

The ‘Month Signs’ in Diego de Landa’s *Relación de las cosas de Yucatán*

Harri Kettunen
University of Helsinki
harri.kettunen@helsinki.fi

Marc Zender
Tulane University
mzender@tulane.edu

The Maya hieroglyphs written on the pages of the manuscript titled Relación de las cosas de Yucatán are the latest known examples of Maya writing. Written in the second half of the 16th century, they illustrate both the continuity of a literary tradition by then almost two millennia old, as well as strikingly innovative conventions reflecting an underlying local language (Yukatekan) distinct from the Ch’olan language of the script’s early developers. The manuscript, ascribed to Diego de Landa, has been a source of numerous (mis)interpretations following its recovery in the 19th century. As a testimony to the collision of cultures and a stockpile of misunderstandings, the Maya ‘alphabet’ found on folio 45r has been labeled everything from a Spanish fabrication to a ‘Rosetta Stone’. Similarly, the often-unique spellings of the Maya month names on folios 34r-43v have occasionally led to raised eyebrows. But it now seems increasingly clear that, while the manuscript’s month spellings do diverge considerably from the traditional Ch’olan spellings of the southern Maya lowlands, they in fact seem to constitute a bridge between the original orthography of these months and their Colonial Yukatekan glosses. Specifically, it would seem that an unknown northern scribe appended phonetic signs indicating the local pronunciation of many of the more divergent names. In this article, we re-examine the ‘month signs’ of the manuscript based on recent developments in Maya decipherment and on new photographs of the original manuscript in the Real Academia de la Historia, Madrid.

Keywords: decipherment, epigraphy, diglossia, Relación, Landa



Discovered by Brasseur de Bourbourg in 1863, and published the following year in a partial French translation, there is arguably no manuscript more central to Maya studies than the *Relación de las cosas de Yucatán* (Brasseur de Bourbourg 1864; Landa 1566; Tozzer 1941). And yet, despite its importance and lengthy publication history, George Stuart (1988) points out that it has frequently been published with entirely inadequate illustrations. Because of this, it can come as a surprise to many Mayanists to learn that the manuscript contains no less than 497 hieroglyphic signs (Zender 2017:9). While most of these are single signs representing the 20 day names, at least 27 represent other logograms (forming parts of the month names) and some 65 are syllabograms. Of the latter, there are 40 graphemically distinct syllabograms representing 35 phonetically distinct syllables. Out of the 90 known syllabic values represented in Maya writing through its history, the *Relación's* 35 syllabograms comprise 39% of all known syllabic values. (Alternatively, given 21 consonant and 5 vowel phonemes in the Colonial Yucatec language, there should be 105 possible CV syllables, of which the manuscript provides 33%). The majority of



the manuscript's syllabic signs appear on folio 45r, including the famous 'abecedary', while the rest appear on folios 34r–43v, the 'calendar section'.

The manuscript's day names are relatively uniform: their outlines were drawn with a compass and internal details provided by hand. Although paleographically significant, these signs do not offer nearly as much epigraphic, linguistic, and cultural information as the month signs and the abecedary. Consequently, we focus on the month signs here and, for reasons of space, leave the abecedary for another study (Zender and Kettunen i.p.).

The manuscript's day names are relatively uniform: their outlines were drawn with a compass and internal details provided by hand. Although paleographically significant, these signs do not offer nearly as much epigraphic, linguistic, and cultural information as the month signs and the abecedary. Consequently, we focus on the month signs here and, for reasons of space, leave the abecedary for another study (Zender and Kettunen i.p.).

The Month Signs

This study builds on Kettunen's (2020) transillumination photographic study of the *Relación* manuscript to highlight hitherto unnoticed or poorly published details of its month names (Figure 1), and to suggest resolutions for several long-vexing mysteries therein. It also develops a recent argument made by Zender (2017:9-10) that close study of the often-unique month names of the *Relación* manuscript have not only been instrumental to past decipherments, but would also repay ongoing investigation. The manuscript includes all 18 Maya months (i.e., the twenty-day periods long termed 'months' in Maya studies), excepting only the 5-day Uayeb period. Of these, at least fifteen include syllabograms. The month signs are presented in Table 1 indicating: (1) the folio where the signs appear; (2) close-up photographs of the glyphs and associated Roman glosses; (3) transliteration of the glyphs; (4) gloss in the Latin alphabet; (5) the month name in Yucatec (including a modernized orthography, where known), and; (6) the month name (and its spelling variations) in Classic Mayan. We discuss each of the months in some detail below, drawing out the significant elements summarized in Table 1.

Pop

This month is written **po-po** [K'AN]JAL-wa on folio 39r, representing both the Yucatekan and Ch'olan names *Póop* and *K'anjalaw* ~ *K'anjalaab*, respectively. This diglossia has long been noted (e.g., Closs 1987:8-9; Fox and Justeson 1984:40; Lounsbury 1973:99-101) and is also present in the

39

días / meses



El primero dia de Popp que es el primero mes de los Yndios es en año nuevo, y entre ellos fiesta muy celebrada porque era general y de todos, y assi todo el pueblo junto bazian fiesta a todos los idolos, para celebrarla con mas solemnidad renouan la este dia todas las cosas de su servicio como platos, vasos, vauquillos, serillas, y la ropa vieja, y las mantillas en que ceñian los idolos, en buel tos. Vacian sus casas, y las vasuca

Pop y estos peltrecos viejos es bant lo fuera del pueblo al munda dar, y nadie ama q lo viese menester tocara a ello. Para esta fiesta comiençan ayunar y abstenerse de las mugeres los ss. y sacerdote, y la gente principal, y los que mas queiran por su deuocion, el tiempo antes que les parecia, ca algunos le comiençan tres meses antes, otros dos, otros como les parecia y ninguno menos de xiiii dias, y estos xiiii dias añadian a la abstiniencia de la muger no comer en los mangares, sal ni de su pi mientra que era tenido por grane penitencia entre ellos. En este tiempo elegian los oficiales obaes para ayudar al sacerdote, y el aparejaua muchas pelotillas de su encienso fresco en unas tablillas que para ello tenian los sacerdotes para q los abstinetes y ayunantes quemass en a los idolos. Los que estos ayunos comiençan no los ostan quebrantar porq ozeia les vendrian algun mal.

c	8		
d	9		
e	10		
f	11		
g	12		
h	13	Kan	
i	14	Cbicba	
j	15	Cimi	
k	16	Mamik	
l	17	Lamat	
m	18	Muluk	
n	19	Oc	
o	20	Cbuen	
p	21	Eb	
q	22	Ben	
r	23	Ix	
s	24	Men	
t	25	Cib	

Figure 1. Folio 39r of the *Relación de las cosas de Yucatán* (Manuscript B-68, 9-27-2, 5153, Real Academia de la Historia, Madrid). Transillumination photograph by Harri Kettunen.

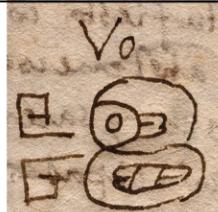
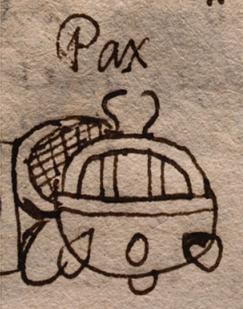
Folio:	Sign:	Transliteration:	Gloss:	Yucatec:	Classic Mayan:
39r		po-po [K'AN]JAL-wa	<Pop>	<Pop> <i>Póop</i>	<i>K'anjalaw ~</i> <i>K'anjalaab</i> [K'AN]JAL-wa [K'AN]JAL-wa- bu [K'AN]JAL-bu
39v		wo IHK'-AT	<Vo>	<Uo> <Wo>	<i>Ihk' At</i> IHK'-AT IHK'-AT-ta IHK'[AT]-ta wo-hi
40r		?-CHAK-AT	<Zip>	<Zip> <i>Sip</i>	<i>Chak At</i> CHAK-AT CHAK-AT-ta
40v		SOTZ'	<Tzoz>	<Zotz> <i>Sòotz'</i>	<i>Suutz'</i> SUUTZ'
41r		se-wa	<Tzec>	<Tzec> <Sek>	<i>Kaseew</i> ka-se-wa ka[se]-wa ka-se se-ka-wa (Dresden)

Table 1, Parts 1 and 2. The 'month signs' of the *Relación* (Manuscript B-68, 9-27-2, 5153, Real Academia de la Historia, Madrid): Pop – Yax. Photographs by Harri Kettunen.

42r		TZ'IK?-ni	<Xul>	<Xul> <i>Xul?</i>	<i>Tz'ikin</i> TZ'IK?-ni TZ'IK?-ki-ni tz'i-ki-ni (Chunchimay)
42v		YAX-K'IN-ni	<Yaxkin>	<Yaxkin> <i>Ya('a)k'iin</i>	<i>Yax'kin</i> YAX-K'IN-ni YAX-K'IN
43r		mo[lo]	<Mol>	<Mol> <Mol> (perhaps <i>Móol</i>)	<i>Mol ~ Moolool ~ Moloow</i> mo[lo] mo[lo]-la mo[lo]-wa
43v		i-ki-SIJOOM-ma	<chen>	<Chen> <i>Ch'e'en</i>	<i>Ihk' Sijoom</i> IHK'-SIJOOM-ma IHK'-SIJOOM [IHK']SIJOOM-ma
34r		YAX-SIJOOM?-ni	<Yax>	<Yax> <i>Ya?ax</i>	<i>Yax Sijoom</i> YAX-SIJOOM-ma ya-YAX-SIJOOM-ma (CHN T4L, L1) YAX-SIJOOM

34v		<p>SAK-ka? SIJOOM?</p>	<Zac>	<p><Zac> <i>Sak</i></p>	<p><i>Sak Sijoom</i> SAK-SIJOOM- ma SAK-ka- SIJOOM (NTN dr 82) SAK-SIJOOM SAK-si- SIJOOM (TAM HS 2) SAK-SIJOM-mo (IXK St 5)</p>
35r		<p>CHAK- SIJOOM?-ni</p>	<Ceh>	<p><Ceh> <i>Kéeh</i></p>	<p><i>Chak Sijoom</i> CHAK- SIJOOM-ma CHAK- SIJOOM</p>
35v		<p>ma-MAHK</p>	<Mac>	<p><Mac> <i>Máak</i></p>	<p><i>Mahk</i> ma-ka ma-MAHK ma-MAHK-ka</p>
36r		<p>K'IN-ni?- [K'AN]UUN-wa</p>	<Kankin>	<p><Kankin> <i>K'ank'iin</i></p>	<p><i>Uniw</i> UUN-wa UUN-wi UUN-ni-wa UUN</p>

Table 1, Parts 3 and 4. The 'month signs' of the *Relación* (Manuscript B-68, 9-27-2, 5153, Real Academia de la Historia, Madrid): Zac – Cumhu. Photographs by Harri Kettunen.

36v		MUWAAN(-ni?)	<Muan>	<Muan> <Muwan>	<i>Muwaan</i> MUWAAN MUWAAN-ni MUWAN-na mu-wa-ni (QRG and Dresden 46c)
37r		pa-?-PAAX	<Pax>	<Pax> <i>Pàax</i>	<i>Paax ~ Paxiil</i> PAAX? [PAAX]xi-la (pa)PAX-xa (Dresden) pa-xa (NTN)
37v		k'a-ba-[K'AN]a-wa	<Kaiab>	<Kayab> <K'ayab>	<i>K'anasiy</i> [K'AN]a-si-ya [K'AN]a-si [K'AN]a-wa (Dresden)
38r		ku-k'u/K'UH-BIX-OHL	<Cumhu>	<Cumku> <i>Kumk'u</i>	<i>Hul Ohl ~ Bix Ohl</i> HUL-OHL-la HUL-OHL BIX-OHL-la BIX-OHL

months *Uo*, *Zip?*, *Kankin*, *Kayab*, and *Cumku* in the Landa manuscript. The word *pohp* is a well-known term for ‘mat’ in Mayan languages, with various cultural connotations, including ‘authority’. Yucatec *póop* (Bricker et al. 1998:220) and Proto-Ch’olan **pohp* (Kaufman and Norman 1984: 129) are just two forms that attest to an original infix *h* in Proto-Mayan **pohp* (Kaufman 2003: 967). The term *K’anjalaw* ~ *K’anjalab* for the month name in Classic Mayan is more challenging. While *k’an* ‘yellow, pale’ and *jal-* ‘to weave’ are both well attested, the varying suffixes, although likely regional (see Lacadena and Wichmann 2002:311), remain of unclear significance, although the *-Vw* variant potentially has cognates in three other month names: *Kaseew* (*Zec*), *Moloow* (*Mol*), and *Uniiw* (*Kankin*).

Uo

As first recognized by David Stuart (1987b), this month is written **wo IHK’-AT?** on folio 39v, with the first sign signaling the Yucatekan name (glossed <Vo> in the *Relación*, <Uo> elsewhere), and the following elements providing Classic Mayan **IHK’-AT** (the final element must be either a compressed **AT** [T552] or a **ta** syllabogram [see Beliaev 2013]).

The meaning of either <Uo> or *Ihk’ At* is not clear. Regarding the former, Thompson (1950: 108) notes that:

“Uo is the Yucatecan name for a variety of small frogs which are almost black in color but with a yellow line down the spine. They are usually found in the ground [...] According to Maya legend they are the musicians of the Chacs, the rain gods, probably because the croaking of frogs announces rain. Nevertheless, I do not believe that the name of this month can have any connection with these small frogs [...]”

Potential Yucatekan sources for the sequence /wo/ include frog, dragon fruit, writing, letter, and the sound of running liquids. The colonial Motul dictionary (Ciudad Real 1577) includes all of the following:

- <Uo: pitahayas, y la mata que las lleva.> “dragon fruits, and the plant that carries them” (Ciudad Real 1577, I: 451r)
- <Uo: unas ranas de mucho unto y manteca. buenas de comer: dan gritos muy triftes.> “[Types of] frogs with a lot of grease and fat. Good to eat. Their cry sounds very sad.” (Ciudad Real 1577, I: 451r)
- <Uooh: caracter o letra.> “character or letter” (Ciudad Real 1577, I: 451r)

Additionally, Pérez (1877: 381, 382) includes:

- <uo> (wo?) “un animal pequeño á manera de rana, y de un canto mas alto y monótono que el de esta. Críase bajo las piedras en los lugares húmedos. | Rana, pitahaya (la mata). | Segundo mes del año indio; comenzaba 5 de Agosto.” (“A small animal like a frog, and with a higher and more monotonous song than this. Breeds under stones in damp places. Frog, dragon fruit (the plant). Second month of the Indian year; it started on August 5th.”)
- <uoh> (*woh*) “el murmullo del agua; el ruido que hace al caer. [...]” (“The murmur of the water; the noise it makes when it falls.”)
- <uooh> (*wooh*) “bullir los insectos. | Ruido de cualquier líquido al caer o derramarse y tambien se aplica al [ruido] de los granos. | Letra. | Escribir.” (“Rustling of insects. Sound of any liquid falling or spilling; also applies to the [sound] of grains. Letter. To write.”)

An important late ninth century context for *Wo()* appears at Chichen Itza (Figure 2) where the following date is written not less than five times in the Monjas Lintels:

8-‘Manik’ u **K’IN-ni tu 5-10-na IHK’-[AT]ta wo-i**
waxak ‘Manik’ uk’in tuho’lajun ihk’at wo’i()
 “The day 8 Deer, on the 15th of Ihk’ At, which is *Wo()*”
 (5th Feb, AD 880)

Zender (2017, 2021) has noted that these texts include precisely the same diglossic relationship between Yukatekan and Ch’olan month names which continues into the late-16th century *Relación*. Thus, minimally, northern and southern names for this month have been distinct for at least eight centuries.

This might help to explain the otherwise unique **wo-hi** spelling on a Late Classic codex-style vase (Figure 3:M4), first noted by Simon Martin (1997:854; 2017). Although this might seem to provide some evidence for a Yukatekan affiliation, other spellings on the same vase—such as [K’AN] **JAL-bu** (at B1, I4b, and L1b), **UUN-wa** (at G2b), and **ka-se-wa** (at I5b)—reflect a Ch’olan or even Western Ch’olan affiliation (Lacadena and Wichmann 2002). In light of this, it may simply be the case that *Wooh* was an alternative, northern designation for the month; one that we identify as ‘Yukatekan’ merely because it survived to be recorded in Colonial Yucatec sources.

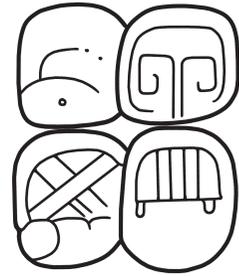


Figure 2. Late 9th century bilingual spelling of *Ihk’ At / Wo()*. Monjas Lintel 4 (underside): A4, Chichen Itza. Redrawn by Harri Kettunen after a drawing by Ian Graham.

Zip

The next month appears on folio 40r as (?-)**CHAK-AT**, where the element prefixed to the left of **CHAK** is unclear. It might have been another phonetic complement or parallel spelling providing the Yukatekan month name; alternatively, it may merely have been an unrelated marking made by the 16th century copyist.

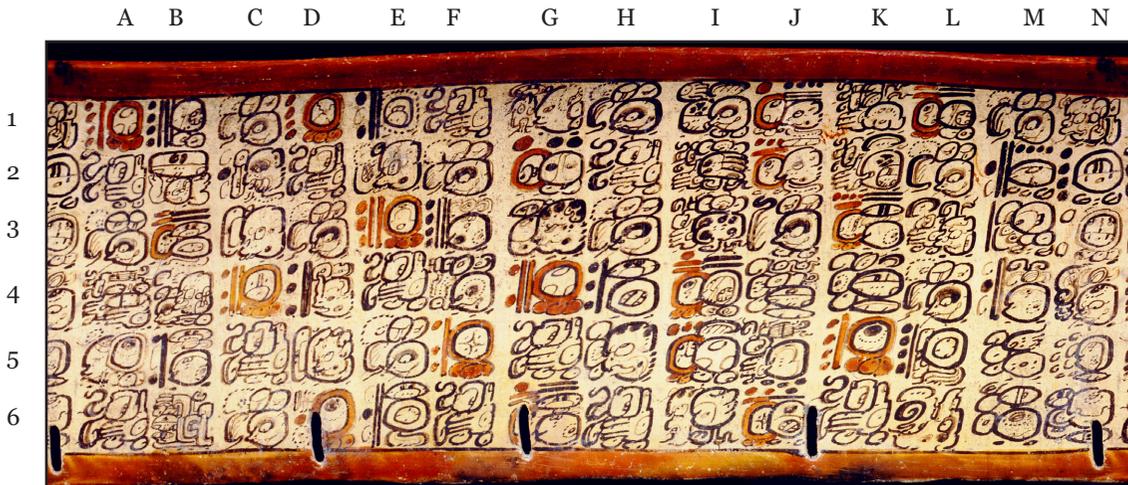


Figure 3. Late Classic codex-style vase (K6751). Rollout photograph by Justin Kerr.

The Ch'olan name *Chak At* 'Red At' follows the pattern of the previous month (i.e., *Ihk' At* 'Black At'). The meaning of the substantive, *At*, remains unclear. However, worth mentioning is that there is a dance at Yaxchilan (Lintels 6 and 43) where *chak at* appears to refer to an object held by the king (Alexandre Tokovinine, pers. comm. 2021). This pattern of 'color' months is also present in the month names Chen, Yax, Zac, and Ceh discussed below. The Yucatekan name *Zip*, however, has evident associations with hunting (Edmonson 1986:32, 34; 1988: 248; Tozzer 1941:155, Note 781). Landa (1666:Folio 41r) notes that during the month of *Zip*, hunters carried out rituals to the gods of the hunt:

<El dia ^ de a delante se juntavan los caçadores en una casa de uno de ellos, y llevando consigo sus mugeres como los demas venian los sacerdotes y echav̄ el demonio como solian. Echado ponian en medio el adereço para el sacrificio, de encienso, y fuego nuevo, y el betún azul. Y con su devocion invocavan los caçadores a los dioses de la caça: Acanum Zuhuyzipi tabai, y otros y repartian les el encienso, el qual echavan en el brasero, y entanto que ardia sacava cada uno flecha, y una calabera de venado, las quales los chaces untavan con el betun azul, y untadas vailavan con ellas en las manos unos [...] >

“The next day the hunters gathered in one of their houses bringing with them their wives like the others, the priests came and cast out the demons like they used to. This done, they put in the middle the adornments for the sacrifice of incense, the new fire, and blue pigment. The hunters with their devotion invoked the gods of the hunt, *Acanum*, *Zuhuyzipitabai*, and others, and they distributed the incense, which they each threw into the brazier. While it burned, each one took out an arrow and a deer skull, which the *Chacs* smeared with the blue pigment. Anointed, they danced with them in their hands [...] (Transliteration and translation by Harri Kettunen and John Chuchiak, 2021).

In addition to the hunt deity cited by Landa, Redfield and Villa (1962:117-118) note the belief that “deer are guarded by certain supernatural beings called *zip* ... [who] look like deer, having their bodies, their horns and their hoofs; only they are small, about the size of a dog”. Although of uncertain etymology, one of us has noted the likely derivation of Yucatec *sip* from Proto-Mayan **xib* ‘male; stag’ with some irregular phonetic and semantic influence from Proto-Mayan **siip* ‘tick’ (Zender 2016; see also Looper 2019:211, Note 6). It seems likely, in any case, that the Yucatec name of this month ultimately derives from its association with the hunt.

Zodz

As usual, the next month (folio 40v) is written with a logogram representing a bat's head. Glossed <Tzoz> in the manuscript, this apparently cues Yucatec *sòotz'* 'bat,' contrasting with Ch'olan *suutz'*. The gloss is unique and peculiar, being written <Tzoz> rather than the expected <Zotz> ~ <Zodz>. This might perhaps be explained by damage, the folio around the sign showing clear signs of repair (see Kettunen 2020:68, Figure 7 for a transillumination image of the damaged section of the folio).



Figure 4. Variant spellings of the month Zec in the Dresden Codex: (a) 7-**se-ka-wa**, Dresden 62; (b) 19-**se-ka**, Dresden 46; (c) **CHUM-se-ka**, Dresden 50; (d) 15-**se-ka**, Dresden 50. Photographs courtesy of Sächsische Landesbibliothek, Staats- und Universitätsbibliothek, Dresden, digital.slub-dresden.de.

Zec

The next month is written **se-wa** and glossed <Tzec> (folio 41r). The traditional Ch’olan name of the month is *Kaseew*, usually written **ka-se-wa**. The more common Colonial Yucatec name <Zec> suggests a reason for the omission of **ka** here, since the glyph would then have the benefit of beginning with the same sound as the local name. This might also explain the spellings **se-ka-wa** (Figure 4a) and (more commonly) **se-ka** (Figure 4b–d) in the Dresden Codex, which also reflect some reorganization evidently prioritizing the Yukatekan pronunciation. Unfortunately, neither *sek* nor *kaseew* are presently explicable. That said, *Kaseew* evidently refers to a type of a palm tree in the Poqomchi’ calendar (Termer 1930: 395), and it’s also possible that the final -VVw of *Kaseew* has some connection with a similar suffix in the months *K’anjalaw* (Pop), *Moloow* (Mol), and *Uniiw* (Kankin).

Xul

This month is written with the T758v mammalian head **TZ’IK?** and a **ni** syllabogram (folio 42r). On the Chunchimay 2 capstone (Figure 5), we have a clear phonetic spelling of this month name as **tz’i-ki-ni**, and this is further supported by Yaxchilan Altar 1 (L4), where the T758v animal head takes the complements **-ki-ni**. *Tz’ikin* is a widespread term for ‘bird’, but the motivation for the mammal head logogram, as first noted by Lamb (2002:17-18), may relate to the pre-Ch’ol root **tz’ik* ‘animal’ proposed by Attinasi (1973:349). In the Q’eqchi’ calendar, the month name is *Chichin* (Thompson 1932: 449-450) and in Poqomchi’ *Tzikin-kij* (Termer 1930: 394-395).



Figure 5. Detail of Chunchimay 2 capstone, Campeche, showing the Calendar Round 9-KAB-ba tu 9-tz’i-ki-ni, *bolon kab tu bolon tz’ikin*, “9 Caban on the 9th of Xul” (after Benavides and Novelo 2009:230, Figure 4). Drawing by Marc Zender.

Yaxkin

Written **YAX-K'IN-ni** (folio 42v), this spelling adequately reflects both Yucatekan and Ch'olan. The first element derives from Proto-Mayan **ra'x* 'green-blue; unripe, raw; new, first' (Kaufman 2003:225-228; 2017:89), and the second from Proto-Mayan **q'iiŋ* 'sun; day, time; festival' (Kaufman 2003: 461-463; 2017: 96). Thompson (1950: 110) offers no less than four translations for the name of the month: “new sun,” “green sun,” “first sun,” and “dry season,” while Tozzer (1941: 159, footnote 818) has “new sun,” “new day,” and “first day.” Ultimately, an original seasonal association seems likely, albeit probably altered by the drift of the seasons against this calendar over time (see also Lamb 2002, 2017).

Mol

Most Classic texts spell this month **mo[lo]**, just as we see on folio 43r, though a few settings include the additional suffixes -VVl, -VVm, or -VVw (Lamb 2002:18). Landa (folios 42v-43r) notes that during the month of *Yaxkin*, preparations were made for festivities held in *Mol*, providing a good clue to the meaning of the month name:

<En este mes de Yaxkin se comencavan a aparejar como solian para una fiesta q̄ hazia general en Mol en el dia q̄ señalava el sacerdote, a todos Los dioses. llamavanla Olob-Zab· Kamyax. Lo q̄ despues juntos en el templo, y hechas las ceremonias y saumerios que en las passadas hazian precendian era untar con el betun azul que hazian todos los instrumentos de todos los oficios desde el sacerdote hasta los husos de la mugeres y los postes de sus casas. Para esta fiesta juntavan todos los niños y niñas del pueblo, y en lugar de enbadurnamientos, y ceremonias les davan en las conjunturas de las manos por la parte de fuera cada nueve golpezillos, y las niñas se las dava una viejas vestida de un habito de plumas que las traia alli y por esto la llamavan Ixmol que quiere dezir la allegadera [...] >

“In this month of *Yaxkin*, they began to prepare, as was their custom, for a festival that was usually held in *Mol*, on the day that the priest indicated, to all the gods. They called it *Olob-Zab Kamyax*. After getting together in the temple, and after the ceremonies and burning of incense, which they had done in the past [ceremonies], their intention was to anoint with blue pigment, which they had made, all the instruments of all the trades from the priest to the spindles of the women and the posts of their houses. For this festival, they gathered all the boys and girls of the town, and instead of smearing and ceremonies, they knocked them on the joints of the back of their hands nine times; and to the girls, these were given by an old woman dressed in a costume of feathers, who brought them there, and that is why they called her *Ixmol*, which means the gatherer [...]”

The term *mol*- ‘gather’ can be traced all the way back to Proto-Mayan **mol*- ‘to gather, pick up, stash’ (Kaufman 2003:170-171; see also Proto-Ch'olan **mol*- ‘to gather into a pile’ [Kaufman

and Norman 1984:126] and Ch’olti’ <molo> ‘congregar / congregate, bring together’ [Moran 1695:97]). Further, given the Ch’ol term *mol* ‘*tornamil(pa)*, i.e., the winter maize crop’ (Aulie and Aulie 2009:59), an original harvest season association seems likely.

Chen

This is the first in the series of four so-called ‘color months’, written **i-ki-T528-ma** on folio 37v. The traditional Ch’olan name was **IHK’-SIJOOM(-ma)**, *Ihk’ Sijoom*, ‘Black *Sijoom*’. A **SIJOOM** reading for the polyvalent T528 was first proposed by David Stuart in the early 1980s (see Fox and Justeson 1984:52, Note 30), and although there are no complete phonetic substitutions in the context of a month name, the sign frequently takes **-ma** and (at least once) **-mo**, and Christian Prager (2014) has noted an initial **si-** phonetic complement on Tamarindito HS 2. Additionally, although no proof of the reading of T528, the nominal sequence **si-[jo]mo** attested on K6395 at least indicates that *sijom* was an extant Late Classic lexical item (quite likely part of a theophoric name involving rain deities, as noticed by Yuriy Polyukhovych and Alexandre Tokovinine [pers. comm. 2021]). In light of these patterns, we may be considerably encouraged by La Farge’s (1947:168) observation, referencing work by Antonio Juarez, that the Q’anjobal calendar includes the month names <Khek Sihom>, <Yax Sihom>, <Sah Sihom>, and <Khak Sihom>.

One potentially relevant term, referring to *Sapindus saponaria* (English soapberry, Spanish *jaboncillo*), is widely attested in relevant languages, including: Ch’olti’ <zionte> (Moran 1695:116, 131); Ch’ol *sijonte*’ (Aulie and Aulie 2009:213); Chuj *sijum te*’ ‘*Sapindus saponaria*’ (Hopkins 2012:293); Lacandon *sijoom* ‘soaproot’ (Hofling 2014:309); and Mopan *sijom* ‘wild soap tree’ (Hofling 2011:385). Mopan also has (*aj*)*säk sijom* ‘amole blanco’ and (*aj*)*chäk sijom* ‘amole rojo’ (Hofling 2011:508) pointing towards a possible vestige of the Classic Mayan names of these months. Probably more relevant, however, is the Ch’ol term *sijom* ‘*tornamil(pa)*, i.e., the winter maize crop’ (Aulie and Aulie 1978:105), a synonym of *mol* (i.e., of the previous month), considerably reinforcing an original harvest association for *Mol* and the following four ‘color months’, a 100-day period closely approximating a typical ‘season’, as first noted by Fox and Justeson (1984:52, Note 30; see also Lamb 2002, 2017).

The *Relación* spelling is particularly interesting for its rendering of Ch’olan *ihk*’ ‘black’ as **i-ki**, with an unglottalized *k*. The Yucatec cognate is of course *éek*’, and it may be that the Yucatec speaker/scribe did not understand the first syllable as meaning ‘black’. This might also explain



Figure 6. Variant spellings of the month Chen in the Dresden Codex, pp.47 and 48. Drawings by Harri Kettunen.

why he did not employ the logogram for the color, as he did in each of the following three months. An important clue to the puzzle comes from the Dresden Codex, where all of the Chen months are written with infixed **IHK** ‘black’ (Figure 6; cf. Figure 3:F3), while the rest of the ‘color months’ are written with prefixes. The conventional conflation may have facilitated future scribal confusion. However, worth noticing is that in Ch’orti’ black has an unglottalized *k*. Consequently, as Alexandre Tokovinine points out (pers. comm. 2021), this **i-ki** spelling may in fact reflect a vernacular pronunciation of the term for ‘black’ in some Ch’olan languages or dialects during the Post-Classic. Furthermore, another point of departure is the phonetic complementation of T528 with a **ma** syllabogram; although this mirrors its Classic Mayan form, the following three months all complement T528 with **ni** or not at all.

The Yucatecan name of this month, *Chen*, has no apparent connection to its Ch’olan counterpart. In Yucatec, *ch’e’en* means ‘well’ (Bricker et al. 1998:82). The latter also has a wider semantic range in other Mayan languages, including caves and any cavernous formations in the landscape. The rationale of this name is, however, far from being transparent.

Yax

As noted above, this month is written **YAX-T528-ni** on folio 34r, with a **YAX** prefix meaning ‘green-blue; unripe, raw; new, first’. The complementation with **-ni** almost suggests that T528 **SIJOOM** here behaves like its own homograph, **TUUN** ‘stone’. It is tempting to suggest a local unfamiliarity with Ch’olan *sijoom*, but if so the aforementioned **i-ki-SIJOOM?-ma** lacks a good explanation. Nonetheless, the fact that T528 in both *Yax* and *Ceh* is complemented with **-ni** signals some departure from the traditional spelling practices of the south. Perhaps the frequent use of **-ni** on T528 **TUUN** was so habituating that its presence was compelled here, as a kind of ‘fossilized’ spelling.

Zac

In keeping with the other color months, Zac is written as **SAK-SIJOOM?** or ‘White Sijoom?’ on folio 34v (cf. Ch’ol *säk* ‘white’, Ch’orti’ *saksak* ‘white,’ etc., from Proto-Mayan **saq* [Kaufman 2017:89] for the meaning of the prefix). Intriguingly, the final sign receives no complement here, leaving it open to question whether the **SIJOOM?** was truly intended to have that value, particularly given its variable complementation in **-ma** and **-ni** noted above. Worth noticing in this connection is the spelling of the month as **SAK-T528-ka** at Naj Tunich (Drawing 82), potentially indicating that at least one eighth-century scribe pronounced the month name as *Sak* instead of *Sak Sijoom* (Alexandre Tokovinine, pers. comm. 2021).

Ceh

The month *Ceh* is written as **CHAK-SIJOOM?-ni** or ‘Red Sijoom?’ on folio 35r (cf. Ch’ol *chäk* ‘red’, Ch’orti’ *chakchak* ‘red’, etc., from pM **kaq* [Kaufman 2017:89]). The Yucatec name does not

mean ‘red’ but rather ‘deer’ (i.e., Yucatec *kéeh*), and the connection remains as difficult to explain as the substitution of earlier *Ihk’ Sijoom* for *Ch’e’en* ‘cave’, discussed above.

In summary, the four ‘color months’—*Chen*, *Yax*, *Zac*, and *Ceh*—have undergone considerable changes since their Classic Ch’olan origins as *Ihk’ Sijoom*, *Yax Sijoom*, *Sak Sijoom*, and *Chak Sijoom*, inclusive of the loss of a chromatic significance for two of the periods, and of the unifying *sijoom* ending (at least in pronunciation). Visually speaking, however, the retention of the stony **SIJOOM** sign in all four cases speaks to the weight of ancient tradition.

Mac

Written **ma-MAHK** on folio 35v, this is one of the most stable month names across both the languages and the calendrical traditions (Thompson 1950:106, 113). The term has the general meaning of ‘covering’ or ‘enclosure’ in several Mayan languages (Zender 2006). Thompson (1950:113) has suggested that it “may refer the fact that with the end of Mac 260 days of the year have been counted, and that ... [it] was regarded as a sort of compartment within the year.” However, other possibilities for the origin of this month name ought to be considered.

Kankin

The spelling of this month on folio 36r is graphemically the most complex of all the month signs in the manuscript. The compound on the lower right seems to correspond to the traditional Ch’olan name, *Uniiw*, composed of a logogram **UUN** with the suffix **wa**. However, the right half of **UUN** is uniquely infixed with **K’AN**, which apparently collaborates with the overlarge **K’IN** sign to the right, perhaps with a hint of a **ni** phonetic complement to lower left. Consequently, we appear to have both Yucatekan *K’ank’in* and Ch’olan *Uniiw*. The former is composed of terms for ‘yellow, ripe’ and ‘sun, day’, suggesting a related meaning to the previously-discussed *Yaxk’in*. *Uniiw*, on the other hand, seems to incorporate Ch’olan *uun* ‘avocado’—ultimately from pM *ooŋ (Kaufman 2003:1110-1111)—followed by a -VVw suffix of uncertain meaning, but perhaps shared with *K’anjalaw* (Pop), *Kaseew* (Zec), and *Moloow* (Mol). Given the agricultural and seasonal terms discussed above, it seems at least plausible that ‘ripe time’ and ‘avocado’ might have some bearing on the original meaning of this month. As first recognized by Lacadena and Wichmann (2002:383; see also Zender 2021), a late 8th century spelling of Yucatekan *K’ank’in* appears on Xcalumkin Panel 2 (Figure 7), indicating once again that the forms seen in the *Relación* have a lengthy history.

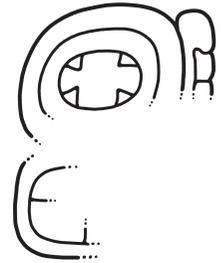


Figure 7. Late 8th century Yucatekan spelling of *K’ank’in*. Xcalumkin Panel 2: A14b. Redrawn by Harri Kettunen after a drawing by Eric von Euw.

Muan

The profile head of a bird of prey suffices to indicate the next month on folio 36v, though it is possible that the original manuscript had a clearer -**ni**, here only suggestively present at lower

right. During the Classic Period, the name of the month was written in a very similar manner, occasionally taking (-**wa**)-**ni** or, later, -**na**. In the Dresden Codex (page 46c) the name is fully written as **mu-wa-ni**, *muwaan*, ‘hawk,’ as first identified by Yuriy Knorozov (1952:115).

Pax



Figure 8. The month position 18 Pax, Dresden 47. Photograph courtesy of SLUB, Dresden.

On folio 37r we find the ‘drum’ logogram **PAAX** preceded by a phonetic complement **pa**. Underneath the **pa** sign is a curvilinear element that may reflect yet another sign in the original manuscript. As first established by David Stuart (1987a:28-33), a fully phonetic **pa-xa** spelling at Naj Tunich and a -**xa** complement on Dresden 61c provide the later synharmonic spellings of this month name, while earlier spellings typically involve a final **xi** syllable (e.g., [**PAAX**]**xi-la** on Ixtutz Stela 4:B1, cf. Zender 2002). Particularly noteworthy is an example of full phonetic complementation in a [**pa**]**PAX-xa** spelling from the Dresden Codex (Figure 8). It is very likely that this month name relates to Yucatec *pàax* ‘music, celebration’ (Bricker et al. 1998:209).

Kayab

Glossed <Kaiab> on folio 37v, and written as **k’a-ba-[K’AN]a-wa**, the Classic Mayan name for this month was *K’anasiy*, invariably written as [**K’AN**]**a-si(-ya)**. In the Dresden Codex, however, the name of the month is typically written [**K’AN**]**a-wa** (e.g., Dresden 47 and 50), closely reflecting the spelling in the *Relación*. Attached to the upper left corner of this compound, we have **k’a-ba**, presumably targeting the attested Yucatekan name <Kayab> (/K’ayab/). As David Stuart notes (pers. comm. 2015), *asiy* might conceivably be related to Q’eqchi’ *asij* ‘cicada’ (Haeserijn 1979:42; Sedat 1955:16), and K’anasiy perhaps glossed as ‘Mature Cicada’. If so, then an original seasonal implication of late spring or early summer is indicated. Further, given the characteristic ‘song’ of the cicada, the Yucatec name Kayab might well relate to *k’àay* ‘song’ (Bricker et al. 1998:149).

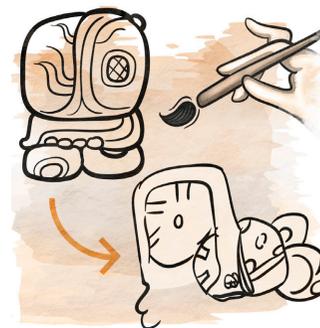
Cumku

The final month is glossed <Cumhu> on folio 38r, and written **ku-k’u/K’UH-T155-OHL**. As first recognized by Ringle (1988), the first two signs pair polyvalent T528 (**ku**, but also **CHAHUK** and **TUUN**) with T1016 **K’UH** (or perhaps **k’u**) ‘god’. Together, these would approximate the Yucatekan name. Following this is the traditional Ch’olan name, here written with T155 **BIX?** (Bíró et al. 2014) and T506 **OHL/WAAJ/K’AN(AN)?**, though equally frequent in Classic inscriptions is one of a series of **HUL** allographs (David Stuart, pers. comm., 1999). Given this variation, the Ch’olan name is difficult to parse with certainty, but Yucatec *kuum* is a well-known term for ‘jar, pot’ (Bricker et al. 1998:137), suggesting a potential connection between the month name *Kuumk’uh* and Lacandon ‘god pots’.

Conclusions

As we have noted, published editions of the *Relación* have often been incomplete with respect to both the text and the illustrations. George Stuart (1988:27) has observed that “[v]irtually all the editions ... have, to varying extents, re-arranged the textual material or the sequence of the calendrical glyphs, often adding ‘chapter’ headings; always using second-generation renderings of most of the glyphs; and, more often than not, editing the number of drawings”. For these reasons, we have focused first and foremost on the recent high-resolution transillumination photographs of the original manuscript housed at the Real Academia de la Historia, Madrid (see Kettunen 2020). This has allowed us to recognize several instances where errors and subsequent corrections stand between us and the original scribe(s), as well as additional instances where the copy that has come down to us surely misrepresents some elements of its source(s). A proper understanding of the manuscript’s history and lost original(s) is thus a prerequisite for any understanding of the intentional deviations from other hieroglyphic spellings of the month names of the ancient calendar.

With specific reference to the 18 glyphic compounds recording the month names on folios 34r-43v, we have stressed that what makes these compounds particularly important is that, while they are foundationally written in the same manner as month glyphs found hundreds of years earlier on monuments from across the Maya lowlands, they also deviate in patterned ways from our expectations. Colonial Yucatec month names were sometimes similar to those of the Classic Ch’olan people, but at least a dozen of these names diverge considerably from the earlier models. It would seem that, in order to provide a bridge between the original orthography of these months and their Colonial Yucatec glosses, an unknown northern scribe has appended phonetic signs indicating the Yucatekan pronunciation of at least seven and perhaps as many as eleven of the more divergent



names. As discussed above, several of these deviations began to be noted in the 1970s, such as the spelling of <Pop> discussed by Lounsbury (1973:99-101), while others were not explained until the 1980s (e.g., Closs 1987; Fox and Justeseon 1984; Ringle 1988; Stuart 1987a, 1987b). In all cases, an explanation of bilingualism and/or diglossia seems probable. Importantly, however, we have also been able to show that some of the most divergent spellings in the manuscript—i.e., those involving the months Uo and K’ank’in—can in fact be traced to late 8th and early 9th century spellings on monuments from the northern Maya lowlands, with still others attested in the 13th century Dresden Codex. Taken together, these document an impressive nine centuries of bilingualism and/or diglossia in the region.

Finally, the internal consistency of this remarkable biscript, its coherence with monumental and codical representations of the same months, and our considerable success in motivating its departures from earlier convention go a considerable way towards assuaging any lingering doubts as to the accuracy of these hieroglyphs in light of the *Relación*’s admittedly uncertain provenance and copying history.

References

- Attinasi, John J.
1973 *Lak T'an: A Grammar of the Chol (Mayan) Word*. Ph.D. Dissertation, Dept. of Anthropology, University of Chicago.
- Aulie, H. Wilbur, and Evelyn W. Aulie
1978 *Diccionario Ch'ol*. Instituto Lingüístico de Verano, Mexico.
2009 *Diccionario Ch'ol de Tumbalá, Chiapas, con variaciones dialectales de Tila y Sabanilla* (3rd edition). Instituto Lingüístico de Verano, Mexico.
- Barrera Vásquez, Alfredo
1980 *Diccionario Maya Cordemex: Maya-Español, Español-Maya*. Ediciones Cordemex, Mérida.
- Beliaev, Dmitri
2013 Western Foreigners in the Dresden Codex. In *The Maya in a Mesoamerican Context: Comparative Approaches to Maya Studies*, edited by Jesper Nielsen and Christophe Helmke, pp. 167–173. Acta Mesoamericana. Verlag Anton Saurwein, Markt Schwaben.
- Beltrán de Santa Rosa María, Pedro
1746 *Arte de el Idioma maya reducido a succinctas reglas, y semilexicon yucateco*. Viuda de D. Joseph Bernardo de Hogal, Mexico.
- Benavides C., Antonio, and Sara Novelo
2009 Los grupos arquitectónicos de Chunchimay en el noreste campechano. *Los Investigadores de la Cultura Maya* 17(2):205-235.
- Bíró, Péter, Barbara MacLeod, and Michael Grofe
2014 The Classic Period Readings of T155. *Mexicon* 36(6): 166-177.
- Brasseur de Bourbourg, Charles E.
1864 *Relation des Choses de Yucatán de Diego de Landa*. Arthus Bertrand and Trübner, Paris.
- Bricker, Victoria R., Eleuterio Po'ot Yah, and Ofelia Dzul de Po'ot
1998 *A Dictionary of the Maya Language as Spoken in Hocabá, Yucatán*. University of Utah Press, Salt Lake City.
- Ciudad Real, Antonio de
1577 *Vocabulario en la lengua de Maya* [Diccionario de Motul, Vols 1-2]. Manuscript. Electronic document, www.brown.edu/Facilities/John_Carter_Brown_Library/exhibitions/ildb/details.php?id=710, accessed June 1, 2021.
- Closs, Michael P.
1987 Bilingual Glyphs. *Research Reports on Ancient Maya Writing* 12:5–12. Center for Maya Research, Washington, D.C.
- Edmonson, Munro S.
1986 *The Book of Chilam Balam of Chumayel: Heaven Born Mérida and Its Destiny*. University of Texas Press, Austin.
1988 *The Book of the Year: Middle American Calendrical Systems*. University of Utah Press, Salt Lake City.

Fox, James A., and John S. Justeson

1984 Polyvalence in Mayan Hieroglyphic Writing. In *Phoneticism in Mayan Hieroglyphic Writing*, edited by John S. Justeson and Lyle Campbell, pp. 17–76. Institute for Mesoamerican Studies, State University of New York, Albany.

Haeserijn, Esteban V.

1979 *Diccionario K'ek'chi'-Español*. Talleres Editorial 'Piedra Santa', Guatemala.

Hofling, Charles Andrew

2011 *Mopan Maya-Spanish-English Dictionary*. University of Utah Press, Salt Lake City.

2014 *Lacandon Maya-Spanish-English Dictionary*. University of Utah Press, Salt Lake City.

Hofling, Charles Andrew, and Félix Fernando Tesucún

1997 *Itzaj Maya-Spanish-English Dictionary / Diccionario maya itzaj-español-inglés*. University of Utah Press, Salt Lake City.

Hopkins, Nicholas

2012 *A Dictionary of the Chuj (Mayan) Language as Spoken in San Mateo Ixtatán, Huehuetenango, Guatemala, ca. 1964-65*. Jaguar Tours, Tallahassee.

Kaufman, Terrence

2003 *A Preliminary Mayan Etymological Dictionary*. With the assistance of John Justeson. Electronic document, www.famsi.org/reports/01051/pmed.pdf, accessed June 1, 2021.

2017 Aspects of the Lexicon of Proto-Mayan and Its Earliest Descendants. In *The Mayan Languages*, edited by Judith Aissen, Nora C. England, and Roberto Zavala, pp. 62–111. Routledge, New York.

Kaufman, Terrence, and William M. Norman

1984 An Outline of Proto-Cholan Phonology, Morphology and Vocabulary. In *Phoneticism in Mayan Hieroglyphic Writing*, edited by John S. Justeson and Lyle Campbell, pp. 77–166. Institute for Mesoamerican Studies, State University of New York, Albany.

Kettunen, Harri

2020 Observations Based on Transillumination Photography of Diego de Landa's *Relación de las cosas de Yucatán*. *The Mayanist* 1(2):53-74.

Кнорозов, Юрий

1952 Древняя письменность Центральной Америки (Ancient Writings of Central America). Советская Этнография (*Soviet Ethnography*) 1952 (3): 100–118.

La Farge, Oliver

1947 *Santa Eulalia: The Religion of a Cuchumatán Indian Town*. University of Chicago Press, Chicago.

Lacadena, Alfonso, and Søren Wichmann

2002 The Distribution of Lowland Maya Languages in the Classic Period. In *Memoria de la Tercera Mesa Redonda de Palenque, Vol 2*, edited by Vera Tiesler, Rafael Cobos, and Merle Greene Robertson, pp. 275–319. INAH, Mexico.

Lamb, Weldon

2002 *The Maya Month Names*. Ph.D. Dissertation, Dept. of Anthropology, Tulane University, New Orleans.

2017 *The Maya Calendar: A Book of Months, 400-2000 CE*. University of Oklahoma Press, Norman.

Landa, Diego de

1566 *Relación de las cosas de Yucatán*. Manuscript B-68, 9-27-2, 5153, Real Academia de la Historia, Madrid.

Looper, Matthew

2019 *The Beast Between: Deer in Maya Art and Culture*. University of Texas Press, Austin.

Lounsbury, Floyd G.

1973 On the Derivation and Reading of the 'Ben-Ich' Prefix. In *Mesoamerican Writing Systems*, edited by Elizabeth P. Benson, pp. 99-144. Dumbarton Oaks, Washington, D.C.

Martin, Simon

1997 The Painted King List: A Commentary on Codex-style Dynastic Vases. In *The Maya Vase Book, Volume 5: A Corpus of Roll-out Photographs*, edited by Barbara Kerr and Justin Kerr, pp. 846-867. Kerr Associates, New York.

2017 Secrets of the Painted King List: Recovering the Early History of the Snake Dynasty. *Maya Decipherment*, May 5, 2017. Electronic document, mayadecipherment.com/2017/05/05/, accessed June 1, 2021.

Moran, Fray Francisco de

1695 *Arte y Vocabulario de la lengua Cholti que quiere decir la Lengua de Milperos*. Manuscript Collection 497.4/M79, American Philosophical Society, Philadelphia.

Pérez [Bermón], Juan Pío

1877 *Diccionario de la lengua maya*. Imprenta Literaria de Juan F. Molina Solis, Merida, Yucatan, Mexico.

Prager, Christian

2014 <SAK si-hi>: A Phonetic Spelling of the Classic Maya Month Name *Sak*. Manuscript on file, Rheinische Friedrich-Wilhelms-Universität Bonn, Abteilung für Altamerikanistik.

Redfield, Robert, and Alfonso Villa Rojas

1962 *Chan Kom: A Maya Village* (abridged edition). University of Chicago Press, Chicago.

Ringle, William M.

1988 Of Mice and Monkeys: The Value and Meaning of T1016, the God C Hieroglyph. *Research Reports on Ancient Maya Writing* 19:1-22. Center for Maya Research, Washington, D.C.

Roys, Ralph L.

1957 *The Political Geography of the Yucatan Maya*. Carnegie Institution of Washington, Washington, D.C.

Sedat S., Guillermo

1955 *Nuevo Diccionario de las Lenguas K'ekchi' y Española*. DEENSP, Guatemala.

Stuart, David

1987a Ten Phonetic Syllables. *Research Reports on Ancient Maya Writing* 14:1–52. Center for Maya Research, Washington, D.C.

1987b *Uo* syllable. Manuscript dated July 31st, 1987. Electronic document, decipherment.wordpress.com/2016/10/21, accessed June 1, 2021.

Stuart, George

1988 Glyph Drawings from Landa's *Relación*: A Caveat to the Investigator. *Research Reports on Ancient Maya Writing* 19:23–32. Center for Maya Research, Washington, D.C.

Termer, Franz

1930 Zur Ethnologie und Ethnographie des nördlichen Mittelamerika. *Ibero-Amerikanisches Archiv* 4(3). F. Dümmler, Berlin.

Thompson, J. Eric S.

1932 A Maya Calendar From the Alta Vera Paz, Guatemala. *American Anthropologist* 34: 449–454.

1950 *Maya Hieroglyphic Writing: Introduction*. Carnegie Institution of Washington, Washington, D.C.

Tozzer, Alfred M.

1941 *Landa's Relación de las Cosas de Yucatán: A Translation*. Peabody Museum of American Archaeology and Ethnology, Harvard University, Cambridge, Massachusetts.

Zender, Marc

2002 A Note on the Inscription of Ixtutz Stela 4. *The PARI Journal* 3(1):17-22, 27.

2006 Teasing the Turtle from its Shell: *AHK* and *MAHK* in Maya Writing. *The PARI Journal* 6(3):1-14.

2016 The Maize God and the Deer Lord's Wife. Paper presented at the 22nd Annual European Maya Conference, Malmö University, Sweden. Manuscript on file at the Department of Anthropology, Tulane University.

2017 Theory and Method in Maya Decipherment. *The PARI Journal* 18(2):1-48.

2019 *Reflexiones sobre el desciframiento de la escritura maya*. Paper presented at the XI Congreso Internacional de Mayistas, Chetumal, June 2019. Manuscript on file at the Department of Anthropology, Tulane University.

2021 *How Writing Came to Northern Yucatán*. Paper presented in the Boundary End Archaeology Research Center Virtual Lecture on the Ancient Americas Series, June 2021. Electronic document, www.youtube.com/watch?v=R5XuYnoGa3Q, accessed June 1, 2021.

Zender, Marc, and Harri Kettunen

2021 The 'Abecedy' in Diego de Landa's *Relación de las cosas de Yucatán*. Manuscript in preparation, on file at the Department of Anthropology, Tulane University.