

Bats

in Sculpture and
Hieroglyphic Inscriptions
of Copan, Honduras

Museo de Escultura de Copán
Parque Arqueológico
Copán, Honduras

Nicholas Hellmuth
FLAAR Reports

FLAAR MESOAMÉRICA
FLAAR



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October 2023

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Acknowledgements

To achieve these photographs FLAAR sent a photography crew to Honduras with a complete portable studio. With a Linhof 4x5, Wisner 4x5-inch camera, several Hasselblads, Leicas, and a complete Dicomed-Better Light digital tri-linear scanback camera, Nicholas Hellmuth and Andrea David did exhaustive photography in both museums. In following decades FLAAR accomplished additional photography, again bringing an entire photo studio and helpful assistants to set everything up each evening. In many museums around the world the curators let us do photography at night after the museum is closed. Plus of course we also do photography during the day.

This photography many decades ago was aided in all aspects by IHAH and Professor Oscar Cruz. We appreciate the assistance of the Hotel Marina for providing a courtesy room in their annex. In subsequent decades each of the new administrators of IHAH and the Parque Arqueológico Copán and curator and directors of the Museo de Escultura de Copán provided access and hospitality.

I first studied the Camazotz "Vampire" Bat Sculpture in the Copan Ruinas village archaeology museum. Now this impressive bat has been moved to the larger Museo de Escultura de Copán in the main Parque Arqueológico Copán, Honduras, Central America. Keep in mind these sculptures and hieroglyphs are not the vampire bat of the movies; the bat of the sacred book of the Popol Vuh is carnivorous: it eats raw flesh plus blood; the Camazotz does not just suck blood from the neck. This bat, literally, slices off the neck of small birds and other animals and eats the bleeding flesh. This method of preying is why I named the bat the Slicer We discuss that further in the report.

We have done additional photography of this remarkable Mayan anthropomorphic killer bat monster between 2010 and 2012 and will be doing more publications on bats in Maya mythology (and bats in the caves and rain forests) during coming years. In the meantime we are posting a bibliography on bats of the Maya area of Mesoamerica on our Maya-ethnozoology.org web site.

The giant 3-dimensional sculpture of the "Death Bat" of Copan, Honduras, has been photographed thousands of times and is pictured in books, articles, and hundreds of web pages. But our goal is to make photos available at high resolution for people in Honduras. So, our photos can be copied-and-pasted and used for schools, for web pages on Copan, etc.

The photos we make available in the present report can be used by students for their term papers and by professors for their lectures. It helps to have high-resolution so you can zoom in on details, especially for affixes of hieroglyphs. We issue two versions: PDF (open, not locked) and PowerPoint to make it easier for people to use the photos and drawings in their own lectures.

I thank Flor Morales Arroyo for helping with the bibliography content.



The animals most commonly pictured in Classic Maya art are:

- snakes (various species)
- jaguars
- waterbirds
- snake-eating hawk (laughing falcon), the Principal Bird Deity other raptors, especially in the Long Count hieroglyphs
- deer (often with monkey tail)
- spider monkey (often with deer ears)
- crocodile and/or caiman
- spondylus shells
- hummingbirds
- Bufo toad (*Rhinalla marina* and others)
- Turkey tail feathers (more often than full bird)
- peccary
- fish (often associated with water lily flowers)
- armadillos
- turtles
- dogs
- plus lots more (insects, spiders, amphibians, iguanas)

Bats are well known and frequently featured but snakes, jaguars and waterbirds are the most common. Where bats got their fame is from the sacred book of the Popol Vuh, the bats within the inframundo, which in the Popol Vuh cosmology is named Xibalba.

The present FLAAR Reports is one of the first to show two of the "human sized" bat sculptures. Most books and articles show only one. We have not yet seen the other three that were rescued in early excacations. The present report also shows a selection of bats in hieroglyphic inscriptions at Copan. "Bats in Maya Art" is a separate topic we have researched; today we focus exclusively on bats of Copan, Honduras.



James Brady and Jeremy Coltman have suggested that the bats in Classic Maya art are not Camazotz of the Popol Vuh. Their article should be read by epigraphers, iconographers, and bat-ologists working on bats of Guatemala and especially on bats of the Popol Vuh. Brady is an experienced Maya archaeologist specialized in caves, so he knows bats of caves. Coltman has also worked in caves and studied Maya iconography, including the Early Postclassic of Chichen Itza.

Some bat species live under palm leaves, literally. Other bats live inside giant *Ceiba pentandra* trees because these trees rot from the middle and Ceiba borer beetles, *Euchroma giganteum*, eat out the insides. Then termites also have a place to stay inside the now rotting trunk. So the Ceiba continues to grow on the outside of the trunk (and the canopy of limbs, branches and leaves continues to grow) but the center gets "eaten away" and a hole develops at the base. The Classic Mays show this hole as the mouth of a deity at the base of a tree. Bats can fly in and out of this hollow tree trunk.

So I dedicated about seven years to finding and photographing every *Ceiba pentandra* tree in Guatemala that had a "doorway to inner rot" that was large enough that I could enter the tree, literally. I could walk into the middle of the trunk of the giant Ceibas and look many meters upwards.

This is my style: if I find an aspect of Classic Maya art, or an aspect of flora, fauna or biodiverse ecosystem, I cross-cross Guatemala for thousands of kilometers to learn more than is in a library at a university. To study *Plumeria* flowers of Guatemala we criss-crossed Guatemala for about 4,000 kilometers during 2023 on multiple field trips with a Mavic 3 drone and several photographers to document the trees, flowers and habitat of wild ***Plumeria***. This plant provides perfume to the Maya in past centuries and has other uses. Plus J. Eric S. Thompson mistakenly came up with the idea (or read it somewhere else and repeated it) that *Plumeria* flowers were the origin of the Kin hieroglyph, the Maya glyph for Sun for over a thousand years. Totally wrong since *Plumeria* has 5 petals and Kin has 4 petals; so in past decades we have accomplished field trips to find and photograph every flower of Guatemala that has 4 petals.

This bat sculpture was in Structure 10L-20 but every time the Rio Copan flooded, it would wash away parts of the back of the acropolis. So century by century most of this structure collapsed. Fortunately, the fragments of this bat sculpture were salvaged and so today you can see it in the museum.



Of all the bat sculptures at Copan, the one above from Structure 20 is the one most often published.

William Fash astutely mentions that the % sign means death. That is direct evidence that "killer bat" is an acceptable term.

Barbara Fash mentions that there are five known bat sculptures from Copan (2011, caption of Figure 92, page 80). But frankly in decades of studying the art of Copan, it's the other bat sculpture that gets the most attention. The "second bat" that I show here is pictured in only one (Fash 1991: Figure 81) of the three major books on Copan of the current quarter-century of publications (would help to have citations to the "missing three other bat sculptures" in a technical report that someone will send me a link to).



There are "hundreds" of different bat species in Mesoamerica. 90% of captions for the bats used for hieroglyphs is "leaf-nosed bat." To identify which is which is a long-range project. The bat I am most interested in is Vampyrum spectrum, the larger of the two species named "false vampire." This is the largest bat in the Maya Lowlands. It has a leaf-nose, so we need to be careful when using "leaf-nosed bat" as a generic ID to suggest "well, they are just a miscellaneous bat, one of the many with a leaf-shaped nose." Since the size and shape of the leaf-nose of each bat species is slightly different, it would help for a bat-ologist to work together with epigraphers and iconographers to resolve this issue.

There are lots of videos and reports on the false vampire bat. One is: (Click here to read more). Searching for the Vampire Bat (should be renamed, Searching for the False Vampire Bat, Vampyrum spectrum).

Bat as the Emblem Glyph of Copan

If you had a term paper or BA thesis on "Bats at Copan, Honduras", surely you could find dozens of bats as hieroglyphs. For the first edition of this report on photographs of bats in the FLAAR Photo Archive on Copan we show several examples. For epigraphic research on the Bat as an emblem glyph, check out the 2018 article by Valencia and Esparza, Boot 2009 and Carrol 2013. There are more on-line but these three will get you started.

The Sky Band bench front shows rabbit, a bird at each end, scorpion, possible centipede, but no bat. However two other bench fronts do feature bats:

- Copan Structure 9M-146, the "Harvard Bench" drawing by Barbara Fash (Baudez 1994: Figure 112 and in other publications, Sarah Jackson and David Stuart 2001 for example).

- Copan Structure 9N-82, front of masonry throne inside the House of the Bacabs, drawing by Anne Dowd (Baudez 1994: Figure 111). This long horizontal hieroglyphic inscription has two full-figure bats:

    - Glyph Block 11, on left half
    - Glyph Block 15, on right half

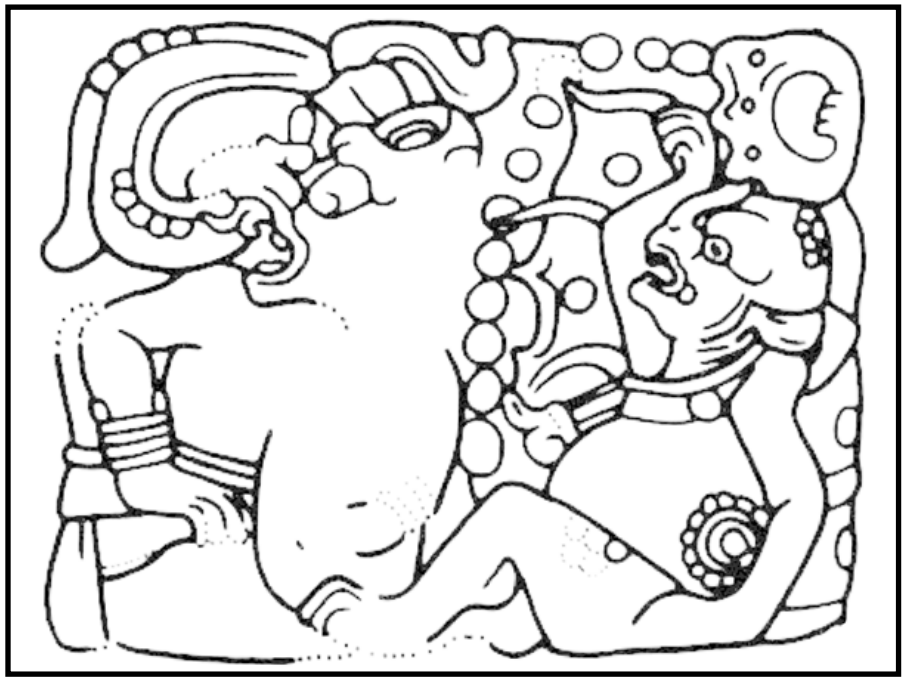
If you are a full-time epigrapher, if you are working at Copan for years on its inscriptions, or if you have access to a hieroglyphic database you can find a more complete list of all the Copan sculptures that show the Bat Emblem Glyph. But here are samples that I was able to find so far. If you know of more examples, please let me know. There are also Copan Emblem Glyphs at Quirigua and other sites where Copan, Tikal, Calakmul etc. sent envoys for royal events at those other sites.

Copan Stela A, CPN 1, south side
Copan Stela A, west side (back)
Copan Stela D, CPN, full-figure personified bat as emblem glyph block B9
Copan Stela I, CPN 18, south side, has two bat emblem glyphs on the same side (C6 and C9) and another bat on the other side (D9) but superfix area eroded. Glyph Block C6 is one of the best preserved and most detailed bat emblem glyph at Copan.
Copan Stela N, CPN, Glyph Block A8, deep relief rendition of the Copan emblem glyph.
Base surrounding Copan Stela N, glyph block 6.
Copan Stela 1, CPN, Glyph Block D4
Copan Stela 7, CPN 54, two bat glyphs
Copan Stela 8, CPN 55, one bat emblem glyph on each side (front and back)
Copan Stela 10, CPN 57, two bat glyphs: one as Emblem Glyph the other not.
Copan Stela 11, CPN 60, nice example on the back
Copan, Papagayo stela, CPN, an Early Classic example of the Bat as Emblem Glyph for Copan.
Copan Stela A, west side, Glyph D10, nice example
Copan Stela A, south side, Copan, Tikal (Mutu'ul), Calakmul, B'aakal Palenque sequence.
Copan Altar G1, north side, B5, eroded
Copan Altar G, south side, bat present D3 but not in Emblem Glyph context
Copan Altar K, west side, block Q1, eroded.
Copan Altar T, CPN 33, group facing left, full-figure seated bat-man (human size, shape body but bat-like head) (Baudez 1994: Fig. 43)
Copan Altar U, CPN 34, top
Copan Altar U, CPN 34, rear
Copan Temple 11 bench; one on West half; one on East Half
Copan Structure 12, Reviewing Stand
Copan Structure 9N-82, front of masonry throne inside the House of the Bacabs. Two bats; need to decide which is Emblem Glyph and which has other purpose.

The Copan Bat Emblem Glyph at other sites has been presented by many epigraphers. I suggest reading *La presencia del Glifo Emblema del murciélago en El Petén y el sur de Campeche y sus implicaciones políticas* by Valenciz and Esparza 2018.

Bat Emblem Glyph as full-figure personified Bat

Most hieroglyphs are faces, called face-variants. But there are also hieroglyphs on over two-dozen stelae and other Classic Maya art (murals and other art) that have the deity face or the animal or bird or toad face as a complete body, complete with arms and legs. These are called full-figure hieroglyphs. I call them full-figure personified hieroglyphs. Copan Stela A (CPN 1) has the emblem glyph as a complete bat. The K'awil (God K) in front is also a full-figured deity.

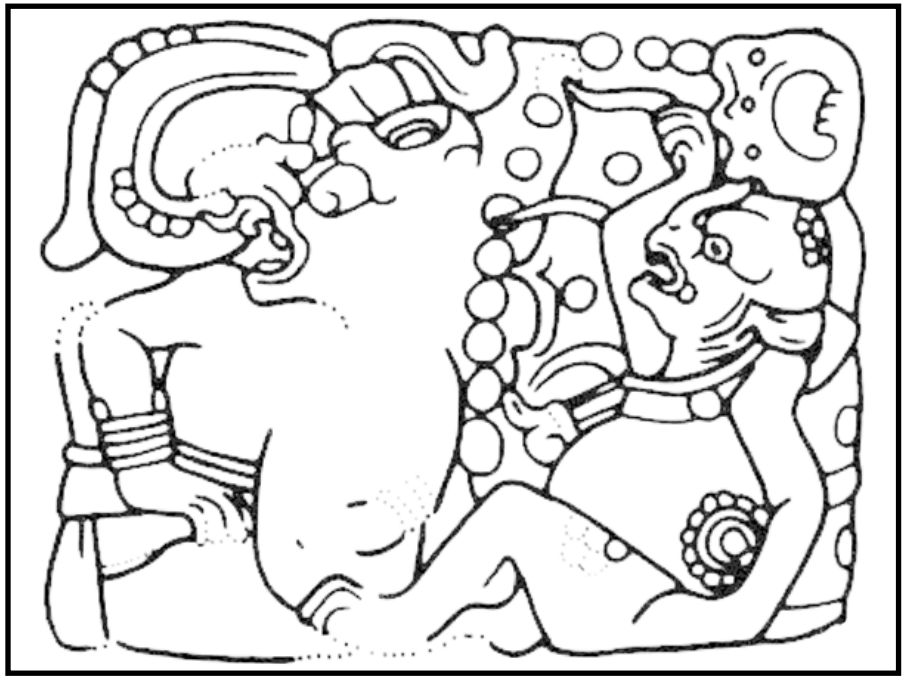


This image is noticeably better (not perfect, but much clearer and cleaner and less smudged). But to achieve this I had to put the image into Adobe Photoshop and process it. With thousands of hieroglyphs, deities and other motifs that I am doing research on, having to "clean and clear up each individual image" wastes lots of time. But at least you can improve the drawings of the previous century a tad.

Today I met with an epigrapher and he agreed with me that each individual hieroglyph should be drawn at mas o menos page size (usually a Wacom tablet or comparable). So for each stela, show: a: show the entire stela, but, b: have each individual hieroglyph available for epigraphers, linguists and archaeologists at good size and excellent resolution.



This is one of the most lively full-figure bat emblem glyphs at Copan, back side of Stela D, CPN 7. Cropped by Hellmuth from drawing by Linda Schele, SD-1006. In that decade (probably 1990's or before) the drawings were to show the entire stelae, so the overall drawing was not large. Thus each individual hieroglyph is barely a centimeter high. So when you crop one hieroglyph from the FAMSI database, it comes out smudged (not just Schele drawings, but all drawings from all publications if you scan the page and crop to the drawing). We use Epson Perfection V850 Pro scanner with professional SilverFast 9 software but still the image comes out smudged (above was simply copied from the FAMSI web site).

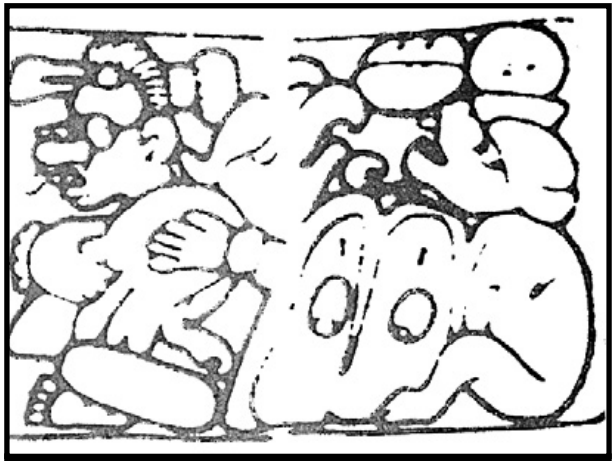




The Schele drawing has assisted epigraphers for decades. But with better photos (mine is a single snapshot), the style of the drawing could better reflect the bas-relief carving style, such as the frame of the mouth of K'awil (God K). The glyph needs to be re-photographed with different angles of lighting to bring out even more detail. Frankly for this glyph block, the drawing by Schele shows the scene more easily than the Hellmuth photo… but the photo shows the 2-dimensional bas-relief sculptor's style better. Full-figure personified version of the Copan Emblem Glyph with K'awil as full-bodied deity in front. Copan Stela A, CPN 1, south side. Curiously no drawings of the sides of Stela A are in Baudez 1994 monograph on *The Maya Sculptures of Copan*.



Drawing by Linda Schele, rescued in software by Hellmuth.



Drawing by Barbara Fash. When you copy a published drawing, the quality is awful. The original drawing is probably very precise, but can't show that until a high-resolution file is available.

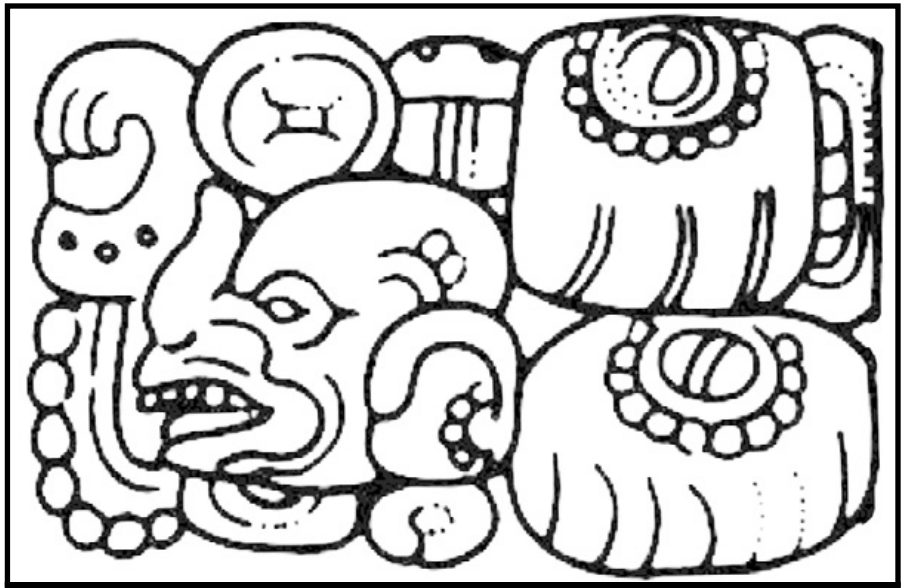


Copan Structure 9M-146, bench front, Block M God K, K'awil at the left and bat emblem glyph of Copan at the right.

Here we see that both on Copan Stela D, CPN 7 and on the bench front of full-figure personified hieroglyphs of Copan Structure 9M-146, you get K'awil (God K, often carried as a royal scepter by a Maya ruler). The bat in both is sitting but in a position as if pushed over. On Str. 9M-146 a bird with giant sharp beak angles at the bat (God K is holding the bird in a protective manner). The wings on Stela D bat have the same three curved raised aspects on the inside of the wings featured (identical to the two giant 3-dimensional Copan bat sculptures). The bat on the bench has what could be the so-called "disembodied eye" symbol (the size and shape that often hang from necklaces). This "eye" has no nerve squiggling out the end. I would respect alternative interpretations by epigraphers or iconographers.



Obviously I "click to enlarge" but that is still not high enough resolution. So on my 32" 4K monitor I enlarge it to 500% and then crop the single glyph block (346KB which is the size (for this one glyph) as an entire rollout photograph in the Kerr archive (which is why it is so helpful that Dumbarton Oaks is rescuing those antiquated files). Would help if an epigraphy database could find all ORIGINAL Schele drawings and scan each individual segment (so not just the entire stelae).

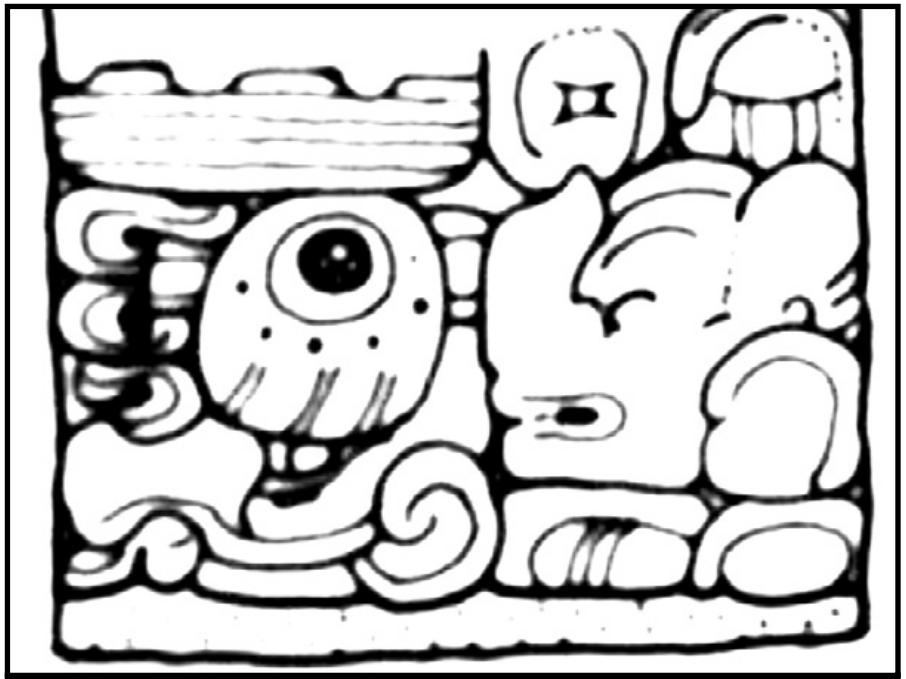


Brightness, maxed to 150; Contrast maxed to 100; Levels to remove a tad more of the smudged blacks. Bit of Curves. If you use Lightroom perhaps you can do better; Capture One is THE best, but I use only Photoshop. If you are an expert you should do much better than what I show here, but at least I salvaged it from the download from the database issue.

I hope these comments help students and epigraphers see how to improve low-resolution drawings from antiquated databases.



These are provenanced sculptures, preserved by Honduras in-situ and in the sculpture museum. Many capable archaeologists, epigraphers, iconographers and photographers from Honduras and around the world have worked here. All the drawings should be at the quality of that of Copan Stela I, CPN 18 that we show on the next page.



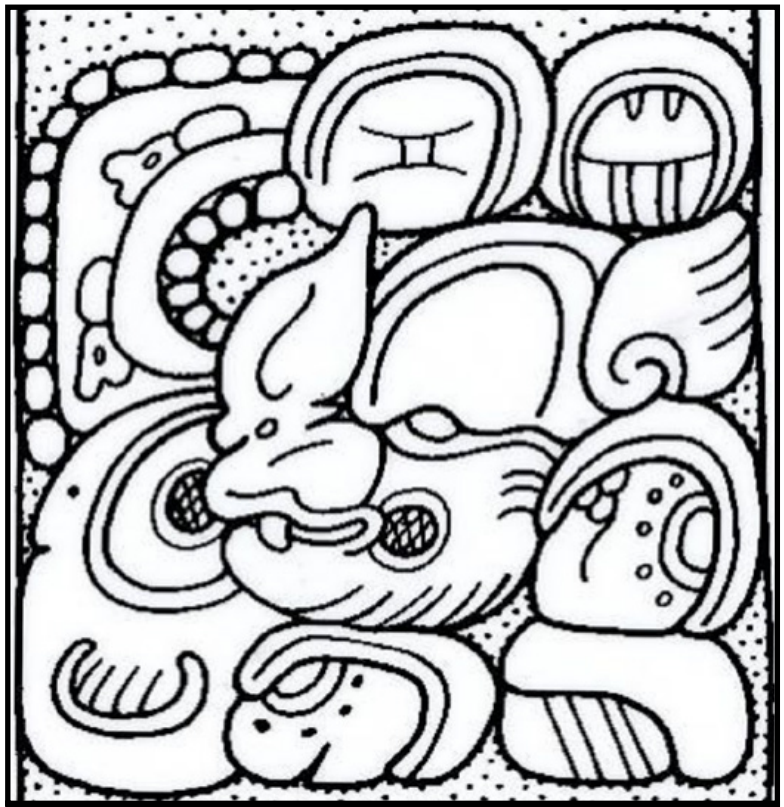
This glyph block could not be rescued (but if you are better at software than I am, surely you can do better). Curves and Levels were tough since this image is very smudged.

Copan Stela I, CPN 18, cropped from Schele SD-1012 and processed by Hellmuth.

Since no peer-reviewed journal has space for individual hieroglyphs at large size, and since over 80% of publishers "just want to get the book into print at lowest cost, by reducing illustration size" there has never been a need for individual glyphs to be at adequate size to see the details.

But… Maya hieroglyphs deserve to be available to epigraphers, iconographers, archaeologists and students at good resolution at a healthy size. To study epigraphy, and to teach epigraphy, it helps to have context (glyphs in their reading order) but to get started, we all need to memorize hundreds and hundreds of hieroglyphs, one-at-a-time. The tradition of the past century was to do drawings at a scale, say 1:10 or whatever was the project norm. This is because the goal of the person recording is to show each entire stela each

entire altar, each complete wide throne front. So the individual glyphs get lost. Our goal is to show how helpful it would be to have each independent hieroglyph at the quality of the Copan Emblem Glyph in this drawing below, from Copan Stela I, CPN 18.



For some reason this crop from Copan Stela I, CPN 18, came out crisper. The nose here seems almost to have been turned by the sculptor to show the leaf-shaped nose in almost frontal view.



This drawing was a thousand times better in the download, so I had to only: Brightness 20; Contrast maxed to 100; Levels to remove a tad more of the smudged blacks. Only a tad of Curves.



Full-figure personified Maya hieroglyphs with a seated bat up front (at the left). Bench front inside Copan Structure 9N-82, House of the Bacabs. Glyph Block K This bat has human arms, legs and body proportions. No wings are noticeable. It is typical on a lengthy hieroglyphic inscription for several different sculptors to have worked on the project.

With the help of close-up photographs a student could have a project to determine how many sculptors worked on this bench front and which glyph blocks each one did. Such a study is not possible with drawings since the archaeologist or epigrapher usually draws everything in one style.



Front of bench inside Copan Structure 9N-82, House of the Bacabs. Hieroglyph Block O. Photo by Nicholas Hellmuth, FLAAR Photo Archive. This “leaf nose” of this bat portrait goes almost up to the top of his head.

Why the interest in bats of the Maya world here?

As a child I spent a lot of time exploring caves in the karst area of the Missouri Ozark Mountains. We had a large family farm here, where we kids went every weekend. Our property is filled with caves, including many caves with springs. There is even a cenote within 100 meters of our house, just like in the karst area of the Maya world of Peten, Izabal, Alta Verapaz, Belize, Yucatan, and Quintana Roo.

Plus, I have always enjoyed learning about animals. Since bats are frequently shown in the art and hieroglyphic inscriptions of Copan ruins of Honduras, and since bats are well known on polychrome Maya vases from the Chama area of the Maya Highlands of Guatemala, as an iconographer I have long recognized the importance of bats.

Which actual species of bat Is the inspiration for the Slicer Bat of Xibalba, of the Popol Vuh?

It is well known that "Death Bats" inhabit Xibalba, the Caves of underworld Hell of the Popol Vuh. And the ceramics of both Chama, polychrome Peten, and Codex Style show "bat men" The Museo Popol Vuh has a good example of an anthropomorphic bat on the "Castillo Bowl" which features both enema paraphernalia and self-sacrifice. The Museo Popol Vuh also has a stone sculpture of a bat monster. Plus the comparable human-sized bat monster sculptures at Copan Ruinas, Honduras are well known.

But what species of bat is the model for these creatures? For another one of the challenges or obstacles of Xibalba, it is clear that the normal jaguar is the model.

The key to recognizing which bat is the most likely model is actually present in the Popol Vuh. Snag is that the K'iche' words of a thousand years ago, or even of the time of the Spanish conquest, are not always easy to translate. Mayan sagas such as the Popol Vuh are often a play on words. And we all know the Chilam Balam of Chumayel which presents the language of Zuyua which is one word puzzle after another. Lots of riddles so that the average person, or a foreigner, could not understand. You had to be trained in the upper class to understand this hidden language. And the Popol Vuh and other Maya sagas are filled with play on words.

So first let's look at the candidates. The bats involved are clearly dangerous, and clearly cave oriented (though the most likely bat model inhabits hollow trees).

There are three species of normal vampire bats in Mesoamerica. Two of these species are readily available: *Desmodus rotundus* and *Diphylla ecaudata*. The third vampire species, *Diaemus youngi,* is not as common in Mesoamerica and usually is not in the specific lists of bats of Guatemala. It prefers blood from birds.

There are other species of bats which eat "meat": *Noctilio leporinus* and *Trachops cirrhosis.* But they are usually considered fishing bats, and also eat frogs and perhaps crustaceans. Ironically the latter bat species may in turn be eaten by *Vampyrum spectrum*. Yes, both false vampire bats delight in eating other bats.

While on the subject of bat diet, we normally think of the fruit eating bats of Asia, or insect eating bats. Plus the bats of Guatemala which help pollinize the ceiba tree. If you are standing under a blooming ceiba tree, at 6 pm the buds are straining to open. When they finally literally pop open all at once, within a few minutes hundreds and hundreds of bats show up to lap up the sweet nectar. So many bats are flying around, that when I am below doing macro photography of the flowers opening, a rain of nectar falls on me (hopefully it is nectar and not bat urine). Actually the nectar is so sweet I taste-tested it on another ceiba tree which opened during a full moon (when not a single bat showed up). The ceiba nectar was absolutely delicious.

So not all bats eat meat, or even eat insects. Yet there is an omnivorous bat, *Phyllostomus hastatus*. It relishes insects (especially swarming termites), bats, mice and birds, fruits (Psidium guajava, Cecropia, and Piper), flowers, nectar, and pollen. Also eats ants and roaches (Santos et al. 2003:722). This bat maintains a large harem of females (no wonder it needs lots of food). While on this subject, *Vampyrum spectrum* is monogamous, plus takes good care of its spouse and children, even wrapping them up together in its wings when they sleep (this hat has a total wingspan of almost a full meter, so has plenty of wing to use as a bed cover).

The two best candidates for the 3-dimensional sculptures of the Museo Popol Vuh (UFM) and the sculpture museum of Copan, Honduras, are the largest meat-eating bats: *Chrotopterus auritus* and *Vampyrum spectrum.*

If you are familiar with the eating habits of vampires, false vampires, and other carnivorous bats, you already realize that the vampire movies and vampire TV series are sheer entertainment: there are no vampire bat species in Eastern Europe (nor in Western Europe). And the "false vampires" which exist outside Latin America are in India or Malaysia.

The other aspect of misinformation is that vampires do not suck blood through their fangs. The fangs are to puncture the skin; the vampire then laps up the blood. Also, actual vampires in Mesoamerica normally do not attack the neck; they go for the toes.

But… the false vampires are the ones who go for the neck, but not to suck blood from the neck, but to slice off the entire neck and then eat the fresh bloody meat below! This is why I call them the Slicer Bats. That is exactly what the bat did to Hunahpu: it cut off his entire head in "one blow" so to speak. Of course a real bat would have to do some chewing to get the entire head off, but the end effect was the same: off with the head.

My favorite candidate was *Vampyrum spectrum* but *Chrotopterus auritus* is also possible

First, the scientific name has "blood" all over it. Second, this is the largest bat in Mesoamerica (so even if not man-sized, it definitely has a head start over the others). But after studying the roosting preferences and actual diet, my favorite *Vampyrum spectrum* did not meet all the requirements. Most crucial is where they normally roost in hollow trees, not in Xibalba-like caves.

Yes, if you were a Maya High Priest you could easily capture a dozen *Vampyrum spectrum* bats and put them in a cave area. Ironically this bat is friendly and adapts well to people. You can even train them to come to you when you whistle (as long as you whistle at a correct frequency). Plus it definitely helps if you wave a baby bird or mouse at them for a quick free meal. So *Vampyrum spectrum* is not impossible, but the habits of this bat are slightly different than I expected.

After studying the killing habits of bats, I now estimate that *Chrotopterus auritus* was the model used by the Maya. This bat is more likely to be found inside a cave naturally (though it also roosts in trees). And the eating habits of this bat are a tad close to slicing off heads of animals as a model for "Slicer Bat" of the Popol Vuh. Although the scientific name lacks reference to blood, meat, or vampires, this is still a large bat and is classified by zoologists as a false-vampire. But… if the bats that Cucu and Erick (FLAAR Mesoamerica) photographed inside a cave in Costa Rica are Vampyrum spectrum then we can say that *Vampyrum spectrum* can live in caves in addition to hollow trees.

All the following photographs of bats (in Costa Rica) are by Mellany (Cucu) Quiñonez with a Canon EOS 6D, May 5, 2017, 75-300mm zoom telephoto lens, FLAAR Photo Archive. In addition to the FLAAR Photo Archive of Maya art and architecture we also have many TERAbytes on fauna of Guatemala and about 30 TERAbytes on flora and ecosysems of Guatemala, especially the Reserva de la Biosfera Maya (RBM), Peten, but also eastern part of Municipio de Livingston, eastern Izabal and bosque seco areas of Guatemala, plus Monterrico area, inland along the Pacific Ocean coast.







FLAAR (USA) and FLAAR Mesoamerica (Guatemala) is one of the few Maya iconography research institutes that focuses on flora and fauna field work in order to have better knowledge of flowers, mammals, birds, insects, amphibians, etc. in Classic Maya art.

To find both of the species of false vampire bat is our goal for year 2024, but to photograph the larger of the false vampire bats it was quicker and easier to fly two of the team (Cucu and Erick) to Costa Rica where this bat was already well known where, when, and how to see it.

Mellany (Cucu) Quiñonez and Erick Flores were capable photographers already when students. They worked for FLAAR and FLAAR Mesoamerica for many helpful years, in graphic design of publications and for photography while on field trips.

For year 2024 we would like to find where both species are in Guatemala.

All the photos of these bats are by Cucu Quiñonez, May 5, 2017.



In summary, the Central Mexican, Zapotec, Classic Veracruz, and Maya of all time periods had available a diverse range of bat species to serve as models. Most of these are leaf-nosed bats. However there are many leaf-nosed bats which are not bloodthirsty. But let's look at the blood and meat focused bats:

- Three true vampires, these lap up blood; they do not tend to "eat" meat.
- two False vampires, these prefer meat in addition to blood. These are large bats.
- Another large meat-eating bat, but which for some reason did not get included in the "false vampire" clique, possibly because it does not specialize in slicing off the head at the neck?
- At least two fishing bats; enjoy frog meat and fish, but not focused on blood per se.

I hope this discussion of bat species is helpful to iconographers, epigraphers, zooarchaeologists, ethnographers and ethnohistorians. I have been working on flora and fauna of the Mayan areas of Mesoamerica for many decades, since most skilled, experienced, and capable Mayan scholars have not had an opportunity to get to know the insects, arachnids, amblypygids, mammals, birds, and creatures that actually exist. Calling the insects on Tikal and Uaxactun pottery various names is the best example of unfortunate misidentifications. Yes, in rare instances bees are pictured, but the ID of bees in the FAMSI database of rollouts are mostly either incorrect or need to offer chance to the other potential insects that actually are quite common on Tepeu 1 bowls. When I was an archaeology student at Tikal in 1965, we put lighting bugs in glass containers as our reading lights at night. I have a lot still to learn since there are thousands of utilitarian plants. And lots of fish and shells that I am still learning about: we are now studying the one species of Caribbean shark which readily swims up fresh water rivers, deep into Mexico and Guatemala. So the Classic Maya would have seen their Xoc Monster in the major rivers of the Lowlands, in addition to shell and fish specialists in their canoes out in the reef areas.

The most misleading misidentification of plants and animals is that of J . Eric S. Thompson, who repeatedly claimed the *Plumeria* flower was the Maya model for the kin hieroglyph. Since there were several bowls with 4-petaled flowers in Tikal Burial 196, which I discovered in 1965, I have spent 49 years trying to figure out which species were intended. So I spent three years driving through all eco-systems of Guatemala, making notes on every 4-petaled flower I could find. Then I amassed a library of books on flowers of Mesoamerica, and did endless library research. I now have an entire high-resolution photographic reference archive of over a dozen species of native 4-petaled flowers which are potential candidates. Plus a similar study would need to be done in the Teotihuacan area, since 4-petaled flowers were a special feature of their art. But the point is simple: if you want to identify plants and animals in Mayan art, go out and learn about these in-person, out in the diverse eco-systems.

We raise tailless whip scorpions, regular scorpions, spiders of many species, two species of stingless bees, wasps, and many butterfly species inside and around our facilities, plus have endless species of medicinal and rare utilitarian plants in our FLAAR Ethnobotanical Research Garden. Every month I find flowers in my own garden that I have never previously been able to study in 50+ years in Mesoamerica: we just found that the flowering vine used to vulcanize rubber grows on our front porch. We also have bats, though at our altitude of 1500 meters, none of the vampires.

I hope this report instills in students the initiative to get out into the fields, forests, swamps, and mountains of Mesoamerica and learn in-person for your thesis or dissertation. And especially, be wary of citing earlier scholars in their "identifications" of plants and animals in the art of Mesoamerica.

Further Research would be Helpful

How many different bat species are pictured by the Maya in hieroglyphs? Are the leaf-nosed bats of the hieroglyphs all the same species or at least same genus, or are there several different species being shown? Where to these bats live: are they all really cave-focused?

About eight different species of bats in the Maya areas of Mexico, Guatemala, Belize, and Honduras prefer to eat raw meat or suck blood:

- 3 vampire bats
    - *Desmodus rotundus*
    - *Diphylla ecaudata*
    - *Diaemus youngi* (prefers birds)

- 2 false vampire bats
    - *Chrotopterus auratus*
    - *Vampyrum spectrum*

- 2 fish-eating bats, one is *Noctilio leporinus*

and another meat-eating bat, *Phyllostomus hastatus*.

How many different words in each Mayan language are there for bats? And especially, is there a word or category for true vampire bats (which actually are rather small)? Is there a special word for the two species of false vampires?

What about the wings of actual bats? The two sculptures show an obvious wing structure? Is this an exaggeration or is this a noticeable aspect of actual false vampire bats.





Photographed by Nicholas Hellmuth at Copan, Honduras, August 3, 2013, with Nikon D800E with 60mm Nikkor (Nikon) lens. We also photographed this bat on several earlier photo field trips, including December 24, 2008, 2:09 pm, with Nikon D300.



This row of two photos (FLAAR Photo Archive) and the drawing (Linda Schele) are to show the "extended, raised, featured "fingernails"" on the wings of these three representations. Will these raised aspects assist bat specialists to ID this bat?



Digitally cropped and cleaned by Hellmuth from Linda Schele drawing SD-1006 in FAMSI database. The area above the head and behind the hear perhaps should alsobe removed.

It would help to locate and photograph the other three bat sculptures that the CIW found almost a century ago at Copan, to see whether these have noses that are better preserved than the two that are in the museums.

The other well-known 3-dimensional bat sculpture is in the Museo Popol Vuh, Universidad Francisco Marroquin. I see this every several months when I am at the museum discussing iconography and epigraphy with curator Camilo Luin.



The other, not well known bat sculpture, is from a photograph by Dr Mata, one of the founders of the Museo Popol Vuh. He obtained the photo from people he knew. The past and present location of this 3-dimensional bat sculpture is not known. Would be helpful to find it and do fresh digital photography with proper cross-lighting.

The nose on this bat is only half the length of Copan Emblem Glyph bats. Of the 3-dimensional bat sculptures of Copan, the only two available to photograph so far had the nose damaged over past thousand years.

Dr. Guillermo Mata was the dentist who took care of my teeth in the 1970's onwards. His son, Dr. Estuardo Mata, and clinic continue. Billy Mata kindly sent me this photo of a bat sculpture that needs to be "rediscovered" so the nose can be studied. None of the full-figure 3-dimensional bat sculptures of Copan have details remaining on their nose.



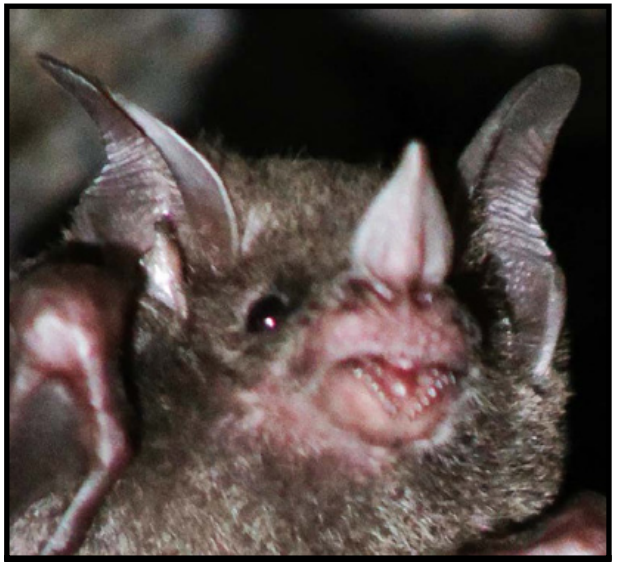
I estimate this bat sculpture is potentially from Izabal and could be found if a student dedicates themselves the same way I spent SEVEN YEARS to rediscover where the lost Blom Plate was. I finally found it and photographed it for my PhD dissertation plus encouraged the owner to donate it to IHAH museum in Mexico so all epigraphers, iconographers, archaeologists and students could also study it.



Closeup of 3-dimensional bat sculpture in the Museo Popol Vuh, Universidad Francisco Marroquin. This is just a snapshot with no lighting. The ears of this bat are well preserved and totally different than either actual false vampire species. Some of these bat heads are slightly anthropomorphized (making the heads, especially the cheek and width of the mouth and chin) more human-like than bat-like.



These ears are more naturalistic, but nowhere near the size or shape of actual false vampire bats that fly around the Maya Lowlands. The nose of this bat is identical in size, shape to the bat at the Museo Popol Vuh (expanded upper lip before nose starts up). Best photos of the actual false vampire bat are from Campeche by Rodrigo Medellin.



Crop zooming in on just the head of this false vampire bat in a cave in Costa Rica. This is a close-up of the photos of Cucu shown previously. The focus was on another part of the bat. On a future trip we will focus on the nose and mouth and get better photos. We also need photos of the dentition (from an open mouth).

Would also help to have improved photography, meaning taking photos in RAW (DNG) mode for higher quality and using several angles of lighting on other bat hieroglyphs, both at Copan and elsewhere, to help zoologists see if they can determine which species or genera are being portrayed.

So far, most field work on false vampire bats has been accomplished in Campeche, Mexico, by zoologist Rodrigo Medellin. This level of photography and documentation deserves to be initiated and accomplished in Peten, Chiapas, Quintana Roo, and Belize.

Bibliography
Suggested Reading, books and articles on Bats

Sorry, we skip novels and do not feature books with doubtful background in either bats or Maya culture. As with most people I have watched vampire movies as a child and even as an adult I enjoy an occasional Dracula movie. But we are so deep into the rain forests, swamps, and mountains of the Maya area that I do not have time to watch vampire soap operas (plus we do not even have a TV set where I live nor in our office).

So, the books we list here are mostly on the biology of bats by biologists, or books on ethnography of Mayan speaking areas.

If you are doing a thesis or dissertation, you will easily find several hundred more articles and over a dozen monographs. But the list below will be plenty if you are just curious about bats of the Maya, or if you have a school assignment on bats of the Neotropics.

To find the bats in Chama vases, Google Mayan bats Chama A bibliography about bats in Maya art would be another late night and we are working on several hundred other creatures and over 500 utilitarian plants, so for today, here at least is a starting bibliography on the remarkable bats of Mesoamerica.

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Videos on
False Vampire Bats

Exploring The Bats That Live In The Rainforests Of Central America | Our World

https://www.youtube.com/watch?v=3gJmlPtEWP4

Follow Mexico's 'Bat Man' on a Search for Vampire Bats | Short Film Showcase

https://www.youtube.com/watch?v=lx7mcGmHDnE&t=9s

Murciélagos Gigantes | Nat Geo

https://www.youtube.com/watch?v=7lPaE24kjNI

Vampire Bat vs Wrinkle Bat | National Geographic
https://www.youtube.com/watch?v=RBtmcsJ0XUI

Short but excellent; however title should be False Vampire Bat vs Wrinkle Bat.

Peters's wooly false vampire (*Chrotopterus auritus*) weighs between 72 and 90 grams (two and a half to three ounces) and ranges from southern Mexico to Paraguay and northern Argentina. This bat has a small wart in the center of the lower lip with a narrow elevation on either side. They roost in groups of one to seven bats and have been found roosting in caves, hollow trees, and even Mayan ruins. They eat everything from insects and fruit to mice, birds, lizards, frogs, opossums, and other bats. When filming this species for BCI's documentary The Secret World of Bats, Merlin Tuttle was able to train one to come to his hand on call within just 30 minutes of catching it in a mist net in the rain forest.

Bats in Maya Art, Maya Myths, Suggested Reading

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1972 The Black Man of Zinacantán, A Central American Legend. University of Texas Press.

An ethnography, not a zoology, but still helpful.

BOOT, Eric

2009 The Bat Sign in Maya Hieroglyphic Writing: Some Notes and Suggestions, Based on Examples on Late Classic Ceramics. 14 pages.

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CARROLL, Patrick

2013 Reevaluating the Late Classic Lu-Bat Glyphic Phrase: The Artist and The Underworld. University of Central Florida. A thesis. Electronic Theses and Dissertations. 128 pages.

Excellent discussion of bats in Maya hieroglyphs and intelligently also includes bats in pre-Columbian art elsewhere in Mesoamerica.

CHACON, Belen and **Vivian HURTADO**

2022 An Introduction to Bats of Biotopo Protegido San Miguel La Palotada El Zotz. FLAAR Mesoamerica. 46 pages.

Best place to see bats in Guatemala is this nature reserve in Peten. FLAAR has accomplished field work here last year.

Just Google bat El Zotz, FLAAR and you can see videos and web pages that show the bats that you will experience here.

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1972 The Sculptures of El Tajin, Veracruz, Mexico. University of Florida Press.

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This is available as a free download on the FLAAR websites network. We thank Charles Comparato, the son of Frank Comparato, for giving his okay for us to scan this important document prepared and published by his father.

SHOOK, Edwin M. and **Elayne MARQUIS**

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A useful and important compilation of yokes, hachas and palmas primarily from Guatemala and mostly from outside the Peten or adjacent Lowlands areas of Guatemala. In other words, most of these ballgame accessories come from the Costa Sur (Tiquisate and nearby areas) or adjacent Highlands (Kaminaljuyu).

Many of the hachas show birds, bats or mammals.

Several of the photographs and line drawings in this book were provided to the authors by Nicholas Hellmuth from the FLAAR Photo Archive.

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Bats in the Maya stories the Popol Vuh

Each translator, each editor, each commentator on the Popol Vuh has their own concepts. So not every editor accepts the same aspects. And all of us have our own point of view as to whether, or not, the Popol Vuh should be used to reconstruct Classic Maya life the same way the excellent documentation by Bishop Diego de Landa's eye-witness material is available from the Yucatan Peninsula. Several segments of the Popol Vuh are discussed in Hellmuth 1986 PhD dissertation (published 1987). Plus I have explored lots of caves which have precisely, exactly what is described in segments of the Popol Vuh. Plus in the 1980's I rediscovered the Blom Plate which had been published in 1950 by Frans Blom but the plate had disappeared. I found the plate and arranged for it to be donated to INAH museum in Mexico (the plate was discovered when the bulldozers in the 1940's leveled Maya pyramids to make an airport for Chetumal, Quintana Roo). The Blom Plate clearly shows Maya hunters with blowguns aiming for the Principal Bird Deity that is earlier pictured in the stelae of Izapa and the murals of San Bartolo.

Although the last remaining copy actually documented was from the Maya Highlands, almost all the animals and plants in the Popol Vuh are from the Maya Lowlands. Every Maya city and every Maya royal family would have created their own version: the Hero Twins would be in all versions, but the warfare and conquest aspects are separate. So the book of the Popol Vuh that we have today is XY% Highland Maya pre-Hispanic history of warfare; and AB% of Xibalba, Hero Twins, and the cosmology of the Maya world. The rulers of Tikal would have had the XY% very different than the rulers of Chichicastenango a thousand years later. But the Hero Twins and Xibalba remained incredibly consistent from Izapa and San Bartolo through scenes on Tepeu 1 and Tepeu 2 pottery.

The bat aspect is the "chapter" along with Seven Macaw chapter that are featured at Copan. The present report covers the bat aspect. The bats in Classic Maya art are rather obviously not frugivorous, unlikely the insectivorous bats nor are they the fishing bats.

Death Bat (Slicer Bat) in the book of the Popol Vuh

Bats that are capable of literally slicing off the head of their victim are clearly mentioned in the Popol Vuh. There is even an entire area of Xibalba named for these bats:

> The fourth trial is named Bat House, for there are none but bats inside. In this house they squeak. They shriek as they fly about in the house, for they are captive bats and cannot come out.
>
> (Christenson 2003: 112)

So clearly this is a cave, not a hollow tree trunk. However a few species of bats can live in either a hollow tree or a cave, depending on which is available

> HUNAHPU AND XBALANQUE IN THE HOUSE OF BATS
>
> NEXT they were put inside Bat House, which had only bats inside. It was a house of death bats. These were great beasts with snouts like blades that they used as murderous weapons.
>
> When they arrived there, they were to be finished off. They had to crawl inside their blowguns to sleep so that they would not be eaten there in this house. Nevertheless, it was because of a single death bat that they gave themselves up in defeat. It came swooping down. But this was merely a way to manifest themselves when it occurred.
>
> Thus they pleaded for wisdom all that night as the bats made a din with their flapping wings.
>
> "Keeleetz! Keeleetz!" they said all night long. At length things quieted a little, and the bats became motionless.
>
> Thus one of the boys crawled to the end of his blowgun. Xbalanque said, "Hunahpu, do you see the dawn yet?" "I will go and see for certain if has happened," he replied.
>
> Hunahpu truly wanted to look out of the mouth of his blowgun to see the dawn. But when he did so, his head was cut off by the death bat,393 leaving the greater part of his body behind.
>
> 393 The ability of bats to cut down fruit from trees while in flight associated them in the mind of the ancient Maya with decapitation sacrifice. Bats are often seen painted on ancient Maya vessels as underworld denizens of death, decorated with crossed bones and extruded eyeballs that have their optic nerves still dangling from them.
>
> (Christenson 2003: 160-161)

A good example of how it helps to write about the Maya if you have experience with flora and fauna. The two false vampire bats don't need to practice cutting fruit off trees. The false vampire bats slice off the heads of their victims, which is why I call them Slicer Bats.

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SAM COLOP, Luis Enrique

Popol Wuj. F&G Editores. Many editions, so many different years and different publishers. It helps to read editions by Guatemalan authors.

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ESTRADA Monroy, Agustín

Popol Vuh. There are many editions over several decades, so I leave it without a date.

Since Agustín Estrada was an ethnohistorian and knew the archives, we often cooperated when I was looking for documents on the Cholti Lacandon (the original Lacandones, before the Yucatec-speaking Lacandon moved in after the Spanish eradicated the original Cholti-speaking Lacandon). Plus I lived in the building adjacent to Estrada's house for several years.

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It helps to read every single edition, but focus on those written by linguists who have worked in the Maya Highlands their entire life. But since Morley knew a lot about the Classic Maya, his comments also help, though today, with the Blom Plate and dozens of rollouts by Justin Kerr we know more about the Hero Twins from Coe's 1973 Grolier Club exhibit text onward.

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Web sites

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Charles Zidar, Ancient Maya Zoological Research.

http://www.noseleaf.org/
Smithsonian Bat Lab, Smithsonian Tropical Research Institute, Panama.

Bat mailing list

Jim Kennedy, NSS 26791FL, Cave Resources Specialist, Bat Conservation International, Post Office Box 162603, Austin, TX 78716-2603 (jkennedy@batcon.org)

Lots more photo albums are in preparation

Here is the initial list of work-in-progress. Copan CPN 25 was published in September.

Cauac Monster, Cosmic Monster with Quadripartite Badge Headdress, Crocodile & God N, Copan CPN 25, Altar of Stela M
FLAAR Photo Archive Publication Number 1,
Maya Sculptures of Copan, Honduras, Publication Number 1

Scorpion, Venus, Moon Goddess with Rabbit Companion Celestial Deities on Sky Band Motifs on Copan Structure 8N-66C Bench Front
FLAAR Photo Archive Publication Number 2,
Maya Sculptures of Copan, Honduras, Publication Number 2

Copan Ceramic Incensario Lids, Local adaptation of Teotihuacan Style
Volume I, Photos in full-page Height, Horizontal Format
FLAAR Photo Archive Publication Number 3,
Maya Ceramics of Copan, Honduras, Publication Number 1A

Copan Ceramic Incensario Lids, Local adaptation of Teotihuacan Style
Volume II, Vertical Format
FLAAR Photo Archive Publication Number 4,
Maya Ceramics of Copan, Honduras, Publication Number 1B

Full-Figure Personified Hieroglyphs on front of Bench in Str. 9N-82 (House of the Bacabs)
FLAAR Photo Archive Publication Number 5,
Maya Sculptures of Copan, Honduras, Publication Number 3

Beards on Kings of Copan
Beards on Kings of Copan-FLAAR-Photo-Archive-Copan.docx
FLAAR Photo Archive Publication Number 6,
Maya Sculptures of Copan, Honduras, Publication Number 4

Paddler God Faces and Hieroglyphs at Copan
FLAAR Photo Archive Publication Number 7,
Maya Sculptures of Copan, Honduras, Publication Number 5

Cauac Monsters at Copan, especially in Stacks on Corners of Palaces and Mythical Structures
FLAAR Photo Archive Publication Number 8,
Maya Sculptures of Copan, Honduras, Publication Number 6

Copan Maya Ballgame Players, Maya Outfits: Chest Protector & Deflector and Thigh Protector Mexican Ballgame Outfits: Yoke, Hacha and Ballgame Handstone
FLAAR Photo Archive Publication Number 9,
Maya Sculptures of Copan, Honduras, Publication Number 7

Copan Maya Ballcourt Architecture & Scarlet Macaw Logo Goal Stones Stepped Areas were as important as Playing Field down the Center
FLAAR Photo Archive Publication Number 10,
Maya Architecture of Copan, Honduras, Publication Number 1

Maya Ballcourt Architecture 3-Dimensional Architectural Reconstruction Drawings by David Morgan
FLAAR Photo Archive Publication Number 11,
FLAAR Drawings Archive Segment, Publication Number 1.

Toads and/or Frogs in Art and Iconography of Copan, Honduras
FLAAR Photo Archive Publication Number 12,
Maya Sculptures of Copan, Honduras, Publication Number 8

Bats in Sculpture and Hieroglyphic Inscriptions of Copan, Honduras
FLAAR Photo Archive Publication Number 13,
Maya Sculptures of Copan, Honduras, Publication Number 9

Samples of Classic Maya Ceramics of Copan, Honduras
FLAAR Photo Archive Publication Number 14,
Maya Ceramics of Copan, Honduras, Publication Number 2

Jade and Greenstone Craftsmanship of Copan, Honduras Finished Jade Ornaments plus Documentation of Jade Working on Raw Stone
FLAAR Photo Archive Publication Number 15,
Artifacts of Jade, Obsidian, Flint (Chert) and other Materials of Copan, Honduras, Publication Number 1.

Full-Figure Personified Hieroglyphs: Bench Front inside Copan Structure 9M-146
FLAAR Photo Archive Publication Number 16
Maya Sculptures of Copan, Honduras, Publication Number 10

Iconography of Incense Scattering and Face-Variant Long-Count Maya Hieroglyphs on Nim Li Punit Stela 15, Belize
FLAAR Photo Archive Publication Number 17
Maya Sculptures of Belize, Publication Number 1

The Story of the Blom Plate: a Masterpiece of Maya Iconography and Primary Standard Sequence, PSS, Hieroglyphs, Chetumal, Quintana Roo, Mexico
FLAAR Photo Archive Publication Number 18
Iconography of Maya Ceramics of Mexico, Publication Number 1
Primary Standard Sequence, PSS, Maya Hieroglyphs in the FLAAR Photo Archive, Publication Number 1

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Flor de María Setina is in charge of the financial administration of the institution and supports the supervision of daily activities.

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Vivian Hurtado is the current project manager of the FLAAR divisions: Flora & Fauna and MayanToons. She is also an environmental engineer and a passionate researcher.

Victor Mendoza environmental engineer in charge of the photographic database and its taxonomic identification. He also helps with the coordination of research activities.

Sergio Jerez agronomy engineering student involved in the identification of plants and support in research topics.

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Myrna Galindo is a biologist who manages all our social media and digital community to transfer information on biodiversity and the topics that FLAAR is interested in.

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Edwin Solares is a photographer and videographer during our expeditions. Later, he edits this content to be used in our different materials.

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Pedro Pablo Ranero with a degree in communication is responsible for editing videos of flora and fauna to create content on our sites.

Andrea Sánchez graphic designer who helps prepare the graphic line of our publications. She is our editorial art director.

Jaqueline González graphic designer who combines text layout and photo editing to create our reports.

Heidy Galindo graphic designer who combines text layout and photo editing to create our reports.

Josefina Sequén is an illustrator for MayanToons.

David Arrivillaga is an experienced photographer and graphic designer. Sometimes he is a photographer during our expeditions, but he also designs our flora and fauna reports.

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Paulo Núñez is an engineer and our webmaster. He is the person in charge of the maintenance and programming of the entire network of FLAAR websites.

Juan Carlos Hernández is a graphic designer and part of the web team. Receive the material we produce to place on our sites.

María José García is a graphic designer and part of the web team. Receive the material we produce to place on our sites.

Andrés Fernández is a graphic designer and in charge of keeping our websites updated and more efficient for the user.

Karla Cho helps with general research and design assistant in the office.

Luis Molina is a professional illustrator specialized in line drawings of Maya vases, bowls, and plates.

Valeria Áviles is a graphic designer and illustrator. She is in charge of coordinating the activities of MayanToons, as well as making illustrations for the different materials that we prepare.

Laura Morales is a digital content engineer, She is in charge of directing the animation area of our MayanToons project.

Paula García is part of our MayanToons animation team. Her job is to bring our favorite characters to life.

Niza Franco is part of our MayanToons animation team. Her job is to bring our favorite characters to life.

Isabel Trejo is a graphic designer and illustrator for MayanToons and for social media posts.

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Rosa Sequén is an illustrator for MayanToons.

Karan Arana assists in the planning and management of FLAAR USA and FLAAR Mesoamerica activities. She also provides English lessons to the Mayan-speaking team working with FLAAR Mesoamerica.



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