

Figure 1. Five incised jades from Cache O-13-6 at Piedras Negras.

Maya Archaeology Reports

# Painted Lithic Artifacts from Piedras Negras, Guatemala

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In 2003 a series of barely identifiable ancient Maya paintings came to light at the University of Pennsylvania Museum of Archeology and Anthropology and subsequently at the Museo Nacional de Arqueología e Historia de Guatemala. Images of Maya gods were rendered not on stucco, pots, or codices, but on biface-reduction flakes of chert—artifacts that archaeologists typically consider to be ancient refuse. The quality and calligraphic style of the paintings suggests that they were done by a master scribe or court artisan. These artifacts were found in ritual deposits, dubbed caches in archaeological literature, which were excavated at Piedras Negras by the University of Pennsylvania in the 1930s. Caches also included seemingly more elaborate finds, such as chert and obsidian eccentrics, jades, pyrite and hematite mirrors, animal sacrifices, and ceramic

vessels, which have been the traditional focus of cache analysis. The painted lithic artifacts were overlooked because they appear to be common “flint flakes” and were described as such by William Coe (1959) during his doctoral research. The remnant pigments were only noticed during a detailed technological analysis of the flakes that required close scrutiny of the objects (Hruby 2003a). That the paintings were often rubbed or washed off to make a clear space for field numbers is further evidence that they had not been identified earlier.

We revisited the University Museum and conducted multispectral imaging on the painted flakes to thoroughly document the remaining pigments and to determine the iconographic nature of the images. This technique was successfully used on the murals of Bonampak, Mexico (Ware



**Figure 2.** Cache R-5-4 from Piedras Negras, with incised shell depicting the Jester God (photo by Zachary Hruby).

et al. 2002) and La Pasadita, Guatemala (Kamal et al. 1999). Multispectral imaging is able to record eroded lines and pigment residues not readily visible to the naked eye. In addition, pigments can be differentiated and classified based on their spectral reflectance, which allows for the comparison of pigments between lithics. Composite multispectral images and drawings based on those images produce the best available reconstruction of the original painting.

Using this technique we were able to confirm the iconographic nature of known paintings, as well as identify a

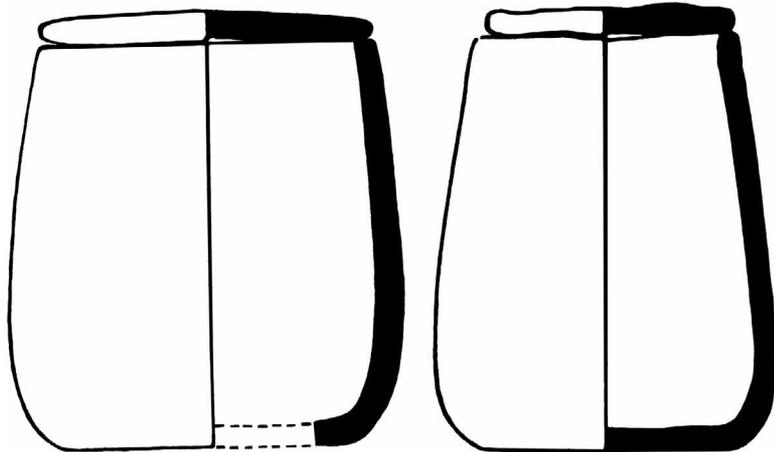
total of nine painted pieces from the University Museum sample. The Classic Maya gods painted on these stones include K'awiil, the god of lightning, and the Jester God, who is associated with the three hearthstones of creation (Taube 1998). Of special interest is a notched-flake eccentric that features K'awiil painted on its dorsal surface. The painted line follows the contour of the eccentric, suggesting that many undecipherable, "eccentrically" chipped flakes were painted at one time and were actually meant to symbolize gods and supernatural elements. Thus the present study has the potential for understanding a previously opaque class of symbolic lithics (Meadows 2001). We analyzed artifacts of other material types and in one case found that Maya were also painting cached jades.

This paper briefly describes the method we used to record the pigments, the images rendered on the flakes, and the context of their deposition. We also offer a few interpretations of their function and meaning in ancient Maya society. Another methodological issue is implied: that the processing, cataloguing, and handling of artifacts after their collection in the field are still critical phases in the preservation of unrecognized perishable remains.

#### **Caches and Their Archaeological Contexts at Piedras Negras**

Royal caches at Piedras Negras were deposited in four general contexts, almost always associated with mortuary temples: (1) below or to the sides of stelae, (2) in platforms, (3) along or under stairways, and (4) in the floors of temple rooms. These caches, often housed in stone cysts or ceramic vessels, contained jade, sea shells (from both the Pacific and Atlantic Oceans), iron pyrite, and chipped-obsidian and microcrystalline quartzes (e.g., chert and chalcedony). In an analysis of caches from the O-13 pyramid at Piedras Negras, Rosemary Joyce (1992) noted that the material content and configuration of these caches varied according to their location in the temple, symbolic meaning, and function. Maya caches appear to be meaningful at many levels, including the location of the cache, the position of objects within the cache, the symbolism of the raw materials used to make the objects, the production knowledge and practice of the crafters, the histories of the objects, and the technological and symbolic forms of the individual cache objects. The existence of painted images on cache artifacts adds yet another level of symbolic meaning to these deposits.

The majority of painted flakes were found in the O-13 temple in the northeastern area of Piedras Negras. O-13 is among the largest of the funerary buildings at Piedras Negras and resembles others from the western Maya Lowlands, such as the Temple of the Inscriptions at Palenque. Although the temples



**Figure 3.** Cylindrical cache vessel found in the rear room of the O-13 superstructure.

are similar in structure, the caching traditions from each vary dramatically in content. Piedras Negras caches resemble those from Tikal and Uaxactun that contain large quantities of obsidian and microcrystalline quartz eccentrics, while Palenque caches focus on large ceramic incensarios, jade, and marine specimens. However, similar to O-13, the upper rooms of Palenque's Cross Group pyramids contain bloodletting "equipment," such as bone needles, awls, stingray spines, and unworked obsidian blades and chert flakes, indicating that these inner sanctums may have been desirable locations for bloodletting activities (Joyce 1992). The top rooms of O-13 were some of the most ritually modified structures known for the Maya Lowlands, with up to 21 caches deposited in a single room. The contents of these caches indicate that the relationship between form, location, and content proposed by Joyce was correct. Recent analysis also shows that each cache represents a multi-textured and more complex aspect of royal ritual at Piedras Negras than previously described.

The majority of painted lithics were found in architectural additions to the O-13 temple dating to the Terminal Classic period (i.e., Chacalhaaz ceramic phase, AD 750-830). They were discovered in caches located in the back room of the superstructure of O-13. William Coe (1959:79-81) dated these subfloor caches to the O-13-1<sup>st</sup> phase of construction, which for him occurred between 9.12.0.0.0 and 9.17.15.0.0 (AD 672-785). We believe that the rear-room caches fall closer to the latter time because of their unique content, the morphology of eccentrics, and a cache vessel form that was not found in earlier contexts at the site (Figure 3). Given the unparalleled caching intensity in this room, it is conceivable that some of the caches actually postdate the capture of the last king and the possible disintegration of the royal dynasty at Piedras Negras in the year

AD 808 (Stuart 1999). The large number of caches containing bloodletting tools suggests that the declining fortunes of the polity may have heightened the perceived need for autosacrifice by Piedras Negras elites.

The O-13 caches that contain painted lithic artifacts, O-13-27, O-13-32, O-13-36, O-13-37, O-13-46, O-13-47, and O-13-51, share some common traits, such as the inclusion of possible bloodletters. The artifacts from Caches O-13-27, O-13-32, O-13-36, and O-13-47 were deposited in ceramic vessels, which likely aided in the preservation of the paintings. The cylindrical vessels used for these caches are unique among cache containers at Piedras Negras and likely date to the Chacalhaaz phase and perhaps the post-dynastic Late Chacalhaaz phase (AD 808-830). It is possible that many of the paintings were preserved because these vessels were covered with lids. Some vessels retained blue pigment on their exteriors, however, suggesting that the subfloor context in O-13 was amenable to the preservation of delicate pigments.

The caches with ceramic containers may have been closely related to bloodletting rituals since they tend to feature sharp artifacts made from obsidian and chert flakes and blades. Cache O-13-27, for example, consisted of a lidded pot that contained chert, jade, and obsidian objects, but the majority of artifacts were flakes and blades that could have been used as bloodletting instruments. O-13-36 contained an obsidian with a *pop* or mat design, a first-series prismatic blade, one partially worked jade, two flakes painted with deity images, and one notched flake in the form of a K'awiil silhouette. It is interesting that the mouths of the deity images were painted along the sharpest margins of the flake and to postulate that these miniature god effigies may have been the firsthand recipients of human blood offerings. Microwear analysis may be able to test this hypothesis (Aoyama 1995, 2001), but it is also clear that the painted flakes had other uses (see below).

Another type of cache from the upper rooms of the O-13 pyramid does not utilize a ceramic vessel and tends to feature greater numbers of eccentrics. Cache O-13-37, for which no container was recorded, was one of the more elaborate caches from the rear room. It contained eccentrics, four pieces of jadeite, painted flakes, and a shark tooth. This variety in cache objects suggests that O-13-37 could have been deposited as part of a dedication ritual for the superstructure of the building. The primary "function" for the painted flakes is less clear, and the search for function becomes problematic because of the wide array of items deposited in the cache and the sheer symbolic complexity they represent. At this point it is necessary to explain the often arbitrary distinctions made between different classes of cache objects.

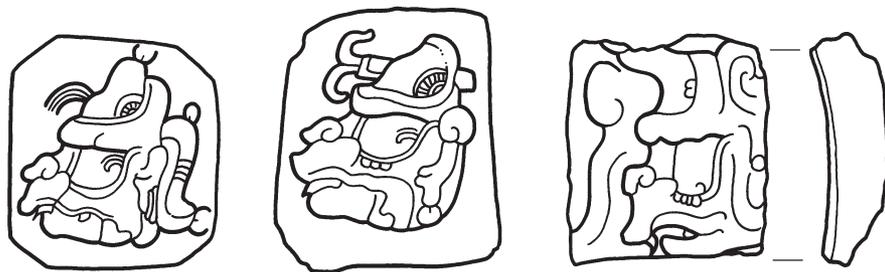


Figure 4. Incised shells from Cache R-5-4 (after drawings by Stephen Houston).

### Eccentrics and Other Cache Goods

Although there was an exceedingly wide variety of goods used in ancient Maya caches, such as painted pots, crocodiles, and human body parts, many fall into the general category of “god effigy.” By god effigy we mean an object that represented a specific god and perhaps acted as its proxy in certain ritual events. These effigies could be made out of any kind of material, although stone and shell objects are the best known due to their durable nature. It is not entirely clear what were the specific functions of these effigies, or if jade or shell objects always had a different function from chipped-stone objects, but similar themes and deities appear to cross-cut material type. Thus while the symbol system used in the caches of Piedras Negras and other Maya centers is not completely understood, it is important not to conflate the function of these goods with the materials and technologies used to create them. In short, cache objects should be analyzed as a whole and not only according to their basic material type.

One factor complicating our understanding of cache symbolism is that particular icons sometimes substituted for god images, which could be knapped, carved, incised, or painted. As in the logosyllabic writing system, the crescent moon sign could substitute for an image of the moon goddess, and vice versa (Hruby 2007). Although substitutions may ultimately lead to an understanding of the symbolic and iconic code of eccentrics and other cache goods, currently they do little to elucidate the possible functions of cache goods.

Of particular interest to this study are the so-called “eccentrics,” which are chipped-stone artifacts that have been knapped into seemingly arcane symbols. The past and present studies of flint and obsidian eccentrics have been somewhat indiscriminate. They are simultaneously the most widely published chipped-stone artifacts from the Maya area and also the least systematically studied; this is true both in terms of the technologies used to create them and also their symbolic content (see Meadows 2001 for an exception). Not surprisingly, the basic elements of eccentrics—technology and symbolism—are intimately connected and combine to produce unique meanings and uses (Hruby 2003b). These multivalent artifacts have their own convoluted histories, including Preclassic origins and Central Mexican influences. The production of eccentrics in the Maya Lowlands appears to have begun during the Late Preclassic period and continued under

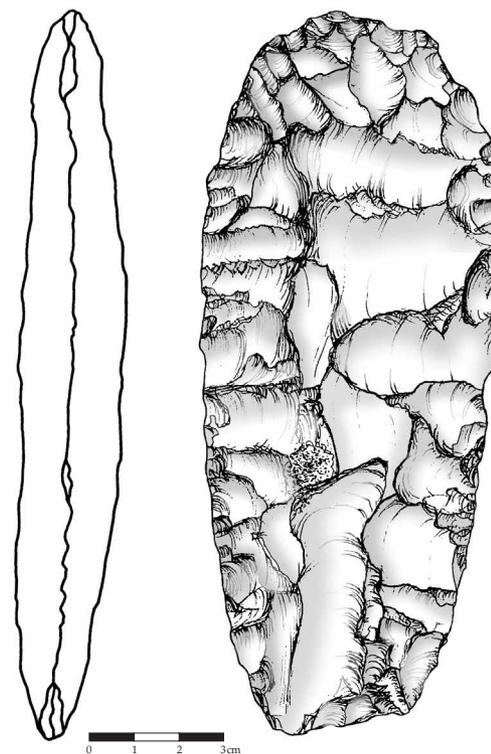
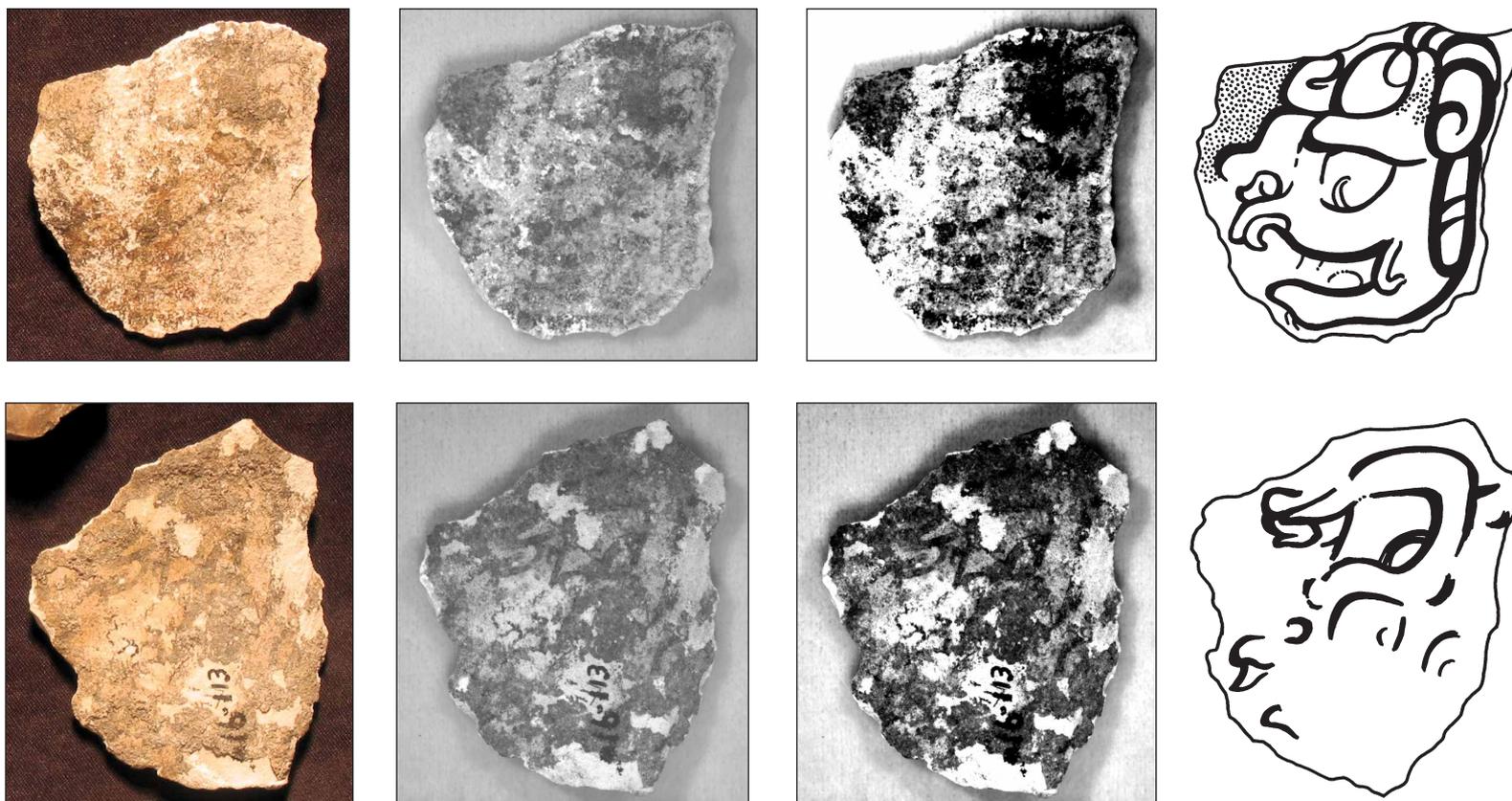


Figure 5. Large biface from Piedras Negras (drawing by Zachary Hruby).



Figure 6. The imaging equipment at the University Museum.



**Figure 7.** Two painted flakes recorded at the University Museum, with reflectivity recorded at different wavelengths.

various guises up until the Spanish conquest. The chipped-stone eccentric tradition reached its most elaborate state in the Maya Lowlands during the Late Classic period.

The majority of eccentrics at Piedras Negras represent a complex symbol system that was key to platform and stela dedication rituals (Escobedo and Hruby 2002). Material and technology were essential elements in determining the symbolic meaning of an eccentric, how it was used, and the role it played in the composition of a cache (Hruby 2006a, 2007). Some eccentrics were hafted, while others were probably used as bloodletters, and still others had multiple meanings and uses. A number of technologies were used to create them, including direct percussion, indirect percussion, and pressure flaking. In some cases, these reduction techniques were related to the symbolism of the eccentric. For example, pressure-notched flakes were often used for naturalistic god images, while bifacial reduction by pressure was reserved for purely iconic symbols (Hruby 2007).

Analytical difficulties arise when unmodified flakes and blades were placed alongside eccentrics in special deposits. They are technologically distinct but appear to have had similar

functions. Distinctions between eccentrics and other cache goods are further complicated by the incision of flakes and blades with icons. At Tikal and Uaxactun, unmodified flakes and blades of obsidian were incised with god images but clearly performed the same function in caches as chipped eccentrics. At Piedras Negras obsidians were not incised, but jades and shells were. For example, carved shells from cache R-5-4 depict the Jester God and also K'awiil (Figures 2, 4). Are these incised shells to be considered as separate classes of artifacts from the incised jades that feature the same deities (Figure 1)? Are our etic perspectives and analytical techniques deleterious to a detailed understanding of what caches meant to the ancient Maya?

Instead of a collection of shells, jades, and flints, one type of cache at Piedras Negras is more accurately characterized as a collection of god effigies and related symbolic goods. Certainly materials and technologies contributed to the meaning of individual objects, but in many cases there is more similarity than difference between cache goods of different material types. This is the context in which the painted lithics from Piedras Negras are considered for the present study.

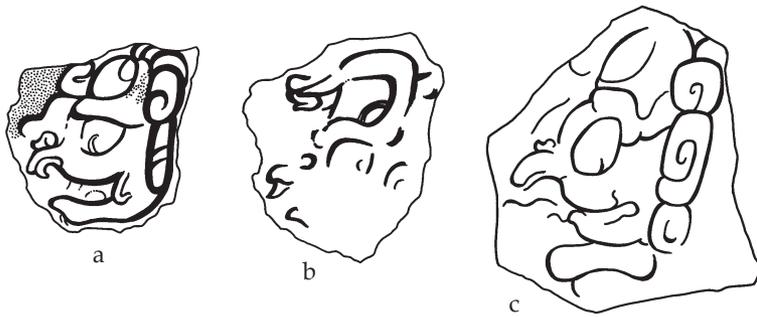


Figure 8. Paintings of K'awiil: (a) with ample hair; (b) with no hair; (c) on a large biface-reduction flake.

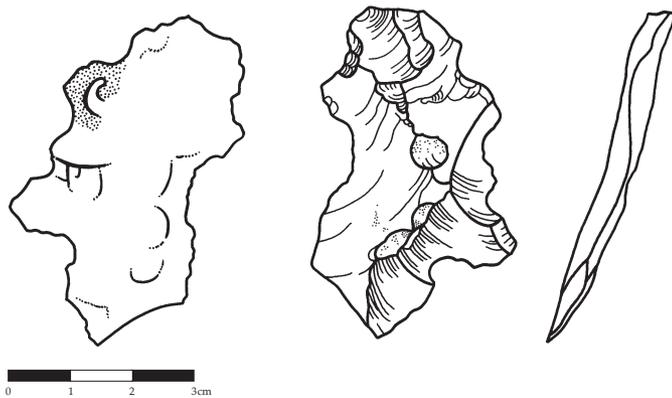


Figure 9. K'awiil painted on a notched flake.

### Methods of Analysis

Preliminary analyses focused on the technological and morphological traits of the artifacts in the University Museum sample. The identification of these traits was based on replication experiments in which bifaces were produced using direct percussion with local materials. The majority of the flakes in the sample appear to be biface-reduction flakes, or flakes that were removed from a blank or early-stage biface to create an axe, spearhead, or other large-to-medium-sized tool (Figure 5).<sup>1</sup> When possible, differences between early- and late-stage biface-reduction flakes were also noted. During this technological analysis, artifacts that featured pigment, retained substantial

<sup>1</sup> We do not distinguish between so-called primary, secondary, and tertiary flakes here because there were no primary or mostly cortical flakes in the sample. In this typological scheme, technology was the primary trait identified, and not the possible stage of nodule reduction as evidenced by cortex on the dorsal side of the flake, although all of the flakes described here can be classified as "interior flakes." The difference between early- and late-stage biface-reduction flakes is based on the complexity of the platform and the dorsal scar morphology.

residue, or were in caches with other painted artifacts were noted and set aside for multispectral imaging. It should be noted that chert bifaces, chert unifaces, and even jades appear to have been painted anciently. This report focuses on the clearest paintings in the sample, which also happen to have been carried out on early- and late-stage biface-reduction flakes.<sup>2</sup>

Once painted or potentially painted artifacts were identified, they were digitally photographed to produce multispectral images of extant pigments. A Kodak 4.2i Megaplus scientific-grade digital camera was used in conjunction with a filter wheel and interference filters of 400, 450, 500, 550, 600, 650, 700, 750, 800, 900, and 950 nanometers, with a bandwidth of 40 nanometers. The camera and filter wheel were controlled with an IBM Thinkpad A30 system computer (Figure 6).

Multispectral imaging produces a set of gray-scale images, which record the reflectivity at the wavelength selected by the filter (Figure 7). As such, these images do not contain color in the normal sense. Instead, they may be thought of as an image cube with two spatial dimensions and one wavelength dimension. Depending on the color and density of the pigment, remaining elements of the original line may be clearly visible at one or more wavelengths. To determine what a specific painting depicted, all of the images were compared, and finally a drawing was created based on this composite image.

### Painted Flakes: Summary of Results

Given the degraded nature of the paintings, it is likely that accompanying flakes from the same caches were also decorated; however, only nine in the tested sample were securely identified.

<sup>2</sup> Further symbolic analysis of these artifacts is also warranted, such as counting colors and types of artifacts in specific caches; however, that study requires a separate treatment in a long-format paper and is beyond the scope of the present article.

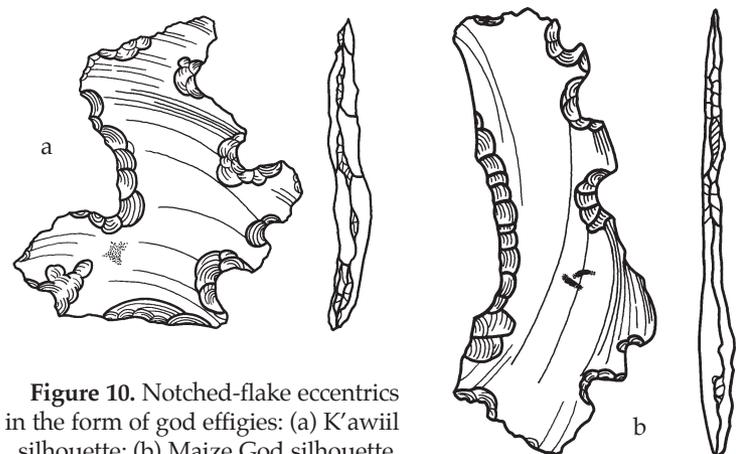


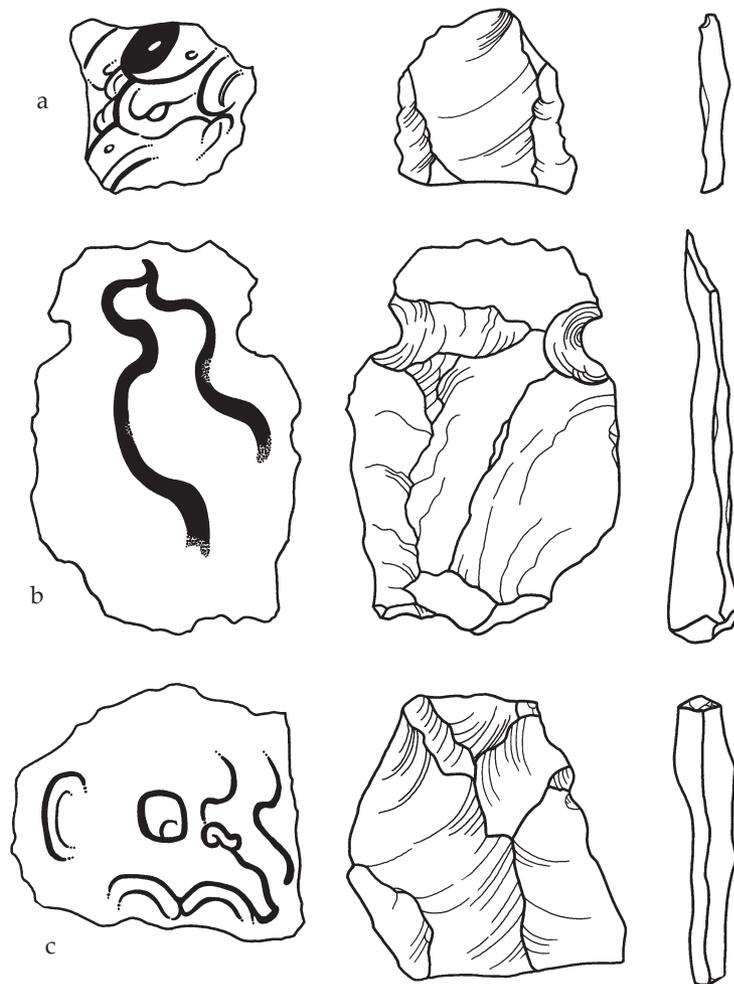
Figure 10. Notched-flake eccentrics in the form of god effigies: (a) K'awiil silhouette; (b) Maize God silhouette.

Similar to the incised obsidians from Tikal, only the ventral surface was selected for decoration, and most of this surface was used for the intended artwork. There is no evidence that paintings or incisions were carried out on the dorsal surfaces of the flakes. It is unclear whether the shape of the flake determined the final form of the image, or whether the intended image determined which flake was chosen for decoration. Only biface-reduction flakes of medium-grained material were chosen to be painted. In other words, unmodified flake-core flakes and nodule reduction flakes (i.e., flakes not directly associated with biface manufacture) do not appear to have been decorated in this way. Furthermore, extremely fine-grained flints and coarse-grained cherts were not used, indicating that the porous nature of mid-grade chert and chalcedony made it optimal for retaining pigment without smearing or wearing off.

The lightning god K'awiil is the most common deity painted on the flakes (Figure 8). Classic-period versions of this deity are usually marked by a smoking torch or axe emanating from the forehead, which is typically elongated and depicted as a shining object, such as a mirror or a polished jade celt. Although it is clear the paintings were executed with great skill, line widths vary between paintings, and particular characteristics of the deity, such as the hair or the forehead, were emphasized in some cases more than others. The hair in Figure 8a, for example, is well defined, while an angular, hairless forehead was emphasized in 8b. That the images differ in line width and size suggests that the paintings were likely carried out by a few, rather than a single artist. That some of these materials are likely local in origin indicates that the images were painted by local artisans and not imported from elsewhere in the Maya Lowlands.

Flake size and morphology also differ between the various K'awiil images. The flake shown in Figure 8c was painted on a large biface-reduction flake, which resulted from the early stages of biface production, while those in Figures 8a and 8b were painted on late-stage biface-reduction flakes. In the very special case of Figure 9, the early-stage biface-reduction flake was chipped into a rough outline of a K'awiil head before the painting was carried out.

It is important to note that without the pigment, the painted notched flake would be classified as an indeterminate "eccentric" and not as a deity silhouette. Although this example should not be considered to be a Rosetta Stone for interpreting all eccentrics, it is clear that many of the notched-flake eccentrics from Piedras Negras should be understood as the rough outlines of deity images. In some cases, it is possible to determine which god is represented according to the morphology of the flake, especially if the god has distinctive features, such as the



**Figure 11.** Other painted images on flakes from Piedras Negras: (a) vulture *ajaw* from the Museo Nacional in Guatemala; (b–c) possible images of the Jester God.

protruding axe on the forehead of K'awiil (Figure 10a). Some clear examples can be found in the R-5-4 cache from Piedras Negras where K'awiil and the maize god are outlined in profile (Escobedo and Hruby 2002; Escobedo and Zamora 1999) (Figure 10a–b). Others are more difficult to identify, but with the aid of the present discovery and additional information from the cache, future identifications may be possible. It will be important to include other examples of chipped-stone silhouettes from Altar de Sacrificios, Tikal, Copan, and other sites that feature this type of artifact.

Deities and icons other than K'awiil were also painted on these flakes. Figure 11a depicts a vulture, an entity which may represent the royal bloodline and lordship, inasmuch as the vulture appears in Maya writing as the logograph **AJAW** "lord, king." Figures 11b and 11c probably represent the so-called Jester

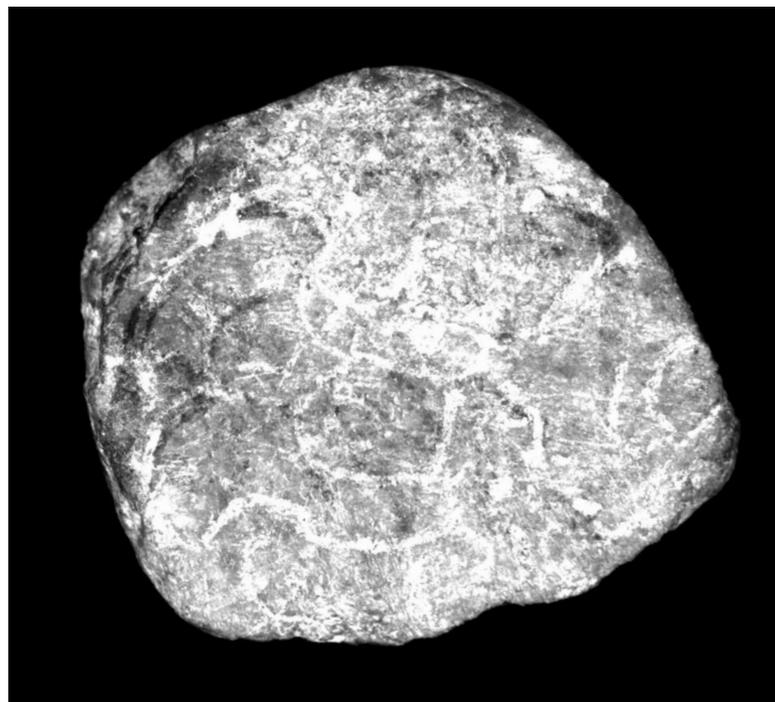


Figure 12. Painted jade from Piedras Negras.

God, a motif used as a diadem to mark kingship and elite status. Aside from K'awiil, the Jester God is the most common deity evoked in caches and caching rituals. In fact, the Jester God and K'awiil are often positioned as opposites to one another. In Cache R-5-4 the Jester God and K'awiil are the only two gods incised on white seashells.

In addition to chert, our analysis also showed that the Maya of Piedras Negras painted the unpolished jades that were so common to their caching tradition. Figure 12 shows a larger example of one of these jades with the Jester God incised on its surface. Upon close inspection it is possible to see paint strokes following the incisions on the surface indicating that the incisions may have acted as a guide for the painted line. The overlapping of two lines with two different wear patterns suggests that the piece was repainted during some part of its use life. Incised jades are common in the caches at Piedras Negras, and as Figure 1 shows, the subject matter is the same as painted flakes, many eccentrics, and the incised obsidians from Tikal. The motifs on the Cache O-13-6 jades include the *pop* or mat design, the Jester God, GI, the Moon Goddess, and K'awiil. Given that some jades and cherts were painted, it is likely that other objects, perhaps of other nonperishable and perishable materials, were painted before they were finally deposited in the cache. Poor preservation and washing by archaeologists are some of the likely causes of pigment removal.

### Discussion and Conclusions

From an economic point of view, it is surprising that typical biface-reduction flakes, characterized as waste by most archaeologists, would be decorated elegantly with fine-line painting. However, from a functional perspective, if one considers these caches to be special deposits of ritual and symbolically rich goods, then they fit a well-established pattern: another type of god effigy or image. God images are the most common iconographic component of these caches, and the pattern extends beyond chert to include obsidian, jade, shell, and probably other perishable materials. Similar to obsidian eccentrics, painted flakes could have doubled as a form of bloodletting instrument, but without detailed use-wear analysis the primary function of these goods is still largely unknown.

It may be important to make the distinction between god portrait and god effigy in this case. *Portrait* is a rather static or passive concept that, if applied to this class of portable objects, indicates a less active role in the cache ritual, relegating them to the role of an art piece or tessera of a larger mosaic. Viewing each cache object as a god effigy, however, shifts the focus of agency to an interactive relationship between actor and object, which forces one to consider the use life of the object. That the jade example in Figure 12 was repainted indicates that some of these objects were used over a long period of time, perhaps in a variety of capacities, before they were ritually deposited. A close inspection

of many of these items reveals that they were handled, used, and perhaps cherished items, while others appear to have been produced more expediently, perhaps for a specific caching event. Further research is needed to better understand why and how differently used items were chosen for inclusion in a given cache.

If jades, cherts, obsidians, and shells were transformed into miniature god effigies and were functionally similar to each other, then what were they used for? We propose that they were used as divining stones by priests, the royal family, and most probably by the king himself. Since many of these goods were deposited in sub-stela, column altar, and architectural contexts, the god effigies could have been used as part of a keeping of the days and ritually deposited in a central location after an important period-completion ceremony was carried out. Many caches may have acted as repositories for divining stones, especially at the end of a significant period of time, such as a K'atun ending. The fact that many gods were associated with particular periods of time and even constellations and planetary bodies strengthens the argument that the cache goods at Piedras Negras had a calendrical significance. It is interesting to note that no glyphic or historical information is recorded on these cache goods. The carvings and paintings are strictly iconographic, thus giving them a rather primordial, pre-calendrical, or pre-historical quality.

Of course this characterization is overly general, and it is clear that caches and cache goods had many different meanings and functions over time. Nevertheless, the paintings discussed here, as well as the additional information we have collected on eccentrics and the uses of cache goods, show that the cache itself may not have been the *raison d'être* for their production. This study represents another step toward more complete interpretations of eccentrics and caches. Only through a detailed technological, morphological, iconographic, and epigraphic analysis can we begin to understand the intricate religious and practical nature of ancient Maya caches. Associations between

materials and directional symbolism, cosmology, and technology are some of the avenues that require further investigation.

Wider implications of this research extend beyond the caching traditions of Piedras Negras, toward an understanding of the social relations of the artisans who crafted the cache goods and those who used those objects (Hruby 2007). Some cache goods must be seen as products of more than one artisan, while others could have come from one artisan who mastered multiple craft skills. The god images and the "mundane" flakes they were painted on should be viewed as religious symbols, but also as markers of production knowledge. The present research shows that cache good production was a rather complicated process, perhaps involving stoneworkers and scribes, or perhaps scribes who mastered stone working as part of a holistic artisan skill set (Aoyama 2007:25; Hruby 2006a). With specific symbolic identifications of eccentrics as Maya gods, it will be possible to decipher the meaning of more lowland Maya caches and gain insight into the religious and economic significance of "eccentrics" and their uses.

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