

Chapter 5

Masks and Iconography

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The Early Classic stuccos from the Temple of the Night Sun (Strs. F8-1-Sub.1B and F8-1-Sub.1C) stand apart for their complexity and quality. In the past, their effect must have been overwhelming. Deep, volumetric relief offered a bold show at dawn and dusk. Depending on weather, raking sunlight would slant across the Temple's high location on the Buenavista Escarpment, a display enhanced by the saturated red color of the stuccos. It is surely no coincidence that the Sun God dominated the iconography of the Temple. Yet the high relief posed certain challenges, too. Excavations proved that portions of the elaborate façades had sloughed off even before the Temple's abandonment and burial. Ambitious in conception, the stuccos were poorly bonded to their backing. For some of their visible lifetime, they were as much examples of decay as triumphant, unblemished commissions of the local dynasty.

The Program

Most of the exposed and documented stucco sculpture appears on the Temple's cornice, extending around all sides of the building. In addition, remnants of sculpture occur on the front of the Temple's roofcomb. Damaged by rainfall and slump since its exposure by looters, the roofcomb was nonetheless documented in situ by Martin Diedrich, who took photographs in 1980 (see Chapter 2). Diedrich's images, along with what

Figure 5.1. The Sun God (Mask 3), on the northeast corner of the Temple of the Night Sun, and Chahk (Mask 4), on the northern façade. Image: Katie Simon, CAST.

2015 In *Temple of the Night Sun: A Royal Tomb at El Diablo, Guatemala*, by Stephen Houston, Sarah Newman, Edwin Román, and Thomas Garrison, pp. 208-229. Precolumbia Mesoweb Press, San Francisco. High-resolution version available at www.mesoweb.com/publications/TNS/index.html.



Figure 5.2. The extant masks on the upper frieze of the Temple of the Night Sun. For the individual masks see Figures 5.14–5.21. Drawings: Stephen Houston and Mary Clarke.

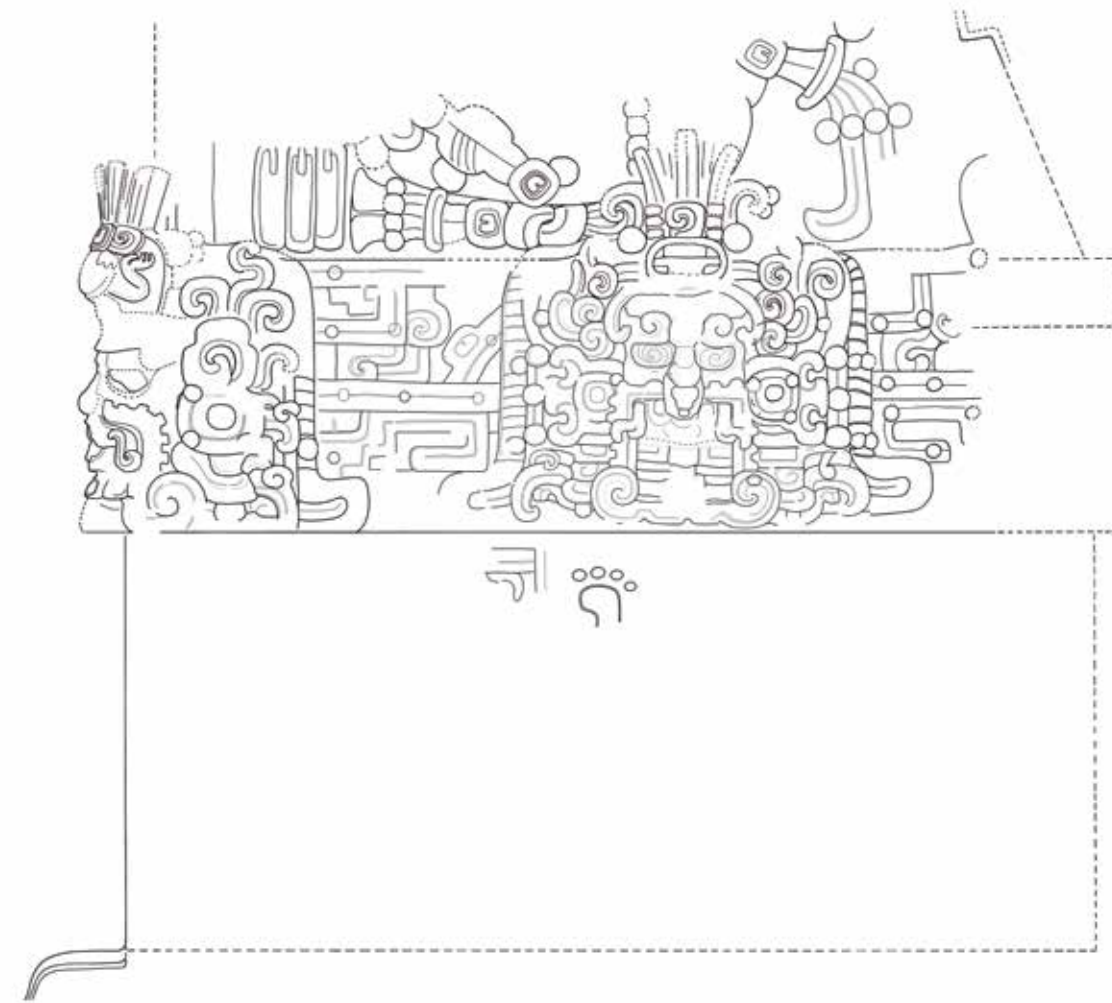


Figure 5.3. Forward-facing Chahk head (Mask 4) from the Temple's northern façade, with remains of seated male figure above. Drawing: Mary Clarke.

remains on view, show a central mask with large earspools on its main, east-west axis. Presumably, a seated body, not excavated because of structural instability, was linked to the mask, thus composing an entire figure. The mask was heavily affected by burning when Str. F8-1-2nd (the Middle Temple) was constructed; pieces of fire-darkened, red-painted stucco mix with fill in front of the mask. Vertical placement on the roof-comb suggests that the figure was seated, much like that on the recently discovered façade at Holmul, Guatemala (Than 2013). To the side, in fragments that have slumped a meter to the south since 1980, was a vertical element clutched by a deity, identified by the ovals or "god-markings" on the body. Similar beings are found on the Early Classic Stela 1 at Tikal, perhaps as part of a lateral backrack extension or as an element in some celestial tableau (Jones and Satterthwaite

1982:Fig. 1). The Hauberg Stela at the Princeton Museum of Art displays comparable deities holding a curving serpent (Figure 5.8b; Schele and Miller 1986:Pl. 66).

Among the most important motifs on the sloping cornice are massive, frontally facing deity masks. Ten are now attested, most by excavation but one solely by a Diedrich photograph. The overall number must have been 14, with only those on the southeastern and southwestern corners unaccounted for. To facilitate discussion, these are labeled in counter-clockwise order (Figures 5.2 and 5.14–5.21): Mask 1, eastern façade, at the back axis of the Temple; Mask 2, eastern façade; Mask 3, the Sun God, at the northeastern corner; Mask 4, the storm god Chahk, northern façade; Mask 5, a GI-semblant, northern façade; Mask 6, a largely destroyed sculpture on the western façade; Mask 7, western façade;

Mask 8, above the doorway to the Temple. Masks 9 and 10, on the western façade, are still in fill but must correlate, presumably in their content too, with Masks 6 and 7. Mask 11, attested in a photograph by Diedrich, appears to have the end of a twisting facial "cruller" passing through its earspool and matches Mask 5 on the northern façade in this respect. Mask 12 is another Chahk on the southern façade. Masks 13 and 14 are unexcavated but must have resembled Masks 2 and 3. Further, Masks 5 and 6 associate with niche-like features that call to mind the slightly later Shrine erected in front of the Temple (see Chapter 2).

The likelihood is that the overall program was symmetrical, making it possible to understand the whole without complete excavation—the unexposed corners are too close to the surface to allow exhaustive work. Two Chahk heads (Masks 4 and 12) on the north and south sides of the temple appear to be virtually identical in form and placement, suggesting bilateral patterns on the cornice (Figures 5.3 and 5.4). Just above the Chahk heads, the lower portions of two seated figures can be discerned. The figure on the north side (Figure 5.3) wears triple belt celts on his back and a skirt bordered with beads. A diagonal element with a prominent *yax* sign crosses the thigh. The horizontal knotted element below could be either part of the same belt assemblage or his loincloth folded under his knees. The diagonal belt element is common in royal male costume and often has a pendant Chahk figure, as on the Early Classic Tikal Stelae 28 and 39, Uolantun Stela 1, and the Late Classic West Jamb of the Temple of Foliated Cross at Palenque (e.g., Jones and Satterthwaite 1982:Figs. 48, 76). The seated ruler on the fragmentary Stela 18 of Tikal is notably similar to the El Zotz figure, including the pendant belt

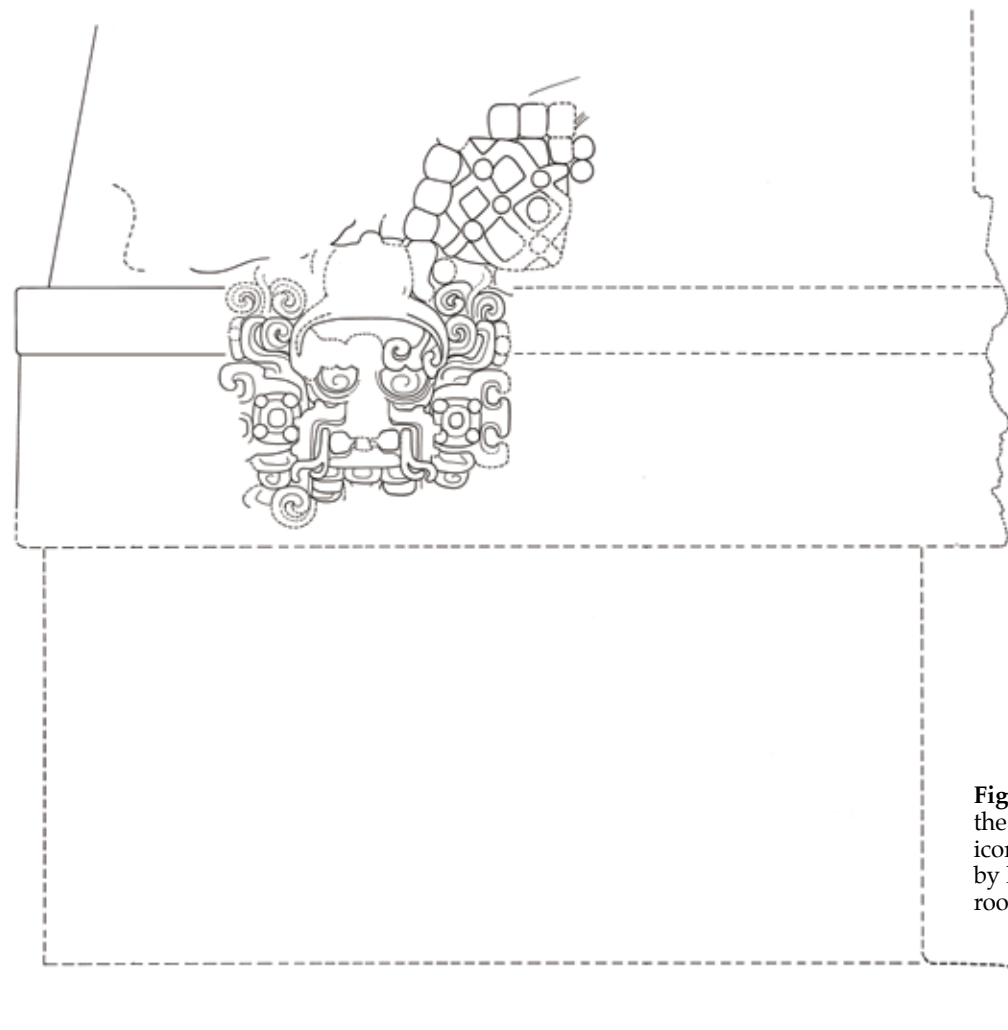


Figure 5.4. Chahk head (Mask 12) from the Temple's southern façade (remaining iconography and architecture largely destroyed by looting), beneath female with beaded skirt on roofcomb. Drawing: Mary Clarke.

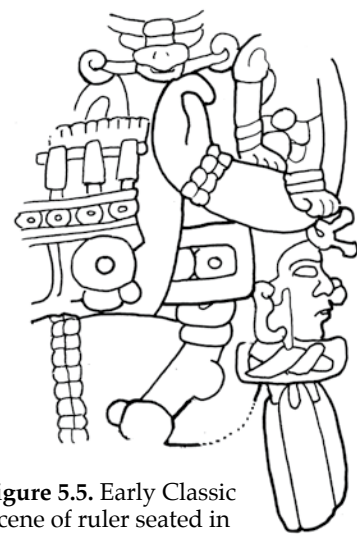


Figure 5.5. Early Classic scene of ruler seated in profile atop zoomorphic mountain; Tikal Stela 18. Drawing: Karl Taube, after Jones and Satterthwaite 1982:Fig. 26a.

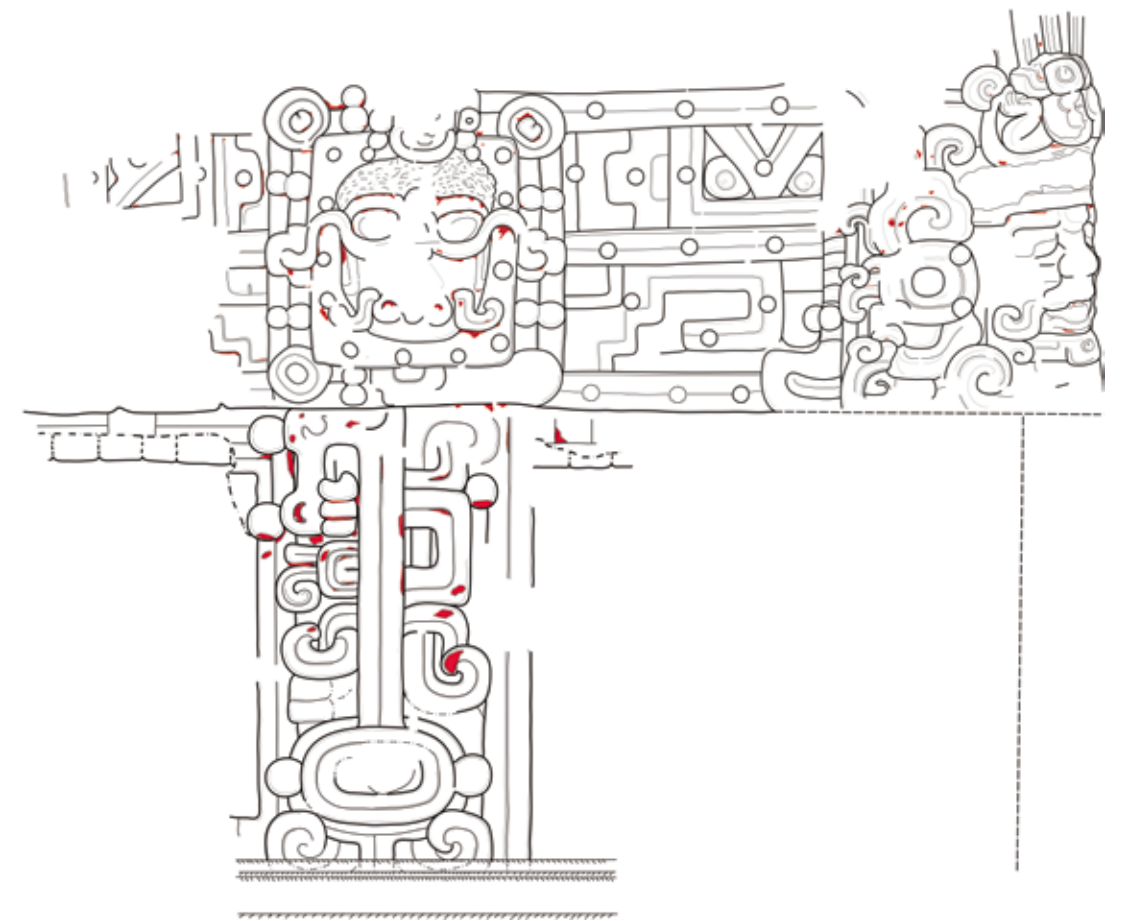


Figure 5.6. Deity masks (Masks 1, 2, and 3) on the sculpted band that encircles the Temple. Beneath the band on the lower façade is a downward-pointing serpent head. Drawing: Stephen Houston.

celts, diagonal belt element, and beaded skirt (Figure 5.5). A Teotihuacan-style headdress or more probably a deity head rests in the Tikal figure's lap. The pendant beaded element before the knee of the El Zotz figure could also form part of a headdress.

The opposite south façade features another seated figure, although in this case one that wears a beaded net skirt, a frequent costume element of royal women (Figure 5.4). We suspect the two figures constitute a royal couple. In this regard, the pattern would resemble Tikal Stela 40, which has the parents of K'an Chitam on the sides, the mother again with net skirt (Valdés et al. 1997). Below the two seated figures is a sculpted band with large deity masks that encircles the building (Figure 5.6). The lower half of the band has stepped frets that look like woven textile, but the upper portion represents a skyband, including a star or Venus sign of angular, archaic form on

the east façade between Masks 2 and 3. Excavations in 2013 exposed a massive serpent head with its snout pointing downward beneath Mask 2 on the northern portion of the east façade. There was surely another on the southern end. During the Late Preclassic and Early Classic periods, pairs of similar serpent heads often mark the ends of skybands, as on sculptures at Izapa, Takalik Abaj, San Bartolo, and Kohunlich. Many, too, have a circular blossom at the tip of the snout (e.g., Taube et al. 2010:Figs. 26, 30, 31). As will be noted, a pair of heads of the same creature, symmetrically oriented, flank Mask 7 on the excavated principal portion of the west façade to the north of the central doorway (Figure 5.10), with another probable pair on the other side of the doorway to the south. The long tabular element above Mask 7 could well be a skyband with the serpent heads descending at both ends.

As for the nine extant deity masks,

all have glyphic signs atop their brows, most likely an epigraphic convention for naming them. The practice is also attested on portrayals of Classic Maya royalty, as on Stela 40 of Tikal. However, since these are the uppermost, highly exposed portions of the masks, they tend to be poorly preserved. Most appear to be smaller heads with earspools, but three have partly legible signs. The Sun God—Mask 3—was labeled by a compound consisting of raised hands supporting a *yu* syllable, along with a schematic, inverted face in between (Figure 5.16). A remarkable feature is that the glyph was amended at some point. A face with deep mouth and sharply defined trefoil eye was covered by stucco to create a more stylized visage. Mask 4, a Chahk, recorded a sky sign, a bundle, and superimposed volute, perhaps a vocalization; the link with a resonant sky fits well with Chahk (Figure 5.17). A glyph for *ak'ab*,

“darkness,” may occur with Mask 8 above the front doorway (Figure 5.10).

Most of the masks denote aspects of the Sun God, with the majority alluding to the deity known to scholars as the Jaguar God of the Underworld (hereafter JGU). In Classic Maya calendrics, this god appears as the personified glyphs for the day Kib and the number seven, as well as the patron of the month Wo (Thompson 1950:Figs. 9.52, 22.8-10, 24.38-41). With his large eyes and profile, he displays some of the basic features of the diurnal Sun God, K'inich Ajaw, but with important distinctions. Although K'inich Ajaw can display jaguar ears, this is invariably the case for the JGU. In addition, he has spiral eyes, in contrast to the cross-eyed pupils of the Sun God. As noted in a previous publication (Houston and Taube 2000), the spiral motif designates darkness as distinct from the brightly shining eye of the day sun. The cheeks of the JGU often bear the so-called *ak'bal*, “night,”

sign. An especially important and diagnostic trait of the JGU is the facial element, often referred to as a “cruller,” that frames the lower portions of the eyes and twists above on the central brow just above the nose. At times, as in the case of an example on the front of Tikal Stela 31, the cruller is marked with a beaded water motif, which is also consistent with the spiral eye appearing in some water bands (Figure 5.7b; Houston and Taube 2000:Fig. 19h, i). In Classic Maya iconography, the underworld was an aquatic place, part of a sea sustaining the world (Finamore and Houston 2010; Taube 2010). Although the watery nature of the facial features is consistent with underworld symbolism, David Stuart (1998) notes that the JGU may well constitute the Classic Maya fire god, hence his prominence in censer supports at Palenque (Cuevas García 2007). In addition, the jaguar ears of the JGU commonly emit flames and smoke, as in the case of a massive JGU on the

lower west façade of the Temple (Figure 5.10).

With his attributes of darkness, water, and jaguars, as well as facial features of the sun deity, the JGU plausibly represents the nocturnal Sun God, perhaps at his midnight nadir in the underworld. Aside from the El Diablo façades, one of the most conspicuous examples of this being occurs on the Jaguar Stairway on the west side of the East Court in the Copan Acropolis, in that case flanked by massive star signs (Baudez 1994:Fig. 105). Moreover, William Fash (personal communication, 1996) notes that there is a similarly massive head of K'inich Ajaw that probably faced the JGU on the east side of the courtyard, placing them in a dyadic relationship as eastern and western aspects of the Sun God (Maudslay 1889-1902:1:Pl. 10b). This also suggests that the dawning sun would light the face of the eastern-facing JGU on the west side of the court while, conversely, the diurnal sun on

the east side faced to the west. The same pattern occurs on the stairway image of K'inich Yax K'uk' Mo' from the immediately adjacent Temple 16 in the West Court of the Copan Acropolis, where he appears as the rising day sun facing west (Taube 2013). The orientation of the East Court sculptures at Copan indicates that, while K'inich Ajaw denotes the east and the diurnal celestial sun, the JGU represents the west and the sun in the dark underworld.

In the El Diablo Temple, the orientation is quite the opposite. The JGU as the night sun dominates the western doorway (Mask 8). As a prominent building at the western edge of El Zotz, the Temple also faces west, and its central theme might be the night sun orienting west to mark its descent into the dark underworld. The concept of a temple dedicated to the night sun also appears in Classic Maya iconography, including a Late Classic vase portraying a temple marked with eyeballs denoting darkness and the head of the JGU on the roof (K5538). Moreover, the concept of temples dedicated to the night sun can be traced to the Late Preclassic period (ca. 100 BC). Mural fragments excavated from the Ixim temple in the Pinturas Group at San Bartolo depict what appears to be a temple roof with the spiral eyes denoting darkness framed by the JGU cruller, a secure reference to this being, despite the fact that there are as yet no explicit representations of this god for the Late Preclassic (Figure 5.7d). This repetitive cruller motif also appears on a Late Classic panel from Pomona, Chiapas, portraying a shield rimmed with "death eyes" denoting death and darkness (Figure 5.7e). The shield center contains the cruller element atop a jaguar pelt, a probable allusion to the face of the JGU.

One of the striking and unusual traits of certain JGU heads, seen on the Temple and elsewhere, is that the twisted cruller element penetrates their earspools and even the jaguar ears in the case of the JGU on the lower Temple façade. The earliest known example appears on the San Diego cliff relief in the northern Peten, dating to roughly AD 300. The trait also appears on Stela 31 at Tikal, both in a belt piece worn by the ruler, Sihyaj Chan K'awiil, and a portrait

glyph of the JGU in the lengthy text on the back (Figure 5.7c). In fact, this glyph could be an epigraphic reference to the El Diablo Temple (see Chapter 6; Houston et al. 2013). While not the JGU, Mask 7 from the west façade has similar eye elements passing through earspools, although in this case descending from the brow. The undulating ends that rise through the earspools signal that they are probably serpents; indeed, a Protoclassic stucco mask from the North Acropolis at Tikal portrays a form of the JGU with the cruller clearly terminating in a pair of serpent heads (Figure 5.7a). The concept of serpent heads passing through earspools is commonly found with Early Classic portrayals of *witz* "hill" heads, although in this case they emerge from the corners of the mouth (Taube 2003b, 2004b). These beings constitute the "breath of the mountain," in other words, wind. In fact, Vincent Stanzione (personal communication, 2000) has noted that in Tz'utujil the term for wind is *xlaajuyu'*, meaning "mountain breath" (Saturno et al. 2005:25). If serpents emerging from *witz* maws denote breath, perhaps snakes terminating eye elements constitute an aspect of sight as a form of "vision serpent." Serpents of vision and sight would be entirely appropriate symbolism for imagery pertaining to aspects of the Sun God.

Directly above the massive celestial serpent head on the eastern façade, there is the face of the JGU within a square frame having four prominent bosses at its corners (Mask 2). Although this is the only example documented for the many masks constituting the upper frieze, it probably occurs as well on the unexcavated southern portion of the same wall (the hypothetical Mask 14). The square motif probably constitutes an early version of the JGU shields commonly wielded by Classic Maya kings. On Dos Pilas Stela 9, a shield not only shows jaguar pelage but is marked **u-[K'IN]-chi-NAL** (Greene et al. 1972:Pl. 93). Of uncertain meaning, it may read *u k'inichnal*, "his Sun God Place," or, parsed another way, *u k'in ichnal*, "his sun presence," in either instance referring to solar beings. One of the most elaborate and best-known examples of this shield appears on the Tablet of

the Temple of the Sun at Palenque atop two crossed spears, again with four feathered bosses rimming the edge (Maudslay 1889-1902:4:Pl. 88). Although well attested in the Late Classic period, the El Diablo Temple motif would not be the only Early Classic JGU shield. A ceramic lid from a royal tomb in Str. IX at Becan, Campeche, portrays a central face framed by a circular device with four feathered bosses, a version of the Late Classic shield noted for Palenque (Campaña and Boucher 2002:69). In addition, this central face is rimmed by the same woven motif found with the Palenque example. As noted by Campaña and Boucher (2002:69), the central face portrays the night sun, in other words, the JGU. Although this is certainly the case, the visage is still more complex, as it has the fur and beaded elements found with the howler monkey scribe, as in the case of the two remarkable vessels discovered in Burial 9 (see Chapter 3). The left cheek of the Becan face is black, the other is red, and this could well allude to dusk and dawn. In this regard, it is possible that the JGU shields pertain to the concept of raising one's shield at dawn, when battle became possible. If so, the JGU shields of the El Zotz Temple are on the eastern side to receive the first rays of dawn.

In contrast to the probable JGU shield motif, the other deity masks from the Temple façades have elaborate earspool compositions at the sides of their heads. First known from Kohunlich in southern Quintana Roo, these earspool groupings are now widely documented for Early Classic stucco façades as well as ceramic urns, in most cases with aspects of the Sun God (e.g., Hellmuth 1987:75-78, 81-83, 86-87, 107-109; Taube 1998:Fig. 14a-b). The most common composition is a central earspool with profile heads of the Principal Bird Deity at the base and a fish or "Xok" head at the top, which seems a striking contradiction of the sky and the fish as a basic reference to the watery underworld. Beaks often protrude from the sides of the central earspools, suggesting macaw heads with large, round eyes, but as of yet there is no secondary evidence, such as beading around the eyes, to suggest this attribution. Aside from the probable

shield motif, all of the other documented masks from the El Diablo façades share features of this program. In tight unison, the three traits appear in Mask 5 at the northwest corner, with Principal Bird Deity heads at the base, earspools with beaks, and profile fish heads above. The principal central mask above the western doorway, Mask 8, displayed all three elements as well, although only the upper portions of the lower bird heads remain.

Another basic attribute of Early Classic deity masks as well as royal headdresses is a "chin strap" head just below the main portrait, as can be vividly seen with the headdress raised by Sihyaj Chan K'awiil on Tikal Stela 31 (Jones and Satterthwaite 1982:Fig. 51). This convention is so central that it was copied at Teotihuacan as a ceramic *almena* mask of a probable Maya king, including the elaborate earspool assemblages as well (Taube 2003b:Fig. 11.1a). The meaning of this lower face remains obscure, although it could well signify the support and "vehicle" for the main face above. In many cases, the head is a serpent, the most widespread creature associated with the travel of supernatural beings, including bicephalic serpent bars as well as the great plumed serpent emerging from Flower Mountain in the Late Preclassic north wall mural at San Bartolo (Saturno et al. 2005).

A noteworthy trait of several of the Temple deity masks is a crenellated element encircling the mouth, much like a beard (see Masks 4, 8, and 12 in Figure 5.2). Rather than hair, this motif probably alludes to blood, and it appears on the Hauberg Stela falling from the mouth of GI—an aquatic aspect of the Sun God—in a stream that carries three dismembered human figures (Figure 5.8b). It is also marked by crosshatched undulating elements, rendered in red as an explicit blood band on an Early Classic vessel lid from Becan (Taube and Houston 2010:Pl. 82). At Tonina, in highland Chiapas, a pair of balustrades depict jaguar heads with similar crenellations bordering blood scrolls (Figure 5.8c). It is quite possible that this motif rimming the mouth of the Temple masks shows them to be "blood drinkers," which would be consistent with the sanguinary, war-like nature of the Maya Sun God (Houston et al. 2006:123, Fig. 3.21). However, aside from the diurnal sun and nocturnal JGU, the Chahk masks on the north and south sides of the Temple (Masks 4 and 12) also have this facial element. Although not known for Maya depictions of the rain god, Late Classic Maya depictions of the Central Mexican god of rain and lightning, Tlaloc, portray him with a trefoil blood scroll in the mouth, including a massive example from Temple 16 at Copan

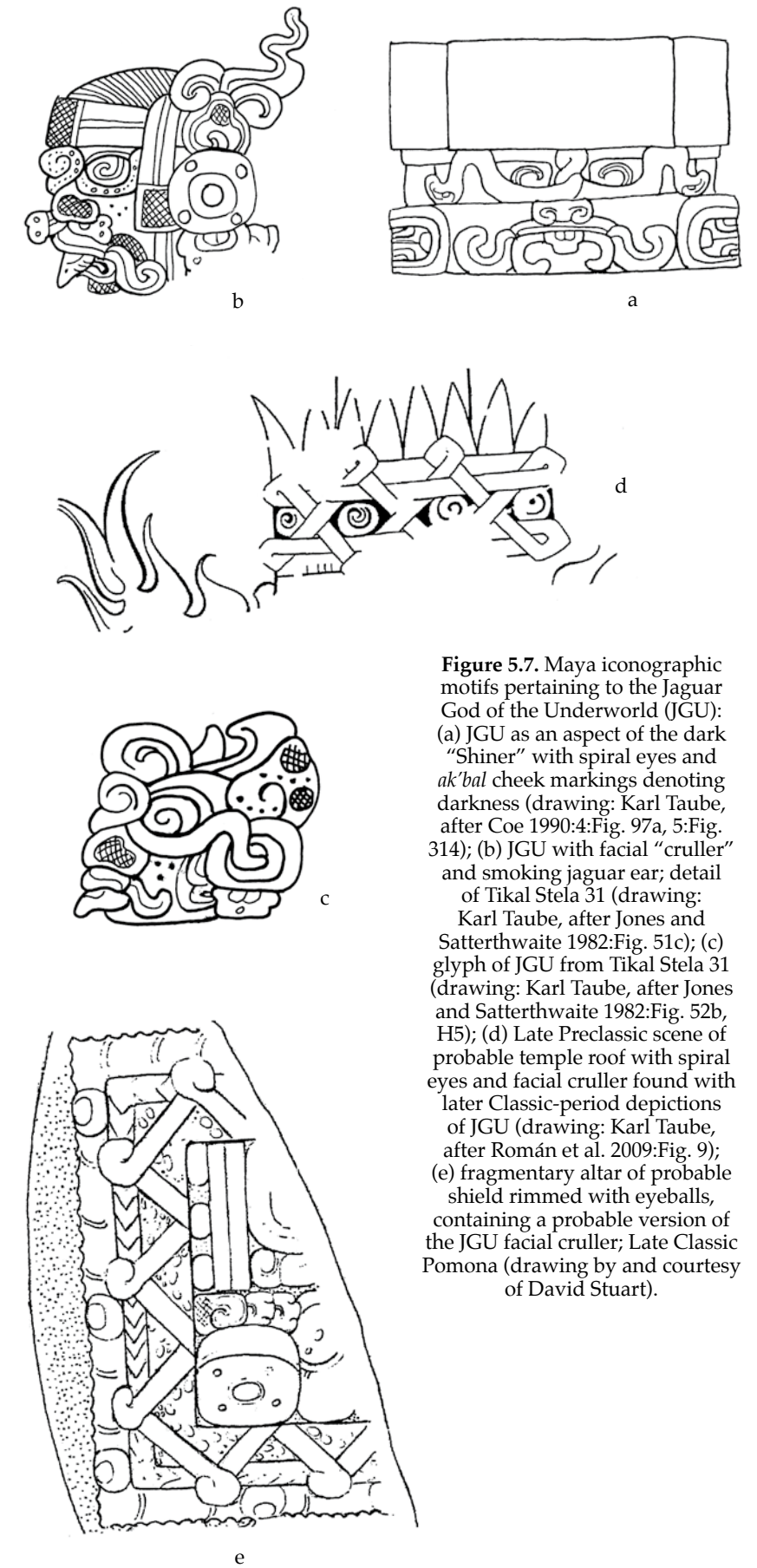
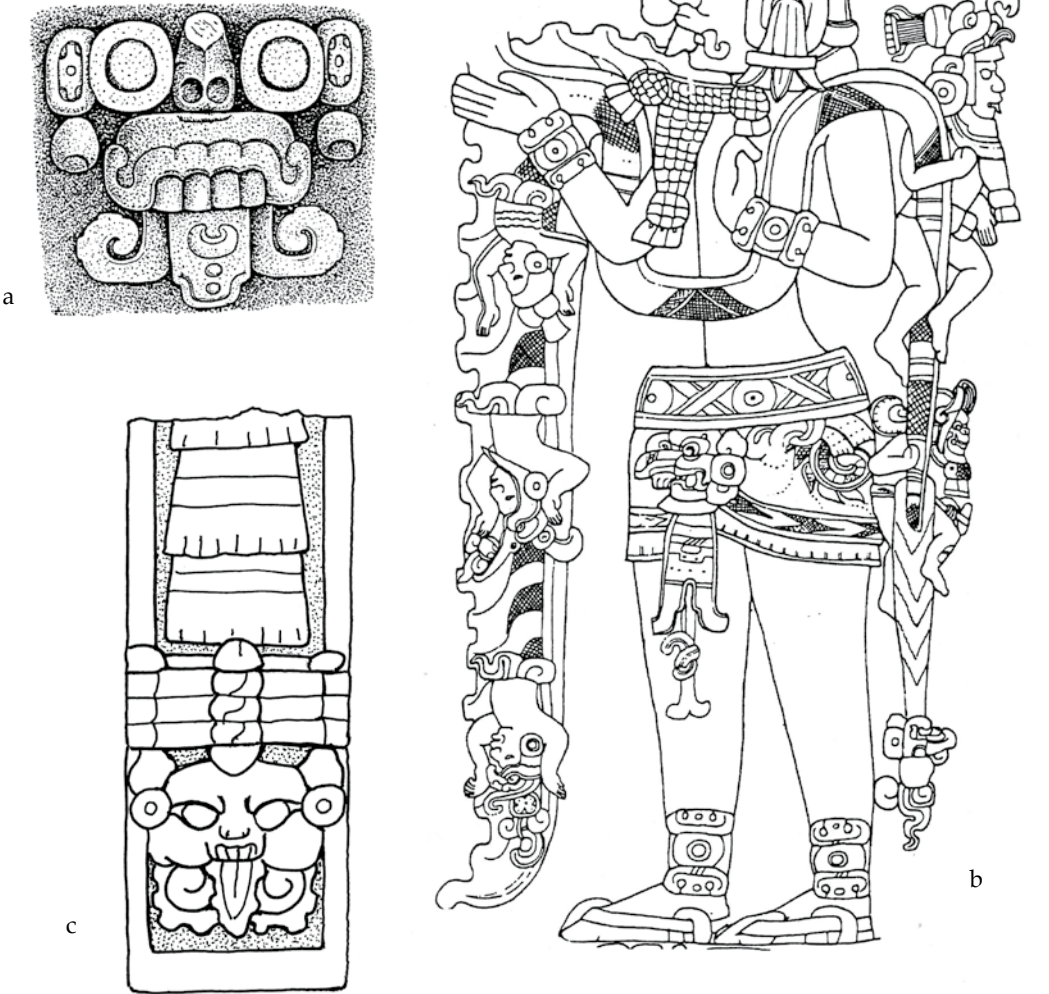


Figure 5.7. Maya iconographic motifs pertaining to the Jaguar God of the Underworld (JGU): (a) JGU as an aspect of the dark "Shiner" with spiral eyes and *ak'bal* cheek markings denoting darkness (drawing: Karl Taube, after Coe 1990:4:Fig. 97a, 5:Fig. 314); (b) JGU with facial "cruller" and smoking jaguar ear; detail of Tikal Stela 31 (drawing: Karl Taube, after Jones and Satterthwaite 1982:Fig. 51c); (c) glyph of JGU from Tikal Stela 31 (drawing: Karl Taube, after Jones and Satterthwaite 1982:Fig. 52b, H5); (d) Late Preclassic scene of probable temple roof with spiral eyes and facial cruller found with later Classic-period depictions of JGU (drawing: Karl Taube, after Román et al. 2009:Fig. 9); (e) fragmentary altar of probable shield rimmed with eyeballs, containing a probable version of the JGU facial cruller; Late Classic Pomona (drawing by and courtesy of David Stuart).

Figure 5.8. The “spoked” blood motif in Maya iconography: (a) Late Classic Maya portrayal of the Teotihuacan rain god Tlaloc with trefoil blood scroll in mouth; detail of stairway sculpture from Temple 16, Copan (drawing: Karl Taube [2004b:Fig. 13.12b]); (b) Protoclassic Maya depiction of sacrificial blood falling from the mouth of a god; detail of drawing of Hauberg Stela (drawing: Linda Schele courtesy of David Schele); (c) stucco balustrade sculpture from Tonina of feline with trefoil blood scroll in mouth (drawing: Karl Taube, after Becquelin and Baudez 1982:Fig. 24).



with projecting tabs, a simpler form of the crenellation blood motif (Figure 5.8a).

The Temple masks pertain directly to its westerly orientation, with most depicting elaborate portrayals of the JGU, including Mask 8 above the west doorway of the Temple (see Figure 5.2). His headdress is topped with a glyphic element containing the sign for darkness, an element commonly found on the cheeks of this being. In addition, the profile fish heads above the earspools are surmounted by circular

cartouches containing diagonal bands, which denote shining reflective surfaces in Maya iconography. On one cartouche are the remains of curling vegetation to one side, and a more complete example from Mask 5, a JGU mask from the north façade, reveals that the cartouche and vegetation denote an ear of corn, or *nal*. In fact, many Late Classic masks and headdresses have *nal* maize signs above the earspools (Taube 1985:Figs. 2g, 9f). A fragmentary *nal* sign can also be discerned on Mask 6 on the northern end

of the western cornice, doubtless matched with an unexcavated southern counterpart (Mask 10). Below the *nal* elements, there are also the remains of the profile earspools and avian heads. Although of slightly different proportions, it is possible that Mask 6 and the hypothetical Mask 10 were versions of the same being above the western doorway (Mask 8).

The north façade JGU, Mask 5, has a shark tooth as a central incisor, a convention common with GI but not with this being (Figure 5.9). However, the two gods do overlap in physical appearance, including the spiral eyes, the two major differences being the facial cruller and burning jaguar ears of the JGU, as well as the shark tooth and fish fins or barbels on the cheeks of GI. Although rare, there are other examples of the JGU displaying a shark tooth canine, including one from the front of Tikal Stela 31 (Jones and Satterthwaite 1982:Fig. 51c). Although Mask 5 is the only JGU on the Temple displaying an intact incisor, the other examples may have also had the same shark tooth.

For the east side of the building, another feline being with jaguar ears, Mask 1, appears on the upper frieze south of the probable JGU shield, Mask 2, with another corresponding mask probably further south, the hypothetical Mask 14. Mask 1's sunken features and small pair of canines suggest an aged god with chapfallen face. Given the condition of the mask, the identity of this being remains elusive, but one possibility is the jaguar deity appearing as one of the two aged “Paddler Gods,” a dark solar being with jaguar attributes paired opposite an aspect of the diurnal sun (Stuart 1988:189-193).

The northeast corner of the Temple bore an image of the Sun God, Mask 3 (Figure 5.16), with one probably at the southeast as well, Mask 13. Although possessing the burning jaguar

ear commonly found with the JGU, he lacks the spiral eye of the nocturnal Sun God. Instead, he displays the cross-eyed pupils of the diurnal Sun God, appearing epigraphically as the patron for the month Yaxk'in and the personification of the numeral 4 (Thompson 1950:Figs. 22, 24). However, most Classic-period Sun Gods have crossed-eyed pupils delineated only by an incision. By contrast, Mask 3, the northeastern solar deity, has rectangular holes cut out, thereby creating sideways L-shapes. For the El Zotz mask, this is a decidedly archaic convention that is best known for the Late Preclassic period, including deities from the murals at San Bartolo, Guatemala (Saturno et al. 2005:Fig. 30). The meaning of the hollowed pupil remains obscure, but it could allude to a “passage-way” opening to the numinous place of gods and ancestors, and perhaps to the play of light and shadow on the Temple.

Just to the north of the central JGU above the western doorway, there is another deity, Mask 7, which lacks feline or sun god attributes (Figure 5.10). Given the clear bilateral symmetry in the façade program, this would have been paired with another on the opposite southern side of the doorway, the hypothetical Mask 9. As with JGU masks on the western and northern façades, facial serpents pass through the mask's earspools. However, in this case they are distinct from the JGU facial cruller, as they extend down from the brows rather than rise from the cheeks. It is possible that the pair of masks depict the howler monkey scribes, which in the Early Classic appear with similarly snarling muzzles and beaded beards, including the ceramic examples from the nearby royal tomb (see Chapter 3). In addition, a large-scale pair of southwardly facing masks on Str. 33-2nd from the North Acropolis at Tikal probably depict the same being and may relate to the monkey

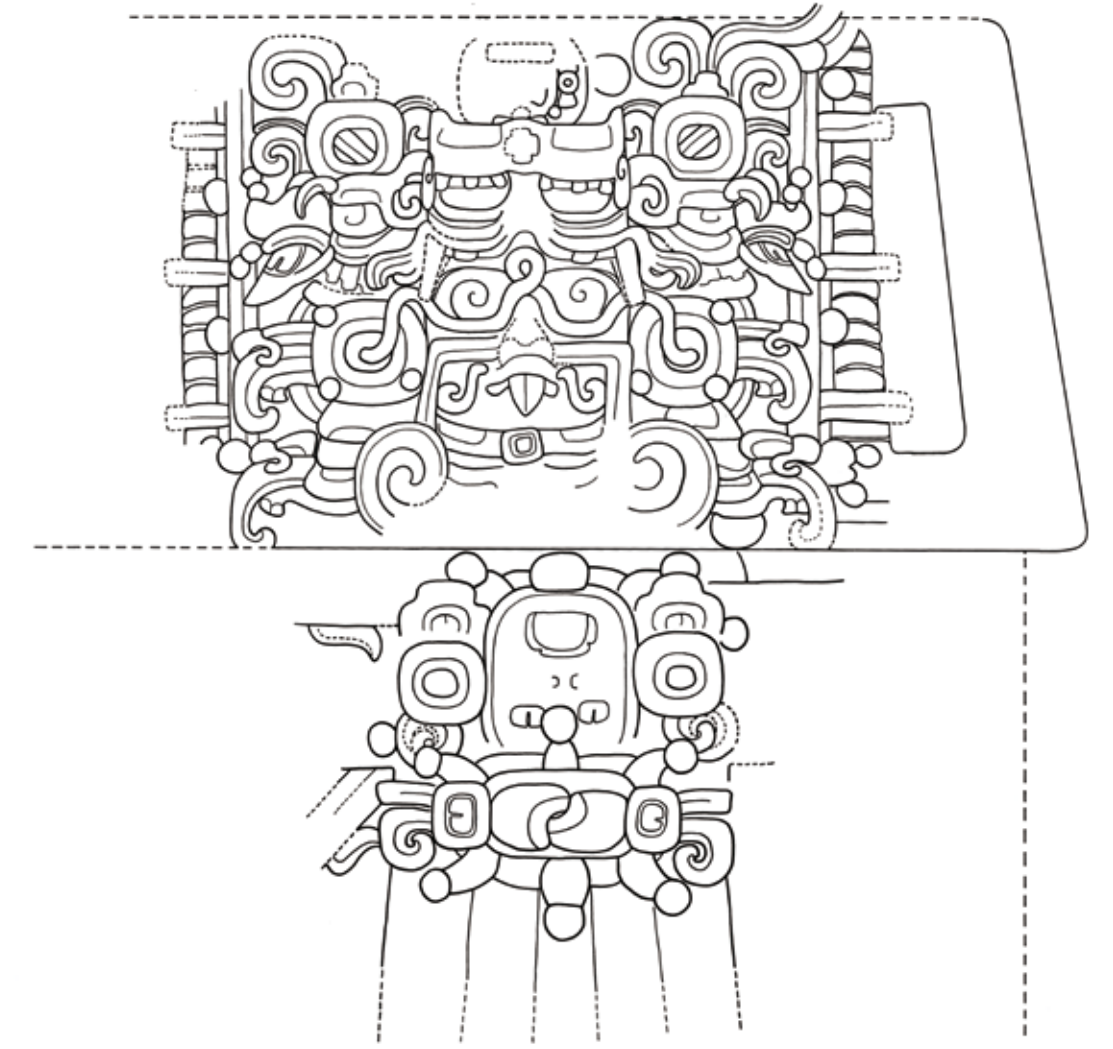


Figure 5.9. Mask 5, a Jaguar God of the Underworld, from the Temple's northern façade. Drawing: Mary Clarke.

scribe twins of the sixteenth-century K'iche' Popol Vuh (W. Coe 1990:5:Fig. 317; see also M. Coe 1978). It is likely that a still earlier building from the North Acropolis, dating to the third century AD, also bore masks of these beings (Coe 1990:4:Fig. 96). Two downwardly facing serpent heads with floral-tipped snouts flank Mask 7. Although the snouts are bent rather than straight, they are the same serpent on the lower façade of the east wall below the skyband (Figure 5.6). The horizontal rectangular element above Mask 7 and the serpent heads may also have been part of a celestial register.

Just below the seated royal couple on the north and south cornices of the Temple are the Chahks, Masks 4 and 12 (Figures 5.3 and 5.4), with the best preserved being the northern example, Mask 4. Along with the

feline-appearing snout and trefoil brows of Chahk, the masks also have *Spondylus* earpieces, a diagnostic marker of the Classic Maya god of rain and lightning. However, the earpieces also contain jade earspools, with jade often placed in *Spondylus* shells in Classic Maya caches (Finamore and Houston 2010:Pl. 89). The swirling elements directly above the earpieces are probably profile fish heads, although in this case oriented vertically. Mention has been made of the probable crenellated blood scrolls pouring from the mouths of some of the Temple masks; the Chahk examples are the best preserved. These blood elements may be personified with eyes or jeweled elements still visible on the better-preserved Mask 4.

Below the masks on the upper frieze, elaborate sculptural programs are also

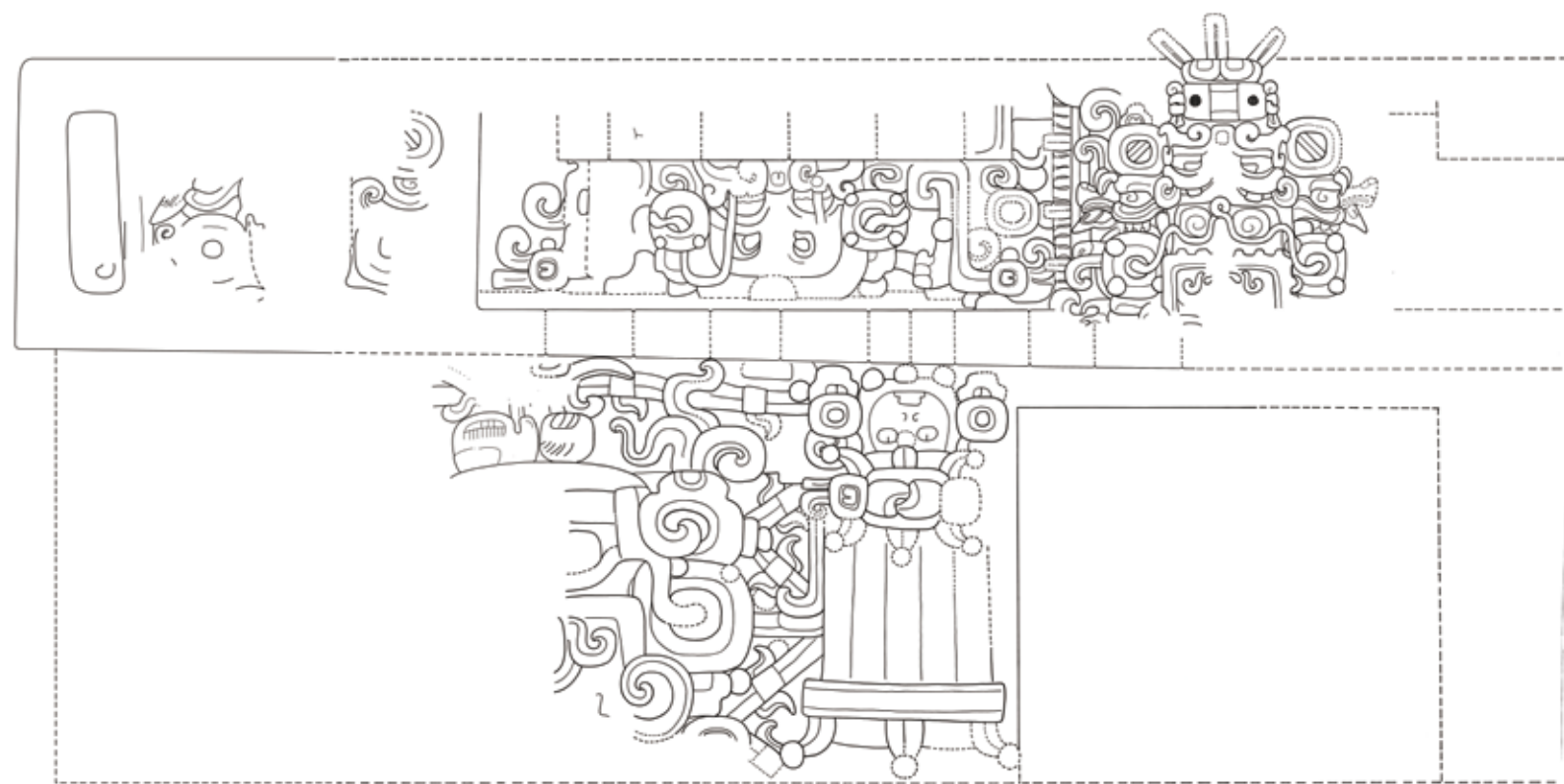


Figure 5.10. Mask 6 (mostly destroyed), Mask 7, and Mask 8 on the cornice of the Temple's western façade. Mask 8 is centered above the door, to the left of which is an inverted human head and a massive Jaguar God of the Underworld. Drawing: Mary Clarke.

present on the lower Temple, especially its western façade. This wall features a massive head of the JGU with the burning jaguar ear and facial cruller (Figure 5.10). In addition, the headband is very similar to the being on Tikal Stela 31 that combines the JGU and GI (Figure 5.7b). Just to the south, there is an abstract inverted human head with earspools and a large pendant element next to the doorway; another was probably on the southern side of the doorway as well. These heads probably pertain to death and human sacrifice; similar pendant bands appear on the stucco balustrade sculptures from Tonina, in this case with jaguar masks having the trefoil blood motif in their jawless mouths (Figure 5.8c). The Temple heads likely refer to flayed human faces as war trophies. At Late Classic Palenque, flayed faces often appear on shields as a reference to warfare—the wide oval cut around the mouth does resemble the inverted El Diablo faces (Figures 5.9, 5.10, and 5.11c). The Classic Maya flayed faces recall Xipe Totec of highland Mexico, a deity who wears a flayed human skin over his torso and face. For the Late

Postclassic Mixtec of Oaxaca, Xipe Totec can appear as a head with white material protruding much like a tongue from his mouth (Figure 5.11b). However, aside from these Mixtec severed heads, highland Mexican Xipe figures never display this curious attribute.

With their white oral elements, the Mixtec heads probably represent flayed human faces wrapped over some sort of stuffing, quite probably unspun or woven cotton. In other words, they would be much like the well-known “shrunk heads” of the Jívaro of Ecuador, the one difference being that the Mixtec examples have the center core of cotton. Although not explicitly the flayed deity, very similar examples of trophy heads are common in Classic Maya iconography, often worn by armed men as tokens of victory, including Yax Pabsaj from Temple 18 at Copan (Figure 5.11d–f). Typically, the head hangs inverted with long locks of hair, recalling the long pendant elements below the heads appearing on the west and north sides of the Temple. However, these hanging devices may also be paper, which is related to death and sacrifice,

and also appears on the aforementioned bloody jaguar balustrades at Tonina (Figure 5.8c). If the inverted heads denote war trophies, their prominent placement at the western entrance to the Temple suggests a place of human sacrifice, as, probably, in the building at Tonina. This is certainly the case for the skeletal Tlaloc sculpture from Temple 16 at Copan (Figure 5.8a). Not only is it devouring blood, but it forms part of a macabre façade of massive human skulls surrounding the Tlaloc mask (Taube 2004a). This convention of marking structures as places of sacrifice can be traced to as early as the third century AD at Tikal, where the principal stairway of the North Acropolis had massive stucco sculptures of inverted humans severed in half, much like the Hauberg Stela (Figure 5.8b; see Coe 1990:4:Fig. 164, 5:Fig. 316). As with the contact period Aztec, human sacrifice was almost certainly performed on temple stairways by the Classic Maya.

For the north façade example (Figure 5.9), the inverted head appears atop crossed diagonal poles, quite like trophy heads at Tonina which appear on a

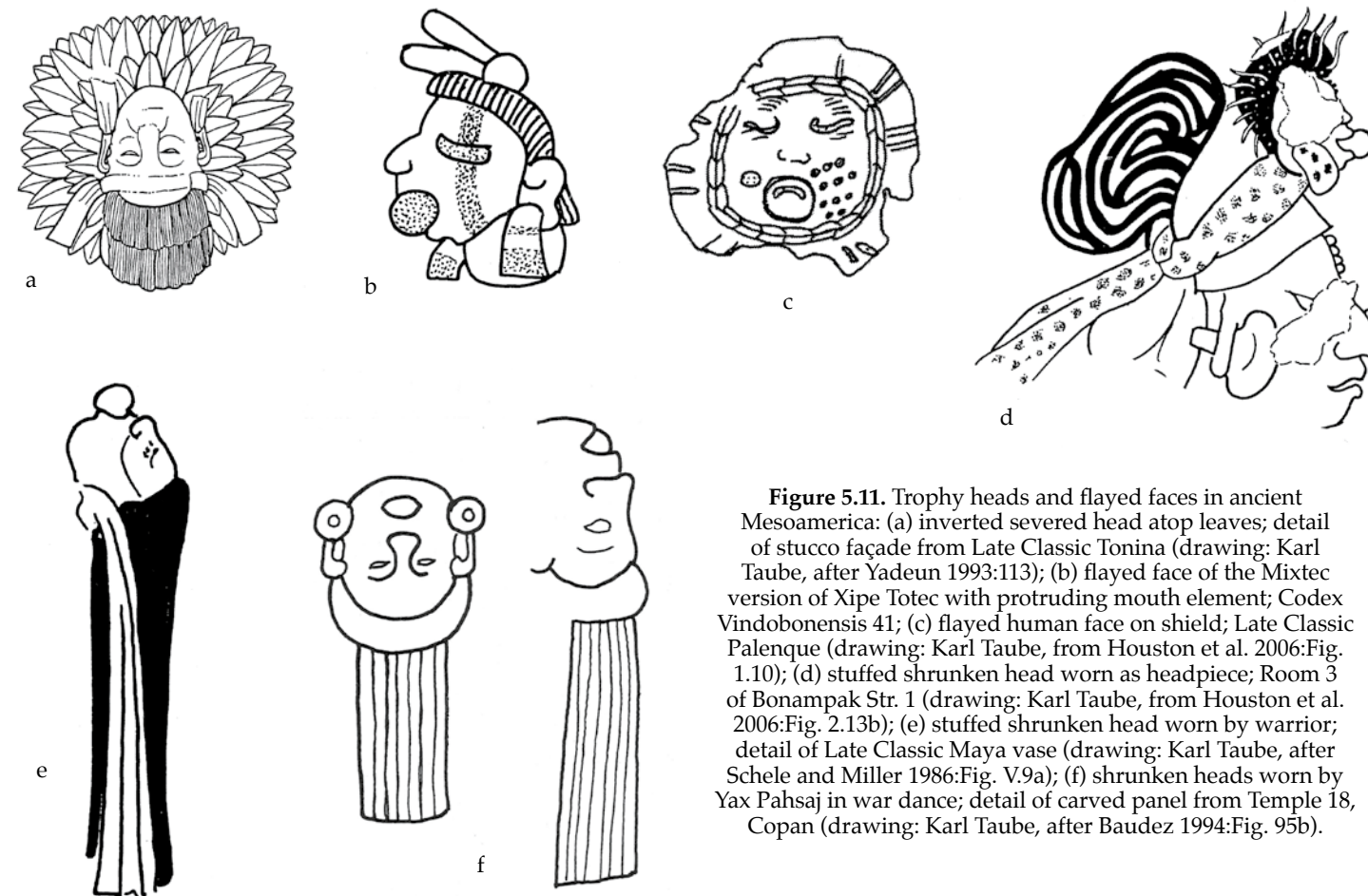


Figure 5.11. Trophy heads and flayed faces in ancient Mesoamerica: (a) inverted severed head atop leaves; detail of stucco façade from Late Classic Tonina (drawing: Karl Taube, after Yadeun 1993:113); (b) flayed face of the Mixtec version of Xipe Totec with protruding mouth element; Codex Vindobonensis 41; (c) flayed human face on shield; Late Classic Palenque (drawing: Karl Taube, from Houston et al. 2006:Fig. 1.10); (d) stuffed shrunken head worn as headpiece; Room 3 of Bonampak Str. 1 (drawing: Karl Taube, from Houston et al. 2006:Fig. 2.13b); (e) stuffed shrunken head worn by warrior; detail of Late Classic Maya vase (drawing: Karl Taube, after Schele and Miller 1986:Fig. V.9a); (f) shrunken heads worn by Yax Pabsaj in war dance; detail of carved panel from Temple 18, Copan (drawing: Karl Taube, after Baudez 1994:Fig. 95b).

similar scaffold frieze (Figure 5.11a; see Yadeun 1993:108–115). A more intact portion of the diagonal scaffolding also appears on the northern portion of the western doorway adjacent to the inverted head (Figure 5.10), suggesting that parts of the lower portion of the Temple may have been “wrapped” with the motif of heads atop scaffolding. For this more intact portion, the scaffolding also has horizontal poles as well, suggesting a solidly constructed lattice. For both the west and north façades, the scaffold poles have a central line segmented by horizontal bands, along with pairs of curling elements at the sides. This rare motif is also found on the famed “niche stelae” at Piedras Negras first identified by Tatiana Proskouriakoff as monuments associated with royal accession (Figure 5.12b–d). As noted by Taube (1988), the niche stelae portray scaffolds for human sacrifice, with the “niche” simply being the vertical poles of the structure. The lower diagonal

poles of these scaffolds have the same curling elements on the sides of the poles, indicating the presence of vegetal growth.

The segmented pole motif with the outwardly curving forms on the sides also appears in the inner shrine as well as flanking *alfarda* panels of the Temple of the Foliated Cross at Palenque, sculptures thematically devoted to both maize and royal accession (David Stuart, personal communication, 2013; Stuart 2006:135–149; see Robertson 1991:Pls. 165–167). The *alfardas* and sides of the shrine roof are ornamented with the very same poles and vegetal growth found on the Temple, but also the *k'an* sign, a cross denoting concepts of yellow and preciousness (Figure 5.12a). In addition, David Stuart (2006:135) notes that the name of the shrine or sanctuary refers to the same plant as shoots rising from a *k'an* cross. For Stuart, the vegetal elements represented a form of grass. More specifically, a case can be made

here that this particular grass was bamboo, a plant fully consistent with the segmented poles and side shoots seen on the west and north sides of the Temple.

Asia is not the only area with bamboo, as there are many native species in the Maya region (Breedlove and Laughlin 2000:150–151, Pl. 10). Terms vary in Mayan languages: Tzotzil, *bix* (*Olmeca* sp., *Oatea* sp.), *ne kotom* (*Chusquea* sp.), *otot* or *taro* (*Bambusa* sp.; Breedlove and Laughlin 2000:150–151); Ch'orti', *har* (genus unknown; Wisdom 1950); and Ch'ol, *chejp* (genus unknown; Aulie and de Aulie 1998:171). Conceivably, the *har* in Ch'orti', descending from *hal*—probably a cognate of Ch'ol *jalal*, a flute made from reeds—links in some manner to the glyphic description of the Temple of the Foliated Cross. That building was labeled in part by means of a sign that sometimes ends, as in Tomb 6 at Río Azul, with a subfixed *la* syllable

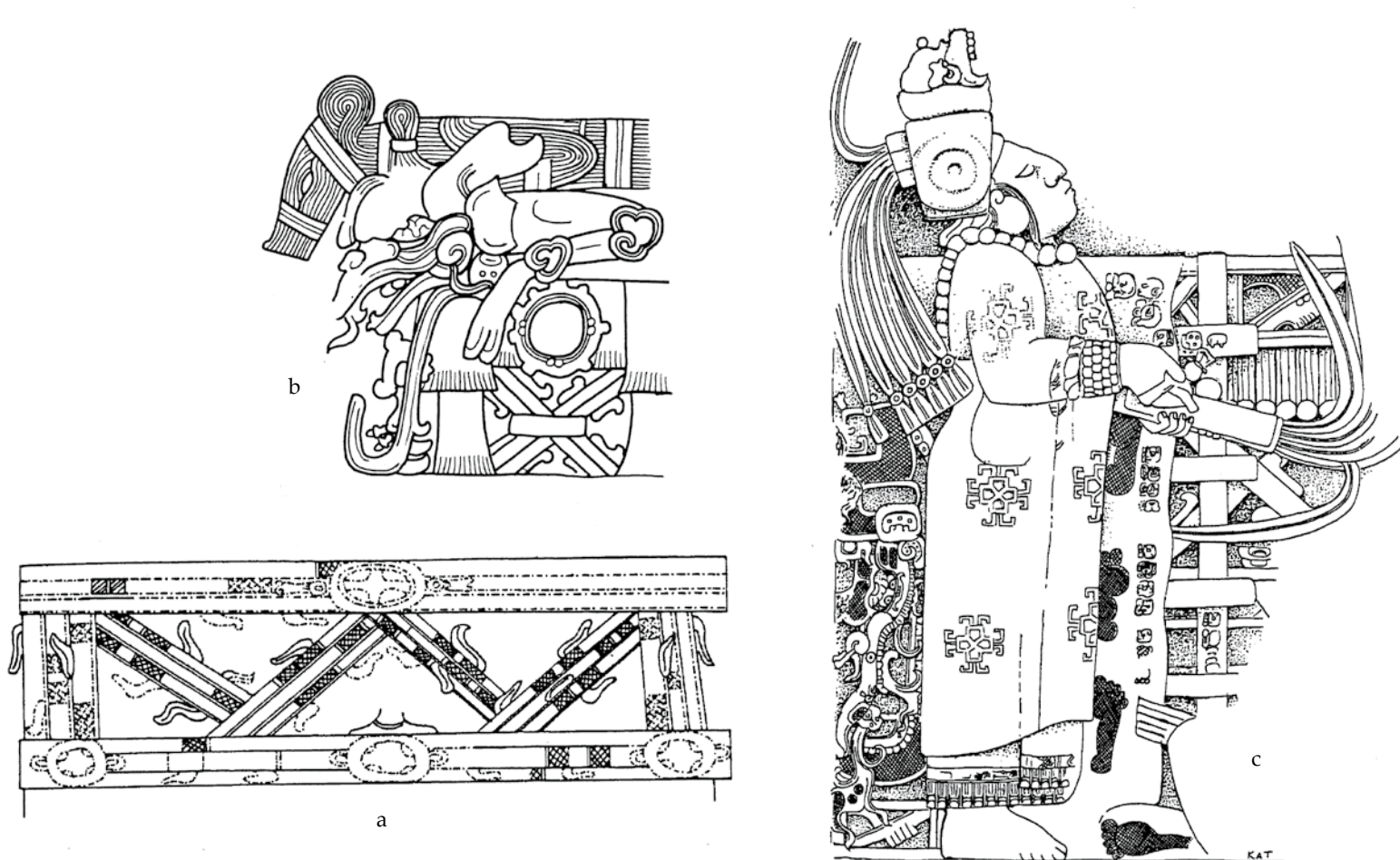


Figure 5.12. Portrayals of bamboo scaffolding in Late Classic Maya art: (a) bamboo scaffolding with *k'an* crosses appearing on roof of interior shrine in the Temple of the Cross, Palenque (drawing by and courtesy of David Stuart, from Stuart 2006:135); (b) accession scaffold with diagonal bamboo poles; Piedras Negras Stela 33 (drawing: Karl Taube [1988:Fig. 12.14]); (c) base of accession scaffold with diagonal bamboo poles; Piedras Negras Stela 14 (drawing: Karl Taube [1988:Fig. 12.18]); (d) accession scaffold platform with diagonal bamboo poles near base; Piedras Negras Stela 11 (detail of a drawing by and courtesy of David Stuart [Stuart and Graham 2003:Fig. 9:57]).

(cf. Adams 1999:Fig. 3-17, upper left glyph, east wall; Houston 1996:135, Fig. 3). The poles appearing on the accession scaffolds at Piedras Negras are likely to be bamboo, which also relates to the far earlier scaffold scenes from the Late Preclassic murals from San Bartolo, Guatemala (Taube et al. 2010:Fig. 39). For the scaffold appearing at the north end of the San Bartolo West Wall murals, the platform is marked with *k'an* crosses, which also appear with the bamboo poles on the *alfardas* and roof of the shrine of the Temple of the Foliated Cross at Palenque (Figure 5.12a). Whether the *k'an* crosses refer to yellow bamboo or the concept of preciousness remains obscure.

In the entire El Diablo stucco program, a very important detail is the vertical strip below the seated ruler and Chahk mask on the Temple's north cornice

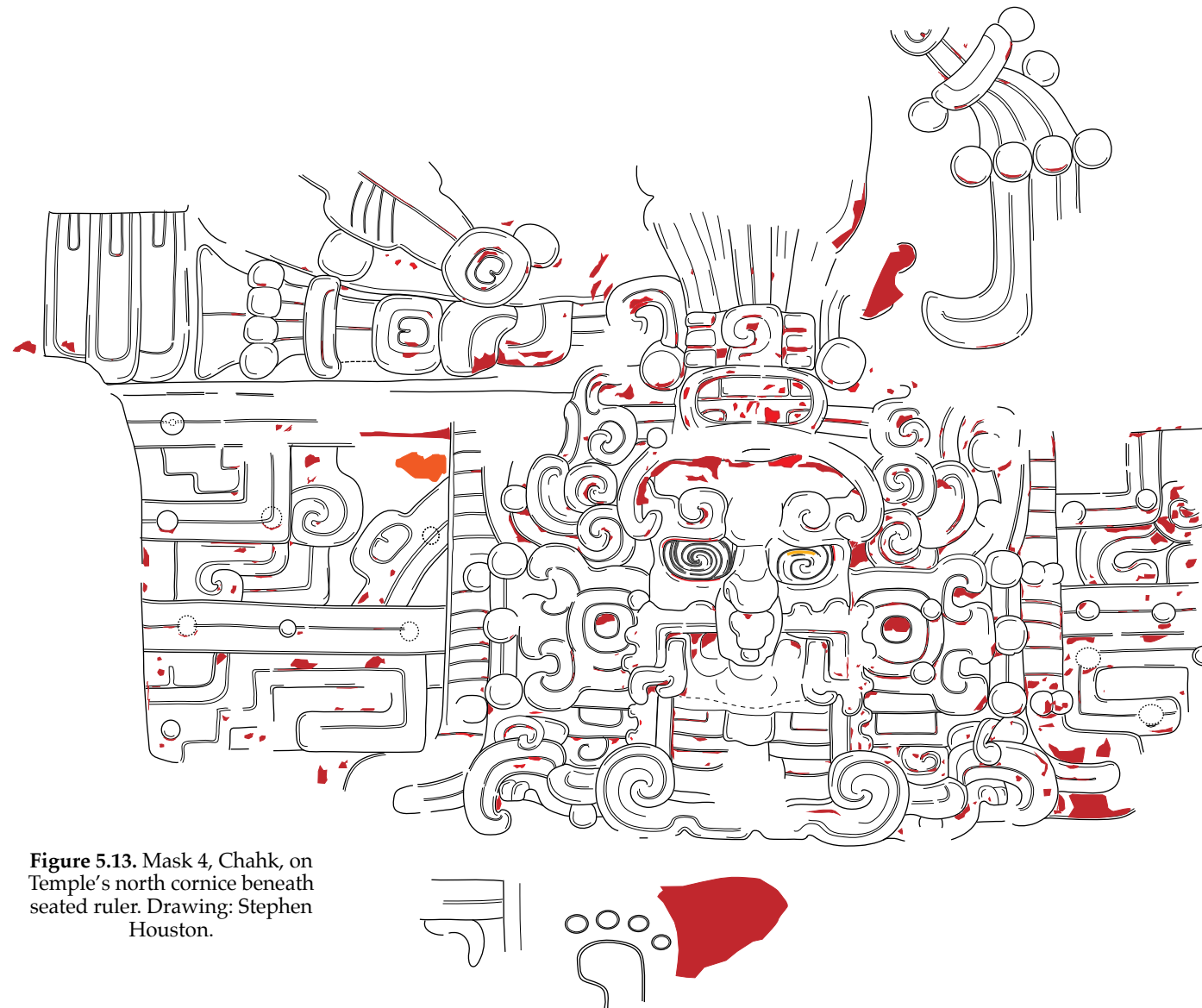
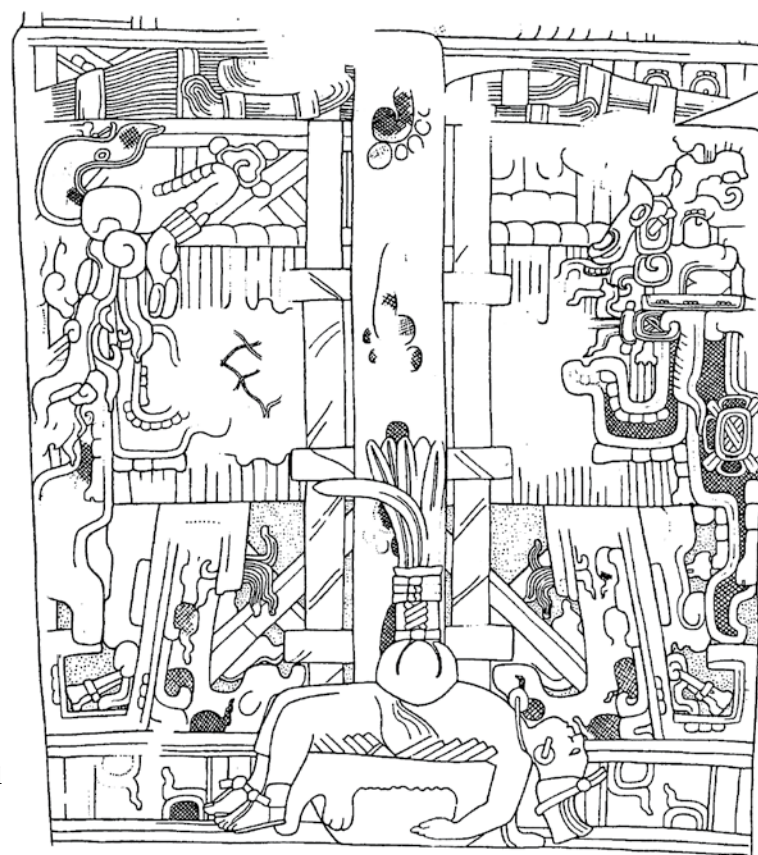


Figure 5.13. Mask 4, Chahk, on Temple's north cornice beneath seated ruler. Drawing: Stephen Houston.

(Figure 5.13). It features a human footprint with a small portion of the bamboo scaffolding just to the east. Human footprints are extremely rare in Maya iconography, with the most obvious examples being on the vertical strips on the ladders of the bamboo scaffolds at Piedras Negras (Taube 1988:Figs. 12.15, 12.18). Remarkably enough, this motif also appears in one of the Late Preclassic scaffold scenes on the West Wall mural at San Bartolo, where a human footprint is depicted atop a strip of cloth or paper hanging from the center of the platform (Taube et al. 2010:Fig. 39). The occurrence of the bamboo scaffold motif on the Temple's west and north sides suggests that the entire building may have been wrapped with this element, marking it as a structure devoted to the royal accession of a founding king

and queen or to the first major Period Ending after an accession. Such bamboo framework was common at all Classic Maya sites, referring to the basic elements from which Maya monuments and structures were created—one can imagine such light but sturdy scaffolding inserted into visible holes associated with buildings at Tikal (Coe 1990:5:Figs. 253a, c)—and to elemental concepts of human construction, founding, temporal shifts, sacred space, and royal accession.

Conclusion

The stucco program on the Temple of the Night Sun is an ambitious compendium of themes, executed by stucco craftsmen of high skill. The focal imagery concerns aspects of the sun and a celestial companion, Chahk, with

evidence that both beings feasted on blood. Other clues, only partly revealed by excavation, point to something larger than an exposition of diurnal patterns. The trophy heads and shields express the martial underpinnings of rulership, while the presence of possible parents roots kings in legitimate bloodlines. Transition, too: the scaffolding suggests that the Temple of the Night Sun celebrates a moment of change, implied by the royal body in Burial 9, leading logically to other rulers of just lineage. Tombs can also serve the living, and the Temple may well have been, for later generations, a place of accession and calendrical ceremonies. It facilitated contact with founders, reminding the people of El Zotz that dynasties can begin but must, by continued ritual, strive to endure.



Figure 5.14. Mask 1, on the eastern cornice of the Temple of the Night Sun. Image: Katie Simon, CAST.

Figure 5.15. Mask 2, on the eastern cornice of the Temple.
Image: Katie Simon, CAST.





Figure 5.16. Mask 3, on the northeast corner of the Temple. Image: Katie Simon, CAST.



Figure 5.17. Mask 4, on the northern cornice of the Temple. Image: Katie Simon, CAST.



Figure 5.18. Mask 5, on the northern cornice of the Temple. Image: Katie Simon, CAST.



Figure 5.19. Mask 7, on the western cornice of the Temple. Image: Katie Simon, CAST.



Figure 5.20. Mask 8, on the western cornice of the Temple. Image: Katie Simon, CAST.



Figure 5.21. Mask 12, on the southern cornice of the Temple.
Image: Katie Simon, CAST.

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, Merida.
- 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.
- Pincemin, 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.