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From Crafting to Caching: Technological and Iconographic Analyses of Blue Creek Cache 37

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ABSTRACT

This paper presents technological and iconographic analyses of a Late Classic (A.D. 600–830) lithics cache recovered from the ancient Maya site of Blue Creek, Belize. The cache consisted of 21 obsidian prismatic blades and a number of chert artifacts, including 21 stemmed bifaces, a large laurel leaf biface, and a tridentate eccentric. The technological analysis of the stemmed bifaces identified three distinct stem production techniques that may be attributable to a combination of idiosyncratic knapping gestures and laterality, or handedness. A survey of Maya iconography demonstrated that large laurel-leaf bifaces and tridentate eccentrics occur in scenes depicting sacrifice and the burning of human remains, often by ritual specialists titled ch’ajoom, or “person of incense.” It is suggested that the presence of a large laurel-leaf biface and tridentate eccentric in the cache may indicate that Blue Creek was the residence of ch’ajoom at some point during the Late Classic period.

The functional dimension of ancient Maya caches has long been recognized (Coe 1959). These ritual deposits served to imbue and terminate the life force of structures and artifacts, commemorate deceased ancestors, mark calendrical events, and define/protect sacred space (Agurcia Fasquelle, Sheets, and Taube 2016; Becker 1993; Chase and Chase 1998; Coe 1959). It has also been demonstrated that the types, counts, arrangement, and raw materials from which cached objects were produced embodied Maya ideology and cosmology (Freidel, Schele, and Parker 1993; Mathews and Garber 2004). Despite spatiotemporal variation, broad patterns have been identified in Lowland caching practices, including the use of chert and obsidian eccentrics as primary cache elements during the Late Classic period (Agurcia Fasquelle, Sheets, and Taube 2016; Aoyama 2006; Pendergast 2006; Stemp et al. 2018). This paper contributes to the aforementioned studies of caching behavior by employing technological and iconographic analyses to examine a Late Classic eccentric cache from Blue Creek, Belize. The results of our study demonstrate that technological analyses can provide information concerning the production and acquisition of cache objects. Furthermore, iconographic analyses illuminate references by cached artifacts to the supernatural, social categories, places, and acts.

Symbolic and Technological Dimensions of Eccentrics

Studies of eccentrics, defined here as non-utilitarian flaked stone objects, have transitioned from appreciations of exotica to identifying them as artifacts encoded with important information concerning Mesoamerican worldviews (Carballo 2011; Hruby 2007; Iannone and Conlon 1993; Stemp et al. 2012, 2014). The symbolic dimension of these artifacts is multi-layered and complex, drawing upon not only morphology, but also raw material properties. Karl Taube (Agurcia Fasquelle, Sheets, and Taube 2016, 16–19) notes that the Maya attributed the origins of chert and obsidian to lightning.
strikes, a view shared beyond the borders of Mesoamerica and maintained by many contemporary Maya (Brown 2015). Thus, these stones did not reside in the realm of mundane raw materials, but instead referenced Chalchi and K’awiil, deities of rain and lightning (Taube 1992). Eccentrics could have retained the essence of these gods or minimally, if inert, a direct linkage that provided a different kind of power through association with the divine (Agurcia Fasquelle, Sheets, and Taube 2016, 16–19; Houston 2014, 25). These stones were also integral to Maya color directional symbolism, perhaps even referencing specific places. Obsidian in Maya art is “denoted with the Ak’bal sign signifying darkness as well as blackness, a color solidly identified with the west in Maya thought” (Agurcia Fasquelle, Sheets, and Taube 2016, 12). Houston (2014, 25) suggests the Maya may have associated obsidian with Central Mexico, as it is depicted most frequently in monuments employing Teotihuacan imagery. Such a connection would have been largely symbolic, as the Lowland Maya were aware that the vast majority of obsidian available in local markets originated in Highland Guatemala. Chert, in contrast, was recognized as local stone associated with the Maya Lowlands, and by extension Kinich Ajaw, the diurnal sun god that rises in the east (Agurcia Fasquelle, Sheets, and Taube 2016, 14–15). Multiple authors have also commented on the multi-sensory experience of working these materials—the raucous sound and occasional spark—invoking themes of violence and perhaps warfare (Agurcia Fasquelle, Sheets, and Taube 2016, 16; Houston 2014, 25; Zender 2010).

In rare occasions the ventral surface of obsidian flakes or blades served as a canvas for incised or painted depictions of deities, animals, and other phenomena (Hruby and Ware 2009; Moholy-Nagy 2002), but in most cases artifact morphology is the primary signifier. The deciphemer of Maya eccentrics is complicated by a vast repertoire of forms (Meadows 2001, 2003) that is not found in other areas, such as Highland Mexico (Carballo 2011; Parry 2014; Stocker and Spence 1973). Some forms, such as the centipede or scorpion zoomorphs, are easily recognizable even though their broader symbolism may be abstract. For others, the iconography and inscriptions present on monuments and ceramic vessels provide an essential guide. For example, without reference to Maya art, eccentrics depicting the maize god (Agurcia Fasquelle, Sheets, and Taube 2016, 29–37) are ambiguous, and could be argued to represent ancestors or historical personages.

This sentiment sets the stage for the following discussion of the Blue Creek eccentric cache, in that Maya art depicts a limited suite of eccentrics, thus providing contextual evidence concerning the function and meaning of these objects. In addition to examining the Blue Creek eccentrics through the lens of iconography, we have also integrated a technological analysis, which carries the potential of greatly expanding the web of information obtained from caches. If the cache is viewed through the lens of chaîne opératoire, then technological analyses can provide early-stage information concerning artifact production, which in turn elucidates issues related to the acquisition of cached objects.

**History and Background**

**Blue Creek**

The site of Blue Creek is situated atop the Bravo Escarpment in northwest Belize, overlooking where the Rio Bravo and Rio Azul meet to form the Rio Hondo (Figure 1). This location along an important trade route linking the Caribbean coast with the interior southern lowlands, in conjunction with an abundance of highly productive agricultural land, fueled the city’s growth and prosperity. Two central plazas bounded by monumental architecture form the site core, which is surrounded by numerous residential groups distributed across 100–150 km² that span the socio-political spectrum (Guderjan 2007, 2016; Guderjan, Lichtenstein, and Hanratty 2003; Lichtenstein 2000). By the Terminal Late Preclassic period (A.D. 100–150), the site core had become an important central place. Current research suggests that an independent royal dynasty emerged during this period or the ensuing Early Classic period (A.D. 250–600). A dedicatory offering comprised of hundreds of obsidian blades and blade cores is associated with the earliest phase of Structure 4. Guderjan (2016) suggests this deposit may represent a mass bloodletting event associated with the seating of Blue Creek’s first king. Stronger support for this hypothesis comes from the Early Classic (ca. A.D. 300–400) five-paneled stucco frieze on the façade of Structure 9, which includes a mask depicting an ahau, or ruler. This frieze has been discussed in detail elsewhere (Grube, Guderjan, and Haines 1995; Guderjan 1998, 2007, 35–40, 2016), though the current interpretation is that it functioned to mark the building as a niktei’ na, or accession house for the city’s rulers (Wagner 2000). Structure 9 also exhibits architectural innovation in the form of a colonnade superstructure that supported a perishable roof, a style that would not become widespread until the Postclassic period.

The distribution of jade provides insight regarding the city’s wealth and political dynamics during the Classic period. Associated with rulership (Taube 2005) and considered “precious” by the Maya (Stuart 2006), jade is found in a wide array of contexts preceding the Late Classic period totaling almost 1500 pieces. Approximately 900 of these were recovered from three caches deposited as part of a single event ca. A.D. 500 within a masonry-lined shaft that penetrated Structure 4. Many of the jade objects are broken, suggesting they were ritually killed. This event has been interpreted as marking the termination of the Blue Creek dynasty (Guderjan 1998, 2007) and the city’s loss of independence. Following this event access to jade is severely limited as evidenced by the recovery of only 27 artifacts from later contexts. There is also a significant shift in the architecture of Structures 1, 5, and 9 from Petén-style pyramids to that of the coastal Belize zone (Guderjan 2016). It appears that construction projects in the site core ceased by the end of the Late Classic period, with almost complete abandonment of Blue Creek by the beginning of the Terminal Classic period (A.D. 830–850).

**Kin T’an and Cache 37**

Despite the cessation of construction projects within the site core and the site-wide loss of access to jade, many of Blue Creek’s residential groups experienced a construction boom during the Late Classic period. One such group, the Structure 37 plazuela, sits on a 14 m hill approximately 600 m northwest of the site core and forms the southern boundary of a larger settlement cluster known as K’in T’an. Plazuela groups represent extended family households, and are comprised of multiple structures surrounding one or more patios (Thompson 1931, 233). The final iteration of this plazuela consists of
seven buildings organized around two exterior spaces designated as Areas A and B (FIGURE 2). Hanratty’s (2002; Guderjan, Lichtenstein, and Hanratty 2003; Hanratty and Driver 1997) excavations determined that the group had a significantly different layout during the Early Classic period when only Structures 34 and 37 were in place. Structure 34, a shrine that sits on the eastern side of the plazuela, was constructed over a tomb and crypt dating to the Late Preclassic–Early Classic transition. During the Late Classic period, the architectural program expanded significantly, and the plazuela group appears to have transitioned from public ritual space to a private residence. Even so, Area B, where Cache 37 was discovered, remained a locus of ritual practice throughout the Late Classic period. The abandonment of K’in T’an during the Terminal Classic period was marked by the deposition of approximately 70,000 sherds, many resulting from partial or whole vessels, along the baselines of three different structures in what has been interpreted as a termination event.

Cache 37 was recovered from under the plaza floor in Area B, a few meters south of the Structure 34 shrine (FIGURE 3). The contents included 21 stemmed chert bifaces, a 35 cm long laurel-leaf biface, a perforated, tridentate eccentric, and 21 obsidian prismatic blades. Ceramic analysis places this deposit within the Late Classic to early Terminal Classic periods, though multiple lines of evidence suggest deposition during the former. As mentioned previously, eccentric-based caches are characteristic of the Late Classic period, and iconographic and archaeological examples of tridentate eccentrics date to the 7th–9th centuries (discussed below). Additionally, the inclusion of only El Chayal prismatic blades corresponds with Late Classic ritual obsidian consumption patterns for the region (Haines and Glascock 2016). No exact analog to Cache 37 is known from the Maya area, though a cache recovered by Thompson (1948) at El Baúl exhibits similarities. The following sections present the results of the technological and iconographic analyses of the chert artifacts. As the obsidian prismatic blades were not available at the time of analysis, they are not included in the ensuing discussion.

Cache 37: Technological Analysis

Stemmed bifaces

Chert stemmed bifaces have been reported at sites throughout the Lowlands, though in all cases they comprise a small fraction of lithic formal tool assemblages. Large examples with pronounced shoulders, such as those from Blue Creek Cache 37, are even rarer. One explanation for the paucity of this form may be related to the mass production of stemmed macrolutes at Colha during the Late Preclassic–Late Classic periods (Hester and Shafer 1994; Shafer and Hester 1983, 1991). While technologically distinct, these objects may have been functionally equivalent. However, this model loses explanatory power with distance from the Colha consumer sphere. Some of the earliest known examples of chert stemmed bifaces, made from a non-local “dark, fine-textured” chert, were recovered from early Late Preclassic (400–150 B.C.) contexts at Tikal (Moholy-Nagy 2002, 2011, 30). The characterization of these bifaces as having been produced from high quality, non-local brown to gray material is a common theme (Barrett 2004; Coe 1959; Hester, Shafer, and Berry 1991; Hruby 2006), perhaps suggesting the existence of an as yet unidentified workshop(s) in the Belize chert bearing zone. Current data indicate this biface form occurs with greatest frequency in Late Classic contexts (Andresen 1983; Aoyama 2005; Coe 1959; Healy 1990; Hester, Shafer, and Berry 1991; Kidder 1947; Pendergast 1979; Rovner and Lewenstein 1997; Willey 1972, 1978).

In terms of reduction sequence, the Blue Creek bifaces were produced from flake blanks struck from nodular chert. Eight of the bifaces retain the original blank platform on the distal end of the stem, three of which are cortex-bearing. Blanks were then shaped and thinned to produce an elongated ovoid bifacial
preform. The final step involved the creation of the tapered hafting element through the removal of flakes at an approximately 45° angle from the proximal corners of the preform. The technological analysis of the bifaces resulted in the identification of three distinct techniques for fashioning the hafting elements. We refer to these as Technique 1: single face; Technique 2: left corner only; and Technique 3: right corner only (FIGURE 4). By examining the height of the working edge in relation to the biface mid-plane and the directionality of flake scars, we were able to determine the orientation of the biface—in terms of which face was providing platforms—as the stem was created. In describing these techniques, we use “final flakes” to denote the last few flake removals that marked the end of the production process. In other words, there may be flake scars that deviate from the patterns described, but these occurred earlier in the sequence and have been partially obscured by later removals. The hallmark of Technique 1 is that final flake removals associated with the hafting element were struck from a single face. With Technique 2, regardless of which face is viewed, the final flakes were removed from only the left proximal corner of the biface. The same process is evident in Technique 3 with the exception that flakes were removed from only the right side of the stem. Technique 1 occurs with the highest frequency (n = 12), followed by Techniques 2 (n = 7) and 3 (n = 2). We argue this variation is attributable to the interplay of idiosyncratic knapping gestures and laterality, or handedness.

Flaked stone tool production is a form of bimanual action, and so reconstructions of flint knapping gestures must consider both hand/arm assemblages, one that wields the percussor and the other that supports and orients the objective piece (Uomini 2008). Gestures associated with the latter in particular have been shown to be idiosyncratic among both contemporary and prehistoric knappers, even when producing the same tool form (Uomini 2005; Whittaker 1987, 1994). If multiple artisans were involved in the production of the Cache 37 bifaces, we might expect to find evidence of different production techniques even though the finished tool morphology was intentionally standardized (Costin 1991). The results of the technological analysis match this expectation. Furthermore, studies of human and non-human primates have demonstrated that an increase in lateralization is positively correlated with the skill required to complete a manual task (Byrne and Byrne 1991, 2001; Steenhuis and Bryden 1989; Uomini 2008, 2009). Thus, if the bifaces represent skilled production, laterality may explain some of the variation in stem production techniques. Archaeological measures of skill are diverse (Bamforth and Finlay 2008, 5, table 1), though degree of standardization is often cited (Costin 1991; Clark 2003; Finlay 2008). Eerkens and Bettinger (2001; Eerkens 1998, 2000) present a strong case for the use of coefficient of variation (CV), defined as the ratio of standard deviation to the mean, as a robust statistical measure of standardization. They argue that a CV of 1.7% represents the highest degree of standardization that can be achieved in manual production, as humans are not able to detect variation below this level without the assistance of an independent measure. A CV of 57.7% represents the opposite end of the spectrum,
where production is random or exhibits intentional variation. Noting that some technologies (e.g., ceramic production) are more amenable to error minimization and correction than others, a CV of 10–15% is suggested as being indicative of standardized lithic production (Bamforth and Finlay 2008; Eerkens 2000, 666–667). Table 1 presents CV values at the technique and assemblage levels for the Cache 37 bifaces. At the assemblage level, only stem thickness exhibits variation outside the predicted range while the other metric attributes are within or below it, suggesting that the bifaces do indeed represent skilled, standardized production.

Laterality appears to explain Techniques 2 and 3 quite well. For example, the removal of flakes from only the left proximal corner while producing the hafting element (Technique 2) could be attributed to left-handedness. In such a case, the percussor would have been wielded by the left hand while the right hand supported the biface. After striking flakes from one corner, the biface would have been flipped in the right hand, and then additional flakes would have once again been removed from the left corner. The same process but opposite handedness (i.e., right-handed) accounts for the pattern exhibited by Technique 3. It should be noted that this is only a model, and that variation in biface support and orientation preferences could result in the “left corner only” technique being produced by a right-handed individual. What is important is not the identification of which hand is dominant in a specific technique, but rather the identification of the existence of different techniques and their association with distinct individuals. Laterality fails to explain Technique 1 where flakes were removed from a single face. Rather than being indicative of ambidexterity, we suggest that Technique 1 represents an idiosyncratic method of supporting the objective piece that relied on ulnar and radial flexion to orient the biface, rather than the flipping method. Ultimately the identification of lateralization is not surprising, as this phenomenon has been well documented for our species and immediate ancestors (Cavanagh et al. 2016; Cornford 1986; Rugg and Mulane 2001; Toth 1985; Uomini 2011). Instead, the association of different techniques with multiple artisans has important implications for the organization of ancient Maya craft production and
the acquisition of goods for ritual deposits. These issues are addressed in the closing discussion.

**Eccentrics**

We consider both the tridentate eccentric and laurel-leaf biface (FIGURE 5), which were produced from the same material as the stemmed bifaces, to be eccentrics. The form of the latter is ubiquitous, but extremely large examples such as the Blue Creek specimen (35 × 8 × 2 cm; 649 g) are non-utilitarian and have only been recovered from caches or burials (e.g., Coe 1959; Willey 1972). A similar biface nearly identical in length and width, but half the thickness and 132 g heavier, formed part of the Rosalila eccentric cache at Copan (Agurcia Fasquelle, Sheets, and Taube 2016). This object presents an excellent analog with which to elucidate the production process of the Cache 37 specimen.

Payson Sheets (Agurcia Fasquelle, Sheets, and Taube 2016, 72) suggests that after initial percussion shaping an indirect percussion technique was employed to thin the Copan biface, involving at least two artisans, one to support the biface and the other to operate the punch. Such a method increases precision and reduces the chances of production failure via stress fracture due to poor support of the biface. A similar technique was likely used for the Cache 37 biface. The Rosalila specimen exhibits pressure flaking along the lateral margins, but this technique was used sparingly for the Blue Creek specimen. A significant point of divergence concerns raw material morphology: the Rosalila biface was produced using tabular chert from an as yet unidentified source, while the Cache 37 biface appears to have been produced from nodular chert. The latter has a pronounced biconvex cross-section and small amount of cortex present on one of the tips. The Rosalila biface represents the pinnacle of Maya lithic production skill, but the artisans who produced the Blue Creek specimen were not far behind. The large size and thinness, as well as the small number of hinge and step terminations, support this observation.

The rarest technological attribute of the tridentate eccentric is the perforation. Contemporary and prehistoric

<table>
<thead>
<tr>
<th>Technique</th>
<th>Weight (g)</th>
<th>Length (mm)</th>
<th>Width (mm)</th>
<th>Thickness (mm)</th>
<th>Stem Length (mm)</th>
<th>Stem Width (mm)</th>
<th>Stem Thickness (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Std. Dev.</td>
<td>7.778</td>
<td>7.698</td>
<td>3.005</td>
<td>1.126</td>
<td>1.506</td>
<td>1.838</td>
<td>1.551</td>
</tr>
<tr>
<td>CV</td>
<td>12.54%</td>
<td>6.79%</td>
<td>5.96%</td>
<td>9.27%</td>
<td>8.34%</td>
<td>7.54%</td>
<td>16.47%</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>1.740</td>
<td>8.260</td>
<td>3.800</td>
<td>0.010</td>
<td>0.515</td>
<td>4.350</td>
<td>0.105</td>
</tr>
<tr>
<td>CV</td>
<td>2.83%</td>
<td>7.35%</td>
<td>7.44%</td>
<td>0.08%</td>
<td>2.24%</td>
<td>16.72%</td>
<td>1.38%</td>
</tr>
<tr>
<td>Left</td>
<td>55.067</td>
<td>107.906</td>
<td>50.129</td>
<td>11.137</td>
<td>18.674</td>
<td>24.436</td>
<td>8.557</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>5.722</td>
<td>4.434</td>
<td>3.309</td>
<td>1.190</td>
<td>2.177</td>
<td>2.992</td>
<td>1.369</td>
</tr>
<tr>
<td>CV</td>
<td>10.39%</td>
<td>4.11%</td>
<td>6.60%</td>
<td>10.68%</td>
<td>11.66%</td>
<td>12.24%</td>
<td>16.000</td>
</tr>
<tr>
<td>All Techniques</td>
<td>59.663</td>
<td>111.424</td>
<td>50.404</td>
<td>11.825</td>
<td>19.182</td>
<td>24.546</td>
<td>8.960</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>7.507</td>
<td>7.292</td>
<td>3.202</td>
<td>1.198</td>
<td>1.887</td>
<td>2.635</td>
<td>1.530</td>
</tr>
<tr>
<td>CV</td>
<td>12.58%</td>
<td>6.54%</td>
<td>6.35%</td>
<td>10.13%</td>
<td>9.84%</td>
<td>10.74%</td>
<td>17.07%</td>
</tr>
</tbody>
</table>

**Figure 5.** Blue Creek eccentrics: A) laurel-leaf biface, Cache 37, B) cruciform, Structure 4, and C) tridentate, Cache 37. All artifacts shown at same scale.
knappers used a number of methods for perforating chert, including the use of incipient cones and/or drilling. Incipient cones occur when a flat surface is struck, resulting in the production of a Hertzian cone that penetrates the objective piece but does not exit the opposite side. They can be identified by ring cracks present on the surface of objective pieces, or as a cone rising from the ventral surface of a flake (Whittaker 1994, 34). Incipient cones are often viewed as a byproduct of unskilled or careless blows, though one of the authors has witnessed contemporary knappers utilize these with great skill to initiate perforations in large bifaces. However, they are easy to identify in production debris and the authors are not aware of any evidence indicating the use of this technique by the ancient Maya. Instead, drilling appears to have been the favored means of perforating most objects. As the modern hydrocarbon industry can attest, the hardness of chert makes drilling a difficult, time-consuming task. Nonetheless, there is abundant evidence that the Maya used this technique to work jade (Kovacevich 2017; Taube and Ishihara-Brito 2012), a mineral with approximately the same hardness as chert on the Mohs scale (i.e., 6.5–7.0 out of 10). With eccentrics the inherent challenges of drilling such a hard material were mitigated by selecting nodular chert and attending to which we have added stelae from Caracol, Ucanal, and Lamanai (Meadows 2001, 2003). An example of this production technique was also recovered from one of the shaft caches from Blue Creek Structure 4 (FIGURE 5).

**Iconography and Cache Symbolism**

In contrast to eccentric axes/cels and bifaces (Thompson 1996), tridentates are depicted infrequently in Maya art, and so they serve as the focus of this section. In the 1980s, David Stuart proposed that tridentates may represent feline paws, an identification supported by the prevalence of jaguar imagery in the scenes described below. Depictions of rulers and attendants wielding feline-themed implements, such as jaguar paw scepters (e.g., Tikal Stela 39, Yaxchilan Lintel 6) or gloves (e.g., Seibal Stela 8), are not uncommon. Kubler (1977), in his treatise on the Uaxactun Initial Series Vase, compiled an early list of monuments depicting tridentates to which we have added stelae from Caracol, Ucanal, and an unprovenienced monument, as well as a number of codex-style and polychrome vessels (TABLE 2). The authors do not claim this list to be exhaustive. Before discussing these in detail, it should be noted that the morphology of the Blue Creek tridentate is not identical to many of these examples. While its body shares the truncated cartouche-like form, its central prong is significantly longer than the two lateral prongs. It could be argued the central prong is actually a haft element, but this is not supported by the data. Neither macroscopic nor low power microscopic (i.e., 10×) observation detected evidence of hafting, such as edge abrasion, polish, or striations (Rots 2003; Rots et al. 2006). In a study of over 500 Maya eccentrics, Meadows (2001, 293–637, appendix A) reported that evidence of hafting was rare, even in cases where a presumed hafting element was present. Furthermore, scenes from ceramic vessels (e.g., K5509, K8351) portraying eccentrics similar to the Blue Creek specimens suggest this form is a variation of tridentates with prongs of equal length.

Examples of tridentates listed in Table 2 appear to represent disparate scenes depicting a wide array of actors and actions. However, closer inspection demonstrates shared themes related to the institution of divine kingship, the supernatural realm, and the ritual practices that linked the two. Depictions of tridentates can largely be divided into two groups based on who is shown wielding the eccentrics—rulers and their attendants, or death gods and associated way. According to Houston and Stuart (1989, 1), a way is a companion spirit or "co-essence" that shares the consciousness of its human or supernatural owner. Naranjo Stela 30 (FIGURE 6), erected by K’ak Tiliw Chan Chahk in A.D. 714, is a prime example of the first category of depictions (Martin and Grube 2008, 75). This monument depicts the ruler with the hallmark facial cruffer of the Jaguar God of the Underworld (JGU) (Schele and Miller 1986, 50; Taube 1992, 54), an artistic element named for its resemblance to the pastry. The JGU identification is further supported by the accompanying text, which states that he is impersonating this deity (Houston and Stuart 1996). It has been argued that the JGU, "with his attributes of darkness, water, and jaguars, as well as facial features of the sun deity … plausibly represents the nocturnal Sun God, perhaps at his midnight nadir in the underworld" (Taube and Houston 2015, 213). In addition to the tridentate eccentric, the ruler holds a ceremonial fire drill decorated with segments of knotted cloth (Stuart 1998, 404). Taube (1992, 54–56) notes the association of jaguar symbolism with fire in Maya thought, a link that may indicate the JGU was the patron of fire and fire making rituals (Stuart 1998, 403). Stela 30 and similar monuments depicting rulers impersonating the JGU and holding ceremonial fire drills are suggestive of rites of ritual burning. Stuart (1998, 403) argues that as a form of ritual offering, burning events were as important—and likely as frequent—as bloodletting, and that the two were often intertwined. But what role do tridentate eccentrics play in this symbolism? A discussion of the second group of depictions, those related to the death gods and way, provides further clues.

![Table 2. Examples of tridentate eccentrics in Maya art](image-url)

<table>
<thead>
<tr>
<th>Medium</th>
<th>Site</th>
<th>Monument/Vessel</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monuments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caracol</td>
<td>Stela 6</td>
<td></td>
<td>Beetz and Satterthwaite</td>
</tr>
<tr>
<td>Naranjo</td>
<td>Stelae 30, 33</td>
<td>Altar 5; Temple 3; Lintel 2</td>
<td>Graham 1978</td>
</tr>
<tr>
<td>Tikal</td>
<td></td>
<td></td>
<td>Jones and Satterthwaite</td>
</tr>
<tr>
<td>Ucanal</td>
<td>Stela 4</td>
<td></td>
<td>Graham 1980</td>
</tr>
<tr>
<td>Unknown</td>
<td>Unprovenienced monument</td>
<td>Scherer and Houston 2018, fig. 5.13</td>
<td></td>
</tr>
<tr>
<td>Codex-Style &amp; Polychrome Ceramic Vessels</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uaxactun</td>
<td>Initial Series Vase</td>
<td>K2213, K2286, K2716, K3042, K5509, K8351, K9266</td>
<td>Smith 1932</td>
</tr>
<tr>
<td>Unknown</td>
<td>K3042, K5509, K8351, K9266</td>
<td>Kerr n.d.</td>
<td></td>
</tr>
<tr>
<td>Unknown</td>
<td>RIK30</td>
<td></td>
<td>Robiscek and Hales 1981</td>
</tr>
</tbody>
</table>

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**Table 2. Examples of tridentate eccentrics in Maya art**

<table>
<thead>
<tr>
<th>Medium</th>
<th>Site</th>
<th>Monument/Vessel</th>
<th>Source</th>
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<tr>
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<td>Stela 6</td>
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<td>Naranjo</td>
<td>Stelae 30, 33</td>
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<td>Tikal</td>
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<td>Ucanal</td>
<td>Stela 4</td>
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<td>Unprovenienced monument</td>
<td>Scherer and Houston 2018, fig. 5.13</td>
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<td>Codex-Style &amp; Polychrome Ceramic Vessels</td>
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<td>Uaxactun</td>
<td>Initial Series Vase</td>
<td>K2213, K2286, K2716, K3042, K5509, K8351, K9266</td>
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In the case of Late Classic ceramic vessels, particularly those of the codex-style believed to be 7th–8th century in date (Reents-Budet et al. 2010), tridentates are often associated with God A, God A', or way of the Akan complex (Grube 2004). For example, Vessel 30 from Robicsek and Hales (1981) depicts God A holding a tridentate accompanied by Chahk and Waterlily Jaguar in a scene of ritual decapitation and dismemberment. A similar
scene is shown on Vessel K2213 (Figure 7) with the Infant Jaguar, the uner (baby) manifestation of the JGU (Doyle 2016; Scherer and Houston 2018, 126), substituted for Waterlily Jaguar. In this instance God A wears a tridentate around his shin, a rather intimate association that may indicate that the perforation in tridentates held meaning as a portal to the underworld. In another scene of sacrifice including Waterlily Jaguar (K3042), what appears to be a way of the Akan complex, identified by upswept, tied hair with disembodied eyeballs, holds a tridentate (Grube 2004; Taube 1992). An Akan way in the form of a bat emitting a k’ahk’ (fire) sign, skeletal in appearance with a defleshed jaw and wings adorned with disembodied eyeballs, holds a tridentate in a scene of sacrifice on K2716 (Figure 8). In addition to the Akan symbolism, bats were associated with violent death, particularly decapitation (Stone and Zender 2011, 177). Vessel K2286 is unique in that it depicts three Akan way, one of whom, siti’ winik, holds not only a tridentate eccentric, but what also appears to be a large laurel-leaf biface, the same implements from the Blue Creek cache (Grube and Nahm 1994). A female way facing sitting on K2286 depicts the kimi “percentage sign” on her arms, perhaps the result of having been pierced by the tridentate (Scherer 2015a, 157). Two Late Classic polychromes (K5509, K8351) depict single-prong eccentrics similar to the Blue Creek specimen. The first shows a procession of characters, including God A’ and Waterlily Jaguar, carrying implements of sacrifice. The other vessel portrays an individual laying on an altar in the midst of sacrifice by an unidentified lord wielding a tridentate as another holds Waterlily Jaguar, suggesting he is either bearing witness to the event or the next victim. A final example, K9266, depicts two seated individuals holding tridentates and wearing red scarfs that are stylistically identical to those worn by Waterlily Jaguar (Schele and Miller 1986, 51) and way (Grube and Nahm 1994) in sacrifice scenes (e.g., K1230, K1376).

The connections between the symbolism of these two groups of depictions are manifest in Tikal Altar 5 (Figure 9). This monument depicts Jasaw Chan K’awiil and a lord of Maasal conducting a fire making ritual in A.D. 711, centered on the exhumed bones of a woman buried eight years prior (Martin and Grube 2008, 46; Stuart 1998, 407). Both figures hold ceremonial fire drills and exhibit the facial cruller, indicating they are JGU impersonators. Furthermore, both bear markers of Gods A and A’ including eyes on the hems of their clothing and strips of what may be blood spattered cloth (Grube 2004). The figure on the left sports a headdress adorned with eyes and a skeletal element through the mouth of which protrudes his upswept, tied hair. The figure on the right is shown wearing a sombrero marked with eyes and crossed bones that are associated with Akan way (Grube 2004). In the fashion of siti’ winik (K2286) and the Blue Creek cache, one individual holds a tridentate and the other a large laurel-leaf biface. Drawing parallels with Lintel 2 from Tikal Temple 3, Scherer and Houston (2018, 122) note the two figures bear the markings of cha’ajoom, or “person of incense.” This is a Late Classic title employed by royalty and high-ranking nobles associated with burning rites and sacrifice, particularly of children and adolescents.

In summary, scenes depicting tridentate eccentrics are replete with references to death (God A), particularly violent decapitation and dismemberment (God A’ and Akan way). Allusions to the Sun God, who is also associated with decapitation (Taube 1992, 52), in the form of jaguar symbolism (e.g., JGU, Infant Jaguar, Waterlily Jaguar) and ritual burning are also prevalent. Based on the broad cast of characters shown wielding tridentates and the analysis presented above, we suggest that these implements denote the act of ritual sacrifice—likely decapitation or dismemberment—rather than any particular deity or person. Such an identification seems obvious in scenes of sacrifice depicted on ceramic vessels, but less so in the ruler JGU impersonation cases. Recalling the identification of JGU as the god of fire and fire making rituals and the role of cha’ajoom, the presence of the eccentrics may allude to what is to be burned as an offering. The ritual burning of human remains is a well-documented practice exhibiting broad spatiotemporal distribution (Scherer 2015a; Graña-Behrens and Tiesler 2017), with El Zotz’s Early Classic Temple of the Night Sun, adorned with JGU imagery, being a prime example (Houston et al. 2015). The occupant of Tomb 9 was accompanied by the remains of five children in various states of completion placed within lip-to-lip cache vessels, all of which exhibited signs of burning (Scherer 2015b). Commenting on the JGU scene on the Uaxactun Initial Series Vase (Smith 1932, fig. 9), Morley (1937–1938, 229) suggests that the bundled lip-to-lip vessels offered by a seated jaguar may have contained a human skull, two examples of which were recovered from Structures
E-II and E-III at the site (Kubler 1977, 19). One of the attendants holds a staff that may be a ceremonial fire drill. Fire events varied in purpose from marking calendric events to the dedication of buildings and tomb renewal ceremonies (Stuart 1998). Arguing for the extraordinary nature of these rituals, Scherer and Houston (2018, 119) stress that these acts served to maintain “the sacred hearth that symbolized origin accounts and the centrality” of rulers’ kingdoms. The arrangement of the Blue Creek cache bifaces into three distinct groups (FIGURE 3) is reminiscent of the three-stone hearth, possibly marking the offering as an axis mundi (Taube 1998).

Discussion

In contextualizing the above data, we proceed with two questions. First, what do the technological data tell us about the production and acquisition of the Blue Creek cache artifacts? Second, what can be inferred about the residents of K’in T’an from the cache contents? In terms of the technological analysis, the lack of production context necessitates avoiding many of the themes addressed by organization of technology studies (Costin 1991). Nonetheless, the data support the designation of the artifacts as being the products of specialized production. Two factors rule out a local origin for the cache.
lithics: first, no lithic workshops have been identified at Blue Creek, and second, the cache artifacts are made from non-local chert. Under less-restrictive definitions, production for consumption outside of the producer’s household is considered specialized (Clark 1995; Flad and Hruby 2007). Additional lines of evidence support this designation, such as the skill necessary to produce the complex forms of the eccentrics, likely involving the use of an indirect percussion technique that required two artisans working in tandem. The stemmed bifaces exhibit a high level of standardization, as measured by coefficient of variation, providing further testimony to the producers’ skill. The technological data provide further information concerning the number of producers: three for the bifaces, and perhaps two for the eccentrics. We suggest the bifaces represent the work of a collective of artisans rather than discrete efforts. Again, this is supported by their standardized form. The frequencies with which different stem production techniques are represented raise a number of important questions. For instance, do they represent a spectrum of skill and efficiency in terms of time required to complete a task, or instead a division of labor where one individual (i.e., Technique 1) focused primarily on biface production while the others worked on the eccentrics? Were the bifaces and eccentrics produced by the same collective? Although the answers to these questions are unknown, the technological data have prompted us to consider how we might develop methodologies to address these issues in the future. For example, the orientation of flake scars on bifaces has been successfully employed to identify handedness (Andrews 2002; Uomini 2008), and could prove fruitful in assessing the linkage, or lack thereof, between the eccentrics and bifaces.

As outlined in the opening discussion, the complexity of cache symbolism is reflected by the care in selecting and arranging cache elements. Surely most caches were not assembled ad-hoc from an inventory of on-hand items, but rather involved conceptualizing a desired arrangement, assembling the necessary elements, and perhaps commissioning items that were lacking. The socioeconomic status of some households limited access to certain types of material (e.g., jade), though these concerns were probably minimal for elite households such as K’in T’an. Adding to the standardization and stem production technique data, none of the Cache 37 bifaces exhibit evidence of use-wear. This could be interpreted as indicating the bifaces were stockpiled over an extended period, though based on what can be inferred about the production context, it is more likely they represent a single production event. Perhaps they were commissioned by the residents of K’in T’an specifically for inclusion in Cache 37. For reasons discussed below, we are less confident in attributing the eccentrics to this production event, though it remains a possibility.

The extremely small sample of tridentates that have been recovered from archaeological excavations may indicate access to these implements was restricted. In further support, tridentates are shown as possessions of supernatural beings, rulers, and courtiers involved in rites of sacrifice and the burning of human remains, practices central to the institution of divine kingship. As such, the inclusion of a tridentate in Cache 37 is intriguing, particularly when viewed in the context of Blue Creek’s Late Classic political fortunes. If, as we have suggested, Blue Creek was no longer the seat of an independent dynasty, how were the residents of K’in T’an able to obtain and cache such a symbolically charged, possibly restricted implement? Known examples of tridentates are confined to the Late Classic period, thus it could not have been an heirloom or relic of one of the site’s Early Classic kings. Ruling out the possibility that K’in T’an was the abode of a deity or ruler, we are left with the third category of individuals known to have possessed tridentates: courtiers. Clues further defining the role of these individuals are provided by the Uaxactun Initial Series Vase and Lintel 2 from Tikal’s Temple 3. As previously noted, Scherer and Houston (2018, 122) have identified the attendants in the Tikal lintel as ch’a’joom, a designation they also apply to the actors on a unprovenienced stela from the Museo del Hotel Santo Domingo in Antigua (Scherer and Houston 2018, fig. 5.13). They further note that ch’a’joom imagery overlaps with that of kings and queens conducting rites of sacrifice and burning. The Uaxactun vessel (FIGURE 10) appears to show a similar
ceremony, and though markings of cha’ajoom are not as neatly bundled, they are present. The two individuals holding tridentates have tied hair, one with a topknot and the other a long ponytail. The skin of the attendants to the left, one of whom holds a possible ceremonial fire drill, are black. Further evidence that this is a sacrifice and burning event come from the seated lord. He wears a jaguar headdress, the mouth of which vents a k’ahk’ sign. From the headress emerges an undulating stem bearing a waterlily flower and a spotted jaguar tail with black tip; the association with Waterlily Jaguar is clear. The face of the lord is eroded, but what appears to be a tendril projects from his forehead, paralleling the facial vegetation often borne by cha’ajoom (Scherer and Houston 2018, 118–119). Although frequently associated with kings and queens, the above examples confirm that lesser nobles also held this title. Therefore, the presence of a tridentate in Cache 37 may indicate that K’in T’an was the residence of a cha’ajoom at some point during the Late Classic period. The eccentric laurel-leaf biface, held by one of the Tikal Altar 5 cha’ajoom and the K2286 way sitz’ winik, may further attest to the sacrificial duties of this individual.

If the above interpretation is valid, then the presence of a cha’ajoom at a subordinate site raises a number of important issues concerning the political dynamics of elite ritual practice. Perhaps Blue Creek’s elites were conducting human sacrifice and burning events despite their loss of independence, though it is difficult to formulate a scenario where this would not intrude on the privileged domain of the sovereign. Indeed, the authors do not argue that K’in T’an served as a venue for the ritual practices described above. The diminished Late Classic political stature of Blue Creek and residential function of the complex provide evidence to the contrary. A more plausible interpretation is that some of the attendants depicted in the above scenes are nobility from other locales. As such, we suggest that the eccentrics simply provide evidence that a cha’ajoom resided at K’in T’an, and that at some point in time the ritual toolkit of this individual was deposited during a caching event. Affording elites from subordinate centers an active role in rituals solidifying the king’s authority and privileged position could have been essential to establishing and maintaining political alliances.

Conclusions

This paper has demonstrated that the application of detailed technological and iconographic analyses, when possible, can expand our understanding of ancient ritual deposits beyond function and depositional event. The technological analysis, in conjunction with comparative data from Copan’s Rosalilla cache, identified a suite of production techniques that resulted from the work of at least three artisans. Highly standardized biface morphology, variation in stem production techniques, and the two-person eccentric production technique all provide quantitative and qualitative measures of artisan skill, while also proving informative of the organization of production. In addition to identifying who (i.e., skilled artisans) and how the cache artifacts were made, this paper has addressed the question of where they were made. The absence of lithic workshops at Blue Creek and the use of non-local chert indicate the artifacts were not produced by the residents of K’in T’an, thus requiring a consideration of how these artifacts were obtained for deposition within the cache. The standardization exhibited by the bifaces suggests a single production event, perhaps on commission, though the potentially restricted nature of tridentates may indicate the artifacts were a gift, or perhaps that ownership of these objects was sanctioned.

Reference to Maya art provided information concerning the function of large laurel-leaf bifaces, and tridentates in particular, as implements of human sacrifice wielded by deities, way, and nobility. This last group, in the role of ritual specialists titled cha’ajoom, performed these sacrificial duties as part of a broader practice that involved the burning of human remains, especially children and adolescents. The presence of these artifacts in Cache 37 may indicate that K’in T’an was the residence of a cha’ajoom at some point during the Late Classic period. Finally, it was suggested that some of the courtiers depicted as cha’ajoom in Maya art could be elites from subordinate sites. Providing dependents with an active role in rituals affirming the ruler’s sovereignty would be an effective means of maintaining power relations.

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Disclosure Statement

No potential conflict of interest was reported by the author(s).

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