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Religious Imagery in Mayapan's Murals

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Murals at Mayapan in Yucatan provide a rich picture of the changing nature of religious imagery in the Postclassic period. Mixteca-Puebla traders from Central Mexico or Oaxaca may have introduced foreign religious cults at the Postclassic Maya capital as early as 1325 or 1350. Relationships with the Mixteca-Puebla style are evident in Mayapan murals that date between 1350 and 1400. Later, Aztec stylistic elements were introduced in architectural sculpture and murals, dating circa 1400-1450, probably through itinerant artists accompanying traders from the Valley of Mexico. These stylistic changes also relate to modifications in religious imagery, the main focus of discussion here. Dates for the murals are based on Mayapan's archaeological chronology and comparisons with murals from other sites in Mesoamerica (Milbrath and Peraza 2003).

Sala de los Símbolos Solares

The latest murals at Mayapan are painted on the Sala de los Símbolos Solares (Structure Q.161), an addition to the Castillo that dates to the last decades of Mayapan's occupation (Milbrath and Peraza 2003:19, Table 1; Peraza et al. 2001) (Figure 1). The solar disks on Mayapan's Structure Q.161 can be compared to Late Postclassic Aztec sculptures and to Mixteca-Puebla codices and murals at sites such as Mitla and Santa Rita (Figures 2–3). The Mayapan solar disks with only four rays seem simplified when compared to the more complex Aztec and Mixteca-Puebla forms, but this is not a significant stylistic difference because there is considerable variety in Mixteca-Puebla and Aztec solar disks (Miller 1982:Figure 109; Nuttal 1975:9,10,19,21; Pasztory 1983:Plates 36, 85, 90, 234; Taube 1992:Figure 77).[1] More

Figure 1. Structure Q.161, one of eight similar scenes with solar disks (photo by Joel Skidmore).

Figure 2. Solar disk from Structure Q.161 (photo by Joel Skidmore).

significant in terms of style is the fact that the Mayapan forms are rendered with broad color areas, lacking the black lines that form detailed cell partitions in murals and codices painted in the Mixteca-Puebla style or its East Coast variant known from sites like Tulum and Santa Rita (Robertson 1970).

The Mayapan murals from Q.161 share some stylistic elements with Aztec art. The striding profile figures facing each other across a sun disk in the murals resemble the central relief on the Aztec Teocalli (Pasztory 1983:Plate 127).[2] The costuming, proportions, and pose of the profile figures in Mayapan's Q.161 mural are like those seen in early Aztec art, especially murals from Phase II of the Templo Mayor, ca. 1375-1427 (López Luján 2006:122; Milbrath and Peraza 2003:29).

Mayapan's Sala de los Símbolos Solares is painted with broad areas of color more closely resembling the Templo Mayor murals, but the paintings lack the thin black outlines seen in the Phase II Aztec murals (de la Fuente et al. 1999:Colorplates 69 and 145) (Figures 1–2). The panels in the Q.161 mural include a green border, a color not seen in the Templo Mayor murals, and the lavish use of Maya Blue in the background is also a distinguishing feature. Apart from these differences, both murals share a color palate featuring red, blue, yellow (ochre), and white (Lopez Luján 2005:17, Figure 8). The use of Maya Blue in the Templo Mayor murals may provide a key to possible connections between the Aztec area and the Mayapan area, one of the principal sources of Maya Blue. The Aztecs or their Canul trading partners may have obtained the blue pigment from the area of Mayapan as early as 1375 (Milbrath and Peraza 2003:30).[3]

Sun disks with solar deities are represented in

[1] Like Aztec examples of sun disks, the Church Group murals from Mitla represent a solar disk with eight rays, four terminating in scroll ends, and a multitude of jade and feather symbols (Milbrath 1999:Figure 5.6h). The Santa Rita sun disk has primary solar rays with scroll ends and bands with beads at the ends in between these rays (Figure 3). This format resembles the solar disks on Codex Nuttall 9 and 21 (Nuttal 1975:9, 21), but the codex also represents solar disks with rays lacking scroll ends (Nuttall 1975:10, 19, 21).

[2] Compositions with two figures facing each other across a central object are typical of early Aztec sculptures dating prior to 1427, according to Emily Umberger (1981:225-226). Nonetheless, Leonardo López Luján (2006:104, 114) points out that this conclusion is based on a faulty chronology that places the benches of the Casa de las Aguilas with its "Toltec" figures as among the earliest Aztec reliefs when in fact they are purposefully rendered in an archaic style to allude to a Toltec heritage.

Aztec and Mixteca-Puebla art, including the mural at Santa Rita painted in the East Coast International style (Robertson 1970; Taube 1992:140-142, Figures 77–78) (Figure 3). The diving figures in the center of the Mayapan sun disks have their arms and legs forming a design resembling a swastika (a "pinwheel pose"), comparable to the representation of the Sun God on Codex Nuttall 9 (Nuttall 1975:9), although the codex figure is not represented in a diving pose. A figure in a pinwheel pose on an Aztec sun disk could represent a sacrificed warrior rather than the Sun God (see catalog number 11/8220 in the National Museum of the American Indian; Saville 1924:Figure 41). Because the figure has a dart in his mouth and his heart has been extracted, he could represent a warrior sacrificed to the sun, in keeping with the concept of a deceased warrior serving as a companion to the sun from sunrise to noon in Aztec accounts (Sahagún 1950-82:Book 6:162). On the other hand, Leonardo López Luján (personal communication 2009) interprets this warrior as an image of the deceased Sun God, Tonatiuh.

In the Mayapan murals, there were originally eight different figures on the sun disks, each represented in a descending pose (Figure 4).[4] The diving figures could be deceased warriors comparable to Aztec images, but the grouping of eight solar disks suggests an alternate interpretation. The eight sun disks in Q.161 may symbolize eight solar years in the Venus almanac, equivalent to five Venus cycles (5 x 584 = 8 x 365 days;

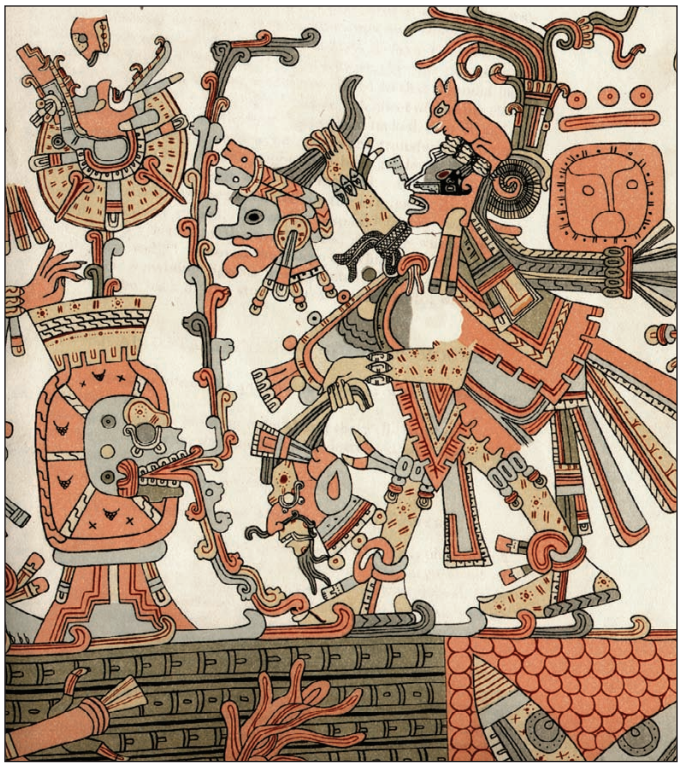

Figure 3. Sun Disk from Mural at Santa Rita (Gann 1900:Plate 31).

Milbrath 1999:58-59; Milbrath and Peraza 2003:28). In this case, the descending figures would be different avatars of the sun representing different years in the Venus almanac. At least one of these seems to be dead, his body pale and covered with what appear to be death spots (Figure 2).

A connection between the murals and the Venus cycle has been proposed in studies of the alignment of Structure Q.161 (Sala de Símbolos Solares). Observing times when the light of the rising sun illuminated the murals resulted in dates that divide the year into a 2/3 ratio in relation to the summer solstice, and these dates have been used to derive numerical coefficients that link the solar year with the synodic cycle of Venus by marking the dates that Venus could be seen behind the tower of the Templo Redondo (Q.152) when viewed from Q.161 (Ruiz Gallut et al. 2001). The Q.161 structure itself does not have an orientation to a significant horizon position for Venus, but its north and northwest walls are illuminated by the rising sun on the summer solstice, and its south wall is illuminated by the winter solstice sunrise. Observations made from the Templo Redondo, which clearly functioned as an observatory, indicate that alignments toward the Castillo and the adjacent Q.161 mark important solar dates (Aveni et al. 2004). Venus alignments were not evident along the same trajectory, but an interest in the solar cycle in relation to Venus may be evident in the grouping of eight sun disks, one for each year of the Venus almanac.

[3] The Templo Mayor includes Maya Blue made from indigo, a plant grown in tropical regions. Through a heating process, indigo was combined at a molecular level with palygorskite clay from northern Yucatán, or alternatively the combination included mixed palygorskite and sepiolite clay from the area of Campeche (Lopez Luján et al. 2005). It is not clear whether the Aztecs made the pigment from imported raw materials or whether they or their trading partners imported Maya Blue as a prepared pigment. There is some evidence of changes in the sources of Maya Blue over time. One sculpture tested from the Templo Mayor was originally painted with Maya Blue made with clays comparable to the Campeche sources, but was later painted over in a repair that used a Maya Blue made from the type of clay characteristic of northern Yucatán (Lopez Luján et al. 2005:26, n. 62). A third unknown source of clay used for Maya Blue may be from Oaxaca (Lopez Luján et al. 2005). It seems likely that the Aztecs began to exploit clay sources near Mayapán through trade or some other form of contact because there are Mayapán sculptures that seem to be inspired by those from Central Mexico, and Landa recounts that there was an influx of "Mexicans" shortly before an internal revolt led the city to collapse around 1450 (Milbrath and Peraza 2003:25-26, 30-31).

[4] Only eight scenes are preserved, and six of these preserve solar disks, four of which have descending figures that are still visible (Figure 4). Although the eight panels are not completely preserved, it is possible that the design represents eight solar deities. There are also fragmentary murals in the area where the corner of Q.161 meets the eastern staircase of the Castillo. Given the loss of stucco in other parts of the walls, it is likely that there were other subsidiary scenes, but these areas do not seem large enough to fit in another complete sun disk panel.

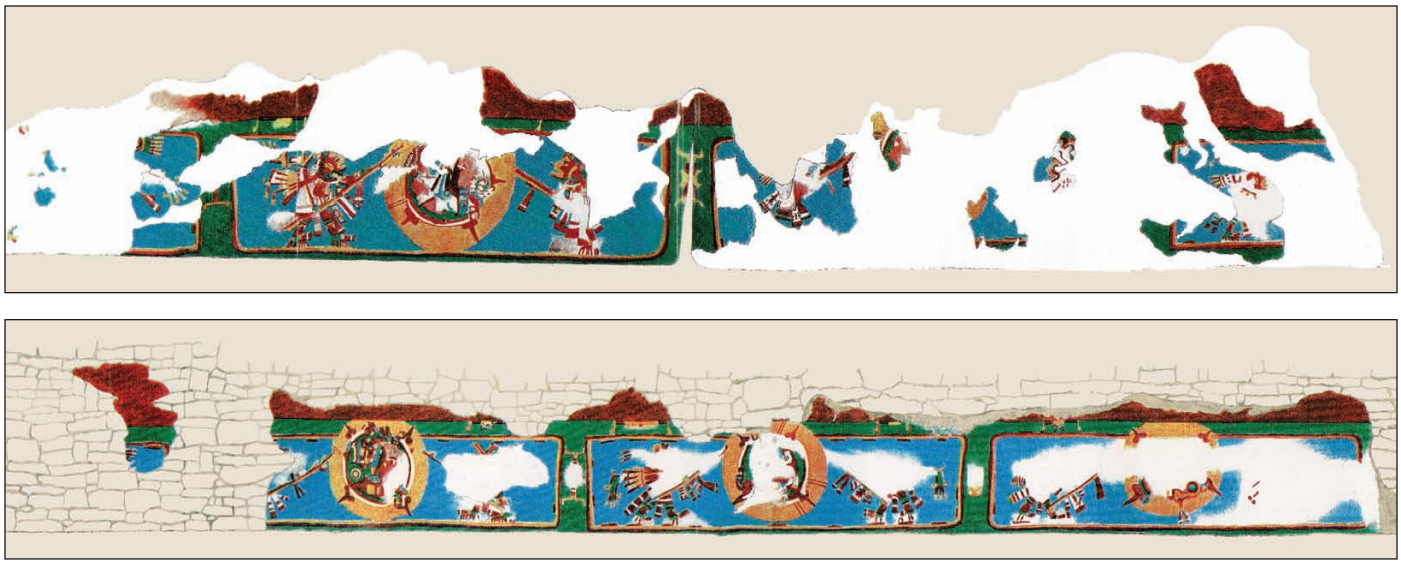

Figure 4. Reproduction of murals in Structure Q.161 showing remains of the original eight panels on the the north, northwest, and south walls (Barerra and Peraza 2001:Plates 16–17).

Venus Imagery in the Templo de los Nichos Pintados

The Venus almanac seems to be important in the Templo de los Nichos Pintados (Temple of the Painted Niches or Structure Q.80) excavated by the Carnegie archaeological project in the 1950s (Milbrath and Peraza 2003:26-27) (Figure 5). Mural paintings in Q.80 depict reptiles and temples that reflect Mayapan's participation in Mixteca-Puebla traditions (Milbrath and Peraza 2003:26-27; Barrera and Peraza 2001:443, Plates 5-11). The dentition of the two preserved reptile faces clearly indicates that the figures are serpents, most probably symbolizing Quetzalcoatl. The serpents resemble examples known from Coba (Lombardo 1987:Figure 46; Milbrath and Peraza 2003:27) and those on Mixteca-Puebla pottery from Cholula, dated circa 1350 to 1550 (McCafferty 1996:Figure 16f).

The murals depict small areas of blue, black, red, white, and yellow outlined in black to form color cells like those seen in Mixteca-Puebla codices (Milbrath and Peraza 2003:29). This format is also seen on Mural 10 of Tulum's Structure 16, one of the few polychrome murals at the site (Miller 1982:Plate 33). Arthur Miller (1982:70-73, Plates 25-40) notes that Mixteca-Puebla stylistic elements in the Tulum paintings in Structures 5 and 16 indicate a date after 1400, but Leticia Staines Cicero (1995:61) suggests these murals date between 1300 and 1450. The Q.80 murals represent the Mixteca-Puebla style in an East Coast manifestation known as the International Style (Robertson 1970). They date to the last construction phase of the structure (Phase IV), but the site chronology suggests that they are not the latest murals at Mayapan (Milbrath and Peraza 2003:Table 1). Although murals in Structure Q.80 have been known for more than 50 years, their relationship to Mixteca-Puebla Venus imagery has only recently been recognized (Milbrath and Peraza 2003:19, 26). The five temples represented in the murals may relate to the Venus cycle, for there is one temple for each of the five synodic cycles in the Venus almanac of eight solar years (Milbrath 1999:158-159). The five niches forming the entryway to the temples were clearly intended for offerings, and these offerings were probably made in accord with the five divisions of the Venus almanac.

The five temples represented in the Mayapan mural may relate to five serpent temples known from the central area of Mayapan (Pugh 2001; Delgado 2004:123-129). These buildings are the Castillo (Q.162), the Crematory (Q.58), and Structures Q.143, Q.159, and Q.218. Timothy Pugh (2001:255) notes that the Castillo, the largest of these serpent temples, is positioned in the center of a cosmic diagram marking five world directions. The Castillo as the center point may have been the site of calendar festivals related to the five Venus cycles in the eight-year Venus almanac.

Mayapan's Castillo is a copy of the Castillo of Chichen Itza, an earlier structure known to have a number of astronomical alignments (Aveni et al. 2004; Milbrath 1999:66-68, Figure 3.1b; Milbrath and Peraza 2003:22, 38). Friar Diego de Landa clearly links Chichen Itza's Castillo to the Maya god of the feathered serpent, known as Kukulcan, and he notes that the cult of Kukulcan was brought from Chichen Itza to Mayapan (Tozzer 1941:20-25). Kukulcan is the Maya counterpart of Quetzalcoatl, a culture hero who was transformed into the Morning Star according to the *Anales de Cuauhtitlán* (Milbrath 1999:177). The religious cult of Quetzalcoatl was introduced in Yucatan in conjunction with trade from Central Mexico (Miller 1983:8-9; Ringle et al. 1998). In the case of Mayapan, the cult seems to make its first

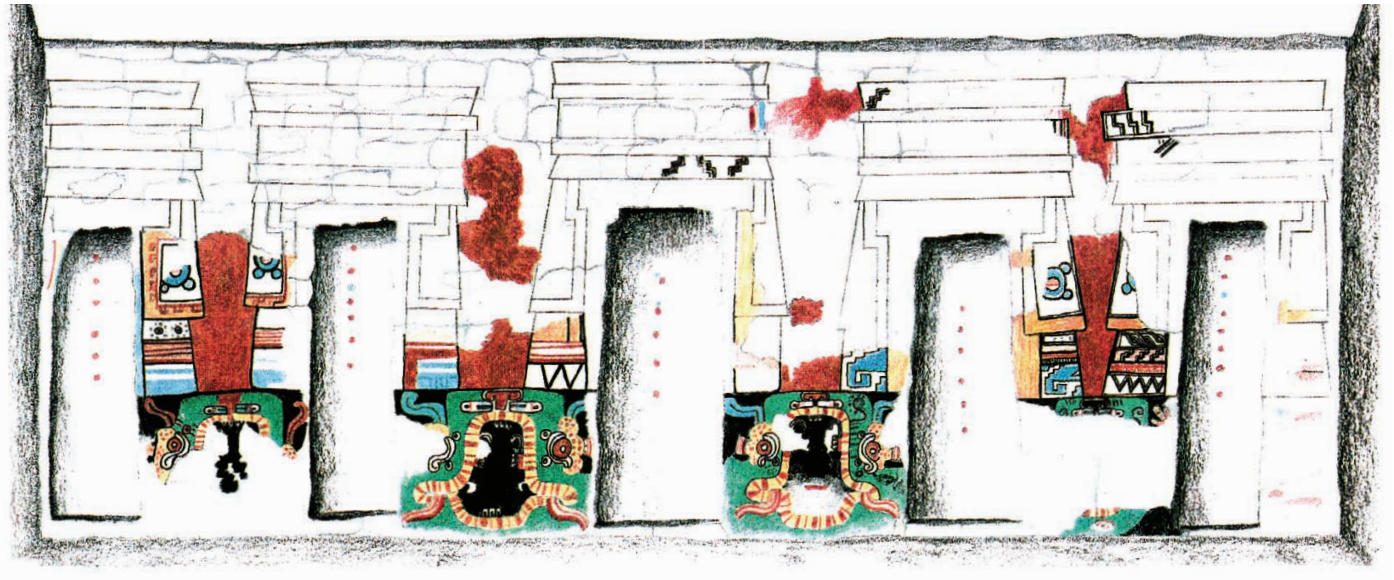

Figure 5. Structure Q.80 with five serpent temples (Barerra and Peraza 2001:Plate 5).

appearance in serpent temples that range in date from 1325/1350 to 1400, according to our study of the sequence of architecture at the site (Milbrath and Peraza 2003:Table 1). The four serpents in between the five temples in the Q.80 murals may be intended to represent serpent balustrades like those on the Castillo, and they certainly symbolize a link with the cult of Quetzalcoatl.

Although the serpent temples in the Q.80 mural are all similar in form, they are slightly different in detail, suggesting their iconographic variations may be significant (Figure 5). The one on the left has death spots on a white ground comparable to one of the diving figures on Q.161 (Figure 2), possibly also related to an underworld band seen beneath a temple on Codex Nuttall 15 (Figure 6). Another has a step fret like that seen at the base of this temple. These may be symbolic components linked in some way Venus imagery.

The five niches in Q.80 have vertical columns of dots, varying in number from six to eight, painted either solid red or blue. This intriguing detail may be a Central Mexican or Mixtec calendar inscription. The variation in numbers could represent the number of days in the disappearance interval for Venus in inferior conjunction (Aveni, personal communication 2007). The Maya bar-dot combination is lacking, but the alternation of red and blue color for the dots in the interior of the niches is similar to the alternation of red and black numbers in Maya codices (Delgado 2009:158).

All five temples apparently had symbols for jade or "precious stone" (*chalchihuitl)* painted on the upper walls (Figure 5). According to Tatiana Proskouriakoff's 1962 reconstruction of the mural, these symbols were also found on the roof (see Milbrath and Peraza 2003:Figure 23). The Mixteca-Puebla symbol for jade on the five temples can be compared to a similar symbol on a skyband in Structure 16 at Tulum (Mural 3), where an astronomical context is clearly evident (Barrera and Peraza 2001; Milbrath and Peraza 2003:27; Miller 1982:Plate 39). A *chalchihuitl* symbol is also prominent on the roof of Quetzalcoatl's temple on Codex Nuttall 15 (Figure 6). A Mixteca-Puebla image of the feathered serpent wraps around the temple in the Codex Nuttall image. Alfonso Caso (1979, I:56) had designated the Codex Nuttall temple as Quetzalcoatl's Temple of

Figure 6. Detail of Codex Nuttall 15 (Nuttall 1975:15).

Figure 7. Mural from Structure Q.95 showing Quetzalcoatl, the Chicchan Serpent, and a bound crocodile. (The image is oriented to represent the viewpoint from the entry to the chamber, as seen in Figure 9.) Drawing by Barbara Escamilla Ojeda.

Figure 8. Chicchan serpents in Madrid Codex 11-14 (Milbrath 1999:Cover).

Figure 9. Mural in Structure Q.95 (photo by Susan Milbrath).

Turquoise in Acatlan, Puebla, but more recently it has been identified as the round "wind temple" of the Place of the Red and White Bundle, located in the Mixteca Alta of Oaxaca (Byland and Pohl 1994:76-80, Figure 30). In any case, the Codex Nuttall temple houses the sacred bundle of the culture hero Nine Wind, indicating a link with the Venus cult associated with Ehecatl-Quetzalcoatl. Quetzalcoatl is a paramount deity in the Venus complex (Milbrath 1999:177-186).

Astronomical Symbolism in the Templo del Pescador

A Mixteca-Puebla style mural discovered by the INAH project in Structure Q.95 is known as the Templo del Pescador (Peraza et al. 2001:286-287; Peraza et al. 2003:47-55) (Figures 7, 9). The scene shows a marine setting with waves, three triggerfish, and a crocodilian that is probably Morelet's crocodile (*Crocodylus moreletii*), well known in mangroves along the coast of Yucatan. The mural also depicts an elaborately dressed male who apparently has speared two of the fish and the crocodile (Barrera and Peraza 2001:Figure 31, Pl. 32).

The Templo del Pescador mural is rendered with the small color cells outlined in black, like Mixteca-Puebla style murals and Mayapan's Templo de los Nichos Pintados (Milbrath and Peraza 2003:29) (Figure 5). The Templo del Pescador also has ties to early murals from Tulum, especially the substructure of Tulum's Castillo (Structure 1), a relatively early mural that depicts a "ring-tailed fish" and a crocodile amid undulating waves similar to those in the Mayapan mural (Barrera and Peraza 2001:443, Figure 33; Miller 1982:Pls. 13, 14). Although this iconographic comparison could suggest that the Mayapan mural is as early as the substructure of Tulum's Castillo, the dense polychrome cells more closely resemble the style of Mural 10 in Structure 16, tentatively dated between 1300 and 1450 (Milbrath and Peraza 2003:27-28; Staines 1995:61).

A number of scholars link the anthropomorphic deity in the Structure Q.95 mural with Quetzalcoatl (Masson and Peraza 2007:82; Stuart 2005:179). Careful study of the costume on the Mayapan figure suggests that *chalchihuitl* symbols are painted on the loincloth (Delgado 2009:197). This symbol is also found in the context of Venus imagery in Structure Q.80 and in the Codex Nuttall (Nuttall 1975:15, 17). The shell worn by the male figure in Q.95 seems to be an *Oliva*, suggested by the markings at the ends and the crenellations along the lateral opening. In the Dresden Codex 4a, the same shell is used in a necklace worn by God H, considered to be a manifestation of Quetzalcoatl-Kukulcan (Milbrath 1999:Figure 5.4a; Taube 1992:59-60, Figure 27a). A similar shell is devoured by a fish in the lower mural of Tulum Structure 5 (Miller 1982:Pl. 28). This type of shell also appears with *chalchihuitl* symbols in the skyband of Mural 3 in Structure 16 at Tulum, suggesting it is a celestial symbol in some contexts (Miller 1982:Pl. 39).

Equally intriguing in terms of celestial counterparts is the fish-snake in Q.95, which is closely related to the Chicchan serpent in the Madrid Codex (Milbrath and Peraza 2003:28) (Figures 7–8). Both display body stripes with paired parallel lines and serpent spots like the day sign Chicchan ("celestial snake"). These symbols have also been compared to the Mexican symbol for *chalchihuitl* seen in the Templo de los Nichos Pintados (Q.80; Barrera and Peraza 2001:430). The Madrid Codex imagery suggests a link between rain, serpents, and Venus imagery (Milbrath 1999:261). Chicchan serpents are rain serpents associated with the cardinal directions among the Chorti, and they may also be linked with Venus (Milbrath 1999:36).[5]

The crocodile in the Templo del Pescador has its front feet bound by ropes like the crocodiles on the

[5] The Mayapán mural may show the serpent with a fish tail, or perhaps a flower, if Karl Taube (2007) is correct in relating it to a pattern linking the feathered serpent and flowers.

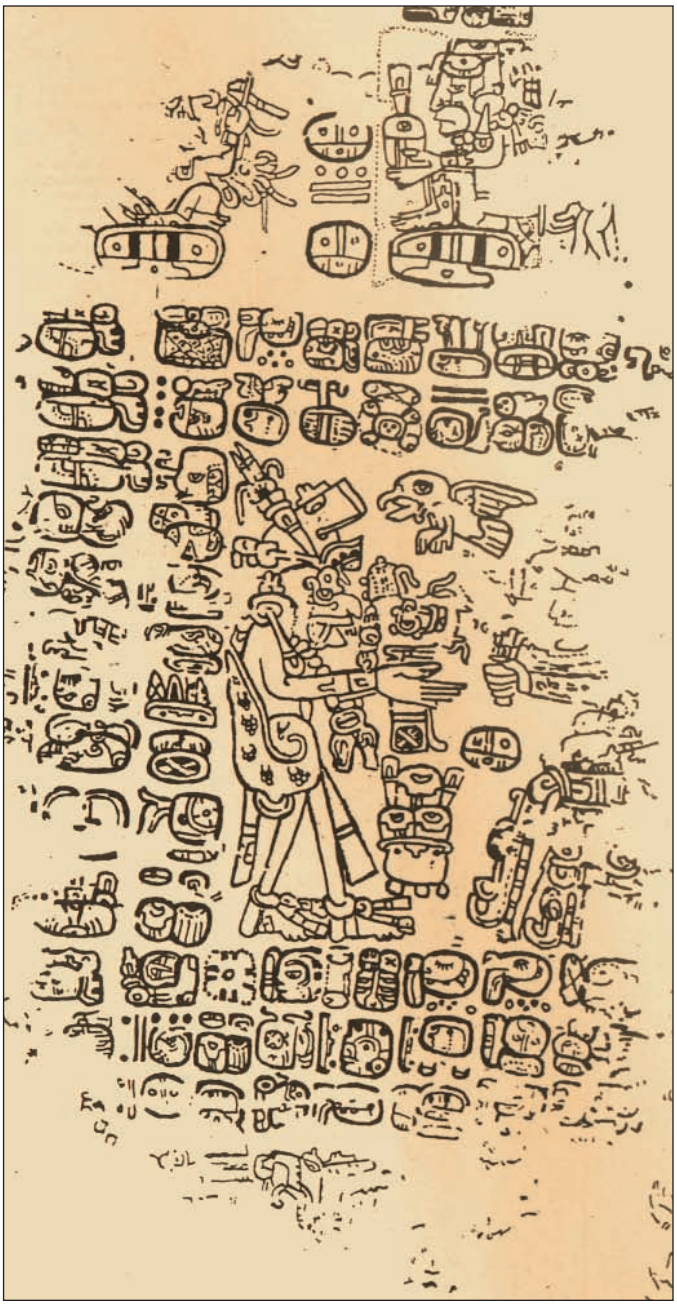

Figure 10. Paris Codex 6 Katun pages (Villacorta and Villacorta 1976).

Paris Codex katun pages (Milbrath and Peraza 2003:28) (Figure 10). A bound crocodile serves as a throne on all of the surviving katun pages of the Paris Codex (Love 1994:18). The bound crocodile in the Q.95 mural relates to both Postclassic katun ceremonies in the codices and possibly also to cosmological events described in the books of Chilam Balam. Maya accounts of the flood say that a cosmic crocodile (Itzam Cab Ain) was decapitated or dismembered. The Pérez Codex notes that Bolon ti Ku cut the throat of the crocodile just after the flood (Velásquez 2006:6-8). The Chilam Balam of Tizimin says that Itzam Cab Ain (the earth monster) ended the Katun 13 Ahau with a flood, after which his throat was cut when the "word of the katun" came to an end (Edmonson 1982:41). This account and a similar one in the Chilam Balam of Mani both place the flood event in Katun 13 Ahau, the last in the katun cycle, linking the decapitated crocodile to the concept of completion and renewal, when the world was restored and the katun cycle reestablished (Taube 1989:9).

Following up on an interpretation of the Mayapan mural published by David Stuart (2005), Gabrielle Vail (2006) suggests that the mural refers to the epic flood associated with a cosmic crocodile. She notes that instead of the Maya image of the great flood alluding to the decapitation of the crocodile, the Mayapan image evokes Central Mexican imagery, with the crocodile speared by Quetzalcoatl. Vail relates the destruction of the earth in the form of a crocodile or caiman to a Venus heliacal rise event, with the Venus god hurling his dart into the water, as seen in the Venus almanac on Codex Borgia 53.

Concluding Remarks

Studying the imagery in Mayapan's murals seems to indicate changes in cosmological themes over time. Of the three murals discussed here, the earliest may be the "flood" scene preserved in the Templo del Pescador mural (Q.95). Here Maya imagery predominates, but the mural also incorporates the paramount Central Mexican Venus god, Quetzalcoatl. The imagery alludes to creation cosmology in relation to the Maya katun cycle, for ceremonies of world renewal are implicit in the cycle of katuns. The intrusive element seems to be Venus symbolism linked with Quetzalcoatl. A similar fusion is seen in the context of Venus imagery in the Maya Dresden Codex (46-50), which depicts three Central Mexican deities among the five Venus gods in the Venus almanac (Milbrath 1999:173-174; Taube 1992). Glyphic texts on page 60 of the Dresden Codex refer to Katun 11 Ahau, the first katun in a cycle of 13 katuns that ends on Katun 13 Ahau (Thompson 1972:78-79). The scene on page 60 represents a Maya Venus god (God L), the same god associated with the heliacal rise of Venus on Dresden 46 in the Venus almanac (Milbrath 1999:173). Painted around the end of the tenth baktun in 1224, the Dresden Codex provides a bridge between the Classic-period calendar with its emphasis on Ahau dates as katun endings and the Postclassic Venus calendar with its focus on Ahau dates as heliacal rise events (Milbrath 2008). The Q.95 mural represents a similar fusion of katun imagery associated with katun endings and the Postclassic Venus almanac, suggesting a calendar reform was in progress at Mayapan by around 1350-1400.

Around this time or shortly thereafter, a fully developed Mixteca-Puebla Venus cult appears in the Temple of the Niches (Q.80), which shows a number of features that are comparable to the Codex Nuttall and

the East Coast International Style. Feathered serpents are flanked by five Venus temples that may represent the five Venus cycles of the eight-year Venus almanac. Still later, solar imagery seems increasingly important in relation to the eight-year Venus almanac, as seen in the eight solar disks represented in the Sala de los Símbolos Solares (Q.161). These murals were inspired by contact with the area of Central Mexico and reflect an increasing emphasis on solar imagery that may be part of religious reforms introduced around 1400 to 1450 at Mayapan.

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Glyph F of the Supplementary Series: *Ti' Hu'n*, Mouth of the Book

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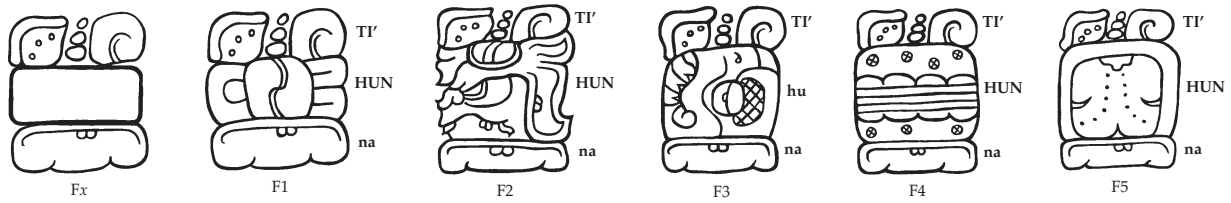

Figure 1. Common Glyph F variants (redrawn from Calvin 2004).

Glyph F appears as a regular part of the Supplementary Series that has long been known to define the role of the Lord of the Night. Although it has been discussed by a number of scholars, there has been no agreed-upon reading or interpretation of this glyph block. Many interpretations are based on inferred semantic meanings, totally divorced from phonetic readings. Others utilize the phonetic values of the signs but the readings do not make semantic sense. This article will briefly describe Glyph F and its variants. A database of dates with Glyph F variants is statistically examined for variation over time and space. The previous interpretations which are most often used today are examined critically before a new interpretation based on phonetic readings and logical context is given.

Glyph F Background

Glyph F is a regular, yet unexplained, part of the Supplementary Series. Although sometimes omitted, it is usually present either directly following or conflated with Glyph G. The superfix and subfix are constant, while the main sign can vary or even be left out when conflated with Glyph G. The superfix (T128) consists of three elements in a line, illustrated in Figure 1. The left-most segment is "leaf-like," often with three diagonal dots (Thompson 1960:212). The center element is either two or three dots in a vertical line or a wavy, pointed element, much like the **ya** (T126) central element. The right part also looks like the curved loop of the **ya** syllabic sign. These elements together are read **TI'** (and appear to be a representation of a rare full-figured head variant), known through a substitution with **ti-'i** on the La Esperanza ball court marker, meaning "mouth," "lips," "opening," or "edge" (Stuart 1998, personal communication 2009; Stuart et al. 1999:II-38; Zender 2004:212-213). The subfix is a syllabic **na** (T23) and almost always present. When Glyph F is combined into a single block with Glyph G, the main signs are frequently conflated (Figure 2a–b), or Glyph F's main sign can be entirely suppressed leaving only the **TI'** and **na** (Figure 2c).

The variable main sign can take at least five forms, all illustrated in Figure 1. The most common is the **HUN** logogram (T60) shaped like a knotted cord or cloth. This is called the "normal form of Glyph F of Lunar Series" by Thompson (1962:46) and will be referred to as F1. The next-most-common element is a head-variant with a barbel emanating from its mouth, a squarish drop-pupil, fish- or foliage-like protuberances, and a "shiny" sign on top; the reading of this must also be **HUN** from its context. This will be called F2. A third main-sign variant, F3, is the upended frog head lacking dots across the top (T740), giving the syllable **hu**; long known to be a Glyph F variant (Thompson 1962:320). The fourth version, F4, is a jaguar-pelt-bound codex (T609b; compare to the codex of the rabbit scribe on the Princeton Pot), which must read **HUN**. This is not to be confused with the similar jaguar-pelt-covered diadem or cushion (T609a) differentiated with the **po/TZ'AM** dimple. A final variant is a square sign with dots falling from a small "T"-shaped element and two spikes coming in from either side (T522), also given as **HUN**, here referred to as F5. Thompson (1962:126) notes that this sign "occurs only in [the] Chiapas area, at Tikal, and [in the] Codex Paris." From the **HUN-(na)** and **hu-n(a)** transliterations above, a reading of *hun* can be suggested, discussed at

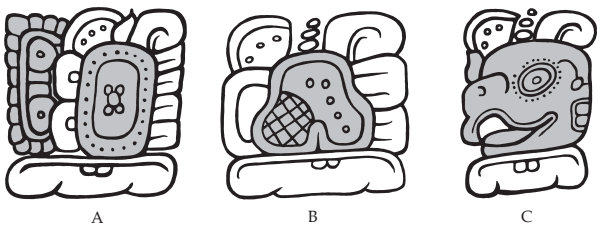

Figure 2. Common Glyph G and F conflations, Lord of the Night components shaded (redrawn from Calvin 2004).

Glyph F by Site	Data						Row Proportions					
	F1	F2	F3	F4	F5	Total	F1	F2	F3	F4	F5	Total
COB	3	0	0	0	0	3	100%	0%	0%	0%	0%	100%
CPN	2	0	0	1	0	3	67%	0%	0%	33%	0%	100%
ITB	2	0	0	0	0	2	100%	0%	0%	0%	0%	100%
NAR	2	0	0	0	0	2	100%	0%	0%	0%	0%	100%
PAL	4	1	3	0	0	8	50%	13%	38%	0%	0%	100%
PNG	9	6	0	0	1	16	56%	38%	0%	0%	6%	100%
PUS	3	0	0	0	0	3	100%	0%	0%	0%	0%	100%
QRG	0	2	0	0	0	2	0%	100%	0%	0%	0%	100%
TIK	4	0	0	0	0	4	100%	0%	0%	0%	0%	100%
TNA	2	0	0	0	0	2	100%	0%	0%	0%	0%	100%
UAX	2	0	1	0	0	3	67%	0%	33%	0%	0%	100%
YAX	3	1	4	0	0	8	38%	13%	50%	0%	0%	100%
Total	36	10	8	1	1	56	64%	18%	14%	2%	2%	100%
Period	F1	F2	F3	F4	F5	Total	F1	F2	F3	F4	F5	Total
EC	12	0	1	0	0	13	92%	0%	8%	0%	0%	100%
LC	21	4	7	1	1	34	62%	12%	21%	3%	3%	100%
Total	33	4	8	1	1	46	72%	9%	9%	2%	2%	100%
Glyph G	F1	F2	F3	F4	F5	Total	F1	F2	F3	F4	F5	Total
G1	2	3	0	0	0	5	40%	60%	0%	0%	0%	100%
G2	0	0	4	0	0	4	0%	0%	100%	0%	0%	100%
G3	1	0	0	0	0	1	100%	0%	0%	0%	0%	100%
G4	4	1	0	0	0	5	80%	20%	0%	0%	0%	100%
G5	2	0	0	0	0	2	100%	0%	0%	0%	0%	100%
G6	0	1	0	0	0	1	0%	100%	0%	0%	0%	100%
G7	3	1	1	0	1	6	50%	17%	17%	0%	17%	100%
G8	6	1	0	0	0	7	86%	14%	0%	0%	0%	100%
G9	24	4	2	1	0	31	77%	13%	6%	3%	0%	100%
Total	42	11	7	1	1	62	68%	18%	11%	2%	2%	100%
Conflation	F1	F2	F3	F4	F5	Total	F1	F2	F3	F4	F5	Total
Conflated	12	2	2	1	0	17	71%	12%	12%	6%	0%	100%
Not Confl.	29	9	5	0	1	44	66%	20%	11%	0%	2%	100%
Total	41	11	7	1	1	61	67%	18%	11%	2%	2%	100%

Table 1. Frequency and row proportions of Glyph F variants and various comparisons (site codes per Graham and Mathews 1999).

length below (possibly *huun* or *hu'n*, as per Houston et al. 2004 or Lacadena and Wichmann 2004 respectively).

Collected Data

The data collected for this study were primarily drawn from the *Corpus of Maya Hieroglyphic Inscriptions* (Graham 1975-present) and Morley's (1937) *Inscriptions of Peten*, supplemented by various readers and informal collections of inscriptions. Each inscription was recorded, noting the Long Count, Tzolk'in, Haab, Glyph G, Glyph F (labeled according to the divisions in Figure 1), Glyph G and F conflation, and the presence or absence of a syllabic **u-** Glyph F prefix. Impossible long count and calendar round combinations were noted. Complete dates were not needed for all of the analyses, as long as Glyphs G and F were legible. In total, 64 inscriptions were compiled into a small database, shown in Table 1. Correspondences between Glyph F variants and site, chronological period, Glyph G, or likelihood of conflation were examined. A further correspondence between sites and Glyphs G and F conflation was explored.

Site	Inscription	Day Number	Baktun	K'atun	Tuun	Winal	K'in	Tzolkin	Haab	G	F	Confl	+u
CNC	STL 18	1368000	9	10	0	0	0	1 Ajaw	8 Kayab	9	1		
COB	STL 1	275480	1	18	5	4	0	1 Ajaw	13 Mak	8	1	Confl	
COB	STL 20	1422000	9	17	10	0	0	12 Ajaw	8 Pax	9	1		
COB	STL 6	1364400	9	9	10	0	0	2 Ajaw	13 Pohp	9	1		
CPN	STL 6	X	8	12	10	0		8*	18 Sotz'*	9	1		
CPN	STL 63	1296000	9	0	0	0	0	8 Ajaw	13 Keh	9	1	Confl	
CPN	STL D	1405800	9	15	5	0	0	10 Ajaw	8 Ch'en	9	4	Confl	
DPL	STL 8	1384871	9	12	6	15	11	13*	*	4	1		
CAY		X						1		4	2		
Houston	PNL	1319004	9	3	3	16	4	3 K'an	2 Mak	9	1		
ITB	STL 2	1407600	9	15	10	0	0	3 Ajaw	3 Mol	9	1	Confl	
ITB	STL 5	1404000	9	15	0	0	0	4 Ajaw	13 Yax	9	1	Confl	
IXK	STL 2	1421653	9	17	9	0	13	3 Ben	6 K'ayab	4	1		
NCT	STL 8	1411200	9	16	0	0	0	7 Ajaw*	13 Tzek*	8	1	Confl	
NAR	STL 13	1422000	9	17	10	0	0	12 Ajaw	8 Pax	9	1		
NAR	STL 18	1402200	9	14	15	0	0	11 Ajaw	18 Sak	9	1		
PAL	HRS HSE C	1357100	9	8	9	13	0	8 Ajaw	13 Pohp	8			
PAL	Olvidado	1373150	9	10	14	5	10	3 Ok	3 Pohp	2	3	Confl	
PAL	PLC TBL	1372300	9	10	11	17	0	11 Ajaw	8 Mak	7	1	Confl	
PAL	TPL CRS	1804760	12	10	13	4	0	8 Ajaw*	18 Sek*	8	1	Confl	
PAL	TPL CRS In.	1373528	9	10	15	6	8	4 Lamat	16 Pohp	2	3	Confl	
PAL	TPL SUN	275466	1	18	5	3	6	13 Kimi	19 Keh	3	1	Confl	
PAL	TPL XIX	1800622	12	10	1	13	2	9 Ik'	5 Sotz'	1	2	Confl	
PAL	TPL XVII	1315982	9	2	15	9	2	9 Ik'	0 Mol	7*	1	confl	
PAL		1373528	9	10	15	6	8	4 Lamat	16 Pohp	2	3		
PNG	LTL 12	1324692	9	3	19	12	12	9 Eb	10 Zek	8	1	confl	
PNG	LTL 2	1377401	9	11	6	2	1	3 Imix	19 Keh	5	1		
PNG	LTL 3	X	9					5 Ik'	16 Ch'en	1	2		+u
PNG	STL 1	1396800	9	14	0	0	0	6 Ajaw	13 Muwan	9	1		
PNG	STL 1	1383136	9	12	2	0	16	5 Kib	14 Yaxkin	7	1		
PNG	STL 10	1407600	9	15	10	0	0	3 Ajaw	3 Mol	9	1	confl	
PNG	STL 11	1404000	9	15	0	0	0	4 Ajaw	13 Yax	9	2		
PNG	STL 14	824021	5	14	8	17	1	7 Imix	19 Yax	8	2		
PNG	STL 3	1383136	9	12	2	0	16	5 Kib	14 Yaxkin	7	5		
PNG	STL 32	1396800	9	14	0	0	0	6 Ajaw	13 Muwan	9	1		+u
PNG	STL 36	1370269	9	10	6	5	9	8 Muluk	2 Sip	1	1		
PNG	STL 4					0	0	7 Ajaw		9	1		
PNG	STL 40	1408141	9	15	11	9	1	11 Imix*	19 Pax*	1	2		
PNG	STL 5	1398600	9	14	5	0	0	12 Ajaw	8 K'ank'in	9	1		
PNG	STL 8	1379662	9	11	12	7	2	2 Ik'	10 Pax	7	2		
PNG	STL 9			15	5		0	Ajaw		9	2		+u
PUS	STL O	1346400	9	7	0	0	0	7 Ajaw	3 K'ank'in	9	1		
PUS	STL P	1346400	9	7	0	0	0	7 Ajaw	3 K'ank'in	9	1		
PUS	STL P	1373400	9	10	15	0	0	6 Ajaw	13 Mak	9	1		
QRG	STL F	1414800	9	16	10	0	0	1 Ajaw	3 Zip	9	2	confl	
QRG	STL J		9		5	14				9	2		
SBL	TBL 1	1408940	9	15	13	13	0	4 Ajaw	3 Wo	8	1		
TIK	STL 1	1299600	9	0	10	0	0	7 Ajaw	3 Yax	9	1		
TIK	STL 31	1299600	9	0	10	0	0	7 Ajaw*	3 Yax*	9	1		
TNA	FRG 88									9	1		
TNA	MNT 161	1403572	9	14	18	14	12	5 Eb	10 Yaxkin	4	1		
Unprov.	TRN	1327969	9	4	8	14	9	*	*	1	1		
UAX	PLYCHR STR I	1044000	7	5	0	0	0	3 Ajaw*	18 K'ank'in	9	1		
UAX	STL 18	1267200	8	16	0	0	0	3 Ajaw	8 K'ank'in	9	1		
UAX	STL 22	1321200	9	3	10	0	0	1 Ajaw	8 Mak	9	3		
YAX	Berlin LTL	1406421	9	15	6	13	1	7 Imix	19 Sip	9	3		
YAX	LTL 21	1302884	9	0	19	2	4	2 K'an	2 Yax	8	1	confl	
YAX	LTL 26	X	9	14		13			13 Yaxkin		3		
YAX	LTL 29	1395970	9	13	17	12	10	8 Ox	13 Yax	7	3		+u
YAX	LTL 48	1328936	9	4	11	8	16	2 Kib	19 Pax	5	1		
YAX	STL 11	1411560	9	16	1	0	0	11 Ajaw	8 Sek	9	1		
YAX	STL 6	1184613	8	4	10	10	13	5 Ben	11 Ch'en	6	2		+u
YAX	STR 44	1385561	9	12	8	14	1	12 Imix	4 Pohp	2	3		

Table 2. Collected Data (STL = stela, PNL = panel, LTL = lintel, HRS = hiero. stair, MNT = monument; TBL = tablet; FRG = fragment; site codes per Graham and Mathews 1999).

Results and Analysis

Glyph F varies independently across all sites in this study. As seen in Table 2, F1 appears at each site in the database. This is illustrated in Figure 3, showing there were no sites which show a preference for one particular variant of Glyph F (excepting Quirigua, which only had a small sample size of two). A greater sample size would increase the robustness of this test. In this sample there is a slight chance this outcome was due to the vagaries of sampling, and there is only a moderate divergence from the expected values ($\chi^2 = 57.35$; $df = 44$; $p < .09$; Cramer's V = .51, where 0 is no deviation and 1 is complete deviation from expected values).

Glyph F variants appear to increase in number over time. Although dates ranged from the Old Era (12.10.0.0.0) through 9.17.0.0.0.0, as seen in Table 1, they were all likely written in the ninth baktun. F1 is the most popular variant throughout the Classic, but after 9.10.0.0.0 (the Late Classic), a wider variety of Glyph F variants are used. F1 is used in 92.3 percent of Early Classic inscriptions (before 9.10.0.0.0; n=12 of 13) but only 64.7 percent in the Late Classic (after 9.10.0.0.0; n=21 of 34). There is moderate chance these results were due to the vagaries of sampling, and results were not as divergent as they might seem in Figure 3 ($\chi^2 = 4.46$; $df = 4$; $p < .4$; Cramer's V = .31).

Although it appears glyphs G9 and F1 are strongly correlated, analysis showed there was no particular relationship between any Lord of the Night and Glyph F variant. The raw data show a large number of G9/F1 co-occurrences (38 percent), but this is due to the fact that G9 and F1 are the most common variants, comprising 50 and 68 percent of the sample respectively. When shown proportionally, in Figure 3, it is clear that F1 appears frequently with most Lords of the Night. A larger sample of non-G9 inscriptions is needed, but there is only a small chance that this outcome is due to the vagaries of sampling, and there is only a moderate divergence from the expected values ($\chi^2 = 57.51$; $df = 32$; $p < .01$; Cramer's V = .48).

Similarly, F1 appears to be the most commonly conflated variant, but this again was a result of its overall popularity. Although F1 is present in 71 percent of the conflations (n=12 of 17), it is present in 66 percent of the non-conflated (n=29 of 44) examples as well. This can be seen graphically in Figure 3, showing that any Glyph F variant is as likely to be conflated as its overall likelihood of being used at all. Unfortunately, a larger sample is needed, as there is a large enough chance that this outcome is due to the vagaries of sampling, but the results were close to the expected values ($\chi^2 = 3.84$; $df = 4$; $p < .5$; Cramer's V = .24).

Preliminary results suggest Palenque, Quirigua, and Copan had a higher proportion of conflation of Glyphs G and F. This is significant in that these three sites are well known for their artistic flair. On average, only 30 percent of inscriptions at any site are conflated, but Palenque, Quirigua, and Copan each had significantly higher percentages of conflation: 78, 67, and 50 percent, respectively. Even with a small sample size, there is a very low chance that these results are due to the vagaries of sampling, and there is a moderate to large

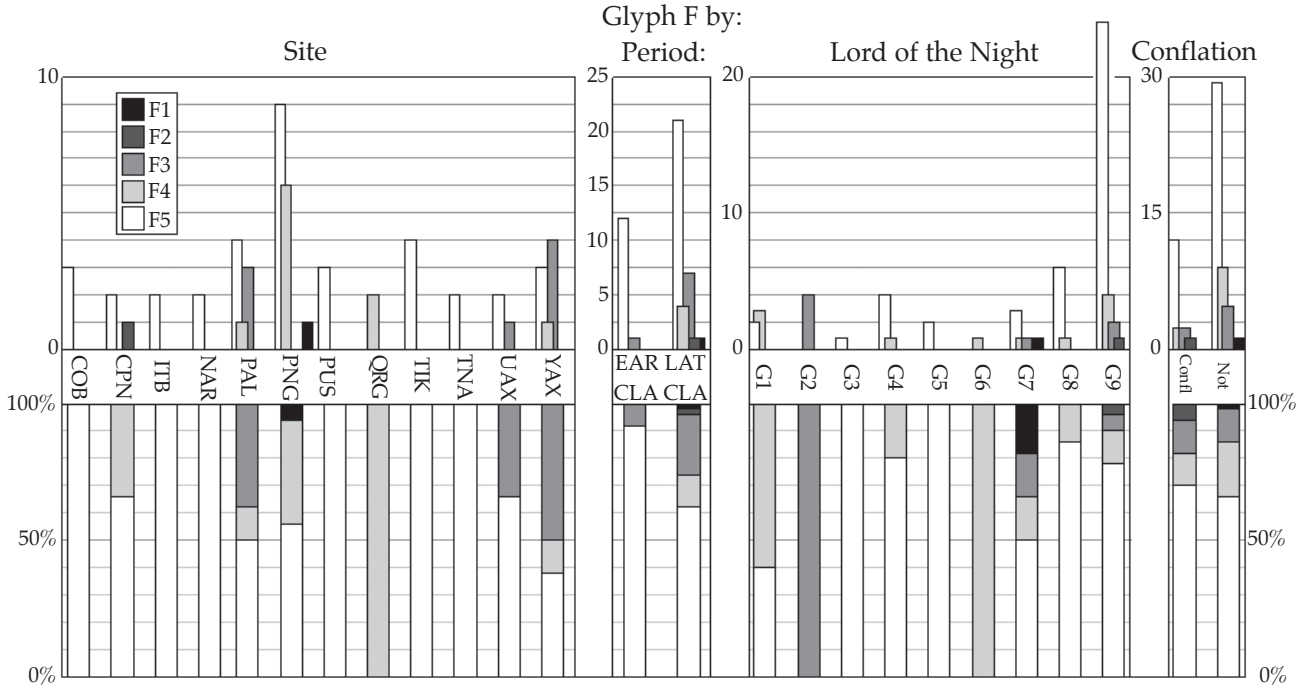

Figure 3. Graphs of observed frequencies and proportions of Glyph F variants.

G	F	Day Number	2 Day Cycle	3 Day Cycle	4 Day Cycle	5 Day Cycle	6 Day Cycle	7 Day Cycle	8 Day Cycle	9 Day Cycle
3	1	275466.00	0	0	2	1	0	2	2	3
8	1	275480.00	0	2	0	0	2	2	0	8
9	1	1044000.00	0	0	0	0	0	6	0	0
9	1	1267200.00	0	0	0	0	0	4	0	0
9	1	1296000.00	0	0	0	0	0	6	0	0
9	1	1299600.00	0	0	0	0	0	1	0	0
9	1	1299600.00	0	0	0	0	0	1	0	0
8	1	1302884.00	0	2	0	4	2	2	4	8
7*	1	1315982.00	0	2	2	2	2	3	6	2
9	1	1319004.00	0	0	0	4	0	1	4	0
8	1	1324692.00	0	0	0	2	0	5	4	0
1	1	1327969.00	1	1	1	4	1	6	1	1
5	1	1328936.00	0	2	0	1	2	0	0	5
9	1	1346400.00	0	0	0	0	0	6	0	0
9	1	1346400.00	0	0	0	0	0	6	0	0
9	1	1364400.00	0	0	0	0	0	2	0	0
9	1	1368000.00	0	0	0	0	0	4	0	0
1	1	1370269.00	1	1	1	4	1	5	5	1
7	1	1372300.00	0	1	0	0	4	6	4	7
9	1	1373400.00	0	0	0	0	0	0	0	0
5	1	1377401.00	1	2	1	1	5	4	1	5
7	1	1383136.00	0	1	0	1	4	6	0	7
4	1	1396800.00	0	0	0	0	0	6	0	0
9	1	1396800.00	0	0	0	0	0	6	0	0
9	1	1398600.00	0	0	0	0	0	0	0	0
9	1	1402200.00	0	0	0	0	0	2	0	0
4	1	1403572.00	0	1	0	2	4	2	4	4
9	1	1404000.00	0	0	0	0	0	3	0	0
9	1	1407600.00	0	0	0	0	0	5	0	0
9	1	1407600.00	0	0	0	0	0	5	0	0
8	1	1408940.00	0	2	0	0	2	1	4	8
8	1	1411200.00	0	0	0	0	0	0	0	0
9	1	1411560.00	0	0	0	0	0	3	0	0
4	1	1421653.00	1	1	1	3	1	2	5	4
9	1	1422000.00	0	0	0	0	0	6	0	0
9	1	1422000.00	0	0	0	0	0	6	0	0
8	1	1804760.00	0	2	0	0	2	6	0	8
8	2	824021.00	1	2	1	1	5	2	5	8
6	2	1184613.00	1	0	1	3	3	3	5	6
7	2	1379662.00	0	1	2	2	4	4	6	7
9	2	1404000.00	0	0	0	0	0	3	0	0
1	2	1408141.00	1	1	1	1	1	0	5	1
9	2	1414800.00	0	0	0	0	0	2	0	0
1	2	1800622.00	0	1	2	2	4	5	6	1
9	3	1321200.00	0	0	0	0	0	6	0	0
2	3	1373150.00	0	2	2	0	2	2	6	2
2	3	1373528.00	0	2	0	3	2	2	0	2
2	3	1373528.00	0	2	0	3	2	2	0	2
2	3	1385561.00	1	2	1	1	5	2	1	2
7	3	1395970.00	0	1	2	0	4	2	2	7
9	3	1406421.00	1	0	1	1	3	2	5	0
9	4	1405800.00	0	0	0	0	0	4	0	0
7	5	1383136.00	0	1	0	1	4	6	0	7

Table 3. Correlation of Glyphs G and F, Day Numbers, and cycles of 2-9 days; the numbers indicate the day-number's position in a cycle of the number of days at the head of the column.

differentiation between the expected and observed percentages ($\chi^2 = 25.34$; $df = 11$; $p < .01$; Cramer's V = .64).

The final analysis shows empirically that Glyph F variants are not part of a repeating cycle. Table 3 shows each Glyph F with a complete long count date, with its associated Glyph G, and day number (long count date converted to decimal system). In each of the nine columns to the right, the day number has been divided by the number of days in each cycle (from two to nine), and the remainder is displayed. If a cycle of Glyph F existed, the numbers in the corresponding cycle-length would

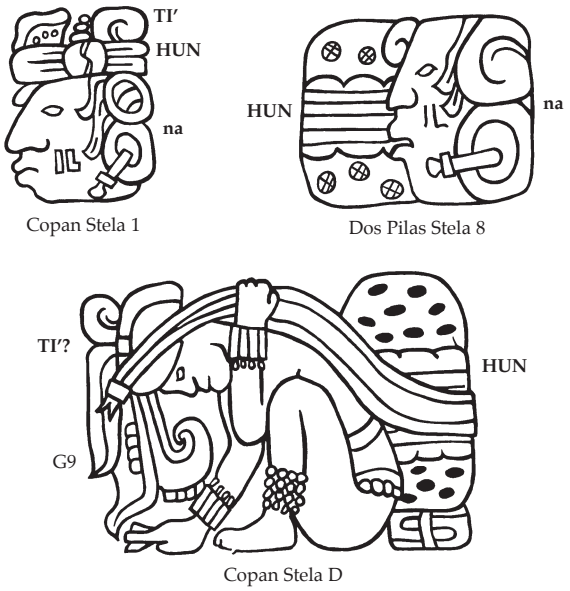

Figure 4. Atypical Glyph F variants (redrawn from Schele and Miller 1983:Figure 32).

appear contiguously in that column. Glyph G's cycle is born out by this, as the numbers in the "nine-day cycle" column match those in the Glyph G column. There is no cycle of Glyph F variants (less than nine days) even if there were more or less than the five variants I have defined. If there were less, and a cycle existed, a number of Glyph F variants would share an identical remainder. If there were more, a variant's section would have more than one remainder, but the all of those remainders would be within that variant. This is not the case, and there appears to be no cycle.

Another aspect of examination is whether or not the same day can be represented by different Glyph F variants. Of the seven pairs of recurring dates in my sample, five evince the same Glyph F variant, while two show different variants. One pair of mismatched Glyph Fs comes from Piedras Negras. Stelae 1 and 3 have the same date (9.12.2.0.16) but give F1 and F5 respectively. Another mismatch comes from two different sites. Itzimte's Stela 5 shows F1 for the same day (9.15.0.0.0) that Piedras Negras' Stela 11 gives F2. Of the five pairs of monuments which share a date and Glyph F variant, all are inscribed with F1, by far the most popular manifestation. Three of the matching pairs are from the same sites. Tikal Stelae 1 and 31, Pusilha Stelae P and O, and Piedras Negras Stelae 3 and 1 share dates and the F1 variant. Coba Stela 20 also matches Naranjo Stela 13 in date (9.17.10.0.0) and F Glyph (F1). Another pair of matching dates and Glyph F variants are Stela 2 at Itzimte and Piedras Negras Stela 10—interesting in that these two sites are also an example of mismatched F-variants described above. It should be noted, although it comes as no surprise, Glyph G was correct and matched for all of these examples. Although this is a small sample, it seems likely that there was no need to agree on the Glyph F variant in a long count. This further suggests that there was no underlying cycle or reason for the choice of Glyph F variant used in an inscription beyond scribal preference.

Implications of Analysis

Although no predictive patterns were found, there are a number of observations that can be made about Glyph F from these collected and analyzed data. First, Glyph F variants occur independent of the Long Count, Supplementary Series, and location. It does appear, though, that a greater variety of Glyph F variants were used after 9.10.0.0.0. The variants can be said to be completely interchangeable; just as the scribe has a choice between writing **ba-la-m(a)**, **BALAM**, or **BALAM-(ma)** to give the word *bahlam*. This suggests that the variation is purely orthographic, not a variable denoting a position in any cycle or count. Of course, this observation is not new, but this paper statistically demonstrates the free variation of Glyph F.

Second, the fact that Glyph F is a constant part of the calendar formula suggests it has a static reading for all of its occurrences. The full reading of Glyph F appears to be **TI' HUN-(na)** or **TI' hu-n(a)**, giving *ti' huun/hu'n*. There is no single agreed-upon gloss for this phrase in the topical literature.

The term *ti'* is attested as "mouth" in Ch'ol, Chontal, and Ch'orti' (Aulie and Aulie 1978; Hull 2005; Keller and Luciano 1997; K'ulb'il Yol Twitz Paxil 2001; Pérez González and de la Cruz 1998; Schumann 1973), as well as Tzotzil, Tzeltal, Tojolab'al, Q'anjob'al, Aketeko, and Yucatec (Zender 2004:Table 4, citing Barrera Vásquez et al. 1980:91, Bricker et al. 1998:68, Furbee-Losee 1976:397, Laughlin 1975:337, Lenkersdorf 1981:351, and Slocum et al. 1999:122). These entries seem to confirm the suggested gloss of "mouth" and "lips." The other meanings of "opening" and "edge" are semantically related to mouth and recorded in Ch'ol, Tzotzil, Tzeltal, Tojolab'al, and Yucatec (Zender 2004:Table 4, citing Barrera Vásquez et al. 1980:91, Bricker et al. 1998:68, Furbee-Losee 1976:397, Laughlin 1975:337, Lenkersdorf 1981:351, and Slocum et al. 1999:122). The lexeme *ti'* is also recorded as "to speak" in Tzotzil and Yucatec, as well as "language" in Ch'orti' (Zender 2004:Table 5, citing Heath de Zapata 1980:183-184, Laughlin 1975:337, and Wisdom 1950:672; see also Houston 2009). It is from this reading that the similar title *ti' sak huun/hu'n* is glossed as "speaker of the white headband."

Clearly *huun* or *hu'n* is suggested by the **hu-n(a)** or **HUN-(na)** reading of each variant. Glossed as "book," "paper," "headdress," or "bundle" it is likely that only one meaning is expressed in this formulaic context. **HUN** may be semantically related to, or an underspelling of, *huunal/hu'nal* that is, "headdress." This is thought to be the headband with which rulers are bound (Jackson and

Stuart 2001:222). The traditional "headdress" reading is mirrored in the royal title *sak huun/hu'n*, or "white crown" (Schele et al. 1990:4; Zender 2004:215). I have found no examples of a complete **HUN-na-la** or **hu-na-la** spelling. There are, however, three examples (Quirigua Stela K, Copan Stela I, and Dos Pilas Stela 8) which one might interpret as **TI'-HUN-NAL** (T128:60:1000a), giving *ti' hu'nal*, or "headdress;" illustrated in Figure 4. Although the T1000a glyph in these examples might represent an aspect of the Maize God (*nal* is glossed as "corn" but is not currently an accepted reading for this glyph), it more likely represents the syllable **na**, an allograph of the usual T23 subfix of Glyph F. The lack of a clear *huunal/hu'nal* example leads me to believe that "headdress" is not meant in Glyph F. Furthermore, although it could be argued that a bark paper headdress might be referred to as *huun/hu'n* because of the material, this must be more firmly demonstrated through iconography before it can be applied to an isolated **HUN** reading, especially one which is represented with the T609b/codex variant.

In another interpretation, Schele (1983:79, 90) suggests the central element is a sacred bundle or jaguar throne pillow, which is carried by the Lord of the Night as his *patan*, or "burden." Although *patan* would be complemented by the final **-na** syllable, the central element can now be read as **HUN** or **hu**. As Schele (1983:80) herself mentions, at the time of her writing, the syllabic sign we now read as **hu** (T740) was not yet understood.

In contrast to these views, I would suggest the reading of "book" is more likely, particularly in the presence of the T609b, F4 variant. This is a clear depiction of a jaguar-pelt-bound codex (the horizontal lines are pages of the codex, the jaguar pelt is the cover), not a cushion or bundle, as others have suggested (Schele 1983:79, 90; Thompson 1962:212). Furthermore, the word *huun/hu'n/hun* or some cognate thereof (usually *jun*) is glossed as "paper" in Ch'ol and Ch'orti' and even "book" in Chontal (Aulie and de Aulie 1978; Hull 2005; K'ulb'il Yol Twitz Paxil 2001; Keller and Luciano 1997; Pérez González and de la Cruz 1998; Schumann 1973). One possible problem with this argument, however, is that the "codex" variant does not appear until late in my examples. If the meaning of "book" were meant, the F4 variant might be expected to be the most commonly occurring variant early on. However, T609b is not attested in any context before the Late Classic, mitigating this problematic point.

The complete phrase has a number of suggested readings. The possible glosses described above suggest mouth/lips/opening/edge combined with book/headdress/bundle. In Thompson's (1962) *Maya Hieroglyphic Writing: Introduction*, he devotes less than one page to describing this glyph. He suggests that it stands to "explain or amplify the function of Glyph G" and that together they should be interpreted as "God G*n* is the Lord of the Night" but notes this is not a direct translation (Thompson 1962:212). He does make the important observation linking the "jaguar bundle" (T609b) and the "knotted element" (T60) in Glyph F, showing the rarer form is not a local variant but dispersed across the Maya area (Thompson 1962:212).

Linda Schele (1983:90) suggested the meaning "in office" or "in power," but her literal reading was *patan*, meaning "cargo" or "burden," discussed above. David Stuart (2005:196) has recently suggested the reading "is (at) the margin(?)," drawing on evidence such as Yucatec *u chi' hú'un*, "margin of the book" (Zender 2004:217-218, citing Barrera Vásquez et al. 1980:91, Heath de Zapata 1980:183) and Colonial Tzotzil *ti'il hun*, "book margin" (Laughlin 1988:1:313). But it is unclear exactly how this is to be meaningfully connected with Glyph G.

All of the suggested readings are somewhat problematic. Either the phrase does not make semantic sense in relation to the Lord of the Night, or it is not a close reading of the glyphs. There is a semantic relationship between "mouth" and "book," though, especially in a society of limited literacy. Books may have been read aloud and religious texts chanted. For instance, the similar phrase *ti' sak huun/hu'n* is glossed as "speaker of the white crown" (Schele et al. 1990:4; Zender 2004:215), but in this case *ti' huun/hu'n* might be read instead as "speaker of the book," or more literally, "mouth of the book."

This reading of *ti' huun/hu'n*, as "speaker of the book," makes semantic sense in relation with Glyph G, which is the "Lord of the Night" patron deity of that particular day. Glyph G and F might then be read *Gx ti' huun/hu'n*, or "Gx [is the] speaker of the book." Although "speaker" might be a liberal translation, the association of speech and mouth are clear. A similar connection between "mouth" and speech is described above, where *ti'* is attested as the verb "to speak" and "language." A reading of "Gx [is the] mouth of the book" or "Gx [is the] mouthpiece of the book" does not seem a stretch of the data. If the particular Lord of the Night is the patron for a day, it is not unlikely that he has a shamanic duty, which would involve the use of divinatory books. The interpretation of **HUN** alone as "paper" is equally possible, but with the presence of "mouth" and the T609b variant, the gloss of "book" makes more semantic sense.

Glyph F occasionally appears with an **u-** prefix, indicating possession or the third-person singular ergative pronoun. Out of my 64 examples, five are preceded by a possessive prefix, **u-**: Piedras Negras Lintel 3 (**u-TI'-HUN-(na)**, F2), Stela 3 (**u-TI'-HUN-(na)**, F1), and Stela 9 (**u-TI'-HUN-(na)**, F2), as well as Yaxchilan Lintel 29 (**u-TI'-hu-n(a)**, F3) and Stela 6 (**u-TI'-HUN-(na)**, F2). Furthermore, Copan's Stela D has a full-figure G9 carrying a large T609b codex on his back with a tumpline, drawn in Figure 4. This suggests again that

Glyph F is intimately associated with the current Lord of the Night. Interestingly, Mathews and Biro (2006, but see also Zender 2004:214) state that the possessed form of *ti' sak hu'n* is *u ti' hu'nil*; the *-il* is a common possessive suffix (Houston et al. 2001). This is not seen on any of the five possessed Glyph F examples above, but rather *u ti' huun/hu'n*. Although I do not wish to dwell on the *sak hu'n* title, it may be that the term "book" is meant here too; a book might need a speaker, but a crown might not. What is needed is a clear iconographic depiction of somebody with the *ti' sak huun/hu'n* title either with a book, or wearing a distinctive headdress.

Furthermore, as pointed out by Jackson and Stuart (2001:219), a possessed title between two nouns links them in a direct way. When Glyph F is preceded by **u-**, it suggests that the Lord of the Night is directly linked to the oral recitation of the book. This might suggest that the Lord of the Night is the reader of the book containing the lunar series calculations or other divinatory material; the Lord of the Night is the day keeper for that entire day and night. *Gx uti' huun/hu'n* might be translated as "Gx, [it is] his speaking of the book."

Another topic, on which these findings bear is the use of the knotted **HUN** glyph in the *aj k'uhun* title discussed in depth by Jackson and Stuart (2001). They discount Lacadena's (1993, cited in Jackson and Stuart 2001:221-222) reading of **a-k'u-HUN-na** as *ak'hun*, or "he who gives/bears paper" because the God C head does not have the value of **k'u** in any other context but rather **K'UH** or **K'UHUL** only. They also shy away from Houston and Grube's (cited in Jackson and Stuart 2001:221-223) reading of **AJ-K'UHUL-HUN-(na)**, or *aj k'uhul hu'n*, glossed as "he of the holy books/headbands/paper" for a number of reasons. First, "books" and the implied scribal aspects thereof are considered to be too narrow of a reading because of the variable meaning of **HUN** (or **HU'N** in the authors' orthography). Second, the fact that "the appearance of **HU'N** or -**HU'N-na** in the God C title is quite rare and generally late in date, falling in the last century of the Classic period" (Jackson and Stuart 2001:223; Zender 2004:215). In the data compiled for this paper, it can be clearly seen that T60/**HUN** was by far the most popular Glyph F variant from 9.0.0.0.0 (ca. 435 AD) through the end of the Classic (the last date in this database is 9.17.0.0.0, ca. 771 AD). Furthermore, in his discussion of the *ti' sakhuun/hu'n* title, which contains another **HUN** element (T522), Zender (2004:212) states that this title's morphology is "highly standardized and formally conservative," that is, largely unchanging over time in contrast to the "relatively chaotic spellings of the *ajk'uhuun*[/*aj k'uhun*]" title over time. Therefore, if the title were meant to be *aj k'uhul hu'n*, it is likely that the **HUN** element would have appeared more frequently and earlier. Jackson and Stuart (2001:224-226) gloss their reading of *aj k'uhun* as "one who keeps/guards/worships/venerates" on the back of similar meanings from modern Greater Tzeltalan languages.

Conclusion

Although it has been generally accepted that Glyph F in the Supplementary Series was a freely-varying, even optional component, this paper demonstrates this fact statistically. There is no correlation between any Glyph F variant and a specific site, its Glyph G counterpart, or tendency to conflation. It is likely, though, that Copan, Quirigua, and Palenque had a greater penchant for conflating Glyphs F and G than other sites, although a larger sample size is needed. Therefore, it can be concluded that Glyph F is a formulaic part of the Supplementary Series.

Although there have been many suggested readings for Glyph F and its relationship with Glyph G, they have been either divorced from glyphic readings or semantically unclear. I suggest that Glyph F describes the Lord of the Night as responsible for reading a divinatory codex. Glyphs G and F, reading **Gx TI'-HUN-na** or *Gx ti' huun/hu'n* may be translated as "X Lord of the Night is the mouth/speaker of the book," which possibly contains Lunar Series, astronomical, or divinatory information. Finally, the continuous use of the "knotted element" through the entire ninth baktun supports the argument for Jackson and Stuart's (2001) *aj k'uhun* reading.

Aknowledgments

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Morley's Diary, 1932

Editor's note

A leading archaeologist of his time, Sylvanus Griswold Morley was an Associate of the Carnegie Institution of Washington, the foremost organization excavating archaeological sites in Mexico, Guatemala, and Honduras in the early part of the twentieth century. This diary continues his account of the Carnegie Institution's expedition to Calakmul begun on April 3, 1932. Morley's professional companions were his wife Frances, Karl Rupert, John Bolles, and Gustav Stromsvic.

April 26 - Tuesday (cont.)

Chicle-blocks which had been loaded on to these three carts were removed and our own baggage divided into 3 parts loaded on in place.

We were to go on ahead mounted taking with us on our saddles, sleeping accoutrements, so that we could rest comfortably at Tanché until the carts caught up. Don Manuel said if we left at six we should be a Tanché by midnight, and from there we might be able – or might not – to catch the greatly to be desired truck.

Happily these plans, which would have involved a long and tiring night ride for us never materialized, for just at six, the long awaited truck was heard snorting in the distance. It was our old friend "The San Juan" which had brought us out and at the moment the only one of Francisco Buenfil's three trucks that would run.

I arranged with Don Manuel and the chauffeur that we would start back in it at once, i.e. after supper. Frances ordered a third meal from the nice Señora who had given us breakfast and luncheon and as soon as the truck was unloaded – corn was being brought in for the mules – a layer of chicle was stored on the bottom and then our baggage went aboard.

Again Gustav superintended loading, lashing boxes, kayaks, etc. down. Again sleeping space was reserved for us at the front – Frances, myself, Karl, John and Gustav – then Tarsisio and Arturo and lastly Demetrio with his Simonita. Frances achieved almost a mattress by building up blankets, three of them, on the chicle under us.

We bid goodbye to Don Manuel, to Carlos, the Belizano, and climbed aboard.

The chauffeurs were tinkering with a part to replace part of the steering apparatus if it broke, which seemed a not remote contingency in the light of recent experience, and everything was at last ready to start.

We pulled out of Rio Desempeño at 8:40, only 40 minutes after the boys said they would be ready, almost a record in our experience. It was hot and at first we did not use the single blanket Frances reserved to go over us. Undressing consisted in removing one's shoes.

In spite of the constant jarring and jolts we caught naps here and there and so the night advanced. Before midnight we caught up with the carts of chicle which had left El Rio at six and after fooling along behind them for a considerable time the road widened at a despecho or alternative road to avoid a mud-hole where we passed them. These carts are hauled by six mules each and make fairly good time, themselves.

We only bogged down once in the long akalche between Tumbo and El Rio, which had given us such trouble coming in, and this caused only a slight loss of time. And so bumping along, lurching along, and jolting along Tuesday passed into Wednesday.

April 27 - Wednesday

Sleeping was only fitful as the bumps were continuous though irregular and I was not sorry to reach Tanché sometime after midnight. We had a rather longish stop here while the truck was watered, oiled, and gasolined. I suspect the chauffeurs had a little coffee too as we heard laughing and chattering in a lighted hut nearby in spite of the graveyardness of the hour.

We got under way again and I think I must have slept more. I do not remember passing through the Maya village of Paso Hol. If the dogs barked they did not awaken me. Two of our boys at Calakmul, Lino and Rafael Paat come from this village.

Just beyond, i.e. this side now we crossed quite a hill, indeed a fair range, known locally as "El Cerro de la Paloma Blanca", "The Hill of the White Pigeon". This I do remember rumbling down, though afterward I fell asleep again.

When I awoke dawn was coloring the east and we were dashing along at a smart clip, perhaps 15 or even 18 miles an hour! We were in the flats just outside of La Gloria.

And here we nearly had trouble with the truck. The boys had forgotten to fill the extra water tin at the last place where water was to be had and in consequence we were blowing off steam at a great rate, the engine had lost half of its pulling power and indeed was beginning to pound. But La Gloria was actually round the next corner and an ayudante was sent ahead with the ever faithful gasoline tin to get some water.