

Layser AHAN7024 Assignment 2

Sky Journal

by CHRISTOPHER A Layser

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1402292

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The Frog, Shark, Scorpion, and Rattlesnake: Identifying Maya Zodiacal Constellations through Phenomenological Observation

The ancient Maya meticulously watched the night sky, and in it they identified thirteen celestial figures understood today as zodiacal constellations.¹ The aim of this research is to observe a subset of these constellations in the field using phenomenological means- to *see* these celestial figures as the ancient Maya may have seen them- and offer interpretations as to their identification. Maya artisans left clues to the identity of these star-patterns carved and painted on art of the Classic period, as well as in Post-Classic texts such as the Popol Vuh and the few remaining codices; and then this knowledge was largely lost. Understanding the underlying significance of these primary sources has been a focus of ethnoastronomy and iconology since the late nineteenth-century. Although scholars such as Linda Schele, David Kelley and Harvey and Victoria Bricker have greatly contributed to its understanding, the academic community remains largely divided on a zodiacal sequence due to differing interpretations of calendric evidence in the Paris Codex and the importance placed upon a single sixteenth-century dictionary entry. This research will consider these diverse opinions as part of its academic rationale, but rather than looking to written sources it will look to the sky, focusing on constellations visible from the Maya lowlands region during the contemporary summer rainy season, and in doing so will offer identifications for a frog, shark, scorpion and rattlesnake.



Review of the Research

That the celestial figures illustrated in the Paris Codex might 'represent thirteen signs of a zodiac' (constellations within the narrow band of the ecliptic which marks the path of the Sun, Moon, and planets across the sky) was first suggested by Herbert Spinden who also noted similar 'star symbols over the doorway in the east wing of the Casa de Monjas, Chichen Itza'.² David Kelley suggested the vigesimal number 8.8 (20x8 +8) which appeared between each figure revealed a 168-day interval between the rising of each zodiacal constellation.³ He suggested that 'if one accepts the identification of the Turtle constellation (*Ac Ek*) as Gemini, one can reconstruct a zodiacal sequence with fair reliability.'⁴ Kelley's reasoning for beginning with the turtle is based upon an entry in the sixteenth-century Maya/Spanish *Motul* Dictionary. Gregory Severin explains this source

¹ Susan Milbrath, *Star Gods of the Maya: Astronomy in Art, Folklore, and Calendars* (Austin: University of Texas Press, 2000), p. 254.

² Herbert J. Spinden, 'The Question of the Zodiac in America', *American Anthropologist*, New Series, Vol. 18, No. 1 (1916), pp. 76-77.

³ Kelley, David Humiston Kelley, *Deciphering the Maya Script*, (Austin: University of Texas Press, 1976), p.45

⁴ Kelley, *Deciphering the Maya Script*, p.49.

lists but two Maya constellations with their known counterparts in the Greco-Babylonian zodiac: *tzab*, the "tail of the rattlesnake" known to us as the Pleiades, part of the constellation Taurus; and *ac ek*, the "turtle stars," which correspond in part to stars in the constellation Gemini, adjacent to Taurus. The unmistakable forms of a rattlesnake and a turtle appear on the upper celestial band on Paris 24. Thus, the sequence Taurus/Gemini corroborates the sequence Rattlesnake/Turtle and shows that the beings on Paris 23-24 represent constellations in the sequence they are seen in the sky.⁵

Bruce Love also proposed this sequential alignment of the animals in the Codex to the constellations of western zodiac.⁶ These theories conflict with Kelley's sequence which placed the rattlesnake constellation near Sagittarius.⁷

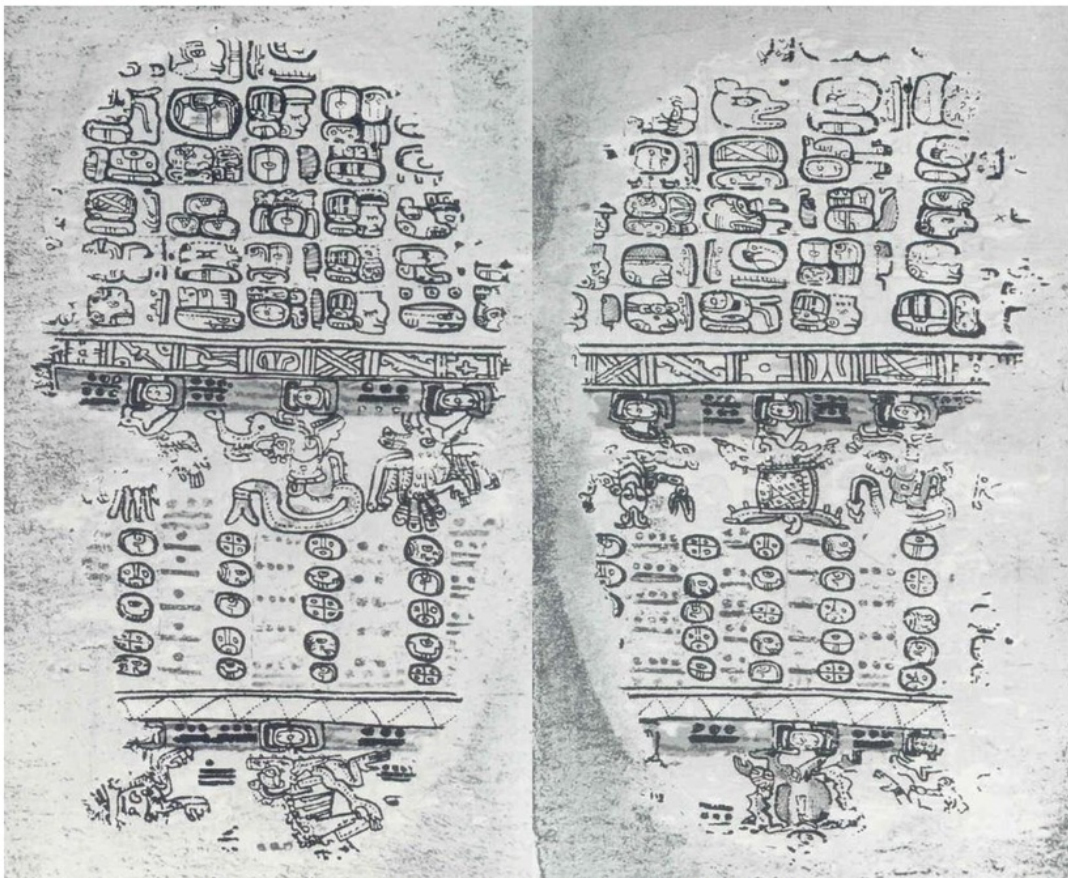


Figure 1: Pages 23-24 of the Códice Pérez (The Paris Codex), Fonds mexicain, No 386, Bibliothèque nationale de France

⁵ Gregory M. Severin, 'The Paris Codex: Decoding an Astronomical Ephemeris', *Transactions of the American Philosophical Society*, Vol. 71, No. 5 (1981), p.8.

⁶ Bruce Love, *The Paris Codex: Handbook for a Maya Priest*, (Austin: University of Texas Press, 1994), pp.100-101.

⁷ Kelley, *Deciphering the Maya Script*, p.50.

Linda Schele and colleagues proposed a 'creation centered model of Maya cosmology' which argued 'most ancient Maya iconographic assemblages reflected native cosmology and astronomical knowledge.'⁸ Using ethnographic sources, planetarium software and the Murals of Bonampak, Schele convincingly argued that the Turtle constellation was Orion and the 'copulating peccaries' represented the constellation Gemini.⁹ She successfully tested Kelley's sequence against this model- starting with the Scorpion- and added that 'Richard Johnson and Michael Quenon used a slightly different technique and worked out the boundaries of the thirteen Maya constellations' (figure 2).¹⁰ At Warner Nahm's suggestion she matched the carved 'creatures crawling up the serpents on the Hauberg Stela and Tikal Stela 1' to the Paris Codex beasts and found a correlate to Kelley's sequence of jaguar (Capricorn), rattlesnake (Sagittarius), Scorpion (omitted on the Stele due to its position on the Milkyway), Shark (Libra) and, erroneously, a Chac-Peccary (Virgo).¹¹

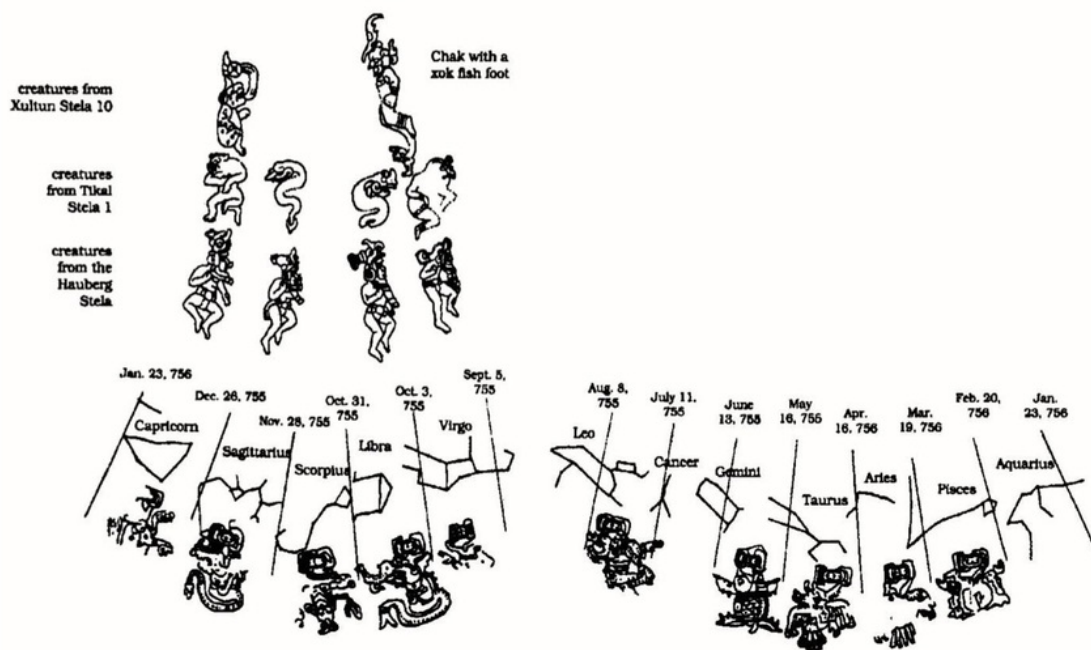


Figure 2: Johson and Quenon's Zodiacal sequence boundaries (bottom) matched to the beasts of the Hauberg Stele and the Tikal Stele 1. Drawn by Linda Schele, originally published in *Maya Cosmos*.1992

Harvey and Victoria Bricker contend that Schele's model 'fails to achieve verisimilitude' due to its 'identification of the rattlesnake as Sagittarius instead of Taurus'.¹² They created their own

⁸ Villela, Khistaan D. and Linda Schele, 'Astronomy and the Iconography of Creation among the Classic and Colonial Period Maya' In *Eighth Palenque Round Table, 1993*, ed. by Merle Greene Robertson, Martha J. Macri and Jan McHargue. (Austin: University of Texas Press, 1996) p.4.

⁹ David Freidel, Linda Schele and Joy Parker, *Maya Cosmos: Three Thousand Years on the Shaman's Path*, (William Morrow Paperbacks, 1993), pp.79-82.

¹⁰ Freidel, Schele and Parker, *Maya Cosmos*, p.102.

¹¹ Villela and Schele, 'Astronomy and the Iconography of Creation', p.4.

¹² Harvey M. Bricker and Victoria R. Bricker, *Astronomy in the Maya Codices*, (Philadelphia: American Philosophical Society, 2011), p. 720.

model for a Maya zodiac based upon a strict adherence the rattlesnake is the Pleiades and a theory they called 'horizon pairs' - required to make the calendric interpretations work.¹³ They believed the sidereal months could be defined by 'pairs of constellations that bracket the ecliptic at Sunrise and Sunset.'¹⁴ Table 1 illustrates wide difference between several opposing sequences. As has been shown, these differences derive from how they address the turtle, the scorpion, and most importantly, the rattlesnake.

Western Constellation	Love	Johnson and Quenon	Bricker and Bricker
Taurus	Rattlesake	Owl	Rattlesnake
Aries	?	Bird 3	Jaguar
Pisces	Jaguar	Bat	Skeleton
Aquarius	Skeleton	?	Bat
Capricorn	?	Jaguar	Bird 3
Sagittarius	?	Rattlesnake	Fish-snake/Shark
Scorpio	Bat	Scorpion	Scorpion
Libra	Dog?	Fish-snake/Shark	Bird 1
Virgo	Bird	Peccary	deer?
Eastern Leo	Fish-snake/Shark	?	peccary?
Western Leo/Cancer	Owl (bird 2)	Skeleton	Frog
Gemini	Scorpion	Turtle	Owl (bird 2)
Orion	Turtle	?	Turtle

Table 1: Zodiacal Sequences as proposed by Love, Johnson and Quenon, and Bricker and Bricker

Methodology

The methodology used in this research is phenomenologically grounded naked-eye observation- necessarily equipped with a degree of preconceived notions based upon the theories outlined above- to *experience* these celestial figures as the ancient Maya may have experienced them.

'When humans experience the world', explains Mark Vagle, they '*find themselves* in the experience'.¹⁵ 'The verb *find*', he continues, 'is not meant to signal an archaeological excavation of meaning, but a careful, reflexive, contemplative examination of how to *be* in the world.'¹⁶

Any such phenomenological exercise necessitates a degree of reflexive considerations required to 'validate the research', as the researcher is a 'modern' American and not an ancient Maya.¹⁷

For example, the researcher and the ancient skywatcher adhere to different religious beliefs and notions concerning the nature of the sky and have therefore developed differing cosmologies, defined by Nicholas Campion as 'meaning-systems'.¹⁸ Claude Lévy-Bruhl argued that cultures such as the ancient Maya developed these meaning-systems through an ongoing practice of 'participation' - between persons and the sky- which form part of a 'collective representation'.¹⁹

The phenomenological methodology of *participating with the Maya sky* is used in an attempt to

¹³ Bricker and Bricker, *Astronomy in the Maya Codices*, pp. 729-736.

¹⁴ Harvey M. Bricker and Victoria R. Bricker, 'Zodiacal References in the Maya Codices', in *The Sky in Mayan Literature*, ed. by Anthony Aveni, (New York and Oxford: Oxford University Press, 1992), p.169

¹⁵ Mark D. Vagle, *Crafting Phenomenological Research*, (Walnut Creek, CA: Left Coast Press, 2014), pp.20-21

¹⁶ Vagle, *Crafting Phenomenological Research*, pp.20-21.

¹⁷ Monique Hennick, Inge Hutter, and Ajay Bailey, *Qualitative Research Methods*, (London, Thousand Oaks, New Delhi, and Singapore: Sage Publications, Ltd, 2011), p.19.

¹⁸ Nicholas Campion, *Astrology and Cosmology in the World's Religions*, (New York and London: New York University Press, 2012), pp.1-2.

¹⁹ Claude Lévy-Bruhl, *How Natives Think*, (Princeton: Princeton University Press, 1985 [1922]), p.76.

better appreciate this collective representation and approach the identification of ancient Maya constellations from a new angle- from that of looking up.

4

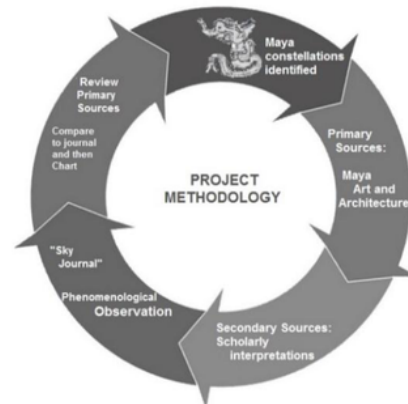


Figure 3: project methodology

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Initial observations undertaken in the north-eastern United States yielded little results, due in part to light pollution and weather conditions, and were therefore augmented with investigations using Starry Night CSAP™ planetarium software. Field observations were then conducted in north-western Belize near the ruins of the ancient Maya polity now known as Blue Creek, specifically near the elite residential complex of Rosita, between July 17th and July 29th, 2017. Subsequent viewing was continued upon return to the United States. All observations were recorded nightly in a 'Sky Journal'; these notes were often augmented with Starry Night CSAP™ and Photoshop renderings. The results of phenomenological observation in the field are presented as superimpositions of constellation images onto the sky.

The Frog

Kelley and others interpreted the heavily damaged figure in the lower-left of corner of the Paris Codex page 24 (P.24) as a Peccary.²⁰ Rather, clues to the actual identification of this figure a frog can be found in the Madrid Codex, most clearly on the lower register of M.101 (figure 5). Bricker and Bricker point out that the images from both the Paris and Madrid codices portray 'the same lips, neckless, and bracelets'.²¹

²⁰ Kelley, *Deciphering the Maya Script*, p.50.

²¹ Bricker and Bricker, *Astronomy in the Maya Codices*, p. 705.

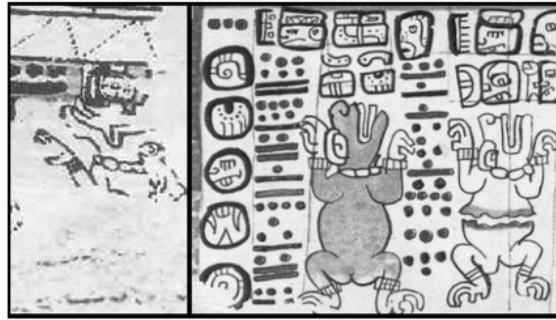


Figure 4: Similar representations of the frog, page P.24 of the Paris Codex (left) and page M.101d of the Madrid Codex (right)

Prior to fieldwork in Belize, investigations using Starry Night software between Libra and Virgo lead to the initial identification of the frog's legs. Looking skyward, the left leg appears as the stars (and/or double stars) Beta-, Omicron-, and Xi Hydrae, HIP56280, HIP57613, and Alchiba. Similarly, the right frog-leg appears as Theta-, Epsilon-, Delta-, Gamma- and Zeta Cretaris – the upper portion of the constellation Cretaris. In the field, 'the importance placed upon the frog's neckless and bracelets' in the iconography became apparent. Spica and Gamma Hydrae the bracelets and the faint band of stars between comprising the neckless.²²



Figure 5: The Frog

²² Sky Journal, July 20th, 2017 (Blue Creek, Belize)

During field observation, the path of Jupiter bisected this constellation, recalling the severed frog on the right side of  9. The glyphs above the bifurcated frog signify death, opening speculation that perhaps the retrograde motion of Jupiter across the frog may signify bad omens.

The Shark

Represented in the Paris Codex, Tikal Stele 1, and Las Monjas complex is a creature identified by Severin as a 'Marine Monster...a mythical beast of indeterminate species, possibly the *Xoc* fish.'²³ Bricker and Bricker suggest an epigraphic identification of the 'fish-snake' based on the glyph *Xoc*, glossed as shark, which features a 'fleshy protuberance' that may represent the bull shark's ventral mouth.²⁴ Simon Martin agrees, adding that 'we do not understand the full mythic cycle which the shark is related to' but demonstrates using 'snippets' from ceramic art (vases K595 and K3033) that the Maize God was swallowed by the shark but later escapes.²⁵ Whether this story has astronomical significance has yet to be determined.

It was observation of this constellation in the field- 'looking at the stars as if I were an ancient Maya, putting myself in that distant time, but same place' - that led to the primary revelation of this research.²⁶ Whereas the figures of the Greco-Babylonian constellations are typically represented as lines drawn between bright stars, the Maya understanding of the constellations included all the stars within a given portion of the sky. The way to see the shark is not to 'connect the dots' but to observe the beast in its entirety.  By this participation with the 'Maya sky' it was revealed that the images in the Paris Codex are, in fact, meant to be near exact representations of the figures they saw in the night sky. The stars that make up the shark are not actually those of Libra as suggested by many sources, but all the stars in the vicinity of *Lupus- the serpentine body of the shark*, and the upper portion of Centaurus- *the fleshy snout-like protuberance and agape mouth*. On this basis identification of Maya constellations becomes readily apparent as the illustrations in the Paris Codex, such as the shark, can be superimposed onto the night sky to form very plausible matches .

²³ Severin, 'The Paris Codex: Decoding an Astronomical Ephemeris', p.11.

²⁴ Harvey M. Bricker and Victoria R. Bricker, *Astronomy in the Maya Codices*, (Philadelphia: American Philosophical Society, 2011), p. 704.

²⁵ Simon Martin, 'Monsters of the Maya Cosmos', Lecture presented at the University of Pennsylvania Museum of Archaeology and Anthropology as part of the *Great Beasts of Legend* series, <<https://www.penn.museum/collections/videos/video/1168>>, accessed August 10th, 2017.

²⁶ Sky Journal, July 20th, 2017 (Blue Creek, Belize)



Figure 6: The Shark

The Scorpion

Arguably the most obvious Maya constellation in the rainy season night sky is the large Scorpion who emerges from the crack in the Milkyway. John Carlson and Ron Cherry note that ‘although many scholars over the years have suggested that [the Maya Scorpion constellation named *Sinan Ek*’ corresponds] with our zodiacal Scorpius, there is as of yet no certain proof’.²⁷ If one accepts the premise that ‘the animal drawings in the Paris Codex zodiac pages can actually be seen full figured- not stick drawings- in the night sky’, then the Scorpion’s identification is secure.²⁸ The Maya Scorpion ‘looms large in the night sky’, much larger in fact than it’s Greco-Babylonian counterpart as it includes not only the body- comprised of the constellation Scorpio proper, but the massive pincers which encompass most of Libra as well.²⁹ Upon returning to the north-eastern United States, the ‘Greco-Babylonian Scorpio was still identifiable in the night sky, but the large *Sinan Ek*’ comprised of both Scorpio and Libra, was no longer obvious, nor was the crevasse in the Milkyway from which he crawled.’³⁰

²⁷ John B. Carlson and Ron Cherry, ‘Arthropods in Astronomy: Cases in “Western” and Mesoamerican Ethnoentomology’, *American Entomologist*, Vol. 42, No. 3 (1996), pp. 152-153.

²⁸ Sky Journal, July 20th, 2017 (Blue Creek, Belize)

²⁹ Sky Journal, July 26th, 2017 (Blue Creek, Belize)

³⁰ Sky Journal, August 8, 2017 (Pennsylvania, USA)



Figure 7: *tpion, Sinan Ek'*

The Rattlesnake

The *Motul* offers the following:

tzab *sus. ast.* las cabrillas, constelación de siete estrallas, y los cascabeles de la víbora.³¹

This simple dictionary entry identifying the Pleiades as the rattlesnake's tail has been treated as an immovable object in the sequencing of the Maya zodiacal constellations by many scholars and has led to complex calendrical theories needed in order to make the pieces fit together. This study challenges those assertions and suggests instead that the tail and rattle of the snake of the Maya zodiac are in fact the comprised of the constellation Corona Australis, the arc and length of which align to the Paris Codex rattlesnake illustration. Most of the rattlesnake body and head is comprised of the stars of Sagittarius as Kelley surmised. 'The Maya placed many bird constellations in the night sky; there is no reason to believe that they could not have placed two rattlesnake tails.'³²

³¹ *Calepino de Motul: Diccionario Maya-Español, Tomo I*, ed. Marín, Ramón Arzápalo, (Mexico: Universidad Nacional Autónoma de México, 1995), Folio 113v, p.188.

³² Sky Journal, July 21st, 2017 (Blue Creek, Belize)



Figure 8: The Rattlesnake, with the tail revealed to be the stars of Corona Australis

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Support for this argument can be found on a painted ceramic vase which depicts a scene from the Popol Vuh where the hero twins shoot down the prideful bird-deity Seven Macaw from the World Tree upon which he is perched. This scene has been recognized as a star myth, and Dennis Tedlock points out that Seven Macaw 'remains as the seven stars Big Dipper'.³³ Linda Schele has made a strong case as part of her creation-centered cosmology model that the tree depicted in this star myth is the Milkyway.³⁴ Figure 10, the 'Blowgunner Vase', depicts the Scorpion to the right of the tree (Milkyway) and a rattlesnake to the left, with Seven Macaw perched atop of the branches. This scene can be viewed as an ancient Maya map of the sky, providing further proof that the stars of Sagittarius and Corona Australis to the left of the Milkyway were the stars of the Rattlesnake constellation.

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³³ Dennis Tedlock, *Popol Vuh: The Definitive Edition of The Mayan Book of The Dawn of Life and The Glories of Gods and Kings*, (New York: Touchstone, 1996), p. 34.

³⁴ Freidel, Schele and Parker, *Maya Cosmos*, pp.88-89.



Figure 9: The 'Blowgunner Vase', slightly modified to illustrate the position of the rattlesnake from a photograph by Justin Kerr (K1226). Museum of Fine Arts Boston MA 1988.1173

Discussion

The points of intersection between the ecliptic and Milkyway were intensely important to the ancient Maya. Susan Milbrath believes in fact that the 'skyband' of Maya iconography actually 'refers to the place where the ecliptic crosses the Milky Way'.³⁵ Furthermore, she argues that the beasts hanging from the top ornate skyband on the Paris zodiac lay along the ecliptic near the Milkyway and those hanging from the lower unadorned band lay along the ecliptic but not along the Milkyway.³⁶ A foundational concept in the development of Schele and colleagues' creation-centered cosmological model was the identification of Gemini and Orion as the Peccary and Turtle constellations along the ecliptic- as depicted on the Murals of Bonampak- flanking a vertical Milkyway (tree) in the pre-dawn sky on the creation date of 13th of August, 3114 B.C.³⁷ It is compelling that in Maya mythology, the fall of Seven Macaw occurs just prior to this creation date, and this is played out in the July night sky at the opposite intersection of the Milkyway and the ecliptic (Scorpion and Rattlesnake) from the creation event (Turtle and Peccary) in August's pre-dawn sky.

Figure 10 offers a new 168-day sequence of the Paris Codex zodiac which incorporates evidence from the Las Monjas complex, Schele's interpretation of the Murals of Bonampak, Bricker and Bricker's beast identification, the Madrid Codex, painted ceramics, and the observations of this research.

	1	2	3	4	5	6	7	8	9	10	11	12	13
A						X					X		
B	X			X	X	X	X		X				
C													
D													
E	Frog (Virgo)	Shark (Libra)	Scorpion (Scorpio)	Rattlesnake (Sagittarius)	Jaguar (Capricorn)	Deer (Aquarius)	Bat (Pisces)	Parrot (Aries)	Owl (Taurus)	Turtle (Orion)	Peccary (Gemini)	Skeleton (Cancer/Leo)	Vulture (Leo)

Figure 4: Matrix of the 13 Constellations of the Maya Zodiac (Columns 1-13). Row A depicts the images from pages 23-24 of the Paris Codex. Row B illustrates the same constellations from Las Monjas at Chichén Itzá, and Row C shows miscellaneous

³⁵ Milbrath, *Star Gods of the Maya*, p. 277.
³⁶ Milbrath, *Star Gods of the Maya*, p. 277.
³⁷ Freidel, Schele and Parker, *Maya Cosmos*, pp.75-99.

iconographic images from the Madrid and Dresden Codices, the murals of Bonampak (turtle and peccary), and the 'Vase of the Stars' (deer). Images re-oriented to face the same direction. 'X' denotes missing or effaced images.

A new full Maya Zodiac Star Map is presented below, although if Milbrath's ornate Milkyway skyband theory is correct, the true positions of the Peccary and the Vulture may need to be reconsidered.



Figure 11: Proposed Maya Zodiacal sequence and constellation placement. Image rendered by author. All constellation figures from the Paris Codex except for the Peccaries (Bonampak Murals), the Frog and Deer (Madrid Codex) and the Vulture (reconstructed for this image)

In conclusion, although many scholars have addressed the subject of the Maya Zodiac contained within the Paris Codex, and produced many conflicting zodiacal sequences to explain it, no published study hitherto has approached the problem by looking to the night sky using a methodology of phenomenological observation to experience the celestial figures as the ancient Maya may have seen them. In doing so, this study suggests that the illustrations in the Paris Codex were meant to be close representations of what the ancient skywatchers saw in the night sky, and therefore identification of these constellations can be verified through naked eye observation alone. Identification and general locations of the Frog, Shark, Scorpion, and Rattlesnake constellations have been proposed and these results support the position of Kelley, Schele, and others who assigned the location of the rattlesnake to the vicinity of Sagittarius. Many scholars insist the snake's tail and rattle are the stars of the Pleiades based upon an entry in the sixteenth-century *Motul* dictionary, but this study has found them to be the Corona Australis instead. The large Maya Scorpion comprises the stars of both Scorpio and Libra, while the shark, fleshed out by the stars forming Lupus and the upper portion of Centaurus, swims just below the ecliptic. Nearby is the Frog, adorned with the jewels of Spica and Gamma Hydrae. The Maya

identified thirteen celestial animals in the night sky along or near the ecliptic and illustrated them within the pages of the Paris Codex exactly as they saw them.

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Electronic version. San Francisco: Pre-Columbian Art Research Institute 1996

Layser AHAN7024 Assignment 2 Sky Journal

GRADEMARK REPORT

FINAL GRADE

61 /100

GENERAL COMMENTS

Instructor

Comments from B Brady:

This paper reports on the naked-eye observation of the sky in a consideration of the Mayan proposed constellations in order to step closer to the original method of how these constellations were formed.

In many places this paper is of high distinction standard. For example, it is highly original and if developed could potentially offer valuable contributions to the academic debates on these locations of these constellations. The difficulty of the paper is that it has tried to achieve too much within the limits of the word count. Thus valuable findings are only briefly stated. Your insight about whole creatures in the sky – rather than the modern idea of stick figures - shows your participation with the sky for the stick figures belong more to the modern period of cartography than any ancient sky view.

However you do make the excellent point of using the Milky Way as an anchor to help locate other constellations. Nevertheless, do you have supporting material that the Mayan did represent things in space in this manner? Mapping is not the same in all cultures and thus your Milky Way thinking is insightful but is it logical in terms of the Mayan culture?

You have used sky images to make your argument however in order for this image to offer the reader evidence you needed to label them more fully, name the stars and even draw faintly over them the modern constellations so the reader could follow you. Also you needed to address the fact that your constellations did not appear to use all the stars in the area, as you claim, and also seem to rely on faint stars instead of nearby brighter stars.

You also introduce the idea of paran constellations but then fail to develop it. This could have also been a valuable tool in helping explore these constellations.

Given the above points your conclusion where you propose the Mayan zodiac and its location in the sky is not actually supported by the evidence that you have presented. Thus the paper suffers from you trying to achieve too much, rather than focusing on the actual focus on the research which was you learning how to see some of the constellations and providing greater clarity around the insights that you had. I hope that you will develop this work more fully in a later work – or book!

What you did well

You observed the sky and thus began to see the constellations

Points for Improvement

Focus on the task at hand and avoid letting the project escalate.

Nick Campion

This essay presents the marker with a dilemma. On the one hand it is a high-distinction piece of scholarship. But on the other it has departed from the designated assignment which was to report on a reflexive sky journal. However, there is some observation, which informs the scholarly analysis. Hence a mark in the low merit range is acceptable.

Text Comment. 61%

Text Comment. 61%

Text Comment. 61%

Text Comment. See my comments below

Text Comment. Bernadette Brady

Text Comment. 28 Aug 2017

Text Comment. Nick Campion



Comment 1

Excellent introduction



Comment 2

These would be paranatellonta, a concept that you may wish to explore if they are being used in Mayan astronomy.



Comment 3

You should also state that you are a man and white. Think how the observations would be different if you were a native American woman. The reader will find this to put your thoughts and findings into context.



Comment 4

Good justification of your method. Also you could have used the word 'I' rather than 'the researcher'. This is one of the few types of academic work where you can use the personal pronouns.

]◆◆◆B◆%



Comment 5

This is a good diagram but you make no reference to it in your text. You needed to write a few sentences about this research cycle and stating as shown in figure 3.

**Comment 6**

Two points

With these you needed to also list there magnitude, because the question arises is why did they use such faint stars when other brighter stars are close by?

Where is Cretaris? There is no such constellation. Did you mean Corvus the Crow?

**Comment 7**

Why did it become apparent? Because there are the only two bright stars?

**Comment 8**

This sky images is not helpful. You needed to label the stars and even put a faint overlap of the modern constellations so the reader could follow your argument.

**Comment 9**

What is this number M.101d. ?

**Comment 10**

This is excellent, but what led you to this insight – you need to give further information here. Also the constellations we know today were not first conceived as stick figures – which are post Ptolemy – but rather as you describe here, whole images in the sky. This does not reduce your finding but strengthens it. In other words you expected that they were talking stick figures thus you were looking for stick figure, but by participating with the sky you ‘saw’ the whole image. ->💎💎💎[💎%

**Comment 11**

You have not really made this argument as according to your image there are still quite a few stars left out. Also as per my previous comment on the Frog, you needed to label the stars and even show the modern constellations.

**Comment 12**

As per my other comments re these sky maps, they do not actually support your argument as stars are falling outside the constellation and you needed to label everything.

PAGE 12



Comment 13

More details needed.



Comment 14

This is an excellent insight you just needed to be clearer with your sky images.

PAGE 13



Comment 15

This is an important theme, using the Milky Way, as a central motif and thus a way to help with constellation identification really needed to be explored in its own right.



Comment 16

You have not really spoken of your observations, just your realisation that they appear as the images using all the stars. Also you have not talked of the pairs of constellations that you mentioned earlier. So this is a leap to now try and reconstruct the entire Mayan sky!

gmen💎💎💎💎/

PAGE 14



Comment 17

You have not really presented the detailed evidence to support this claim. Indeed it lies outside of the scope of your sky journal!



Comment 18

Yes, this is your insight – removing your modern expectations and seeing the sky in a more natural way.



Comment 19

That would be hard to truly support – because the naked eye can make many patterns, you need to be strongly guided by the Codex and other evidence.



Comment 20

Identical to the Scorpion from the Mesopotamian tradition.



Comment 21

Your observations of the sky suggest Corona Australis. But why? Did it rise and set at a key time with other important constellations?

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PAGE 16
