above the tomb's vault, a flat slab well-fixed in compact plaster (*sascab*) supported what can only be described, by analogy with the Temple of the Inscriptions at Palenque, as a psychoduct. This tube or cavity seemed to exist for ritual reasons, perhaps to facilitate sustained contact with the occupant of the tomb (Figure 2.24). In this case, the cavity was triangular in section, 10 cm wide at its base, and extended at least some 80 cm to the south. Its terminus or point of exit could not be established, as it was buried in architectural fill beyond the limits of excavated tunnels. The orientation of this cavity accorded perfectly with the vault line below. A dense pack of *sascab* plaster filled the area above the triangular opening and below two separate caches placed to mark the mid-line and mid-point of the platform over the tomb. The first to be found (although the second to be inserted by the Maya) was Cache 1, consisting of four bowls of the Aguila Orange type of the Aguila ceramic group in two lip-to-lip pairs, with the upper pair of vessels (1A and 1B) containing a single human phalanx (Figures 2.25 to 2.27; see Chapter 4). A lone sherd, also of the Aguila Orange type of the Aguila variety was found curated with the four bowls, a pattern mimicked in the later arrangement of Cache 9 (see below). Cache 2, the second cache found near the first, included another lip-to-lip of the same type-variety, but now with three adult phalanges (Figure 2.28). When found, the caches were nested within cavities which still bore the impressions of long leaves enveloping the vessel pairs, somewhat similar to the palm (*Coccothrinax* sp.) or bob (*Coccoloba* sp.) leaves that wrap sacred breads, *waanaj*, in



Figure 2.27. (top right) Superior vessel (1C) of the second pair of vessels within Cache 1; (bottom right) inferior vessel (1D) paired with Vessel 1C; (above) Vessels 1C and 1D prior to excavation. Photos: Sarah Newman and Arturo Godoy.



Figure 2.28. (top left) Superior vessel (2A) of Cache 2; (top right) inferior vessel (2B) of Cache 2; (bottom) Cache 2 prior to excavation. Photos: Jorge Pérez de Lara and Arturo Godoy.

Yucatan (Figure 2.29; Love 1989:336; Redfield and Villa Rojas 1934:129). After positioning the caches, masons leveled and completed the final, burnished floor some 5 cm above Cache 1. This floor showed faint signs of burning, little more than grey soot, hinting that offerings may have been made there as well.

Such layers of construction resulted in a long, elevated platform that would serve as the base for both the Temple of the Night Sun and the Shrine. It is possible that the platform had another underlying basal tier, but this remains unconfirmed by excavation. What is known, however, is that the initial construction of the platform featured two smaller areas atop its eastern and western sides, each with beveled edges roughly 4 m apart. The eastern rise served as the base for the rear chamber of the Temple of the Night Sun, while its western counterpart would later hold the Shrine. The northern and southern sides of the long platform have not been exposed because of the quantity of fill over them and their proximity to the surface of the ruined pyramid of Str. F8-1. The front of this platform, facing toward the plaza to the west, was defined by a set of five steps, the lowermost revealed in 2012 (see below). These led down to the floor level at the base of the column altar, the same floor that lipped over the western wall of the tomb while the burial chamber lay open (see above). This level served as the frontal approach to the Temple of the Night Sun even after the altar's burial and may also have served as El Diablo's main plaza surface.

The Temple of the Night Sun (hereafter "the Temple") was built in two distinct phases. The first, Str. F8-1-Sub.1C formed the rear (eastern) vaulted chamber. This was situated directly above the raised area on the eastern side of the platform covering the tomb. With dimensions of approximately 4.2 m east-west and 9 m north-south, the initial form of the Temple contained only a single vaulted chamber, creating roughly 1.86 m by 6.6 m of interior space, stuccoed and painted red. A bench ran along the eastern wall of the chamber, constructed after the lower courses of the Temple's walls. The



Figure 2.29. Stucco around Caches 1 and 2, revealing impressions of long leaves that once enveloped the lip-to-lip vessels. Photo: Arturo Godoy.

walls themselves contained dressed stones of 20 to 30 cm in depth, and the doorways were bridged by flat wooden lintels, four over the entrance to the rear chamber, probably of chicozapote (*Manilkara zapota*) or some other hard yet shapeable wood. The beams have left impressions of their grain in the plaster above and to the sides. This moderately sized chamber, however, supported a roofcomb towering more than 7.8 m above the surface of the underlying elongated platform. The initial

phase of the building and its massive roofcomb appear to have been covered in the primary iteration of the elaborate stucco masks whose iconographic elements give the structure its name (see Chapter 5). Later excavations along the south side of the Temple, which revealed the front chamber to be a secondary addition, also showed a later Chahk mask stuccoed atop the building's earlier iconography. This displayed a male and female pair, most likely the father and mother of the founder in the tomb below.



Figure 2.30. Front chamber of Temple of the Night Sun, reinforced by thickening the door jamb of its middle wall to combat structural failures. Photo: Arturo Godoy.

**Phase 4:
Construction of the Front Chamber of the Temple of the Night Sun (Str. F8-1-Sub.1B); Failure and Attempted Repair of the Temple of the Night Sun**

Perhaps because of the immense weight of the high roofcomb, a second vaulted chamber, Str. F8-1-Sub.1B, was added to the front (western side) of the Temple. Cross beams within the rear chamber

issues from the very beginning. The new and larger vaulted chamber, measuring roughly 10.7 m north-south and extending 2.7 m from the wall of the rear chamber, joined a low, flat roof in front of the towering roofcomb. This gave the Temple a "T-shape" in plan where it reached beyond the north and south walls of the rear chamber. Yet it seems to have done little to reinforce the unstable Temple. The dramatic contrast between a high-vaulted back room and much lower front room eventually led to a structural catastrophe. The front

chamber seems to have collapsed not long after construction, although the amount of time involved is unclear. Masons had to reinforce the front chamber with a thickened door jamb in the middle wall and narrow it as well, thinning the interior space available within the room (Figure 2.30). The vault appears to have been lowered in the process—indeed, so low as to become precarious. A new set of cross beams gave some comfort to the builders, anxious about collapse, but it is doubtful this did much good.



Figure 2.31. Thin layers of paint used to sketch out later stucco sculptures. Photo: Stephen Houston.

The iconography of the façade will be discussed in Chapter 5, but its manner of construction deserves immediate comment. The lower part of the external walls, measuring approximately 1.8 m in height, sits below a sloping roof that cantilevers 25 cm out beyond the vertical thrust of the wall. The slope of the roof was prepared carefully with plaster, along with outset blocks of masonry to support the series of elaborate stucco masks placed upon it, while recessed areas in between the masks feature skybands with jeweled beads. After what must have been a process of curing the plaster to a hardened consistency, a master artist daubed an initial sketch, more suggestion than firm design, of the stucco sculpture to be affixed to the plaster. This paint survives in ephemeral, scarcely detectable form in a few areas where the overlaid stucco has sloughed away (Figure 2.31). The stucco program of the Temple attests to two major stages of application, with the deity heads coming last. The façade of the front chamber was somewhat more complex in layout, perhaps as a result of its being a later addition.

Recessed panels, later echoed in the Shrine built atop the rise to the west (see below), showed other deities. All stuccoes were painted with red pigment. Some small highlighting with other colors appears, including yellow and orange in the eyes of the back central mask (Figure 2.32) and black-painted whorls in the eyes of a Jaguar God of the Underworld on the northern façade (Figure 2.33). Like the building below it, the roofcomb was similarly covered in sculptural elements. Of these, a seated figure remains visible on the north side, overlapped by the later stucco sculpture of Chahk below, along with a central mask (now partially destroyed) to the southern front of the roofcomb and a deity clambering up a pole.

The skill and execution of these stucco sculptures is impressive. What puzzles is the way that they were so weakly attached to their backing, especially on the sloped roof, but also the front lower façade. A continual danger during excavation was that of undermining thick, heavy stucco that lacked armature and proved ready to slide off. All that held



Figure 2.32. Color in the eyes of Mask 1, the central mask on the east cornice of the Temple of the Night Sun. Photo: Arturo Godoy.

Figure 2.33. Remains of black paint on Mask 5, a Jaguar God of the Underworld on the Temple of the Night Sun's northern façade. Photo: Arturo Godoy.



the stucco in place, particularly at the bottom, was the internal integrity of the plaster material itself. Gravity conspired against that integrity, and without careful digging pieces would crumble off the façade. Excavations in the corridor between the front of the Temple of the Night Sun and the eastern edge of the Shrine platform showed that, even prior to the elevation and repair of floors between the two buildings, the stucco program experienced significant damage. Parts of the Jaguar God of the Underworld on the front lower façade, west, were missing even *below* elevated berms. These failures signal, perhaps, that the local dynasty either did not wish to mend such damage or that it no longer enjoyed access to sculptors capable of such work. The Temple must have had a ragged appearance even during its time of full use. Still, it may be that the main damage was concealed by the Shrine (discussed below) and thus did not call out for urgent repair.

Phase 5:
The Shrine (Str. F8-1-Sub.1A)

At some juncture after the construction of the Temple's two chambers, a small structure was erected immediately to the west of this richly stuccoed building, a few meters directly above Burial 9 (see Figure 2.3). The motivation for this "Shrine" was evidently to cover the area above the tomb and its caches, perhaps for all-weather rituals. The Shrine may have been preceded by a perishable structure referencing Caches 1 and 2 below the surface of the platform, but, for structural reasons, excavations could not be undertaken to confirm this supposition. The small building measures only 4.5 m (north-south) by 2 m wide (east-west) and, for decoration, is limited to simple, square architectural features and recessed areas on either side of its front doorway. The recessed elements mimic those of the Temple behind it, pointing to the intriguing possibility that architects intended to cover the Shrine with a similar program of sculpted stucco. Perhaps they were unable to do so, for reasons unknown. The Shrine had at least two entrances, east and west, both with inset holders for doors or curtains. Unlike the Temple, the interior doorjambs of the Shrine show traces of ancient graffiti, including, on the northwest jamb, a full-length deity with characteristic "eagle" eyes (Figure 2.34). A thought arises, not testable unfortunately, that the rendering recalls a figure carved on the now-missing wooden lintel



Figure 2.34. Ancient graffiti etched into the interior doorjambs of the Shrine, including full-length deity with "eagle" eyes. Photo: Arturo Godoy.



Figure 2.35. The Adosado, with its top molding, basal terrace, and projecting outset on the front axis, was placed over the front stairway and altered access to the Shrine and the Temple of the Night Sun. Photo: Edwin Román.

above. A similar carving from Str. M7-1 in the main part of El Zotz indicates that the city invested in such work, albeit a century or so later. The absence of ornamentation on the Shrine, in conjunction with the unrepaired damage to the iconographic program of the Temple, hints that the talented sculptor or atelier responsible for the stuccoed masks of the Temple was no longer present.

**Phase 6:
The Adosado and its Altar**

After the construction of the Temple of the Night Sun, perhaps timed to coincide with the new Shrine, a sizeable outset was placed over the front stairway, altering access to both the Shrine and the Temple beyond it. The “Adosado” took the form of an outthrust baulk with a top molding and basal terrace, each 30 cm in height, with another small outset projecting directly on the front axis (Figures 2.35 and 2.36). Only one side of the Adosado was exposed, but enough remains to show that the overall length was 4.6 m. The original stairway is preserved to the side. In creating the Adosado, two events took place. The first was the placement of a lip-to-lip cache vessel (Cache 3/Burial 6, EZ 5B-28-9; Figure 2.37) containing the burned remains of a two- to four-year-old child (see Chapter 4), perhaps referencing the lip-to-lip caches in Burial 9 below (see above and Chapter 3). Presumably, those interring the child inserted the body into the container with a combustant, covered it with a lid, and forced it down into the lower part of the vessel, causing the ceramics to crack. Signs of burning extended into the cracks of the vessel, suggesting that combustion took place post-breakage. Closing the bowl most likely interrupted the burning, cutting off the oxygen needed to sustain the fire. The results would have been thwarted, flickering



Figure 2.36. The Adosado, with its basal terrace and projecting outset. Photo: Edwin Román.



Figure 2.37. (left) Cache 3/Burial 6, a pair of lip-to-lip vessels situated atop the original stairway to the Shrine and the Temple of the Night Sun; (right) inside were the burned remains of a two- to four-year-old child. Photos: Arturo Godoy and Stephen Houston.



Figure 2.38. Cache 9, positioned in front of the Adosado, with two pairs of lip-to-lip vessels and a lone sherd. Photo: Edwin Román.



Figure 2.39. A single painted polychrome sherd found curated with Cache 9, positioned between the Adosado and the column altar to the west. Photo: Edwin Román.

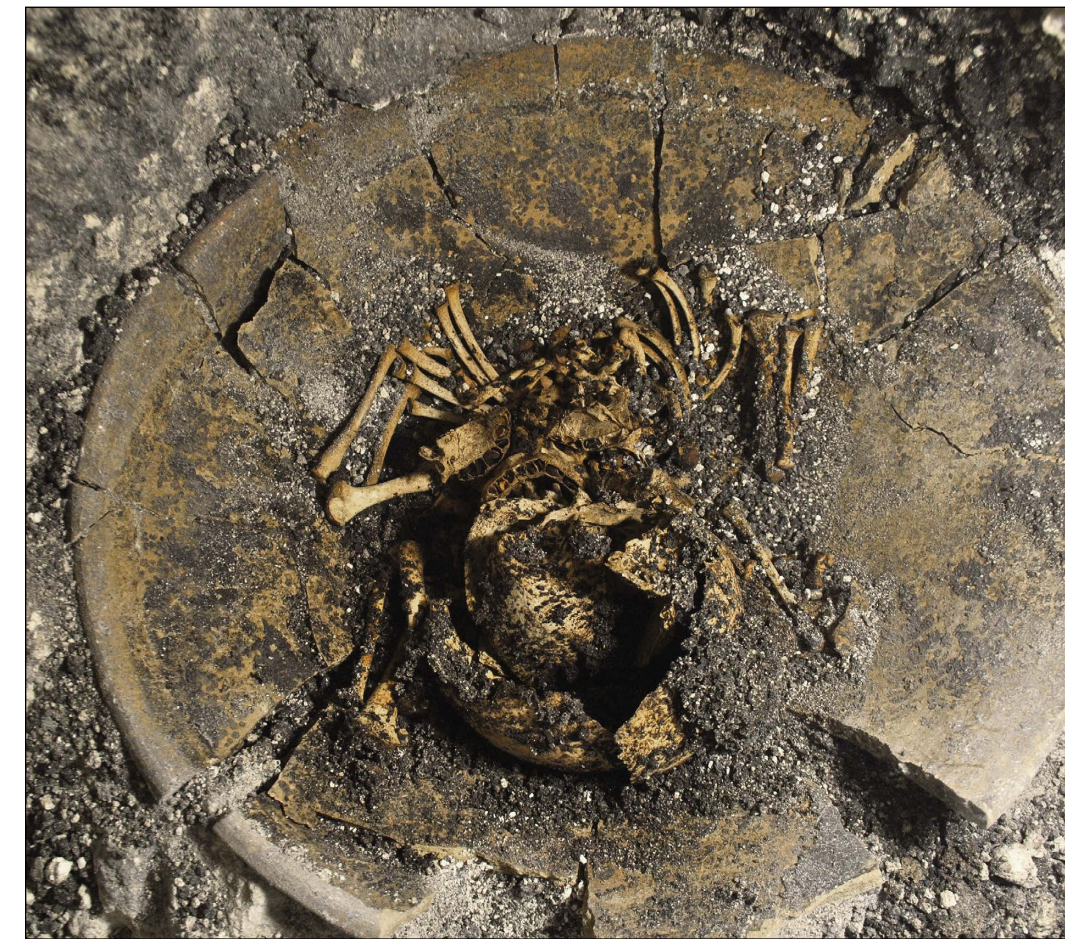


Figure 2.40. Cache 10/Burial 15, placed atop bedrock, with pair of lip-to-lip vessels containing the remains of a complete and well-preserved, though decapitated, infant. Photo: Edwin Román.

flame and acrid, dark smoke. A carved-out hollow was made on the first step leading down from the platform supporting the Shrine and leading to the Temple of the Night Sun; the two large bowls and their grisly contents were placed atop the step and the Adosado constructed above.

A second event, perhaps simultaneous with the first, was the positioning of two other caches in front of the Adosado, both excavated in 2012 (Figure 2.38; Gutiérrez et al. 2012:21-23). Like those under the floor of the Shrine, Cache 9 (EZ 19A-10-2) contained two pairs of lip-to-lip Aguila Orange type vessels of the Aguila variety. The first pair of vessels (Vessels 9A and 9B) was found only 8 cm below the level surface extending from the Adosado to the west; it contained an incisor, a phalanx, and an unidentified, possibly organic material. A polychrome sherd was seemingly curated and placed with the cache, a pattern similarly attested in the placement of the two lip-to-lip pairs forming Cache 1 above (Figure 2.39). Just to the northeast, at a depth of 20 cm, was the second set of lip-to-lip vessels from Cache 9 (Vessels 9C and 9D), also with tooth and phalanx, though covered with a fine grey paste not present in any of the other caches recovered from Str. F8-1. Just atop the bedrock was a final cache, designated Cache 10/Burial 15 (EZ 19A-10-4), which was also a lip-to-lip pair of bowls. Cache 10/Burial 15 enclosed the remains of a complete, though decapitated, infant (Figure 2.40; see Chapter 4). A separate excavation unit to the west (EZ 19A-9) showed what appeared to be remains of a floor, detected in a separate excavation unit to the northwest of the Adosado. This ran just beneath the final floor, accompanied by a complex sequence of tamped surfaces and rocks. Crucially, the floor was not visible in the pit



Figure 2.41. Large circular altar to the west of the Adosado, marking the edge of a cut excavated down to bedrock.
Photo: Edwin Román.



Figure 2.42. One of the series of berms. Photo: Arturo Godoy.



Figure 2.43. Berms were raised within the doorways on either side of the Shrine.
Photo: Stephen Houston.

where Cache 10/Burial 15 was found, indicating a cut to bedrock to prepare for the Adosado. Thus, the outset (a) measures 4.6 m x 1.3 m, (b) involved a slicing operation to sterile rock, (c) was accompanied by an elaborate set of new caches, and (d) lay just to the west of Burial 9. All of these pointed to the strong chance that another burial or substantial deposit lay within, some 50 cm or so from the lower front of the Adosado, but excavations in 2015 disproved this possibility. A circular masonry altar in front of the Adosado, probably marking the western edge of the cut to bedrock, parallels the mortuary altar in front of Burial 9 but must have had some purpose other than mortuary veneration (Figure 2.41). This altar, slightly tapered at its top and one meter in diameter at its base, lacked any stucco decoration.

**Phase 7:
Raising the Plaza Level;
Ensuing Problems of
Drainage**

Access to the Temple of the Night Sun, the Shrine, and the Adosado changed when the floor of the central plaza of the El Diablo group was raised roughly 10 cm above the elongated platform running beneath the Temple and the Shrine. What had been elevated buildings, approached first by direct ascent up a stairway, later by split ascent to either side of the Adosado, changed markedly to a set of buildings level with the plaza (this change in elevation most likely resulted from the construction of Str. F8-5 to the west of the Temple and the Shrine). The new plaza level allowed for unrestricted flow of human traffic, but it also created new problems. Rainwater that had previously washed down and around the Temple and Shrine now drained directly into them. In response, masons raised two berms within the doorways on either side the Shrine. The eastern berm features a small perforation to allow water to drain out of the structure's central room (Figures 2.42 and 2.43). The berms preserved proximity to



Figure 2.44. Cache of empty lip-to-lip vessels placed at the level of the plaza floor in front of the central stairway of Strs. F8-1-2nd and F8-1-1st, echoing the style of caches associated with the tomb. Photo: Arturo Godoy.



Figure 2.45. Weathering of red paint on the Temple of the Night Sun. Photo: James Doyle.

the subfloor caches within the Shrine while preventing water from running across its highly burnished floors. Soon thereafter, a second raised floor level and berm were configured to block the entrance to the front chamber of the Temple of the Night Sun. As mentioned above, some of the stucco sculptures on this front façade had already begun to fail, perhaps as a result of water coursing through the structure—possibly this had weakened the bond between stucco and backing wall. As in the case of the Shrine, the interior floors of the chambers went untouched, reducing the doorway to the Temple of the Night Sun to an uncomfortable height of one meter. Entrants were now forced to stoop, step down into the front chamber, then

step up into the rear room. A cache that might have accompanied this raising of plaza level included another pair of lip-to-lip vessels at the level of the plaza floor, just in front of the later staircase shared by both Str. F8-1-2nd and F8-1-1st (Figure 2.44). Although this pair of vessels lacked human remains, they were close in size and nearly identical in form to those found with sacrificed infants or children (Román and Carter 2009:108).

**Phase 8:
The Middle Temple (Str. F8-1-2nd)**

The span of time during which the Temple, the Shrine, and the raised floor between the two buildings were in active use is difficult to determine

but was likely at least a decade or two. The key piece of evidence is the degree of weathering in the red paint of the Temple. It retains a sharp, luminous orange-red only under the cantilevered roof, in areas sheltered to the front, and under points of deep relief in the stucco sculptures (Figure 2.45). The rest has washed away. It seems logical to assume that the intense scouring by seasonal rains and year-round sunlight would quickly deteriorate the Temple's painted stucco surfaces, a crude indication of a relatively limited span of time during which the building was exposed. The dilapidated stucco must have also been a concern. Distressing quantities of the northern façade and probably parts of the roofcomb as well were in poor shape

Figure 2.46. Intentional mutilation of stuccos, Temple of the Night Sun. Photo: Edwin Román.



Figure 2.47. Fill above the Temple of the Night Sun, with retaining walls to prevent lateral displacement of the newly added bulk for Str. F8-1-2nd. Photo: Arturo Godoy.

even before the Temple was enclosed within later construction phases of Str. F8-1. Wishing to maintain the structure as a point of ritual focus, yet mindful of its increasing deterioration, masons interred the Temple and the Shrine (the Adosado now invisible beneath the raised plaza floor) beneath the most massive structure in the pyramid's sequence: Str. F8-1-2nd.

Once the decision had been made to cover the Temple and Shrine, the buildings were ceremonially filled and buried. This process involved intense burning, as evidenced by the heavily mottled and blackened interior walls of the Temple's rear chamber. The stucco program seems to have also been intentionally mutilated, with a focus on the noses, mouths, and headdresses of the deity faces (Figure 2.46). A curious feature of the fill levels surrounding the Temple was that the fill shifted from large blocks to finer material at a mid-section on the sloping roof, as though the builders wished to consolidate the structure before heaping more debris atop it. This finer level of fill also included several perpendicular retention walls, probably to prevent lateral displacement of the new bulk added to the pyramid and provide rough guidelines as construction progressed (Figure 2.47).

In bulk, the amount of fill brought to this location was at least five times as much as



Figure 2.48. Stucco sculptures remaining on the roofcomb were covered over with fill. Photo: Arturo Godoy.

the separate constructions underneath. Not incremental but rather massive in investment, Str. F8-1-2nd represented a profound reworking of this center of ritual activity. From distinct structures, accessed by walking across a plaza, the structure now vaulted 8 m at the base, with its roof higher still. Relevant rites took place not in a variety of buildings with several rooms and multiple means of access, but in a single chamber. In short, Str. F8-1-2nd represented a ritual condensation, even simplification, of past activities.

The architecture of Str. F8-1-2nd is poorly understood. Preparations for this construction focused first on filling areas over and around the Shrine and front chamber of the Temple of the Night Sun. Concurrently, hacking and burning disfigured the central mask on the western front of the roofcomb. A plaster floor was then prepared across the fill, sloping slightly upwards toward the east so as to cover the roofcomb and its remaining stucco sculptures (Figures 2.48 and 2.49). In all likelihood, this was simply a leveling rather than a functional floor for pedestrian use or to prepare a temple. Instead, this level established a secure foundation for the visible summit of Str. F8-1-2nd. It may also correspond to an external, second terrace of the newly formed pyramid—the first terrace is hypothetical, but would



Figure 2.49. Plaster floor, sloping slightly upwards to cover the roofcomb of the Temple of the Night Sun, leveling the fill of F8-1-2nd and creating a secure foundation for the temple's summit. Photo: Arturo Godoy.

be consistent with the height and proportions of the altered structure. Like the better-preserved chamber of the final summit building, this room had a step-up of some 30 cm flanked by door jambs; the latter have now disappeared into a colossal looters' trench that gouged the southern summit of Str. F8-1 (see below). The single room measured 2.3 m deep and rested 1 m down on a clear, if rough, leveling of fill.

Notably, the chamber at the summit of Str. F8-1-2nd no longer had a permanent vault. Instead, it must have employed flat beams or, less likely, a peaked roof of thatch. This redesign enabled a larger interior expanse, prefiguring the flat roof and central access space of El Zotz's much later and most massive pyramid, Str. L7-11. The result: a significant departure from the look and display function of the massive roofcomb of the Temple of the Night Sun. The footprint of the chamber is noteworthy in another respect. It closely matches the wall of the front room of the Temple below. The positioning and dimensions must have been deliberate, carried out with an awareness of the building that had just been buried. Flat-roofed structures such as Str. F8-1-2nd most likely had limited sculptural programs. Small frontal masks above the entrance to the temple room and wooden lintels defining central doorways supplanted the elaborate deities completely encircling previous architecture. Iconographic ambitions at El Diablo seem to have shifted from the bold statements of the Temple of the Night Sun to more reduced versions in Str. F8-1-2nd.

The stairway of Str. F8-1-2nd



Figure 2.50. Modeled stucco recovered from the remnants of Str. F8-1-1st, recalling stucco program of masks on the Temple of the Night Sun, buried below. Photo: Arturo Godoy.



Figure 2.51. Modeled stucco recovered from the remnants of Str. F8-1-1st. Photo: Arturo Godoy.

is not securely discernible. Nonetheless, the fill in the excavation tunnel above the Adosado reveals no possible steps for this building, nor does the tunnel that pierces the back of the structure show any vestige of a separate terrace for Str. F8-1-2nd. This evidence suggests that the latest, visible terrace and stairway were probably shared between Str. F8-1-2nd, the penultimate building in the sequence, and the last, Str. F8-1-1st. The building seen today, with its ruined sides and barely detectable inset for a frontal stairway, was therefore reused by the final iteration of the structure, but created for its immediate precursor. Excavation has yet to probe the outset areas to either side of the front stairway of this building, but it is likely that these hold decayed stucco masks. Indeed, one set seems apparent in the surface debris of the final phase architecture.

Phase 9: The Upper Temple (Str. F8-1-1st)

The final phase, Str. F8-1-1st, can be best understood as a slight refurbishment of Str. F8-1-2nd. The heavy work of creating the pyramid's height and volume had been done. Atop the structure, a simple one-room structure facing west was erected, with its room measuring roughly 8 m (north-south) by 3 m (east-west). This phase also featured a stucco mask above the doorway, some fragments of which were recovered, though they have not survived well (Figures 2.50 and 2.51). Nevertheless, the stucco program still hints at continuity: earspools with



Figure 2.52. Three lidded, cylindrical vessels on the bottom two steps of the central stairway and east-west axis of Str. F8-1-1st, packed in among sherds and plaster. Photo: Arturo Godoy.

side-views of a shark recovered from the summit of Str. F8-1-1st resemble those on masks from the Temple of the Night Sun, far below. For frontal access, this final building continued to use the floor and stairway platform made for Str. F8-1-2nd. While the motivations for the refurbishment are unclear, it is possible that royal patrons or builders wished to move the summit temple closer to the front edge of the pyramid, perhaps to better display its iconography. Another explanation might be a need to create a slightly larger chamber or, possibly, to replace a structure that had become unstable with its highly exposed, flat roof. The consistency of the iconography and ceramics recovered from the structure's architectural fill underscore that the time from the Temple of the Night Sun to these drastic changes was only a span of several generations at most (see "Ceramics from El Diablo Fill," below).

Phase 10: Abandonment

At some point in the early to mid-fifth century AD, all major buildings of El Diablo fell into disuse. Some were apparently at the point of being rebuilt

at greater height (Román and Carter 2009:85), but the process was inexplicably aborted. Strs. F8-7 and F8-5 had their rooms filled with deep debris, but no construction or occupational floors cover these fill deposits. At the nearby El Tejón hilltop, in a complex clearly oriented towards El Diablo, similar filling may also be attested (Piedrasanta 2011:192). Yet this too could represent fallen buildings or interrupted construction. At a much later time, comparable patterns appear in Str. L7-1 of the El Zotz Acropolis. Dating to ca. AD 600, the rooms of the structure were packed some two centuries later with concentrations of pottery and other artifacts; the chambers were then covered by 2 to 3 m of fill. A similar process appears to have occurred in the case of Str. F8-1-1st. On the bottom two steps of the pyramid's stairway, three lidded, cylindrical vessels were placed along the structure's east-west axis in a deposit of ashes, *cal* (densely packed lime plaster), and ceramic sherds (Figure 2.52). After this, El Diablo receded into oblivion. Only a handful of Late Classic ceramics were found in surface deposits in Strs. F8-1, F8-7, and F8-17; these were of the Pedregal Modeled type (see "Ceramics from El Diablo Fill," below).



Figure 2.53. Photo by George Andrews in 1978, showing the Temple of the Night Sun and the original looters' tunnel penetrating into the structure from the south. Photo: George Andrews, courtesy of Edwin Román.

The Great Looting

Sometime in the 1970s, perhaps even the late 1960s, looting began in earnest at El Zotz and at El Diablo in particular. A visit by George Andrews in 1978 confirmed that the southwest bottom corner of the Temple of the Night Sun was accessible through a deep looters' trench and tunnel on the southern flank of Str. F8-1 (Andrews 1986:Fig. 5). Photos taken by Andrews show clearly the corner of a building, along with what appears to be a tunnel penetrating into the structure (Figure 2.53; one of the images, Andrews 1986:Fig. 4, is mis-oriented, being turned 90° clockwise from its correct position). Just beneath the cornice had a hook-like stucco ornament also seen during excavations of the northern side of the Temple of the Night Sun. This evidence proved that Andrews had seen something that was quickly covered since his visit in 1978: the southern side of the Temple. Within two years, a large-scale trench filled the area documented by Andrews, exposing the front of the top of the Temple of the Night Sun. The date of this destruction can be assigned with confidence to the time between 1978 and 1980, when other photographs were taken by Martin Diedrich (personal communication, 2012) and Jacques VanKirk (VanKirk and Bassett-VanKirk 1996:61-62, 124, this last photograph published incorrectly, 90 degrees counter-clockwise). Diedrich's photographs (Figure 2.54) confirmed that much of the stucco sculpture on the top roofcomb had slumped since 1980. Excavations within the massive looters' trench showed the same pieces seen by Diedrich, though now roughly a meter to the south of their original location. Diedrich's photographs also indicated the presence of additional stucco. The angle of light on Diedrich's images allowed Houston to hypothesize that another large Chahk mask embellished the southern cornice of the Temple, in exact opposition to a nearly identical mask found during excavation on the northern cornice. In 2013, this was confirmed by extensive cleaning of the looters' backfill.

Diedrich's photographs provide a precise understanding of the sequence of the looting that took place at El Diablo. The tunnel viewed by Andrews was hacked out first. Within two years, looters had filled that tunnel with debris from a massive lateral cut in the summit of the pyramid. Further clearing of the area around the Chahk mask originally seen by Diedrich was also useful in determining the orientation of the tunnel documented by Andrews. He had seen the southeastern outset of the frontal



Figure 2.54. Photographs taken by Martin Diedrich, 1980, helping to date the looting at El Diablo and to clarify the views seen by earlier visitors to the site: (top) western front of the roofcomb, showing stuccos before slumping; (bottom left) Chahk mask still preserved on the south wall of the Temple of the Night Sun (see Figure 2.55); (bottom right) deity with “cruller” passing through earspool on the south side of the Temple’s frontal chamber. Photos: Martin Diedrich.



Figure 2.55. Queen in beaded jade skirt, most likely the mother of the tomb’s occupant, with superimposed mask of Chahk. Photo: Edwin Román.

chamber of the Temple, along with part of the outer wall of the back chamber. One of Diedrich’s other photographs most likely shows a deity on that outset with the end of a twisting facial “cruller” passing through its earspool. Looters had penetrated into the divide between the first phase of the Temple (its rear chamber) and its later outset phase in front. Diedrich’s documentation prompted further excavations in 2013, exposing what may be one of the earliest known depictions of a queen in Maya imagery (Figure 2.55). Excavations a meter to the west of the southern Chahk underscored the fact that the frontal chamber of the Temple of the Night Sun had been added as a second phase of the structure: the joins between the two buildings were clearly visible, leading to the looters’ tunnel that entered the buildings in this junction.

An important point deserves reiteration here. The complex stratigraphic sequence of Str. F8-1’s many phases took place within a relatively short span of time. Each subsequent construction episode was shaped, at least in part, by that which came before. All such phases lead back to Burial 9, the interment being the motivating factor underlying such investments. The Temple of the Night Sun, the Shrine, the Adosado, and the complete reworking of the pyramid in Strs. F8-1-2nd and F8-1-1st heralded the El Diablo hilltop as the focal point of dynastic creation and celebration. As will be seen in subsequent chapters and appendices, the tomb and the iconographic program of the Temple of the Night Sun set the stage for continued commemoration, highlighting the roles required of the dynastic ruler in life and after.

Ceramics from El Diablo Fill

Alyce de Carteret

Since 2008, the El Zotz Archaeological Project has excavated more than 5,000 ceramic sherds from the palatial complex of El Diablo. The majority of these excavations focused on the final phases of construction for a number of buildings, including Strs. F8-2, F8-4, and F8-5, as well as Strs. F8-12, F8-13, F8-15, F8-16, and F8-17. Other buildings, including Strs. F8-7 and F8-8, Str. F8-18, and, most extensively, Str. F8-1, received more intensive investigation of earlier phases of construction and sequences of occupation. The ceramics recovered from these operations, then, represent layers of architectural fill and collapse. Only one possible midden was excavated in the course of this project (Op. EZ-5L), the material from which is not included in the present analysis. Complete vessels recovered from Burial 9 and cache deposits are assessed elsewhere (see Chapter 3).

In order to provide a more nuanced chronology of the complex, the author and Joel López Muñoz analyzed the ceramic assemblage recovered from the excavations described above. This study employed two analytical approaches: type-variety, based on surface treatment (see, e.g., Gifford 1960); and modal, derived from a more holistic set of features, from paste to form to color (Smith et al. 1960:331). The types and varieties of ceramics encountered at El Zotz appear across the Maya lowlands, most notably at the nearby sites of Uaxactun (Table 2.1; see Smith 1955; Smith and Gifford 1966) and Tikal (see Culbert 1993). The Saquij ceramic phase of El Zotz, corresponding with the Early Classic period at the site, exhibits

Table 2.1.

Date	Group	Type: Variety	Number of Sherds	Weight (g)
Late Preclassic	Polvero	Polvero Black	1	5
Early Classic	Quintal	Quintal Unslipped	100	1763
		Cubierta Impressed	2	13
	Triunfo	Triunfo Striated	216	3639
	Aguila	Aguila Orange	279	5139
	Remate	Aduana Red	1	4
	Pucte	Pucte Brown	28	439
	Balanza	Balanza Black	25	327
		Urita Gouged-Incised	1	7
	Dos Hermanos	Dos Hermanos Red	33	414
	Caribal	Caribal Red	60	1426
		Dos Arroyos	Dos Arroyos Orange Polychrome	7
	Yaloche	San Blas Red on Orange	6	98
		Yaloche Cream Polychrome	2	49
Caldero	Caldero Buff Polychrome	1	17	
	Late Classic	Cambio	Pedregal Modeled	5
Total			767	13960

Table 2.2.

Lot	Structure	Ceramic Date
EZ-5B-3-6	F8-1	Early Saquij
EZ-5B-30-1	F8-1	Early Saquij
EZ-5B-1-1	F8-1	Middle Saquij
EZ-5B-37-1	F8-1	Middle Saquij
EZ-19A-12-7	F8-1	Middle Saquij
EZ-5B-3-1	F8-1	Late Saquij
EZ-5B-11-1	F8-1	Late Saquij
EZ-5B-11-2	F8-1	Late Saquij
EZ-5B-12-1	F8-1	Late Saquij
EZ-5B-12-2	F8-1	Late Saquij
EZ-5B-13-2	F8-1	Late Saquij
EZ-5B-14-1	F8-1	Late Saquij
EZ-5B-15-1	F8-1	Late Saquij
EZ-5B-16-1	F8-1	Late Saquij
EZ-5B-17-1	F8-1	Late Saquij
EZ-5B-20-1	F8-1	Late Saquij
EZ-5B-3-3	F8-1	Mo'



Early Saquij – Basal Flange: A basal flange of a bowl of the type Dos Arroyos Orange Polychrome. The flange exhibits a geometric design characteristic of the Early Saquij subphase (see also Smith 1955:Fig. 76a).

Middle Saquij – Annular Bases: Examples of the thin, shallow annular bases characteristic of the Middle Saquij subphase.

Late Saquij – Thin Folded Rim: A bowl of the type Quintal Unslipped (unusually common at El Diablo in the Early Classic period) with a thickened rim characteristic of the Late Saquij subphase. Thickened rims become smaller in width over the course of the Early Classic period.

strong associations with the Tzakol and Manik phases of Uaxactun and Tikal, respectively (Walker 2009:296). Many of the characteristics that define Tzakol I, Tzakol II, and Tzakol III at Uaxactun are also present at El Diablo, allowing for the preliminary division of the Saquij complex into three subphases: Early, Middle, and Late (Czapiewska et al. 2014).

As with Tzakol ceramics at Uaxactun (Smith 1955:23), Saquij-phase pottery at El Diablo is broadly characterized by the prevalence of glossy wares, basal flanges, annular and pedestal bases, outflaring-side cache vessels, and distinctive Z-angle bowls. The Early, Middle, and Late facets can be distinguished from one another by the presence of these and transitional forms, which evolve gradually over the course of the Early Classic period. Diagnostic changes to vessel form include the incremental disappearance of Z-angles in the Middle Saquij subphase, the appearance and increasing popularity of pedestal and annular bases in the middle and late facets, and the disappearance of basal flanges in the Late Saquij subphase. Additionally, the paste of monochromatic pottery appears to undergo a distinct transformation between the Early and Middle Saquij facets. Early Saquij ceramics exhibit pale, chalky pastes that are often tempered with river sand, potentially taken from local drainage sources. Later pastes take on a rosier, orange hue and lose this distinctive sandy texture. (For more information on the Saquij complex at El Zotz, see Czapiewska et al. 2014.)

Empirical evidence suggests that the use of ceramics exhibiting particular modes did not extend far beyond their associated subphases. For instance, while Middle Saquij sherds may occasionally be found in fill with Late Saquij material, very rarely would Early and Late Saquij pottery be found in the same context. The appearance of diagnostic modes, then, indicated relatively reliably the subphase to which the excavation lot belonged. Furthermore, due to the eroded state of the assemblage, and of monochromatic pottery in particular (nearly 40% of El Diablo's monochromes are eroded or otherwise non-diagnostic), paste played a crucial role in confirming and challenging the chronological designations suggested by vessel form. Using this methodology, eighteen lots excavated from Str. F8-1 could be assigned to one of the three Saquij subphases (see Table 2.2). In addition, one lot (EZ 5B-3-3) corresponding with a level of architectural collapse, contained Mo'-phase (i.e., Late Classic) ceramics. Late Classic ceramic presence is limited to five sherds of Pedregal Modeled type, likely comprising the remains of a single vessel. The strength of Early Classic material in this lot suggests that Late Classic forms were only beginning to be used when El Diablo was abandoned, indicating that occupation of the pyramid ended near the end of the Late Saquij subphase, in the fifth to early sixth centuries AD.

References

- Abbott, Tucker
1996 *Seashells of North America: A Guide to Field Identification*. St. Martin's Press, New York.
- Adams, Richard E. W.
1971 *The Ceramics of Altar de Sacrificios*. Papers 63(1). Peabody Museum of Archaeology and Ethnology, Cambridge.
1999 *Río Azul: An Ancient Maya City*. University of Oklahoma Press, Norman.
- Aldenderfer, Mark
1991 Functional Evidence for Lapidary and Carpentry Craft Specialties in the Late Classic of the Central Peten Lakes Region. *Ancient Mesoamerica* 2(2):205-214.
- Aldenderfer, Mark, Larry Kimball, and April Sievert
1989 Microwear Analysis in the Maya Lowlands: The Use of Functional Data in a Complex-Society Setting. *Journal of Field Archaeology* 16:47-60.
- Anders, Ferdinand, Maarten Jansen, and G. Aurora Pérez Jiménez
1992 *Origen e historia de los reyes mixtecos. Libro explicativo del llamado Códice Vindobonensis*. Fondo de Cultura Económica, Mexico.
- Aoyama, Kazuo
1989 Estudio experimental de las huellas de uso sobre material lítico de obsidiana y sílex. *Mesoamérica* 17:185-214.
1995 Microwear Analysis in the Southeast Maya Lowlands: Two Case Studies at Copán, Honduras. *Latin American Antiquity* 6(2):129-144.
1999 *Ancient Maya State, Urbanism, Exchange, and Craft Specialization: Chipped Stone Evidence from the Copán Valley and the La Entrada Region, Honduras*. Memoirs in Latin American Archaeology 12. University of Pittsburgh, Pittsburgh.
2001 Ritos de plebeyos mayas en la Cueva Gordon no. 3 de Copán (Honduras) durante el Período Clásico: análisis de las microhuellas de uso sobre la lítica menor de obsidiana. *Mayab* 14:5-16.
2004 El intercambio, producción y función de los artefactos de obsidiana del período formativo temprano en la costa del Pacífico de Guatemala: un estudio diacrónico y análisis de las microhuellas de uso sobre la lítica de obsidiana del complejo San Jerónimo, Escuintla, Guatemala. *U Tz'ib* 3(7):14-34.
2005 Classic Maya Warfare and Weapons: Spear, Dart and Arrow Points of Aguateca and Copan. *Ancient Mesoamerica* 16(2):291-304.
2007 Elite Artists and Craft Producers in Classic Maya Society: Lithic Evidence from Aguateca, Guatemala. *Latin American Antiquity* 18(1):3-26.
2008 Preclassic and Classic Maya Obsidian Exchange, Artistic and Craft Production, and Weapons in the Aguateca Region and Seibal, Guatemala. *Mexicon* 30(4):78-86.
- 2009 *Elite Craft Producers, Artists, and Warriors at Aguateca: Lithic Analysis*. Monographs of the Aguateca Archaeological Project First Phase, 2. University of Utah Press, Salt Lake City.
- Aulie, H. Wilbur, and Evelyn W. de Aulie
1998 *Diccionario ch'ol de Tumbalá, Chiapas, con variaciones dialectales de Tila y Sabanilla*. Instituto Lingüístico de Verano, Mexico.
- Baez, Miguel
2009 Stèle en pierre taillée. In *Teotihuacan: Cité des Dieux*, edited by Felipe Gómez Solís, p. 439. Somogy Editions D'Art, Paris.
- Baker, Brenda J., Tosha L. Dupras, and Matthew W. Tocheri
2005 *The Osteology of Infants and Children*. Texas A&M University Press, College Station.
- Ball, Joseph W.
1977 *The Archaeological Ceramics of Becan, Campeche, Mexico*. Publication 43. Middle American Research Institute, Tulane University, New Orleans.
- Batta, Erasmo, Carlos Argáez, Josefina Mansilla, Carmen Pijoan, and Pedro Bosch
2013 On Yellow and Red Pigmented Bones Found in Mayan Burials of Jaina. *Journal of Archaeological Science* 40(1):712-722.
- Baudez, Claude-François
1994 *Maya Sculpture of Copán: The Iconography*. University of Oklahoma Press, Norman.
- Becquelin, Pierre, and Claude F. Baudez
1982 *Tonina, une cité maya du Chiapas (Mexique)*, t. 2. Mission Archéologique et Ethnologique Française au Mexique, Etudes Mésoaméricaines 6(2). Centre d'Études Mexicaines et Centraméricaines, Mexico.
- Bell, Ellen Elizabeth
2007 Early Classic Ritual Deposits within the Copan Acropolis: The Material Foundations of Political Power at a Classic Period Maya Center. Ph.D. dissertation, Department of Anthropology, University of Pennsylvania, Philadelphia.
- Bell, Ellen E., Robert J. Sharer, David W. Sedat, Marcello A. Canuto, and Lynn A. Grant
2000 The Margarita Tomb at Copan, Honduras: A Research Update. *Expedition* 42(3):21-25.
- Bell, Ellen E., Robert J. Sharer, Loa P. Traxler, David W. Sedat, Christine W. Carrelli, and Lynn Grant
2004 Tombs and Burials in the Early Classic Acropolis at Copan. In *Understanding Early Classic Copan*, edited by Ellen E. Bell, Marcello A. Canuto, and Robert J. Sharer, pp. 131-157. University of Pennsylvania Museum of Archaeology and Anthropology, Philadelphia.

- Berjonneau, Gerald, Emile Deletaille, and Jean-Louis Sonneray
1985 *Rediscovered Masterpieces of Mesoamerica: Mexico-Guatemala-Honduras*. Editions Arts 135, Boulogne.
- Binski, Paul
1996 *Medieval Death: Ritual and Representation*. Cornell University Press, Ithaca.
- Blainey, Marc G.
1997 Surfaces and Beyond: The Political, Ideological, and Economic Significance of Ancient Maya Iron-Ore Mirrors. M.A. thesis, Department of Anthropology, Trent University, Peterborough.
- Bloch, Maurice, and Jonathan Parry
1982 Introduction: Death and the Regeneration of Life. In *Death and the Regeneration of Life*, edited by Maurice Bloch and Jonathan Parry, pp. 1-44. Cambridge University Press, Cambridge.
- Blom, Frans, and Oliver La Farge
1926 *Tribes and Temples: A Record of the Expedition to Middle America Conducted by the Tulane University of Louisiana in 1925*, v. 1. Tulane University, New Orleans.
- Boone, Elizabeth H.
2000 *Stories in Red and Black: Pictorial Histories of the Aztecs and Mixtecs*. University of Texas Press, Austin.
2007 The House of the Eagle. In *Cave, City, and Eagle's Nest: An Interpretive Journey through the Mapa de Cuauhtinchan No. 2*, edited by David Carrasco and Scott Sessions, pp. 27-48. University of New Mexico Press, Albuquerque.
- Bosecker, Klaus
1997 Biobleaching: Metal Solubilization by Microorganisms. *FEMS Microbiology Reviews* 20(3-4):591-604.
- Boyle, Alan
2013 Inside a Maya Pyramid, Mysterious Carvings Hint at Superpower Struggle. *NBC News*: www.nbcnews.com/science/inside-maya-pyramid-mysterious-carvings-hint-superpower-struggle-6C10861128.
- Brady, James E., and Dominique Rissolo
2006 A Reappraisal of Ancient Maya Cave Mining. *Journal of Anthropological Research* 62(4):471-490.
- Braswell, Geoffrey E.
2003 Dating Early Classic Interaction Between Kaminaljuyu and Central Mexico. In *The Maya and Teotihuacan: Reinterpreting Early Classic Interaction*, edited by Geoffrey E. Braswell, pp. 81-104. University of Texas Press, Austin.
- Breedlove, Dennis E., and Robert M. Laughlin
2000 *The Flowering of Man: A Tzotzil Botany of Zinacantán*. Abridged ed. Smithsonian Institution Press, Washington, D.C.
- Buikstra, Jane E., and Douglas H. Ubelaker
1994 *Standards for Data Collection from Human Skeletal Remains*. Research Series 44. Arkansas Archeological Survey, Fayetteville.
- Callaghan, Michael G.
2009 Technologies of Power: Ritual Economy and Ceramic Production in the Terminal Preclassic Period Holmul Region, Guatemala. Ph.D. dissertation, Department of Anthropology, Vanderbilt University, Nashville.
- Campaña, Luz Evelia, and Sylvian Boucher
2002 Nuevas imágenes de Becán, Campeche. *Arqueología Mexicana* 10(56):64-69.
- Carter, Benjamin P.
2011 *Spondylus* in South American Prehistory. In *Spondylus in Prehistory: New Data and Approaches. Contributions to the Archaeology of Shell Technologies*, edited by Fotis Ifantidis and Marianna Nikolaidou, pp. 63-89. BAR International Series 2216. British Archaeological Reports, Oxford.
- Carter, Nicholas P., Rony E. Piedrasanta, Stephen D. Houston, and Zachary Hruby
2012 Signs of Supplication: Two Mosaic Earflare Plaques from El Zotz, Guatemala. *Antiquity* 86(333), Project Gallery: <http://antiquity.ac.uk/projgall/carter333/>.
- Chase, Arlen F., and Diane Z. Chase
1987 *Investigations at the Classic Maya City of Caracol Belize: 1985-1987*. Pre-Columbian Art Research Institute, San Francisco.
2011 Heterogeneity in Residential Group Composition: Continued Investigation in and near Caracol's Epicenter: Caracol Archaeological Project Investigations for 2011. Report submitted to the Belize Institute of Archaeology, Belize.
- Chase, Arlen F., Diane Z. Chase, Elayne Zorn, and Wendy Teeter
2008 Textiles and the Maya Archaeological Record. *Ancient Mesoamerica* 19(1):127-142.
- Chase, Diane Z., and Arlen F. Chase
1998 The Archaeological Context of Caches, Burials, and Other Ritual Activities for the Classic Period (as Reflected at Caracol, Belize). In *Function and Meaning in Classic Maya Architecture*, edited by Stephen D. Houston, pp. 299-332. Dumbarton Oaks, Washington, D.C.
2004 Archaeological Perspectives on Classic Maya Social Organization from Caracol, Belize. *Ancient Mesoamerica* 15(1):139-147.
- Cheetham, David T.
2004 The Role of "Terminus Groups" in Lowland Maya Site Planning: An Example from Cahal Pech. In *The Ancient Maya of the Belize Valley: Half a Century of Archaeological Research*, edited by James F. Garber, pp. 125-148. University Press of Florida, Gainesville.
- Chinchilla Mazariegos, Oswaldo
2013 Tecum, the Fallen Sun: Mesoamerican Cosmogony and the Spanish Conquest of Guatemala. *Ethnohistory* 60(4):693-719.
- Codex Magliabechiano
2013 Electronic document, www.famsi.org/research/graz/magliabechiano/index.html.
- Coe, Michael D.
1977 Supernatural Patrons of Maya Scribes and Artists. In *Social Process in Maya Prehistory: Studies in Honour of Sir Eric Thompson*, edited by Norman Hammond, pp. 327-346. Academic Press, London.
- Coe, William R.
1990 *Excavations in the Great Plaza, North Terrace, and North Acropolis of Tikal*. 5 vols. Tikal Report 14. University Museum, University of Pennsylvania, Philadelphia.
- Coggins, Clemency C.
1988 Classic Maya Metaphors of Death and Life. *RES: Anthropology and Aesthetics* 16:64-84.
- Cucina, Andrea, and Vera Tiesler
2006 The Companions of Janaab' Pakal and the "Red Queen" from Palenque, Chiapas: Meanings of Human Companion Sacrifice in Classic Maya Society. In *Janaab' Pakal of Palenque: Reconstructing the Life and Death of a Maya Ruler*, edited by Vera Tiesler and Andrea Cucina, pp. 102-125. University of Arizona Press, Tucson.
- Cuevas García, Martha
2007 *Los incensarios efigie de Palenque. Deidades y rituales mayas*. Universidad Nacional Autónoma de México; Instituto Nacional de Antropología e Historia, Mexico.
- Culbert, T. Patrick
1993 *The Ceramics of Tikal: Vessels from the Burials, Caches, and Problematical Deposits*. Tikal Report 25, Part A. University Museum, University of Pennsylvania, Philadelphia.
- Czapiewska, Ewa, Thomas Garrison, Edwin Román, and Stephen Houston
2014 La cerámica de los grupos de élite: análisis de los restos hallados en El Zotz, Petén, Guatemala. In *XXVII Simposio de Investigaciones Arqueológicas en Guatemala, 2013*, edited by Bárbara Arroyo, Luis Méndez Salinas, and Andrea Rojas, v. 1, pp. 283-296. Ministerio de Cultura y Deportes; Instituto de Antropología e Historia; Asociación Tikal, Guatemala.
- Danien, Elin C.
2002 *Guide to the Mesoamerican Gallery at the University of Pennsylvania Museum of Archaeology and Anthropology*. University Museum, University of Pennsylvania, Philadelphia.
- Díaz Balsera, Viviana
2008 Celebrating the Rise of a New Sun: The Tlaxcalans Conquer Jerusalem in 1539. *Estudios de Cultura Nahuatl* 39:311-330.
- Doyle, James A.
2012 Regroup on "E-Groups": Monumentality and Early Centers in the Middle Preclassic Maya Lowlands. *Latin American Antiquity* 23(4):355-379.
2013 The First Maya "Collapse": The End of the Preclassic Period at El Palmar, Peten, Guatemala. Ph.D. dissertation, Department of Anthropology, Brown University, Providence.
- Eberl, Markus
2005 *Muerte, entierro y ascención. Ritos funerarios entre los antiguos mayas*. Universidad Autónoma de Yucatán, Mérida.
- Emery, Kitty, and Kazuo Aoyama
2007 Bone, Shell, and Lithic Evidence for Crafting in Elite Maya Households at Aguateca, Guatemala. *Ancient Mesoamerica* 18(1):69-89.
- Escobedo, Héctor L.
2004 Tales from the Crypt: The Burial Place of Ruler 4, Piedras Negras. In *Courtly Art of the Ancient Maya*, edited by Mary Miller and Simon Martin, pp. 277-280. Thames and Hudson, New York.
- Estrada Reynoso, José Luis
2009 Extrémities supérieures de marqueur, fragment. In *Teotihuacan: Cité des Dieux*, edited by Felipe Gómez Solís, p. 246. Somogy Editions D'Art, Paris.
- Fash, William L., Jr.
1989 The Sculptural Façade of Structure 9N-82: Content, Form, and Significance. In *The House of the Bacabs, Copan, Honduras*, edited by David Webster, pp. 41-72. Studies in Pre-Columbian Art and Archaeology 29. Dumbarton Oaks, Washington, D.C.
- Filloy Nadal, Laura, and Sofía Martínez del Campo Lanz
2010 El rostro eterno de K'inich Janaab' Pakal: la máscara funeraria. In *Misterios de un rostro maya. La máscara funeraria de K'inich Janaab' Pakal de Palenque*, edited by Laura Filloy Nadal, pp. 108-129. Instituto Nacional de Antropología e Historia, Mexico.
- Fitzsimmons, James L.
2009 *Death and the Classic Maya Kings*. University of Texas Press, Austin.
- Foias, Antonia E.
1996 Changing Ceramic Production and Exchange Systems and the Classic Maya Collapse in the Petexbatun Region. Ph.D. dissertation, Department of Anthropology, Vanderbilt University, Nashville.
- Folan, William J., Joyce Marcus, Sophia Pincemin, María del Rosario Domínguez Carrasco, Laraine Fletcher, and Abel Morales López
1995 Calakmul: New Data from an Ancient Maya Capital in Campeche, Mexico. *Latin American Antiquity* 6(4):310-334.
- Forsyth, Donald W.
1989 *The Ceramics of El Mirador, Petén, Guatemala*. El Mirador Series, Part 4. Papers 63. New World Archaeological Foundation, Brigham Young University, Provo.
- Furst, Jill L.
1978 *Codex Vindobonensis Mexicanus I: A Commentary*. Institute of Mesoamerican Studies Publication 4. State University of New York, Albany.

- Garrison, Thomas, and Fernando Beltrán
2011 Investigaciones en Bejucal. In Proyecto Arqueológico “El Zotz,” informe no. 5, temporada 2010, edited by Jose Luis Garrido López, Stephen Houston, and Edwin Román, pp. 293-319. Report submitted to the Dirección General del Patrimonio Cultural y Natural de Guatemala.
- Garrison, Thomas, Jose Luis Garrido, Octavio Axpuc, Alexander Smith, Timothy Beach, Sheryl Luzzadder-Beach, and Fernando Beltrán
2011 Programa de investigaciones regionales (mapeo y excavaciones). In Proyecto Arqueológico “El Zotz,” informe no. 5, temporada 2010, edited by Jose Luis Garrido López, Stephen Houston, and Edwin Román, pp. 321-386. Report submitted to the Dirección General del Patrimonio Cultural y Natural de Guatemala.
- Gifford, James C.
1960 The Type-Variety Method of Ceramic Classification as an Indicator of Cultural Phenomena. *American Antiquity* 25(3):341-347.
- Goodall, Rosemary A., Jay Hall, Rene Viel, F. Ricardo Agurcia, Howell G. M. Edwards, and Peter M. Fredericks
2006 Raman Microscopic Investigation of Paint Samples from the Rosalila Building, Copan, Honduras. *Journal of Raman Spectroscopy* 37(10):1072-1077.
- Graham, Ian
1967 *Archaeological Explorations in El Peten, Guatemala*. Publication 33. Middle American Research Institute, Tulane University, New Orleans.
- Greene, Merle, Robert L. Rands, and John A. Graham
1972 *Maya Sculpture from the Southern Lowlands, Highlands and Pacific Piedmont, Guatemala, Mexico, Honduras*. Lederer, Street and Zeus, Berkeley, CA.
- Gutiérrez Castillo, Yeny Myshell, Stephen Houston, Edwin Román, Thomas Garrison, Sarah Newman, and Catherine Magee
2013 Entre conchas y océanos: analizando los artefactos malacológicos procedentes del Entierro 9 de El Zotz, Petén, Guatemala. In *XXVI Simposio de Investigaciones Arqueológicas en Guatemala, 2012*, edited by Bárbara Arroyo and Luis Méndez Salinas, v. 2, pp. 597-609. Ministerio de Cultura y Deportes; Instituto de Antropología e Historia; Asociación Tikal, Guatemala.
- Hall, Grant D.
1985 Results of Tomb Investigations at Río Azul, Season of 1984. Report submitted to Richard E. W. Adams for *Río Azul Reports, No. 2*, July 1985.
1989 Realm of Death: Royal Mortuary Customs and Polity Interaction in the Classic Maya Lowlands. Ph.D. dissertation, Department of Anthropology, Harvard University, Cambridge.
- Hamman, Byron
2002 The Social Life of Pre-Sunrise Things: Indigenous Mesoamerican Archaeology. *Current Anthropology* 43(3):351-382.
- Hammond, Norman
1984 Holmul and Nohmul: A Comparison and Assessment of Two Maya Lowland Protoclassic Sites. *Ceramica de Cultura Maya* 13:1-17.
- Hanks, William F.
1990 *Referential Practice: Language and Lived Space among the Maya*. University of Chicago Press, Chicago.
- Hansford, Geoff S., and Tomás Vargas
2001 Chemical and Electrochemical Basis of Bioleaching Processes. *Hydrometallurgy* 59(2):135-145.
- Harrison-Buck, Eleanor, Patricia A. McAnany, and Rebecca Storey
2007 Empowered and Disempowered During the Late to Terminal Classic Transition: Maya Burial and Termination Rituals in the Sibun Valley, Belize. In *New Perspectives on Human Sacrifice and Ritual Body Treatments in Ancient Maya Society*, edited by Vera Tiesler and Andrea Cucina, pp. 74-101. Springer, New York.
- Hellmuth, Nicholas
1987 *Monster und Menschen in der Maya-Kunst: Eine Ikonographie der alten Religionen Mexikos und Guatemalas*. Akademische Druck- u. Verlagsanstalt, Graz.
- Henderson, Lucia R.
2013 Bodies Politic, Bodies in Stone: Imagery of the Human and the Divine in the Sculpture of Late Preclassic Kaminaljuyú, Guatemala. Ph.D. dissertation, Department of Art and Art History, University of Texas at Austin.
- Houk, Brett A., Hubert R. Robichaux, and Fred Valdez, Jr.
2010 An Early Royal Maya Tomb from Chan Chich, Belize. *Ancient Mesoamerica* 21(2):229-248.
- Houston, Stephen D.
1996 Symbolic Sweatbaths of the Maya: Architectural Meaning in the Cross Group at Palenque, Mexico. *Latin American Antiquity* 7(2):132-151.
2008 In the Shadow of a Giant. *Mesoweb*: www.mesoweb.com/zotz/articles/Shadow-of-a-Giant.pdf.
2012 Diadems in the Rough. *Maya Decipherment*: decipherment.wordpress.com/2012/10/06/diadems-in-the-rough/.
- Houston, Stephen D., and Andrew K. Scherer
2010 La ofrenda máxima: el sacrificio humano en la parte central del área maya. In *El sacrificio humano en la tradición religiosa mesoamericana*, edited by Leonardo López Luján and Guilhem Olivier, pp. 169-193. Instituto Nacional de Antropología e Historia; Universidad Nacional Autónoma de México, Mexico.
- Houston, Stephen, and David Stuart
1996 Of Gods, Glyphs, and Kings: Divinity and Rulership among the Classic Maya. *Antiquity* 70(268):289-312.
- Houston, Stephen, and Karl Taube
2000 An Archaeology of the Senses: Perception and Cultural Expression in Ancient Mesoamerica. *Cambridge Archaeological Journal* 10(2):261-294.
- Houston, Stephen, Edwin Román, and Thomas Garrison
2013 The Temple of the Night Sun: Configuring Kinship at El Diablo, Guatemala. Paper presented at The Maya Meetings, University of Texas at Austin.
- Houston, Stephen, David Stuart, and Karl Taube
2006 *The Memory of Bones: Body, Being, and Experience among the Classic Maya*. University of Texas Press, Austin.
- Houston, Stephen, Claudia Brittenham, Cassandra Mesick, Alexandre Tokovinine, and Christina Warinner
2009 *Veiled Brightness: A History of Ancient Maya Color*. University of Texas Press, Austin.
- Houston, Stephen, Héctor Escobedo, Andrew Scherer, Mark Child, and James Fitzsimmons
2003 Classic Maya Death at Piedras Negras, Guatemala. In *Antropología de la eternidad: la muerte en la cultura maya*, edited by Andrés Ciudad Ruiz, Mario Humberto Ruz Sosa, and María Josefa Iglesias Ponce de León, pp. 113-143. Sociedad Española de Estudios Mayas, Madrid.
- Huntington, Richard, and Peter Metcalf
1979 *Celebrations of Death: The Anthropology of Mortuary Ritual*. Cambridge University Press, Cambridge.
- Iglesias, María Josefa, Andrés Ciudad, Eduardo Arroyo, Jesús Adánez, and Sara Álvarez
2001 Aplicaciones de la antropología molecular a la arqueología maya: el caso de Tikal. In *XIV Simposio de Investigaciones Arqueológicas en Guatemala, 2000*, edited by Juan Pedro Laporte, Ana Claudia de Suasnávar, and Bárbara Arroyo, v. 2, pp. 1069-1088. Ministerio de Cultura y Deportes; Instituto de Antropología e Historia; Asociación Tikal, Guatemala.
- Jansen, Maarten
1997 La serpiente emplumada y el amanecer de la historia. In *Códices, caciques y comunidades*, edited by Maarten Jansen and Luis Reyes García, pp. 11-63. Cuadernos de Historia Latinoamericana 5. Asociación de Historiadores Latinoamericanistas Europeos, Ridderkerk.
- Jones, Christopher, and Linton Satterthwaite
1982 *The Monuments and Inscriptions of Tikal: The Carved Monuments*. Tikal Report 33, Part A. University Museum, University of Pennsylvania, Philadelphia.
- Joyce, Rosemary A., and John S. Henderson
2007 From Feasting to Cuisine: Implications of Archaeological Research in an Early Honduran Village. *American Anthropologist* 109(4):642-653.
- Keeley, Lawrence H.
1980 *Experimental Determination of Stone Tool Uses: A Microwear Analysis*. University of Chicago Press, Chicago.
- Keen, Myra
1971 *Sea Shells of Tropical West America: Marine Mollusks from Baja California to Peru*. 2nd ed. Stanford University Press, Stanford.
- Kidder, Alfred Vincent, Jesse David Jennings, Edwin M. Shook
1946 *Excavations at Kaminaljuyu, Guatemala*. Publication 561. Carnegie Institute of Washington, Washington, D.C.
- Kovacevich, Brigitte
2006 Reconstructing Classic Maya Economic Systems: Production and Exchange at Cancuen, Guatemala. Ph.D. dissertation, Department of Anthropology, Vanderbilt University, Nashville.
2011 The Organization of Jade Production at Cancuen, Guatemala. In *The Technology of Maya Civilization: Political Economy and Beyond in Lithic Studies*, edited by Zachary X. Hruby, Geoffrey E. Braswell, and Oswaldo Chinchilla Mazariegos, pp. 149-161. Equinox Publishing, London.
- Kovacevich, Brigitte, and Zachary Hruby
2005 Towards an Understanding of the Value of Jade in Two Lowland Classic Maya City Centers, Cancuen and Piedras Negras. Paper presented at the 70th Annual Meeting of the Society for American Archaeology, Salt Lake City.
- Krejci, Estella, and T. Patrick Culbert
1995 Preclassic and Classic Burials and Caches in the Maya Lowlands. In *The Emergence of Lowland Maya Civilization: The Transition from Preclassic to Early Classic*, edited by Nikolai Grube, pp. 103-116. Acta Mesoamerica 8. Verlag Anton Saurwein, Möckmühl.
- Lacadena, Alfonso
2004 The Glyphic Corpus from Ek’ Balam, Yucatán, México. Report submitted to the Foundation for the Advancement of Mesoamerican Studies, Inc. Available: www.famsi.org/reports/01057/01057LacadenaGarciaGallo01.pdf.
- Laporte, Juan Pedro
1989 Alternativas del clásico temprano en la relación Tikal-Teotihuacán: Grupo 6C-XVI, Tikal, Petén, Guatemala. Ph.D. dissertation, Universidad Nacional Autónoma de México, Mexico.
2005 Exploración y restauración en la Plataforma Este de Mundo Perdido, Tikal (Estructuras 5D-83 a 5D-89). In *XVIII Simposio de Investigaciones Arqueológicas en Guatemala, 2004*, edited by Juan Pedro Laporte, Bárbara Arroyo, and Héctor E. Mejía, v. 1, pp. 153-200. Ministerio de Cultura y Deportes; Instituto de Antropología e Historia; Asociación Tikal; Foundation for the Advancement of Mesoamerican Studies, Guatemala.
- Laporte, Juan Pedro, and Vilma Fialko
1987 La cerámica del Clásico Temprano desde Mundo Perdido, Tikal: una reevaluación. In *Maya Ceramics: Papers from the 1985 Maya Ceramics Conference*, edited by Prudence M. Rice and Robert J. Sharer, pp. 123-181. BAR International Series 345. British Archaeological Reports, Oxford.
1995 Un reencuentro con Mundo Perdido, Tikal. *Ancient Mesoamerica* 6(1):58-62.
- LeCount, Lisa J.
2001 Like Water for Chocolate: Feasting and Political Ritual Among the Late Classic Maya at Xunantunich, Belize. *American Anthropologist* 103(4):935-953.

- Lewenstein, Suzanne M.
1987 *Stone Tool Use at Cerros*. University of Texas Press, Austin.
- 1991 Woodworking Tools at Cerros. In *Maya Stone Tools: Selected Papers from the Second Maya Lithic Conference*, edited by Thomas R. Hester and Harry J. Shafer, pp. 239-249. Prehistory Press, Madison.
- López Castro, Hermenegildo F., and Ethelia Ruiz Medrano
2010 *Tutu Nuu Oko. Libro del pueblo veinte. Relatos de la tradición oral mixteca de Pinotepa Nacional, Oaxaca*. Instituto Nacional de Lenguas Indígenas, Mexico.
- Loten, H. Stanley
2003 The North Acropolis: Monumentality, Function, and Architectural Development. In *Tikal: Dynasties, Foreigners, and Affairs of State*, edited by Jeremy A. Sabloff, pp. 227-252. School of American Research Press, Santa Fe.
- Lothrop, Joy Mahler
1992 Textiles. In *Artifacts from the Cenote of Sacrifice, Chichen Itza, Yucatan*, edited by Clemency Chase Coggins, pp. 33-90. Memoirs 10(3). Peabody Museum of Archaeology and Ethnology, Harvard University, Cambridge.
- Love, Bruce
1989 Yucatec Sacred Breads through Time. In *Word and Image in Maya Culture: Explorations in Language, Writing, and Representation*, edited by William F. Hanks and Don S. Rice, pp. 336-350. University of Utah Press, Salt Lake City.
- Lucero, Lisa J.
2003 The Politics of Ritual: The Emergence of Classic Maya Rulers. *Current Anthropology* 44(4):523-558.
- Marcus, Joyce, and Kent V. Flannery
2000 Ancient Zapotec Ritual and Religion: An Application of the Direct Historical Approach. In *The Ancient Civilizations of Mesoamerica: A Reader*, edited by Michael E. Smith and Marilyn A. Masson, pp. 400-421. Blackwell, Malden, MA.
- Martin, Simon
2003 In Line of the Founder: A View of Dynastic Politics at Tikal. In *Tikal: Dynasties, Foreigners, and Affairs of State*, edited by Jeremy A. Sabloff, pp. 3-45. School of American Research Press, Santa Fe.
- Martin, Simon, and Nikolai Grube
2008 *Chronicle of the Maya Kings and Queens: Deciphering the Dynasties of the Ancient Maya*. 2nd ed. Thames and Hudson, London.
- Martin-Sanchez, Pedro M., Santiago Sanchez-Cortes, Eduardo Lopez-Tobar, Valme Jurado, Fabiola Bastian, Claude Alabouvette, and Cesareo Saiz-Jimenez
2012 The Nature of Black Stains in Lascaux Cave, France, as Revealed by Surface-Enhanced Raman Spectroscopy. *Journal of Raman Spectroscopy* 43(3):464-467.
- Mathema, Vivek Bhakta, Balkrishna Chand Thakuri, and Mika Sillanpää
2011 Bacterial Mer Operon-Mediated Detoxification of Mercurial Compounds: A Short Review. *Archives of Microbiology* 193(12):837-844.
- Mathews, Peter
1975 The Lintels of Structure 12, Yaxchilan, Chiapas. Paper presented at the Annual Conference of the Northeastern Anthropological Association, Wesleyan University, Middletown.
- Matthews, Robert W., and Jorge M. González
2004 Nesting Biology of *Zeta argillaceum* (Hymenoptera: Vespidae: Eumeninae) in Southern Florida, U.S. *Florida Entomologist* 87:37-40. Available: www.bioone.org/doi/full/10.1653/0015-4040%282004%29087%5B0037%3ANBOZAH%5D2.0.CO%3B2.
- Maudslay, Alfred P.
1889-1902 *Archaeology*. 5 vols. Appendix to *Biologia Centrali-Americana; or, Contributions to the Knowledge of the Fauna and Flora of Mexico and Central America*. R. H. Porter and Dulau, London.
- Maynard, David F., and Frances F. Berdan
2010 El adhesivo y el material de reparación de la máscara. In *Misterios de un rostro maya. La máscara funeraria de K'inich Janaab' Pakal de Palenque*, edited by Laura Filloy Nadal, pp. 154-161. Instituto Nacional de Antropología e Historia, Mexico.
- McAnany, Patricia A.
1995 *Living with the Ancestors: Kinship and Kingship in Ancient Maya Society*. University of Texas Press, Austin.
1998 Ancestors and the Classic Maya Built Environment. In *Function and Meaning in Classic Maya Architecture*, edited by Stephen D. Houston, pp. 271-298. Dumbarton Oaks, Washington, D.C.
- McNeil, Cameron L.
2010 Death and Chocolate: The Significance of Cacao Offerings in Ancient Maya Tombs and Caches at Copan, Honduras. In *Pre-Columbian Foodways: Interdisciplinary Approaches to Food, Culture, and Markets in Ancient Mesoamerica*, edited by John E. Staller and Michael Carrasco, pp. 293-314. Springer, New York.
- Merwin, Raymond E., and George C. Vaillant
1932 *The Ruins of Holmul, Guatemala*. Memoirs 3(2). Peabody Museum of Archaeology and Ethnology, Harvard University, Cambridge.
- Miho Museum
2011 Tetrapod Vessel with Dog on Lid. *Miho Museum*: <http://miho.jp/booth/html/artcon/00004354e.htm>.
- Miller, Mary, and Claudia Brittenham
2013 *The Spectacle of the Late Maya Court: Reflections on the Murals of Bonampak*. University of Texas Press, Austin.
- Moholy-Nagy, Hattula, with William R. Coe
2008 *The Artifacts of Tikal: Ornamental and Ceremonial Artifacts and Unworked Material*. Tikal Report 27, Part A. Monograph 127. University of Pennsylvania Museum of Archaeology and Anthropology, Philadelphia.
- Nascimento, Andréa M. A., and Edmar Chartone-Souza
2003 Operon Mer: Bacterial Resistance to Mercury and Potential for Bioremediation of Contaminated Environments. *Genetics and Molecular Research* 2(1):92-101.
- Nuland, Sherwin B.
1994 *How We Die: Reflections on Life's Final Chapter*. Random House, New York.
- Orrego Corzo, Miguel
2000 Informe sobre las investigaciones arqueológicas en el conjunto A-3, temporadas 1986-87, Río Azul, Municipio de Melchor de Mencos, Petén, Guatemala. In *Río Azul Reports, No. 5: The 1987 Season*, edited by Richard E. W. Adams, pp. 54-107. University of Texas at San Antonio, San Antonio.
- Ortner, Donald J.
2002 *Identification of Pathological Conditions in Human Skeletal Remains*. 2nd ed. Academic Press, London.
- Orton, Clive, Paul Tyers, and Alan Vince
1993 *Pottery in Archaeology*. Cambridge University Press, Cambridge.
- Parsons, Elsie Clew
1933 Some Aztec and Pueblo Parallels. *American Anthropologist* 35(4):611-631.
- Pereira, Grégory, and Dominique Michelet
2004 Gobernantes mayas en lechos de muerte: el caso de Balamkú, un patron funerario del Clásico Temprano. In *Culto funerario en la sociedad maya. Memoria de la Cuarta Mesa Redonda de Palenque*, edited by Rafael Cobos, pp. 333-368. Instituto Nacional de Antropología e Historia, Mexico.
- Pendergast, David M.
1969 *Altun Ha, British Honduras (Belize): The Sun God's Tomb*. Art and Archaeology Occasional Papers 16. Royal Ontario Museum, Toronto.
1982a *Excavations at Altun Ha, Belize, 1964-1970*, v. 2. Royal Ontario Museum, Toronto.
1982b Ancient Maya Mercury. *Science* 217(4559):533-535.
- Pillsbury, Joanne
1996 The Thorny Oyster and the Origins of Empire: Implications of Recently Uncovered *Spondylus* Imagery from Chan Chan, Peru. *Latin American Antiquity* 7(4):313-340.
- Pires-Ferreira, Jane Wheeler
1978 Shell Exchange Networks in Formative Mesoamerica. In *Cultural Continuity in Mesoamerica*, edited by David L. Browman, pp. 79-100. Mouton Publishers, Chicago.
- Pinchemin, Sophia, Joyce Marcus, Lynda Florey Folan, William J. Folan, María del Rosario Domínguez Carrasco, and Abel Morales López
1998 Extending the Calakmul Dynasty Back in Time: A New Stela from a Maya Capital in Campeche, Mexico. *Latin American Antiquity* 9(4):310-327.
- Plesters, Joyce
1956 Cross-sections and Chemical Analysis of Paint Samples. *Conservation* 2(3):110-157.
- Pohl, John M. D.
2005 The Arroyo Group Lintel Painting at Mitla, Oaxaca. In *Painted Books and Indigenous Knowledge in Mesoamerica: Manuscript Studies in Honor of Mary Elizabeth Smith*, edited by Elizabeth H. Boone, pp. 109-127. Publication 69. Middle American Research Institute, Tulane University, New Orleans.
- Pohl, Mary D.
1983 Maya Ritual Faunas: Vertebrate Remains from Burials, Caches, Caves, and Cenotes in the Maya Lowlands. In *Civilization in the Ancient Americas: Essays in Honor of Gordon R. Willey*, edited by Richard M. Leventhal and Alan L. Kolata, pp. 55-103. Peabody Museum of Archaeology and Ethnology, Harvard University; University of New Mexico Press, Albuquerque.
- Powis, Terry G., Fred Valdez, Jr., Thomas R. Hester, W. Jeffrey Hurst, and Stanley M. Tarka, Jr.
2002 Spouted Vessels and Cacao Use among the Preclassic Maya. *Latin American Antiquity* 13(1):85-106.
- Pring, Duncan C.
2000 *The Protoclassic in the Maya Lowlands*. BAR International Series 908. British Archaeological Reports, Oxford.
- Redfield, Robert, and Alfonso Villa Rojas
1934 *Chan Kom: A Maya Village*. Publication 448. Carnegie Institution of Washington, Washington, D.C.
- Rich, Michelle E.
2011 Ritual, Royalty, and Classic Period Politics: The Archaeology of the Mirador Group at El Perú-Waka', Petén, Guatemala. Ph.D. dissertation, Department of Anthropology, Southern Methodist University, Dallas.
- Ricketson, Oliver G., Jr., and Edith B. Ricketson
1937 *Uaxactun, Guatemala: Group E, 1926-1931*. Publication 477. Carnegie Institution of Washington, Washington, D.C.
- Riese, Berthold
1984 Hel Hieroglyphs. In *Phoneticism in Mayan Hieroglyphic Writing*, edited by John S. Justeson and Lyle Campbell, pp. 263-286. Institute for Mesoamerican Studies Publication 9. State University of New York at Albany.
- Robertson, John, Stephen Houston, Marc Zender, and David Stuart
2007 *Universals and the Logic of the Material Implication: A Case Study from Maya Hieroglyphic Writing*. Research Reports on Ancient Maya Writing 62. Electronic document, <http://repositories.lib.utexas.edu/handle/2152/17706>.
- Robertson, Merle G.
1991 *The Sculpture of Palenque, Volume IV: The Cross Group, the North Group, the Olvidado, and Other Pieces*. Princeton University Press, Princeton.

- Rochette, Erick T.
2009 The Late Classic Organization of Jade Artifact Production in the Middle Motagua Valley, Zacapa, Guatemala. Ph.D. dissertation, Department of Anthropology, Pennsylvania State University, University Park.
- Román Ramírez, Edwin
2011 Living the Sacred Landscape: The Process of Abandonment of the Early Classic Maya Group of El Diablo at El Zotz, Peten, Guatemala. M.A. thesis, Department of Latin American Studies, University of Texas at Austin.
- Román, Edwin, Heather Hurst, Karl Taube, David Stuart, and William Saturno
2006 Nuevos hallazgos arquitectónicos y pictóricos en la Pirámide Las Pinturas, San Bartolo, Petén. In *XIX Simposio de Investigaciones Arqueológicas en Guatemala, 2005*, edited by Juan Pedro Laporte, Bárbara Arroyo, and Héctor E. Mejía, v. 2, pp. 571-578. Ministerio de Cultura y Deportes; Instituto de Antropología e Historia; Asociación Tikal; Fundación Arqueológica del Nuevo Mundo, Guatemala.
- 2009 Estructuras ceremoniales del periodo Preclásico: Ixim, un ejemplo de ello. In *XXII Simposio de Investigaciones Arqueológicas en Guatemala, 2008*, edited by Juan Pedro Laporte, Bárbara Arroyo, and Héctor E. Mejía, v. 2, pp. 1253-1265. Ministerio de Cultura y Deportes; Instituto de Antropología e Historia; Asociación Tikal, Guatemala.
- Román, Edwin, and Sarah Newman
2011 Excavaciones en el Grupo El Diablo (Operación 5). In Proyecto Arqueológico “El Zotz,” informe no. 5, temporada 2010, edited by Jose Luis Garrido López, Stephen Houston, and Edwin Román, pp. 117-162. Report submitted to the Dirección General del Patrimonio Cultural y Natural de Guatemala.
- Romero Molina, Javier
1986 *Catálogo de la colección de dientes mutilados prehispánicos, IV parte*. Colección Fuentes. Instituto Nacional de Antropología e Historia, Mexico.
- Ruz Lhuillier, Alberto
1968 *Costumbres funerarias de los antiguos mayas*. Universidad Nacional Autónoma de México, Mexico.
- Sahagún, Bernardino de
1950-1982 *Florentine Codex: General History of the Things of New Spain*. Translated from the Aztec into English, with Notes and Illustrations by Arthur J. O. Anderson and Charles E. Dibble. 12 vols. School of American Research Press; University of Utah, Santa Fe.
- Saturno, William, Karl A. Taube, and David Stuart
2005 *The Murals of San Bartolo, El Petén, Guatemala, Part I: The North Wall*. Ancient America 7. Center for Ancient American Studies, Barnardville, NC.
- Saunders, Nicholas J.
1988 Anthropological Reflections on Archaeological Mirrors. In *Recent Studies in Pre-Columbian Archaeology*, edited by Nicholas J. Saunders and Olivier de Montmollin, pp. 1-39. BAR International Series 421. British Archaeological Reports, Oxford.
- Sax, Margaret, Nigel D. Meeks, and Dominique Collon
2000 The Introduction of the Lapidary Engraving Wheel in Mesopotamia. *Antiquity* 74(284):380-387.
- Schele, Linda
1992 The Founders of Lineages at Copan and Other Maya Sites. *Ancient Mesoamerica* 3(1):135-144.
- Schele, Linda, and Mary Ellen Miller
1986 *The Blood of Kings: Dynasty and Ritual in Maya Art*. Braziller; Kimbell Art Museum, Fort Worth.
- Scott, David A., M. Newman, M. Schilling, M. Derrick, and H. P. Khanjian
1996 Blood as a Binding Medium in a Chumash Indian Pigment Cake. *Archaeometry* 38(1):103-112.
- Schmidt, Christopher W., and Steven A. Symes, eds.
2008 *The Analysis of Burned Human Remains*. Academic Press, Oxford.
- Sempowski, Martha L., and Michael W. Spence
1994 *Mortuary Practices and Skeletal Remains at Teotihuacan*. Urbanization at Teotihuacan, Mexico 3. University of Utah Press, Salt Lake City.
- Sharer, Robert J., David W. Sedat, Loa P. Traxler, Julia C. Miller, and Ellen E. Bell
2005 Early Classic Royal Power in Copan: The Origins and Development of the Acropolis (ca. A.D. 250-600). In *Copán: The History of an Ancient Maya Kingdom*, edited by E. Wyllys Andrews, and William L. Fash, pp. 139-199. School of American Research Press, Santa Fe.
- Sievert, April K.
1990 Postclassic Maya Ritual Behavior: Regional Microwear Analysis of Stone Tools from Ceremonial Contexts. In *The Interpretative Possibilities of Microwear Studies*, edited by Bo Gräslund, Helena Knutsson, Kjell Knutsson, and Jaqueline Taffinder, pp. 147-158. AUN 14. Societas Archaeologica Upsaliensis, Uppsala.
- 1992 *Maya Ceremonial Specialization: Lithic Tools from the Sacred Cenote at Chichén Itzá, Yucatán*. Prehistory Press, Madison.
- Smith, Alfred Ledyard
1950 *Uaxactun, Guatemala: Excavations of 1931-1937*. Publication 588. Carnegie Institute of Washington, Washington, D.C.
- Smith, B. Holly
1991 Standards of Human Tooth Formation and Dental Age Assessment. In *Advances in Dental Anthropology*, edited by Mark A. Kelley and Clark S. Larsen, pp. 143-168. Wiley, New York. Available: <http://deepblue.lib.umich.edu/handle/2027.42/90867>.
- Smith, Robert E.
1955 *Ceramic Sequence at Uaxactun, Guatemala*. 2 vols. Publication 20. Middle American Research Institute, Tulane University, New Orleans.
- Smith, Robert E., and James C. Gifford
1966 Maya Ceramic Varieties, Types, and Wares at Uaxactun: Supplement to “Ceramic Sequence at Uaxactun, Guatemala.” Preprint of *Middle American Research Records* 3:125-174. Publication 28. Middle American Research Institute, Tulane University, New Orleans.
- Stemp, William J.
2001 *Chipped Stone Tool Use in the Maya Coastal Economies of Marco Gonzalez and San Pedro, Ambergris Caye, Belize*. BAR International Series 935. British Archaeological Reports, Oxford.
- 2004 Maya Coastal Subsistence and Craft-Production at San Pedro, Ambergris Caye, Belize: The Lithic Use-Wear Evidence. *Lithic Technology* 29(1):33-73.
- Stemp, William J., Christophe G. B. Helmke, and Jaime J. Awe
2010 Evidence for Maya Household Subsistence and Domestic Activities: Use-Wear Analysis of the Chipped Chert Assemblage from Pook’s Hill, Belize. *Journal of Field Archaeology* 35(2):217-234.
- Stuart, David
1988 Blood Symbolism in Maya Iconography. In *Maya Iconography*, edited by Elizabeth P. Benson and Gillett G. Griffin, pp. 175-221. Princeton University Press, Princeton.
- 2006 *Sourcebook for the 30th Maya Meetings, March 14-19, 2006*. Mesoamerican Center; Department of Art and Art History, University of Texas, Austin.
- 2007 Old Notes on the Possible ITZAM Sign. *Maya Decipherment*: decipherment.wordpress.com/2007/09/29/old-notes-on-the-possible-itzam-sign.
- 2010 Shining Stones: Observations on the Ritual Meaning of Early Maya Stelae. In *The Place of Stone Monuments: Context, Use, and Meaning in Mesoamerica’s Preclassic Transition*, edited by Julia Guernsey, John E. Clark, and Barbara Arroyo, pp. 283-340. Dumbarton Oaks, Washington, D.C.
- Stuart, David, and George Stuart
2008 *Palenque: Eternal City of the Maya*. Thames and Hudson, New York.
- Suzuki, Isamu
2001 Microbial Leaching of Metals from Sulfide Minerals. *Biotechnology Advances* 19(2):119-132.
- Syms, Steven A., Christopher W. Rainwater, Erin N. Chapman, Desina Rachael Gipson, and Andrea L. Piper
2008 Patterned Thermal Destruction of Human Remains in a Forensic Setting. In *The Analysis of Burned Human Remains*, edited by Christopher W. Schmidt and Steven A. Symes, pp. 15-54. Academic Press, London.
- Taschek, Jennifer T., and Joseph W. Ball
1999 Las Ruinas de Arenal: Preliminary Report on a Subregional Major Center in the Western Belize Valley (1991-1992 Excavations). *Ancient Mesoamerica* 10(2):215-235.
- Taube, Karl A.
1988 A Study of Classic Maya Scaffold Sacrifice. In *Maya Iconography*, edited by Elizabeth P. Benson and Gillett G. Griffin, pp. 331-351. Princeton University Press, Princeton.
- 1989 The Maize Tamale in Classic Maya Diet, Epigraphy, and Art. *American Antiquity* 54(1):31-51.
- 1993a *Aztec and Maya Myths*. University of Texas Press, Austin.
- 1993b The Iconography of Mirrors at Teotihuacan. In *Art, Ideology, and the City of Teotihuacan*, edited by Janet C. Berlo, pp. 169-204. Dumbarton Oaks, Washington, D.C.
- 1998 The Jade Hearth: Centrality, Rulership, and the Classic Maya Temple. In *Function and Meaning in Classic Maya Architecture*, edited by Stephen D. Houston, pp. 427-478. Dumbarton Oaks, Washington, D.C.
- 2000 *The Writing System of Ancient Teotihuacan*. Ancient America 1. Center for Ancient American Studies, Barnardville, NC.
- 2003a Ancient and Contemporary Maya Conceptions about Field and Forest. In *The Lowland Maya Area: Three Millennia at the Human-Wildland Interface*, edited by Arturo Gómez-Pompa, Michael F. Allen, Scott L. Fedick, and Juan J. Jiménez-Osornio, pp. 461-492. Food Products Press, New York.
- 2003b Maws of Heaven and Hell: The Symbolism of the Centipede and Serpent in Classic Maya Religion. In *Antropología de la eternidad: la muerte en la cultura maya*, edited by Andrés Ciudad Ruiz, Mario Humberto Ruz Sosa, and María Josefa Iglesias Ponce de León, pp. 405-442. Sociedad Española de Estudios Mayas, Madrid.
- 2004a Structure 10L-16 and Its Early Classic Antecedents: Fire and the Evocation and Resurrection of K’inich Yax K’uk’ Mo’. In *Understanding Early Classic Copan*, edited by Ellen E. Bell, Marcello A. Canuto, and Robert J. Sharer, pp. 265-295. University of Pennsylvania Museum of Archaeology and Anthropology, Philadelphia.
- 2004b Flower Mountain: Concepts of Life, Beauty and Paradise among the Classic Maya. *Res: Anthropology and Aesthetics* 45:69-98.
- 2005 The Symbolism of Jade in Classic Maya Religion. *Ancient Mesoamerica* 16(1):23-50.
- 2010 Where Earth and Sky Meet: The Sea in Ancient and Contemporary Maya Cosmology. In *Fiery Pool: The Maya and the Mythic Sea*, edited by Daniel Finamore and Stephen D. Houston, pp. 202-219. Peabody Essex Museum; Yale University Press, New Haven.
- 2011 Iconographie du monde maya ancien. In *Maya de l’aube au crépuscule: Collections nationales du Guatemala*, pp. 50-57. Musée du quai Branly, Paris.
- 2013 The Classic Maya Temple: Centrality, Cosmology and Sacred Geography in Ancient Mesoamerica. In *Heaven on Earth: Temples, Ritual and Cosmic Symbolism in the Ancient World*, edited by Deena Ragavan, pp. 89-125. Oriental Institute, University of Chicago.
- Taube, Karl, and Stephen Houston
2010 Lidded Bowl with the Iguana-Jaguar Eviscerating Humans. In *Fiery Pool: The Maya and the Mythic Sea*, edited by Daniel Finamore and Stephen D. Houston, pp. 250-253. Peabody Essex Museum; Yale University Press, New Haven.
- Taube, Karl A., and Reiko Ishihara-Brito
2012 From Stone to Jewel. In *Ancient Maya Art at Dumbarton Oaks*, edited by Joanne Pillsbury, Miriam Doutriaux, Reiko Ishihara-Brito, and Alexandre Tokovinine, pp. 134-153. Dumbarton Oaks, Washington, D.C.

- Taube, Karl, William Saturno, David Stuart, and Heather Hurst
2010 *The Murals of San Bartolo, El Petén, Guatemala, Part 2: The West Wall*. *Ancient America* 10. Boundary End Archaeology Research Center, Barnardsville, NC.
- Than, Ker
2013 Giant Maya Carvings Found in Guatemala. *National Geographic Daily News*: news.nationalgeographic.com/news/2013/08/pictures/130807-maya-frieze-discovered-holmul-guatemala-archaeology.
- Tiesler Blos, Vera
1998 *La costumbre de la deformación cefálica entre los antiguos mayas. Aspectos morfológicos y culturales*. Instituto Nacional de Antropología e Historia, Mexico.
- Turner, Christy G., II, C. R. Nichol, and G. Richard Scott
1991 Scoring Procedures for Key Morphological Traits of the Permanent Dentition: The Arizona State University Dental Anthropology System. In *Advances in Dental Anthropology*, edited by Mark A. Kelley and Clark S. Larsen, pp. 13-31. Wiley, New York.
- Ubelaker, Douglas H.
1999 *Human Skeletal Remains: Excavation, Analysis, and Interpretation*. 3rd ed. Taraxacum, Washington, D.C.
- Valdés, Juan Antonio
2005 El Grupo A: nacimiento y ocaso de la Plaza Este. In *El período Clásico Temprano en Uxactún, Guatemala*, edited by Juan Antonio Valdés, pp. 27-68. Instituto de Investigaciones Antropológicas y Arqueológicas, Universidad de San Carlos, Guatemala.
- Valdés, Juan Antonio, and Federico Fahsen
1995 The Reigning Dynasty of Uxactun during the Early Classic: The Rulers and the Ruled. *Ancient Mesoamerica* 6(2):197-220.
- Valdés, Juan Antonio, Federico Fahsen, and Gaspar Muñoz Cosme
1997 *Estela 40 de Tikal. Hallazgo y lectura*. Instituto de Antropología e Historia de Guatemala, Guatemala.
- Vasanthakumar, Archana, Alice DeAraujo, Joy Mazurek, Michael Schilling, and Ralph Mitchell
2013 Microbiological Survey for Analysis of the Brown Spots on the Walls of the Tomb of King Tutankhamun. *International Biodeterioration & Biodegradation* 79:56-63.
- Vaughan, Patrick
1985 *Use-Wear Analysis of Flaked Stone Tools*. University of Arizona Press, Tucson.
- Vázquez de Agredos Pascual, María Luisa
2007 Los colores y las técnicas de la pintura mural maya. *Proceedings of the Anales del Museo de América* 15:55-66.
- Von Winning, Hasso
1987 *La iconografía de Teotihuacán. Los dioses y los signos*. Universidad Nacional Autónoma de México, Mexico.
- Walsh, Jane MacLaren
2008 The Dumbarton Oaks Tlazolteotl: Looking Beneath the Surface. *Journal de la Société des Américanistes* 94(1):7-43. Available: <http://jsa.revues.org/8623>.
- Wagner-Döbler, Irene
2003 Pilot Plant for Bioremediation of Mercury-Containing Industrial Wastewater. *Applied Microbiology and Biotechnology* 62(2-3):124-133.
- Watanabe, John M.
1992 *Maya Saints and Souls in a Changing World*. University of Texas Press, Austin.
- Welsh, W. Bruce M.
1988 *An Analysis of Classic Lowland Maya Burials*. BAR International Series 409. British Archaeological Reports, Oxford.
- Wisdom, Charles
1950 Materials on the Chorti Language. Microfilm Collection of Manuscripts on Middle American Cultural Anthropology 28. University of Chicago Library, Chicago. Available: www.utexas.edu/courses/stross/chorti/.
- Wright, Lori E.
2005 In Search of Yax Nuun Ayiin I: Revisiting the Tikal Project's Burial 10. *Ancient Mesoamerica* 16(1):89-100.
- Wright, Lori E., Juan Antonio Valdés, James H. Burton, T. Douglas Price, and Henry P. Schwarcz
2010 The Children of Kaminaljuyu: Isotopic Insight into Diet and Long Distance Interaction in Mesoamerica. *Journal of Anthropological Archaeology* 29(2):155-178.
- Yadeun, Juan
1993 *Toniná*. El Equilibrista, Mexico.