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A Possible [tze] Syllable and its Associates in Maya Writing

Una propuesta para el silabograma [tze] en la escritura jeroglífica maya

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ABSTRACT: The decipherment of the Maya script is still far from completion and awaits the interpretation of a considerable number of logograms and syllabic signs. This paper is dedicated to the composite sign that has been previously considered a ligature of two syllabic signs, **tzo** and **ko**. The present analysis shows that these two graphic elements are never written separately and that the **ko**-like element differs from the other **ko** syllables attested in the corresponding inscriptions. The sign is found in the context of other syllables involving the mid-front *e* vowel, implying a previously unrecognized **Ce** syllable, with "C" standing for an unknown consonant. In Palenque, the sign follows the **le** syllable; the combination of these two signs is attested in the position of a predicate, which might be interpreted as the verb *letz-e*, "he/she climbed, went up". The data collected allow us to propose the phonetic reading **tze** and fill one more gap in the Maya syllabic grid.

KEYWORDS: Classic Maya; Maya inscriptions; epigraphy; decipherment; syllabary.

RESUMEN: Hasta la fecha, un número significativo de logogramas y silabogramas mayas permanecen sin interpretación. Este artículo está dedicado a un signo que anteriormente ha sido considerado como una ligadura de dos signos silábicos, **tzo** y **ko**. El análisis presentado aquí muestra que estos elementos gráficos nunca se escriben por separado; además, el elemento parecido al silabograma **ko** en el contexto bajo estudio difiere de los signos para la sílaba **ko** en las inscripciones correspondientes. Este signo compuesto se encuentra en el contexto de los silabogramas con la vocal *e,* implicando un valor de lectura **Ce**, donde "C" indica una consonante desconocida. Dicho signo sigue al silabograma **le** como parte de un predicado en las inscripciones de Palenque: éste se puede interpretar como el verbo *letz-e*, "subió". De tal manera,

los contextos nos permiten proponer la lectura fonética **tze** para el signo estudiado y llenar una laguna en el cuadro silábico de la escritura jeroglífica maya.

Palabras clave: Clásico maya; inscripciones mayas; epigrafía; desciframiento; silabario.

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In 2008, David Stuart (2008) presented evidence for reading an undeciphered sign in the Maya script as a syllabic sign **Co**, with an unknown consonant and the mid-back vowel *o*. The composite glyph under discussion consists of three graphic elements. The upper element resembles Diego de Landa's **ma** syllable (G. Stuart, 1988: 25). The central element resembles the **TAL** logogram. The lower element varies: some examples feature a "fish fin" design (mostly in Early Classic examples, Figure 1a), and others a so-called "shiner" marker (mostly in Late Classic examples, Figure 1b). Stuart identified four examples of the glyph in the contexts of different **Co** syllables, namely, **mo**, **lo** and **ko**. One more context with the **ko** syllable was identified by Christophe Helmke on Copan Stela 13 (see comments in G. Stuart, 2008). The fact that the sign under discussion always appears in combination with other syllabic signs strongly suggests a syllabic reading value (D. Stuart, 1995: 47-49). As D. Stuart (2008) noted, the fact that the adjacent signs are **Co** syllables strongly suggests the mid-back *o* vowel as part of its syllabic value (Zender, 2017: 9). The best candidate for the reading seems to be **tzo**. This interpretation works perfectly on Tortuguero Monument 6, resulting in the collocation **ʔu-tzo-lo-wa** "he/she puts in order (periods of time)", cf. **tzol-* "(t.v.) to put in order, count" (see lexical entries, reconstructions and orthographic conventions in the appendix below). The other contexts remained unexplained, however.

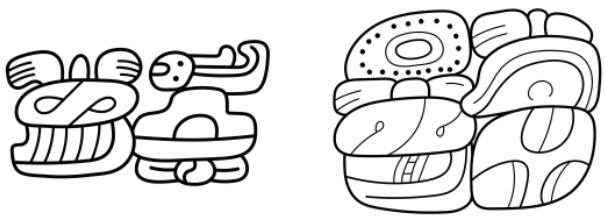

Figure 1. The examples of the **Co** syllable noticed by Stuart: (a) **X-lo-ʔ-WINKIL?**, the earspool of Altun Ha (after Peter Mathews in D. Stuart, 2008: Example a; (b) **mo-X-no?-cha/se**, Tortuguero Monument 8, Block G (after unpublished photographs by Elisabeth Wagner and Sven Gronemeyer). Drawings by Sergei Vepretskii.

During the workshop "Grammar of Hieroglyphic Maya", held during the 18th European Maya Conference in Brussels in 2013, one of the authors (Davletshin) presented two examples of the sign under discussion, attested as part of a predicate on two panels in the Cross Group of Palenque (Figure 2a, b). Both panels refer to the same ritual event in which six-year-old K'ihnich Kan B'ahlam II was involved. According to the interpretation proposed at that time, the **le** syllable and the ligature of the signs **tzo** and **ko** give us *letzok*, the optative mood of the intransitive verbal root *letz-*, attested in both Ch'orti' and Ch'ol as "to go up, climb, ascend" (Stuart, 2006: 130). On the panel from the Temple of Cross, the glyphic collocation is followed by the sequence **ta-b'a-la b'o-jo TE$^{?}$-le**, *ta b'alal b'ojte$^{?}$el*. This can be interpreted as "at the forbidden city", literally, "at a place protected by wooden walls" (Davletshin and Vepretskii, 2017; Stuart, 2006: 130-131). It was suggested that the optative in this collocation was intended to show that the described action had taken place in a secluded room, where people were unable to see the actor. This use of the optative mood is attested in many languages all over the world. Thus, *letzok ta b'alal b'ojte$^{?}$el* can be translated as "they say he ascended to a place protected by wooden walls" or "he allegedly ascended to the place".

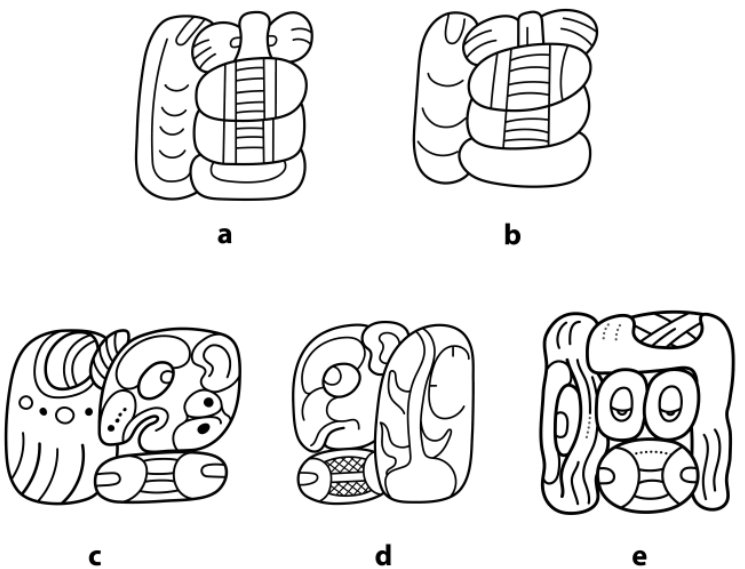

Figure 2. The sign under discussion compared with the **ko** syllable on Palenque Cross Group Panels: (a) **le-X**, Temple of Cross, I1 (after Linda Schele in Stuart, 2006: 131); (b) **le-X**, Temple of Sun, I2 (after Linda Schele in Stuart, 2006: 170); (c) **b'a-ch'o-ko**, Temple of Foliated Cross, K3 (after Linda Schele in Stuart, 2006: 150); (d) **ch'o-ko-TAK**, Temple of Sun, M2 (after unpublished photographs by Ivan Savchenko and Yuriy Polyukhovych); (e) **$^{?}$u-ch'o-ko-K'AB'A$^{?}$**, Temple of Sun, A12 (after unpublished photographs by Ivan Savchenko and Yuriy Polyukhovych). Drawings by Sergei Vepretskii.

A possible [Ce] sign

The suggested interpretation of the Palenque examples is attractive. However, the graphic element inscribed into the supposed **tzo** syllable is distinct from the other syllabic signs **ko** attested on the same panels (Figure 2c, d, e). In both examples under consideration, the graphic element is doubled and lacks the characteristic dots on the sides that indicate holes in the turtle shell represented by the **ko** syllable, derived from Proto-Mayan **kok* 'turtle' (Houston, Robertson and Stuart, 2000: 328). The example on Copan Stela 13 (Figure 3a) is suspiciously similar in this respect: the **ko** syllables (B7, D3 and D8) differ from the supposedly equivalent element inscribed in the **tzo** sign (Figure 3b, c). The meaning of the glyphic collocation in this text is obscure, but, importantly, the alleged ligature of the syllables **tzo** and **ko** precedes a syllable **he**. Basing himself on this, one of the authors (Vepretskii) questioned the original proposal and suggested that the alleged ligature of the syllables **tzo** and **ko** is a previously unrecognized **Ce** syllable. Two graphic designs (A and B) with the same reading value are expected to be in free distribution, and the probability of sign substitution between A and B should be close to the probability obtained by multiplying the probabilities of occurrence for the designs A and B in the parallel texts (Davletshin, 2017: 69-70). This condition is not satisfied when we compare the distribution of the composite sign with the **TAL**-like element with the distribution of the composite sign with the **ko**-like element. Because of this, we assume that the combination of three graphic elements under discussion is a single **Ce** syllable for it is attested in the context of other syllabic signs involving the mid front *e* vowel.

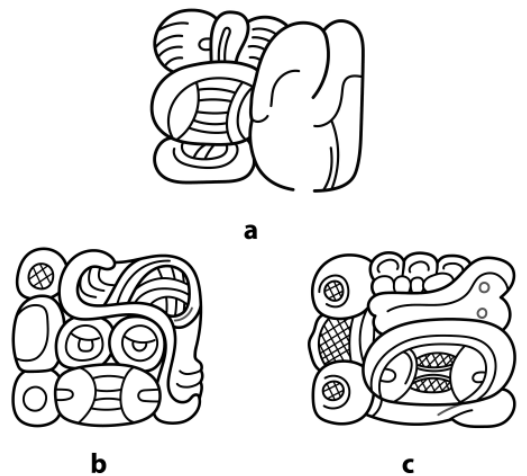

Figure 3. The sign under discussion compared with the **ko** syllable on Copan Stela 13: (a) **X-he**, E6; (b) **ʔu-ch'o-ko-K'AB'Aʔ**, B7; (c) **ʔu-cho-ko-wa?**, D8. Drawings by Sergei Vepretskii after Linda Schele, <http://research.famsi.org/schele.html>, #1040.

Let us return to the example from Palenque. Importantly, the descriptions of the rituals implemented by K'ihnich Kan B'ahlam II mention another event that occurred 536 days later. It is spelt as **ju-b'i** *jub'-i* on the panel from the Temple of Cross and as **ju-b'u-yi** *jub'uuy* on the panel from the Temple of Sun; both are based on the intransitive verb *jub'-* "to go down" and can be translated into English as "he descended" (see below for a dialectal interpretation of the form *iub'-i*). This parallel strongly speaks in favor of the suggested interpretation *letz-* "to ascend," for the future king goes up to a secluded place and later returns from it by coming down. Thus we suggest the reading value **tze** for the sign. In fact, the second *e* vowel of the verb can be interpreted as the thematic vowel attested in Ch'orti' *letz-e* "to climb, mount" (Wichmann, 1999: §2.2). Both syllabic spellings and cognates in Cholan languages imply that the suffix terminates in a bare vowel (see, for example, Kaufman and Norman, 1984: 93, 102-104); the same applies to two other thematic suffixes attested in the script, although all lexical roots and derivational suffixes end with a consonant in Hieroglyphic Mayan, as well as in most Mayan languages, cf. *hul-i* "he/she arrived (at this place)" and *ʔu-tz'ihb'-a* "he/she wrote (it)". Interestingly, **letz-* "(i.v.) to go up", **b'ojteʔ* "(n.) wooden wall" and **jub'-* "(i.v.) to go down" all are low-level innovations in Cholan languages: **b'ojteʔ* is restricted to the Western Cholan languages Ch'ol and Chontal, and **jub'-* is attested among today's Mayan languages only in Ch'ol. Ch'ol is spoken in close proximity to Palenque today. These three words are likely dialectal isoglosses in Hieroglyphic Mayan. The lexical roots **letz-* and **jub'-* replaced Proto-Cholan **t'ab'-* "(i.v.) to go up" and Proto-Mayan **ʔehm-* "(i.v.) to go down", respectively (for their distribution see the appendix below). The nonstandard thematic suffixes in the intransitive verbs *letz-e* "he/she went up" and *jub'-i* "he/she went down" are likely to be dialectal traits, too.

The unprovenanced celt hosted in the Fidel Tristán Jade Museum features the same syllabic sign preceded by an **ʔu** syllable (Figure 4b). Unfortunately, the preceding block and the following one are not preserved. In other words, the context is unclear and we are unable to suggest any interpretations.

Another example is attested as part of a personal name on Caracol Stela 16, block A18 (Satterthwaite and Willcox, 1954: Fig. 16; Beetz and Satterthwaite, 1981: Fig. 15a, b). The name belonged to the grandfather of the person who assisted the king Tum ʔOl K'ihnich I during the celebration of the period ending in 534 CE. The nominal phrase consists of the signs **K'INICH** and a "Canine Head" (B17), and the proposed **tze** syllable appears in combination with another sign (A18) (Figure 4a). The latter looks like a young male head with black marks on his cheek, similar in appearance to the Tonsured Maize God sign. The Tonsured Maize God sign possesses two reading values – **ʔIXIM** "grain corn" and **na** (Zender, 2014). The cognates of *tzeʔn-* "to laugh, smile" and **tzehn-* "to provide food; sustenance" are widely attested in Lowland Mayan languages. However, both the identification of the Tonsured Maize God sign and the interpretation of the nominal phrase are problematic.

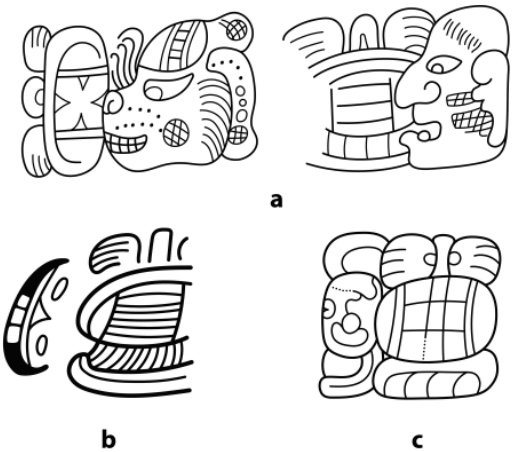

Figure 4. More examples of the sign under discussion: (a) **K'INICH-? X-na?**, Caracol Stela 16, B17-A18 (after the photograph of Penn Museum, Philadelphia, 51-54-5, <https://www.penn.museum/collections/object/75084>); (b) **ʔu-X**, unprovenanced celt hosted in the Fidel Tristán Jade Museum (after David Mora-Marín, 2001: Fig. 16); (c) **ʔu-X-li**, Tonina Monument 171, F1 (after unpublished photographs by Sergei Vepretskii). Drawings by Sergei Vepretskii.

Early Classic examples of both **tzo** and **tze** syllables feature a kind of striation in the lower part, similar to the "fish fins" of the **ka** syllable (Figure 1a, 4a); meanwhile, in Late Classic examples, this striation is replaced with the "shining" marker (Figure 1b, 3a).

Another, rather problematic example comes from Tonina Monument 171 (Graham *et al*., 2006: 116), where two persons are depicted playing ball in 727 CE. The captions identify the player on the left as the Tonina king K'ihnich B'aknal Chaahk (ruled 688-704>), who was already dead by the moment of the depicted event. The person in the right was identified by David Stuart (2013) as the Calakmul king known under the nickname Yukno'm To'k' K'awiil (698-731>). The Tonina king K'ihnich ʔIhch'aak Chapaaʔt (723-739>) is mentioned in connection with the Calakmul ruler. The relational phrase between the two (F1) contains a composite sign similar to the proposed **tze** syllable (Figure 4c). It is different from other known examples, however, because of two graphic peculiarities. First, the central, **ko**-like element includes additional vertical lines unattested elsewhere. Second, the lower part is replaced by the **li** syllable. The sign on Tonina Monument 171 might be a graphic variant of the **tze** syllable, whereby the collocation can be read **ʔu-tze?-li**, *ʔu-tzeel*, "beside him, abreast of him", cf. Proto-Mayan **tzehl* "side". As Stuart (2013) has noted, the scene from the year 727 depicts a long-deceased Tonina ruler playing ball with a foreign Calakmul lord, with the current king named but not even shown. He suggests that the Calakmul king could have participated in a ballgame earlier, when K'ihnich B'aknal Chaahk was

alive, and that the monument commemorated this past event. The scene might depict a ritual re-enactment of the ballgame in which the long-deceased persons were impersonated by the current kings. Similar impersonations of the dead are widely practiced among Pisaflores Tepehuas and Mecapalapa Totonacs of today's Southern Huasteca (Davletshin, fieldwork data from 2007).

The suggested **tze** syllable might be also attested on Nim Li Punit Stela 15, P2 (Grube, MacLeod and Wanyerka, 1999: Fig. 2; Wanyerka, 2003: Fig. 29). The central part of the sign features a doubled **ko**-like element, with the upper and lower elements missing (Figure 5a). It is followed by the **le** syllable. This collocation is likely a part of a personal name, perhaps, related to Proto-Cholan **tzeel* "crest". The same design without the upper and lower elements can be seen on the so-called Akab Dzib Lintel from Structure 4D1 in Chichen Itza (G2). Here, it forms part of a woman's name, following the **me** syllable and resulting in the reading **ʔi-ʔIX-me-tze? TUN-ni**, *ʔIx Metz Tuun* (Figure 5b). Guido Krempel (personal communication, 2020) has suggested to us that the same graphic design is attested in the emblem glyph of Nakum. However, in this particular context the sign behaves like a logogram.

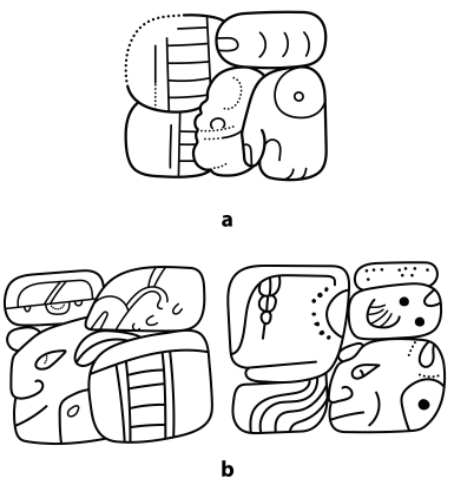

Figure 5. Some variants of the sign under discussion: (a) **X-le-ʔ-k'o**, Nim Li Punit Stela 15, P2 (after photograph by Bruce Love in Prager and Braswell, 2016: Fig. 8); (b) **ʔi-ʔIX-me-X TUN-ni K'UH-lu-ʔIXIK**, Akab Dzib Lintel from Chichen Itza, G2 (after rubbings by John Denison, <http://www.famsi.org/reports/95099/AkabTzibLintelFront.pdf>). Drawings by Sergei Vepretskii.

We suspect that the examples from Nim Li Punit and Chichen Itza represent a late variant of the sign under consideration, reduced to the central **ko**-like element. Interestingly, the same graphic development can be observed for the proposed **tzo** syllable, as has been discussed by Albert Davletshin, Dmitri Beliaev and Guillermo Kantun Rivera in 2014. The emblem glyph of Ek' Balam consists

of the **TAL**-like design combined with the **lo** syllable, giving us **tzo-lo** ʔ**AJAW** (Helmke, 2020: 268). The **TAL**-like sign in these examples is rotated 90 degrees; importantly, too, a few examples show an appendage in the lower part of the sign (Ek' Balam Capstone 14, Mural of the 96 Glyphs and Mural C, see Figure 6). Similar graphic designs frequently undergo analogical developments in Maya script (see many examples in Lacadena, 1995; Davletshin, 2003).

a b

Figure 6. Ek' Balam emblem glyph: (a) **X-lo-**ʔ**AJAW-wa**, Mural C, U (after photograph in Lacadena, 2003: Fig. 20b); (b) **X-[lo]-**ʔ**AJAW-[wa]**, Mural of the 96 Glyphs, F'3 (after Lacadena, 2003: Fig. 18e). Drawings by Sergei Vepretskii.

Another possible [*tze*] sign

One more sign resembles the proposed **tzo** and **tze** syllables, but it differs because of a distinctive graphic element in the centre (Figure 7a, b). It is attested on Tonina Monument 84 (Graham and Mathews, 1996: 114) and on the painted vase K5855 (Marc Zender, personal communication, 2018). The central element resembles the "Eye" design of the logographic signs ʔ**UT** "eye" and ʔ**ILA-** "to see". On Tonina Monument 84 (Figure 7a), it follows the syllable **pe** (Davletshin and Beliaev, 2001). On K5855 (Figure 7b), it follows the syllable **we** (Zender, Beliaev and Davletshin, 2016). Both examples likely spell personal names. Thus, the contexts are obscure and can be subjected to three different interpretations. Firstly, the sign might be another variant of the **tze** syllable. Secondly, it might be an unknown **Ce** syllable, **t'e**, **ch'e**, **xe** or, less likely, **p'e**. Thirdly, the sign might be an unknown **Ce** syllable written in a ligature with the proposed **tze** syllable.

The second and third solutions seem more plausible because the "Eye" syllable is also attested in three other contexts, although we were unable to find any likely lexical glosses for these contexts in Mayan dictionaries. First, the "Eye" syllable is written as part of a name-tag on the so-called Calabaza de Acanceh (Voss and Kremer, 2000: Fig. 1, A1-A2): **yu-xu-lu-li** ʔ**u-(C?)e-b'e** *y-uxulil* ʔ*u-Ceb'*, "the carving of his X", where ʔ**u-(C?)e-b'e** refers to the inscribed object (Figure 7c). Second, the "Eye" syllable is written as part of a personal name, followed by the **le** syllable on Xcalumkin Panel 3 (Figure 7d). Third, the "Eye" syllable is attested

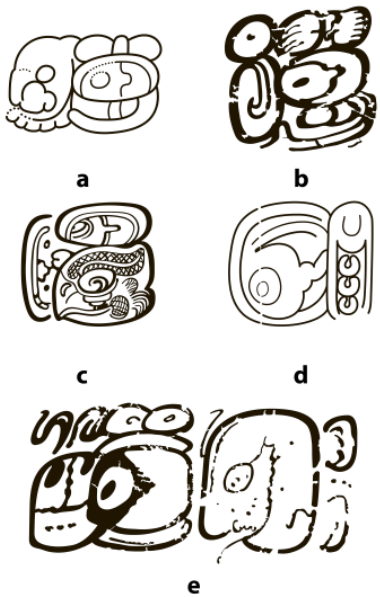

Figure 7. "Eye" syllable: (a) **pe-tze?+X**, Tonina Monument 84, B (after photograph by Peter Mathews in Graham *et al*., 2006: 114); (b) **we-tze?+X**, unprovenanced Codex-style vessel, K5855, C4 (after photograph by Justin Kerr, 1989 <http://research.mayavase.com/kerrmaya_hires.php?vase=5855>); (c) **ʔu-X-b'e**, Calabaza de Acanceh, A2 (after unpublished photographs by Sergei Vepretskii); (d) **X-le**, Xcalumkin Panel 3, B2 (after photograph by Harry Pollock in Graham and Von Euw, 1992: 181); (e) **ʔAJ-we-X pe-ya?**, *fleur-de-lis* cylinder vase (after photograph in Robicsek and Hales, 1981: 200). Drawings by Sergei Vepretskii.

with some additional elements as part of the glyphic collocation **ʔaj-we-(C?)e pe-ya** on the *fleur-de-lis* cylinder vase (Robicsek and Hales, 1981: 200). This third example suggests the possibility that the sign's additional elements correspond to Diego de Landa's **ma** and the lower element of both syllables **tze** and **tzo**. If this suggestion is correct, the complete version of the "Eye" syllable includes these graphic elements in its design, which were eliminated in later examples, sharing this particular paleographic development with the syllables **tze** and **tzo**. An "Eye" sign attested in an unclear context in Palenque (Stucco inscriptions from Temple XIX: D6) might belong to this group, too.

Diego de Landa's <c> Syllable

The Diego de Landa alphabet includes an equivalent for the Spanish letter <c> (Figure 8a), among two dozen of other hieroglyphic signs (Tozzer, 1941; G. Stuart, 1988: 25; Kettunen, 2020: 70). The sign in Figure 8a represents an abstract design; in the second half of the 20th century, epigraphers used to refer to the

sign by the corresponding number in Eric Thompson's catalogue, T520, and sometimes by the nickname "Chuen" (Thompson, 1962; Justeson and Campbell, 1984: 340). This nickname corresponds to the Colonial Yucatec name of the eleventh day in the 20-day calendric cycle.

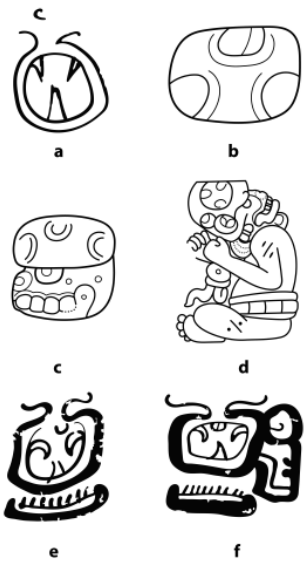

Figure 8. The Diego de Landa's <c>: (a) **X** from Diego de Landa alphabet (after photograph in Kettunen, 2020: Fig.10); (b) **X-ka**, Dresden Codex, P. 50 (after photograph in Grube, 2012); (c) **X-ka-wa**, Dresden Codex, P. 62 (after photograph in Grube, 2012); (d) standard version of **X** Tortuguero Monument 6, G9 (after unpublished photograph by Elisabeth Wagner and Sven Gronemeyer); (e) the head variant of **X**, Yaxchilan Lintel 41, B1 (after photograph by Alfred Maudslay, <https://www.britishmuseum.org/collection/image/336524003>); (f) the full-figured **X**, Copan Str. 9N-82 hieroglyphic bench, 7 (after photograph in Zender, 2019: Fig. 3). Drawings by Sergei Vepretskii.

In the 16th century, Spanish affricates (*ʦ, *ʣ) and sibilants (*s, *z, *ʃ, *ʒ) were merging together; importantly, the process of neutralization took different paths in Castilian and Andalusian varieties of Spanish, resulting in *θ* and *s* in Castilian, and *s* in Andalusian (Penny, 2002: 98-103). For this reason, the letters <c>, <ç> and <tz> may refer to all six sounds in documents from New Spain, and Diego de Landa's <c> can be interpreted as either the syllable **tze** or the syllable **se**. Hence, the reading of Diego de Landa's <c> should be discussed here.

In the last two decades, the sign was tacitly assumed to represent the syllable **se**, although its phonetic reading was not reliably demonstrated until very recently (Zender, 2019). Graphological commentaries are essential for further discussion and are possible thanks to numerous Classic Mayan spellings of the fifth month, where the signs in Figure 8 are combined with the syllables **ka** and **wa**.

Firstly, the once popular nickname "Chuen" is misleading because the logograph **CHUWEN** "howler monkey" is similar but not identical to the sign known as T520; the latter depicts the eye of a howler monkey with an overhanging brow (Dmitri Beliaev, personal communication, 2017). A less common variant "howler monkey's head" is also known. The non-head variant always features the brow, except when the signs **CHUWEN** and the so-called day sign cartouche **K'IN?** are conflated into ligatures. Thus, we can assume that the day sign cartouche suppresses or overlaps the monkey brow. In the Classic period, the forerunner of Diego de Landa's <c> never included the brow element; it corresponds to the eye of the **CHUWEN** logograph from a graphic point of view (Figure 8b). The Postclassic version of the **CHUWEN** logograph does not include the characteristic brow element, but all known examples are attested in ligatures with the cartouche of day signs. Importantly, the so-called monkey eye element of the Classic period bears resemblance to the logograph **WINAK** "person, twenty" in the Dresden Codex (Grube, 2012: *passim*). The **CHUWEN** logograph thus merged with the **WINAK** logograph in the Dresden Codex.

Secondly, Diego de Landa's <c> in his manuscript and in the Postclassic codices shows a characteristic notch in its upper portion with two "tendrils" coming out; it was regarded as a distinct sign by Thompson and designated as T562. In other words, the sign in Figure 8a belongs to the group of the so-called cleft or split signs, which includes the syllables **cha**, **t'i**? and **xo**, and the logographs **PA?** "split", **PAX** "music" and **WA?** "to be upright" (D. Stuart, 1987; Martin, 2004; Davletshin and Bíró, 2014). The eye element of the **CHUWEN** logograph, however, is never split. In the Dresden Codex, all the examples of Diego de Landa's <c> are split and look like a split **WINAK** "person, twenty" sign. In the Classic Period, the se syllable is not split, aside from two likely exceptions (Caracol Stela 22: L11, Dos Pilas Panel 19: P1). On the contrary, the Classic version of the **cha** syllable frequently features a notch resembling Diego de Landa's <c>. Interestingly, the Postclassic descendant of the **cha** syllable in the Dresden Codex is never split and looks quite different from Diego de Landa's <c>.

Thirdly, a few head variants of the sign have long been recognized in Classic inscriptions (Figure 8c, see also Yaxchilan Stela 12, D1; Kuna Lacanja Lintel 1, M5; Zender, 2019: 31). A full-figured one was recently identified by Marc Zender (Figure 8d). Both head and full-figure variants leave no room for doubt that the sign under discussion depicts a kind of insect with a "dead" head, and that the -"Chuen"-like graphic element is a characteristic spot on the head of this particular insect.

After analyzing the graphic characteristics of the sign, we can proceed with the discussion of its reading value. In the Dresden Codex, Diego de Landa's <c> is attested in two different spellings; both refer to the name of the fifth month in the solar year as **Ce-ka** and **Ce-ka-wa**, where **C** stands for either **s** or for **tz** (Figure 8e, f). It has been long recognized that the former spelling corresponds to the Yucatec name of the month, attested as <tzec> in Diego de Landa's "*Relación de las cosas de Yucatán*" and as <zec> and <zeec> in the books of Chilam Balam

(Thompson, 1950: 106). The spelling **Ce-ka-wa** (Dresden Codex, page 62) might be intended to be read **ka-Ce-wa**, which is attested in many Classic inscriptions. This form has been compared to the month name <*cazeu*> in a colonial document from Alta Verapaz, Guatemala (Thompson, 1932). The month names in this document are probably Cholan in origin, although they are followed by a text in Q'eqchi'. The same name is attested as <*kazeu*> in a Poqomchi' list from 1906 (Thompson, 1950: 106).

In Classic inscriptions, the name of the month is written as **ka-Xe-wa**, with a few underspellings of the last consonant **ka-Xe** (Yaxchilan Lintel 41, B1) and three examples from the Northern Yucatan where it is spelt **ku-Ce-wa** (Xcombec, Monument 1, A2 and C1; Itzimte Bolonch'en, Stela 4; see Lacadena and Davletshin, 2013: 11; Galeev, 2017: 81). Thus, the spelling **ka-Ce-wa** is to be interpreted as the Cholan name of the month in the Dresden Codex and **Ce-ka** as its Yucatec dialectal form (Lacadena and Wichmann, 2002). Diego de Landa's spelling of the month name is heavily distorted and likely to be **Ce-wa**.

Unfortunately, the meanings of both month-names are obscure, and the data from the Dresden Codex cannot clarify the phonetic reading of the sign because <c>, <tz> and <z> could be read as both *s* and *tz*. Fortunately, Marc Zender has been recently able to disambiguate the phonetic reading of the sign thanks to two glyphic contexts from Classic Period. One is the causative form *ʔu-t'ab'se* "he/she made it lifted", written as **ʔu-T'AB'-Ce** on the hieroglyphic bench from Copan Structure 9N-82, cf. **t'ab'*- "(i.v.) to go up" (Zender, 2019). The causative suffix is widely attested in Mayan languages, with **-se* being one of its allomorphs, cf. Ch'orti' *t'ab'se* and Ch'olti' <*tabse*> "(t.v.) elevate". The other context is less secure; it is the personal name of a warrior from Pomona *ʔj-K'eʔsem-Toʔkʼ* "He of Sharpen(ed) Flint", written as **ʔaj-k'e-Xe-me-TOK'** on La Mar Stela 3, C2-3, and Piedras Negras Stela 12, D15, cf. **k'eʔs* "(adj.) sharp, stiff" (Zender, 2017: 24-28). Marc Zender has also proposed that the reading value of the sign is acrophonically derived from Proto-Cholan **ses* "bird louse" (Zender, 2019: 31). These three arguments indicate that the phonetic reading of the sign includes the consonant **s**; the vowel **e** is also supported by the phonetic substitution of the **TELES** logograph as **te-le-Xe**, "Jesus Christ lizard (*Basiliscus* sp.)". In modern Mayan languages, the last consonant of the words for "basilisk" is found in sound-symbolic alternations, preventing us from identifying the Classic Mayan consonant (Tzotzil *telex*, Tzeltal *t'ehlech* and *t'erech*, Davletshin, 2011).

Another sign in the Dresden Codex was considered a head variant of Diego de Landa's <c> and read **tze** (Bricker, 1986: 148; Schele and Grube, 1997: 120-121). This sign is not split, in contrast to the syllable **se**, but depicts a human head featuring the monkey eye element that also could be **WINAK** element (Figure 9a). One context is attested in six examples (Dresden Codex, pages 15a-b and 16c). Various deities are shown upside-down or seated: one, the rain god *Chaahk*, holds a sprouting plant in its hands as if he were sowing crops. The accompanying texts record "**ʔu-pa-k'a-ja X-ni**, a name of a deity an augury". Victoria Bricker

equated the sign to Diego de Landa's <c> and interpreted the passage as **ʔu-pa-k'a-ja tze-ni** ..., *ʔu-pak'aj tzeen* ..., "such-and-such deity planted sustenance" (cf. **pak'*- "(t.v.) to plant" and **tzehn*- "(t.v.) to feed").

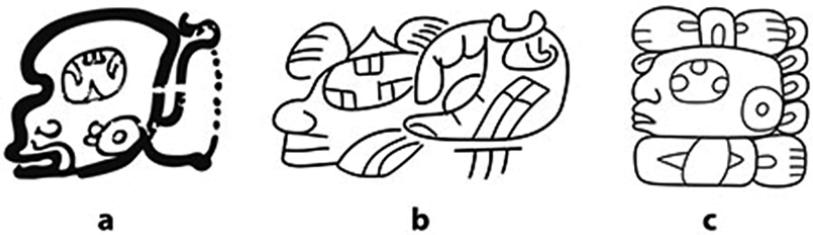

Figure 9. The head sign with the monkey eye element. (a) **X-ni**, Dresden Codex, P. 15-a (after photograph in Grube, 2012); (b) **X-ye-la**, unprovenanced Early Classic jade celt K199a, A4 (after photograph by Justin Kerr, 1989 <http://research.mayavase.com/uploads/kerrfolio/hires/199a.jpg>); (c) **X-ta-no-ma**, Copan Altar U, I2 (after photograph by Alfred Maudslay, <https://www.britishmuseum.org/collection/image/828772001>). Drawings by Sergei Vepretskii.

The suggested interpretation is attractive, although **tzehn*- is a transitive verb root, the suffix-less derivations "fostering, support" and "adopted child" are occasionally attested in Yucatecan languages. Nevertheless, the sign under discussion never substitutes for Diego de Landa's <c>, indicating that the two signs possess different reading values. The **ni** syllable in all six attested spellings suggests that the sign has a syllabic value, perhaps **tze**. Three other attested contexts – **6-X-ni** (page 2b), **mu?-X** (pages 51b and 55b) and **X-WINKIL** (pages 49c, 72b,c and 73c) – cannot be interpreted and actually disfavour the reading value **tze** (for the reading **WINKIL** suggested by David Stuart, see Houston and Schnell, 2018). It still is possible that the sign is a logograph **TZEN** "support, care" and that its reading value, whether logographic or syllabic, has nothing to do with the discussed lexical entry. Importantly, only one of six deities depicted by the discussed glyphic passage holds a plant in its hands.

It should be mentioned that a head sign with the monkey eye element covering its eye and top of the head also forms part of a personal name on two unprovenanced Early Classic jade celts (Figure 9b). The following examples are found: **ma-X-ye CHAN-na-YOP-ʔAT** and **ma-X-ye-la CHAN-na-YOP-ʔAT**, "(The rain god) *Yopʔaat* is not (doing something) in the sky". Alternately, the apparent **ma** syllable could actually be a part of **X**, because Diego de Landa's **ma** also constitutes part of different syllabic and logographic signs: **ma**, **no/TINAM**, **tza**, **tzo**, **tze**, **tz'o**, **tz'e** and **K'INICH**. Our attempts to find a felicitous gloss *sey*- or *tzey*- have turned out unsuccessful. In any case, a sign that is found in combination with two or three syllables is likely to be a syllable, too.

Importantly, the same sign appears as part of an enigmatic title on Copan Altar U, **X-ta-no-ma** (Figure 9c). This context clearly shows that Diego de Landa's

ma is an integral part of the glyph's graphic design because the number of syllables in Mayan lexical words is restricted to one or two. The sign behaves as a syllable in the context under discussion, too. The context strongly suggests that it is a **Ca** syllable because **–no-ma**, *–n-oʔm*, is the composite suffix of agentive nouns derived from *CVC* transitive verb roots, whereas long vowels are banned in non-final syllables (Lacadena and Davletshin, 2013: 16; cf. Kaufman and Norman, 1984: 86). Other agentive nouns of this type are known: **pa-sa-no-ma WAY-ya**, *pasnoʔm way,* "opener of holes" (Copan Stela A, D10-11), **ma-ka-no-ma WAY-ya**, *maknoʔm way,* "closer of holes" (Copan Stela A, D11-12), and **yu-ku-no-ma-CH'EN-na**, *yuknoʔm cheʔn*, "shaker of cities" (Dos Pilas Hieroglyphic Stairway 4, Step III, H2-I1) cf. **mak-* "(t.v.) to close, cover up", **pas-* "(t.v.) to open, unearth, dig up", and **yuhk-* "(t.v.) to shake". For the sign in question, a syllabic value **p'a** would make sense in both contexts: **p'a-ye-la CHAN-na-YOP-ʔAT**, *p'ayeʔl chan yopʔaat*, "(The rain god) *Yopʔaat* is swearing in the sky', cf. **p'aj-* "(t.v.) to swear, curse", and **p'a-ta-no-ma**, *p'atnoʔm*, "one who leaves (something) behind", cf. **p'at-* "(t.v.) to leave behind". Recently, one of the authors (Davletshin, 2020) has revisited the evidence for the ejective bilabial stops *p'* in Hieroglyphic Mayan. Other examples of the medial *-j-* that gives *-y-* in particular morphophonetic contexts are known in hieroglyphic texts: *siyaj* "he/she was born" from the root *sij-* "to be born", and *tayal* "shining", from the root **taj-* "to shine".

It goes without saying that personal names and titles possess loose semantic control so the suggested interpretations and the proposed reading value **p'a** for this sign are uncertain. Intriguingly, the origin of the possible syllable **p'a**? might be related to the word **p'ah* "bird louse" acrophonically, perhaps, clarifying the iconic resemblance of the sign to the **se** syllable, possibly derived from **ses* "bird louse". It is likely that the sign under discussion **p'a**? and the problematic **tze**? syllable from the Dresden Codex are identical, in particular, taking into account the fact all composite syllabic signs are abbreviated in the Dresden Codex (see also comments on the graphic development of **tze** and **tzo** above). In addition, it is worth noting that the shared graphic design in the signs **CHUWEN**, **WA?**, **ʔUH**, **cha**, **se** and **p'a**? might indicate shared visual properties of the objects which the signs in question depict.

Conclusion

To sum up, recurrent graphic differences in various glyphic contexts imply that what has been considered one sign are, in fact, two distinct signs similar in shape that have two different reading values **tze** and **tzo**. Both are attested in combinations with other syllabic signs. The composite sign with the central **TAL**-like element co-occurs with the syllables **lo** and **mo**; its plausible reading value is **tzo**. The composite sign with the central **ko**-like element tends to be associated with the syllables **le** and **he**; its plausible reading value is **tze**. One lexical entry,

tzol- "to count, put in order", supports the identification of the former; another, *letz-* "to go up" supports our interpretation of the latter. In Late Classic inscriptions from Northern Yucatan, both signs undergo the same graphic development, in which the upper and lower elements are eliminated but the central elements are preserved.

Diego de Landa's <c> could potentially be interpreted as either **se** or **tze** based on its representation in his manuscript, but one Classic context, viz. *se* "causative suffix", clearly shows that the reading value of the sign is **se**. Another sign in the Dresden Codex could be interpreted as **tze**. However, this interpretation is restricted to one questionable context and is thus problematic. Importantly, proof for the initial consonant *s* for Diego de Landa's <c> occurs in only one secure context of Classic Period, namely, the causative derivation *ʔu-t'ab'se* "he/she made it lifted". Nonetheless, the reading **se** is considered well established and widely accepted among epigraphers. In this regard, the Classic syllables **tze** and **tzo** both show the same level of validity as the **se** syllable, each one depending on only one reliable context, *letze* "he/she ascended/went up" and *ʔu-tzolow* "he/she counts/puts in order (them)", respectively.

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Appendix: Reconstructed Lexical Entries and Cognate Sets

For the sake of space, only reflexes in Cholan languages are systematically indicated in the following sets, other Mayan languages are presented but scantily; more cognates can be found in available etymological dictionaries (Kaufman and Norman, 1984; Kaufman and Justeson, 2003; Wichmann and Brown, n.d). The orthographies from different sources are normalized. We use the widely established orthography to represent the data from Mayan languages, which is a version of American Phonetic Alphabet. The symbols that differ from the International Phonetic Alphabet symbols are the following: VV = long vowel, C'= glottalized consonant, b' = /ɓ/, x = /ʃ/, tz = /ʦ/, ch = /ʧ/, ty = /tʲ/, y = /j/, and j = /x/. The lexical entries from the Colonial sources (Moran, 1695) are not highly reliable with respect to phonetic transcription; in accordance with the established practice, this is indicated here by surrounding them with angle brackets "<...>". The following abbreviations are used: "n." stands for "noun", "adj." – "adjective", "i.v." – "intransitive verb" and "t.v." – "transitive verb", "etc." – "cognates in other Mayan languages are also attested". "Lowland Mayan" is used for areal terms here, some of them might reflect lexical difussion in (relatively) recent times.

**b'al-* "(t.v.) to cover, protect, hide" /Proto-Mayan: Ch'ol *b'i̱jlel* "(i.v.) ponerse (el sol)" (Aulie and de Aulie, 1998), Chontal *b'i̱le?* "abrigar, recubrir, tapar", *b'al u t'an* "tartamudo" (Keller and Luciano, 1997), Yukatek *b'al-* "(t.v.) to cover, protect, hide" (Bricker, Po'ot and Dzul, 1998), Q'eqchi' *b'alb'o* "escondido (detrás de algo)" (Sam *et al*., 1997), etc.

**b'ojte?* "(n.) wooden wall" /Proto-Western Cholan: Ch'ol *b'ojte?* "pared de madera", *b'ojte?el* "cerca de una casa" (Aulie and de Aulie, 1998), Chontal *b'ojte?* "cercado, cerca (de palos), muro de jahuacte, cerco, corral" (Keller and Luciano, 1997).

**ʔehm-* "(i.v.) to go down" /Proto-Mayan: Ch'ol *ejmel* "(n.) derrumbe" (Aulie and de Aulie, 1998), Chontal *emo* "(i.v.) bajar" (Keller and Luciano, 1997), Ch'olti' <*emel*> "bajar" (Moran, 1695), Ch'orti' *emse* "lower", *ejmar* "down, below" (Hull, 2016), Yukatek *ʔéem-* "(i.v.) to descend" (Bricker, Po'ot and Dzul, 1998), Huastec *emeel* "inclinado, ladeado" (Larsen, 1955), etc.

**jub'-* "(i.v.) to go down, descend" /Proto-Ch'ol: Ch'ol *jub'el* "(i.v.) bajar" (Aulie and de Aulie, 1998), cf. **jub'-* "(t.v.) to hit, destroy, knock over".

**jub'-* "(t.v.) to hit, destroy, knock over" /Proto-Mayan: Yukatek *hub'-* "(t.v.) to disturb, disarrange, loosen" (Bricker, Po'ot and Dzul, 1998), Mopan *jubik* "desbaratar, derribar, botar" (Ulrich and Dixon, 1976), Itzaj *jub'-* "to clear (forest)"

(Hofling and Tesucún, 1997), Tzotzil *jub'an* "(t.v.) beat (eggs)". (Delgaty and Ruíz, 1978), Teco *juub'-i-* "to hit, beat" (Kaufman, 1969), etc.

**kok* "(n.) turtle (small variety)" /Proto-Mayan: Ch'ol *ajkok* "tortuga chica" (Aulie and de Aulie, 1998), Chontal *k'ɨnkok* "pochitoque" (Keller and Luciano, 1997), Yukatek *x=kok-ʔáak*, "small turtle" (Bricker, Po'ot and Dzul, 1998), Tzeltal *kok* "tortuga (pequeña)" (Slocum, Gerdel and Cruz, 1999), Tzotzil *kok* "tortuga" (Delgaty and Ruíz, 1978), Q'eqchi' *kok* "tortuga" (Sam *et al*., 1997), etc.

**k'eʔs* "(adj.) sharp, stiff" /Lowland Mayan: Q'eqchi' *q'es* looks like a borrowing from Ch'orti' and Mopan *k'eʔes* might be a borrowing from a Cholan language too: Ch'orti' *k'esran* "(i.v.) harden up", *k'esres* "(t.v.) harden", *k'es* "(adj.) toasted (by age)", *k'es/k'estuun* "(n.) obsidian" (Hull, 2016), *k'es* "(adj.) toasted (by age)", *k'es* "(n.) vidrio, espejo" (Pérez *et al*., 1996), Mopan *k'eʔes* "(adj.) sharp, (t.v.) sharpen" (Hofling, 2011), Yukatek <*k'es*> "la sal cuando comienza cuajarse en las salinas" (Barrera, 1995), Q'eqchi' *q'es* "(adj.) afilado" (Tema and Cuz, 2004).

**letz-* "(i.v.) to go up, climb" /Proto-Cholan: Ch'ol *letzel* "subir, ascender" (Aulie and de Aulie, 1998), Ch'orti' *letze* "to climb up, mount", *lejtzib'* "belt used in climbing trees" (Wichmann, 1999), "pandearse, curvar la espalda para atrás" (Hull, 2016).

**maq-* "(t.v.) to close, cover up" /Proto-Mayan: Ch'ol *mɨk* "(t.v.) tapar" (Aulie and de Aulie, 1998), Chontal *mɨkeʔ* "encerrar, tapar, cercar" (Keller and Luciano, 1997), Ch'olti' <*maca*> "cerrar" (Moran, 1695), Ch'orti' *maki* "(t.v.) close, cover, enclose" (Hull, 2016), Yukatek *mak-* "(t.v.) to cover" (Bricker, Po'ot and Dzul, 1998), etc.

**pak'-* "(t.v.) to plant, sow" /Proto-Western Mayan: Ch'ol *pɨk'* "(t.v.) sembrar" (Aulie and de Aulie, 1998), Chontal *pɨk'eʔ* "plantar, sembrar, cultivar" (Keller and Luciano, 1997), Ch'olti' <*paca*> "plantar", <*pacbil*> "cosa que se siembra, plantado" (Moran, 1695), Ch'orti' *pak'i* "(t.v.) plant" (Hull, 2016), Yukatek *pak'-* "(t.v.) to plant, sow" (Bricker, Po'ot and Dzul, 1998), Mopan *pak'* "sembrar, plantar" (Ulrich and Dixon, 1976), Itzaj *pak'* "plant" (Hofling and Tesucún, 1997), etc.

**pas-* "(t.v.) to open, unearth, dig up" /Proto-Cholan: Ch'ol *pɨs* "(t.v.) mostrar, enseñar" (Aulie and de Aulie, 1998), Chontal *pɨseʔ* "(t.v.) sacar de debajo de la tierra, desenterrar" (Keller and Luciano, 1997), Ch'orti' *pasi* "(t.v.) open, uncover" (Hull, 2016), etc.

**p'ah* "(n.) bird louse" /Lowland Mayan, the alternative recostruction is **p'aj* because Yukatek and Ch'olti' merged reflexes of **h* and **j*: Ch'olti' <*pa*> "polilla propriamente", <*pa chahk*> "cucaracha" (Moran, 1695), Yukatek *x=p'ah* "chicken louse" (Bricker, Po'ot and Dzul, 1998).

**p'aj-* "(t.v.) to swear, curse" /Lowland Mayan: Ch'ol *p'aj* "(t.v.) maldecir" (Aulie and de Aulie, 1998), Tzeltal *p'ajel* "(t.v.) despreciar" (Slocum *et al*., 1999), Tzotzil *p'ajel* "despreciar" (Delgaty and Ruíz, 1978), etc.

**p'at-* "(t.v.) to leave behind" /Lowland Mayan: Ch'olti' <*pati*> "dejar" (Moran, 1695), Yukatek *p'at-* "(t.v.) to leave, abandon" (Bricker *et al*., 1998), Mopan

p'ɬtik "(t.v.) dejar, abandonar" (Ulrich and Dixon, 1976), Itzaj *p'ɬt-* "to leave" (Hofling and Tesucún, 1997), Tojolab'al *patikan* "dejar atrás" (Lenkersdorf, 1979).

**ses* "(n.) bird louse" /Proto-Cholan: Ch'ol *ses* "avian mite, coloradilla" (Hopkins, Josserand and Cruz, 2011), Ch'orti' *ses* "louse" (Hull, 2016), cf. Tzeltal *jses* "hormiguita" (Slocum, Gerdel and Cruz, 1999).

**sij-* "(i.v.) to be born" /Lowland Mayan: Ch'olti' <*tzialez, tziael*> "engendrar", <*tziahi*> "formado, viviente" (Moran, 1695), Yukatek *síih-* "(i.v.) to be born" (Bricker, Po'ot and Dzul, 1998), Mopan *siil* "naciendo" (Ulrich and Dixon, 1976), etc.

**taj-* "(i.v.) to shine" /Lowland Mayan: Chontal *tajchɬklowan* "(adj.) brillante, al rojo vivo", *tɬjb'en u jut* "apagar la vista, deslumbrar" (Keller and Luciano, 1997), Huastec *tajaab'* "resplandor", *tajab'laab'* "lámpara" (Larsen, 1955), cf. Proto-Mayan **tyaj* "(n.) pine tree, torch".

**t'ab'-* "(i.v.) to go up" /Proto-Cholan: Chontal *t'ɬb'o* "(i.v.) subir, trepar" (Keller and Luciano, 1997), Ch'olti' <*tabse*> "subir" (Moran, 1695), Ch'orti' *t'ab'ay* "go up, ascend", *t'ab'se* "raise up, elevate, put up high, keep safe, lift up" (Hull, 2016).

**tzeel* ~ **t'eel* "(n.) crest (with the sound-symbolic alternations)" /Proto-Western Mayan: Ch'ol *tzel mut* "cresta de pájaro o gallo" (Aulie and de Aulie, 1998), Chontal *ajtze* "gallo" (Keller and Luciano, 1997), Ch'orti' *tzere?* "crest of a bird" (Hull, 2016), Ch'olti' <*tel*> "cresta de toda ave" (Moran, 1695), Yukatek *t'èel* "crest", *h=t'èel* "rooster" (Bricker, Po'ot and Dzul, 1998), Tzeltal *st'el* "cresta (de gallo)" (Slocum, Gerdel and Cruz, 1999), etc.

**tzehl* "(n.) side" /Proto-Mayan: Ch'olti' <*tutze*> "con aquel, con", *tintze* "conmigo" (Moran, 1695), Yukatek *tzéel* "side" (Bricker, Po'ot and Dzul, 1998), Mopan *tzel* "lado" (Ulrich and Dixon, 1976), Tzeltal *chantzehl* "cuadrado (madera, viga)" (Slocum, Gerdel and Cruz, 1999), etc.

**tzehn-* "(t.v.) to feed" /Proto-Mayan: Ch'olti' <*zenu*> "sustentar" (Moran, 1695), Yukatek *tzéen* "person raised by another", *tzéent-* "(t.v.) to feed, rear, nourish, support" (Bricker, Po'ot and Dzul, 1998), Mopan *jubik* "desbaratar, derribar, botar" (Ulrich and Dixon, 1976), Itzaj *tzeen* "food provided, board, rearing", *tzeentik* "sustain, give food" (Hofling and Tesucún, 1997), Huastec *te?neel* "comida" (Larsen, 1955).

**tze?n-* "(i.v.) to laugh" /Proto-Mayan: Ch'ol *tze?ñal* "risa, sonrisa' (Aulie and de Aulie, 1998), Chontal *tze?ne* "carcajada, risa, reír" (Keller and Luciano, 1997), Ch'orti' *tze?ne* "(i.v.) smile, laugh", *tze?ner* "laugh, laughter" (Hull, 2016), Huastec *te?nal* "reír, sonreír", *te?entalaab'* "risa" (Larsen, 1955), etc.

**tzol-* '(t.v.) to put in order, count' /Proto-Mayan: Ch'ol *tzol* "alinear, poner en fila" (Aulie and de Aulie, 1998), Ch'olti' <*tzolo*> "contar cuenta o historia; poner en orden, como procesión" (Moran, 1695), Ch'orti' *tzori* "(t.v.) line up, stack in lines, put into rows" (Hull, 2016), Yukatek *tzol* "(t.v.) explain, advise; put

in order, line up" (Bricker *et al*., 1998), Q'eqchi' *tzol* "fila, surco" (Sam *et al*., 1997), etc.

**yuhk-* "(t.v.) to shake" /Proto-Mayan: Ch'ol *yujkun* "(t.v.) sacudir (planta, árbol)" (Aulie and de Aulie, 1998), Chontal *yukɨn* "mecer" (Keller and Luciano, 1997), Ch'orti' *yujki* "(t.v.) agitate, move around, shake" (Hull, 2016), Yukatek *yúukt-* "(t.v.) to shake" (Bricker, Po'ot and Dzul, 1998), etc.