Chapter 3

Outfitting a King

Sarah Newman,
Stephen Houston,
Thomas Garrison,
and Edwin Román

2015 In *Temple of the Night Sun: A Royal Tomb at El Diablo, Guatemala*, by Stephen Houston, Sarah Newman, Edwin Roman, and Thomas Garrison, pp. 84-179. Precolumbia Mesoweb Press, San Francisco.

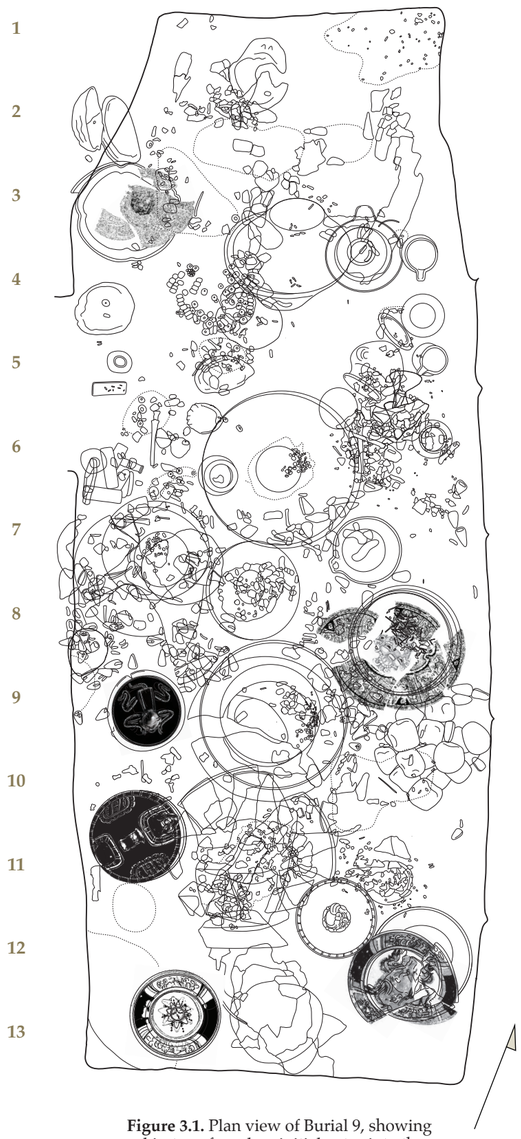


Figure 3.1. Plan view of Burial 9, showing objects as found on initial entry into the tomb. Drawing: Stephen Houston.

As in life, Classic Maya kings entered death with ornate provisions. Textiles wrapped their bodies, further embellished by pigments, worked shell, carved bone, and jade. Made wealthy by trade and tribute, rulers outfitted their afterlife with special foods in serving vessels. Sacrificial offerings accentuated royal status. Grave goods of this sort deepen the analytical value of intact tombs, providing clues as to what makes a Maya king and what was thought to happen to him after death. Along with local touches, they also reveal general themes about rulership. In the case of Burial 9, the trove of evidence is abundant and varied. The tomb's contents offer rare and vivid access to regal deathways during the middle years of the Early Classic period.

The objects inventoried here appear within categories organized primarily by material (shells, jades, ceramics, etc.). Some, however, such as a pyrite mirror or mosaic masks, were composites. Each category follows a sequence that accords roughly with the reconstructed internal order of the tomb. This depositional pattern moves generally from north to south and west to east in successive layers of objects and offerings, from the floor of the tomb chamber to the decorated body of the main occupant atop his wooden funerary bier. During excavation, however, many of these objects were found to have shifted from their original position, in part from natural disintegration but also as a result of wall collapse. Figure 3.1 diagrams the orientations and locations of the grave goods.

Ceramics

Ceramic vessels are a ubiquitous, though not universal, find in royal burials. Burial 82 from Piedras Negras and Burial 125 from Tikal break the mold with their bare-bones assemblages (Fitzsimmons 2009:85). Still, across social strata, bowls, plates, tripods, and other ceramic types represent the most common offerings in burials. These ceramics often include drinking, serving, and storage vessels, variously interpreted as markers of social status (LeCount 2001:945), tokens of social control (Bloch and Parry 1982:35), implements to construct solidarity and inequality (Lucero 2003), or containers to "feed" and serve the dead (Houston et al. 2006:123).

The ceramic assemblage from Burial 9 consists of thirty-eight vessels, including paired bowls in lip-to-lip arrangements and several two-part serving vessels with lids (Figure 3.2; Table 3.1). For us, the forms and type-variety associations of the vessels offered

the first decisive proof, other than the Temple's iconography, that the burial dated to the Early Classic period. The presence of particular forms (especially basal-flange bowls with scutate covers and tetrapod supports) and the absence of others (cylindrical tripod vessels and round-side bowls) paralleled the Manik 2 subdivision of the Early Classic Manik phase at Tikal, suggesting a narrow range of time, perhaps around the mid-fourth century AD (Laporte 1989; Laporte and Fialko 1987, 1995).

Burial 9's Manik 2 characteristics make it one of the few examples from this period with little evidence of Teotihuacan influence and imagery (Krejci and Culbert 1995:109). Nonetheless, a stuccoed wooden vessel astride Sectors C10–D10 likely had slab-footed supports, a feature found on other vessels of Teotihuacan affiliation. A more secure association is found in an unpaired lid from Sector D4, which displays painted elements closely resembling the "ojo de reptil" sign known from the central Mexican city. The dates indicated by the ceramics are confirmed by radiocarbon dating of charcoal samples from within Vessel 13B, one of several vessels containing human remains within Burial 9. The charcoal returned a 2σ calibrated result of AD 240–420, with an intercept at AD 340 (1710 ± 40 BP [Beta-288303/EZ-5B-29-V13B; charred material; δ13C = -25‰]).

Vessel	Width	Height	Vessel	Width	Height
1A	26.0	11.0	14A	15.0	13.5
1B	24.0	9.0	14B	20.5	7.0
2A	34.5	13.0	15A	20.0	11.0
2B	37.0	12.5	15B	22.0	7.5
3A	14.5	10.5	16A	46.5	13.0
3B	22.0	6.5	16B	45.0	13.0
4	9.5	10.0	17A	26.5	10.0
5	13.5	5.5	17B	26.3	13.5
6	13.8	7.0	18A	32.0	12.0
7	7.5	8.4	18B	33.0	17.0
8	12.2	12.5	19A	26.5	10.5
9	8.2	9.1	19B	27.5	9.0
10	10.0	8.4	20A	23.9	10.5
11A	45.3	11.0	20B	23.0	10.5
11B	48.0	17.0	21	--	--
12A	34.0	10.5	22A	31.0	16.0
12B	34.0	9.5	22B	31.5	15.0
13A	31.0	11.5	23A	--	--
13B	31.0	9.5	23B	37.9	15.6

Table 3.1. Dimensions of Burial 9 ceramics (in cm). Width measured at rim, height from base to rim. Vessels not measured where crushed and incomplete.

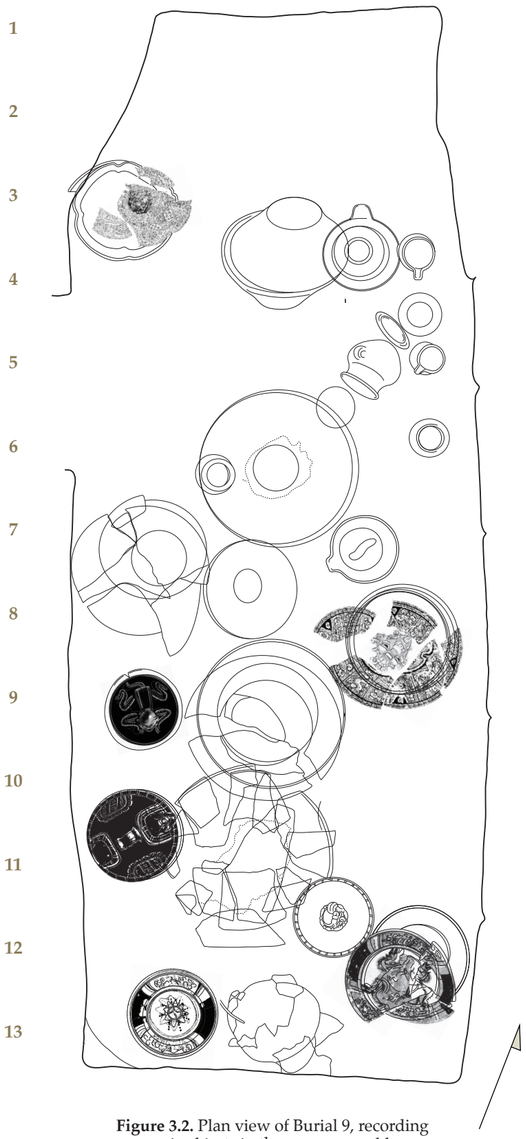


Figure 3.2. Plan view of Burial 9, recording ceramic objects in the grave assemblage. Drawing: Stephen Houston.

Figure 3.3. Vessel 1 after restoration. Photo: Jorge Pérez de Lara.

Figure 3.4. Vessel 1 as found in the tomb chamber. Photo: Arturo Godoy.

Vessel 1

Vessel 1 is a glossy, Urita Gouged-Incised vessel of the Balanza ceramic group (Figures 3.3 to 3.9). A high-sided basal-flange bowl, it also exhibits a scutate cover—a particular lid form featuring a downturned edge overhanging the rim of the associated base. Both bowl and lid have a rare quatrefoil form that must have been difficult to fire. The form of the vessel highlights the skill of its craftsman, further attested by the gouged and incised designs around the walls and the lid of the vessel, which show a high degree of minute detail. The centrally placed effigy handle is modeled in the form of a howler monkey (*Alouatta pigra*), much like the handle on the polychrome Vessel 18 from the Diablo tomb (see below) and monkey effigies attested in other, contemporary burials

Figure 3.5. Vessel 1A (lid of Vessel 1). Photo: Jorge Pérez de Lara; drawing: Kallista Angeloff.

(Coggins 1988:103; Smith 1955:Figs. 11j, 24b.11, 75a.7). Thin, carefully weighted gouges were used to trace the body of the monkey, whose stomach contains an acrobatic Maize God within a quatrefoil. The depicted quatrefoil must have had multiple referents, ranging from a sunken or enclosed area, perhaps the quatrefoil outline of Vessel 1 itself, to the lobes of a *k'in* or "sun" sign associated with this monkey (Taube 2003:Fig. 26.2). A glyph for *k'an*, "yellow," frames the Maize God and imparts the color of harvested corn, ready for consumption. In place of the usual monkey's tail, a centipede curves around the back of the vessel. Such tails are attested in other Maya images of the Classic period, many with scribal associations. Perhaps to show where it "rests," the monkey sits on a thatched or rope motif that courses around the vessel's basal flange.

Scribal howler monkeys, often anthropomorphic, occur with centipede tails on K1180, K1523, and K8425 in the Kerr archive of photographs at www.mayavase.com. As Karl Taube has pointed out to us, a curious detail is that the centipede appears to issue from an open Muwaan bird mouth, as on the Diablo bowl. The same figure adorns the façade of Str. 9N-82 at Copan, Honduras: conch inkwell in hand, the scribe is framed by a double-headed centipede, probably in allusion to this tail (Fash 1989:Fig. 64; see also Schele and Miller 1986:Pl. 46 for a full-version of the humanoid monkey scribe). The so-called "Princeton Vase," K511, shows a less distinct example of this personage, but it may illustrate a story about the execution of a monkey scribe. The body of a youth has precisely the same tail looping up

Figure 3.6. Details of designs on lid and base of Vessel 1. Note acrobatic Maize God in leftmost photo of second row and centipede issuing from Muwaan bird head in third photo from left in second row. Photos: Jorge Pérez de Lara; drawing: Kallista Angeloff.

from behind his mid-section. A trickster rabbit, a puckish feature on K511, seems to have taken over scribal duties, hinting at mythic shenanigans. Unfortunately, the explanatory text is eroded and does little to clarify the episode. Yet the glyphs do refer to an **'a-sa-ya HU'N-na**, *'a say hu'n*, "he of the mulberry-paper(?) or mulberry-paper book," perhaps in reference to scribal activity (Houston 2012).

The howler on Vessel 1 is of a mythic sort, linked by his woven headband and flower adornment to monkey scribes. Parts of his body have a curiously scutate appearance, as though reptilian. Marked with signs for "darkness"—the oblong forms are early and stylized—he also supports on his back the so-called "quadripartite badge," likely a kind of incense censer (Taube 1998:Fig. 10). What may be solar flares, shaped into toothed heads, appear on the lower extremities, one for each limb. On his chest hangs a mirrored pectoral, suspended by a beaded collar, perhaps of jade. This recalls the trifold neck ornament of the Principal Bird Deity in Early Classic imagery (e.g., K2131, K3863). That the creature on Vessel 1 is no ordinary howler monkey becomes more apparent with the cloth banners that stream from divides between his four quarters. On each banner is what may be a decapitated deity. Blood swirls around the base of their necks. To the viewer's left, the front banner shows a Maize God head surmounted by the number "8" (Figure 3.8). This association probably results

from the head variant of that number, the Maize God. To viewer's right is the Jaguar God of the Underworld, now with what may be the number "7," also the appropriate head variant.

More opaque are the deities on banners or pendants behind the head. One is another Maize God, diametrically opposed to the god on front, but now with the number "11." The motivation for this number is unclear. A second banner displays the head of the Sun God, here, too, in logical opposition to its nighttime aspect, the Jaguar God of the Underworld, on the front pendant. The elements above its head are difficult to discern, however; there may be an animal paw and the number "2." Karl Taube (personal communication, 2012) has pointed out that a monkey scribe with similar pendants around his neck appears as a *k'in*, "sun," sign on Quirigua Stela D (glyphs B11-B12; Maudslay 1889-1902:2:Pl. 26, west side, glyph 5). A similar howler, head reared back to roar, also equipped with four banners or pendants, was found by Raymond Merwin at Holmul, Guatemala (Figure 3.10; Merwin and Vaillant 1932:Pl. 23). His head pivots up in throaty vocalization, a gesture evoked on Vessel 1 and Vessel 18 from El Diablo, as well as on a Baxbachan Plano-relief vessel of Early Classic date uncovered in Str. IV-sub, Room 3, Becan, Mexico (Figure 3.11; Ball 1977:Fig. 34). On the Becan vessel, the monkey scribe, represented only by a head with open mouth, disgorges two anthropomorphic versions of the Principal Bird Deity. One is probably connected to the daytime version, the other, suitably equipped with the cruller of the nocturnal Jaguar God of the Underworld, is marked with signs for "darkness."

Such images point to a distinct, dual meaning for Vessel 1: that it is both a howler monkey and a mythic example of the same. Howlers are creatures of the dawn and pre-dawn hours, often bellowing in unwelcome ways when most archaeologists wish to sleep. For the Classic Maya, it seems howlers were heralds of the coming day and the imminent arrival of the Sun God. Glyphic evidence confirms the ties of the bannered howler to *k'in*, "day," as shown explicitly on Quirigua Stela D. It may be that the incense burner displayed on the back of the Vessel 1 monkey refers to a fiery, solar emblem, itself marked with the *k'in* sign. The Becan vase, close in date to the Diablo tomb, strengthens the association by presenting cosmic birds or eagles, the Principal Bird Deity in its two aspects. Each emerges as a tangible being—an embodied vocalization?—from the howler's mouth. Still enigmatic, the Principal Bird Deity nonetheless has liminal properties.

Figure 3.7. Handle of Vessel 1A (lid of Vessel 1). Drawing: Kallista Angeloff; photos: Jorge Pérez de Lara.

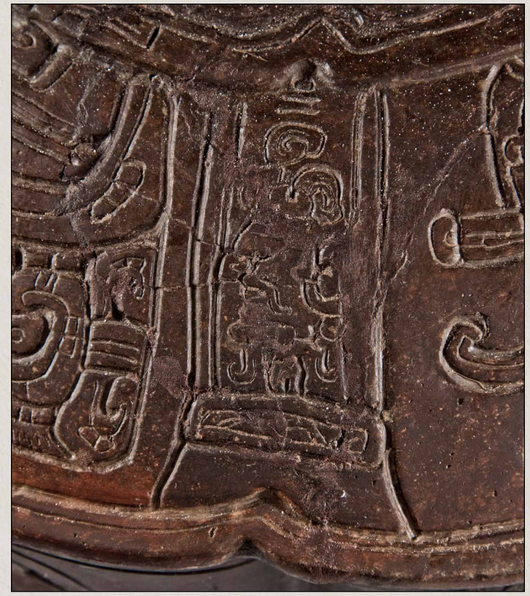


Figure 3.8. Depictions of banners on Vessel 1: (clockwise from top left) Sun God; Maize God with "11" superfix; JGU with possible "7" superfix (note probable second dot of number 7 in circular indentation; compare Figure 3.5); Maize God with "8" superfix. Photos: Jorge Pérez de Lara.

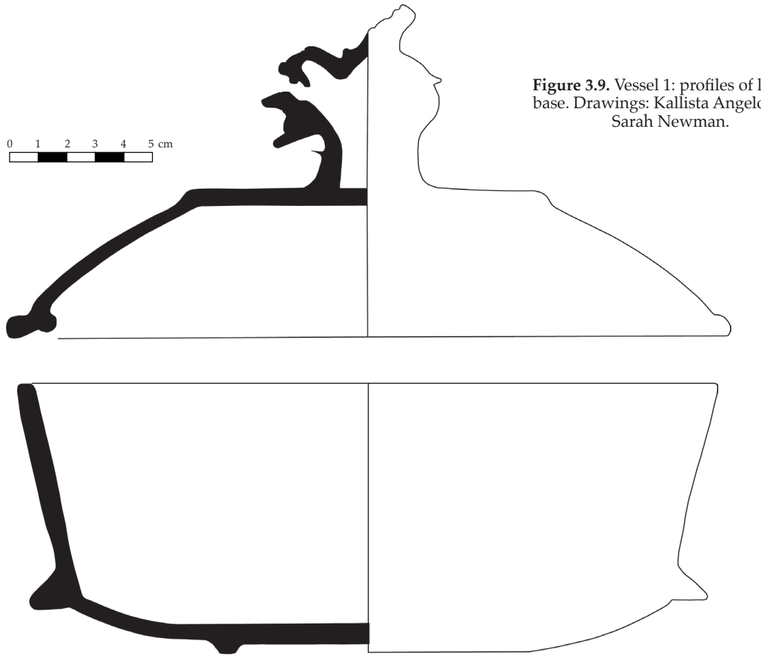


Figure 3.9. Vessel 1: profiles of lid and base. Drawings: Kallista Angeloff and Sarah Newman.

One wing tends to exhibit the *k'in* sign, the other an *ak'ab* for darkness, as though in reference to boundaries between daylight and inky night (e.g., Kaminaljuyu Sculptures 109, 110; Henderson 2013:Fig. 129). The in-between quality of the Principal Bird Deity, celestial yet alighting on trees, accords with another aspect of bird life in the Maya jungle: avian noise and agitated movement peak at dawn or at dusk, when birds find or leave their nightly roosts. Birds, too, were understood in Classic Maya thought as emissaries (Houston et al. 2006:229-250). In this manner, Vessel 1 can be understood as a mythic crystallization of diurnal passage. It commemorates a fraught time when there is promise of sunlight, yet not its full presence. The howler thus announces the dawn, transports emblems of solar fire, and disgorges a particular bird, the Principal Bird Deity, that marks liminal periods and establishes contacts between heaven and earth. (The parallels with winged Eos, Greek goddess of dawn, suggest a similar logic in other parts of the world.) The quatrefoil around the neck of the howler on Vessel 1 hints that the emergence is from a hole; the belly of the creature recalls both maize consumption and an emergent plant depicted as an acrobatic Maize God (Taube 2003:261). In this way, Vessel 1, a relatively small object, embraces far broader cosmic patterns. The small-scale exemplifies the large, and the large is reduced to a form that could be cradled by human hands.

As for its physical details, the modeled head and the curving lid of Vessel 1 are distinct pieces, made separately and joined together for firing. The head is thin and hollow, with a small opening at the mouth of the bellowing monkey. A visible firing core in the rim of the scutate cover indicates organic material in the paste, attesting to close control over the temperature and length of the firing process (Foias 1996:897). Some wear is visible on the monkey's face and around the rim of the lid, but evidence of use is clearest along the base of the lid's lip, where it came into contact with the quatrefoil bowl below, and on the base of the vessel. These abrasions show use before interment and that the bowl was not intended solely as a funerary offering.

Vessel 1 was the first object placed in the burial, at the northwest corner of the crypt's floor of tamped earth and plaster. The monkey's palms on either side of the vessel and the centipede tail at the back present an intriguing feature. In the tomb, the orientation of the lid with respect to the base was intentionally reversed (see Chapter 2)—perhaps a ritual inversion for mortuary purposes? Some residue remained inside the walls and on the base of the vessel, although the layer was extremely thin and analysis did not yield clear results.

Figure 3.10. Roaring howler monkey effigy vessel from Holmul. Photo: Alexandre Tokovinine.

Figure 3.11. Vessel showing monkey scribe and anthropomorphic Principal Bird Deity figure from Becan (Ball 1977:Fig. 34). Courtesy of the Middle American Research Institute, Tulane University.

Figure 3.12. Vessel 2 as found in Burial 9. Photo: Arturo Godoy.

Vessel 2

Vessel 2 consists of two lip-to-lip bowls of the Dos Hermanos Red type of the Dos Hermanos ceramic group, each with outflaring sides and a flat bottom (Figures 3.12 and 3.13). The bowls are plain with simple silhouettes, though the interior of the upper vessel displays two symmetrical pairs of lightly incised lines running from base to rim. Estella Krejci and T. Patrick Culbert (1995:110) argue that the use of such utilitarian wares in lip-to-lip cache vessels—a common occurrence in the Maya area—may emphasize their function solely as containers for the materials they hold. That is, downplaying their external appearance may have highlighted the heavy import of their contents. Several of the lip-to-lip vessels from Burial 9, including Vessel 2, show distinctive root markings around their exterior walls. This suggests that they may have been wrapped in leaves, a possibility supported by other examples of wrapped cache vessels from later phases of Str. F8-1 (see Chapter 2); the nearby site of Bejucal also provided similar evidence (Garrison and Beltrán 2011:295).

Vessel 2 represents the first in a series of six pairs of similar vessels, laid out roughly in a straight line along the central north-south axis of the burial chamber, all but one pair placed lip-to-lip (the sole outlier to the pattern was a pair of stacked vessels, one bowl placed upright inside its counterpart). This arrangement is nearly identical to that of Tomb 1 in Str. III at Calakmul (Folan et al. 1995:322). There, a line of lip-to-lip vessels was laid out below the body of the occupant and covered in textiles, forming a bed for the deceased. Each of the pairs of vessels in Burial 9 held the skeletal remains of a young child or infant, many of which appeared to have been burned prior to placement in the bowls (see Chapter 4). In the case of Vessel 2, the contents consisted of the largely incomplete, fragmented skeleton of a roughly two-year-old child. Comparative data on the practice of inserting infant bodies in cache vessels exist at other sites across the Maya lowlands, including Barton Ramie, Piedras Negras, Tikal, and Uaxactun (Welsh 1988:65, 257), although the examples are rare. In their study of Preclassic and Classic burials and caches, Krejci and Culbert (1995:111) attest to only seven cases in which sufficient quantities of material point to the presence of complete bodies. Like the six pairs of vessels from the tomb at El Diablo, other known examples of caches with human remains contain few other materials.

Figure 3.13. Vessel 2: (top) the two bowls lip-to-lip after restoration; (bottom) inferior bowl. Photos: Jorge Pérez de Lara.

Figure 3.14. Vessel 3: (top photo) hollow, globular body of "lid"; (bottom photo) spouted base. Photos: Jorge Pérez de Lara.

Vessel 3

Vessel 3 is a hollow, globular vessel with an open base set atop a basal-flange bowl with a gutter spout (Figures 3.14 to 3.17). Both are of the Balanza Black type of the Balanza ceramic group. The vessel occupied the northernmost position in the eastern line of ceramic offerings (see Chapter 2), oriented with its spout to the north. The hollow "lid" of the vessel imitates the shape of a slightly outflaring jar, though its "neck" is disconnected and sealed off from the basic spherical shape of the vessel, most likely made separately. The underside and interior of the spouted bowl and hollow lid were badly burnt, blackened, and heat-cracked in some areas, signaling direct exposure to high temperatures. Evidence of intense burning atop an altar outside the tomb itself (see Chapter 2) may correspond to the open flames used to heat some vessels and their contents.

Other examples of spouted bowls are known among Early Classic assemblages (Ball 1977:Fig. 12u; Callaghan 2009:218; Culbert 1993:Fig. 32e; Smith 1955:Fig. 30b3). Examples from Holmul (Callaghan 2009:213), Calakmul (Folan et al. 1995:323), and Tikal (Laporte and Fialko 1987:148-149), however, provide comparative evidence for the pairing of basal-flange bowls with gutter spouts beneath hollow, globular vessels. Examples from the Mundo Perdido at Tikal and the site of Holmul are slightly more complex in design than those found in Burial 9, in that they feature zoomorphic appliqués and effigy faces.

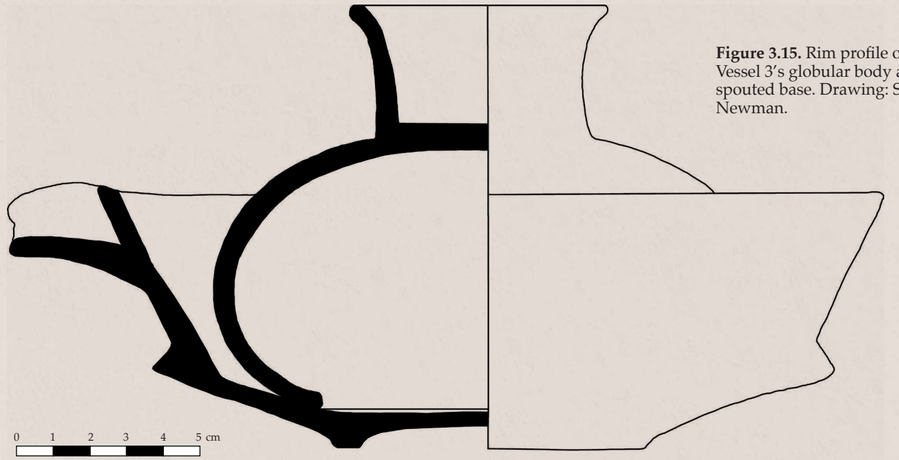


Figure 3.15. Rim profile of Vessel 3's globular body and spouted base. Drawing: Sarah Newman.

Figure 3.16. The two components of Vessel 3 as found together in the tomb, to the right of the larger Vessel 2 and to the left of the spouted Vessel 4. Photo: Arturo Godoy.

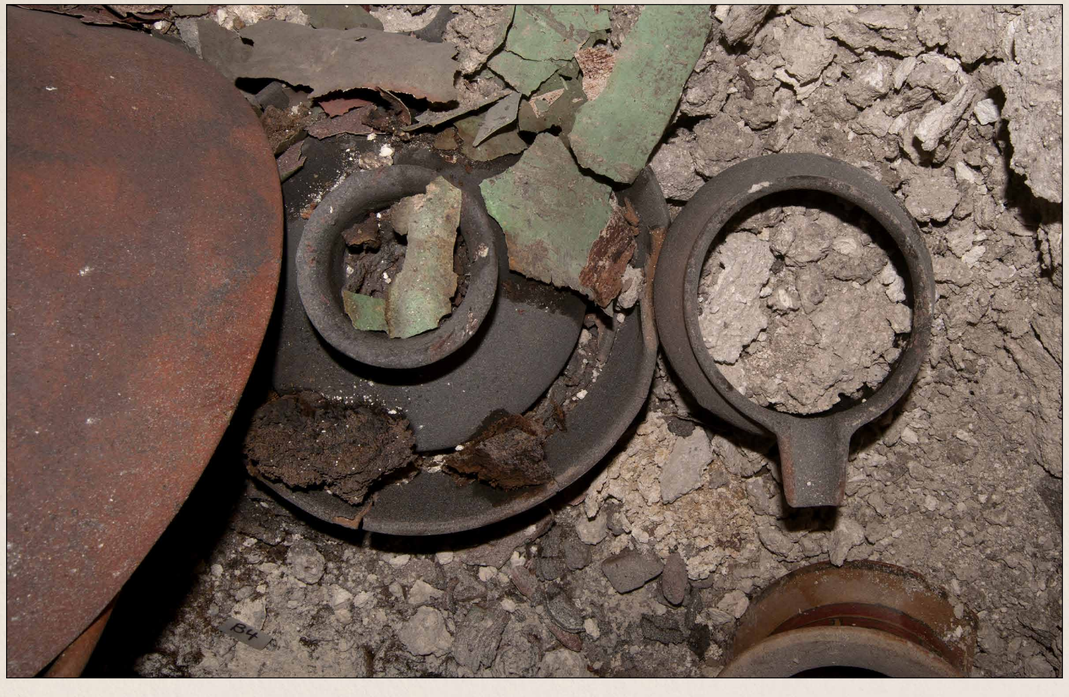
Figure 3.17. Textiles found layered atop Vessel 3 (shown here) and Vessel 14 may have served to insulate their contents. Photo: Arturo Godoy.

The combination of the hollow cavity provided by the upper vessel and the gutter spout feature of the bowl beneath together suggest a possible steaming function for this vessel form, perhaps for tamales (Charles Golden, personal communication, 2010). The globular body of the upper part of the vessel would have retained vapor and kept its contents hot, while the spout allowed pouring of condensed liquid out of the lower bowl. Layered textiles found atop these vessels (Figure 3.17) may have provided additional insulation. However, the severe burning of some vessels from the Diablo tomb shows that they were exposed directly to open flame, most likely transforming the contents within into smoke and ash. From this came an altogether different "food" for the dead (Houston et al. 2006:125).

Vessel 4

Vessel 4 is a globular pitcher with gutter spout and pedestal base, the larger of two very similar vessels recovered from Burial 9 (Figure 3.18). Marked by a heavily striated exterior, it corresponds to a variation of the Pucte Brown type of the Pucte ceramic group. Vessel 4 was placed immediately to the southeast of Vessel 3, its body overlapping the edge of Vessel 3's lower bowl. Although Culbert (1993:Fig. 123r) acknowledges only one instance of a similar vessel form at Tikal, nearly identical examples occur at Holmul (Callaghan 2009:213), the Mundo Perdido at Tikal (Laporte 2005:164), and Uaxactun (Smith 1955:Figs. 12r, 17c16).

Thin rings of residue were detected toward the interior rim of both Vessel 4 and its partner, Vessel 7, as well as within the grooves of their gutter spouts. The exterior of Vessel 4 was badly burnt and revealed severe cracking from intense heat. The burn patterns, most intense on the undersides of the vessel and progressing up the wall of its body, indicate that the pitcher may have been placed directly into open flame. Joyce and Henderson (2007) speculate that chocolate served by the Maya shifted from an alcoholic beverage to a non-alcoholic one, and that drinks once frothed by puffs into spouted vessels were merely whisked. Callaghan (2009:62) has suggested that forms similar to Vessels 4 and 7 from Burial 9, with their gutter spouts and relatively wide orifices, may reflect this shift in the preparation and serving of chocolate, perhaps serving as Early Classic replacements to the well-known forms of Preclassic spouted pitchers. Others consider the shift in vessel design to point toward altered notions of hygiene or to an attempt to avoid contact with spittle (e.g., Powis et al. 2002). The intense burning and direct exposure to flame in Burial 9 still requires explanation. Whatever the liquids in Vessels 4 and 7, the contents were presumably burned off or evaporated to yield a substance thought more suitable for the dead.



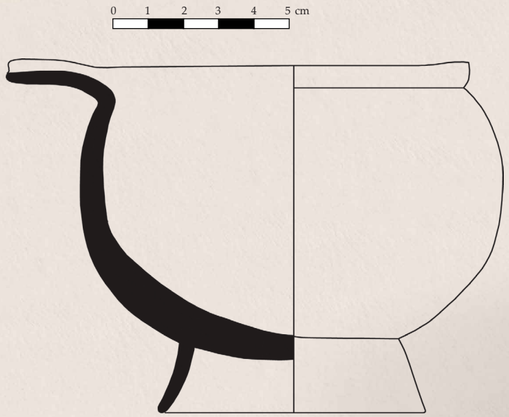
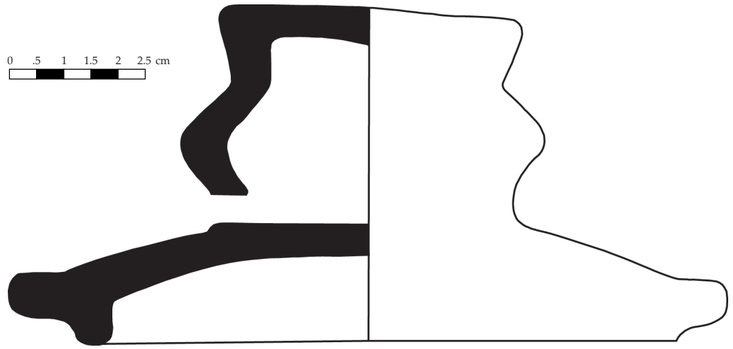


Figure 3.18. Vessel 4: (clockwise from top) in original context, to the right of Vessel 3; in laboratory; in cut-away profile. Photos: Arturo Godoy and Jorge Pérez de Lara; drawing: Sarah Newman.



Vessel 5

Vessel 5 is a lid known as an "apron cover," characterized by a uniform circular rim, concave sloping sides, centrally placed modeled handle, and horizontal edge (Figures 3.19 and 3.20). It belongs to the Caldero type of the Caldero Buff Polychrome group, with alternating red and buff quadrants and iconographic elements painted in black. At times, the brush was charged with viscous ink, thinning out toward the

Figure 3.19. The lid designated Vessel 5: (clockwise from facing page) shown as excavated within tomb chamber (upside down, in center of photo); in profile drawing; after cleaning. Photos: Arturo Godoy and Jorge Pérez de Lara; drawing: Sarah Newman.

Figure 3.20. The "ojo de reptil" variant: (a) painted on Vessel 5 lid from Burial 9 (drawing: Sarah Newman); (b) variant from La Ventilla, Teotihuacan (drawing: Sarah Newman, after Taube 2000:Fig. 10b35); (c) marker fragment from Teotihuacan (drawing: Sarah Newman, after Estrada Reynoso 2009); (d) flowers from House E at Palenque (drawings: Sarah Newman, after von Winning 1987:Fig. 4.2).

limits of the designs. To judge from the right-sloping signs, the painter appears to have been left-handed. The identity of the four, nearly identical painted designs about the lid may help date the Diablo tomb. In their central element, they resemble the "ojo de reptil" sign from Teotihuacan. Note especially the curving line with dotted circumference and short lines, all consistent with variants of that sign (Figure 3.20; cf. Estrada Reynoso 2009; Taube 2000:Fig. 10b-35, from ca. AD 300-450; also von Winning 1987:73-78, Figs. 1-4). The example with a subfixed number at Piedra Labrada, Veracruz, even seems to share the same stylized elements above and below (Baez 2009:Cat. 280). The similarity with floral elements on the much later House E at Palenque, Chiapas, indicates that the "ojo de reptil" sign, which sometimes takes bar and dot notation, is none other than a counterpart to the day sign "ajaw" or "flower" in the Maya calendar (Karl Taube, personal communication, 2013; see also Stuart and Stuart 2008:Pl. 18b). Nonetheless, the only other hint of Teotihuacan-related presence in the tomb is a probable slab-footed wooden tripod, found in Quadrant C10.

The importance of these designs for the chronology of the Diablo tomb is that a cross-tie with the Teotihuacan signary would suggest a date around the time of the so-called "*entrada*" event at Tikal in AD 378 (Martin and Grube 2008:29-31). The main protagonist of the "*entrada*," Sihyaj K'ahk', is also mentioned on Bejucal Stela 2, ca. AD 381, as overlord of the ruler of El Zotz and Bejucal. Such clues imply that Burial 9 and, indeed, the establishment of much of El Diablo, date to within a few decades before or after AD 378. Notably, Vessel 5 belongs to a distinct group of

Figure 3.21. "Vessel" 6 as excavated just to the east of the toppled lid known as Vessel 5. Photo: Arturo Godoy.

vessels—three from the Pennsylvania State University survey of the Tikal periphery and 144 pots from El Zotz—that appear from elemental composition to have been of local manufacture (Ronald Bishop, personal communication, 2013).

Apron covers are well-attested in Early Classic tombs (e.g., Culbert 1993:Fig. 27a5; Hall 1985:32; Laporte and Fialko 1987:147; Smith 1955:Fig. 6i-l). Generally associated with cylindrical vessels, whether tripods (Smith 1950:Fig. 121) or tetrapods (Laporte 2005:165), they may have played a role in preparing or serving liquids, perhaps to keep beverages from spilling over or, if warmed, to maintain their heat. Vessel 5 was not directly associated with another vessel in the tomb, although it was found toppled over immediately to the west of Vessel 6, a ring-shaped pot-stand. A similarly unassociated apron cover was also recovered from Burial 22 at Tikal (Culbert 1993:91). Lids of this form may have once been paired with perishable objects. In the case of the El Diablo tomb, this may have been a gourd or wooden or stucco object that once sat on the pot-stand provided by Vessel 6.

Vessel 6

Vessel 6 is a ring-shaped pot-stand of the Caldero type of the Caldero Buff Polychrome ceramic group (Figures 3.21 and 3.22). Vessel 6 was placed directly south of Vessel 4, in a line along the easternmost edge of the tomb. This "vessel" could not hold its own contents and probably served to elevate another vessel, a perishable gourd or bowl perhaps lidded by Vessel 5. Heavy signs of wear on the top of the pot-stand provide evidence that this object was used prior to placement in the tomb. Vessel

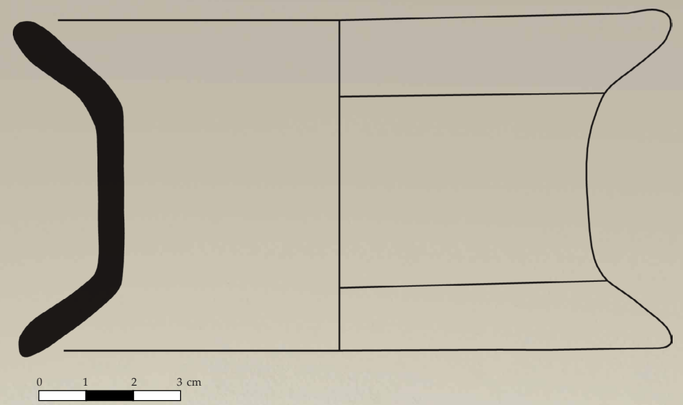


Figure 3.22. "Vessel" 6: (top) cut-away profile; (bottom) cleaned in laboratory. Drawing: Sarah Newman; photo: Jorge Pérez de Lara.

6 is painted with alternating designs in red and black encircling its everted rims, possibly imitating jaguar skin patterns. In subtle opposition, red dots on the top rim sit atop black dots on the lower. The body of the pot-stand features two repetitive, squared designs, symmetrical about the vessel. The uneven lines and thickly applied paint on Vessel 6 appear to be the work of a less careful artist than the one responsible for several other painted polychromes within Burial 9 (e.g., Vessels 18 and 19).

Several similar pot-stands are known from Holmul (Callaghan 2009:61, 107, 138, 153, Figs. 4.24, 4.47, 4.52), Río Azul (Hall 1985:33), and Uaxactun (Smith 1955:Fig.15e1), with polychrome examples being rare in comparison to monochrome vessels decorated with appliqués or perforations. Although pot-stands of this form are frequently included in Late Preclassic assemblages, both Callaghan (2009:136) and Smith (1955:22) believe that the pot-stand is more distinctly Early Classic than Late Preclassic in date. Supports like Vessel 6 may indicate a shift from the low, flat-bottomed vessels of the Preclassic period to an emphasis on height in serving wares during the Classic period. This transition may result from elites hosting feasts while seated on thrones, a practice seen on painted ceramic vessels from the Late Classic (Callaghan 2009:62).

Vessel 7

Like Vessel 4, Vessel 7 is a pitcher with a spherical body, gutter spout, and pedestal base of the Pucte Brown type of the Pucte ceramic group (Figure 3.23). Vessel 7 is slightly smaller than Vessel 4, however, and evidence of burning on Vessel 7's exterior, while present, is less intense than that on Vessel 4. Vessel 7 was placed just to the south of Vessel 6, maintaining the eastern line extending southward from Vessel 3.

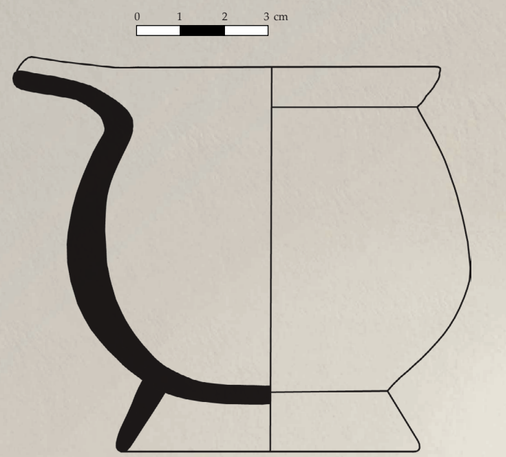


Figure 3.23. Vessel 7: (clockwise from top) in tomb chamber; post-excavation; profile. Photos: Arturo Godoy and Jorge Pérez de Lara; drawing: Sarah Newman.

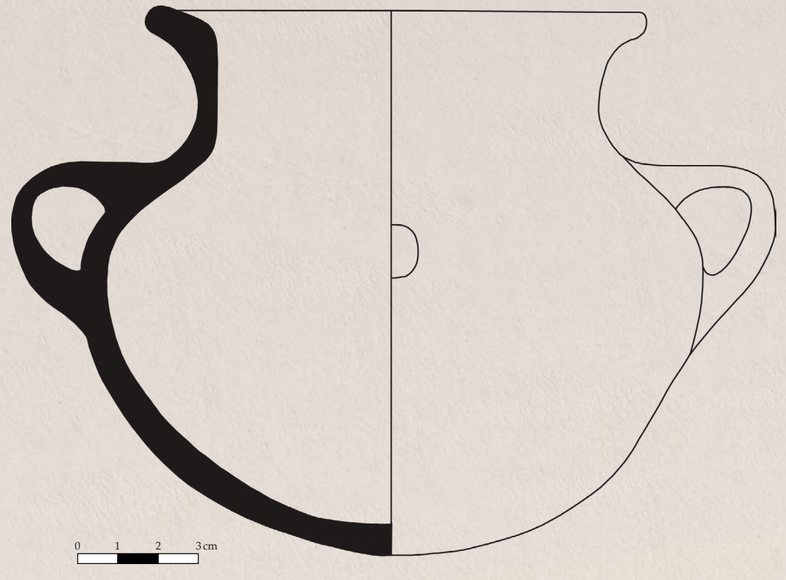


Figure 3.24. Vessel 8: (above) shown toppled over in situ, with the remains of organic cordage around its handle; (facing page, top) profile; (facing page, bottom) upright in laboratory. Photos: Arturo Godoy and Jorge Pérez de Lara; drawing: Sarah Newman.

Vessel 8

Vessel 8 is a wide-mouth jar with a rounded base and appliqué handles on either side, classified as the Caribal Red type of the Caribal group (Figure 3.24). Vessel 8 was found just west of Vessel 7, directly in line with Vessel 3 (though some 25 cm to the south). The ceramic vessels clustered at the northeastern edge of the tomb, from Vessel 3 to Vessel 8, close off a space otherwise devoid of artifacts in an east-west line encompassing excavation quadrants A–E of Row 5 (see Figure 3.1). This may have been where the northern supports for the wooden funerary bier (or *teem;* see Chapter 2) made contact with the floor of the tomb. When the tomb was sealed from the southern end, those filling the burial chamber would have had to leave a space to lower the supports of the opposite end of the bier. There would have been no room to maneuver around the *teem* or to shift its position once it entered the tomb.

Like Vessels 4 and 7, Vessel 8 is heavily burned on its exterior. The remains of organic cordage were found around one of the vessel's handles in the tomb (see below), suggesting that the pot might have been carried or hung. The rounded bottom of the vessel favors this hypothesis, although with careful placement it is able to stand upright on a flat surface. A thin white residue is visible around the upper, inner walls of the vessel, indicating it was once nearly full, probably with some liquid. The same residue can also be seen pooled inside the vessel near the rim and even on the surface of the rim itself. Early in the history of the tomb, the vessel may have tipped and spilled over, presumably while its contents were still fluid. The rim and base of the vessel show only slight signs of wear compared to other vessels, another indication that the vessel was carried or hung. There are two small appliqué "buttons" on either side of the vessel toward the center. The handles also appear to have been made separately and added to the body of the vessel. Finger streaking shows where the potter smoothed the area around the handles.

The high level of liquid and the possibility that it was designed to be hung or carried suggest another association with the frothing of drinking

Figure 3.25. Ceramic disk from Burial 9, possibly loose-fitting lid atop Vessel 8. The disk was originally found leaning against Vessel 8 (see Figure 3.24), which was removed for transportation to the laboratory before this photograph was taken. Photo: Arturo Godoy.

chocolate—in the Classic period, this was often accomplished by pouring chocolate back and forth from one vessel to another (Coe and Coe 1996:50). Although this process generally used cylindrical vases and drinking vessels, these forms are entirely absent from Burial 9. The pitchers and wide-mouth jars found in Burial 9 may therefore represent a transitional ceramic form; chocolate could still be frothed even as spouted jars of the Preclassic period gave way to cylindrical vessels of the Classic (Callaghan 2009:62). Similar handled jars are known from earlier contexts at Kaminaljuyu (Kidder et al. 1946:Fig. 67p, q, 69f, g), and analogous examples are found at Tikal (Culbert 1993:Figs. 11b, 154e).

Ceramic Disk

A small ceramic disk, roughly 15 cm in diameter, was found just to the southwest of Vessel 8 within the tomb (Figure 3.25). The disk is plain and unslipped, buff from the natural hue of the clay, and slightly burnished to create a smooth surface. The disk is wider than the orifice of Vessel 8, but its position and proximity to that jar suggest that it may once have served as a loose-fitting lid to protect the contents or perhaps as a stand for a perishable object.

Vessel 9

Vessel 9 is a small jar of the Dos Hermanos Red variety of the Dos Hermanos ceramic group, found directly south of Vessel 7 in line with the easternmost vessels in the tomb (Figure 3.26). A thick layer of calcification encrusts the entire vessel. This covering obscures its designs and wear patterns, yet the pot's form is somewhat similar to earlier examples with flat bases from Tikal (Culbert 1993:Fig. 11) and an example from Uaxactun, which also features a ring base (Smith 1955:Fig. 13i). A nearly identical specimen was recovered from Burial A31 from Uaxactun (Smith 1955:Fig. 8p), although it was paired with a flat disk-like lid. Comparable forms occur at the Mundo Perdido at Tikal (Laporte and Fialko 1987:151). The shape and surface decoration for

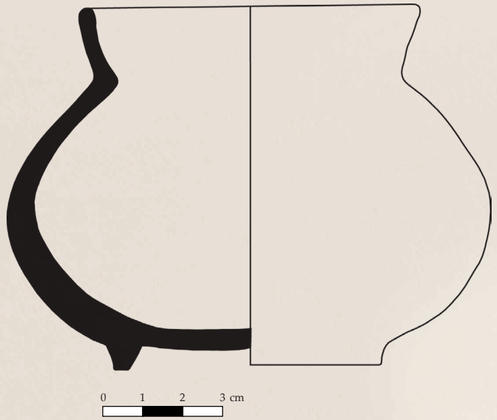


Figure 3.26. Vessel 9: (clockwise from top) filled with debris within Burial 9; heavy layer of calcification more easily observed post-excavation; profile. Photos: Arturo Godoy and Jorge Pérez de Lara; drawing: Sarah Newman.

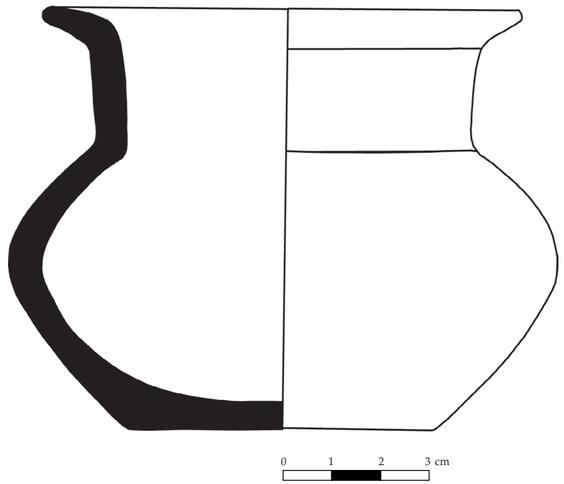


Figure 3.27. Vessel 10: (clockwise from facing page) shown tucked beneath Vessel 11 within the tomb; profile; post-excavation. Note the thin layer of hematite around the rim and neck of the vessel. Photos: Arturo Godoy and Jorge Pérez de Lara; drawing: Sarah Newman.

this vessel correspond to utilitarian wares, yet its small size in comparison to the other vessels in Burial 9 bespeaks rare or valuable contents.

The thick deposit surrounding the vessel, similar to encrustations around the exterior of the base of Vessel 20, resembles that on vessels recovered from cave sites (James Brady, personal communication, 2011). XRF analysis by Hector Neff (personal communication, 2011) showed that "Vessel 9 has up to around 28% [calcium], or 70% [calcium carbonate]…with higher [concentrations] of barium and nickel" than the base of Vessel 20. The encrustation on Vessel 20B appears to be a more "contaminated" deposit, that is, a less-pure calcite. The calcifications on the two vessels thus formed in different locations. According to Thompson (1975:xv-xxii), vessels were sometimes placed within caves to collect *zuhuy ha'* (pure or virgin water). The remote location in which the *zuhuy ha'* is collected and the manner in which it is obtained sanctify the substance, making it categorically distinct from similar activities conducted at the surface (Brady and Rissolo 2006:471). The Buenavista Escarpment, the home of the bats that give El Zotz its modern name, contains at least one large sinkhole, suggesting a geological landscape supporting modest systems of caves.

Vessel 10

Vessel 10 is a small everted-rim jar with a tall neck of an unidentifiable cream variety (Figure 3.27). Vessel 10 was found near the central north-south axis of the tomb, just slightly to the west and beneath the much larger lip-to-lip formed by Vessel 11. The jar's form is somewhat rare for the Peten, with only one or two similar examples found at Holmul (Callaghan 2009:217) and Tikal (Culbert 1993:Fig. 138d). Nonetheless, the addition of an everted rim to jars, rather than bowls or plates, is characteristic of regional trends in the central Peten, emerging as a special feature toward the end of the Early Classic (Adams 1971:132). This vessel contained an extremely thin film of residue on the interior, and it still bears the remains of a layer of hematite around its inner and outer neck and rim. Along with its relatively wide orifice and bulging, almost globular body, this suggests that the vessel served as a storage or holding container for liquid. The remains of the hematite or cinnabar on the neck and rim of the vessel may indicate that these minerals were included in the preparation of the food or drink stored in the vessel, much like examples known from Copan (McNeil 2010:306).

Figure 3.28. Vessel 11: (inset) the largest of the lip-to-lip pairs within the tomb; (background) extreme close-up of human remains found within the vessel (for scale note molar tooth at bottom center; compare Figure 4.28 on page 197). Photos: Arturo Godoy.

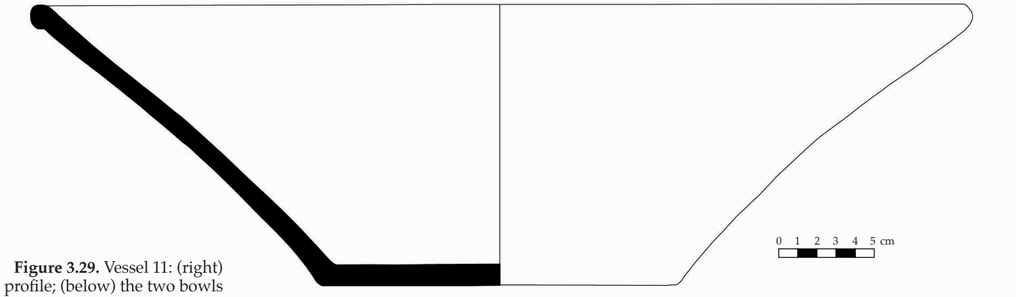


Figure 3.29. Vessel 11: (right) profile; (below) the two bowls after restoration. Drawing: Sarah Newman; photo: Jorge Pérez de Lara.

Vessel 11

Vessel 11 is another pair of lip-to-lip bowls in the line beginning with Vessel 2 (Figures 3.28 and 3.29). The two bowls are of the Aguila Orange type of the Aguila ceramic group and are the largest of the cache-like vessels found within Burial 9. The size of the vessels is surprising, given that they contained only the skull of a four- to five-year-old child (see Chapter 4). Vessel 11 is centrally located within the tomb, roughly in line with the two central axes.

Figure 3.30. Vessel 12: (top) found badly broken within Burial 9; (bottom) base after restoration. Photos: Arturo Godoy and Jorge Pérez de Lara.

Vessel 12

Vessel 12 is the next pair of lip-to-lip cache vessels placed from north to south in the tomb (Figure 3.30). Although both bowls are very similar in size and shape, the upper vessel is of the Triunfo Striated type of the Quintal ceramic group (and therefore unslipped), while the lower vessel is of the Aguila Orange type of the Aguila group (bearing orange slip). These opposed vessels contained the fragmentary remains of the skeleton of a two- to four-year-old child (see Chapter 4). Vessel 12 was found to the southwest of Vessel 11, the only pair of lip-to-lip bowls to diverge from the central north-south line of vessels with human remains.

Vessel 13

Vessel 13 is another pair of bowls with outflaring sides and flat bottoms (Figure 3.31). Unlike other such containers in the tomb, however, these bowls were not arranged lip-to-lip, but rather stacked, both upright, one inside the other. The upper vessel is of the Triunfo Striated type of the Quintal ceramic group, while the lower vessel is of the slightly more plain Quintal Unslipped type of the same group. The remains of a one- to two-year-old child were found placed inside the upper bowl of the stacked pair (see Chapter 4). The vessels were tipped over when the wooden bier collapsed, scattering some of the human remains onto the floor.

Figure 3.31. Vessel 13: (clockwise from right) the pair of stacked cache-like vessels, as found tipped over within the tomb; inferior and superior bowls in laboratory. Photos: Arturo Godoy and Jorge Pérez de Lara.

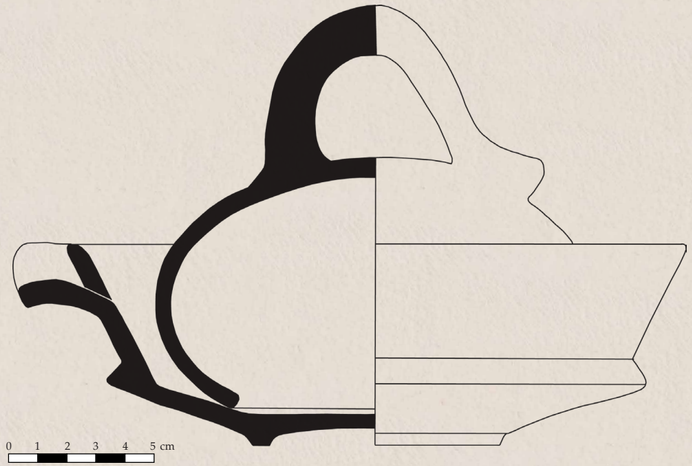


Figure 3.32. Vessel 14: (clockwise from below) with layered textiles as found in tomb; profile; hollow lid post-excavation; spouted base. Photos: Arturo Godoy and Jorge Pérez de Lara; drawing: Sarah Newman.

Vessel 14

Vessel 14, another example of a hollow, globular body set atop a bowl with a gutter spout, is very similar to Vessel 3 (Figure 3.32). Vessel 14 was recovered to the east of Vessel 13 and just to the south of Vessel 11. Vessel 3's hollow component had an imitation jar neck, while Vessel 14's has a long, sweeping handle; it is disconnected from the main body and was probably made separately. Much like Vessel 3, Vessel 14 showed signs of intense burning, probably the result of contact with open flame. The ceramic is even split in several places because of exposure to heat. Again, these rare vessel forms may have served as a steamer or insulator for food.

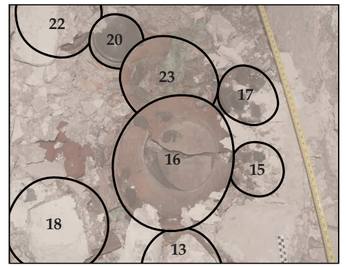


Figure 3.33. Vessel 15 and adjacent vessels in context (facing page); vessel key (above).

Vessel 15

The scutate cover forming Vessel 15's lid is of the Lucha Modeled-Incised type of the Balanza ceramic group, with a modeled form of a howler monkey's head; the base conforms to the Urita Gouged-Incised type of the same group (Figures 3.33 to 3.38). The monkey effigy of the vessel's lid differs from those of Vessels 1 and 18, however. The creature's face does not serve as the handle for the lid, but instead is accompanied by a separate handle directly behind it.

Vessel 15's effigy has the crested hair and beard appropriate to a howler, with an incised depiction of its entire body splayed out on the scutate cover below. The handle corresponds to the arched back of the creature. This decorative style can also be observed on Vessel 22 from Burial 9 and examples from Holmul (Callaghan 2009:195, 203) and Tikal (Culbert 1993:Fig. 22b; Laporte and Fialko 1995:61-62), as well as on unprovenanced ceramics (Miho Museum 2011). Like Vessel 1, the head of the monkey is hollow and made separately from the

Figure 3.34. Vessel 15, one of several modeled howler monkey effigy vessels in Burial 9. Note lid is smaller than base. Photo: Jorge Pérez de Lara.

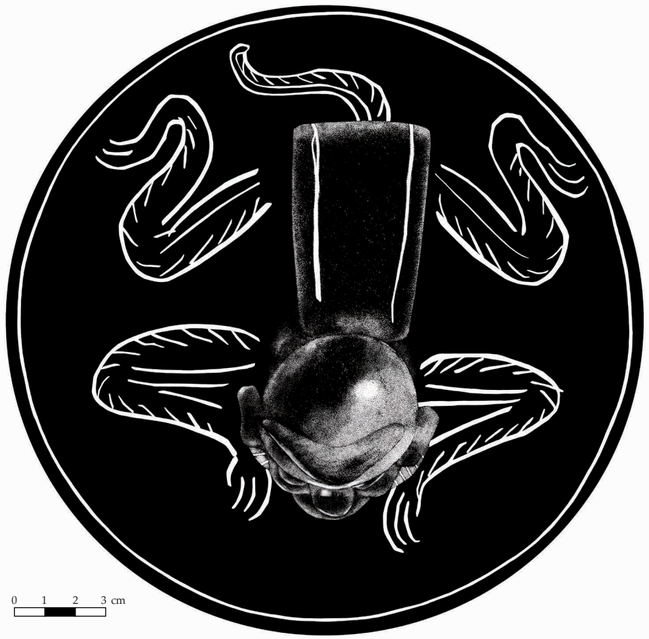


Figure 3.35. Detail of the lid of Vessel 15, highlighting splayed-out body of howler monkey beneath its modeled head. Drawing: Kallista Angeloff.

Figure 3.36. Details of the head of the howler monkey from Vessel 15. Note the small holes for the separate firing of the head. Drawings: Kallista Angeloff.

Figure 3.37. Vessel 15: rollout drawing of base, displaying geometric designs (note the thick, uneven lines in comparison to the craftsmanship of other Burial 9 vessels); profiles of lid and base. Drawings: Kallista Angeloff.

Figure 3.38. Detail of the face of Vessel 15's howler monkey effigy, showing red pigment rubbed into the incised lines of the vessel. Note forehead curl that signals the animal's odor. Photo: Jorge Pérez de Lara.

rest of the lid, with three small holes in the mouth and one in each ear to facilitate firing (Figure 3.36). The monkey's face on Vessel 15 serves an additional function as a rattle, with a small clay bead inside. The face is slightly lopsided, sloping downward toward one side, and a small curl incised in the forehead indicates the animal's odor (Houston 2010). The curl, along with the rest of the incisions on the monkey's face and some of his limbs, is rubbed with a red pigment, probably hematite or cinnabar (Figure 3.38). The incised limbs and tail of the monkey are detailed representations, sketching out the individual lines of the creature's fur and claws. Wear is evident not only on the handle, but on the head of the monkey effigy, perhaps a result of turning the lid upside down and setting it next to the base while filling the container.

The base of Vessel 15 is somewhat larger than its lid, making for an awkward fit between the two parts. They do not seem to have been made for each other. Two symmetrical, geometric designs, perhaps of stylized serpent heads, are located above the basal flange on either side of the base's high walls. The vessel is somewhat crude in comparison to other examples in Burial 9 with its uneven lines, varying depths to the gouging, and a lopsided angle to the entire bowl (Figure 3.37). The center of the base of the vessel's interior also exhibits traces of an incised design, a feature identified in Vessel 19, although the design has mostly been worn away. This wear pattern could result from ancient cleaning of the vessel, perhaps with a rough scourer to remove food residue from the interior (Orton et al. 1993:61). The upper rim of the base is heavily worn from contact with its cover. During excavation, an angled ring of white, chalky residue remained around the vessel's interior. It may have contained a liquid foodstuff, which pooled to one side because of the vessel's uneven positioning on the floor of the tomb.

Vessel 16

Vessel 16 is another pair of lip-to-lip bowls along the north-south axis of the tomb chamber, immediately south of Vessel 13 (Figure 3.39). Like Vessel 11, the paired vessels are slightly larger than the other examples in the tomb and are both of the Aguila Orange type of the Aguila ceramic group. Vessel 16 contained the skull of a human child, probably aged between four and five years old, and a freshwater shell necklace (see Chapter 4 and below).

Figure 3.39. Vessel 16: inferior bowl in laboratory, exhibiting burnt residues within. Photo: Jorge Pérez de Lara.

Vessel 17

Vessel 17, like Vessel 15, has a scutate lid belonging to the Lucha Modeled-Incised type of the Balanza ceramic group, along with a tetrapod base of the Urita Gouged-Incised type of the same group (Figures 3.40 to 3.43). The vessel was placed toward the southern end of the tomb, immediately to the west of the cache formed by Vessel 23. Its lid shows the head and tail of a turtle, with the face of a forelocked

Figure 3.40. Vessel 17 (at right and in detail on facing page). Photos: Jorge Pérez de Lara.



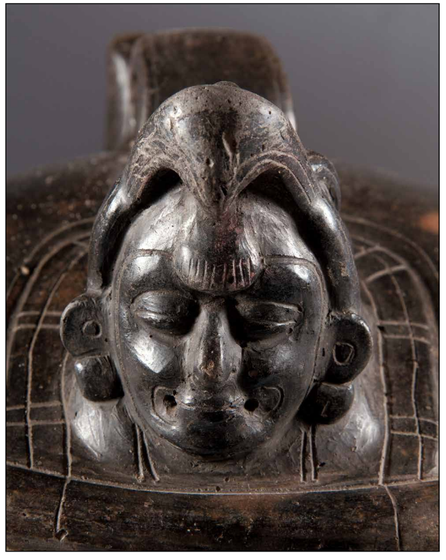





Figure 3.41. Details of Vessel 17. Note that probable *yax* signs on right and left sides of lid are mirrored on base. Photos: Jorge Pérez de Lara.

elderly god emerging from the stretching, open mouth of the reptile; most likely, this an Early Classic version of the being known as *Itzam K'an Ahk* (Stuart 2007). The handle, head, and incised tail again appear to be made separately, with two small holes drilled on either side of the god's mouth for firing. Like Vessel 15, the incisions on the god's face and around the sides of the lid are rubbed with a red pigment, most likely cinnabar or hematite. Unlike Vessel 15, Vessel 17 does not explicitly show the body associated with the molded effigy, although, to be sure, the four legs appear to correspond to those of a turtle (cf. Berjonneau et al. 1985:Fig. 339). Instead, incised designs on either side of the head and tail, most likely *yax* signs seen on other early depictions of aquatic reptiles, mirror those incised on the vessel's base below (Figures 3.42 and 3.43; see also Kaminaljuyu Sculpture 2, Henderson 2013:590).

The tetrapod supports of the base are thick and short, giving the vessel a squat appearance. Four incised and gouged designs are evenly spaced around the walls of the vessel, sharp and clear-cut in comparison to those on the somewhat similar Vessels 15 and 20. Two of the designs are nearly identical, and a third represents an incised pectoral below the modeled effigy head of the scutate cover. The designs on either side of the vessel illustrate a clear directional sway from front to back, which, along with the pectoral design, indicates the intended position of the vessel with respect to its modeled scutate cover (this also allowed Houston to identify the 180° inversion in the placement of its lid in the tomb). Vessel 17 shows similar wear patterns to Vessel 15, with scouring along the interior of the base and around the outer rim of the bowl. It, too, may have been used for some time before being included in the tomb. The vessel's interior is also coated with a thin white residue around the sides and base, indicating that it may have once held foodstuffs similar to those placed inside Vessel 15. Comparable serving bowls of incised monochrome with tetrapod supports are known from Holmul (Callaghan 2009:195, 206) and Calakmul (Folan et al. 1995:323), as well as examples without provenance (Miho Museum 2011). A vessel in a private collection shows nearly identical iconographic elements and style (Figure 3.44; Berjonneau et al. 1985:Fig. 339).

Figure 3.42. Lid of Vessel 17. Note *yax* signs common on depictions of aquatic reptiles. Photo: Jorge Pérez de Lara; drawing: Kallista Angeloff.

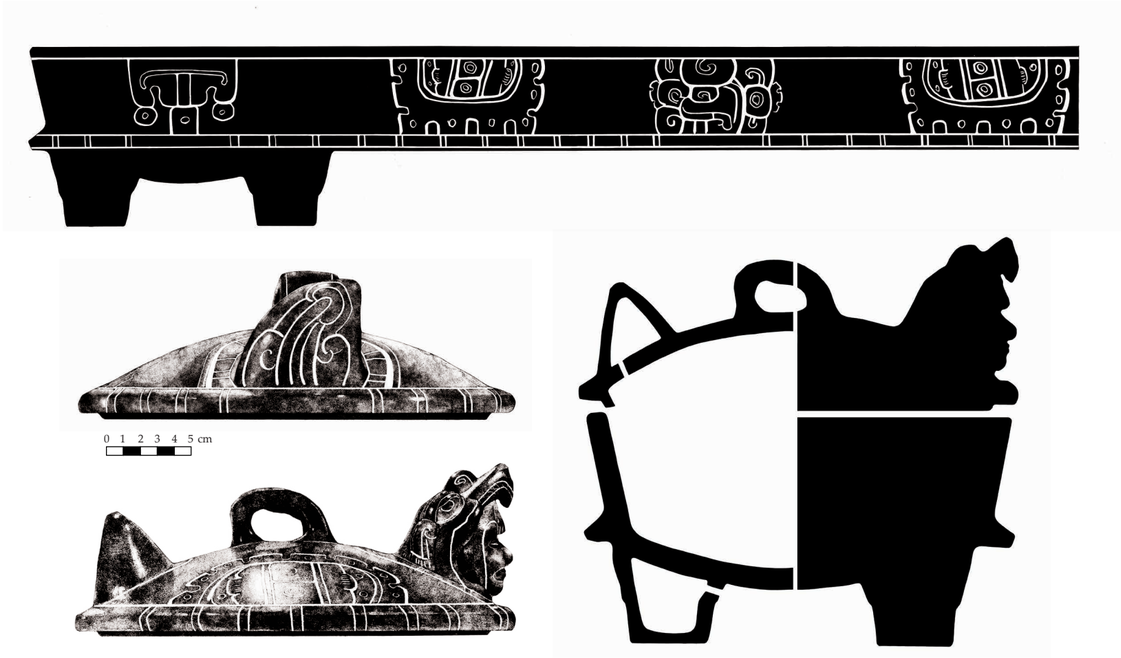


Figure 3.43. Vessel 17: rollout of base above details of back and side of lid and profile. Drawings: Kallista Angeloff.

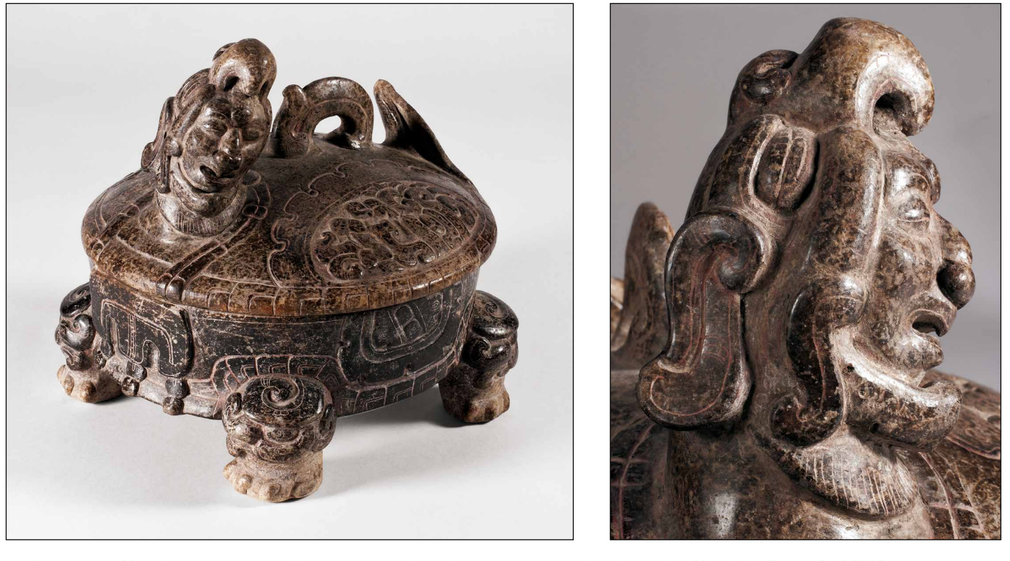


Figure 3.44. Vessel from a private collection with style and iconography nearly identical to Vessel 17. Photo: BAMW Photography.

Figure 3.45. Vessel 18: (clockwise from facing page) broken into large fragments within the tomb; cross-section through lid; paired lid and base after restoration in the laboratory. Photos: Arturo Godoy and Jorge Pérez de Lara; drawing Kallista Angeloff.

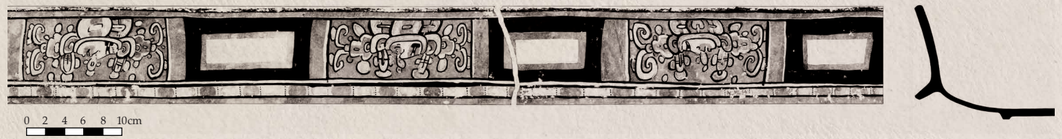
Vessel 18

Vessel 18, located just to the northeast of Vessel 16 and south of Vessel 14, is a painted ceramic of Zotz Red Polychrome (Figures 3.45 to 3.48). The type is unique to the El Zotz area and a probable precursor to a series of distinctive red-background vessels thought to be from the region (Houston 2008:8). Vessel 18's lid is a scutate cover with a modeled effigy handle in the shape of a cosmic howler monkey, similar to that atop Vessel 1. Nonetheless, the fluid lines on Vessel 18 suggest a slightly later date than the more angular incisions of

Vessel 1. The howler monkey's face is surrounded by painted images of gods and a chevron band in shades of grey, orange, buff, and black atop its red base slip. Among this welter of images are: an acrobatic Maize God; several heads of what may be ancestors; a bird-serpent whose body is shown as a watery, bubbly flow; and stylized serpent heads, each on linear bands that crisscross the lid, just below the quatrefoil from which the howler emerges. Other elements include flowers and glyph-like signs that recall those on Vessel 5. The painting is exact and fine, more careful work than can be seen on other polychrome painted vessels from Burial 9's assemblage (such as Vessels 5 and 6, for example). The lid of Vessel 18 was badly broken from

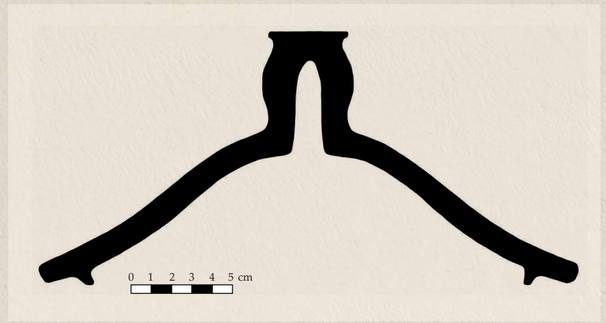
Figure 3.46. Lid of Vessel 18 and its howler monkey effigy handle. Note acrobatic Maize God immediately to left of effigy handle in photograph. Photo: Jorge Pérez de Lara; drawing Kallista Angeloff.

Figure 3.47. Vessel 18's howler monkey effigy handle. Drawing: Kallista Angeloff; photo: Jorge Pérez de Lara.



rock fall when the eastern wall of the tomb collapsed. The sides of the base are remarkably high above its low, deeply angled basal-flange, which hides the base of the vessel when viewed from above. Three brightly painted designs are placed around the vessel's sides (Figure 3.48). Nearly identical designs, all of ancestors facing downwards, are found on another basal-flange bowl from Uaxactun (University of Pennsylvania Museum Photographic Archives #165112). The flange of Vessel 18 exhibits a spotted band of alternating colors, also found on Vessels 19 and 22. The center and the rim of the vessel show wear patterns similar to those observed among the other basal-flange bowls in Burial 9, probably indicating a period of use prior to interment. The bowl of this vessel contained the skeletons of two New World quail, of the genus *Colinus* (see Figure 3.90).

Figure 3.48. Vessel 18: (left) details of ancestors facing downward around the sides of the vessel; (below) profile and rollout drawing of base. Photos: Jorge Pérez de Lara; drawing: Kallista Angeloff.



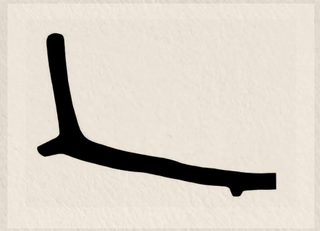


Figure 3.49. Vessel 19: (from top left) profile of lid; profile of base; in laboratory after restoration. Drawings: Kallista Angeloff; photo: Jorge Pérez de Lara.

Vessel 19

Like Vessel 18, Vessel 19 is another painted polychrome of an unidentified, possibly local El Zotz variety; it was discovered at the extreme southwest corner of the tomb (Figures 3.49 to 3.51). Its lid is the only scutate cover from Burial 9 featuring a knob handle with floral or feathery motifs, in lieu of a modeled anthropomorphic or zoomorphic head. The painted designs on the lid are symmetrical depictions of disembodied ancestors on either side of the central handle; the heads themselves appear to be framed in stylized bird beaks (Karl Taube, personal

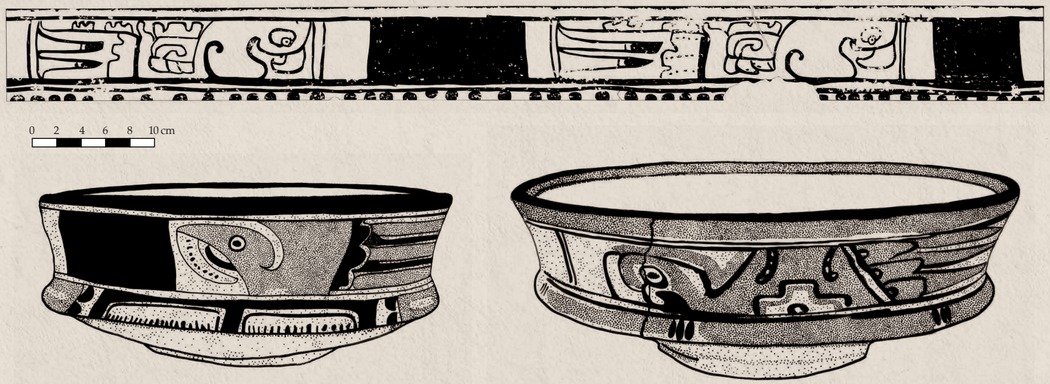


Figure 3.50. Vessel 19: (top) within Burial 9 (photo: Arturo Godoy); (center) rollout drawing of bowl showing its flying macaw motif (drawing: Kallista Angeloff); (bottom) comparative examples of Early Classic vessels with flying macaw motifs: vessel from the Mundo Perdido on the left and one from El Perú-Waka' on the right (drawings: Sarah Newman, El Peru vessel after Rich 2011:Fig. 7.33).

Figure 3.51. Lid of Vessel 19, displaying symmetrical ancestors on either side of the central knob handle. Photo: Jorge Pérez de Lara; drawing: Kallista Angeloff.

communication, 2012). Some of the painting displays thick, uneven lines, which are not as carefully executed as those on Vessel 18. This suggests that separate hands were responsible for the two covers despite their contemporaneity, shared type designations, and evidence of local fabrication. The vessel's base shows similar patterns of use to those seen on the other basal-flange bowls in the collection from Burial 9, although the degree of wear is greater. The underside of the edge of the basal flange is scratched and chipped, a pattern not witnessed on the other bowls from this assemblage. The interior of the vessel has clear residue markings, a distinct ring of a white substance around the side walls, but the pattern differs from other vessels within the tomb. The base of the vessel is fairly clean, enough to show the same possible wear patterns from scouring as on the other basal-flange bowls. Yet the high sides of the vessel are coated nearly to the rim with a thin layer of the white residue. The vessel was found resting at an angle when the tomb was excavated. It may be that the vessel tipped over soon after being placed in the tomb and the food offering within pooled against the sides before evaporating. The collapse of the wooden bier holding the king's body may then be responsible for the chips and scratches on the basal flange, which would have been resting against the floor of the tomb when affected by the fall.

The vessel's base exhibits a common flying macaw motif (Figure 3.50), known from other funerary assemblages including Holmul (Callaghan 2009:134); the Mundo Perdido at Tikal, which was also paired with a scutate lid endowed with a knob handle (Laporte 2005:165); Tomb 5 from Balamku (Museo Nacional de Antropología de Campeche/Bridgeman Art Library); Burial 25 at El Peru (Rich 2011:Fig. 7.33); and Uaxactun (Smith 1955:Fig. 28a1). Pring (2000:51) and Hammond (1984:4-5) identify the sherd temper of vessels with the flying macaw motif as a clearly Late Preclassic paste mode beneath a distinctly Early Classic style of painted decoration. The wide reach of flying macaw motif vessels likely indicates a high level of standardization and perhaps even mass production of these and other painted polychrome vessels across the Peten region (Foias 1996:891-933).

Vessel 20

Vessel 20 is another glossy, incised monochrome vessel, with lid and base both of the Lucha Modeled-Incised type of the Balanza ceramic group (Figure 3.52 to 3.54). Vessel 20 was found toward the southern end of the tomb, just to the southeast of Vessel 23 and slightly to the northwest of Vessel 22. This vessel has only a single anthropomorphic head as a handle, rather than an additional sweeping handle behind the head like Vessels 15 and 17. Showing a man's head (an older god?) with sidelock, the handle seems to have been made separately from the rest of the lid, with two small holes piercing the hollow interior, allowing hot air to escape during firing. The man's incised collar, ear flares, nose bead, and banded hair are lightly rubbed with a red pigment, as with Vessels 15 and 17. There is some wear around the head of the effigy, including a large chip where some of the figure's hair has disappeared, but the vessel

Figure 3.52. Vessel 20 within Burial 9. Photo: Arturo Godoy.

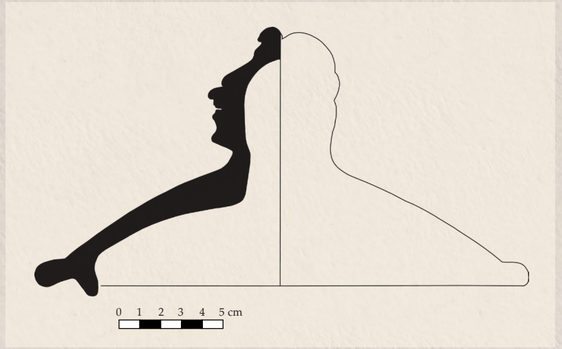


Figure 3.53. Vessel 20: (above) cut-away profile; (below) after restoration. Note the calcifications encrusted around the base of the vessel. Drawing: Sarah Newman; photo: Jorge Pérez de Lara.

is only slightly deteriorated around the lip of the cover.

The base of Vessel 20 is another high-sided basal-flange bowl, slightly lopsided as with Vessel 15. A thick layer of calcification encrusts the entire vessel, obscuring most of its designs and wear patterns. The encrustation on the vessel appears similar to that enveloping Vessel 9, again possibly due to placement within one of the cave systems of the Buenavista Escarpment. Nonetheless, Hector Neff (personal communication, 2011), notes that it is unlikely to have come from the same deposit as Vessel 9: "Vessel 20B has around 25-26% calcium, or about 65% $CaCO_3$ [compared to 70% for Vessel 9]…20B is higher in silicon

Figure 3.54. Detail of Vessel 20 after restoration. Photo: Jorge Pérez de Lara.

(close to 20% SiO2), titanium, manganese, iron, and possibly zinc." The fact that the vessel's scutate cover shows little use wear and no signs of encrustation underscores the supposition that the vessel was placed within a cave to collect drips of sacred water. The vessel's lid may have been removed to allow the collection of the *zuhuy ha'*, before being replaced atop the basal-flange bowl, protecting its precious contents within the tomb.

Vessel 21

Vessel 21 is a glossy, globular-shaped jar with a straight-sided, narrow neck and orifice of the Dos Hermanos Red type of the Dos Hermanos ceramic group (Figure 3.55). This vessel was found at the southern extreme of the tomb, along the central axis formed by the series of lip-to-lip cache vessels. The vessel's form indicates that it differs from most other vessels within the tomb in that it would most likely have been used for storage rather than serving. Portions of the vessel, especially the neck and fragments of its broken base from the tomb floor, are covered with a thick layer of a chalky, almost bubbly white residue, which forms a thick stopper or plug inside the neck of the vessel. Although the neck and nearly half of the body are intact, the base of the vessel appears to have exploded from the inside out after being placed in the tomb. This, along with its unusual patterns of residue, suggests that the jar originally contained some sort of expanding or off-gassing liquid—perhaps the fermented sap beverage known as *pulque* or an *atole* with heavy calcium content (David Killick, personal communication, 2010). The "stopper" packed in the mouth of the vessel most likely prevented the gasses of the fermenting beverage from escaping. Eventually, the trapped pressure caused the bottom to burst and shatter. The substance appears to have affected the vessel's slip too, making it extremely friable in areas where the residue is thickest.

Figure 3.55. Vessel 21: (top) within the tomb, burst; (bottom) in the laboratory after reassembly of sherds, showing thick concentration of residue around the neck of the jar. Photos: Arturo Godoy and Jorge Pérez de Lara.

Vessel 22

Vessel 22 was probably the final vessel interred in the tomb, at the south-eastern corner of the burial chamber (Figures 3.56 and 3.57). This vessel exhibits the same color scheme as Vessels 18 and 19, making it another example of the Zotz Red Polychrome variety that is, on current evidence, a local product of El Zotz. Like Vessels 1, 18, and 20, the modeled peccary effigy head in the center of Vessel 22 also serves as the lid's handle. As on Vessel 15, the body of the peccary is limned across the lid below the handle, although here it is painted, rather than incised. Similar examples of painted

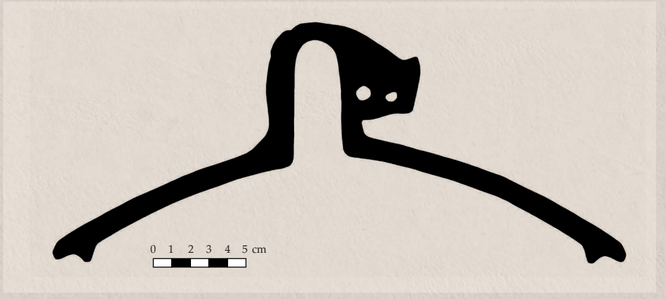
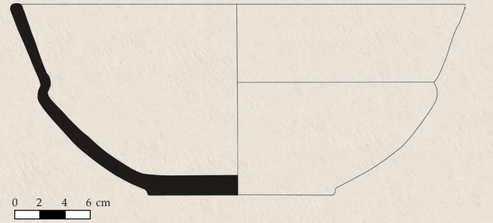


Figure 3.56. Vessel 22: (above and at left) profiles of lid and base; (below) as found badly broken within Burial 9; (facing page) lid and base in laboratory after cleaning. Photos: Arturo Godoy and Jorge Pérez de Lara; drawings: Kallista Angeloff.

Figure 3.57. Vessel 22: (top) lid; (bottom) details of peccary head. Photos: Jorge Pérez de Lara; drawings: Kallista Angeloff.

animal effigies, including jaguars and deer, are found at Tikal (Culbert 1993:Fig. 22; Laporte 2005:164-166) and Uaxactun (Smith 1955:Fig. 3b). The peccary's forehead and back show a painted version of the same curl incised in the forehead of the monkey from Vessel 15, again cuing a potent smell, well-known to anyone who encounters peccaries in the wild. The peccary's nose and head are made separately from the rest of the lid and from one another, with the nose seemingly one thick cylinder-shaped piece, the head hollow. The head of the peccary is visibly worn, making it likely that the vessel was in use for some time prior to interment. In contrast to Vessel 1, no firing core is visible in the lip of the cover, underscoring a different firing process with respect to time and temperature in the production of the tomb's monochromes and polychromes. The base of Vessel 22 is higher and displays sharper angles than most of the other basal-flange bowls among the assemblage from Burial 9; nonetheless, the flange around the bowl features the same alternating spotted band as Vessels 18 and 19. Vessel 22 was found to contain very little residue. The interior of the vessel, however, exhibits the same potential scouring wear-patterns described for the other basal-flange bowls, which may again be evidence of its use as a serving vessel prior to placement in the tomb.



Vessel 23

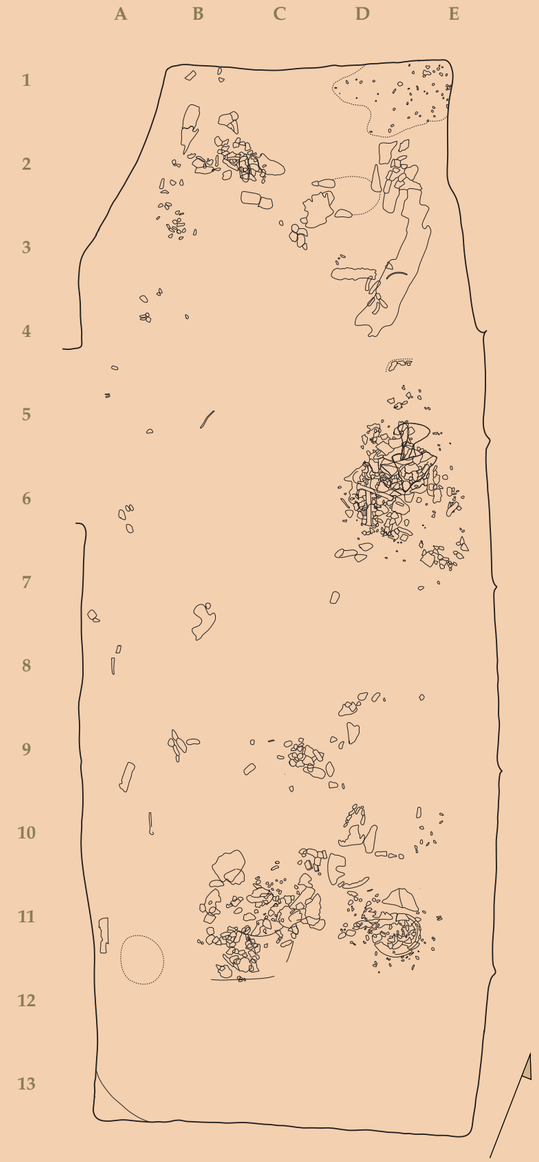
The last of the line of lip-to-lip vessels, Vessel 23 consists of the usual flat-bottomed, outflaring-side bowl form, of the Quintal Unslipped type of the Quintal group, for its upper half; the lower vessel is a simple silhouette bowl with a slight medial flange of the Dos Hermanos Red type of the Dos Hermanos Group (Figure 3.58). The combination of the base's type-variety classification and its medial-flange form suggests it may be substantially older than most of the other vessels found within Burial 9. Other examples of this vessel form and type are known from Late Preclassic contexts at Altar de Sacrificios (Adams 1971:Fig. 10e) and Tikal (Culbert 1993: Fig. 7b-d), often as caches with evidence of charcoal inside the vessels. The paste characteristics and chemical signature of this vessel are closer matches to those of Late Preclassic vessels from El Palmar than to Early Classic types from El Zotz (Ronald Bishop, personal communication, 2012). Although it is not particularly well-made or impressive, Vessel 23 may have been intended as an imitation of an earlier style or even a kind of antique or heirloom, increasing its symbolic value. The vessel is heavily worn around its rim and interior, a sure sign of use prior to interment. This pair of vessels, just to the south of Vessel 16, held the remains of an infant aged 8–16 months (see Chapter 4).

Figure 3.58. Vessel 23: (top) cutaway profile; (middle) base of the lip-to-lip pair after restoration, with Late Preclassic-style medial flange; (bottom) mismatched superior and inferior bowls, found shattered within the tomb chamber. Drawing: Sarah Newman; photos: Jorge Pérez de Lara and Arturo Godoy.

Clay Mirror Back

Though most of the ceramic objects within the Diablo tomb came in the form of elaborate serving vessels, the clay backing to a pyrite mosaic mirror also belongs in this category (Figure 3.59). Archaeologists recovered roughly three-quarters of this object during excavation, enough to highlight its square shape. Its clay substrate was covered in a plaster-like material, into which small cubes of polished pyrite were set in a mosaic pattern. The underside of the clay was coated in thin layers of fine stucco, the last of which also included hieroglyphs painted in black. Now illegible, this was the only text in the tomb; presumably, it named its owner. The sides of the mirror featured bright red and green paint, similar in color to several of the stucco objects found within the tomb and the paint on the wooden bier.

Figure 3.59. Mosaic mirror backed by a square clay substrate with cubes of polished pyrite. Photo: Jorge Pérez de Lara.



Painted Stucco Objects

Pink Object—Sectors B2/C2

A modeled object with deep carving, probably of wood, was found to the north of the ruler's head, perhaps as part of a headdress or stuccoed vessel (Figures 3.60 and 3.61). Aside from one piece with bulbous outset, little of its shape can be reconstructed.

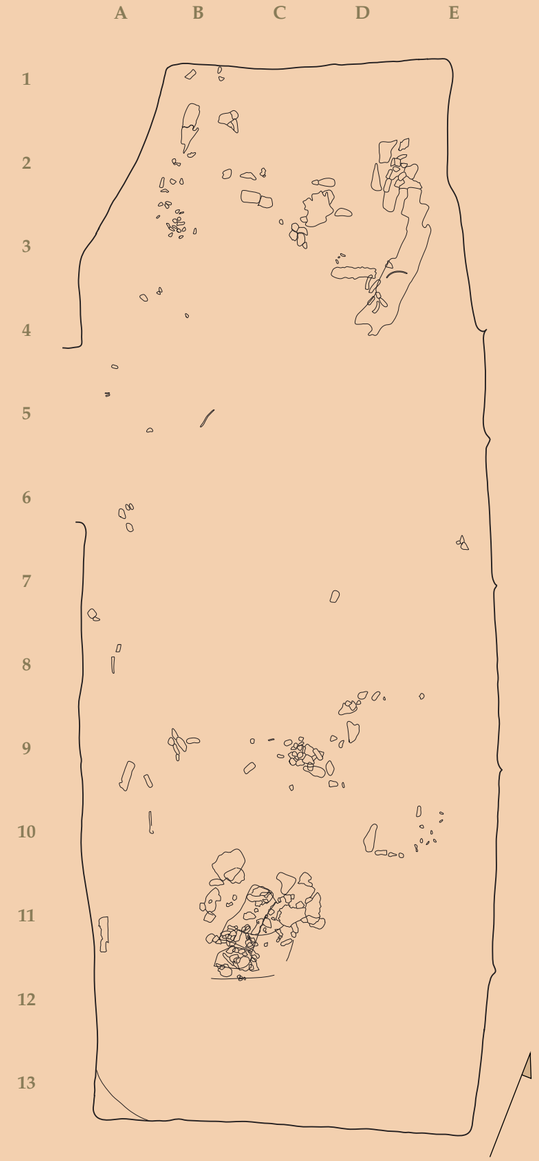
Figure 3.60. Plan view of Burial 9, marking areas with remains of painted stucco. Drawing: Stephen Houston.

Figure 3.61. Pink stuccoed object that may have been part of the ruler's headdress or a perishable vessel placed near the head of the deceased, perhaps just over 18 cm long and 8 cm wide in its full form. Photo: Arturo Godoy.

Wooden Bier Covering—Sectors C/D

When first seen through an aperture in the capstone of the vault, the king's funerary bier consisted of several long pieces of stucco, each ca. 10–15 cm wide, extending in rough north-south orientation along the C and D sectors of Burial 9 (Figure 3.62 and 3.63, see also Figure 2.22 on page 52). Its largest preserved fragment was in sectors D2 to D4, away from other objects that might have caused the stucco to crumble when blocks dislodged from the tomb walls. Within days of discovery, the stucco began to fragment when air circulated around the once-sealed chamber, but originally it must have been some 2 m in length. The wood underneath could be detected in streaks of red resin on the other side of the stucco,

Figure 3.62. Some of the thin layers of painted stucco covering the king's wooden funerary bier still bore traces of the wood grain on their undersides. Photo: Arturo Godoy.



preserving the circular impressions of crosscut wood grain at the ends of the bier. Cross-bars and supports may have existed too, with a similar light-green/blue stucco, but they were probably destroyed when the body and the contents of the bier collapsed onto the floor. Oddly, the larger fragments lay above stones from wall collapse, showing that the bier was still standing when rocks sloughed off the wall of the tomb chamber, perhaps weakened by humidity seeping just above the bedrock.

Pink Object—Sectors A11/A12

An unknown pink object, perhaps a painted gourd, was found at the base of the king's feet but could not be reconstructed.

Destroyed/Pulverized Object—Sector D2

Another indeterminate object, perhaps of wood or painted gourd, lay to the northeast of the ruler's head.

Figure 3.63. Thin layers of painted stucco covering the king's wooden funerary bier, including a fragment over 60 cm in length before deterioration. Drawing: Stephen Houston.

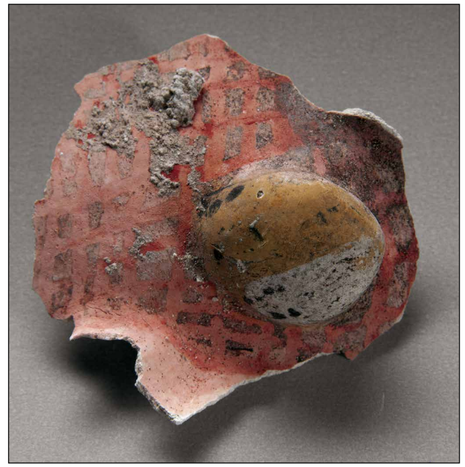
a

b

c

Complex Assemblage (in Multiple Parts?), Including Jaguar God of the Underworld—Sectors D5/D6

A deeply modeled head of the Jaguar God of the Underworld, with full cruller and *k'in* on its cheek, lay within a mass of perishable objects found near the left hand of the ruler, but evidently placed directly on the floor (Figure 3.64a). Two fragments survive of this visage, both by the jaguar's ear (Figure 3.64b). The inner part of the stucco, that closest to the now-destroyed wood, was painted with black lines (Figure 3.64c). The only way to account for such pigment is that it reflects the surface of the underlying wooden original, later stuccoed



d

e

f

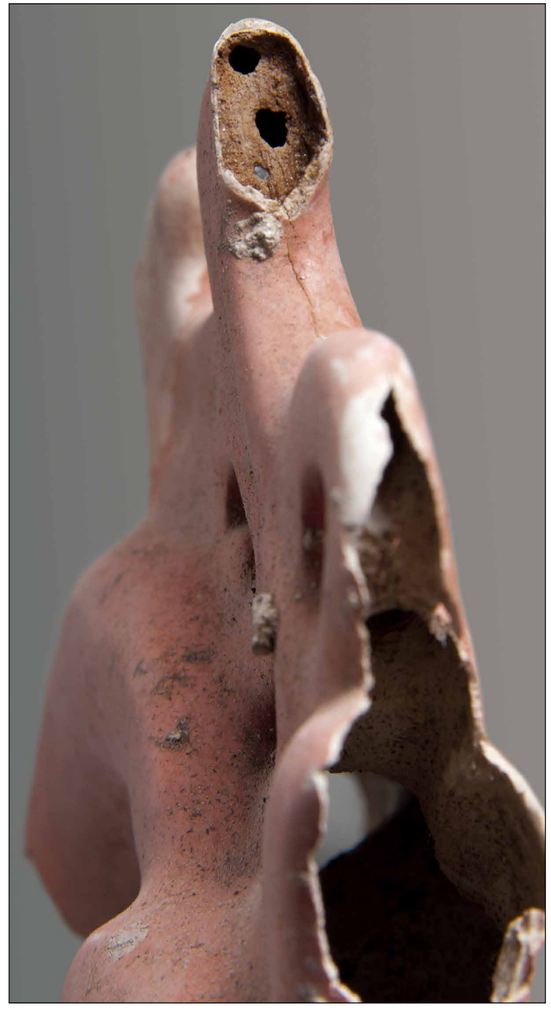
over by the Maya. After decay, the lines adhered to the stucco and survived to the present day. Other components of the assemblage include: simulated basketry (Figure 3.64d); two bulbous outsets, one with scutes, another with cross-hatching (Figure 3.64e); perhaps an eye; and two, narrow "rainbow-hued" cylinders that formed part of an elaborate sculpture (Figure 3.64f). The colors are unusually varied for the tomb, ranging, when joined in one design, from green to yellow to red, in that order, the fields of color sometimes separated by lightly painted black lines. A granular, pink-hued mass within several of the stuccoes raises the possibility that some novel or hitherto undetected technology was involved, perhaps like Japanese *toso*, a hardened mass of sawdust and glue that could be cut and polished on a wooden base. The interiors of several stuccoes were filled with this substance. A similar material, not yet identified, has been found in tombs at El Peru (Harriet Beaubien, personal communication, 2013).

Figure 3.64. Perishable object, seemingly placed on the floor of the tomb chamber, including a modeled head of the Jaguar God of the Underworld (a), characterized by its jaguar ear (b), traces of black paint transferred from the surface of a wooden object underneath the stucco (c), simulated basket-weave patterns (d), and bulbous outsets, roughly 9 cm long (e). Nearby rainbow-hued cylinders, each about 16 cm in length, appear to have been part of the same elaborate sculpture (f). Photos: Arturo Godoy and Jorge Pérez de Lara.

Water Bird Lid—Sector D6

Near the assemblage above, and perhaps forming part of it, was a more interpretable set of stuccos (Figure 3.65). Although fragmented into several pieces, these pink and white shapes doubtless represented the lid of a vessel. Similar lids abound in ceramic, all from the Early Classic period (e.g., K4876, K5834, K9121). The stuccos exhibit a design that consisted of a water bird, a richly painted fish caught within its bill. The initial coat was a pale white-pink, followed by a more saturated pink. Short lines in green highlighted the design, especially on the fish fins.

Figure 3.65. Pink and white stucco fragments formed the head of a water bird (top left), its bill catching a leaping fish, ca. 18 cm in length (bottom left); additional view of bird head and fragments (facing page). Photos: Jorge Pérez de Lara.



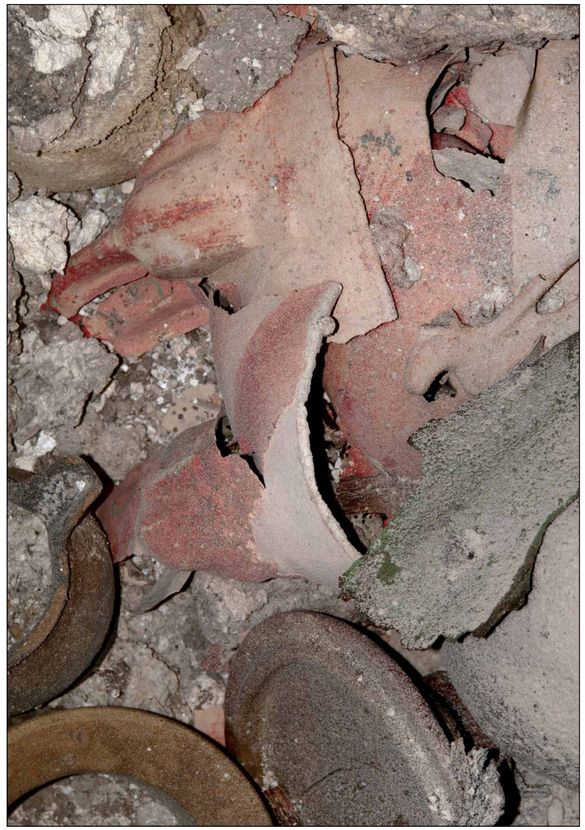


Figure 3.66. A perishable stucco vessel featured four peccary snout feet (above) beneath the wide curvature of what was likely a tetrapod bowl, some 22 cm in diameter (left). Photos: Arturo Godoy.

Peccary-Snout Tetrapod—Sector D6

Just to the east of the water bird lid were the likely remains of the vessel it covered (Figure 3.66). Also of pale pink and white, with highlights in green, and curving fields of alternating pink and white, this was clearly visible in the tomb during excavation—only a few fragments could be lifted whole because of its extreme delicacy. Four peccary snouts supported the vessel, their noses "groveling" downwards, a position in which peccaries root for food in the jungle undergrowth. Delicate lines mark their eyelashes.

Red Object—Sector D10

When first seen, prior to crumbling within the tomb, this object seemed to represent another peccary-snouted bowl like the object above, if with more saturated red coloring.

Red Lid—Sector D11

A red lid, almost certainly over now-perished wood, appeared in this sector (Figure 3.67). Its outline was circular with a flat rim and an everted central section.

Figure 3.67. A circular red lid, approximately 16.5 cm in diameter, that probably once covered a wooden base. Photo: Arturo Godoy.

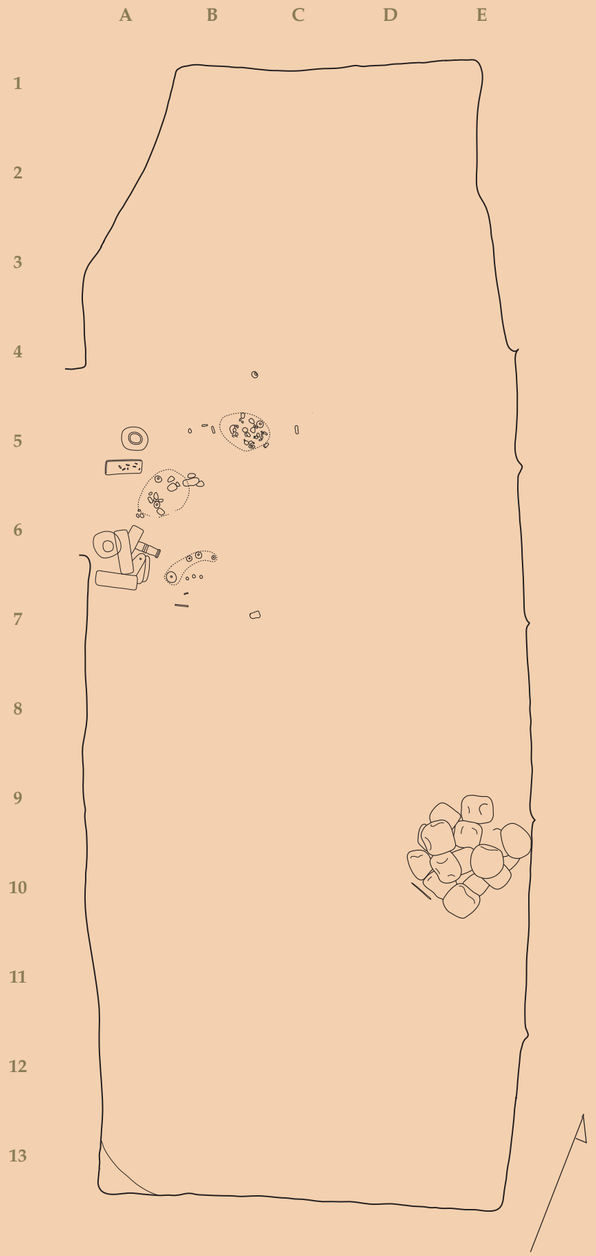
Green Slab-Footed Vessel—Sector C10/C11—With Lid—Sector D10/D11

On-site and subsequent conservation succeeded in lifting a complete lid with flat rim and upthrust central section, much like the red lid above, perhaps as a contrastive, green mate to that object (Figure 3.68). The shape is consistent with the covering of a cylindrical vessel. Nearby, in Sector D10/D11, were visible remains of what seem to have been slab-feet, all of exceptional delicacy.

Miscellanea—Sectors D1/E1 and B10/C11

The list of stuccoes does not exhaust the finds of other perishable objects. Vessels 23a and 23b held a thick accumulation of fragments, some doubtless from the bier's covering but others of delicate painted gourds or wooden vessels, ranging in hue from green to dark red. One fragment, clearly visible in close-up, initial photographs of the tomb, displays a figure with a jaguar kilt (see Figure 3.92). Other fragments nearby also show signs of fine painting with black lines. Most of these pieces were conserved during subsequent lab work. To the far northeast of the tomb was another piece, of intense, almost scarlet red, but perceptible only as a scattering of thin, pulverized stucco. Very little of this stucco shows the resinous streaking that characterized the bier, suggesting that its wood backing was of a different type.

Figure 3.68. Fragmented remains of a flat lid of green stucco, ca. 17 cm in diameter, may have been the cover to a slab-footed cylindrical vessel of the same light green stucco. Photo: Jorge Pérez de Lara.



Minerals/Rocks

In addition to jades (treated separately below and in Appendix I) other inorganic rocks and minerals found within Burial 9 include obsidian, cinnabar, hematite, pyrite, and mica, in variable quantities (Figure 3.69). These materials carry symbolic associations based on their intrinsic properties (color, hardness, reflectivity, translucence, etc.). They also represent valuable trade items and index not only the king's wealth, but his ability to create, maintain, and control those riches.

Cinnabar

Cinnabar, a naturally occurring mercuric sulfide (HgS), is a mineral well known to have been prized by the ancient Maya, perhaps because its bright red color symbolized blood and blood sacrifice (Houston et al. 2009:30-31; Pendergast 1982b:533). Coating deceased bodies, particularly royal bodies, with this symbolic blood may have been a way of signifying rebirth after death among the Maya (Fitzsimmons 2009:83). At El Diablo, the bones of the tomb's main occupant were heavily coated with cinnabar, a process which, unfortunately, appears to have affected their preservation (see Chapter 4).

Figure 3.69. Plan view of Burial 9, with rocks and minerals in the grave assemblage, including objects of jade. Drawing: Stephen Houston.

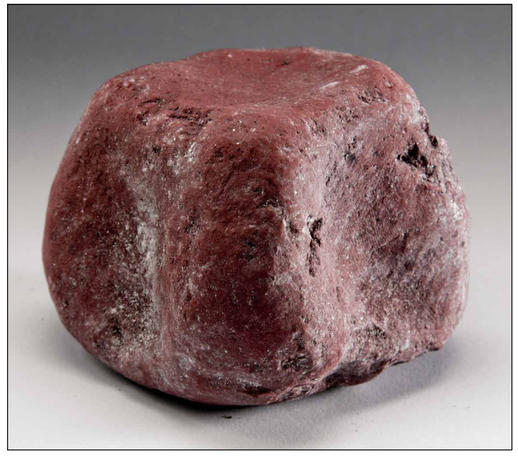


Figure 3.70. Fifteen cubes of specular hematite: (top) found piled atop one another at the southeastern end of the tomb chamber; (bottom left) one of the cubes in the laboratory; (bottom right) the cubes were set atop a woven mat, which also left imprints on the undersides of the hematite squares. Photos: Arturo Godoy and Jorge Pérez de Lara.

Figure 3.71. Obsidian blade found near the king's right hand. Photo: Arturo Godoy.

Hematite

Hematite, the mineral form of iron oxide, is generally a darker, more brick-red color than cinnabar, though it also has a more lustrous quality. Hematite was also found associated with the main body in Burial 9. Like cinnabar, the blood-red color of hematite (from which the mineral gets its name) may have served as a symbolic representation of this vital fluid. Layering of pigments and thick, dark mud around the body of the king (see Chapter 4) suggests that they may have been applied in liquid form, as a water-based paint, not coincidentally much like actual, viscous blood.

This hypothesis is buttressed by much larger quantities of the pigment found as an offering within the tomb. Fifteen brightly colored cubes of specular hematite were piled up towards the southeastern end of the burial chamber (Figure 3.70, see Appendix I). These cuboidal "pigment cakes" were relatively regular in size and shape, molded by hand to roughly 6.4 cm in each dimension. The way in which the specular hematite was mixed with an unknown binder (probably a clay) to form such regular, transportable cubes suggests two things: that the Maya could have easily transformed the mineral into a more malleable form to cover the king's body, and that the consistently shaped cubes represent standardized import quantities of this highly prized material. Most had been flattened, pinched to create their trapezoidal section, and positioned on a flat woven mat of rushes, a *petate*. The seepage of water that undermined the walls of the tomb contributed to a slight melting of the cakes, leaving a clear imprint of the mat on the base of several cakes (Figure 3.70 bottom right). The presence of a needle nearby hints that these had originally been wrapped in cloth, probably sewn into a closed bundle with that needle. Similarly sized balls of copal at Tikal, from a special deposit in Str. 5D-1, as well as an "unidentified clayey material that may imitate copal balls with stick wicks" from a "Late Late Preclassic" tomb, Burial 85, supports the claim for standardized units (Moholy-Nagy 2008:36, Fig. 223a).

Obsidian

A single obsidian macroblade was found in the tomb at El Diablo (Figure 3.71). Details of the manufacture, sourcing, and uses of this blade can be found in Appendices I and II. The large and heavy blade (measuring 14.1 cm long, 5 cm wide, and 2.6 cm thick) was formed from El Chayal obsidian. One end of the blade was sharpened for cutting, while the other was intentionally dulled to serve as a handle, making it unlikely the blade was hafted. The lithic object appears heavily used and encrusted with organic material. Aoyama's microwear analyses (see Appendix II) confirm that the knife was used to cut bone, possibly in association with the human sacrifices cached within and outside the tomb. Its position close to the ruler's right hand leads to the suspicion that it had once been "held" by the deceased.

Pyrite

A square mosaic mirror recovered from the Diablo tomb consisted of small cubes of polished pyrite, set into layers of stucco above a clay substrate (Figures 3.72). Although some of the individual pyrite tesserae remain, most had deteriorated into a powdery yellow substance. As noted before, hieroglyphs painted in black but all illegible and each less than 1 cm in size, appear on the mirror backing. Along the sides of the clay mirror back, remnants of vividly painted stucco in green and red were visible. Mosaic mirrors of pyrite or other iron-ore minerals are known throughout Mesoamerica as decorative and divinatory objects, and courtly items often positioned near rulers in Maya imagery (e.g., Saunders 1988; Taube 1993b). One seems to have been looted or extracted from El Zotz at some point, a gift to the local dynasty from the ruler of El Peru (Houston 2008). The square shape of the Diablo mirror is rare, however, with the few comparative examples known from Baking Pot, Hatzcab Ceel, Pacbitun, and the collections of the American Museum of Natural History (Blainey 2007:206-217) and the University of Pennsylvania Museum (Danien 2002:Pl. 42).

Mica

Mica recovered from the Diablo tomb is limited to small fragments associated with the two jade mosaic masks (Figure 3.73). Mica was prized for its lustrous qualities, even to the point that it served as an additive to the paint used on Copan's Rosalila temple (Goodall et al. 2006). The material would have sparkled in combination with other reflective materials such as shell, obsidian, and the many highly polished jade tesserae of the mosaic masks (Stuart 2010:295).

Figure 3.72. Illegible hieroglyphs on the back of the tomb's pyrite mirror. Photo: Jorge Pérez de Lara.

Figure 3.73. Small fragments of mica found within Burial 9, most likely representing pieces of two jade mosaic masks. Photo: Arturo Godoy.

Figure 3.74. Remains of organic cordage around handles of Vessel 8, suggesting the jar was carried or hung. Photo: Arturo Godoy.

Woven Materials

The majority of preserved textile remains were recovered in association with the king's body atop the funerary bier. Several other types of woven materials, however, such as a grass or reed mat, a basket, and organic rope or cord, were found partially preserved or as impressions in association with objects placed on the floor of the tomb.

Woven Mat

Although the mat itself is not preserved, as commented above, several of the stacked cubes of hematite found in the southeastern corner of the tomb bear impressions from having been piled atop such a plaiting. The mat appears to have been fairly small, perhaps just wide enough to hold the hematite offering.

Basket

Beneath Vessel 21, the exploded storage jar at the southern end of the tomb, lay the remnants of a possible basket. The basket may have initially served to help keep the large jar upright, as its wide, globular shape would have made it slightly unsteady and unwieldy when full of liquid. Presumably, this woven object was toric in shape, converted by the exploded liquid in Vessel 21 into a chalky, friable material.

Organic Cordage

When Vessel 8 was initially found tipped onto on its side within the tomb, the remains of organic cordage were preserved around one of the jar's handles (Figure 3.74). The cordage appeared to have been braided and had a slight yellow tinge, hinting that it may have been the remains of leather. The cord about the handle of the vessel, along with its rounded bottom, indicate that the jar was probably carried or hung.

Another small sample of probable organic cordage was found in association with Vessel 21. This fragment was in significantly worse condition than the cord around the handles of Vessel 8, although it may have been used to secure a perishable cover over the top of the restricted neck of Vessel 21. Cordage was also found in Altun Ha Tomb B-4/7, but not in association with ceramics (Pendergast 1982a:65-66).

Figure 3.75. Textiles scattered atop and among other funerary offerings, most likely located atop the wooden funerary bier (top). The warp and weft of the textile fibers can still be seen (middle), as well as stacking of successive layers of fabrics (bottom).

Textiles

Textile remains from the Diablo tomb do not actually represent preserved cloth, but rather the mineralized remnants of ancient fabrics (Figure 3.75, detailed in Appendix V). The replacement of the original organic materials with inorganic minerals over time hardened the outline of the textiles' warp and weft and even preserved some of the macrobotanical signatures of the plant fibers. Thanks to this accident of preservation, raw materials, production techniques, some color, and even indicators of adornments could be noted at a microscopic level.

Textiles are rare finds in ancient Maya funerary contexts and almost unknown from the Early Classic period—the notable exceptions being the Margarita Tomb from Early Classic Copan (Bell 2002:96) and Tomb B-4/7 from Altun Ha (Pendergast 1982a:65). In Late Classic contexts, they serve mainly as the foundation for a royal body, as in Tikal's Burials 116 and 196. They may also represent the final "wrapping" of the entire assemblage of grave goods and occupants before sealing the burial chamber, as in the case of Tombs 1–3 in Palenque's Temple of the Cross (Fitzsimmons 2009:84). In many cases, the presence of woven textiles or weaving accouterments is interpreted as evidence of the production of cloth on the part of high-status female members of Maya society, a likely if unprovable supposition (Chase et al. 2008:127).

The textiles from Burial 9, however, served multiple functions in interring the king. Some of the textiles found within the tomb were closely associated with the royal body. These may represent a foundational layer between the corpse and wooden bier. Analysis by Margaret Ordoñez (see Appendix V), however, indicates that the textiles associated with the body of the main occupant show signs of having had objects sewn directly into the cloth. Deliberate sewing holes are visible within the warp and weft pattern, along with remains of an additional, larger variety of thread still present within the holes. This could be where some of the *Spondylus* clappers or *Conus* rattles of the king's belt assemblage were integrated into his clothing for wear, a hypothesis supported by a comparative sample of shell-studded cloth known from Early Classic Tomb 1 at Calakmul (Folan et al. 1995:321). As mentioned above, other textile fragments were recovered from atop Vessels 3 and 14, which each feature a hollow, globular lid atop a spouted bowl. The vessels are blackened and cracked from direct heat exposure. Along with the hollow space above to trap heat and moisture and the spout below to pour out excess liquid, this suggests that they were used to steam food, perhaps special tamales or *waaj* (Taube 1989), and that the thick layer of cloth atop the vessels provided insulation to keep them warm. Finally, thick bundles of stacked, multiple textiles were recovered from the southern end of the burial chamber. These may well represent tributary bundles of cloth, which, like the cakes of hematite pigment nearby, represented valuable items of trade

and underscored the economic clout of the king.

Wood

Wooden remains inside the Diablo tomb were extremely friable and preserved only in sparse bits interspersed above and among other artifacts within the burial chamber. However, slightly more robust materials preserved the impressions or outlines of wooden objects within the tomb, such as the funerary platform and several stucco-coated wooden objects.

Funerary Bier

The dispersed remains of wood within Burial 9 indicate that the king's funerary bier was roughly 2 m in length and 50 cm high, set above the carefully placed lines of ceramic vessels on the floor of the tomb. As suggested in the earlier discussion of ceramic vessels, the artifact-free space in the quadrants of Row 5 within the tomb may have been the location of the northern supports for the wooden platform. As noted above, the bier was covered in a thin layer of stucco, painted bright green, which preserved the impression of the wood grain and the shape of some of the individual beams used to construct the bier. This object was most likely a *teem*, a long, low throne acquired in life and used in death (see Chapter 2 for full description). Being made of wood, this platform probably deteriorated after a century or so, its ruination furthered by water penetrating the tomb and affecting its supports, probably by the softening and sloughing off of wall blocks as well. The patterns in which objects atop the bier appear to have fallen or slipped to the western side of the tomb suggest that the supports to the king's right gave way first.

Wooden Vessels and Sculptures

Several of the elaborate stucco objects found within the tomb appear to have had a wooden base. The wood would have provided a suitable substrate for carving the desired shapes and would also have lent stability to the final products (see "Painted Stuccos" above).

Shell

Shells, pearls, sea urchins, and other marine artifacts are common inclusions in royal interments of the Classic-period Maya, particularly at sites such as Altun Ha, Calakmul, and Tikal. The Late Classic tomb of Jasaw Chan K'awiil from Tikal (Burial 116) provides an excellent example, with stingray spines and fish vertebrae laid below the king's body, shells set at his feet, below his head, and throughout the burial chamber, and lines of *Spondylus* shells covering his arms, torso, and legs (Coe 1990:2:604-606). These careful shell alignments may represent an attempt to create iconographic watery bands within tombs, while other marine artifacts metaphorically transformed the burial chamber and created a sense that

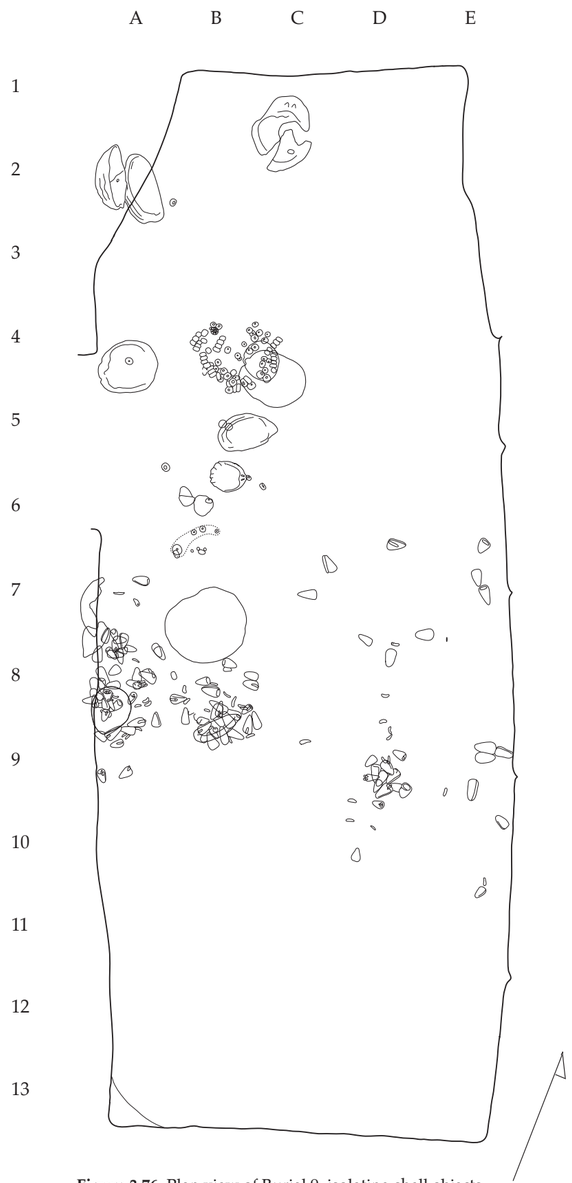


Figure 3.76. Plan view of Burial 9, isolating shell objects. Included, at B4, is a concentric array of pearls on backing of jade; the pearls crumbled to powder on contact. Drawing: Stephen Houston.

Figure 3.77. A large *Spondylus* shell rests face-down atop the fragmented Vessel 12 in the lower portion of the photograph. Photo: Arturo Godoy.

the ruler had been physically immersed within a cave or placed on an underworld surface (Fitzsimmons 2009:90-92).

In the tomb at El Diablo, however, the numerous shell artifacts associated with the body of the king served as functional components of his elaborate funerary regalia, rather than solely as metaphorical symbols. Over one hundred shell ornaments composed his rattling dancer's belt, along with two necklaces comprised of hundreds of worked shell beads (one found in association with the ruler, the other with the remains of a young child in one of the lip-to-lip caches) and several marine shell fragments forming pieces of composite objects, such as mosaic jade masks (Figure 3.76). Yeny Myshell Gutiérrez Castillo identified and analyzed both the worked and unworked shells of the collection from El Diablo, and the descriptions of those materials included here are translations of much of her work (e.g., Gutiérrez Castillo et al. 2013). Although the taxa of heavily worked shell objects and smaller fragments could not be identified, the El Diablo assemblage primarily includes two distinct species, *Spondylus calcifer* and *Conus spurius* (*Spondylus princeps* may be represented as well, but could not be conclusively identified).

Spondylus

The *Spondylus* genus includes large, tropical bivalve molluscs found in warm, moderately deep waters. *Spondylus calcifer* Carpenter, more commonly known as the spiny oyster, is the largest of the American *Spondylus* and distinguished by a wide, purplish-red band around the inner margin of the valves. This particular species is relatively easy to harvest, as it is found just below the low-tide line on Pacific beaches from California to Peru (Carter 2011:63; Keen 1971:96). *Spondylus princeps* is slightly smaller and more delicate than *Spondylus calcifer*, often a more uniform coral-red color, the denizen of slightly deeper water, some 3 to 5 m below the ocean surface (Carter 2011:66). Imported varieties of *Spondylus*, including *Spondylus calcifer,* have a long history as valuable elite goods. Widely traded throughout the Americas, they have been found as both raw materials and worked objects at considerable distances from their natural habitats in Early Formative (Pires-Ferreira 1978:87-94) and even Preceramic contexts (Carter 2011:63; Pillsbury 1996:313).

Figure 3.78. One of the large *Spondylus* shells found in the Diablo tomb (at right). The shells were perforated by small holes and paired with beads, also of *Spondylus* shell, to form rattlers or clappers (below). Photo: Jorge Pérez de Lara.

Figure 3.79. Burial 9's *Spondylus* shells with evidence of reworking or repair, with holes patched by neatly cut fragments of other shells. Photo: Jorge Pérez de Lara.

The tomb at El Diablo included ten complete and four fractured *Spondylus* shells, eleven of which could be identified to the species level as *Spondylus calcifer*; these range between 10.6–20.4 cm long by 9.5–16.1 cm wide (Figures 3.77 and 3.78). Two smaller shells, ranging between 7.3–10.5 cm in length by 10.0–11.9 cm in width, may represent examples of the other *Spondylus* species commonly found in archaeological contexts throughout Mesoamerica and South America, namely, *Spondylus princeps*. A final shell represents an additional member of the *Spondylus* genus, but could not be identified to the species level.

Twelve of the fourteen *Spondylus* shells from the El Diablo assemblage are perforated by small pairs of drilled holes, in addition to natural perforations most likely made by sponges, worms, and smaller bivalves (Figure 3.78; Keen 1971:96-98). These shells also showed signs of having once held or been painted with red pigment,

similar in color and texture to the large quantities of specular hematite found within the tomb (described above). Each included a single bead, also carved from *Spondylus*, placed in the center of the halved bivalve. The drilled holes, the smaller associated beads, and the evident wear from contact between the large *Spondylus* shells and the beads they held suggests that these served as hanging rattlers or clappers (Figure 3.78). Some of the larger shells showed clear evidence of meticulous patches, imperfections filled with additional pieces of *Spondylus*, neatly cut and polished (Figure 3.79).

In addition to the *Spondylus* clappers, 59 shell beads, also seemingly carved from *Spondylus*, formed the bulk of the necklace worn by the deceased ruler (Figure 3.80). These beads make up a largely irregular collection of flattened disks, rounded cylinders, and thicker tube-like shapes, ranging from 12–27 mm in diameter and 2–16 mm in thickness.

Figure 3.80. Beads of worked *Spondylus* forming a necklace worn by the king, block-lifted from the tomb chamber (left) and excavated in the laboratory (below). Photos: Arturo Godoy and Jorge Pérez de Lara.

Figure 3.81. Like the whole bivalve shells, the *Spondylus* beads also revealed signs of repair with small circular pieces of shell and thick coatings of cinnabar to disguise patches. Photos: Jorge Pérez de Lara.

Figure 3.82. Assemblage of nearly one hundred *Conus spurius* shells scattered throughout the tomb chamber, dislodged by the disintegration of the wooden funerary bier. Photo: Arturo Godoy.

Figure 3.83. The *Conus spurius* shells were drilled through the apex, allowing them to hang, and each contained at least one dog canine to produce a series of clinking rattles. Photos: Jorge Pérez de Lara.

Most of the beads of the necklace were cylindrically drilled, but several were biconically or conically perforated. Not only does the necklace lack uniformity in the shapes and manufacture of its components, but several of its beads show signs of reuse and repair, including, as with the larger shells, small plugs of shell to disguise imperfections or change the threading orientation of a bead. Several of the beads were found covered in a thick coating containing cinnabar, further hiding the evidence of their repair or reuse (Figure 3.81).

Conus spurius

Conus spurius is a predatory sea snail, one of about 500 similar marine gastropod molluscs of the family Conidae, distinguished by their cone-shaped, univalve shells and the neurotoxic venom, injected into prey via a tiny harpoon-like tooth, which all species possess. Even modern collectors prize the shells of the Conidae family, which provides some of the most highly valued shells in the world. The smooth shell of this species is generally cream to white in color, decorated with spiraling rows of irregular yellowish-orange squares (the alphabetic letters many collectors "see" in these patterns give the shell its common name, the "alphabet cone"). *Conus spurius* is common in the Caribbean, normally found on sand at depths between 1–50 feet (Abbott 1996:160).

The El Diablo assemblage includes 98 worked *Conus spurius* shells (Figures 3.82 and 3.83). The relatively high spires of the shells were removed, most likely using a percussion method to break the tips off of the otherwise smooth whorl of the shell. Each of the shells has a small hole drilled through its base as well, allowing the cone to hang with the broken-off apex downward. These shells also contained at least one dog canine (and in some cases, up to three teeth), drilled through the root (see below). The opened cone shells, with their clinking teeth inside, formed a rattling dancer's belt at the king's waist (Houston et al. 2006:267).

Unidentifiable Shell Objects

Several of the shell objects within the tomb were intensively shaped and polished, making taxonomic identifications difficult. Among these are two roughly triangular-shaped pendants. The pieces each measure approximately 45 mm long, 18 mm wide, and 4–6 mm thick. Fine lines are incised into the surface of the shells, along with two conical perforations, presumably to allow the objects to be hung. Although the disturbances in the tomb over time displaced many objects from their original positions, these pendants were found together in the north-central part of the tomb, suggesting they may have once formed elements of the king's headdress.

The shell beads of a second necklace found within the tomb also eluded taxonomic identification. Approximately 400 small beads, some articulated, were recovered from one of the tomb's lip-to-lip vessels (Vessel 16), along with the dental remains of a child approximately four to five years old. Although it is possible that these beads represent multiple necklaces or a necklace that originally consisted of multiple strands, the beads were restrung on a single thread following excavation, reaching a total length of 75 cm (Figure 3.84). The necklace included two general types of beads, many of which were burnt. The first type measures 3–4 mm wide and 2 mm in thickness, while the second type is more irregularly shaped and measures only 1–2 mm wide.

Finally, several unidentifiable shell fragments were found in association with the tomb's two jade mosaic masks. These small cut pieces of shell formed part of the headdress, eyes, mouth, and teeth of the jade masks. Although the fragments are too small and worked to be identified, they appear to have been hewn from larger bivalves, based on the front and back surfaces of the small pieces.

Figure 3.84. Necklace of hundreds of tiny shell beads found within Vessel 16, along with the dental remains of a young child. Photo: Jorge Pérez de Lara.

Figure 3.85. Carved Early Classic scene from Bonampak, showing two figures wearing belt assemblages with masks, plaques, and celts at the small of the back. Photo: BAMW Photography.

Jade

Although the quantity and quality of jades and other greenstone materials interred with rulers of the Classic period varies (Fitzsimmons 2009:88), jade's linkage to themes of centrality, rulership, breath, and life essence made it a key component of ancient Maya funerary rites and rituals (Taube 2005:28-32). Moreover, in addition to its symbolic meanings and associations, jade embodied the substantial efforts required to obtain, transport, produce, and finish the objects carved from this hard material (Taube and Ishihara-Brito 2012:140-145).

As in the case of the worked shells found within the El Diablo tomb, the majority of the jade objects formed elements of the king's royal regalia. Comparative Early Classic iconography shows rulers with a complex jade belt assemblage worn at the small of the back, clearly depicting several of the elements identified from the El Diablo tomb: a jade mask, plaques, and celts (Figure 3.85). Many of the jade objects from El Diablo, like the shells described above, also showed evidence of having been reused or repaired for their purpose as part of the king's adornments.

This chapter provides a basic descriptive inventory of these worked jade objects, which include plaques, celts, earspools, beads, and mosaic fragments. For a full treatment of the El Diablo jade assemblage, including potential sourcing and production technologies, see Appendix I.

Figure 3.86. Jade earspools: (inset photos) two large jade earspools were likely attached to the ruler's headdress; (background) two smaller jade earspools formed part of a mosaic mask on the ruler's belt assemblage. Photos: Jorge Pérez de Lara and Arturo Godoy.

Jade Earspools

Burial 9 contained two large earspools likely worn by the ruler and two smaller versions associated with the jade mask from his belt assemblage (Figure 3.86). The king's earspools appear to have been carved from a single jade cobble and hollowed out, reserving material for the future creation of beads or other objects, none of which were found in the tomb. One of the earspools measures 8 cm long, 7.4 cm wide, and 0.3 cm thick, while the other measures 7.65 cm long, 7.45 cm wide, and 0.3 cm thick. Four small holes, biconically drilled into the sides of each of the earspools, probably attached them to the king's larger headdress assemblage or affixed some now-missing internal element. The smaller earspools were cut from high-quality jade similar to that of the bead placed in the king's mouth. These two smaller earspools each measured roughly 1.1 cm long, 1.05 cm wide, and 0.15 cm thick.

Jade Plaques

Four jade plaques were excavated in Burial 9, forming part of the king's belt assemblage and recovered from beneath the remains of the body toward the western edge of the tomb (Figure 3.87). Made from a single core, the four plaques form two distinct pairs in terms of size: one is 10.4 cm long, while the other pair is 12.4 cm long. All four are remarkably similar in width (roughly 4.2 cm) and thickness (approximately 1.35 cm). One pair of plaques was worked along its narrow, long edges; the other pair was similarly worked, but along its broad faces. In each rectangular jade block, a long, thin trench was cut into the material, later repaired with small, polished inlays. Four conically-drilled holes were made in each block as well, one on either end of the sawn trench and two additional holes, centrally placed in each of the sides adjacent to the side with the trench.

Figure 3.87. Jade plaques from ruler's belt assemblage, made from a single core, with signs of sawing, drilling, and later repair work. Photos: Jorge Pérez de Lara.

Jade Celts

In addition to the jade plaques, three jade celts were also incorporated into the ruler's belt assemblage (Figure 3.88). The three celts are nearly identical in shape and size, each measuring approximately 8.5 cm in length, 4.0 cm in width, and 0.35 cm in thickness. As Zachary Hruby has noted (see Appendix I), the three pieces were all sawn from a single celtiform axe. One of the celts showed signs of a manufacturing imperfection (a small divot created when the original axe was divided), which was later polished smooth.

Figure 3.88. Three jade celts, all formed from a single celtiform axe, were part of the king's belt assemblage (below). The celts were found together with the jade plaques, also part of the belt assemblage (above). Photos: Arturo Godoy and Jorge Pérez de Lara.

Jade Beads

Two jade beads were found within the Diablo tomb (Figure 3.89). The first was associated with the ruler's jade belt assemblage, while the second bead was found among the king's cervical vertebrae, most likely originally placed in the mouth of the deceased.

The jade bead associated with the belt assemblage is roughly tubular in shape, with three holes drilled vertically into one side of the bead, most likely to support each of the three jade celts. The tubular bead, measuring 6.7 cm long, 2.25 cm wide, and 1.25 cm thick, was also decorated with chamfering at either end and is oval-shaped in cross-section.

The bead placed within the king's mouth is semi-spherical in shape and carved from brightly polished, high-quality jade. Although placing a jade bead in the mouth of the deceased is a common practice among the ancient Maya (Ruz Lhuillier 1968:459), the bead found with the ruler in the Diablo tomb is slightly unusual in its shape. The large diameter of the hole through the center of the bead and its straight sidewalls suggest that it was drilled with the intention of preserving the core of the material. This bead measured 1.55 cm in length, 1.5 cm in width, and 1.05 cm in thickness.

Figure 3.89. Long tubular bead associated with the king's belt assemblage (top), with rounder bead of higher quality jade most likely placed within the mouth of the deceased (middle and bottom). Photos: Jorge Pérez de Lara and Arturo Godoy.

Jade Mosaic Masks

Two separate mosaic masks, comprised mainly of jade tesserae with additional fragments of shell and obsidian, were found associated with the body of the king at El Diablo. One mask (Mask 1), reconstructed by conservators, represents the jade mask associated with the celts and plaques of the king's belt assemblage, originally worn facing outward at the small of the ruler's back (see Figure 3.86 and Appendix III). The second mask (Mask 2) was probably worn in front, on the king's chest. Although the jade tesserae of the two masks were cut and shaped to fit together, they are slightly rounded and loose-fitting and, according to Zachary Hruby (see Appendix I), may represent the reuse of debitage produced during the manufacturing process of other, larger pieces. The exterior surfaces of the mask tesserae are highly polished, bulge slightly outward, and were constructed atop a backing and held together with organic materials (see Appendix III). It is likely that the bottom of Mask 1 is securely reconstructed, but the upper portion may be a more speculative assembly because of difficulty in establishing clear fits.

Jade Dental Incrustation

Two small, roughly circular fragments of jade were inlaid in the left, second upper incisor of the ruler (see Figure 4.19, page 192). The material is worked but slightly unfinished, with saw marks visible and rough shaping. These tiny pieces of jade were polished only on the exposed side, with the underside left rough, perhaps to aid in the material's adhesion to the tooth. Only one of the two jade inlays could be measured, but they are similar in size, with dimensions of roughly 0.35 cm long, 0.35 cm wide, and 0.15 cm thick.

Faunal Remains

The faunal artifacts found within the Diablo tomb represent both partial remains of the funerary feast interred with the king and non-subsistence uses of animal bones.

Dog Canines

Along with the *Conus* shells described above, the dancer's belt worn by the king included 117 canines of a fairly large New World dog species, perhaps one of the larger furred or hairless breeds represented in contact-period Aztec codices (e.g., Codex Magliabechiano CL. XIII. 3). As noted above, each of these canines was drilled through the root and suspended within a *Conus* shell (some shells held as many as three), creating nearly a hundred small bells or rattles worn on the king's lower body (see Figure 3.83).

New World Quail Skeletons

Vessel 18, a polychrome serving vessel with a howler monkey effigy lid, contained the remains of two nearly complete specimens of New World quail (of the genus *Colinus*; Figure 3.90). Quail, particularly of the *Colinus virginianus* variety, were favored as sacrifices among the Zapotec (Marcus and Flannery 2000:407), who regarded them as "clean" or "pure" animals due to their habit of drinking water from dew drops. They were also used as food offerings among the Mixtec (Boone 2007:42) and the Aztec (Parsons 1933:615), for whom they were intimately associated with the myth of creation (Taube 1993a:38). Among the Maya, complete *Colinus* skeletons are a frequent inclusion in Early Classic burials and caches, including a cache at nearby Bejucal (Garrison and Beltrán 2011:295), Burial 24 at El Peru (Rich 2011:251), and interments from Dzibilchaltun and Uaxactun (Pohl 1983:61).

Figure 3.90. Vessel 18 with nearly complete skeletons of two New World quail. Photo: Arturo Godoy.

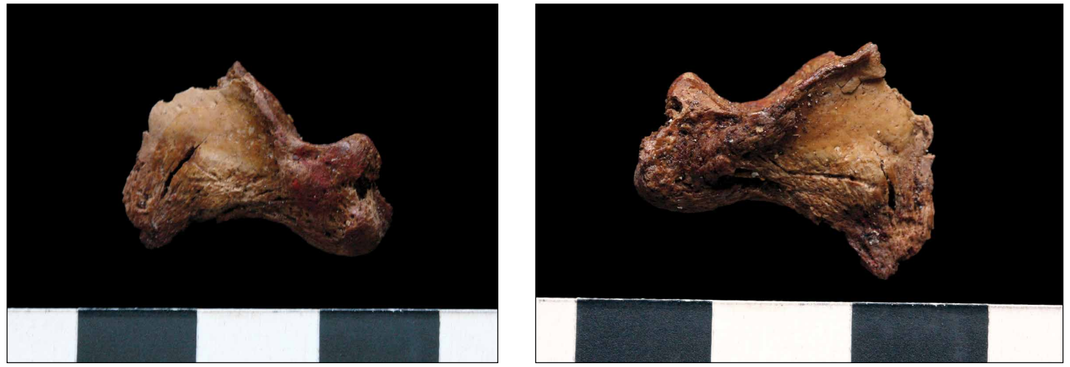


Figure 3.91. Front and back views of a single third phalanx of a small felid, possibly part of pelt or kilt. Photos: Andrew Scherer.

Figure 3.92. Figure with kilt of feline pelt, Vessel 23. Photo taken just after tomb opening, from above the vault. Photo: Arturo Godoy.

Figure 3.93. Thin bone needle found near stacks of hematite, perhaps used to sew or fasten bundle with mineral cubes. Photo: Stephen Houston.

Felid Phalanx

The third phalanx of a medium-to-small felid was found with the body of the ruler in the Diablo tomb (Figure 3.91). Though slightly broken, the phalanx measures roughly 2 cm long, 1 cm wide, and 0.5 cm thick (at its proximal end), suggesting it could potentially represent the phalanx of an ocelot (*Leopardus pardalis*). The bone was recovered just to the south of the tomb's central axis, associated with the pelvic region of the king's body. It is possible that the phalanx represents the remains of a pelt used as part of the king's clothing (perhaps a kilt; see Figure 3.92 for image of jaguar kilt on perishable bowl in Vessels 23a/23b); however, with only a single phalanx recovered, this interpretation remains speculative.

Bone Needle

A single bone needle was recovered from the southeastern area of the tomb chamber (Figure 3.93). The needle has been sawn and smoothed to a bluntly conical point, with a slender tapering shape and circular cross-section. The intensive shaping, smoothing, and polishing of the object prohibits identification of the animal species from which it was manufactured. Perhaps the needle was used in the manufacturing of the textiles recovered from the tomb, or to seal a bundle containing the specular hematite cakes, though these possibilities remain speculations.

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 Sonnery
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 Bioleaching: 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 Extrémité supérieure 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 mascara 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 Axpuac, 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*. Academische Druk- 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 Ñuu 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 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 mascara. 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, Barnardsville, 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 Dominque 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, Kjel 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, Barnardsville, 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 periodo Clásico Temprano en Uaxactún, 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 Uaxactun 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.