
The ideology and symbolism of ancient Maya chert and obsidian eccentrics from central Belize: Materials, contexts, chronology, and meaning

W. James Stemp¹, Jaime J. Awe², Christophe Helmke³, Jordan A. Lee²

1. Department of Sociology, Anthropology and Criminology, Keene State College. 229 Main St., Keene, NH, 03435-3400, U.S.A. Email: jstemp@keene.edu

2. Department of Anthropology, Northern Arizona University. 5 E. McConnell Dr., Flagstaff, AZ, 86011-5200, U.S.A. Email: Jaime.awe@nau.edu; Lee: jal854@nau.edu

3. Institute of Cross-Cultural and Regional Studies, University of Copenhagen. Karen Blixens Plads 8, DK-2300 Copenhagen S, Denmark. Email: cgbh@hum.ku.dk

Abstract:

Eccentrics are associated with fundamentally important concepts in ancient Maya cosmology and religion. As their name implies, eccentrics are irregularly shaped, non-utilitarian, special function artifacts. Knapped from chert and obsidian, they vary in size, take many forms, and can be expediently made or masterfully crafted. In this study, we focus on eccentrics from Central Belize, specifically those from Ballcourt 2 at Xunantunich, as well as examples from caves the Roaring Creek Valley, including Actun Chapat, Actun Tunichil Mucnal, Actun Uayazba Kab, Actun Yaxteel Ahau, Je'reftheel, and Midnight Terror. To understand the uses of eccentrics in the ancient Maya world, we examine them in terms of their archaeological contexts (*e.g.*, caches, burials, caves), dating, lithic raw material types and sources, production techniques, and meanings. This information is used to reconstruct the role of eccentrics in understanding the animate world of the Maya, as well as the embodiment of ancient Maya mythology and cosmology in these ceremonial items. The symbolism with which these artifacts are imbued is examined in relation to numerology and correspondences between Maya iconography and epigraphy. These analyses demonstrate that eccentrics play a significant role in the enactment of ancient Maya mythology and cosmology and embody critically important concepts for Maya success and survival in a natural world entangled in the supernatural. As such, they also served as inalienable possessions offered as gifts to supernatural forces and entities in times of need or crisis. Eccentrics embody and reflect the ideas of kingship, sacrifice, natural phenomena (specifically rain and lightning), celestial bodies (such as the sun, moon, and eclipses), maize, zoomorphic denizens of the Maya underworld (including centipedes, serpents, and scorpions), as well as representations of deities, especially *K'awiil* - the embodiment of lightning. Moreover, the geomorphic designs and numbers of eccentrics, which occur particularly in sets of seven, nine, and thirteen, represent locations and gateways in ancient Maya cosmological understanding of the



structural universe. Significantly, the eccentrics of Xunantunich and Central Belizean caves are consistent with the use of this class of artifacts in a pan-Maya belief system.

Keywords: eccentrics; chert; obsidian; Maya; caches; caves

1. Introduction

In the ancient Maya world, stone was the primary material from which tools were made. In addition to tools necessary for the performance of many daily activities, the Maya also produced powerful symbolic items from stone that archaeologists have called eccentrics. In this paper, we discuss the lithic materials from which eccentrics are made, how they were produced, the contexts associated with deposition, and their associations with fundamentally important concepts in ancient Maya cosmology, mythology, and religion. Our discussion focuses on the eccentrics from the Upper Belize River Valley of Central Belize, specifically those recovered from Xunantunich - with a focus on Ballcourt 2 - and from six caves, including Actun Chapat, Actun Tunichil Mucnal, Actun Uayazba Kab, Actun Yaxteel Ahau, Je'reftheel and Midnight Terror (Figure 1). The information derived from the eccentrics from these seven locations in Central Belize provides opportunities to comment on the use of eccentrics in religious ritual activities, as well as their connections to socio-political and socio-economic aspects of Maya life, particularly among elites. Observations about their political, economic, and ideological functions, their identities as 'living' entities, their roles as gifts to supernatural forces and entities, as well as the importance of ancient Maya cosmology and mythology embodied in them are also discussed in terms of their contexts of deposition. Based on this research, eccentrics clearly served multiple, culturally complex functions in ancient Maya culture that were intricately woven into a larger fabric of ancient Maya culture and identity on many levels.

1.1. Eccentrics: What are they?

Stone was one of the main materials for all tool-making among the ancient Maya as they were, for all intents and purposes, without metallurgy until the Post-Classic period. Knapped stone tools of many types were used in most daily subsistence and domestic activities, as well as in specialized craft-production and warfare (e.g., Andrieu 2013; Aoyama 1999; 2005; 2009; Aoyama *et al.* 2017a; Horowitz 2018; Lewenstein 1987; Shafer & Hester 1983; 1991; Stemp 2001; 2016; Stemp *et al.* 2010; Whittaker *et al.* 2009). Stone tools were also used as part of religious ritual activities, including burials, caches, sacrifice, and blood-letting (Aoyama *et al.* 2017a; Coe 1959: 16; Horowitz *et al.* 2020; Johnson & Johnson 2021; Kidder 1947: 4; Krejci & Culbert 1995; Kwoka *et al.* 2019; Sievert 1992: 111; Stemp & Awe 2014; Stemp *et al.* 2018; 2019), and as important symbolic objects known as eccentrics. Although defined in various ways by Mayanists, eccentrics may be best described as knapped stone artifacts—sometimes irregularly shaped, of extraordinary size, or of exceptionally fine workmanship—utilized primarily for their symbolic value. These artifacts are considered ceremonial items that served multiple functions in Maya ideological and religious systems (Hruby 2007; Iannone 1992; Meadows 2001). For example, Iannone (1992: 249-251; Iannone & Conlon 1993: 82) and others (Hruby 2007: 68; Meadows 2001: 239-241; Schele & Miller 1986: 49, 73) have argued that eccentrics are symbolic depictions of ancestors and gods and, as such, were connected to ancestor worship in significant places such as temples or near stelae. Based on the analysis of the large chert eccentrics from Northern Belize, Meadows (2001: 241) suggests several additional possible uses for eccentrics based on their forms, including depictions of historical figures, personifications of particular events, cosmological

or celestial representations, abstract representations of Maya cultural aesthetics, and ceremonial weaponry. In our analysis, we add the possibility that eccentrics also served as inalienable objects that were gifts left to ancestors and supernatural entities as entreaties for assistance in times of uncertainty, environmental crisis, and social disruption (see Mauss 1990: 20-21).



Figure 1. Map of the Maya Lowlands with sites mentioned in the text (map by C. Helmke).

There are generally four different forms of eccentrics, which can be further sub-divided into particular types (see Meadows 2001; Coe 1959: 16-29; Moholy-Nagy 2008: 21-26 for

multiple sub-types) (Figure 2). Among these forms are the large chert eccentrics (>20 - 100 cm long) that tend to be found at sites in and around the Northern Belize Chert-bearing Zone (NBCZ) (Figure 2d), notably Altun Ha, Colha, and Lamanai (Meadows 2001; Pendergast 1979; 1982) (Figures 1 and 3). Other forms are smaller chert and obsidian eccentrics (<20 cm long) made from flakes, flake-blades, blades, cores, and nodules of various sizes (*e.g.*, Coe 1959; Hruby 2007; Kidder 1947: 16-22; Moholy-Nagy 2008: 22-24 Sullivan 2017; Willey 1972) (Figure 2b). A third form includes the very finely made and delicate “silhouette” or “elaborate” chert eccentrics that are renderings of the profiles of deceased rulers, ancestors, or deities (Agurcia Fasquelle *et al.* 2016: Appendix A) (Figure 2e). The silhouette or elaborate eccentrics are very rare having only been found at a few sites, including Copan, Quirigua, and El Palmar (Agurcia Fasquelle *et al.* 2016; Morley 1935; Thompson 1936). The fourth form includes very finely made laurel-leaf bifaces (Agurcia Fasquelle *et al.* 2016: Appendix A; Kwoka *et al.* 2019; Sheets 1991; Stemp *et al.* 2021) (Figure 2c). In addition, eccentrics could be modified and embellished through the application of painted and incised designs, the former especially on chert implements (Hruby & Ware 2009), the latter particularly on obsidian flake-blades (Figure 2a). Obsidian flake-blades, such as those from Tikal, are typically incised with symbols of royal authority or supernatural entities (Hruby 2007; Moholy-Nagy 2008: 14, 25). The eccentrics discussed in this research include the smaller eccentric forms made from chert and obsidian flakes, flake-blades, blades, cores, and nodules, and the laurel-leaf bifaces produced from chert.

1.2. Contexts

Eccentrics were deposited at both surface sites and in caves throughout the Maya lowlands. At surface sites, most eccentrics are recovered from caches - deposits containing “one or more objects that are found apart from burials and whose contexts suggest that they were purposely deposited as an offering” (Stemp *et al.* 2018) - that were placed within architectural core or beneath monuments (*e.g.*, stelae, altars, or ballcourt markers). Eccentrics in caches are often found in association with other lithic and non-lithic objects and either the remains of animals or humans or both animals and humans. When found as part of these deposits, eccentrics are generally understood as forming part of dedicatory rituals, serving to inaugurate or consecrate a construction effort, a structure or a particular monument. Typically, eccentrics included in caches occur in multiples of numeric significance to the Maya (see below).

The caching complexes at Xunantunich include both dedicatory monument caches and axially-aligned caches, or caches aligned with groups of structures along a central axis (Iannone 1992). Excavations have revealed large eccentric caches at the Eastern Triadic Group’s Structures A-1, A-3, and A-4 (Sullivan 2017; Gann 1918: 96). On Structure A-3 at Xunantunich, excavators discovered a cache under the first step of a construction stair on the plaza floor 50 cm behind a stela which contained 18 eccentrics (Santasilia & Tilden 2016: 126). Structure A-4 also contained caches at its base with associated artifacts including ceramic incense burners and human skulls. Structure A-9 contained two sub-floor caches in association with a stela and the structure’s axial stairway that included marine shells, iron pyrite, jadeite, and chert, and 9 obsidian eccentrics (Awe 2017; Slocum 2018; Sullivan 2017). In Ballcourt 2 at Xunantunich, four caches were discovered in parallel alignment along the playing alley of the feature (Figure 4a). The caches contained 88 chert and obsidian eccentrics (Figures 5-8), consisting of both the smaller forms noted above and the laurel-leaf bifaces, as well as over 200 jute shells, 3 stingray spines, and two lip-to-lip ceramic vessels (Lee 2022) (Figure 4b; Supplementary file 1).

In addition to architectural dedications proper, eccentrics have also been documented in burials and caves, although these constitute a more specific sub-set and are much less frequent and primarily found at Maya sites in Belize. As with eccentrics from caches, those from burials are typically deposited in multiples and may be found with other objects of various materials (*e.g.*, Braswell *et al.* 2005; Lytle *et al.* 2019; Pendergast 1979: 74-76; 1982: 122, 130-132). The small obsidian eccentric from Actun Uayazba Kab (Figure 9) deviates from this pattern in that it was recovered as a single eccentric along with other suspected grave goods associated with the burial of an adult woman in a cave (Ferguson & Gibbs 1999: 119; Stemp *et al.* 2012: 113; Supplementary file 1).



Figure 2. a) incised obsidian flake-blade eccentrics from Tikal, Guatemala (from left to right) - royal mat motif, sun god *K'inich Ajaw*, thunder deity *Chaahk*, and personification of lightning *K'awiil* (photo by C. Helmke); b) small obsidian eccentric from Cache 3, Ballcourt 2 at Xunantunich, Central Belize (photo by J.A. Lee); c) chert laurel-leaf eccentric from Je'reftheel cave, Central Belize (photo by C. Helmke); d) large chert eccentric (r12LA) from Lamanai, Northern Belize (Meadows 2001: 431); e) chert 'silhouette' eccentric (artifact 90-12) from the Rosalila cache, Copan, Honduras (Agurcia-Fasquelle *et al.* 2016: 17, fig. 8). Scale bars are each 3 cm.



Figure 3. Map of chert and obsidian source locations in Mesoamerica (map by C. Helmke).

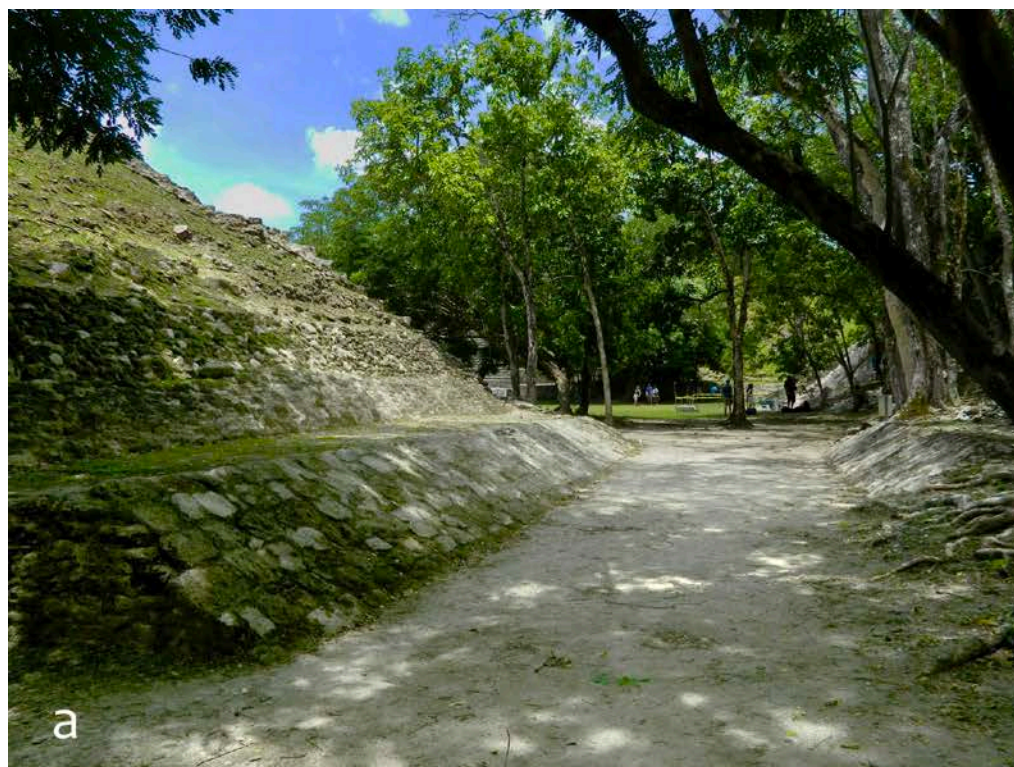


Figure 4. a) Ballcourt 2 at Xunantunich, Central Belize (facing south); b) eccentrics found in lip-to-lip ceramic pots in Cache 1 of Ballcourt 2 [bottom pot containing eccentrics shown here] (photos by J.A. Lee).



Figure 5. Small chert and obsidian eccentrics from Cache 1 in Ballcourt 2, Xunantunich, Central Belize (photo by J.A. Lee).

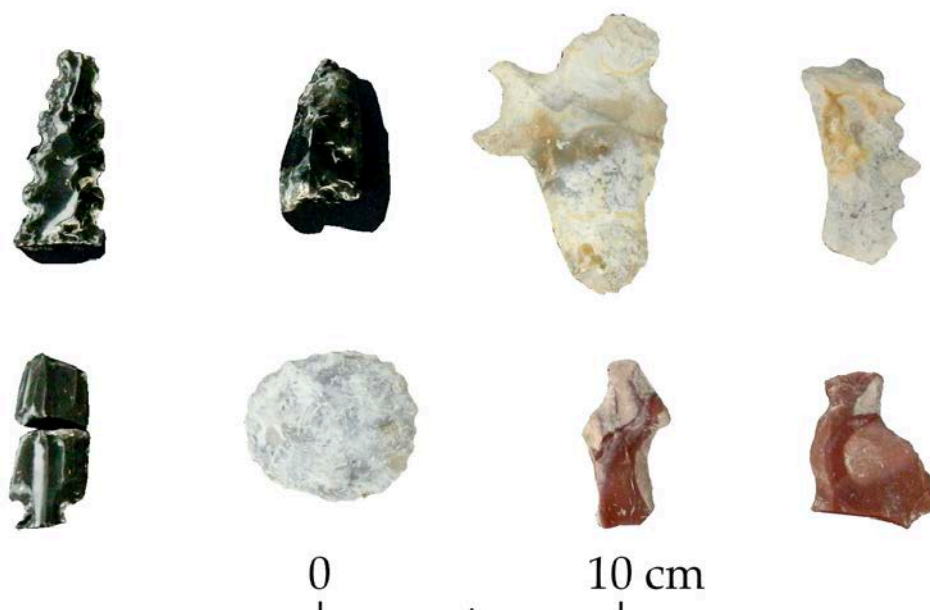


Figure 6. Small chert and obsidian eccentrics from Cache 2 in Ballcourt 2, Xunantunich, Central Belize (photo by J.A. Lee).

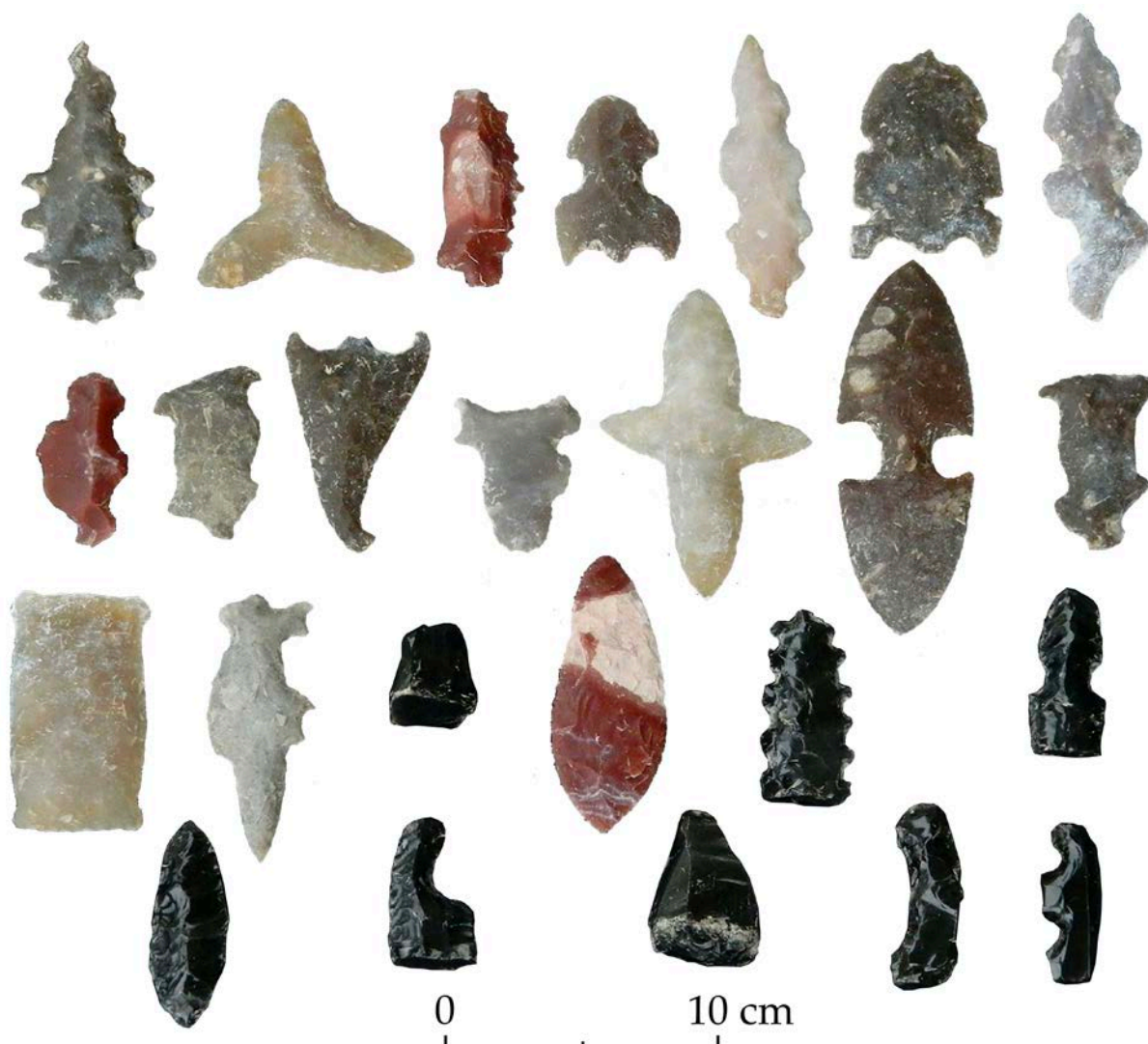


Figure 7. Small chert and obsidian eccentrics from Cache 3 in Ballcourt 2, Xunantunich, Central Belize (photo by J.A. Lee).

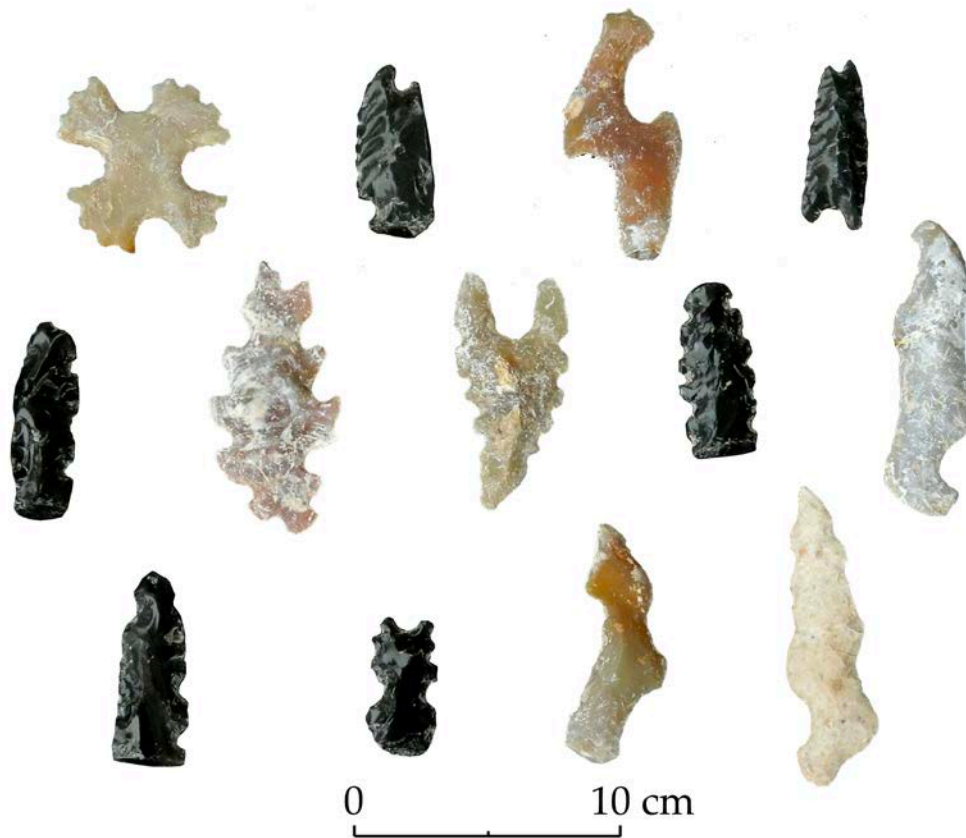


Figure 8. Small chert and obsidian eccentrics from Cache 4 in Ballcourt 2, Xunantunich, Central Belize (photo by J.A. Lee).

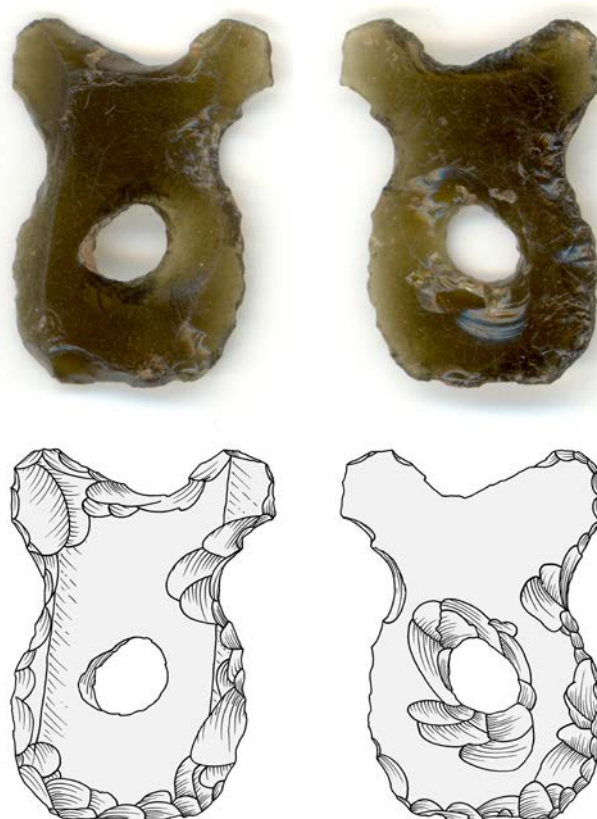


Figure 9. Small green obsidian 'glyph' eccentric from Burial 98-2 at Actun Uayazba Kab, Central Belize (left - dorsal; right - ventral). The eccentric resembles the glyph for *k'ik'* 'blood' (photo by W.J. Stemp and drawing by C. Helmke).

Those recovered from caves are generally placed or deposited in small niches, in alcoves, on ledges, near natural altar-like features, or in transitional passages, and tend to exist as single or individually deposited items. The laurel-leaf bifaces from Actun Chapat, Actun Tunichil Mucnal, Actun Yaxteel Ahau, and Je'reftheel were all deposited individually either on a ledge, in a passage, near a feature, or in a niche (Supplementary file 1). Even though the two biface fragments from Yaxteel Ahau were both found associated with human skeletal remains in Area D of Ledge 2, these were not found together in the same place (Figure 10a). However, sometimes, the eccentrics from caves are found in a small cluster as demonstrated by the five notched chert blades from Midnight Terror (Supplementary file 1). The blades were all aligned parallel to one another, according to a dominant direction, which may have been significant for the Maya (Figure 10b).



Figure 10. a) Laurel-leaf biface as found in Area D, Ledge 2 at Actun Yaxteel Ahau, Central Belize (AYA1); b). Five small chert eccentrics from Midnight Terror cave, Central Belize (photos by J. Awe).

Together, we can thereby qualify eccentrics from caches, burials, and caves as forming part of a more general type of religious ritual practice that can be subsumed under the label of ‘earth-offerings’ (see Becker 1993), as these are found in underground spaces, either physical or emulative. Associations with subterranean spaces have powerful ideological and cosmological connections to Maya concepts of life, death, and the Underworld (see below; Supplementary file 2).

1.3. Periods of use

Eccentrics began to appear during the transition from the Late Preclassic into the Early Classic periods (ca. CE 250) but were not the mainstays of ceremonial caches nor were widely distributed geographically (Iannone 1992: 129). In these periods, most eccentrics were relatively simply made and abstract in design. By the Late Classic (ca. CE 600 - 800), the quantity of eccentrics in ceremonial deposits, notably in caches, increased substantially as did the diversity of forms and the complexity of production of some forms (Iannone 1992: 85). Eccentrics in caches and less commonly in burials and caves became a widespread phenomenon throughout the southern Maya lowlands, particularly in Belize, northern Guatemala, and north-western Honduras. Into the beginning of the Terminal Classic period (ca. CE 800 - 900), eccentrics increasingly occur in cave deposits and continued to be used as items incorporated into caches. However, by the end of the 10th century CE, eccentrics seem to disappear, coinciding with the Classic Maya collapse and the disintegration of elite rule (Iannone 1992: 86). The cessation of eccentric production and use coincides precisely with the social segment that used these objects, as the deposition of eccentrics in caches, burials, and caves was an elite ceremonial practice. As such, increasing ceremonial activities, incorporating eccentrics, were likely attempts by rulers and elites to maintain and perpetuate the religious rituals of old, in order to publicly demonstrate their power and to communicate with ancestors and deities in times of climatic stress, social strife, and increasing warfare. The eccentrics from Ballcourt 2 at Xunantunich and the six caves discussed in this paper date to the end of the Late Classic and into the beginning of the Terminal Classic periods based on the pottery associated with them.

2. Eccentrics and meaning

2.1. Mythology and symbolism

Much of our ability to interpret the roles of eccentrics in ancient Maya society derives from context of recovery and additional information drawn from epigraphy, iconography, ethnohistory, and ethnography that informs us about Maya worldview. This worldview was expressed in Maya art and iconography in many ways. Symbols, including eccentrics, could carry multiple meanings whose specific meaning was correlated with the material, form, period, context, and associations of the symbol (Ramos Ponciano 2017: 62; see Iannone 1992). This would be consistent with the use of Maya hieroglyphs (Coe & Van Stone 2001; Kettunen & Helmke 2020) as previously noted for the eccentric from Actun Uayazba Kab (see below). It is believed that eccentrics deposited as single items or in multiples, possibly with other types of objects, represent sacred narratives, possibly recounting mythological or cosmological events or historical accounts of some type. In this way, eccentrics, as animate objects (see below), may be ‘actors’ symbolically cast in stories of importance to the Maya about their origins, their deities, their ancestors, and events in their lives. The four caches containing eccentrics and other objects in Ballcourt 2 at Xunantunich, for example, each likely conveyed a specific cosmological ‘story’ involving deities, ancestors, animals, celestial

bodies or natural phenomena of relevance to the Maya at that place in that time (see Supplementary file 2).

Significant to their roles and identities, all stone tools, including eccentrics, share a common origin in Maya cosmology. The Maya believed that stone adzes and bifaces were the product of lightning striking the earth and that obsidian was imbued with the power or ‘force’ of lightning (Agurcia Fasquelle *et al.* 2016: 16, 18; Bassie 2002: 14; Freidel *et al.* 1993: 200; Stemp *et al.* 2013). Lightning, in the form of the serpent-footed deity *K’awiil*, is also associated with the origins of maize in caves, which were simultaneously the locations of origin for rain, wind, and storms, in addition to entrances to the Maya Underworld associated with death, rebirth, fertility, sacrifice (Christenson 2007; MacLeod & Puleston 1978; Palka 2014: 155; Redfield 1941: 118; Vogt & Stuart 2005: 164-165, 177). Notably, *K’awiil* is frequently depicted with a smoking stone blade or biface embedded in his forehead (Schele & Miller 1986: 83; Stone & Zender 2011: 49), like those from the caves in Central Belize. Connections to thunder and other atmospheric phenomena in Maya cosmology are also linked to the deity *Chaahk*, that is typically represented wielding a ‘lightning axe’ (essentially a stone biface) in Maya iconography (Supplementary file 2).

Given these associations, it is not surprising that many fundamental concepts about the Maya world, its powerful actors, and its denizens are incorporated into eccentric forms like the laurel-leaf bifaces from Actun Chapat, Actun Tunichil Mucnal, Actun Yaxteel Ahau, and Je’reftheel, and the snake-like notched blades from Midnight Terror. Moreover, the small green obsidian eccentric from Actun Uayazba Kab, rendered in the form of the Maya hieroglyph for *k’ik* ‘blood’ (see below), may connect the artifact to notions of blood-sacrifice and fertility (Stemp *et al.* 2012). Eccentrics were also used to embody and represent sacred notions of place and transition between realms of the Maya universe, as noted for quadripartite forms, such as the *K’an* cross, and tripartite forms in caches at Xunantunich (Supplementary file 2).

2.2. Numbers

Among the Maya, numbers are symbolically important sources of meaning and are often linked to cosmological or supernatural concepts or entities, including their embodiment in eccentrics. In Maya cosmology, for example, the underworld was perceived as being divided into nine areas or regions, while the celestial realm was divided into 13. The earth was essentially deemed to be flat, but each cardinal direction figured prominently in a quadrilateral understanding of the world, with the central point conceived as a midpoint of a quincunx. As such, basic numbers connected to cosmological constructions often entailed 4 or 5, as well as 9 and 13 (Thompson 1950: 10).

Moreover, cardinal numbers were each tied to, personified as, or symbolized by tutelary deities (Kettunen & Helmke 2020: 48, table 6). As such, 0 was connected with the Underworld, 1 was tied to *Juun Ajaw* (literally ‘one lord’), the culture hero who figures prominently in mythological narratives in the deep past. The sun god, *K’inich Ajaw* (literally the ‘radiant lord’), was the tutelary deity of the number 4, whereas 5 was tied to the old Atlantean deities that raised and upheld the heavens. The young maize god, known as *Ajan* was the patron of 8, whereas 9 was connected to *Yax Bahlam*, the younger of the two culture heroes of the great mythic epics (see Thompson 1950: 12).

In addition to more general cosmological numerals and the patron deities of cardinal numbers, a series of important mythological locations were connected to particular numerals. These include one of the locations tied to the Underworld that was known as *Ho’ Mina’an-nal* or ‘five nothingness-place’. *Ho’ Mina’an-nal* was linked to deities of death, as well as a monstrous leviathan connected to a Maize god cycle. Likewise, two complementary localities

were connected with the numerals 7 and 9, wherein the first is tied to the colours *ik* 'black' and *k'an* 'yellow' and the second is paired with the sign for *k'ik* 'blood' (Freidel *et al.* 1993: 269, 307, 372; Schele & Mathews 1998: 99, 166, 350). Another supernatural locality, *Huk Ha'nal*, 'seven water-place' is also specifically cited in the texts as the location where the Maize God was decapitated in the Underworld. To this, we can also recall the nocturnal cycles that were presided over by the nine lords of the night, a calendrical series found in the Maya areas, as well as among Central Mexican cultures (Thompson 1950: 12).

Consequently, numbers are rife in meaning and significance. For instance, at Xunantunich, the cache under the first step of a construction stair on the plaza floor 50 cm behind a stela at Structure A-3 contained 18 eccentrics - nine made of obsidian and nine of chert (Santasilia & Tilden 2016: 126). The two caches at the base of structure A-14 contained nine eccentrics and eight eccentrics and one green jade bead, respectively, and the cache beneath the stairway of Structure A-9 contained nine eccentrics among the deposited items. Ballcourt 2 contained many repetitions of the numbers 9 and 13. In Cache 1 in Ballcourt 2, nine of the eccentrics were made from obsidian (Figure 4). Cache 2 contained a total of 9 eccentrics of both obsidian and chert (Figure 5). In these caches, the number nine may well be tied to the Underworld in a general sense but may equally refer to lords of the night (Thompson 1950: 208-210), with each perhaps connected to one particular entity, or possibly even with indirect references to *Yax Bahlam*. Cache 4 at Ballcourt 2 contained a total of 13 eccentrics (Figure 7). The number 13 is a possible representation of the divisions of the upper world and the 13 deities associated with each part of the heavens. The same type of ambiguity is seen for caches or deposits with five eccentrics, such as the blades from Midnight Terror (Figure 9b). These could represent the four cardinal directions and the centre, and thereby make a cosmological statement, whereas these could make reference to the patron of the number five - the aged Atlantean deities. Or could this eccentric arrangement specifically refer to the named Underworld location *Ho' Mina'an-nal*?

At present, we cannot adequately address these possibilities without further detailed examination of the type or form of each of the eccentrics that are included in a given cache as well as their relationships to one another. However, from preliminary analyses, we can see that there are some systematics concerning inclusions, which together speak to a 'religious ritual syntax'. The frames of reference may have also made systematic references to more local symbolic spaces at individual sites. To this extent, we can recall that the monumental epicentres of Maya sites frequently represented emulations of ceremonially important spaces and places, including cardinal direction alignments, numbers of doorways in buildings, and architectural levels (Ashmore 1991; Ashmore & Sabloff 2002; Awe 2008; von Schwerin 2011).

S3. Analysis of eccentrics

In addition to the study of eccentrics in terms of Maya cosmology, mythology and symbolism, as well as the importance of numbers in Maya divination, analysis of these knapped stone artifacts has also focused on the lithic raw materials from which they were made and their geological sources, their production techniques in terms of skill and esoteric knowledge, their use as gifts and sacred objects, and their identities as animate beings in the Maya world.

3.1. Lithic raw materials and sources

Maya eccentrics were knapped from either chert or obsidian of various types that originated from different sources (Figure 3). The large eccentrics from Northern Belize and many of the laurel-leaf bifaces were made from chert from the Northern Belize Chert-bearing

Zone (NBCZ); however, silhouette eccentrics and some laurel-leaf bifaces were made from fine-grained, high-quality chert whose source or sources are not known (Agurcia Fasquelle *et al.* 2016: 61; Kidder 1947: 25-26; Meadows 2001: 46-47; Stemp *et al.* 2021). Stone tools made from NBCZ chert have been widely traded throughout northern and western Belize and into central Guatemala and northern Honduras over distances greater than 200 km. Finely made lenticular or laurel-leaf bifaces were also produced from obsidian (Kidder 1947: 24; Moholy-Nagy 2008: 23; Willey 1972: 210-211). Smaller eccentrics were made from locally available chert and imported obsidian (Coe 1959: 26; Hruby 2007; Iannone 1992; Moholy-Nagy 2008: 22-23; Sullivan 2017). Obsidian, whether black or green, was a long-distance resource since no obsidian flows exist in the Maya lowlands. Most of the flake-blade, blade, and core eccentrics are made from black obsidian from the Guatemalan highlands, notably from the El Chayal source, as are the incised obsidian eccentrics (Moholy-Nagy 2008: 23, 25). The small simply knapped green obsidian eccentrics were made from the Pachuca (Sierra de las Navajas) outcrops in highland central Mexico roughly 1000 km away (Pendergast 1990; 2003; Spence 1996; Stemp *et al.* 2012). Access to stone that was non-local may have provided makers of eccentrics with a certain amount of prestige, translating into socio-economic and social status (for ritual economy, see Stemp *et al.* 2019; Wells 2006).

It is also likely that black and green obsidians were valuable owing to their colours and, in some cases, their sources. The inky lustre of black obsidian was symbolically related to darkness, night, the cardinal direction west and a particular socio-political status marked by black body paint and the distinctive title *taaj*, literally ‘obsidian’ (Saturno *et al.* 2017). Green obsidian likely held important socio-political, socio-economic, and ceremonial meanings to the Maya, perhaps due to its connection to Teotihuacan, which controlled the Pachuca source and oversaw the trade of this green obsidian, and other symbols of its power, such as Teotihuacan-style ceramic vessels (Sharer 1983: 255; Spence 1996). Green is also associated with the central place of Maya cosmograms (Miller & Taube 1993: 65) and, in the case of jade objects, has symbolic connections to fertility, agriculture and maize, as well as the world tree which connects the three levels of the Maya universe (Taube 2005: 25).

The small eccentrics from Xunantunich caches are made from both black obsidian and what appears to be locally sourced chert. In the Ballcourt 2 caches, the chert eccentrics are represented primarily by large flake and bifacially flaked forms, including a lenticular biface; whereas, the obsidian forms are either single or double-notched unifacially flaked cores. The laurel-leaf biface eccentrics from Actun Chapat, Actun Tunichil Mucnal, Actun Yaxteel Ahau, and Je’reftheel were all made from fine-grained chert from the NBCZ. The single small eccentric from Actun Uayazba Kab was produced from green obsidian. The five chert blades from Midnight Terror are all made from a dark grey-greenish and brownish chert; however, the chert’s source has not been confirmed.

3.2. Production and consumption

3.2.1. Production techniques

Eccentrics were made in a variety of ways with a wide range of expertise. For example, small eccentrics knapped from flakes could likely have been expediently made by individuals with minimal knapping skills; however, most of the small chert and obsidian eccentrics required a reasonable-to-elevated level of lithic production skill and are primarily the products of hard-hammer percussion of flakes, macroflakes, blades, nodules, or exhausted cores (in the case of obsidian) with variable degrees of additional pressure flaking and indirect percussion for notching and perforating (*i.e.*, negative spaces) (Figure 11). Most of the chert and obsidian eccentrics that form the caches at Xunantunich demonstrate these production techniques as do the small obsidian eccentric from Actun Uayazba Kab and the chert eccentrics from Midnight

Terror. The majority of these types of eccentrics could likely not be produced by Maya knappers in commoner households, but required skill and experience associated with lithic workshops where bifaces and blades were made. The degree to which drilling was used in the initial stage of creating negative spaces in eccentrics is not known, yet it seems highly likely that some form of grinding or drilling would have been necessary to establish an opening with exposed edges that could then be subsequently flaked (see Stemp *et al.* 2012; Sullivan 2017: 25). Eccentrics with negative spaces can be found at Actun Uayazba Kab (Figure 9) and Xunantunich (Figure 11).



Figure 11. Small chert eccentric with negative space (XUN-BC2-1-22) from Cache 1, Ballcourt 2, Xunantunich, Central Belize (photo by J.A. Lee).

In contrast, the fine silhouette eccentrics and laurel-leaf bifaces, as well as some of the other large, elaborate eccentrics typical of Northern Belize, were masterfully crafted and demonstrate multiple, complex reduction techniques, including soft-hammer percussion, indirect percussion, and pressure flaking of large percussion flake blanks and tabular chert pieces (Agurcia Fasquelle *et al.* 2016: 61-62; Clark 2019; Stemp *et al.* 2021; Titmus & Woods 2003; Woods 2019). The laurel-leaf bifaces from Actun Chapat, Actun Tunichil Mucnal, Actun Yaxteel Ahau, and Je'reftheel are all examples of very finely made eccentrics that required tremendous skill to successfully execute (Figure 12).

Apprenticeship was necessary to become an eccentric-maker not only in terms of production skill, but also with regard to sacred knowledge needed to commune with the stone itself and to properly perform production rituals (Agurcia Fasquelle *et al.* 2016: 67; Clark 1987; Clark & Woods 2015; Hruby 2007; Titmus & Woods 2003). Undoubtedly, this was especially true for silhouettes, laurel-leaf bifaces, and the very large eccentrics that demonstrate the greatest technological complexity and would have necessitated a master-craftsperson. It is also likely that these eccentrics required two tool-makers in order to prevent breakage, notably medial stress fractures and shock, during their manufacture (Agurcia Fasquelle *et al.* 2016: 67, 72, Appendix A; Kwoka *et al.* 2019: 6). Most likely, the chert silhouette eccentrics, the chert laurel-leaf bifaces, and at least some of the large chert eccentrics were made by attached craft-specialists who likely belonged to workshops controlled by elites or possibly by itinerant specialists given their high level of production,

necessary esoteric knowledge, and overall value (Agurcia Fasquelle *et al.* 2016: 67-68; Clark 1995; Costin 2001; Inomata 2001; Peregrine 1991).

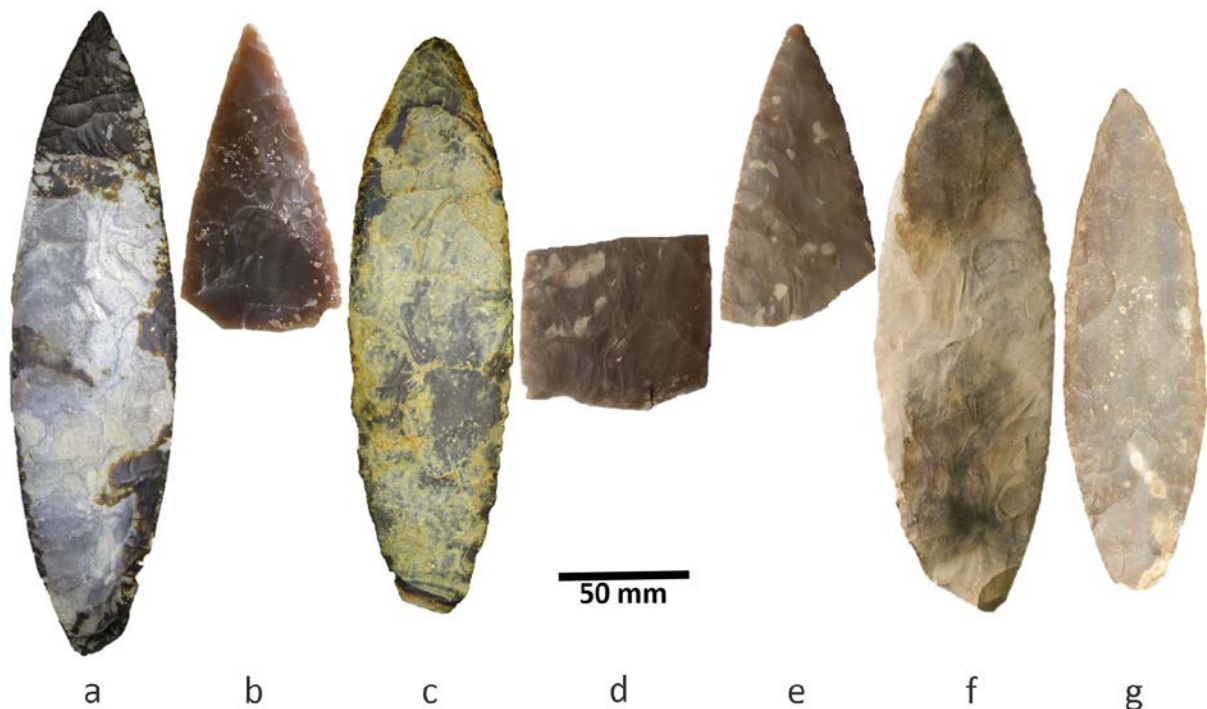


Figure 12. Chert laurel-leaf biface eccentrics from caves in Central Belize: a) Actun Chapat (ACP1); b) Actun Tunichil Mucnal (ATM2); c) Actun Tunichil Mucnal (ATM1); d) Actun Yaxteel Ahau (AYA2); e) Actun Yaxteel Ahau (AYA1); f) Je'reftheel (JRH); and Actun Chapat (ACP2) (photos by J. Awe, L. Pawlowicz, C. Helmke and W.J. Stemp).

3.2.2. Ceremonial power, gifts, and sacred objects

The skill and knowledge needed to make eccentrics were important sources of power incorporated into the religious rituals of the Maya (see Wells & Davis-Salazar 2007: 6-7 for ritual economy; Morehart 2017; Rice 2009). It is assumed eccentrics were purpose-made objects, designed to be deposited as ceremonial offerings. Nevertheless, the roles or identities of all those who made eccentrics were likely variable, although their relationship to the object they produced was likely the same since the eccentric was perceived as both a gift and a sacred object that was spiritually connected to the original maker and ultimately the supernatural (Clark 2007; Godelier 2004: 16, 18; Weiner 1992: 33).

As such, eccentrics are often understood as gifts and sacred objects that were somehow connected to and intended for the supernatural realm. In this sense, the eccentric is an object that could be considered a 'gift-to-god' (Gregory 1980: 645; Mauss 1990: 20-22), in which both possession and control of the gift are forfeited, ostensibly in exchange for something wanted or needed by the Maya from supernatural forces or entities, if only as acknowledgements of human devotion, made manifest in sacral objects. The assumption is that the gift placed in a cache, a burial, or a cave is being returned to its place of origin or to its supernatural creators and will be accepted by the supernatural and therefore initiate, or complete, a cycle of reciprocity (Thompson 1950: 13). The nature of this reciprocity suggests that knapped stone tools, in particular those deposited in religious rituals, constitute inalienable possessions; the Maya are both petitioning the supernatural world with gifts and returning them to the 'Earth Lords' who first created the stone from which the objects were

made (Godelier 2004: 16; Mauss 1990:14-17; Moyes 2012; Palka 2014: 153; Weiner 1992: 34-35, 42; see Lillios 1999: 240 for 'heirlooms').

The act of 'giving', in terms of caching the eccentric, including it in a burial, or depositing it in a cave, also had socio-political and ideological value. As a special gift, the aspects of the maker or giver and the eccentric were entangled and social differentiation could be materialized through the ritualization of production, ownership, and exchange (Godelier 2004: 18; Hodder 2012: 22; Hoskins 1998: 2; McAnany 2008: 238). Not only is there power in the production of the eccentric, there is also power in incorporating it into religious rituals (Stemp *et al.* 2019; Wells 2006; Wells & Davis-Salazar 2007), as well as actual gift-giving among mortal elites (see Inomata 2001; LeCount 1999 for polychrome ceramics) that others may not be able to perform (*i.e.*, agonistic giving). Based on ethnographic evidence, both political and religious status may be connected through strict hierarchical ordering and ascribed position and thus eccentrics were undoubtedly very important in both political and religious rituals (Villa Rojas 1985: 420-421). This practical gift-giving was used by elites to foster alliances and influence subordinates. In such instances of gift-giving, elites may have given eccentrics as prestige items that could be ceremonially wielded and deposited by vassals or subordinates in their own caches or burials, possibly as public spectacles (Iannone 1992; Tsukamoto 2014). As a gift, part of the elite individual was attached to eccentric, and elite power was subsequently conferred onto the vassal or subordinate as the new owner (Hodder 2012: 22).

The public deposition of an eccentric in an underground space may also be interpreted as a form of conspicuous consumption in that the object 'materialized' aspects of status and socio-political and ceremonial power that were meaningful to the ancient Maya. Using the best and most exotic raw material, making the most detailed and intricate object by the most skilled craftsmen, and then just disposing of it through religious ritual in a location where it would be forever more inaccessible is the essence of conspicuous consumption. Thereby, the elite that sponsored and served as patrons for the religious rituals, having commissioned these eccentrics, did so also for the symbolic repercussions of the economics, which were visible to the witnesses - for perhaps just fleeting instances. In essence, public ritual performance and deposition of eccentrics may be akin to other ceremonies of participatory 'giving', such as feasting (Aoyama *et al.* 2017b; Garber *et al.* 2004; Joyce & Henderson 2007), that provided the hosts of the religious rituals, by virtue of their access to the necessary means and materials, with influence over others based on their capacities to engage with supernatural forces or powers that controlled the Maya world. Conspicuous consumption may also be embodied by the act of 'giving' an eccentric to the supernatural on behalf of another who cannot. By providing a gift to the ancestors or deities in this manner, the giver may also be appropriating the 'generosity' of the other and indebting the other to them, especially in a public ceremonial setting. Moreover, gift-giving performed as a public spectacle, especially centred on symbolic objects (Geertz 1973: 89-91), would have bound commoners, subordinates, and elites communally in a ritual of consecration that united those within the political territory and helped to build collective memories grounded in cosmology in both time and place (Chase & Chase 2010; Iannone 2010; Schwake & Iannone 2010).

Although most forms of eccentrics were not intended for use as functional tools, one group of eccentrics appears to be an exception. Microscopic use-wear evidence for contact with soft tissue (meat, skin, hide) and bone indicates that some of the laurel-leaf bifaces from caves in Central Belize may have been used in religious rituals involving human sacrifice (Stemp *et al.* 2021). Sacrifice using eccentrics would further strengthen the importance of these inalienable objects as powerful ceremonial items. In instances of human sacrifice, those wielding the bifaces could provide blood, which contained life-force or *ch'ulel* (see below), to the supernatural as gifts. Providing blood through sacrifice to the supernatural entities who

originally created humans from a mixture of their own blood and maize would have been a significant act of reciprocity by those wielding the bifaces (Christenson 2007; Schele & Miller 1986: 144).

3.2.3. Production, personhood, and animate objects

As noted, the production of eccentrics (and likely all production among the Maya) incorporated more than just crafting skill, but also the ability to commune with the supernatural, in the form of deities who governed the Maya world, ancestors, and the forces within the crafted items themselves, in order to both properly make and use the items in ceremonial activities or performances (Aoyama 2014: 152; Houston *et al.* 2006; Hruby 2007; Jackson 2017; Meadows 2001: 133; Sheets *et al.* 1992: 175; Spielmann 2002; Vogt 1969; Wisdom 1940: 401). Eccentrics were not just used in religious rituals, but also embodied the supernatural power of the ritual and were entities with their own respective identities and spirits or souls (Houston 2014: 98; Jackson 2017: 584; 2019: 33; Schele & Miller 1986: 176). For example, some eccentrics are depictions of deities and humans of some type; whereas others are living entities like animals (see below). Moreover, some eccentrics were painted or decorated with small pieces of shell or stone that provided them with physical characteristics or body parts, such as mouths and eyes, and were, therefore, ‘faced’ (Brown 2015: 59; Gillespie 2008: 130; Houston *et al.* 2006: 107, 141, 154, 163, 166; Jackson 2019: 33-34; also see Aztec *tecpatl* [sacrificial knives] Dehouve 2023: 91; Moctezuma 1985: 809). Some eccentrics may have been wrapped as well (Agurcia Fasquelle *et al.* 2016: 57-58; Meadows 2001: 8), suggesting that perhaps they were ‘dressed’ or wrapped as funerary bundles (Jackson 2019: 37). In this regard, eccentrics were entangled in the Maya concept of an animate universe, in which all living and non-living things were imbued with a life-force or *ch’ulel* (‘godliness’) and some ‘faced’ objects may have been simultaneously imbued with ‘personhood’ (Jackson 2019: 33-34). For the Zinacanteco Maya, *ch’ulel* is used to define the animate essence that gives life (Vogt 1965: 33-34). The word *ch’ulel* is derived from the root *ch’ul* ‘divine’ cognate with *k’uh* in Classic Mayan, for ‘deity’ (Helmke 2012; Kettunen & Helmke 2020: 84, 110; Vogt 1969: 369).

As animate objects created by artisans, production was religiously ritualized and still is to this day. McAnany (2010: 213) states that, among contemporary Maya:

... the original creators are referred to as makers, modelers, and weavers; these generative acts are recapitulated when humans craft goods. Because of the manner in which crafting transforms raw materials, such creative acts must be done carefully and with proper respect for earthly supernatural forces, that is, there needs to be a dialogue with the deities while crafting is underway. Moreover, one of the best ways to initiate and maintain a dialogue is to offer (or sacrifice) to deities a precious thing, such as blood or a beautifully crafted item.

In this regard, eccentrics can be considered ‘beautifully crafted items’ whose original function was as offerings to the supernatural. We argue that most eccentrics were made specifically for caching purposes without an ascribed function prior to ceremonial deposition. This makes eccentrics, like most cached objects, unique among items in the Maya world. This can be demonstrated by the fact that, following production and eventual (albeit fleeting) display, the Maya did not release the lifeforce of eccentrics by breaking or ‘killing’ them as they did with other objects, such as ceramic vessels and stone tools, that were terminated after having fulfilled their intended functions (Helmke 2009; Helmke *et al.* 2015; Morton *et al.* 2019). This is true of other whole or unbroken cached or buried items, such as those contained in lip-to-lip ceramic vessels that have been found at numerous sites throughout the southern Maya lowlands (Freidel *et al.* 1993: 241-242, 414; Haviland *et al.* 1985: 155-156; Lee 2022:

47; Mathews & Garber 2004). The cached ceramic vessels themselves are complete and not smashed or damaged and are sometimes rather poorly made (see Figure 3), suggesting they were likely produced specifically for the cache and just before they went into the cache. An exception to this deposition of eccentrics as whole objects is demonstrated by some of the laurel-leaf bifaces deposited in caves, such as Actun Yaxteel Ahau, as single items that were used as sacrificial knives. After use, these knives were broken to release the *ch'uul* within them (Stemp *et al.* 2021), thus formally ending their use in religious rituals. These were essentially 'lifeless' entities in a way that eccentrics in surface site caches were not.

4. Conclusion

As special symbolic items, eccentrics embody a complex series of ideological, cosmological, and supernatural concepts in the Maya world. These are simultaneously symbols of rulership, objects of veneration, elements of mythology and cosmology, and gifts for people and supernatural forces and entities. In their role as gifts intended for the supernatural, eccentrics were inalienable objects made from stone provided by supernatural forces and entities that served as ceremonial offerings in exchange for stability and success in an unpredictable and stressful world. Whether deposited individually or collectively in an underground space (*i.e.*, cache, burial, cave), eccentrics may represent 'characters' or 'themes' in narratives that connected the Maya to their past and potentially provided a means to reiterate mythological time. Together the forms, colours, and numbers of eccentrics likely represent complex ideas assembled as narratives that did tell a story of sorts, and they likely also served to mark sacred spaces and landscapes connected to origins, deities, ancestors, religious rituals, and spectacles. Although much has now been written about Maya eccentrics, the specific narrative embodied by the eccentrics at each location where they were deposited remains, in most instances, to be deciphered. Based on the existence of pan-Maya narratives, it has been speculated that at least some common stories or themes are symbolically preserved in eccentrics; however, does the same form always carry the same meaning at all sites and in all contexts? For example, were eccentrics symbolically encoded and ritually used in the same way at different sites in different regions of the Maya world, and for all periods? Was the same form of eccentric symbolically coded with the same concept(s) despite whether it was placed in an architectural cache, a burial, or a cave? Did two caches of similar eccentric forms deposited under a stair versus in a ballcourt at the same site convey the same symbolism and story? Did the same form of eccentric carry the same meaning, regardless of whether it was made of chert versus obsidian? This level of detailed analysis of individual forms, composition, and context (*e.g.*, Iannone 1992; Lee 2022; Meadows 2001; Ramos Ponciano 2017; Stemp *et al.* 2012; Sullivan 2017) remains within the purview of future research. Although a daunting task, it would provide yet another glimpse into the complex world of religious ritual, symbolism, and cosmology of the ancient Maya.

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Data accessibility statement

Data is available in Supplementary file 1.

List of supplementary files

Supplementary file 1

STEMP_etal - supplementary file 1 - eccentrics from Central Belize.docx

Table of the eccentrics from sites in Central Belize discussed in the article listed by type, raw material, associated artifacts, and contexts.

Supplementary file 2

STEMP_etal - supplementary file 2 - eccentric forms and meanings.docx

Additional photographs and explanations of the forms of eccentrics and their associated meanings.

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La ideología y el simbolismo de los excéntricos mayas de sílex y obsidiana de Xunantunich y cuevas en el centro de Belice: Contextos, cronología, materiales, producción y significado

W. James Stemp¹, Jaime J. Awe², Christophe Helmke³, Jordan A. Lee²

1. Department of Sociology, Anthropology and Criminology, Keene State College. 229 Main St., Keene, NH, 03435-3400, EE.UU. Email: jstemp@keene.edu
 2. Department of Anthropology, Northern Arizona University. 5 E. McConnell Dr., Flagstaff, AZ, 86011-5200, EE.UU. Email: Jaime.awe@nau.edu; Lee: jal854@nau.edu
 3. Institute of Cross-Cultural and Regional Studies, Københavns Universitet. Karen Blixens Plads 8, DK-2300 Copenhagen S, Dinamarca. Email: cgbh@hum.ku.dk
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Resumen:

Los excéntricos están asociados con conceptos de importancia fundamental en la cosmología y religión de los antiguos mayas. Como lo indica su nombre, los excéntricos son artefactos de función especial, no utilitarios, de forma irregular. Tallados de sílex y de obsidiana, los excéntricos varían en tamaño, toman muchas formas y se pueden hacer de manera expediente o magistralmente. En este estudio, nos enfocamos en excéntricos del centro de Belice, específicamente en los de la Cancha 2 del juego de pelota en Xunantunich, así como en ejemplos de cuevas del valle de Roaring Creek, incluidos Actun Chapat, Actun Tunichil Mucnal, Actun Uayazba Kab, Actun Yaxteel Ahau, Je'reftheel y Midnight Terror. Para entender los usos de los excéntricos en el mundo maya antiguo, examinamos los excéntricos en términos de sus contextos arqueológicos (p. ej., en escondites, entierros, o cuevas), fechamientos, tipos y procedencia de materia prima lítica, técnicas de producción y significados. Esta información se utiliza para reconstruir el papel de los excéntricos en la comprensión del mundo animado de los mayas, así como la encarnación de la mitología y cosmología de los mayas en estos objetos ceremoniales. Se examina el simbolismo que impregna estos objetos en relación con la numerología y las correspondencias entre la iconografía y la epigrafía maya. Estos análisis demuestran que los excéntricos desempeñan un papel importante en la representación de la mitología y la cosmología de los mayas antiguos y encarnan conceptos de importancia crítica para el éxito y la supervivencia de los mayas en un mundo natural enredado en lo sobrenatural. Como tal, también servían como objetos inalienables hechos de piedra proporcionada por lo sobrenatural que se ofrecían como ofrendas a las entidades sobrenaturales en tiempos de necesidad o crisis. Los excéntricos encarnan y reflejan las ideas de la realeza, el sacrificio, los fenómenos naturales (específicamente la lluvia y las tormentas), los cuerpos astrales (como el sol, la luna y los eclipses), el maíz, y los moradores zoomorfos del inframundo maya (incluidos los ciempiés, las serpientes y los escorpiones), así como representaciones de deidades, incluyendo *K'inich Ajaw*, el dios de sol, *Chaahk*, la deidad de lluvia, y, en particular, *K'awiil*, la encarnación del relámpago. Además, las formas geomórficas, los colores, y el número de excéntricos son simbólicamente importantes por los mayas. Por ejemplo, el color negro se relaciona simbólicamente con la oscuridad, la noche, el punto cardinal hacia el oeste, mientras que el color verde se asocia con el lugar central de los cosmogramas mayas, así como la fertilidad, la agricultura, el maíz, y el árbol del mundo, que se conecta los tres niveles del universo maya. Las excéntricas, particularmente en conjuntos de cero, siete, nueve y trece, representan a deidades patronales, ubicaciones y aberturas en el entendimiento cosmológico maya del universo

estructural. Esto se demuestra por el hecho de que el cero estaba conectado con el inframundo, el siete estaba ligado a los colores direccionales *ik'* 'negro' y *k'an* 'amarillo', el inframundo se percibía como dividido en nueve áreas o regiones, y el reino celestial estaba dividido en trece. Significativamente, los excéntricos de Xunantunich y de las cuevas del centro de Belice son consistentes con el uso de esta clase de artefactos en un sistema de creencias pan-maya.

Palabras clave: excéntricos; sílex; obsidiana; Maya; escondites; cuevas