

## **A PALEOGRAPHIC APPROACH TO POLITICAL CHANGE USING CLASSIC MAYA DAY SIGN VARIANTS**

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*“I have given a large number of variants of the day forms, so that it may be seen that great differences in form may occur in the day signs without altering their meaning...”*

(Charles P. Bowditch,  
In: *The Numeration, Calendar Systems  
and Astronomical Knowledge of the Mayas*, 1910: 11).

### **Abstract**

Since the early days of decipherment, scholars have recognized variation among the day names in Maya hieroglyphic writing. Representations of the twenty days have constant meaning, yet extensive temporal and spatial variation over almost two millennia. Variations in day signs, then, have the potential to illuminate the complex relationships and intellectual trends between and among elite groups of literate courts in the Classic Period Maya world (ca. AD 250-900). This paper reports the results of a study analyzing use patterns and details in day sign variants over time and space, and interpreting diachronic changes of essential graphic elements in relation to shifts in scribal knowledge. This study begins with the extensive corpus of Classic Period texts on securely dated monuments, isolates the names of the 20 days throughout, and analyzes the changes in the hieroglyphic representations of the day names. The proposal is that a paleographic approach to the details that either appear or disappear throughout the data will lead to the generation of new hypotheses about Classic Maya politics. Results from this data analysis show that subtle changes in the day signs allow access to local or regional trends previously unavailable through purely archaeological and epigraphic approaches.

### **Resumen**

Desde los primeros días del desciframiento, los académicos han reconocido la variación entre los nombres de los días en la escritura jeroglífica maya. Las representaciones de los veinte días tienen un significado constante, sin embargo, con gran variación temporal y espacial. Las variaciones en signos de los días, entonces, tienen el potencial para iluminar las complejas relaciones y tendencias intelectuales entre grupos de la élite en el mundo del Período Clásico Maya (ca. 250-900 dC). Este artículo reporta los resultados de un estudio que analiza los patrones de uso y detalles en las variantes de los signos de día en el tiempo y el espacio, e interpreta los cambios diacrónicos de los elementos gráficos esenciales en relación a los cambios en el conocimiento de escritores. Este estudio comienza con el extenso corpus de textos clásicos en los monumentos Período de fecha segura, aísla los nombres de los 20 días a lo largo, y analiza los cambios en las representaciones jeroglíficas de los nombres de los días. La propuesta es que un planteamiento paleográfico de los detalles que aparecen o desaparecen a lo largo de los datos hará la generación de nuevas hipótesis sobre la política clásica maya. Los resultados de este análisis muestran que los cambios sutiles en los signos de los días permiten el acceso a las tendencias locales y regionales que antes no estaban disponibles a través de enfoques puramente arqueológicos y epigráficos.

## INTRODUCTION

Since the early days of decipherment, scholars such as Charles Bowditch have recognized the “great differences in form” among the day names in Maya hieroglyphic writing, a system in use from the late, first millennium BC until a century or two after the Spanish conquest. Subsequent research, however, has either failed to address the meaning of these variations or attributed such differences to historical chance or shifts in media: for example, a sculpted form that might vary from its painted counterpart. Representations of the twenty days have constant meaning, yet extensive temporal and spatial variation over almost two millennia. Therefore the nature of the day signs is suggestive of socially conditioned use. Variations in day signs, then, have the potential to illuminate the complex relationships and intellectual trends between and among elite groups of literate courts in the Classic period Maya world (ca. AD 250-900).

This paper reports the results of a study analyzing use patterns and details in day sign variants over time and space, and interpreting diachronic changes of essential graphic elements in relation to shifts in scribal knowledge. This study begins with the extensive corpus of Classic period texts on securely dated monuments, isolates the names of the 20 days throughout, and analyzes the changes in the hieroglyphic representations of the day names. The proposal is that a paleographic approach to the details that either appear or disappear throughout the data will lead to the generation of new hypotheses about Classic Maya politics. Results from this data analysis show that subtle changes in the day signs allow access to local or regional trends previously unavailable through purely archaeological and epigraphic approaches.

## MAYA PALEOGRAPHY

Paleography is the study of ancient writing that operates on the premise that scripts are not random, but learned in a closely controlled setting, making innovation and transmission conditioned by social and political context. Paleography, used extensively in Classical, English, and Asian script traditions (e.g., E. Thompson 1912, Roberts 2005, Prajapati 2004), thus offers the advantage of being able to tease out information from the unconscious details revealed by the scribes as they depart from tradition. Because of the focus on the actual production and preservation of the script, independent of linguistic structure and use, paleography fits into a broader category known as “scientific connoisseurship,” including stylistic studies that have identified idiosyncratic habit among artists (see Wollheim 1974). Although these inquiries have historically concentrated on fields such as Italian artwork or Greek vase painting, various authors have attempted to identify different “hands” or styles in Mesoamerican works, such as the Dresden Codex or the monumental corpus of Palenque (Beazley 1911; Berenson 1902; Beyer 1932; Zimmerman 1956; Van Stone 2001). Several authors have also successfully addressed the social relevance of paleographic studies in Classical languages, such as Stanley Morison (1972: i). This project explores similar themes in the Classic Maya world that Morison explored in the Classical world: the influence of royal personalities, conquest, shifts in ritual beliefs, trade networks, foreigners, and other social phenomena on the development of script.

Others have addressed the historical development of the Maya script and used paleography to study the social trends represented by changes in hieroglyphic writing (Grube 1994; Lacadena 1995; Brewer 1998). For example, Alfonso Lacadena’s doctoral thesis is a guiding example of paleography of Maya hieroglyphic writing, and this study builds upon some of the proposed interpretations of his work, to be discussed later. On the whole, however, paleography in New World scripts is an uncharted field of research that has the potential to yield new information.

## MAYA DAY SIGNS

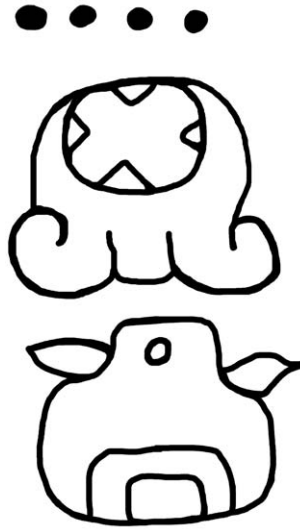
To approach the day sign data set, this study utilizes a method of analysis similar to that used by Gordon and Gordon (1957) in their landmark study of Latin inscriptions. They confined their data to dated monuments in order to notice subtle changes in the script over concrete time increments. As such, this study restricts its data to Classic inscriptions. The “Classic period” lasted roughly from the first Long Count inscription in the Maya lowlands on Tikal Stela 29 in AD 292, to the final monumental inscription in the lowlands in AD 909, on Tonina Monument 101. During this time, linguistic evidence supports the interpretation that one language of the Ch’olan lowland group, Ch’olti’an, dominates the hieroglyphic inscriptions (Houston *et al.* 2000). Because of the linguistic continuity, the Classic period day names are the most easily controlled set of data. Studied sculptures include provenanced examples; exceptions are restricted to panels with a known original location or likely candidate.

The study controls for medium by focusing on the collective body of glyphic knowledge related to monumental works, in carved or modeled stone, wood, and stucco, rather than ceramic painting, carving of portable objects, and paper text production. Carved texts have a different expressive capacity than painted examples, that is, most of them likely began as brushwork, but are the result of sustained contemplation and manual labor. The added dimension of calculated execution makes variations over time and space especially reflective of social processes, rather than individual idiosyncrasies.

The first day signs that appear in the Maya area during the Preclassic period (ca. 300 BC – AD 250) are at the highland sites of Izapa and Kaminaljuyu, as well as some painted signs at Lowland sites such as Uaxactun and San Bartolo, Guatemala. Some argue that these early signs often had the same iconographic characteristics of bloody, decapitated heads (Houston *et al.* 2006). Aside from a few exceptions, the peoples of the Maya area shared a similar 20-day calendar throughout the first millennium and beyond, in post-conquest documents and oral traditions (e.g. de Landa 1941: 134-135; Perez 1864 in Houston *et al.* eds, 2001: 368; Tedlock 1992).

During the Classic period, sculptors often recorded day signs without the Long Count, suggesting that the individual days were perhaps the most important markers of time to some Classic Maya rulers in some settings. Throughout the Classic period, Maya scribes and sculptors displayed a high degree of consistency with the structure of day signs in texts, allowing the reader to easily recognize dates. The day signs are contained within a circular container, or cartouche, supported by volutes and a central graphic element. Not unlike cartouches recording names in Egyptian hieroglyphic writing, the day sign cartouches in Maya writing allow the reader of the texts to easily recognize dates, when events occur, and the general structure of monumental texts. One important early, extended version of an *Ajaw* day sign recorded from Kaminaljuyu (Fig. 1; Kidder *et al.* 1946: fig. 44) may indicate that the cartouche actually carried phonetic and semantic value, with a **K’IN**, or “day” sign set in a cartouche, followed by the early *Ajaw* glyph (Stephen Houston, pers. comm. 2008). It is also significant to note that the month names are never depicted inside a cartouche.

The components of the cartouches and numeral coefficients of the day signs also vary greatly, perhaps reflecting local and regional traditions. Sometimes, cartouches lack the volutes and “pedestal” element, but this does not seem to be a systematic truncation, but rather to save space (e.g., Dos Pilas Hieroglyphic Stairway 4, Step I, C2). Recent compelling evidence suggests that day sign cartouches represent the bloody drippings of decapitation, as “time itself issues from a dismembered body” (Houston *et al.* 2006: 93). Obviously, this has important implications about the vitality and personality embodied within the day sign cartouches. A final aspect of day signs to note is their numeral coefficients, written in bar-and-dot notation that has a deep history in Mesoamerica. A systematic study of Classic Maya numbers also does not exist but could illuminate further concepts regarding timekeeping. A larger study of the visual details of the numbers, as well as the patterns of use, is necessary to elicit more



**Figure 1.** Early possible extended *Ajaw* day sign, Kaminaljuyu. Drawing by the author after Kidder, Jennings, and Shook 1946: fig. 44.

information about the highly widespread and codified counting system of the ancient Maya. However, this study is confined to the central element of each sign.

A guiding resource for approaching the central day sign element was the study by J. Eric S. Thompson of the names and meaning of the hieroglyphic day signs in *Maya Hieroglyphic Writing: an Introduction*, originally published in 1950 (Thompson 1971). His legacy, in the form of a visual catalogue and ethnographic description for each of the twenty days, serves until this day as a resource for epigraphers. Kaufman's (1989) study of Mesoamerican proto-day names also elaborated on the pan-Mesoamerican 20-day system and the meanings of each day. Recent ethnographic studies, including Tedlock's work among modern Quiché speakers (Tedlock 1992: 127), suggest that days have *one* name but *layers* of meanings, brought about by mnemonic devices and living "practice," including poetry and performance (Tedlock 1992: 107, 127). In other words, the day names for the Classic Maya might not have had a singular definition, but would have several indexical linkages borne out of performance and augury (Stross 1983: 215). Unfortunately, this ethnohistorical evidence is lacking for the Classic period, but one could imagine that the commemoration of dates and oral readings with day signs would involve similar ritual and performance (see Inomata 2006).

The nature of day sign knowledge is best understood by exploring how the Maya themselves characterized those who wrote (Houston *et al.* 2006; Stuart 1993). A glyphic compound exists that reads *u wojil* – "his/her/its glyph, sign." According to Stuart (1993: 323), "a term sometimes applied to both scribes and sculptors was *itz'aat*, 'artist, wise man' ... closely tied to, if not participating members of, the priestly and ruling elite." Few depictions of sculptors exist, but at several sites, one or multiple sculptors "sign" their work including at least 42 in the area of Piedras Negras alone. The data from a few sites indicate that one sculptor may have been the master of an atelier of sculptors, who worked for between 7 and 24 years, and could be dispatched to foreign cities in a supposed act of political cooperation; some even seem to be explicitly named as members of the royal family or even youths (Houston 2011). In light of the extant evidence of scribal activity, there are several ways to interpret changes in the style or content of day signs, including:



**Figure 2.** *Imix*, Mundo Perdido, Tikal. Drawing by the author after Laporte and Fialko 1995: fig. 34.

- Shared elements or isolated signs may indicate cooperative or conflicting groups;
- Widespread standardization or heterogeneity may suggest regional or supra-regional political interaction;
- Innovation may signal a change in the scribal community, such as an incursion of people or ideas from another center of learning.

Ideally, in the future, a region with many known scribes could provide a ground-up model for how script changes reflect activity of social actors in the transmission of glyphic knowledge. Paleography of other glyphic elements that are used more frequently would illuminate these micro-processes of scribes at one site and possibly trace changes to other sites or regions (e.g. Brewer 1998).

The data include 800 day signs from a variety of sources based on the main criteria of visibility (as eroded day signs do not show adequate detail), dating (for temporal analysis, secure dating is necessary), and media as mentioned above. The structure of the database enables easy analysis of disparate and similar features when sorted by temporal or spatial information. The database also avoids homogenizing processes that prior paleographic studies used, built upon the diachronic charts popularized by Proskouriakoff. By displaying the line drawing, or photograph when available, of each individual hieroglyph, the database allows future researchers to propose interpretations based on the original data rather than drawings made by the published author. Eventually, the data could be available online and allow collaboration through open access. Perhaps even the database of day signs can help create a working system of stylistic dating and regional placement for unprovenanced monuments or those that only contain day signs.

## ANALYSIS

The present sample includes a wide range of broadly representative examples for preliminary analysis in order to test the merits of a paleographic approach. A study of temporal distribution relies on the degree of preservation of earlier monuments, as many have been intentionally moved or destroyed (Martin 2000). Before 9.11.0.0.0, or AD 652, there are 168 examples (21%). This leaves 79% of the day signs from the Late Classic, the period after AD 652, or of indeterminate age. This may signal that more monuments were produced in the Late Classic, or simply that many Early Classic monuments did not survive or were reused. The date of AD 652 is widely held as a turning point in hieroglyphic

innovation and the greatest number of texts comes from the 8<sup>th</sup> century (Grube 1994: 184-186; Houston 2000: Table 1). The future challenges with the day sign database are to expand the number of signs and lines of inquiry to include patterns of the types of events recorded, particular dynastic activities, and sculptor identities.

In the current study, the most obvious pattern that emerges from the data is the frequency at which day signs appear in the monumental record. *Ajaw*, the last day in the sequence, appears most often because it corresponds to the end of other calendrical cycles and common Classic rituals such as the *tuun* setting events. Among the *Ajaw* day signs, the data also show that scribes and their elite patrons most often memorialized 1-year and 20-year cycles that were probably most salient in the life spans of rulers, rather than emphasizing the grander, longer cycles. Because *Ajaw* exists at a higher frequency than all the other days combined, it will provide the most significant patterns and suggest wider trends. The following discussion of variations will focus on the day names with most compelling examples of clear patterns of use and disuse in graphic elements. Although it is common practice to use Yukatek names, many of these glyphs resist precise decipherment in the Classic language.

To begin, *Imix* displays a high degree of consistency, with very few variants appearing across the Classic period. Many interpretations could possibly explain this phenomenon, the most likely of which is the use of the main sign of *Imix* as a very common syllabogram for “*ba*,” or, in cross-hatched form, a logogram for “**HA**,” “water.” The common use of this sign, which resembles imagery used to depict water lilies, may have engendered a familiarity among scribes that reduced copying error or artistic flourishes across the Classic period. The few *Imix* variants found on Classic monuments are related to the pan-Mesoamerican association of this day with crocodiles. The variant found at Piedras Negras, and possibly at Palenque and La Corona as well, shows the *Imix* main sign above a reptilian head. The reading of this crocodilian day sign as *Imix* receives further support from a listing of painted day signs from an Early Classic vase found at the Mundo Perdido Complex at Tikal, also showing a crocodile (Fig. 2; K5618; Laporte & Fialko 1995: fig. 34). This is perhaps due to creation myths and the association of the crocodile as the earth monster that extends back to the Preclassic period (Taube 1989: 2). In Central Mexico, the crocodilian aspects of this day (Nahuatl: *cipactli*) lasted into the Postclassic period. The prevalence of the “water” sign variant in the central Maya Lowlands does not indicate a loss of the crocodile association with *Imix*, rather, it underscores the complex symbolism of the first day as related to creation.

Other day signs incorporating glyphs used as syllabograms and logograms, especially *Ak’bal*, *Ik’*, *Hix*, and *Kaban*, also demonstrate remarkable consistency in representation over time. This suggests that a class of signs in wide use is less susceptible to changes over time among scribal communities. In other words, the image of the day sign was more likely to become standardized and widespread if the main element was used in other contexts. An interesting further study to enhance paleographic data for *Imix* and other day signs with glyphic counterparts would be to consider the changes over time in their corresponding syllabic and logographic signs.

The day sign *Ik’* represents a concept found often in Maya iconography, that of wind or breath. The most common representation of the second day is the T-shaped element as the main sign, less frequently shown as an element on the head of the wind god (e.g. Quirigua Zoomorph G). In the Late Classic, some *Ik’* days appear to have “caps,” for example Comalcalco Brick 3, but the lack of other examples in this sample prevents further interpretation. The day 9 *Ik’* became especially important at Palenque, serving as an important earthly and mythological day for foundation and accession to kingship (Stuart 2005: 183-185). These examples from Palenque provide an explicit example how certain day sign gained importance at a local dynastic level. Perhaps rulers even scheduled their accessions on a certain date in order to place themselves between broader, mythological cycles of time.



*Ak'bal* consists of the logogram “*ak'ab*,” or “darkness” as the main sign, with a high degree of standardization across the Classic Maya world. The variations lie in the degree of small details, but the main elements persist from the earliest to the latest examples. Consistency in such representations supports the hypothesis that day signs incorporating other signs, such as *Imix* and *Ik'*, in wide use are less susceptible to changes over time among scribal communities.

Thompson characterizes the day *K'an* as that of “the ripe grains of maize, symbol of the young maize god,” but notes that the Classic day sign is “too conventionalized to be any longer recognizable” (Thompson 1971: 75). Karl Taube (1985: 178) has suggested that the main sign of the fourth day is the logograph for “tamale” or “heart,” as found throughout the inscriptions and iconography. Kaufman (1989: 14) notes that the relationship between the Classic glyph and the lizard may be found in the association of green reptiles and green corn. A very late example of one of the simplest, least embellished *K'an* examples is found in the well-known Late Classic Altar Q at Copan.

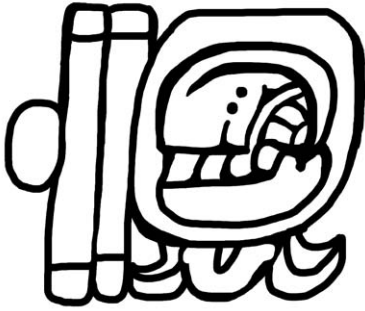
A suggestive pattern emerges with the variants of the fifth day, *Chikchan*, despite its scant representation in the sample. The head of a snake in profile most often composes the main sign of this day; however, the symbolic representation of two diagonal lines or rectangles could have linguistic implications, as noted by Houston (2008b) in the context of onomatopoeia. The two diagonal lines could be the syllabic sign for “*xa*,” signaling, in a form of metonymy, the Maya associating the sound or action of rattling with the day of the snake. The sites where this variant appears include Tonina, Yaxchilan, Itzan, Dos Pilas, Aguateca, and Machaquila – all in the western region of the Maya lowlands, with a possible (eroded) day sign at Copan. The distribution suggests that the innovation of this variant could possibly have originated in the western Maya lowlands of Chiapas, later spreading through the Pasión/Usulután drainages in a relatively short period of time.

*Kimi'* is a day that is consistently associated with death throughout Mesoamerica, both “fresh” death as meat, and “old” death as a skull (Kaufman 1989: 18). The paucity of *Kimi'* day signs in the inscriptions may signal its nature as a negative or malignant day, although *Kimi'* carried positive and negative qualities throughout colonial literature (Kaufman 1989: 18). Supporting ethnographic evidence demonstrates that many days have multiple, polyvalent properties in augury (Kaufman 1989; Tedlock 1992: 98-99). Although the representations of *Kimi'* throughout the Classic period are consistent with the image of a skull, the images later evolved into what has been called the “percent sign,” in a *pars pro toto* process. The percent sign is pervasive in iconography pertaining to death, and is especially prevalent in the day signs in Postclassic manuscripts.

Another example of a syllabic sign used for the main component of a day sign is *Manik'*, which contains the “*chi*” syllable in the form of a severed hand. The relationship of this day to the word “*chihj*” for “deer” or “*ajchihj*” for “hunter” suggests that this hand signal may be intimately linked with hunting, possibly even a system of gestures among hunters (Stephen Houston, pers. comm. 2008). The corresponding day for the Aztec calendar, *mazatl*, also deer, provides supporting comparative evidence for this reading.

The artistic presentation of the *Manik'* day highlights the three-dimensional quality of the Maya day signs, as the fingers are often shown behind one another; this view accords with how the viewer would see his or her own hand. Notably, very early versions of *Manik'* do not display this degree of three-dimensionality (e.g., Uaxactun frescoes), suggesting that this feature developed during the Early Classic period to become standardized in the Late Classic. One further element emerges at Tonina at the end of the 8<sup>th</sup> century: the inclusion of two circular elements in the center of the sign, found in Postclassic codices and even in Diego de Landa's manuscript.

*Lamat*, according to Thompson, represents the “sign for the planet Venus” (Thompson 1971: 77), and the main sign involves the sign ubiquitous in Maya representations of the sky as planet or star.



**Figure 3.** *Eb*, Tikal Stela 31, AD 450. Drawing by the author after Jones, Satterthwaite, and Coe 1982.



**Figure 4.** *Ajaw*, Tikal Temple IV Lintel 3, AD 746. Drawing by the author after Jones, Satterthwaite, and Coe 1982.

The relationship between the heavens and the pan-Mesoamerican rabbit day symbol is borne out in iconography related to fertility, the moon, and rabbits (see Schele & Miller 1986: 55). Kaufman (1989: 22) notes that the rabbit is also associated with ripe corn, and such agricultural fertility and productivity. *Lamat* plays a prominent role in certain sites, such as Naranjo, Guatemala and Yaxchilan, Mexico, whereas it is noticeably absent from other sites' inscriptions. This may signal the association of this day with certain celestial omens, for a star gushing water is the hieroglyph for the warfare event known as the "star war" (see Riese 1984; Lounsbury 1982; Martin 1996). At Naranjo, an important queen "arrives" on a *Lamat* day, which is suggestive of the relationship of females to the celestial iconography of this day sign (Martin & Grube 2008: 74).

*Muluk* appears perhaps as a stylized fish in profile, and in the Postclassic period as an inverted water vessel. These signs and the corresponding Aztec day name, *atl* or "water," support the broadly aquatic meaning of this day. An odd variant using the head of a pocket gopher emerges after AD 750, notably at Yaxchilan and Copan, and its substitution is still unclear in meaning. In ethnographic contexts, this day sign represents water in the earthly plane, rather than water as a storm and precipitation, as *Kawak* does (Kaufman 1989: 44).

The dog (*Ok*) and the monkey (*Chuwen*) are used sparingly as day names and often as elements in elite names or other syllabic or logographic signs. *Chuwen* may also be associated with artisan skill, as attested by its use in other contexts. The later *Ok* signs became abstract in the Postclassic, represented in *pars pro toto* by a stylized version of the tattered dog ear.

The day *Eb* is most famously associated with the "arrival of strangers" from Teotihuacan as recorded at Tikal and Uaxactun (Stuart 2000). The earliest versions of *Eb* consist of a skeletal jawbone, and over time it seems to shift to a more naturalistic representation of a skull with the curved and dotted element in the upper right (Fig. 3). This dotted element is unique to *Eb* and distinguishes it from *Kimi*, which also contains a skull as its main sign. Because of its correspondence to the day name *malinalli* meaning "grass" in the Aztec calendar, Thompson links the jawbone to the "malignant rain deity who sends the mists, dew, and damp weather and produces mildew in the crops," (Thompson 1971: 81). However, the link between grass and a jaw with teeth may lie in the similarity of human teeth to rows of kernels of maize, supported by the act of substitution of corn for teeth in events in the Quiché Maya *Popol Vuh* (e.g., Christenson 2007: 100).

Thompson (1971: 82) suggests that *Ben* was related to agricultural growth based on highland ethnographic evidence, and Kaufman (1989: 32) asserts that the day might have an association with



arrows made from reeds. An Early Classic *Ben* sign on Calakmul Stela 114 supports the agricultural interpretation of this day in the Classic period. It includes a curvilinear vegetal sign for the main element, which seems to have been eclipsed by the more abstract and rectilinear symbol after AD 450. Because of the lack of examples of early *Ben* signs, this day serves as a test case for future investigations into whether early forms of signs were completely abandoned in the Late Classic period.

*Hix* reliably consists of three circular elements, representing the eye and spotted pelt of a feline, corroborated by its use as a logographic sign and in iconography. The representations are remarkably standardized throughout the sample, and distinct from the logograph for “jaguar,” **BAHLAM**. A large percentage of the signs coming from Yaxchilan and Naranjo, and many explicit warfare events occur on *Hix* days. The consistency of the *pars pro toto* feline eye throughout time is likely because of its extensive use in other contexts, such as emblem glyphs.

Representing another example of the day sign symbolizing one of the most important fauna in the Maya area, *Men* consists of the head of an eagle. Ethnographic evidence indicates that this sign could represent a variety of raptors in general, and the Aztec *cuahitli* has a similar categorical use (Kaufman: 1989: 35-36). The sample is very small, but an innovative variant to note is an abstract version, possibly including an eagle eyeball, which appears on Dos Pilas Stela 8.

The 16<sup>th</sup> day begins a series of days related to the earth or earthy substances. *Kib* relates to beeswax in Yukatek (Kaufman 1989: 37), and sometimes contains the head of the Jaguar God of the Underworld as its main sign (e.g. Yaxchilan Hieroglyphic Stairway 5; Caracol Stela 3). *Kaban* contains the logograph for “earth,” **KAB**, which shows a curled element associated with a youthful goddess in the later Maya codices. The wider historical meaning of earthquake for *Kaban* may refer to the power of the movement of the earth, supported by the corresponding Aztec day *ollin* or “movement” (Kaufman 1989: 39). Although they only represent a small percentage of the sample, *Kib* and *Kaban* day signs show a wide distribution of very similar components over the whole Maya area. This pattern supports the hypothesis that a standardized image of the day sign became more widespread if the main element was used in other contexts.

*Etz'nab* presents another case for the complete discontinuity of an old sign and introduction of a new sign. *Etz'nab* represents flint as a sharpened blade, shown as an “X” motif drawn with wavy lines throughout the Classic period. Earlier forms from Tikal, Balakbal, and the painted frescoes at Uaxactun show a significant variation from the signs after AD 500. These signs seem to show a **TUUN**, “stone,” sign next to another element that resembles a jagged surface. Unfortunately, the sample is too small at present to speculate about the causes or chronology of the abandonment of this early form.

*Kawak* contains the logograph **TUUN** for “stone” or syllable for “ku,” with a similar image found across the small sample. Perhaps the association of stone glyphs with the Mesoamerican day meaning of storm or thunder stems from the idea that lightning and thunder sprang from axe-wielding deities Chahk and K'awiil, their blades made of stone (Garcia Barros 2008: 350; Taube 1992).

A stark dualism exists in the representations of *Ajaw*, the most frequently recorded day throughout this sample. One representation, present in the earliest manifestations of the day signs, consists of imagery largely associated with floral motifs, which can be compared to the Aztec day sign counterpart of *xochitl* or “flower” (Thompson 1971: 87; Kaufman 1989: 46). Among these *Ajaw* variants a clear distinction emerges during the 6<sup>th</sup> and 7<sup>th</sup> centuries, as the earlier version of *Ajaw* falls into disuse and instead becomes commonly conflated with a frontal view of a face. The simple frontal face becomes the only variant used in the Late and Terminal Classic period after AD 805 and survives into the Postclassic codices.

The other way that scribes presented *Ajaw* is through the profile image of a ruler or perhaps even the deity Hun Ajaw (1 Ajaw). Quite often the profile variants are used to commemorate K'atun or

half-K'atun endings, even when included in a text as a reference to the past. This trend may reflect the ability of the ruler to personify the *Ajaw* day in important period-ending rituals, epitomized by the full-figure portraits of rulers used at sites such as Machaquila, Copan, Itzimte, Quirigua, El Palma, and Arroyo de Piedra. Furthermore, scribes producing texts on the same monument, such as Quirigua Stela D and Copan Stela C, used differential profile and frontal variants to represent present time, past time, and even future time. In rare instances, the profile includes a vulture head, which is also known to be a logographic sign for the word **AJAW**.

A striking detail that emerged in the frontal face depictions of *Ajaw* occurred on several monuments from Tikal and Dos Pilas, as also noted by Lacadena (1995: 274-278). In the late 7<sup>th</sup> and early 8<sup>th</sup> century, scribes at both sites included a nasal element with what appears to be a ornament made of bone, as if pierced through the septum of the main "face" in the day sign (Fig. 4; "nariguera," nose-plug, Lacadena 1995: 274). This small innovation is significant because of the intimate yet hostile relationship that existed at this time between Tikal and Dos Pilas (Houston 1993; Martin & Grube 2008: 42; 57). Perhaps the innovation has its roots in the revival of Central Mexican imagery by Jasaw Chan K'awiil of Tikal, as noted by David Stuart (2000) and others. A Central Mexican vessel in the Arizona State Museum (A-22752) shows an example of the frontal face with a nose-plug, and a figure with a pierced nose. The act of piercing the nose is a main component of Mexican enthronement rituals from later time periods, such as in the Mixtec codices.

The day sign data related to the nose-plug *Ajaw* confirm the assertion that paleography can suggest patterns of interaction unavailable through epigraphic means, such as scribal knowledge passing from Dos Pilas to Tikal (Lacadena 1995: 277). The *Ajaw* day signs show that before AD 727, there was little sharing of scribal information between Tikal and Dos Pilas, likely because of their status as military and familial rivals. Evidence to support this claim includes the exclusive use of the nasal ornamentation at Tikal before this date, and the use of *Ajaw* profile variants at Dos Pilas during this period that do not appear at Tikal.

Perhaps the sharing of specific elements found only at the two sites signals that the royal families of the 8<sup>th</sup> century, previously geographically severed and competing, renewed amicable relations that are not reflected by the hieroglyphic or material record. Some have argued for reconciliation based on the mention of Itzamnaaj K'awiil's death, using the Dos Pilas toponym, at Tikal around 733 (Martin & Grube 2008: 59). Or, alternatively, the two sites remained enemies and scribes became captives in their political strategy, thus spreading the small details to monuments at the other site. Unfortunately, the signatures of the scribes at the two sites during this time do not exist.

Supporting evidence comes from the monuments at Naranjo during this time period, which represent the work of the daughter of *Bajlaj Chan Kawiil* whom he presumably dispatched to Naranjo in AD 682 (Martin & Grube 2008: 74). The monuments dedicated by her and her son show certain details common to Dos Pilas and Tikal in the frontal *Ajaw* sign. However, the monuments at Naranjo never adopt the details shared between Dos Pilas and Tikal, even after AD 726. This indicates that Naranjo perhaps did not share information during Ruler 3's reign at Dos Pilas, perhaps indicative of the weakening of the familial ties of the Naranjo dynasty to the Dos Pilas dynasty. Defeated by a decisive war event at the hands of Tikal in AD 744, perhaps Naranjo maintained an antagonistic relationship with Tikal, resulting in a lack of information sharing (Martin 1996). This sequence of events hints further at a friendly relationship developed between Tikal and Dos Pilas during this time, when contrasted with the isolation of Naranjo from the shared scribal knowledge.

## CONCLUSIONS

By uncovering processes hidden in changes of the script, the current paleographic study has generated new hypotheses about the shifting relationships between Classic Maya polities to be tested in future archaeological and epigraphic investigations. To conclude, the day sign data suggest the following interpretations:

- Day signs in wide use in other contexts are more likely to become widespread and thus less susceptible to changes over time among scribal communities.
- The use of some innovative variants may have had linguistic implications, as many scholars are beginning to note about innovative phonetic spellings of other glyphs.
- Scribal communities completely abandoned the use of the early forms of some signs after the Early Classic, which is suggestive of widespread shifts in glyphic knowledge.

Ultimately, by uncovering social processes hidden in minute differences of the script, inquiries of this type have the potential to augment the understanding of the Classic Maya political world.

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