

*Introduction to*  
*Maya Hieroglyphs*



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Wayeb  
2024

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*Nineteenth Revised Edition*

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## FOREWORD



During the past few decades, we have witnessed groundbreaking developments in the field of Maya epigraphy. The purpose of this handbook is to provide an introduction to the study of Maya hieroglyphs and is designed to be used in conjunction with Maya hieroglyphic workshops. It is our objective to summarize and render comprehensibly the recent developments of Maya epigraphy (i.e. hieroglyph studies). The audience targeted is that of beginners attending Maya hieroglyphic workshops<sup>3</sup>.

The authors wish to receive any possible comments on the contents and structure of this handbook in order for us to be able to produce improved versions in the future. Readers of this handbook are advised to realize, as noted above, that this introduction is intended to be used in combination with the workshops provided, i.e. the handbook only presents a skeleton of the writing system, and to get the best out of the current volume, the reader is suggested to participate in the workshops and lectures provided by numerous individuals and institutes around the world offering workshops on the ancient Maya script.

## ACKNOWLEDGMENTS

Over the years we have had the opportunity and privilege to work in collaboration with the world's best epigraphers and have often had the opportunity to learn of new decipherments first-hand from the people who made these discoveries. As we owe a great deal of our intellectual baggage to the insight of our colleagues, we would like to acknowledge them collectively for their contribution to this workshop handbook, be it conscious or unconscious, direct or unwitting. These are Dmitri Beliaev, Erik Boot, Pierre Robert Colas, Hugo García Capistrán, Nikolai Grube, Stanley Guenter, Stephen Houston, Kerry Hull, Alfonso Lacadena, Barbara MacLeod, Simon Martin, Peter Mathews, Joel Palka, Carlos Pallán Gayol, Christian Prager, Linda Schele, David Stuart, Erik Velásquez García, Robert Wald, Søren Wichmann, and Marc Zender.

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Last but not least, the authors would also like to express more personal gratitudes. The Senior author thanks Asta, Hilla, and Otso Kettunen for their support and affection. The Junior author wishes to thank Reinhart, Françoise and Eric Helmke and Julie Nehammer Helmke for unflagging emotional support.

Due to the fact that this handbook is designed primarily for beginners' purposes and intended to be a concise introduction to the topic, we are unfortunately unable to cite all the people involved in deciphering particular hieroglyphs or producing ideas, insights, and discoveries related to the subject. We would therefore like to apologize for any substantial omissions regarding ignored acknowledgements – and would welcome feedback in this regard.

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<sup>3</sup> This handbook is also designed for more advanced students, and it should be noted here that some parts of the current volume (e.g. Chapter 4. Conventions of Transliterating and Transcribing Maya Texts, Appendix I: Synharmonic vs. Disharmonic Spelling, Underspelled Sounds, and Reconstructed Glottal Fricatives in Maya Hieroglyphic Writing and Appendix J: Notes on Classic Mayan Grammar) are intended for students already exposed to the Maya writing system, and are only expected to be skimmed through by beginners. This Introduction is intended to be as short as possible as regards to the main part of the volume, but additional information is provided to the audience with extra craving for the intricacies of the Maya script.

## NOTE ON THE ORTHOGRAPHY

The conventions of orthography have plagued Maya studies since the very beginning of the discipline. Maya words have been and still are written in sundry fashion. One illuminating example is the numerously used word for ‘lord’ or ‘king’ which appears at least in five different forms in the Maya literature: *ahau*, *ahaw*, *ajau*, *ajaw* and *’ajaw*. Since the ratification of the new official alphabets for the Guatemalan Mayan languages (*Acuerdo Gubernativo numero 1046-87* [23rd of November 1987]) and its modification (*Acuerdo Gubernativo numero 129-88* [2nd of March 1988]), and its subsequent publication (*Lenguas Mayas de Guatemala: Documento de referencia para la pronunciación de los nuevos alfabetos oficiales*), most but not all Maya scholars around the world have started to use the new alphabet in their publications, with one addition, the distinction between h/j for Classic Mayan.

When it comes to the application of this new alphabet, one can notice various ways of dealing with the issue. The conventions of the orthography usually touch four “domains” of groups of words:

- (1) Words in different Mayan languages;
- (2) Maya words that are considered to be somewhat constant in the terminology of the Maya studies (such as day and month names [derived from colonial Yucatec]);
- (3) Place and proper names
- (4) Names of languages and ethnic groups

On the other end of the “scale” are scholars who use new alphabets for the words in Mayan languages but retain the custom of using old (colonial) alphabets for the cases #2-4; in the middle of the scale are scholars with various solutions: some are applying the new alphabet for the Guatemalan Mayan languages only (case #1), and old alphabets for the others; both of these might use either old or new orthography in the case #2. The Maya name for a so-called ‘day’ may be particularly revealing in this regard: e.g. Cauac/Kawak (see the section on Day Names, below).

On the other end of the “scale” are scholars who employ the new alphabets not only in the cases #1-2, but also in the cases #3-4 thus using Yukatan instead of Yucatan, Waxaktun instead of Uaxactun, and K’iche’ instead of Quiche or Quiché. Also, most scholars who have started employing the new orthography in all the cases stated above, still maintain the convention of using traditional orthography for languages and ethnic groups outside the Maya realm, thus using words such as Q’eqchi’, Kaqchikel, and Wastek in the same text with Mixe, Zoque, and Nahuatl instead of using either one of the following sets:

- (a) Q’eqchi’, Kaqchikel, Wastek, Mihe, Soke, and Nawatl
- (b) Kekchi, Cakchiquel, Huastec, Mixe, Zoque, and Nahuatl

Our position in this medley is that of finding a closely argued, consistent, and coherent standpoint. We have chosen to follow the sequent logic: when it comes to the Maya words, whether in the form of the above stated cases #1 or #2, we have chosen to follow the “new alphabet”. In the case of the place names we have chosen *not* to follow the usage of the “new alphabet” since most place names are well established in the geographical vocabulary, including maps and road signs, and, furthermore, reflect a world-wide custom of natural “frozenness” of place names (on the same grounds the cities of Leicester and Gloucester in England retain their old orthographies, and their spellings are not revised to \*Lester and \*Gloster, respectively).

Thus, we are inclined to hold back to the traditional orthography in the case of such place names as Yucatan (not \*Yukatan), Edzna (not \*Etz’na or \*Ets’na), Coba (not \*Koba), and Uaxactun (instead of \*Waxaktun or \*Waxaktuun). Also, the accents represented on Maya words are redundant since all words of Maya origin are pronounced with the stress placed on their last syllable. Thus, the use of Spanish-derived accents is eliminated: thus e.g. Tonina instead of \*Toniná<sup>4</sup>. The only exception is the usage of accents that represent tones in languages such as Yucatec.

However, in the case of the names of the Mayan languages and “nations” we have chosen to follow the “new” orthography on the ground of practicality and rationality: practicality in the sense that the new forms of the languages and nations have been accepted (with some exceptions) by most scholars whether they live in Central

<sup>4</sup> On the same grounds, for example, all words in Finnish (including place names) are not marked with accents due to the fact that in Finnish the stress is always on the first syllable; thus: Helsinki, not \*Hélsinki (asterisks are used here to indicate incorrect spellings).

America, Mexico, North America, or Europe (regardless of the respective languages they employ); rationality in the sense that the new orthographies reflect the names of the languages and nations far better than the older somewhat inconsistent names.

This reasoning is not, however, accepted by some scholars who – with an understandable and well-grounded argumentation – rationalize that the names of the Mayan languages and nations in the English language are *English* words, i.e. it is not reasonable to assume that the change of the orthography of a given language outside of English-speaking world affects *English* orthography. According to the same reasoning, English speaking people use words such as German (not \*Deutsch), visit countries and places such as Brittany (not \*Bretagne), Saxony (not \*Sachsen), and Finland (not \*Suomi), talk about languages such as French (not \*français), Swedish (not \*svenska), and Spanish (not \*español), etc. From our viewpoint, names of the Mayan languages and nations do not fall into a same type of category as the previous examples. They are less well known and less used in common spoken or written language, and are, therefore, more easily to be “revised” if needed.

In this handbook we will follow the new alphabet and new orthography when dealing with *Maya* names and terminology, but we shall continue using the old orthography when employing names of Maya origin that have been incorporated into English. The ‘old’ or so-called ‘Colonial’ orthography is thus used here to render place names (i.e. toponyms). The only adjustment to the orthography used for modern Mayan languages in Guatemala (see above) is the elimination of the redundant apostrophe marking the glottal stop of the bilabial sound /b/ – as there is no opposition (/b/ ~ /b'/) in Mayan languages (except for Spanish loanwords).

## I INTRODUCTION

The earliest known Maya texts date back to the third century BC, and the latest were written around the time of the Spanish Conquest, although it is possible that the tradition to write with hieroglyphs survived until the 17<sup>th</sup> century in areas unaffected by Spanish control, such as in Tayasal in Northern Petén. A very rough estimate of around 5,000 individual texts can be suggested to account for those that have so far been discovered archaeologically or they are found in the museums or private collections around the world. Most of these texts were written during the Classic period (AD 200–900) on ceramic vessels and on stone monuments, such as stelae (sg. stela) and lintels. Besides these we have hieroglyphic texts on a number of other media and locations, such as codices<sup>5</sup>, wooden lintels, stucco façades, frescoes on the walls of buildings, cave walls, animal shells, bones, jadeite, obsidian, brick, clay, etc.

The system of Maya hieroglyphic writing consists of more than one thousand different signs. However, many of these signs are either variations of the same sign (**allographs**) or signs with the same reading (**homophones**), or they were utilized only at a given time period or in a given location. Thus, the total of hieroglyphs used at any one time did not exceed an inventory of more than 500 signs<sup>6</sup>.

The Maya writing system is described linguistically as a logosyllabic system, comprised of signs representing whole words (**logograms**) and **syllables** (syllabic signs, which can either work as syllables or phonetic signs). There are approximately 200 different syllabic/phonetic signs in the Maya script, of which around 60 percent comprise of homophonic signs. Thus, there are some 80 *phonetic* syllables in the Classic Mayan language and about 200 *graphemic* syllables in the script. Once contrasted to other Mesoamerican writing systems, it is apparent that the ancient Maya used a system of writing that had the potential to record linguistic structures as complex as the syntax present in the oral manifestations of their languages. In practice, however, the writing system is a graphemic abbreviation of highly complex syntactical structures and thus many items omitted had to be provided by readers intimately familiar with the language the script records.

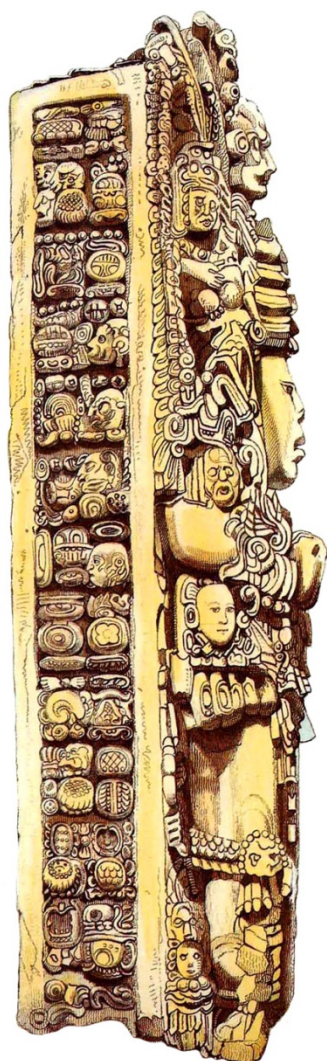
<sup>5</sup> All the four surviving *readable* Maya codices, or books, date back to the Postclassic period (AD 1000–1697). The Maya codices were manufactured using the inner bark of different species of amate (fig tree, *Ficus cotinifolia*, *Ficus padifolia*). These were folded into the shape of an accordion that can be folded and unfolded like a screen. Besides the Postclassic codices, there are a few examples of Classic period codices that have been uncovered archaeologically in burials (cf. e.g. Angulo 1970, Coe 1990, and Fash 1992). However, these codices have been affected so adversely by the tropical climate, that these have been reduced to amorphous heaps of organic remains, plaster and pigment.

<sup>6</sup> Michael Coe (1992: 262) gives a lot lower number of 200–300 glyphs used at any given time with the total of 800 glyphs in the Maya script in general.

## 1. HISTORY OF DECIPHERMENT

The history of the decipherment of the Maya script is an intriguing account, nearly 500 years in duration, wherein a functional understanding of the writing system was pursued, a system that at a first glance looks as alien as can possibly be imagined. It is impossible to relate even the basic features of these histories in this volume, but some outlines of the most important discoveries should be mentioned in order for the reader to be able to comprehend how some of the readings came about.

In 1862, while looking for New World research material at the Royal Academy of History in Madrid, a French clergyman by the name of **Charles Étienne Brasseur de Bourbourg** came upon a manuscript titled *Relación de las cosas de Yucatán*<sup>7</sup> ascribed to bishop **Diego de Landa**. Two years later, Brasseur de Bourbourg published the manuscript as a bilingual edition (Spanish and French) by the name of *Relation des choses de Yucatán de Diego de Landa*.



**Figure 1: Stela A, Copan, Honduras  
(drawing by Frederick Catherwood)**

Three decades prior, American lawyer and travel writer **John Lloyd Stephens** set off with English artist **Frederick Catherwood**, from New York to travel to the Maya area via Belize. During their annual sojourns between 1839 and 1842, they explored ruined Maya sites, wrote reports, drafted maps and sketched ancient sculptures and buildings. Through their efforts they made the “lost cities” of the Maya known for the general audience in two lavishly illustrated volumes: *Incidents of Travel in Central America, Chiapas, and Yucatan* (1841) and *Incidents of Travel in Yucatan* (1843). In the first of these volumes Stephens wrote of Copan:

In regard to the age of this desolate city I shall not at present offer any conjecture. Some idea might perhaps be formed from the accumulations of earth and the gigantic trees growing on the top of the ruined structures, but it would be uncertain and unsatisfactory. Nor shall I at this moment offer any conjecture in regard to the people who built it, or to the time when or the means by which it was depopulated, and became a desolation and ruin; whether it fell by the sword, or famine, or pestilence. The trees which shroud it may have sprung from the blood of its slaughtered inhabitants; they may have perished howling with hunger; or pestilence, like the cholera, may have piled its streets with dead, and driven forever the feeble remnants from their homes; of which dire calamities to other cities we have authentic accounts, in eras both prior and subsequent to the discovery of the country by the Spaniards. One thing I believe, that its history is graven on its monuments. Who shall read them? (Stephens 1993 [1841]: 59).

This challenge was probably put forward by Stephens in view of the fact that the Egyptian script had been cracked (by **Jean-François Champollion**) just decades prior to the publication of his book. However, during Stephen’s times there was no *Rosetta stone*<sup>8</sup> available for the still nascent Maya studies. After the discovery of Landa’s *Relación* by Brasseur de Bourbourg, the scholars thought they had the Rosetta stone of Maya studies at their disposal.

In one of the pages Landa describes what he thought were Maya alphabetic characters. The so-called *Landa alphabet* (see Figure 28) was just about instantly condemned to be a misunderstanding by this Spanish clergyman (which it was – to a certain point at least). Thus, it was assumed that this ‘alphabet’ was useless. Consequently, no correlation or academic examination worthy of consideration were completed during the following hundred years.

One of the problems was that both Landa and the scholars of the late 19<sup>th</sup> century, up to those of the 1950’s, failed to understand that the Maya script was not alphabetic or solely phonetic (or merely

<sup>7</sup> The manuscript is actually an abridgement of a manuscript ascribed to bishop Diego de Landa Calderón, written around 1566 in Spain, but never recovered since. This abridgement proceeded from one copyist to another until a later 17th century version was uncovered by Brasseur de Bourbourg. This version was probably a collection of writings by numerous authors, not only Landa.

<sup>8</sup> The Rosetta stone was discovered in 1798 during the intrusion of the Napoleonic army in Egypt. It contained three parallel texts in Greek, demotic Egyptian, and hieroglyphic Egyptian. The proper names in the parallel texts were the basis for cracking the Egyptian hieroglyphs.



logographic for that matter)<sup>9</sup>. At first scholars tried to apply the Landa alphabet directly (but, time and again, unsuccessfully) to the Maya script. On the other hand – at around the same time – the logograms for calendrical signs depicted in the *Relación* were successfully applied to Maya texts. Based on the success of logographic signs and the failure of so-called alphabetic ones, it was deemed that Maya writing on the whole could not be phonetic<sup>10</sup>.

The study of Maya hieroglyphs advanced towards the 1950's steadily in stages, especially as relates to the glyphs forming the calendrical parts of texts<sup>11</sup>. Perhaps as a direct consequence, the idea was developed that the Maya script was purely logographic. In the same vein, it was presumed that the content of the inscriptions dealt almost exclusively with astronomical and non-historical matters, an idea that prevailed in the academic circles of the time. Attempts to read Maya hieroglyphs (or parts of the hieroglyphs) phonetically were doomed to failure or, conversely, neglected by the leading scholars of the time. However, beginning already in the 19th century, several prolific interpretations were made by a handful of researchers. Nevertheless, all these scholars failed to find a systematic method to fully clarify their ideas.

In 1876, a French academic by the name of **Léon Louis Lucien Prunol de Rosny** proposed in his study *Déchiffrement de l'Écriture Hiéroglyphique de l'Amérique Centrale* that Maya hieroglyphic writing was partly based on phonetic signs. His work on the Maya hieroglyphs and his linguistic background along with his knowledge of other writing systems in the world made him conclude that the Maya script consist of both logograms and phonetic signs. However, third of a century passed by after de Rosny's noteworthy work until the first systematic study of the phonetic content of the Maya script saw daylight.



Figure 2: The “Landa Alphabet” (digital rendering based on a photo by Harri Kettunen, courtesy Real Academia de la Historia, Madrid)

In the beginning of 1950's a researcher from the Institute of Ethnology in Leningrad, **Yuri Knorozov**, tested out the so-called Landa alphabet once again, and compared them with the then few existing reproductions of the three known Maya codices (Villacorta and Villacorta 1933) that the Red Army had apparently stumbled on and ‘rescued’ in 1945 in Berlin.<sup>12</sup>

The method used by Knorozov was to study writing systems, which had already been deciphered. Based on shared similarities between them, and the number of signs used by each type of writing system, Knorozov suggested

that the Maya writing system was comprised of logograms and phonetic signs. In the broad strokes the Maya writing system was thought to resemble the Japanese writing system.

Knorozov set out to test his ideas by using the Landa Alphabet as though it were (partly) comprised not of alphabetic signs, but syllabic ones. The syllabic approach was supported by the fact that this was a typical feature

<sup>9</sup> In 1915 Sylvanus Morley wrote in his *An Introduction to the Study of Maya Hieroglyphs*: “It is apparent at the outset that the first of these theories [that the glyphs are phonetic, each representing some sound, and entirely dissociated from the representation of any thought or idea] can not be accepted in its entirety; for although there are undeniable traces of phoneticism among the Maya glyphs, all attempts to reduce them to a phonetic system or alphabet, which will interpret the writing, have signally failed”. (Morley 1975: 26-27 [our italics]).

<sup>10</sup> Largely due to unsuccessful attempts by linguists like Benjamin Lee Whorf to prove that the Maya script had phonetic signs as well as logographic, Eric Thompson wrote the following in 1950 in his *Maya Hieroglyphic Writing: An Introduction*: “It had been my intention to ignore Whorf’s (1933, 1942) attempts to read the Maya hieroglyphic writing, supposing that all students of the subject would by now have consigned them to that limbo which already holds the discredited interpretations of Brasseur de Bourbourg (1869-70), de Rosny (1876), Charency (1876), Le Plongeon, Cresson (1894), and Cyrus Thomas (1886) [...] Whorf’s writings are a direful warning to those with a similar uncritical approach to the hieroglyphic problems.”

<sup>11</sup> Towards the end of the 19th century, a Saxon librarian by the name of **Ernst Förstemann** studied the calendrical part of Landa’s *Relación* together with the Dresden Codex and other Maya texts. He discovered that the Maya used a vigesimal, or base twenty, system in their calculations, and that they employed the concept of zero in their mathematical system. Förstemann also worked out the Venus tables, the Tzolk’in calendar, and the lunar tables in the Dresden codex, and discovered the Long Count system in Maya monumental texts. Early 20th century saw other discoveries, such as the identification of head variants for Maya numerals and the correlation between the Maya Long Count dates and Gregorian dates by **Joseph T. Goodman**, an American journalist.

<sup>12</sup> Kettunen 1998a & 1998b. Note that Knorozov never entered Berlin during the Second World War but, rather, became familiar with the Villacorta edition in post-war Soviet Union.

of other ancient scripts which had been deciphered previously. He applied some of these signs directly to the corresponding ones in the Maya codices. One of the signs in the codices was Landa's **cu**<sup>13</sup> followed by a then unknown sign. These signs were above a figure representing a turkey, and, consequently, Knorozov assumed that the glyph represents the animal depicted<sup>14</sup>. This assumption was supported by the repeated association between that glyphic collocation and the representation of the turkey in the codices.

In Yucatec Mayan the word for 'turkey' is *kutz* (*cutz* in the old orthography; also used by Knorozov; hence the words below are written in the old orthography to avoid anachronisms). Knorozov reasoned that the first sign might represent the syllable **cu**, also represented in the "Landa Alphabet", while the second ought to be **tzu** (assuming that the last vowel was dropped since most Mayan words end with consonants, and the vowel in the end he presumed to be /u/ according to the **principle of synharmony**)<sup>15</sup>.

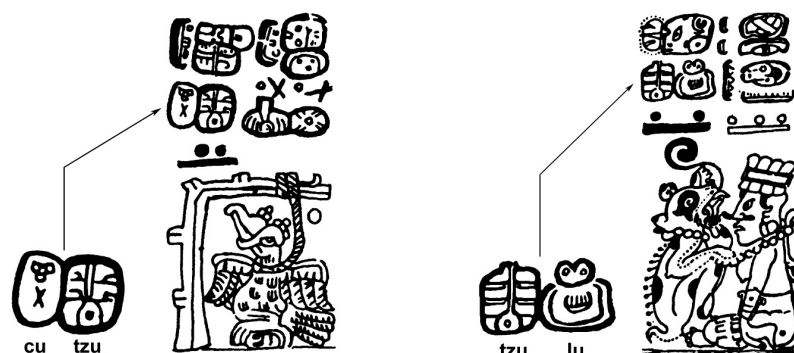


Figure 3: Details from the Madrid and Dresden Codices, respectively (drawings by Carlos A. Villacorta)

As a result, he reached the conclusion that the signs read: **cu-tz(u)**. To verify this, Knorozov looked for a glyph that started with the sign **tzu** – and found it above a picture depicting a dog (*tzul* in Yucatec), and, consequently, the signs ought to be **tzu** and **lu**.

Knorozov went on with other glyphs in the codices – and arrived at a result which was going to divide the established school of Maya hieroglyphic studies in the Western academic tradition.

This rather straightforward theorem and its associated method provided the key for the phonetic reading of various glyphs in the Maya script, and irrevocably changed the course of the Maya hieroglyphic studies. However, change in the field would not be visible for another twenty years, largely due to the cold war politics of the iron curtain, language barriers and lack of communication between academic arenas<sup>16</sup>.

Besides the work of Knorozov, the 1950's and 1960's saw two other developments in the decipherment of the Maya script. Both of these were to have an important impact on the discipline. In late 1950's, **Heinrich Berlin**, a German-born grocery wholesaler living in Mexico, discovered what he called "el glifo 'emblem'" ("Emblem Glyphs"): hieroglyphs that are linked with specific cities or lineages in the Maya inscriptions<sup>17</sup>. In 1960, **Tatiana Proskouriakoff**, a Russian-born American,



Figure 4: Lintel 8, Yaxchilan, Mexico (drawing by Ian Graham).

<sup>13</sup> This is **ku** in the new orthography (see chapter 'Note on the Orthography').

<sup>14</sup> The 'Knorozovian method' is simplified here, and below, to provide readers with a rough grasp on how the system works. For a more detailed analysis one should consult either the studies including analyses of the Knorozovian method (e.g. Coe 1992 and Kettunen 2024), or, preferably, work by Knorozov himself.

<sup>15</sup> Already in 1876, de Rosny had applied the Landa Alphabet for Maya codices. He also used Landa's **cu**-sign for the first symbol in the glyph depicting a turkey in the Madrid Codex – and speculated that the complete hieroglyph might stand for *cutz*, or "turkey" in Yucatec.

<sup>16</sup> In his book *Maya Hieroglyphs Without Tears* Thompson writes: "Overmuch space has been assigned to this 'system' because it has attracted amateurs and a sprinkling of linguists with little or no knowledge of Maya hieroglyphs; keys to codes and simple explanations of complex matters have strange powers to allure. I know of only one serious student of the subject who supports the Knorozov system, and he with reservations." (Thompson 1972: 31).

<sup>17</sup> Berlin 1958: 111-119.

published for the first time evidence that the texts of Maya monuments did indeed contain historical records<sup>18</sup>. Around the same time the “great names” in the field of Maya studies, **J. Eric S. Thompson** and **Sylvanus G. Morley**, declared that the Maya hieroglyphic corpus merely contained dates without any historical information. They also argued that the texts on ceramic vessels were crude copies of monumental inscriptions without any meaning or any linguistic value.

## 2. ORIGINS OF THE MAYA SCRIPT

The Maya were not the first or last to develop writing systems in Mesoamerica. Before the emergence of the first known Maya hieroglyphs (in the third century BC) – or possibly around the same time<sup>19</sup> – writing systems already existed in at least three cultural areas in the region: in the so-called Olmec heartland in the southern coast of the Gulf of Mexico, in the Oaxaca Valley, and in the highland valleys of Alta Verapaz in Southern Guatemala.

Writing in Mesoamerica developed during the late Olmec times, around 700–500 BC, and possibly originated from Olmec iconography that preceded it. Whether this early ‘writing’ is true writing – or merely a composition of pictorial elements that do not represent sounds of any given language – can be debated<sup>20</sup>. This writing system was later separated into two traditions in two different areas: the highlands of Mexico, and the highlands of Guatemala and Chiapas with an adjacent area in the Guatemalan Pacific coast.

The first known signs that can be identified as part of the Maya hieroglyphic writing system can be found at San Bartolo in present day Northern Guatemala<sup>21</sup>. In Structure 1 of San Bartolo one can find early versions of at least 4 signs (syllables/syllabograms **mo**, **po**, and **ja**, and a sign for ‘lord’ or **AJAW**<sup>22</sup>). Other early textual indications from the Maya Lowlands of known archaeological context come from the site of Cerros in Northern Belize. On the masonry masks fronting Structure 5C-2<sup>nd</sup> two glyphs can be identified: **YAX** (blue-green / first) and **K’IN** (sun / day). Roughly contemporaneous to the Cerros example is a masonry mask from Lamanai Structure N9-56 which bears the glyph for **AK’AB** (night / darkness) on its cheek.

Yet another early Maya text is found on a reused Olmec greenstone pectoral (the so-called Dumbarton Oaks jade plaque, Figure 5), which can be dated stylistically as being contemporaneous to the Cerros masks. On the back of the jadeite pectoral are incisions representing the portrait of a seated Maya ruler and two double columns of hieroglyphs.



Figure 5: Text and image from a reused Olmec greenstone pectoral (drawing by Harri Kettunen)

In another early text, a carving on a cliff at the site of San Diego, southern Peten, a standing Maya ruler is depicted with a double column of 19 glyphs. This carving shows that the layout for recording dates (the first two [missing] glyphs, the large Initial Series Introductory Glyph (commonly referred as an ISIG-sign<sup>23</sup>), and the following four

<sup>18</sup> Proskouriakoff 1960: 454-475.

<sup>19</sup> See Saturno, Taube, and Stuart 2005 & Saturno, Stuart, and Beltrán 2006.

<sup>20</sup> See Houston 2004.

<sup>21</sup> See Saturno, Taube, and Stuart 2005 & Saturno, Stuart, and Beltrán 2006.

<sup>22</sup> See Saturno, Taube, and Stuart 2005.

<sup>23</sup> See

glyphs) was still fairly flexible and inconsistent. This carving, along with the Dumbarton Oaks jade pectoral, represents the events that were to be most frequently documented on subsequent Maya monuments, namely bloodletting and royal accession. From the beginning of the Classic Period (ca. AD 250) the Maya script developed into a more consistent and more rigid system that is explained in the following chapters.

### 3. LANGUAGE(S) OF THE HIEROGLYPHS

Until very recently the study of Maya hieroglyphs was a linguistic oddity. Most scholars in the field worked with their respective languages when translating Maya hieroglyphs – and did not realize that the key to understanding Maya hieroglyphs is a basic working knowledge of (at least one) Mayan language. Obviously until the work of Knorozov and Proskouriakoff<sup>24</sup>, there were few tools to work with in the first place. However, most scholars at the time suffered from a type of scientific myopia, as none tried to apply any of the modern Mayan languages to the ancient script. Nowadays it is well established that the languages of the glyphs are very similar to several modern Mayan languages.

Today there are approximately 30 Mayan languages spoken in Southern Mexico, Yucatan, Belize, Guatemala, and Honduras constituting a population of approximately six million speakers. These languages are vaguely distinguished between the highland and lowland Mayan languages. Most likely the highland Mayan languages, or linguistic subgroups, i.e. Q'anjobalan, Q'eqchi'an, Mamean, K'iche'an, and Tojolabalan, had little or nothing to do with the hieroglyphic texts that have preserved to this day. On the other hand, the lowland subgroups, Ch'olan, Tzeltalan, and Yucatecan, are more intimately related to the ancient script.

Nowadays there is substantial evidence that nearly all the Maya hieroglyphic texts were written in an Eastern Ch'olan language, which has been labeled as "Classic Maya", "Classic Mayan" or "Classic Ch'olti'an" (Houston, Robertson, and Stuart 2000) by the linguists. The closest modern relative of this language is Ch'orti', which is spoken in a relatively small area in Eastern Guatemala and Western Honduras (near the ruins of Copan). Besides the Classic Mayan language there is some evidence of the influence of other lowland languages in the Maya hieroglyphic corpus: Tzeltalan in a few texts at Tonina, Yucatecan at various sites in the northern part of the Yucatan peninsula, and isolated Nahuatl words that appear in various texts<sup>25</sup>. Moreover, evidence of the influence of Highland Mayan language(s) in Chama and Nebaj style ceramics has recently been asserted by several scholars (see Beliaev 2005).

## II THE WRITING SYSTEM

### 4. CONVENTIONS OF TRANSLITERATING AND TRANSCRIBING MAYA TEXTS<sup>26</sup>

*When it comes to transliterating Classic Maya texts, the following rules are applied in this volume:*

- (1) Transliterations should be represented in **boldface** letters
- (2) Logograms should be written in **BOLDFACE UPPERCASE** letters
- (3) Syllabic signs (syllabograms) should be written in **boldface lowercase** letters
- (4) Individual signs within a given glyph block should be separated by hyphens (dashes)
- (5) Question marks should be used in the following manner:
  - (a) Separated by hyphens within a given glyph block when the reading is not known
  - (b) Standing alone (isolated) when the reading of a whole glyph(block) is not known

---

Appendix E: Note on the **Calendar**.

<sup>24</sup> Proskouriakoff herself never accepted Knorozov's phonetic approach but, on the other hand, she established the structural methodology to the study of Maya glyphs still used today. This structural approach requires no assumption about the character of the language under investigation.

<sup>25</sup> Lacadena and Wichmann 2000, 2002b and Alfonso Lacadena, personal communication 2010.

<sup>26</sup> *Transliteration* refers to the conversion of one writing system into another whereas *transcription* refers to the method of conveying the sounds of the source word by letters in the target language (Crystal 2008: 490, 494). Note that this practice is in reverse order from that of the previous editions of this workbook. The logic behind the adjustment of the terminology is in the fact that these two terms are used in a reverse order in most schools in linguistics around the world – and also in Maya epigraphy in Spanish.

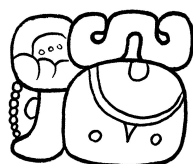
- (c) Immediately following a transliterated syllabogram or a logogram when the reading of a given sign has not been fully attested or is otherwise questionable or uncertain.
- (6) *Reconstructed* (analyzed) sounds, such as underspelled sounds, glottal fricatives (/h/), and glottal plosives/stops (ʔ), long vowels or any complex vowels for that matter should not be represented at this juncture of the transliteration process. This practice extends to logograms as well, which should be represented in their simplest possible form. The transliteration we use is otherwise known as a **broad** transliteration – excluding all analyzed sounds that are not inherent parts of hieroglyphs but were, conversely, indicated by orthography rules (based on historical and comparative linguistics and internal evidence from the writing system itself).

As regards to transcribing Maya texts, the following rules are applied:

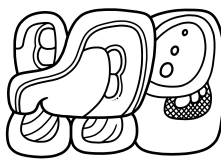
- (1) Transcriptions should be represented in *italics*
- (2) Long vowels and glottal sounds derived from orthography rules<sup>27</sup> are to be indicated without [square brackets]; whereas:
- (3) Reconstructed sounds based on historical, internal, or paleographic evidence should be represented in [square brackets]. Thus, the transcription practice we use is called a **narrow** transcription (including reconstructed sounds based either on historical, internal, or paleographic evidence – instead of **broad** transcription that excludes these reconstructions).

There are different ways of analyzing texts linguistically. The two most common ones are presented on page 78, being described as *morphological segmentation* and *morphological analysis*. The first stage of linguistic analysis represents morphological boundaries divided by hyphens. So-called zero-morphemes are represented by a Ø-sign. In the second type of linguistic analysis the grammatical description of the words is made explicit. There are several methodological ways to describe these components, and the decision is usually left for editors in case of publications. Here we use lowercase letters for glosses<sup>28</sup> and CAPITAL LETTERS for linguistic terminology.

The following is to serve as an example how the above indicated stages function:



1. **a-wo-la**
2. *awo[h]l*
3. aw-ohl
4. 2SE-heart
5. "your heart"



1. **chu-ka-ja**
2. *chu[h]kaj*
3. chu[h]k-aj-Ø
4. capture[PAS]-THM-3SA
5. "he/she was captured"

1 = transliteration

2 = transcription (& phonological reconstruction)

3 = morphological segmentation

4 = morphological / morpho-syntactic analysis<sup>29</sup>

5 = translation

When translating Maya texts, one should keep in mind that there are various ways of interpreting given words and sentences. Quite often one finds rather rigid translations (or more precisely glosses/glossing) of given texts where the sentences are translated (or glossed) word-to-word. One should keep in mind that this is not a real translation *per se* but rather a method to show how the sentence is structured in the original language as opposed to the (target) language into which the sentence is translated.

The actual translation can also be divided into different stages and versions where one can move from rigid to less strict translations. The actual meaning of a word or a clause might be different in another language, but the original concept should be preserved at least in one of the stages of translating the text. In the example on page 17 the expression "his/her (?) white wind/breath got withered" serves as a metaphor or as a euphemism for the targeted meaning of "he/she died." However, such a 'loose translation' can only be achieved by understanding the culturally specific idiom, which is used – thereby eliminating the subtleties of the original expression.

<sup>27</sup> See from page 63 onwards in this volume.

<sup>28</sup> A gloss is a short general translation of a word or morpheme which does not take into account the context in which it occurs.

<sup>29</sup> PASsive voice, THeMatic suffix, 3rd person Singular Absolutive pronoun. See also Glossary of Linguistic Terminology.

As regards translating Maya names and titles, we are leaning towards the routine of *not* translating them at all – or translating only well-attested titles. This approach is based on the fact that the concepts which these embody are not easily translated by a single word in English (as volumes may be written on each concept to clarify the specific meaning of each title).

Modus operandi<sup>30</sup>:

1. Select a text
2. Transliterate the text
  - a. Do not mark reconstructed sounds
  - b. Use **lowercase bold** for syllabic signs
  - c. Use **UPPERCASE BOLD** for logograms
3. Transcribe the text
  - a. use *italics*
  - b. all reconstructed sounds (except for those based on orthography rules should be represented in *[square brackets]*)
4. Analyze the text
  - a. divide morphemes by hyphens
  - b. mark grammatical elements
5. Translate the text using different stages of translation

Finally, one should go back to the original (hieroglyphic) text, and *through these steps*, understand it. Eventually you should reach the point where you go back to the original text and understand it without the restrictions of your innate grammar.

---

<sup>30</sup> During the Maya hieroglyphic workshops, it is not sensible or even possible to go through with all the stages listed here. More commonly, a strategy of *structural analysis* is employed along with basic transliterations, transcriptions and translations.

## 5. READING ORDER

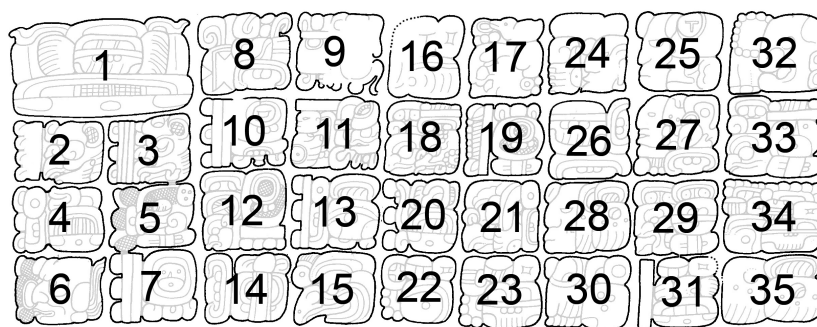


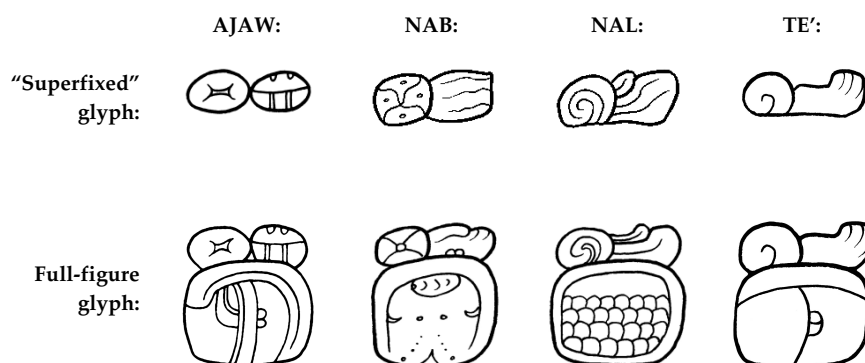
Figure 6: Reading order of the text on the basal register of Stela 11 from Yaxchilan.

As a rule, the Maya texts are written from left to right and from top to bottom in columns of two. Exceptions to this general rule are known, especially in small portable items, ceramic vessels, lintels, uncommon graffiti, and texts painted on cave walls. There are also texts written in mirror image, but these are extremely rare. For the texts that do not follow the general rule, the reading order is determined either by looking into the structure of the passage(s), or comparing it with other **parallel clauses** (sentences recording similar or identical content with a similar or identical syntax structure)<sup>31</sup>.

Reading order within any glyph block usually follows the same rule as with the whole text: from left to right and from top to bottom. However, instances are known wherein aesthetic considerations might compel a scribe to rearrange the individual elements within a collocation.

Most common *prima facie* exceptions to the internal reading order rule are the **AJAW** glyph, and the locative **NAL** superfix, which are seemingly placed on top of a given glyph but read last: e.g. **K'UH AJAW-wa MUT-la** (The Holy Lord of Tikal) is read *k'uhul Mutul ajaw*, and **NAL-yi-chi** is read *yichnal*.

This seeming exception follows the third type of internal reading order, i.e. that of front to back. For example, even though the **NAL** glyph is *graphemically* written on top of the **yi** and **chi** glyphs, it was actually perceived by the Maya as a full-figure **NAL** glyph with only the topmost part visible behind the **yi** and **chi** glyphs.<sup>32</sup>



<sup>31</sup> Note that the letters designating glyph blocks (such as A1-B1-A2-B2-A3 and so on) do not always correspond the reading order in texts with unconventional reading orders. I.e. the letters and numbers only give the reader a point of reference in a given text when one is communicating about the glyphs with other scholars without seeing the glyphs themselves.

<sup>32</sup> For comparison, see the **AJAW** glyphs on page 15.

## 6. COMPOUND GLYPHS, INFIXING, AND CONFLATIONS

The graphic conventions of Maya hieroglyphic writing form a very flexible system, but quite often these are for the most part just puzzling for an untrained eye. There are several ways of writing the same word without changing the reading and / or meaning. *Chum tuun* means “stone-seating” and refers to the beginning of the 360-day period. This can be written in various manners:

CHUM[mu]<sup>33</sup> TUN-ni

CHUM with infixed phonetic complement /mu/ & TUN with phonetic complement /ni/

*independent* glyph blocks



CHUM[mu] TUN-ni

CHUM with infixed phonetic complement /mu/ & TUN with phonetic complement /ni/

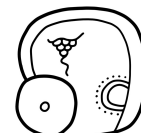
*compound* glyph blocks with *suppressed* left sign



CHUM[TUN-ni]

TUN-ni infixed inside the CHUM glyph

*infixation*



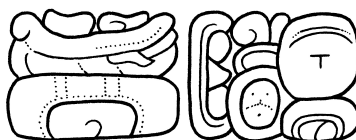
CHUM-TUN (or CHUMTUN)

conflation of both signs

*conflation*: merging of the diagnostic traits of two distinct signs into one

Any one of the arrangements above can occur in any text and more than one can be used in a single text. The reason for this is both economic and artistic: sometimes the scribe might have run out of space, and sometimes variations were used to avoid repetition or *graphemic tautology* (see also the variations with logograms and phonetic complements below).

In the following example, the metaphorical death statement of Itzamnaaj Bahlam, the king of Yaxchilan, and Lady Pakal, his mother, is recorded in the same monument in two different (but parallel) ways, with the latter being compressed to cover a space of one glyph block instead of two:



K'A'-yi u-[?]SAK-ik'-li

*k'a'ay / k'a'aay u...? [u]sak ik'[il] / ik'[aal]*

k'a'-ay-Ø / k'a'-aay-Ø u-? [u-]sak-ik'-il / -ik-aal  
wither-MPAS-3SA 3SE-? [3SE-]white-wind?-POS

“It got withered, his/her ?, his/her white wind/breath”?

(Yaxchilan, Lintel 27: A2-B2)



K'A'-yi-u-[?]SAK-ik'

*k'a'ay / k'a'aay u...? [u]sak ik'[il] / ik'[aal]*

k'a'-ay-Ø / k'a'-aay-Ø u-? [u-]sak-ik'[-il] / -ik[-aal]  
wither-MPAS-3SA 3SE-? [3SE-]white-wind?

“It got withered, his/her ?, his/her white wind/breath”?

(Yaxchilan, Lintel 27: F2)

In addition, different signs of equal phonetic value might be used variably throughout a text, again for aesthetic reasons. It is due to such interchangeability that signs of unknown value can be deciphered if the case is made that it equates another glyph of known value.

<sup>33</sup> Square brackets [...] are used in *transliterations* to designate infixed syllables or words (and in epigraphic analysis to indicate reconstructed sounds).



	<b>ya-YAXUN?-BALAM</b> <i>Yaxuun? Ba[h]lam</i> (Yaxchilan, Lintel 21: D7)		<b>ba-ka-ba</b> <i>ba[ah]kab</i> (K2914: O5)
	<b>ya-YAXUN?-BALAM-ma</b> <i>Yaxuun? Ba[h]lam</i> (Yaxchilan, Lintel 30: G2)		<b>ba-ka-ba</b> <i>ba[ah]kab</i> (Yaxchilan, Lintel 2: Q1)
	<b>ya-YAXUN?-BALAM</b> <i>Yaxuun? Ba[h]lam</i> (Yaxchilan, Hieroglyphic Stairway, Step VII: Q6)		<b>ba-ka-ba</b> <i>ba[ah]kab</i> (Yaxchilan, Lintel 46: J1)
	<b>ya-YAXUN?-BALAM</b> <i>Yaxuun? Ba[h]lam</i> (Yaxchilan, Lintel 43: B2)		<b>ba-ka-KAB</b> <i>ba[ah]kab</i> (K7146: A6)
	<b>ya-xu?-nu BALAM-ma</b> <i>Yaxun? Ba[h]lam</i> (Najtunich, Drawing 69: A1-A2)		<b>ba/BAH-ka-ba</b> <i>ba[ah]kab / ba[a]hka</i> (Denver Panel: pA6b)
	<b>ya-xu?-ni BALAM</b> <i>Yaxuun? Ba[h]lam</i> (Yaxchilan, Stela 12: D4-C5)		<b>ba-ka-ba/BAH</b> <i>ba[ah]kab</i> (Ek Balam, Mural of the 96 Glyphs: M1)

Patterns like these stumped early efforts at decipherment and are thus important to understand. Consequently, such patterns are explored in the following section.

## 7. LOGOGRAMS

The Maya writing system is a mixed, or *logosyllabic*, system, utilizing both **logograms**, and **phonetic** signs. Logograms are signs representing meanings and sounds of complete words. In the two examples below, the word for mountain, or *witz*, is written in two different ways, but both of them read *witz*. The one on the left is a (head variant) logogram, and the one to the right is a logogram with a *phonetic complement* (see the chapters below) attached to it.



**WITZ**  
*witz*  
"mountain"



**wi-WITZ**  
*witz*  
"mountain"

As a rule, the more frequently a given word is present in the hieroglyphic corpus, the more variations it appears to have. A revealing case is that of the word *ajaw* or "lord" which offers dozens of different variations, including:



### 8. SYLLABOGRAMS / PHONOGRAMS

The Maya writing systems uses, besides logograms, also phonetic signs in expressing syllables, or more precisely: *syllabograms* or *phonograms*. These syllables can either work as CV (consonant-vowel) syllables, or C(V) sounds (the sound of the consonant without the sound of the accompanying vowel). As a rule,



← **wi**

← **tzi**

the last vowel of the last syllable in a given word drops out (and as always, there are exceptions to this rule). Thus, the word for mountain, *witz*, can be written phonetically with two syllables, **wi** and **tzi**. Since the last vowel is discarded (due to the harmony principles), the word reads **wi-tz(i)** > *witz*.

### 9. PHONETIC COMPLEMENTS

A phonetic complement is a sign that “helps” the reading of the logogram. It is a pronunciation “assistant” in cases when the main sign has more than one possible reading. Phonetic complements are very common in the Maya script, and they have also played a major role in the modern decipherment of the Maya writing system. Phonetic complements, which cued ancient Maya readers, also cue modern readers thereby facilitating the reading of ambivalent logographic signs. Although common, it is worth noticing that at the same time the distribution of phonetic complements is not uniform, especially when they precede logograms. In the following example, the syllable **wi** (shaded sign) works as a phonetic complement for the logogram **WITZ**. The presence of the prefixed syllable **wi-** therefore informs us that the word represented by the logogram also begins with the phonetic value *wi-*...

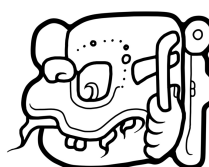


wi-WITZ  
*witz*  
“mountain”

In the example below, the syllabogram **ki** (shaded sign) is attached to the zoomorphic logogram to provide the final sound ...-k of the word *Chahk* (or *Chaak*) to distinguish it from another reading of a similar head in the word *Kalomte'*.



CHAK-ki  
*Chahk / Chaak*  
Name of a deity

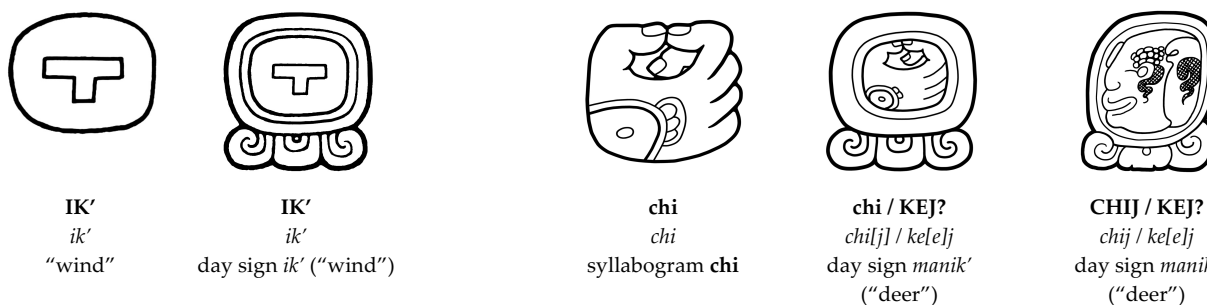


KAL-TE'  
*Kalomte' / Kaloonte'*  
Exalted royal title

### 10. SEMANTIC DETERMINATIVES AND DIACRITICAL SIGNS

A semantic determinative is a sign that specifies the meaning of certain logograms that have more than one meaning. Semantic determinatives, however, are without phonetic value (cf. Zender 1999: 14). The most oft-cited

example of a semantic determinative in the Maya script are the cartouches and pedestals that frame so-called ‘day signs.’ However, based on the interpretation by Alfonso Lacadena (personal communication, 2014), the cartouche and the pedestal actually read *k’in* for ‘day’ rather than being semantic in function. This appears to be evident especially in some texts in northern Yucatan. The interpretation is compelling, and it calls for further examination.



Diacritical markers are signs without phonetic values that assist the reader in expressing the intended pronunciation of a sign or word. Good examples of diacritical marks in Latin-based languages are the ‘cedilla’ of the French word *façade*, as well as the many accents occurring in other European writing systems.

In the ancient Maya writing system, another, more common diacritical sign is represented by a pair of small dots. The most common position of this diacritic is at the upper or lower left-hand corners of syllabic signs (for an example, see *kakaw* below). This diacritic is known as a “syllabic doubling sign”, and as the name implies, serves to



<sup>2</sup>ka-wa  
kakaw  
“cacao”

double the phonetic value of the adjacent sign. Thus, for example, a **ka** syllabogram is read *kak(a)*, or a **le** sign read *lel(e)* when marked with the pair of dots. In glyphic transliterations the presence of this diacritic is marked with a number 2 in a position where it occurs in association with a syllabogram or logogram – usually superfixed and prefixed as <sup>2</sup>ka or <sup>2</sup>le (using the examples cited above), although all four positions are possible:

<sup>2</sup>X<sup>2</sup>  
2X2

Detailed research reveals that these two dots serve to double the value of syllables / syllabograms, exclusively. In the rare instances where this diacritic marks logograms, it is apparently meant to double value of syllabograms that occur towards the end of internal reading order of glyphic collocations (that is at the bottom or right-hand side of collocations). Consequently, the favored position of this diacritic is at the beginning of glyphic collocations. This positioning serves to cue the reader that doubling occurs within that specific glyph block. Also, on some rare occasions the same diacritic sign marks CVC-logograms (words with consonant-vowel-consonant structure) that begin and end with the same consonant. Good examples of these are the logograms **K’AK’** “fire” and **CH’ICH’** or **K’IK’** “blood”.

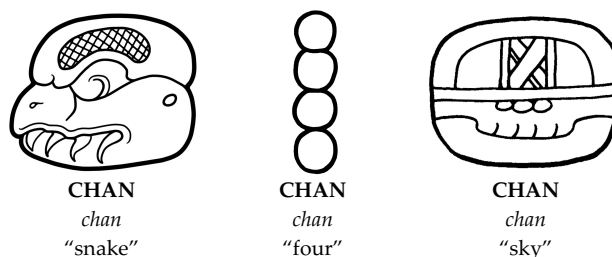
## 11. POLYVALENCE: POLYPHONY AND HOMOPHONY

One more confusing feature in the Maya writing system is *polyvalence*. In fact, this feature is found in every single language in the world, but what makes it knotty in the case of the Maya script, is that it adds to the complexity of the system for an untrained eye. *Polyphony* (or *homography*) means that a given sign has different sound values, and thus may be read differently (although written the same way). In the Maya writing system, words (or sounds) that are read *tuun* and *ku*, can both be written in the same manner, although in most cases the word for stone is written with a phonetic complement **-ni**.



TUN / ku  
tun-tuun / ku  
“stone” / syllabogram ku

*Homophony*, on the other hand, means that different signs represent the same phonetic value, as in a syllable or word. In the Maya script, the words for snake, four, and sky are pronounced in the same manner (*chan* or *kan* depending on the language) but they are all written using different signs:



All of the above might appear rather peculiar and foreign to most people that are used to operate with Latin alphabet. However, our system also consists of letters and signs (logograms) that might appear alien to an eye untrained to Latin alphabet. Also, especially in the case of languages with unsystematic (and less phonemic) orthographies (such as English and French), the varying pronunciation of identical letters causes problems with speakers of other languages.

An enlightening example is the sequence of letters <ough> that can be pronounced in nine different ways, as in the following sentence (which includes all of them): "*A rough-coated, dough-faced, thoughtful ploughman strode through the streets of Scarborough and after falling into a slough, he coughed and hiccoughed*". Another revealing example is that of letter "x" which is pronounced in various ways in the following examples:

letter:	pronunciation:	example:
X	/s/	'xenophobia'
X	/ks/	'excel'
X	/gz/	'exist'
X	/kris/	'Xmas'
X	/kros/	'Xing'
X	/ten/	'(Roman numeral) ten'

Other meanings for the letter "x" are, for example, the following:

X	number 10
X	24th letter in the alphabet
X	unknown quantity
X	multiplication sign
X	negation (e.g. no smoking)
X	pornographic (X-rated)
X	location of place, object, etc.
X	signature of an illiterate

Other "logograms" in our system:

@ £ \$ % & ? ! + § © € ♀ ♂ ®

Additionally, in English<sup>34</sup> there are dozens of homographs, and hundreds of homophones. Consider the following examples:

#### homographs:

- *conduct* ['kɒndəkt] (a standard of personal behavior) — *conduct* [kən'dəkt] (to manage, control, or direct)
- *minute* ['mɪnɪt] (a unit of time and angular measurement) — *minute* [maɪ'nju:t] (of very small size or importance)

<sup>34</sup> The examples given here are based on Hobbs 1999.

**homophones:**

- *buy —by —bye*
- *cite — sight —site*
- *right —rite —wright —write*
- *who's —whose —hoos —hoose* (verminous bronchitis of cattle)
- *weather —whether —wether* (a castrated male sheep)

**12. NUMBER OF KNOWN HIEROGLYPHS**

One of the most common questions to epigraphers concerns the number or percentage of deciphered hieroglyphs. The answer is somewhat more complex than one might expect. First of all, we have to consider what we mean by “deciphered”. If we were to calculate the number of hieroglyphs whose *phonetic value* we know, the total would be around 80 percent. On the other hand, if we were to estimate the number of signs whose *meaning* is securely attested, the number is considerably lower, around 60 percent. The problem lies in the fact that there are several hieroglyphs in the script whose:

- phonetic value is known but the meaning escapes decipherment (more commonly in the case of fully phonetically written signs)
- meaning is known but the phonetic value is uncertain, vague, or not known at all
- phonetic value and meaning are only partly known (for example a word standing for a ritual that was performed before adulthood)
- phonetic value and meaning are only partially known, or not at all

		phonetic value:	
		yes	no
meaning:	yes	completely deciphered	gray area
	no	gray area	completely undeciphered

Furthermore, one needs to take into account the distinction between tokens and types, i.e. how many times a certain sign appears in the corpus vs. how many different signs there are in the corpus (Kettunen and Cases 2013; Kettunen 2014). Yet another problem is that of what we mean by saying that the meaning of a particular hieroglyph is known. The meaning of a single hieroglyph or a set of hieroglyphs in a sentence might be known<sup>35</sup> but the profound contextual significance and implications of the word and sentences need to be checked against all other possible sources, such as ethnology, archaeology, iconography, and present-day manifestations of the Maya culture(s). In a word, Maya epigraphy at its best is a multi- and interdisciplinary branch of learning heavily based on linguistics but taking into account all possible sources and academic disciplines.

On the whole, in all its complexity, the Maya hieroglyphic system is merely one way to make a spoken language visible, and to quote the late Yuri Knorozov: “I believe that anything invented by humans can be deciphered by humans” (Kettunen 1998a).





















<sup>35</sup> A further distinction is made between a *gloss* and a *translation*: a gloss provides a reading for an isolated hieroglyph whereas an accurate translation takes into account the syntax and semantics in the sentence.



# III GRAMMAR

## 13. WORD ORDER

The word order in the Maya hieroglyphic texts, and in the modern Mayan languages alike, usually follows the verb-object-subject (VOS) pattern (unlike English which usually employs SVO-constructions). However, very often in the hieroglyphic texts the object is missing or omitted, and clauses usually begin with a date, giving us a typical formula of Maya texts: date-verb-subject. Dates can often take up the major part of the texts, verbs only one or two glyph blocks in each sentence, and personal names with titles can be as lengthy as the titles of European monarchs.

calendar (temporal adverbial phrase)						
DNIG	DN			ADI/PDI	tzolk'in 'day'	haab 'month'
	day, month	tun 'year'	k'atun 20 'years'			
						
			---			
						

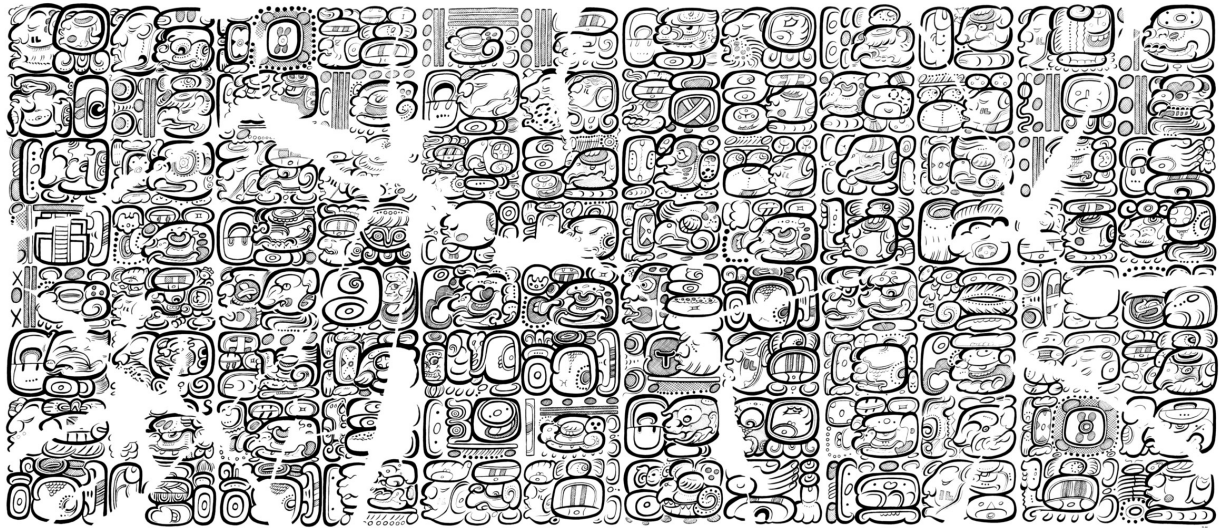


Figure 7: Tablet of 96 Glyphs, Palenque, Chiapas, Mexico (drawing by Simon Martin)

clause proper					
verb	(object)	subject			
	prepositional phrase	(titles and) name			title (EG)
				---	

Structural analysis: Tablet of 96 Glyphs, Palenque: C2-H4 (C2-C7; D8-F5; E7-H4); drawings by Simon Martin.



## 14. VERBS

There are approximately one hundred known verbs in the Maya script with about one dozen grammatical affixes. Almost all the verbs are written in the third person (he/she): **u-** (before words starting with a consonant) or **y-** (before words starting with a vowel (see chapter on pronouns below).

Most verbs typically relate the deeds of ancient lords that have already taken place, by the time these are recorded. However, the controversy remains on whether the Classic Mayan language employed tense (e.g. past, present, future) and/or aspect (e.g. completive, incompletive) that would be demonstrable in the inscriptions.

According to some linguists the Classic Mayan language was a non-aspectual system with no opposition in completive and incompletive. According to others, there was no tense *and* no aspect, and, as suggested by others, there was no tense *or* no aspect. Some verbal affixes also indicate other possible principles, such as the system of employing deictic temporal enclitics.

The grammar of Maya hieroglyphs is rather complex and cannot be adequately discussed in this volume. To explore this matter further it might be suitable to turn into the bibliography at the end of this book, or to attend a specialized grammar workshop of Maya hieroglyphic writing. However, a concise account on grammar is to be found in Appendix J: Notes on Classic Mayan Grammar.

## 15. NOUNS AND ADJECTIVES

Nouns in the Classic Mayan language can be divided into two categories, depending on whether they are derived from another lexical category (i.e. word class / part of speech) or not. In the former case, the traditional linguistic term is a “derived noun”. In the latter case, we speak of “primary nouns”. Derived nouns are either derived from verbs or adjectives, or from other nouns.

In many languages, including Classic Mayan, it is often difficult to make a distinction between nouns and adjectives. In point of fact, this distinction is not always implemented. Moreover, in the Classic Mayan language, both nouns and adjectives can form stative expressions with absolutive pronouns. As the most common pronoun (or, more correctly, *pronominal affix*) in the Maya hieroglyphic script is the third person singular pronoun, and as the absolutive form of this pronoun is a zero morpheme (i.e. an unmarked/unrealized suffix), stative expressions are formally identical to nouns (or adjectives). In practice this means that, for example, the word *ch'ok* can be a noun, adjective and an entire sentence:

- (1) *ch'ok*: child, (a) youth (n.)
- (2) *ch'ok*: young, little (adj.)
- (3) *ch'ok*: “he is young” or “he is a child”  
(*ch'ok-Ø* [young-3SA] / [child-3SA])

Although it is difficult to make a distinction between nouns and adjectives in Mayan languages, the treatment of these two lexical categories differs from each other in at least three ways: (1) adjectives cannot be possessed; (2) adjectives cannot act as an argument of a verb; (3) adjectives cannot stand alone, i.e. they need to be followed by a noun or to construct a stative expression with an absolutive pronoun.

In addition to the division between primary nouns and derived nouns, Mayan languages make a distinction between nouns that are inherently deemed to be possessed and those that are not (absolutive). Besides the fact that any noun can be possessed by attaching an ergative pronoun (pronominal affix) in front of it, there is a set of nouns (such as kinship terminology, the names of body parts and certain items of regalia) that are deemed to be inherently possessed, in Mayan languages. If these nouns are expressed in “unpossessed” form, they require a special suffix to indicate the absolutive state (or case) of the noun.

The suffixes of absolutive nouns in Classic Mayan are  $-\emptyset$ ,  $-aj$  and  $-is$ , whereof the zero morpheme  $-\emptyset$  is used to mark unpossessed nouns, while suffix  $-aj$  marks nouns that designate countable units (of clothing, jewelry, etc.) that are worn by people. Suffix  $-is$ , on the other hand, is used exclusively with nouns that designate body parts (see Zender 2004: 200-204). Examples:

<b>Stem:</b>	<b>Absolutive:</b>	<b>Possessive:</b>
<i>pakal</i> “shield”	<i>pakal-Ø</i> “a shield”	<i>u-pakal</i> “his/her shield”
<i>ohl</i> “heart”	<i>ohl-is</i> “a heart”	<i>y-ohl</i> “his/her heart”
<i>k'ab</i> “hand”	<i>k'ab-is</i> “a hand”	<i>u-k'ab</i> “his/her hand”

In addition to primary nouns (all examples above), new nouns can be created from other nouns, verbs, and adjectives. These derived nouns take, among others, the following suffixes: *-lel* and *-il* (abstractivized nouns), *-ol/-o'l* and *-aj* (nouns derived from transitive verbs), *-el/-e'l* (nouns derived from intransitive verbs), *-iil*, *-ul/-u'l*, *-al*, *-ol*, and *-nal* (toponymic suffixes), and *-ib*, *-ab*, *-ol*, and *-il* (instrumental suffixes).

Abstractivizing suffixes turn nouns into abstract concepts; for example, the word *ajaw* or “lord” turns into “lordship” when suffixed with a *-lel*-abstractivizer. With the instrumental suffixes *-ib*, *-aab*, and *-uub* verbal roots can be transformed into nouns that describe the action of the verb. For example, a noun can be created out of the intransitive verbal root *uk'/uch'* (“to drink”) with an instrumental suffix *-ib*, with the outcome *uk'ib/uch'ib* or literally “drink-implement”, i.e. drinking cup.

In Classic Mayan, adjectives precede nouns, and they are constructed in the following manner: noun + *Vil* suffix (i.e. noun + a vowel that corresponds the vowel of the noun stem + l). For example, an adjective created from the word *kakaw* (“cacao / chocolate”) is *kakawal* (“chocolaty”). In the same manner the word *chan* (“sky” or “heaven”) turns into *chanal* (“heavenly” or “celestial”), the word *k'ahk'* (“fire”) into *k'ahk'al* (“fiery”) and the word *k'uh* (“deity” or “god”) into *k'uhul* (“godly” or “holy”).

Along with a myriad of other nouns, personal names accompanied with titles are very common in the Maya script. Titles can provide us with information on the hierarchies and political alliances in ancient Maya society. Besides titles, also parentage expressions are relatively common in Maya inscriptions, which allow detailed reconstructions of regal dynasties. They are invaluable for the reconstruction of royal lineages at many Maya sites.<sup>36</sup>

## 16. PRONOMINAL SYSTEM

In most Mayan languages, including Classic Mayan, there are two pronominal sets. The first is usually called set A pronouns (pronominal affixes) while the second is set B pronouns (pronominal affixes). Set A (ergative) pronominal affixes are used as the subject of transitive verbs and the possessors of nouns. Set B (absolutive) pronominal affixes are used as objects of transitive verbs and the subjects of intransitives. In English this would mean (set A) that instead of saying “he goes” one would say “goes-him”, or instead of “his house” one would say “he-house”. In Classic Mayan this means that the pronominal affix in sentences like *utz'ihb* (“[it is] his/her writing”) and *utz'apaw* (“he/she inserted/planted it”), is the same /u-/, but in the first example it is the possessor of a noun, and in the second the subject of a transitive verb. In Mayan languages ergative pronominal affixes are attached to the root of the verb on its left side as a prefix (before the verb) whereas the absolutive pronouns are attached to the right side of the verb as a suffix (after the verb).

Besides the third person mentioned above, there are a few rare examples of first person singular ergative pronominal affixes (**in-/ni-**), second person singular ergative pronominal affixes (*a-*), and first person singular absolutive pronominal affixes (*-enl/-een*) in direct quotations in the Classic period ceramic texts, and in the inscriptions occurring in secluded areas of Copan and Piedras Negras (Stuart 1996, Stuart 1999, Stuart, Houston, and Robertson 1999: II-17-22), which may have been of restricted access in antiquity (Helmke 1997). Also, a few independent pronouns, such as *haa'* (he/she/it/that/this), *hat* (you), and *ha'ob* (they/these/ those) have been uncovered in the inscriptions.

<sup>36</sup> For further information, consult e.g. Martin and Grube 2008.

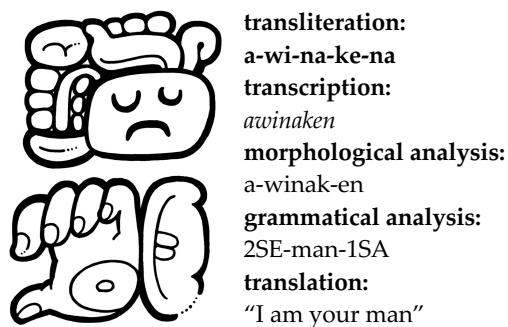


Figure 8: Direct quotation from Panel 3, Piedras Negras (drawing by Christophe Helmke)

Ergative pronominal affixes (Set A prefixes):	Absolutive pronominal affixes (Set B suffixes):
1SE <i>in-</i> / <i>ni-</i> <b>ni</b>	1SA <i>-en/-een</i> <b>Ce-na</b>
2SE <i>a-</i> / <i>aw-</i> <b>a</b> / <b>a-wV</b>	2SA <i>-at</i> / <i>-et</i> <b>ta</b> / <b>te?</b>
3SE <i>u-</i> / <i>y-</i> <b>u</b> / <b>yV</b>	3SA <i>-∅</i> <b>---</b>
1PE <i>ka-</i> <b>ka</b>	1PA <i>-on/-o'n</i> <b>Co-na</b>
2PE <i>i-</i> / <i>iw-</i> <b>i</b> / <b>i-wV</b>	2PA <i>-?</i> / <i>-*ox</i> <b>?</b>
3PE <i>u-</i> / <i>y-</i> <b>u</b> / <b>yV</b>	3PA <i>(-ob/o'b)</i> <b>-Co-ba</b>

Figure 9: Classic Mayan ergative and absolutive pronominal affixes

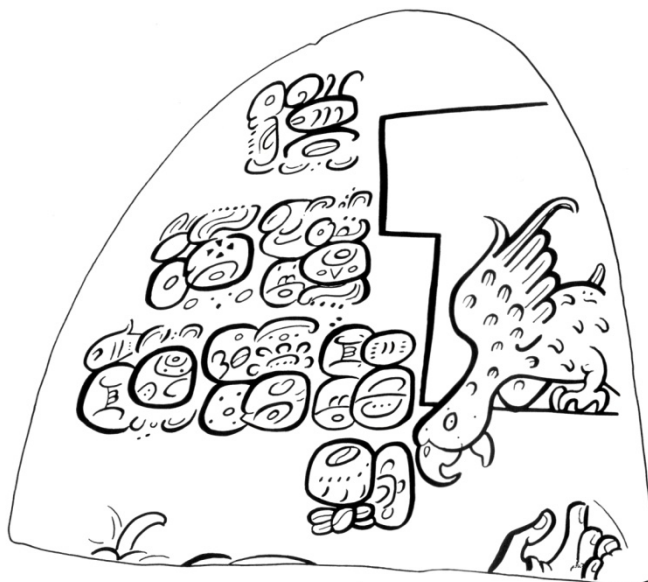


Figure 10: Text and image incised on a shell (drawing by Peter Mathews with slight modifications by Harri Kettunen)



# IV

## TYPICAL STRUCTURE AND CONTENT OF THE TEXTS

### 17. MONUMENTAL INSCRIPTIONS

It is clear now that the content of monumental inscriptions is primarily historical. The focus of these public texts is almost exclusively on important events of particular dynasties. The most common occurrences in the inscriptions consist of royal activities, such as accessions, war, capture, various ritual activities, birth, death, heir-designations, royal visits, and the like. Quite frequently the histories represented in the public art were limited to momentous events in the lives of the elite – and linked with powerful historical or supernatural beings.

The inscriptions on more public monuments, like stelae and altars, deal primarily with historical events and with issues which were deemed acceptable for the scrutiny of the public. The inscriptions in more restricted areas, such as the carved lintels or panels inside temples, deal with limited or more ritual information reserved exclusively for a specific audience.

#### STELA 4 (A1-B5), IXTUTZ, GUATEMALA: TRANSLITERATION, TRANSCRIPTION, AND TRANSLATION:

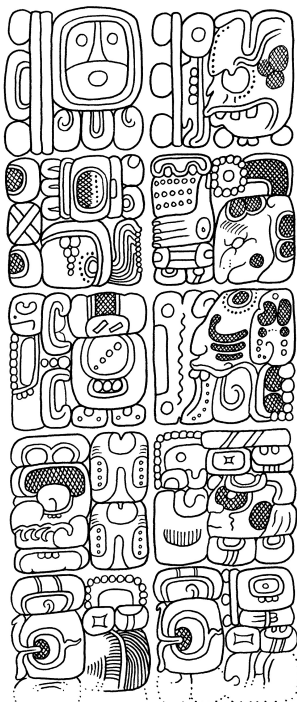
<p><b>A1: 12-AJAW</b> <i>lajunchan? ?k'in? ajaw</i> 12 ajaw</p>		<p><b>B1: 8-TE'-[PA']xi-la</b> <i>waxakte' paxiil</i> 8 pax (9.17.10.0.0)</p>
<p><b>A2: u-tz'a[pa]-wa TUN-ni</b> <i>utz'apaw tuun</i> (he) planted/inserted the stone</p>		<p><b>B2: u-CHOK-ko-wa ch'a-ji</b> <i>uchokow ch'aaj</i> (he) scattered droplets</p>
<p><b>A3: a-ya-YAX-ja-la</b> <i>aj yayaxjal?</i> Aj Yayaxjal?</p>		<p><b>B3: BAK-?</b> <i>baak ...?</i> Baak ...?</p>
<p><b>A4: u-CHAN-na bo-bo</b> <i>ucha[ 'n bo[h]b</i> guardian of Bohb</p>		<p><b>B4: K'UH-lu 5-KAB-AJAW-wa</b> <i>k'uhul ho'kab ajaw</i> divine lord of Ho'kab</p>
<p><b>A5: yi-IL-ji? K'UH-MUT-?-AJAW</b> <i>yila[a]j k'uhul mut[ul] ajaw</i> (he) had seen it, the divine lord of Mutul</p>		<p><b>B5: yi-IL-a? 8-WINAK-ki-AJAW-TAK</b> <i>yila? waxak winak ajawta[a]k</i> (they) saw it, the 28 lords</p>

Figure 11: Stela 4 (A1-B5), Ixtutz, Guatemala (drawing by Harri Kettunen)

“On 12 *ajaw* 8 *pax* (2 December 780), Aj Yayaxjal? Baak ?, guardian of Bohb, divine lord of Ho'kab, planted the stone and scattered droplets. It was seen/witnessed by the divine lord of Mutul and by the 28 lords.”

### 18. CERAMICS

The texts on ceramic vessels range from simple clauses and name-tagging to dynastic lists of kings, and lengthy verbal clauses. A common feature in the texts of ceramic vessels is the so-called Primary Standard Sequence (PSS) – usually written along the rim of the vessel, but sometimes written vertically or diagonally in columns along the body of vessels.

The PSS is actually a complex and highly formulaic nametag usually starting with a so-called **focus marker** glyph (a.k.a. the initial sign). The function of this type of glyph is to indicate where a text begins as the beginning and end of the texts usually meet at the same point (since most vessels are circular).

Other typical glyphic collocations present in the PSS include reference to the manner in which the pot was dedicated (i.e. the introductory section), the contents of the vessel (e.g. *kakaw* (cacao/cocoa), or *ul* (atole, maize gruel), the type of the vessel (i.e. the vessel type section), and its owner or the artist who painted or carved the text/iconography into it. Vessel types include for example *uk'ib*, “drinking cup”, *jaay*, “bowl”, *lak*, “plate”, and *jawa[n]te'*, “tripod plate”.<sup>37</sup>

As ceramics constitute one of the largest groups of media on which hieroglyphs were recorded, they will receive special attention in the present volume. In the following pages one will find information relating to intricacies of texts on ceramic vessels.

### *Reconstructing Ancient Maya Vessel Typology*

Following earlier research, vessels exhibiting more than one text can be said to have a ‘primary’ text which is placed both in a prominent position on a vessel such as along the rim or vertically in wide bands, as well as being written with large glyphs. In contrast are ‘secondary’ texts that are typically shorter, of smaller font, and typically serve as small captions to iconographic scenes.

Both of these types of texts can be either well-preserved or eroded a point of distinction recorded as it potentially may affect the accuracy of glyphic identifications. In addition, texts may range between fully viable and pseudoglyphic (which apparently served to give the impression of writing – and were apparently produced by illiterate artisans).

### *Surface Treatment*

Of those texts that do record the surface treatment by far the largest group is formed by texts referring to the surface treatment as being painted, based on the root noun *tz'ib*<sup>38</sup> for “painting” or “writing” and the verb derived from this root. In its simplest form, painted vessels bear the caption *tz'ib* or *utz'ihb*, while at the opposite extreme it may be rendered as *utz'ibnajal* or *utz'ibalnajal*. Interestingly, it is also with this term, but in the form of *utz'ihba* and introducing a nominal segment, that artists working under royal patronage signed their works (Reents-Budet 1994; MacLeod 1990). To gain a better understanding of these terms and their derivations these are analysed morphologically below:



*utz'i[h]bnajal*<sup>39</sup>  
 u-tz'ihb-n-aj-al-Ø  
 3SE-write/paint-PAS-THM-NOM-3SA  
 “the writing/painting of”

While both *utz'ibnajal* and *utz'ibalnajal* share the same root as well as the same compound suffix, the latter is derived from a noun with an abstractivizing suffix, which alters the meaning of the root from “writing/ painting” to something yet more broad such as “drawing/decoration.”

<sup>37</sup> For further information on texts on ceramics, consult e.g. Reents-Budet 1994.

<sup>38</sup> It should be pointed out that in Mayan languages the distinction between ‘painting’ and ‘writing’ is not made, as the primary means of recording the written word is by means of a paintbrush. However, it should be cautioned that based on modern Mayan cognates, the term, *tz'ib* specifically refers to the painting of designs or decorations, and is often offset from other verbs, as for example those used to refer to the painting of houses (Terry Kaufman, personal communication 2003).

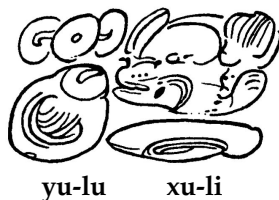
<sup>39</sup> These analyses are based in large part on the research of Alfonso Lacadena who was kind enough to share this information with us in correspondence.



u                      tz'i-ba-li                      na    ja

*utz'i[h]baalnaja[l]*  
 u-tz'ihb-aal-n-aj-al-Ø  
 3SE-write/paint-ABSTR-PAS-THM-NOM-3SA  
 "the drawing/decoration of"

The other principal statement is the root *ux* for "carving" or "scraping." The various manifestations of the word *ux* range from *yux* via *yuxulil* to *yuxulnaja*. These terms, when written in full, also contain an abstractivizing suffix which allows derivation from the verb "carve" into something akin to "carving" although the semantic domain would allow for something broader. In a few rare cases the collocation ends with a final suffix marking the carving as the inalienable possession of the patient to which it is connected by the initial third person singular ergative pronominal affix (functioning as a possessor) "his/her" inextricably connecting these surface treatment expressions to the vessels that bear them.



yu-lu      xu-li

*yuxul[i]l*  
 y-ux-ul-il-Ø  
 3SE-carve-ABSTR-POS-3SA  
 "(it is the) carving of"



yu      xu [lu]      na [ja]      la

*yuxulnaja*  
 y-ux-ul-n-aj-al-Ø  
 3SE-carve-ABSTR-PAS-THM-NOM-3SA  
 "(it is the) carving of"

### Vessel Type

The vessel type collocations typically occur following reference made to the surface treatment and before mention of the contents. The total number of distinct vessel types discovered thus far amounts to over 20. The majority of these terms occur only rarely in the inscriptions and a few of these terms may simply be variables of a type. For the latter examples, these may eventually be conflated into the same category if it can be demonstrated statistically as well as linguistically that these are just variants of other well-established terms.

Vast majority of vessel types that are represented in the glyphic texts are dominated by drinking vessels. These represent the most specialized types of vessels used by the ancient Maya. Based on contextual and iconographic evidence as well as the titles of the patrons or owners of these vessels it is clear that these vessels were used by the high elite during the course of festive events (Reents-Budet 1994: 72-75).

Such vessels represent the highest investment of time and labour, yet their diminutive size, the restriction of their usage to festive occasions and the private sectors of the lord's residence indicate that few people would have been able to see these vessels. The names of master artisans that signed the vessels they produced, as well as the names of sculptors, reveal that most of these boast exalted titles of the elite, with several bearing even royal titles. Thus, as a means of controlling not only the use of such vessels, but their production, the knowledge was maintained within the household of the highest elite.










	<p><b>yu-k'i-bi / yu-k'i-bi-la</b>  <i>yuk'ib / yuk'ibi[i]</i>  y-uk'-ib / y-uk'-ib-iil  3SE-drink-INST-REL  "his/her drinking cup"</p>
	<p><b>yu-UK'-bi / yu-UK'</b>  <i>yuk'[i]b / yuk'[i]b</i>  y-uk'-ib  3SE-drink-(INST)  "his/her drinking cup"</p>
	<p><b>u-ja-yi / u-ja-ya</b>  <i>ujaay / ujay</i>  u-jaay / u-jay  3SE-bowl  "his/her bowl"</p>
	<p><b>u-la-ka / u-LAK</b>  <i>ulak</i>  u-lak  3SE-plate  "his/her plate"</p>
	<p><b>u-ja-wa-TE' / u-ja-TE'</b>  <i>ujawa[n]te' / uja[wan]te'</i>  u-jaw-an-te' / u-jaw-wan-te'  3SE-face.up-EXIST/ POS-?  "his/her plate (with legs)"</p>
	<p><b>u-WE'-bi / WE'-ma</b>  <i>uwe'[i]b / we'[e]m</i>  u-we'-ib / we'-em  3SE-eat/food-INS  "his/her plate for eating/food"</p>
	<p><b>u-po-ko-lo-che-e-bu / chu-ba-la-che-bu</b>  <i>upokol che'[ebu][i] / chubal che'[ebu][i]</i>  u-pok-ol che'eb-ul / chub-al che'eb-ul  3SE-wash-THM pincel-THM-3SA  "his/her quill/brush rinser?"</p>
	<p><b>ya-k'u-tu-u</b>  <i>ya[h]k'utu' / ya[h]k'utu'</i>  y-ahk'-tu' / y-ahk' u-tu'  3SE-give-INST?  "his/her gift"</p>
	<p><b>yu-bi</b>  <i>yuub / yu[i]b</i>  y-uub / y-u-ib  3SE-?/3SE-?-INS  "his/her ?"</p>

Table 1: Common Classic Maya vessel type glyphs (drawings by Christophe Helmke)



	<i>yuk'ib'</i>	<i>ujaay yuk'ib'</i>	<i>ujaay</i>	<i>ulak</i>	<i>ujawante'</i>	<i>we'e'm</i>	<i>pokol</i>	<i>yahk'utu'</i>	<i>yuub'</i>
	<i>kakaw</i> (cacao)	<i>kakaw</i> (cacao)	<i>kakaw</i> (cacao)						<i>kakaw</i> (cacao)
								---	(no data)
	<i>kakaw</i> (cacao) <i>ul</i> (atole)	<i>kakaw</i> (cacao) <i>ul</i> (atole)	<i>kakaw</i> (cacao) <i>ul</i> (atole)					<i>ch'e'eb'ul</i> (quill)	
				<i>waaj</i> (tamale)		<i>we'</i> (food)			
					<i>waaj</i> (tamale)				

**Table 2: Comparisons between idealized vessel forms (cross-sections) and vessel type referents represented glyphically on these vessels. The incidence of two matching criteria is indicated by references made to the most common type of contents. (Chart and drawings by Christophe Helmke).**

*yuk'ib(iil)*

This vessel type refers to cylinder vases and barrel-shaped vases with flat bases as well as straight-walled bowls with or without small tripod, nubbin or tau-shaped supports. Based on the many examples of this vessel type designation the structure of this term and its root were successfully identified as early as 1987 (MacLeod 1990: 315). Analyses of the term indicated that it is prefixed by the third person ergative pronominal affix, followed by the verbal root *uk'*, “to drink<sup>40</sup>” and closed by an instrumental suffix. Thus, literally vessels bearing these types of collocations are “drinking implements”. The term survives in the Ch’olan entry *uch’ibal* (Aulie & Aulie 1978: 125), as well as in the Ch’orti’ term *uch’p’ir*<sup>41</sup> (Wisdom 1950: 750), and in the dictionary of Colonial Tzotzil as *uch’obil* (Laughlin 1988: 159).

*ujaay / ujay*<sup>42</sup>

This vessel type refers to bowls with rounded or flat bases and more rarely to short, straight-walled bowls. It has been suggested that this term is related to the cognate root *jay* for “thin” in Yucatec, Ch’olan, and Tzotzil (MacLeod 1990: 363). However, this interpretation has syntactical problems since it frequently includes a possessive pronominal prefix indicating that it must function as a noun rather than an adjective. Indeed, a possessed adjective such as “his/her thin” is awkward and hardly resolved by this interpretation. In contrast, MacLeod (1990: 363-364) has pointed to productive entries such as “tortilla gourd” (Laughlin 1988: 148), “tub”, “basin” and “plate” in Colonial Tzotzil (Laughlin 1988: 207), which in this context fulfil not only the syntactical requirements but also expected semantic values.

<sup>40</sup> This root is typically written syllabically as **yu-k’i** – but can also be written with a logogram standing for **UK’**. This latter sign has only recently been deciphered and greatly clarifies the assemblage of vessel type designations present in the script. Equivalency between the syllabic and logographic signs as first pointed out to us by Alfonso Lacadena but was first made by David Stuart.

<sup>41</sup> Note here that *uch’* is cognate of *uk’*. In addition, the phonological correspondence set for Ch’orti’ differs from many of the related Ch’olan languages. Thus, in the example of *uch’p’ir*, /p’/ is phonologically equivalent to /b/ of the instrumental suffix –ib and /r/ is typical of /l/ in other Mayan languages.

<sup>42</sup> The difference in the value of the vowel in the terms *jaay* and *jay* is a regional one. In western Yucatan and Northern Campeche, Mexico the term *jaay* prevailed in exclusivity. While the same term is present in the central Lowlands, *jay* is occasionally represented indicating regional linguistic variation. The meaning of the term appears to have been the same despite these phonological changes.

Generally, vessels attributed the designation *jaay* are bowl-shaped and thus bear overall similarity to halved gourds, the probable origin of the term. Nonetheless, few existing cognates exist suggesting that the term fell into disuse after the Classic period. Despite the paucity of relevant linguistic data, Alfonso Lacadena found *jay* for “*tazón de barro*” (“clay bowl”) in Tzotzil (personal communication 2002) suggesting that once ceramic vessels came to replace the original gourd counterparts the term was preserved, nonetheless. Based on these analyses the term \**jaay* thus seems to be a descriptive rather than a functional designation, for “bowls” and originally for “gourd-shaped bowls.”

*jaay yuk'i'b(iil) / jay yuk'ib(iil)*

This vessel type refers to vases and bowls, although the latter predominate, as do rounded bases. This vessel type designation is represented by the compounding of the two terms previously reviewed. In this context, were the (possessive) pronominal affix absent on the second term and present on the first, the interpretation of “his/her thin drinking implement” would be supported syntactically. However, these circumstances are not present suggesting that the adjectival interpretation of *jaay* should be abandoned.

*ulak*

This vessel type is used to refer to flat-based wide-mouthed plates or dishes. The root term remains problematical, owing to the few productive entries but in all occurrences of this term it refers to objects that are generally flat (Reents-Budet 1994: n.24, 101). For example, an unprovenanced jade plaque, apparently a centerpiece for a necklace (von Winning 1986: Fig. 166) as well as a brick with a modeled-incised text from Comalcalco (Grube & al. 2002: II-46) are both designated as *lak*. Instances in which examples of this form contain the term *we'ib* (“food implement”) it is clear that it was used as serving vessel for solid foods, *we'*, “food” being synonymous in many Mayan languages with “*tamale*” (a type of steamed maize dough bread, with vegetable, turkey or game filling) and “meat” (Zender 1999).

*jawante'*

This vessel type refers to dishes or plates with hollow oven-type tripod supports. Aside from the supports, vessels with this designator are identical in most all other respects to the *lak* described above. Stephen Houston equated the term with an exact entry in a colonial dictionary of Yucatec (Perez 1866-77) for *hawante*: “*vasija de boca ancha y escasa profundidad*” (a wide-mouthed vessel of shallow depth) (MacLeod 1990: 300-303). Analyses of this term allow the identification as the root as the positional *jaw* > \**jäw* “face up” (Kaufman & Norman 1984). However, the original Spanish entry of “*boca arriba*” should be noted as may more correctly describe the original semantic domain, as “mouth up.” MacLeod has understood the suffix *-an* as a participial, where it is known as a suffix for positional verbs (Boot 2001), as in *chum-w-aan-Ø*, “was seated.”

Together this suggests that the term may have originally been intended as *jaw-w-an-Ø* for “was faced upwards.” All the few *jawante'* documented to date are tripod dishes, suggesting that the presence of the tripod supports is the feature distinguishing these vessels from *lak* dishes, as otherwise these have all other modal attributes in common. To date no satisfactory explanation has been provided for the final suffix *-te'*. MacLeod speculated that since the word refers “tree” and “wood” (the primary meaning of this term) that this vessel form may have had antecedents made of wood, which once made in ceramic, maintained their original designation as if the Late Classic examples were skeuomorphic (MacLeod 1990: 302-303). However, it should be noted that (as a suffix) *-te'* functions, among other things, as a numerical classifier for counts of 20-day period (Boot 2001) and as a suffix to the prominent title *kalomte'*. Based on the attributes surrounding the ascent to the rank of *kalomte'* and the features distinguishing *lak* from *jawante'* we would like to tentatively suggest that *-te'* may be a suffix for things that are ‘stood up’ or ‘made to stand up.’ If this interpretation is correct, the term *jawante'* may be literally refer to a vessel that is made to “face upwards and stand upright.” Based on these analyses it thus seems that the designation of tripod dishes is essentially descriptive rather than functional.

other vessels

In addition to the vessel types examined above, which represent the vast majority of glyphic entries for vessel types in the inscriptions, roughly twenty additional types have been identified (cf. Boot 2005). These include (*y*)*uub*,

*yahk'utu', pokol che'ebul, kuch sibik, uch'aajil (or uch'aajul), bu'b, chuhib, ajal(a)jib, jaay chu'bal che'eb, otot, tzimal jaay uk'ib, we'em, and uma? tz'ihk.*

## Vessel Contents

All contents sections of Primary Standard Sequences are prepositional sub-clauses in which a new argument is introduced to principal clause (Schele & Grube 2002: I-37). The nouns of this sub-clause are the indirect objects of the vessel type, the subject of the PSS. The most common prepositions in Classic Mayan are the analogous *ti* or *ta* variously meaning “in, at, on, to, by, as, from, with” (Coe and Van Stone 2001; Kettunen and Helmke 2002; Schele and Grube 2002: I-37).

Three basic contents types have been documented in the glyphic texts adorning ancient ceramic vessels: *kakaw*, *ul* and ‘other.’ *Kakaw* refers to beverages made from the fruity pulp of the cacao bean, or the dried, roasted, fermented and ground bean (used in cacao or hot chocolate). An alternate beverage made specifically from the bean rather than the fruit is known as *pinole* (Coe 1995; Young 1994). *Kakaw* and its many variants is a festival beverage still enjoyed in traditional Maya communities, known to have mild psychotropic effects. The beverage is flavoured with vanilla, aromatic flowers, the sap of the maguey plant, *chile*, or honey and which to varying degrees may be mixed or diluted with other maize-based drinks. *Ull* is the term for a thick, semi-liquid maize gruel, the most cherished being considered apart and made from immature, new, green maize (known as *nal*). This gruel is also considered a special festival food although it is more common, typically used in weaning small children, while the special kind is made at the start of the harvests. Altering the flavour of this beverage is attained by the addition – singularly, or in combination – of boiled brown beans, ground pumpkin seeds, sap of the maguey plant, the whole being flavoured with honey, *chile*, and/or allspice to taste. Both *ul* and *kakaw* may be served fresh or as a fermented alcoholic brew, the latter being set aside by the use of other referents. The third contents type refers to any other type of contents, since in comparison to the two preceding types these are rare incidences.

As these occur in the glyphic inscriptions, these three basic contents types can be modified by the addition of modifying prefixes. *Kakaw* can be modified in several ways. First, an adjective can be invoked such as *chak* (“red”), *k'an* (“yellow / ripe”), *kab* (“sweet”), *om*<sup>43</sup> (“frothy”), or by unclear collocations apparently referring to a type of flower<sup>44</sup> (possibly used as a flavouring agent). Second, a toponym may be added, specifying the origin of the *kakaw* used in the beverage, in a practice similar to the ‘appellation contrôlée’ designations of wine (such as Bordeaux or Champagne)<sup>45</sup>. Prevalent toponyms in the case of the PSS are *Ho'kab* (“Five Lands”), the Early Classic (AD 250–550) name for the ancient polity of the site of Naranjo, Guatemala, *Saal* or *Sataal* (of unknown meaning) the nominal referent of the heraldic emblem of the Naranjo polity, *Huxwitzik* (“Three Hills”) and *Mo'witz* (“Macaw Mountain”) two of the many toponyms of the Copan polity, of western Honduras, and finally by *Sakha'al* (“White Lake<sup>46</sup>”) the name of a small polity located in the vicinity of Naranjo, possibly situated along the shores of lake Sacnab, in Guatemala<sup>47</sup>. Third, *kakaw* may be modified by prefixes resisting decipherment, either due to illegibility (erosion and/or calligraphy) or forming a term with no recognised cognates. It is likely that this third category would align to either adjectival or toponymic modifiers were these signs successfully read. Consequently, this category remains a provisional construct imposed by our ability to read the glyphs, rather than reflecting three inherent emic divisions.

<sup>43</sup> This reading was first suggested by Barbara MacLeod (1990). While the suggested phonetic value of this sign as well as the existence thereof has been challenged over the years, no suggestions superseding it have been made.

<sup>44</sup> The readings offered for both of these collocations are tentative as these include glyphic elements whose phonetic values are still debated. The first may be variously read as *k'al[h]k' tzih nik?*, or *k'al[h]k'nal nik?*, where *nik* is a known term for “flower”, while in the other case the logogram may be read as *janaahb*, which based on other contexts also refers to a type of flower although a productive modern cognate is still wanting.

<sup>45</sup> Earlier research had identified the occasional incidence of toponymic modifiers (cf. MacLeod 1990; Reents-Budet and MacLeod 1994). Recently, evidence has been gathered by the authors demonstrating that toponymic modifiers form a discrete and cohesive group of *kakaw*-modifiers, an aspect that remained overlooked until now. The importance of this discovery lies in that the term *sakha'(al)* may no longer be understood as a contents collocation (initially analysed as *sak-ha'* or “white liquid” as a metaphor for maize gruel (Houston & al. 1989), which is indeed a whitish liquid), but instead serves as a modifier of *kakaw*. The evidence for this interpretation will be reported elsewhere (Helmke and Kettunen n.d.).

<sup>46</sup> An alternate translation may be “Pure Rain.” *Ha'al* and *ha'ha'(al)* are definite terms for ‘rain’, but in this case the term may be analysed as *ha'-al*, water-ABSTR or water-REL, the latter then referring to a body of water such as a lake. *Sak* is more difficult to elucidate outside of syntactical context since it may mean “pure” and is also used to refer to things that are person-made or artificial.

<sup>47</sup> While the toponym *Sakha'al* is known the archaeological site corresponding to this ancient polity has not yet been identified. Due the incidence of this toponym in the texts of Naranjo it is assumed that it was located in the vicinity. Sacnab, the name of a nearby lake is a perfect cognate of *Sakha'al*, suggesting that the former may be the Late Postclassic name of its Classic period precursor.

## 19. CODICES

In contrast to the remainder of Mesoamerica, only four glyphic codices subsist from the Maya area. This low number is all the more surprising considering that the largest Prehispanic corpus of glyphic texts is that of the Maya, consisting of thousands of carved monuments and an equal number of painted ceramics.<sup>48</sup> As such it is clear that Maya civilization was one of the most literate societies in the ancient Americas, making the paucity of codices all the more frustrating, especially when compared to the relative abundance of manuscripts in other parts of Mesoamerica.



Figure 12: (a) Page 9 from the Dresden Codex (after Förstemann 1880); (b) page 91 from the Madrid Codex (after *Codex Tro-Cortesianus [Codex Madrid]* 1967); (c) page 6 from the Paris Codex (after *Codex Peresianus [Codex Paris]* 1968); and (d) pages 3-5 from the Grolier Codex / Maya Codex of Mexico (photo by Justin Kerr).

<sup>48</sup> See, e.g., Graham 1971; Reents-Budet (ed.) 1994; and Coe and Kerr 1997.



Shortly after the European conquest of the Yucatan in the 1540s, the Spanish authorities initiated widespread and mass conversions to Catholicism, instated the independent Spanish Inquisition and a program of extirpation of ritual objects, deity effigies and all elements of material culture pertaining to Maya religious practices, including codices.<sup>49</sup> These practices had been refined by the Spaniards on the Iberian peninsula as part of the *reconquista* and having honed their skills were only too eager to implement similar institutions and practices in the New World. Events came to a head on the 12<sup>th</sup> of July 1562, when an *auto da fé* took place at the Yucatec town of Mani, where in a show of faith the Maya were forced to burn countless deity effigies, ritual paraphernalia and codices. These events had far-reaching repercussions, and religious authorities were even accused of being overzealous and appropriating too much political clout from the secular authorities. Retrospective accounts recorded by Diego de Landa—a Franciscan friar, and eventually became the second Bishop of Yucatan and who was one of the main figures behind the *auto da fé* of Mani—report that the fires were kept burning for three straight days, giving an indication of the destruction wrought on the identity, religion and knowledge of Maya culture. A famous quote by Landa, made in this connection is:

“We found a large number of books in these characters and, because they had nothing in which there was no superstition and lies of the devil, we burned them all, which they regretted to an amazing degree, and which caused them much suffering.”<sup>50</sup>

If even such a relatively small and somewhat rural administrative center, such as Mani, could produce so many religious objects and codices, one can wonder as to how many once existed at any given time throughout the Maya area. This opens the question as to how many aspects of Maya knowledge, literature, and knowledge were once recorded in codices that have since been lost irremediably and forever. Where are the records of tribute and taxation, the grammars of literary prose, the love letters? All of these have vanished even though small tantalizing shreds of evidence subsist here and there.

Nevertheless, whereas it may be tempting to blame the wholesale destruction of Maya codices on the Spanish *auto da fé*, in fact the vast majority of codices have succumbed to the vagaries of time and the inclemency of tropical weather, high humidity, mildew, rot and insects such as bookworms and paper lice. As a result, the Maya, much as any literary culture that used manuscripts often had to resort to making copies of older documents, which as in any philological endeavor, somewhat complicates the dating of the extant documents. Based on archaeological remains discovered in tombs, it is clear that codices were used throughout the Classic Period, from at least the Early Classic, which is to say from the 3<sup>rd</sup> century onwards. Archaeologically, the remains of codices, subsist as poorly preserved and roughly rectangular stacks of painted stucco laminae, but nothing allows these to be restored or even opened in any way that does not result in their complete and utter destruction. Traces of such codices have been found at several archaeological sites including Uaxactun and Nebaj in Guatemala, as well as Altun Ha, in Belize, and Copan in Honduras.<sup>51</sup>

Using the mean size of pages of extant codices it has also been possible to identify containers that once served to house codices. These have all been found in caves since these the afford better preservation due to more stable ambient temperature and humidity. For instance, a plain wooden box that undoubtedly housed a codex has been found in Actun Polbilche in Belize,<sup>52</sup> whereas two carved wooden boxes have been found in caves in Chiapas, Mexico,<sup>53</sup> and a similar stone box has been found in Hunyenal cave in Guatemala.<sup>54</sup>

All extant Maya codices were produced from the inner bark of the fig tree (*Ficus sp.*) that were covered with a thin veneer of fine lime plaster, that can be described as gesso. Due to their often eventful history, these codices have suffered a bit, not the least of which during WWII, and have preserved differentially, over the last five centuries. Their physical characteristics can be summarized as follows:

<sup>49</sup> Chuchiak 2005.

<sup>50</sup> Original Spanish text in Landa’s *Relación* (folio 44v): <Hallamos les grande numero de libros destas sus letras, y porq[ue] no tenian cosa, en que no viesse supersticion y engaño falsedades del demonio se los quemamos todos, lo qual a maravilla sentian, y les dava pena.> (Translation into English by Harri Kettunen).

<sup>51</sup> Whiting 1998. In certain cases, clusters of painted and stuccoed gesso are misidentified as the remains of codices. This is the case with an example excavated at Baking Pot, since its laminae are curved and undoubtedly represent the remains of a painted and stuccoed gourd bowl; see Audet 2005.

<sup>52</sup> Pendergast 1974: 48-49, Fig. 11a, Plates 6-8.

<sup>53</sup> Coe 1974: 51-58; Zender and Bassie 2004; and Anaya H. et al. 2001.

<sup>54</sup> Demarest 2012.

	page height	page width	total length	paginated folds	total pages
Dresden Codex	20,5 cm	10,0 cm	3,56 m	39	78
Madrid Codex	23,2 cm	12,2 cm	6,83 m	56	112
Paris Codex	23,5 cm	12,7 cm	1,45 m	11	24
Grolier Codex	> 18,0 cm	12,5 cm	1,38 m	11	11

**Table 3: The physical characteristics of the four Maya codices.**  
The page measurements are averages, whereas the length are maxima.

Here we will provide an overview of the Dresden Codex (*Codex Dresdensis*) and briefly touch on the Madrid Codex (*Codex Tro-Cortesianus*) since these are the longer and better understood of the codices. While we will not describe the Paris Codex (*Codex Peresianus*),<sup>55</sup> we will return to the possible fourth manuscript, the Grolier Codex (Sáenz Codex), at the close of this section. The extant codices can all be described as almanacs, which were used by calendar priests as manuals and reference materials. In this respect, the Maya codices can be said to resemble the manuscripts of the Borgia group of western Mesoamerica. This also means, that no traces of genealogical, dynastic, historic, cartographic or tribute codices subsist for the Maya, only underling the great lacunae that plague our understanding of this important civilization.

Much like the other three well-known codices, the Dresden Codex was held as part of library holdings, until it was recognized by scholars, who first reported them to the world in studies or facsimiles. The earliest of these to be rediscovered is the Dresden Codex, which is still housed in the collections of the Sächsische Landesbibliothek, in Dresden. The codex was acquired in 1739 from a Viennese private owner. As such it has been speculated that the codex may have made its way from the New World to Spain and from there to Austria sometime around the reign of Charles V, since Vienna was part of the dominion of the Habsburgs, who also reigned over New Spain.

In 1810 Alexander von Humboldt published five pages of the Dresden Codex recognizing it as a Native American document,<sup>56</sup> but it took until 1841 for John Lloyd Stephens to identify it as a Maya codex, by comparing it to monuments from Copan.<sup>57</sup> From 1880 to 1900 the Dresden librarian Ernst Wilhelm Förstemann studied the codex, keeping it in the drawer of his desk. In his intimacy with the codex, Förstemann was the first to succeed in working out some of the mathematics of the codex, discovering the basics of the numeral system and recognizing that the Maya used a vigesimal system.<sup>58</sup> At roughly the same time Paul Schellhas studied the same codex and began a system of classification of the creatures and individuals represented, pairing off iconographic depictions with glyphic captions. In his publication of 1897, he stipulated that each of these creatures were supernatural entities and named each as a “god” with a different letter designation.<sup>59</sup>

Whereas our comprehension of the ancient Maya pantheon has greatly progressed since then, in many ways the Schellhas classification remains the cornerstone of our understanding of the ancient Maya pantheon and some of the designations remain in common use today, such as God D and God L.<sup>60</sup> With the first facsimiles of the Dresden Codex newer generations of scholars were able to dedicate themselves to the mysterious manuscript before them. Thus in the 1930s, Herbert Spinden provided a cogent study of the Eclipse Tables and the permutations of the so-called Serpent Numbers were explained at around the same time by Herman Beyer.<sup>61</sup> Finally, it was also based on a facsimile of the Dresden Codex that Yuri Knorozov finally elucidated the principles of Maya glyphic writing in 1952, based on patterns of substitution sets between the spellings of different animals represented in the codex and based on an account by Diego de Landa that provides a rudimentary set of phonetic signs, or syllabograms to be precise, that he erroneously called an “alphabet”.<sup>62</sup> As such it is clear that the Dresden Codex holds a very special place in Maya scholarship as one of the treasures of ancient knowledge that fortune has preserved for posterity.

<sup>55</sup> Bibliothèque Nationale de France 2011; Love 1994; and Severin 1981.

<sup>56</sup> Von Humboldt 1810.

<sup>57</sup> Coe 1992: 97. Charles Étienne Brasseur de Bourbourg (1853: 417) appears to have independently identified the Maya nature of the Dresden Codex.

<sup>58</sup> Förstemann 1880. See also Coe 1992: 73-98.

<sup>59</sup> Schellhas 1897.

<sup>60</sup> For recent treatments of the Maya pantheon that have as their starting point the Schellhas classification, see Taube 1992 and Helmke 2012.

<sup>61</sup> Spinden 1930; Beyer: 1933: 1-7.

<sup>62</sup> Knorozov 1952. For other selected works see also Knorozov 1956 and 1958.

The Dresden Codex is divided into several thematic sections, or chapters, that can be broadly described based on their contents and their function. One of the first challenges is based on the pagination and correct reading order, since the codex is composed of two fragments that were inadequately restored in the 1830s. As such the codex has very unusual pagination since the pages of the first fragment were numbered from 1 to 24 on the recto and from 25 to 45 in decreasing order on the verso.

The second fragment in turn was numbered from 46 to 60 on the recto and from 61 to 74 on the verso, also in decreasing order (Figure 13). Nevertheless, based on current understanding of the codex and its contents it is clear that the correct reading order is from left to right, from the first to the last page of the recto, then turning the codex and continuing to read from left to right from the first to last page on the verso. This means that the very last page of the codex is on the verso of the very first page. As such the correct reading order is from 1 to 24, from 46 to 60, followed by 61 to 74 and closed by 25 to 45. Although the original pagination is evidently erroneous it has been maintained by subsequent scholarship, even though it is at odds with the original reading order.

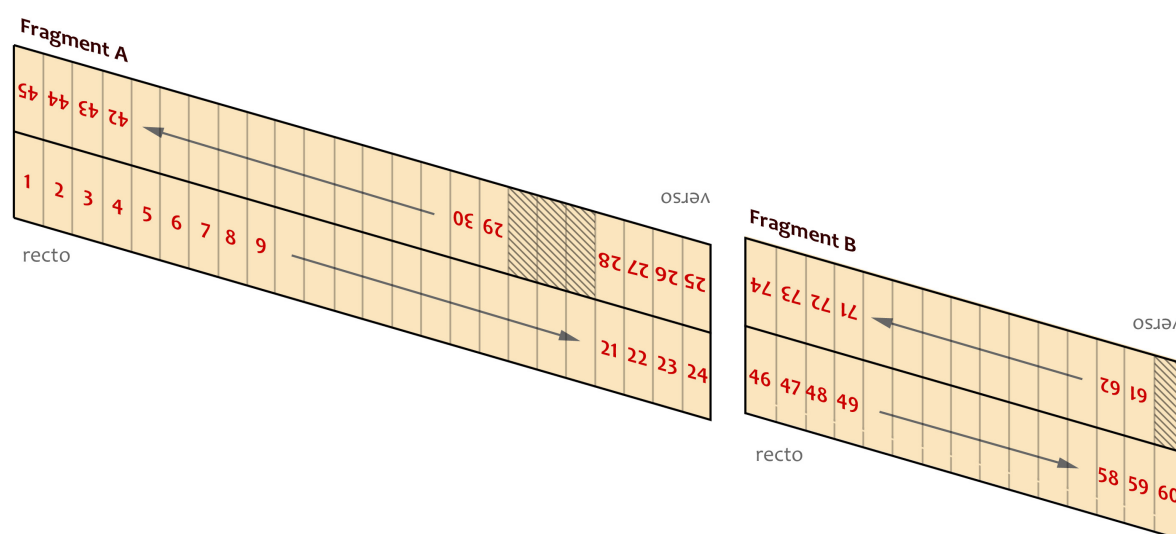


Figure 13: Page numeration of the Dresden Codex

The first major section spans over pages 1 through 23 and can be called the auguries of deities. Here different deities are shown seated cross-legged, and each is accompanied by short captions that generally comprise four glyphs. In rare cases we also see divinities with their spouses and selected animals are also represented. Most pages are subdivided into three, with groups of deities in each section. Along the edge of each section are five day signs in the ritual 260-day calendar, and these are accompanied by a wide array of numbers. That written in red above the columns of day signs provides the base date and combines with the uppermost day sign.

The first black number represents a distance number or interval of days that separates the base date from an unspecified date that can be reconstructed, based partially on the following number in red, which is its coefficient. The pattern is then repeated by adding another black number, finding the third day and matching it up with the third red coefficient. This is repeated until the last distance number is computed, yielding a new set of dates that matches the second day sign given. Adding all the distance numbers together, the total number of days elapsed should amount to 52, which is to say a fifth of the 260 permutations possible in this ritual calendar.



Figure 14: Pages 5–6 (detail), Dresden Codex

By cycling through all the combinations, one then returns to the initial start anchor and the cycle begins anew. Thus, split over pages 5-6 we see a group of four deities (Figure 14), including (from the left to the right) the youthful God R, the death deity God A' (*Ahkan*), the supreme celestial God D, and God Q. These are all shown drilling a fire and the associated glyphs over each

deity specifies whether the dates associated with each provide good or bad auguries, whether these are propitious or inauspicious. For example, the glyphs above God R can be read as:

*joch' uchich buluk kab? tz'ak ajaw*  
 'drilling are the tidings of God R, good augury'

Whereas those above God A' read:

*joch' uchich ahkan umu'k*  
 'drilling are the tidings of Ahkan, poor augury'

Whereas the texts that accompany each of these divinities seem terse, the regular composition and the repetition of elements means that it is fairly easy to find one's way through the codex and find the relevant section. This part of the Dresden Codex thus served as an almanac or reference book to ritual specialists to establish which dates were propitious to particular activities, in this case the drilling of fire. Using the same section of the codex, the calendrical computations here can be summarized as follows,<sup>63</sup> with items in bold font representing the elements that are represented in the codex (with coloration duplicating that of the original), the remaining items in grey needing to be reconstructed by both the ancient priest and the modern reader:

anchor date	distance number	resulting date	distance number	resulting date	distance number	resulting date	distance number
<b>1 manik'</b>	+ 16	<b>4 ak'bal</b>	+ 9	<b>13 eb</b>	+ 25	<b>12 kaban</b>	+ 2
<b>1 kawak</b>	+ 16	<b>4 men</b>	+ 9	<b>13 k'an</b>	+ 25	<b>12 muluk</b>	+ 2
<b>1 chuwen</b>	+ 16	<b>4 manik'</b>	+ 9	<b>13 kib</b>	+ 25	<b>12 imix</b>	+ 2
<b>1 ak'bal</b>	+ 16	<b>4 kawak</b>	+ 9	<b>13 lamat</b>	+ 25	<b>12 ben</b>	+ 2
<b>1 men</b>	+ 16	<b>4 chuwen</b>	+ 9	<b>13 ajaw</b>	+ 25	<b>12 chikchan</b>	+ 2

Table 4: Example of the calendrical computations associated with one particular set of deities in the auguries section of the Dresden Codex. The way to interpret this table is by reading each line from left to right and from the uppermost row to the lowest. By adding the final distance number to the date 12 chikchan the table starts anew with the first date, 1 manik', in the upper left corner.

In addition to these auguries, the Dresden Codex also contains a chapter that is known as the Venus Pages (p. 24, 46-50), the Eclipse Tables (p. 51-60), the Serpent Numbers (p. 61-64, 69), the Ring Numbers (p. 70-73), and the New Year's pages (p. 25-28).<sup>64</sup> As the name suggests the Venus pages were used to calculate the synodic cycles of the planet and therefore this portion of the Dresden is better referred to as an Ephemeris. These pages use a base computation of 236+90+250+8 days or 584 days in all, which corresponds to a complete Venus cycle, reaching back

<sup>63</sup> For computations of other similar almanacs, see Schele and Grube 1997.

<sup>64</sup> For a recent comparative analysis of the Year Bearer's pages see Hernández 2009: 321-364.



to mythic time and the last era date in 3114 BC.<sup>65</sup> Another interesting feature is the presence of Nahuatl loanwords for certain personifications of Venus as the morning star, indicating close links between central Mexico and the Maya in the Postclassic period.<sup>66</sup>

In much the same way as the Venus Pages, are the Eclipse Tables, wherein such events were computed based on intervals ranging from 148 to 178 days<sup>67</sup> and recent research suggests that the Dresden may even contain data pertaining to a Mars cycle.<sup>68</sup> In addition, one scene that may have introduced the New Year's pages represents what may be a diluvian destruction of the world (p. 74) and a large portion of the codex is dedicated to the thunder and rain deity *Chaak* (p. 29-45, 65-69), who is shown in a variety of guises and locations, and again different auguries are attached to these many manifestations. At times, the codex is also careful to specify which offerings are appropriate. For example (Figure 15):

<i>ta ha' chaak</i>	'in the water Chaak'	requires fish	(p. 40c1)
<i>ti chan chaak</i>	'in the sky Chaak'	requires iguana tamales <sup>69</sup>	(p. 40c3)
<i>ta bih chaak</i>	'on the road Chaak'	requires turkey tamales	(p. 41c1)
<i>yotoch chaak</i>	'[in] the house Chaak'	requires a great many tamales	(p. 41c2)



Figure 15: Dresden Codex, pages 40–41 (bottom section)

As such, it should be clear the wealth of information that is contained in the Dresden Codex and what an indispensable tool it was to ritual practitioners in Prehispanic times. Considering the inclusion of many elements of iconography and language that hark back to the Classic period, it seems clear that the Dresden Codex must be a more recent copy of another much earlier manuscript, although the codex as we know it is undeniably Prehispanic.<sup>70</sup>

With this overview of the Dresden Codex, we will now turn briefly to the other lengthy Maya manuscript, namely the Madrid Codex, which is currently housed in the Museo de América in Madrid. Much like the Dresden Codex it is composed of two parts, but these two were in two different holdings, until it was realized that these were part and parcel of the same manuscript. The smaller part, known as the Cortesianus Codex spans 42 pages, and covers pages 1-21 and 57-77. The other, larger part, also known as the Troano Codex, after its original owner Juan Tro y Ortolano, spans over 70 pages, and covers pages 22-56 and 78-112. As a result, the alternate name of this codex is

<sup>65</sup> Closs 1977. See also Hofling; 1988.

<sup>66</sup> Taube and Bade 1991. See also: Whittaker 1986.

<sup>67</sup> Hofling and O'Neil 1992.

<sup>68</sup> Love 1995.

<sup>69</sup> A *tamale* is a small loaf of steamed bread, made of maize dough, that is usually filled with a little portion of stewed meat and or beans. Whereas nowadays tamales are usually steamed in banana leaves, these have been an integral portion of Maya fare and have been so throughout Maya history for as far back as archaeological and pictorial records reach back.

<sup>70</sup> Wald 2004. For similar conclusions pertaining to the linguistic content of the Madrid Codex, see Lacadena 1997.

the Tro-Cortesiano, an abbreviated amalgam of the names of the two previous owners. As reunited, the codex is the longest surviving Maya codex and spans over a series of discrete sections.

Based on detailed paleographic analyses of the codex, Lacadena (2000) has pointed out that this manuscript was produced by as many as nine different scribes, who each produced different sections in different inks, although some shared base pigments.<sup>71</sup> As part of these and related studies the material culture represented in the Codex has also been taken into account, and based on the ceramics jars and the spiked censers represented, a likely date for the production of this manuscript is the Late Postclassic period, which is to say in the centuries before the Spanish conquest.<sup>72</sup>



**Figure 16: Bottom of the page 56 from the Madrid Codex (rotated 90 degrees counter-clockwise and flipped horizontally) showing Latin text (after Codex Tro-Cortesiano (Codex Madrid) 1967)**

Nevertheless, a patch of paper with European writing has been identified on the upper portion of page 56. For a time, it was surmised that this patch was integrated into the codex, suggesting that the Maya who produced this codex partially recycled European paper into the *amate* fiber.<sup>73</sup> If this was the case, this would conclusively demonstrate that the codex was produced in the first few decades after the conquest.

The existence of European paper was previously noticed by Ernst Förstemann and Ferdinand Anders, but neither of them perceived the European layer to occur between the Maya layers of the codex. In November 2003 the authors had a chance to visually inspect the Madrid Codex with other scholars during the 8th European Maya Conference, held in Madrid. Observing the disputed Page 56 of the codex it became clear that the European layer (or layers) of paper in the codex were placed on top of the original Maya bark paper layers<sup>74</sup>. As a result, the argument that the codex is of Postconquest origin – based on assumption that the layers of European paper forms an integral part of the layers of Maya bark paper – is no longer tenable.

A careful analysis of the seventeen partial lines of text and its paleography, by John Chuchiak, has revealed that the original document is a Papal Bull, possibly emitted under pope Gregory XIII.<sup>75</sup> As such one might conclude that the codex is Prehispanic, but that a Papal Bull was subsequently affixed to it; some have suggested in an attempt to better protect this manuscript from destruction by the inquisition. A careful examination of the Madrid Codex, especially on page 39, however, reveals that a European sword, known as a rapier, to be precise,<sup>76</sup> is represented impaling a deer, in the same hand and ink as the remainder of the section. As such, it is clear that the codex is from the earliest part of the Colonial period and was completed sometime before 1610, one of the latest possible dates for this particular Papal Bull.

Much like the Dresden Codex, the Madrid Codex also has chapters, including one on the Mars cycle (p. 1-9), one on agricultural deities (p. 10-29), followed by a section on calamities and natural disasters (30-33), calendrical sections focused on various cycles (p. 34-37, 75-78), and one on sacrificial rituals (p. 50-56).<sup>77</sup> Most comparable to the Dresden Codex are the chapters on the deeds and auguries of deities (p. 57-74 and 79-88) where *Chaak* also figures prominently;<sup>78</sup> but what most distinguishes the Madrid from the other codices, however, is the inclusion of deer-hunting almanacs (p. 38-49), and even beekeeping almanacs (103-112).<sup>79</sup> As such, even activities that we may consider prosaic and quotidian deserved the same kind of attentive reflection, planning

<sup>71</sup> Lacadena 2000. See also Ciudad Ruiz and Lacadena García-Gallo 1998. These findings go against earlier claims by Coe and Kerr 1997, who suggested that the codex was painted in a single and uniform hand. For recent pigment analyses, see Buti et al. 2014.

<sup>72</sup> See Vail 2006.

<sup>73</sup> Coe and Kerr 1997 also held this view.

<sup>74</sup> The writing appears reversed, or in mirror image, having bled through the paper.

<sup>75</sup> Chuchiak 2004; Bricker 2009.

<sup>76</sup> For a study on the presence of a European rapier in the archaeological record of the Maya area, see Awe and Helmke 2015.

<sup>77</sup> Vail and Aveni (eds.) 2004.

<sup>78</sup> See Aveni 2009.

<sup>79</sup> Vail 1994, 1997.

and divination as any other wholly ritual activity. As the most extensive of the codices the Madrid Codex has really only just begun to shed light on the multifaceted aspect of Maya ritual practices and careful scrutiny is slowly revealing that these functional almanacs with their terse language, do contain clues as to poetic structure and compositions.<sup>80</sup>

Among the extant Maya codices, the Grolier Codex (Figure 12d) – also known as the Sáenz Codex or Códice de México – is the most distinctive. This codex stands out for its distinctive squat format, short lists of calendrical signs and numerical coefficients, paired with schematic representations of supernatural figures, which are departures from the more complex texts and iconography of the other codices. Uniquely, it contains no verbs or grammatical sentences. Discovered in the 1960s in a cave in Chiapas, Mexico, reportedly in a wooden box alongside other ancient artifacts, the Grolier Codex has had a controversial history.<sup>81</sup> Its authenticity was initially questioned due to the lack of clear archaeological provenance. However, its authenticity has been increasingly supported by scientific analyses, including AMS (Accelerator Mass Spectrometry) dating of organic materials, which places the codex in the Late Postclassic period, between AD 1150 and 1300. These results align with radiocarbon assays of strips of the codex's bark paper, which produced dates of AD 1257 ± 110 and AD 1212 ± 40. In addition to its date, it is also remarkable for being the only pre-Hispanic manuscript discovered in the 20th century.

The Grolier Codex was first exhibited in 1971 at the Grolier Club of New York, thanks to the efforts of archaeologist Michael Coe. Since then, a growing body of scholarship, including work by Michael Coe, Stephen Houston, Mary Miller, and Karl Taube, has supported its legitimacy. Pigment analyses have revealed the presence of Maya blue, a distinctive pigment used by the Maya, further bolstering the case for its authenticity. In iconographic terms, the Grolier Codex aligns with Postclassic Maya traditions, particularly in its depictions of deities and cosmological themes, which are consistent with those found in the Dresden, Paris, and Madrid codices. Despite its checkered history, the Grolier Codex has now largely been accepted as genuine,<sup>82</sup> as scholars point to the combined evidence of material composition, radiocarbon dating, pigment analysis, and iconographic consistency to place it firmly within the Maya corpus of manuscripts. These elements, along with its focus on ritual and astronomical content, affirm its place as an important Maya codex.

## 20. PORTABLE ARTEFACTS

The inscriptions on portable artefacts, like shell, bone, jadeite beads, etc. are – logically – a lot shorter than the texts on the monuments. Many small artefacts just state the owner and the name of the object; for example (see Figure 17): *ubaak jasaw t'ochawaan? k'uhul mutul ajaw ochk'in kalomte' umijmil? nu'n ujol chahk k'uhul mutul ajaw* ("this is the bone of Jasaw, t'ochawaan?, divine Mutul king, west kalomte', the child of Nu'n Ujol Chahk, divine Mutul king"), but some have lengthier texts with verbal clauses. These simple statements of ownership are sometimes referred to as 'name-tagging'.



Figure 17: Carved bone from Burial 116, Tikal (TIK MT-44);  
Drawing by Christophe Helmke (based on drawing by Annemarie Seuffert)

<sup>80</sup> Lacadena 2009.

<sup>81</sup> The circumstances of discovery surrounding this codex are summarized in a vivid and colorful way by Coe (1992: 227-229). See also Olsen Bruhns and Vitelli 1977; Baudez 2002; and Marhenke 2012.

<sup>82</sup> Studies questioning the authenticity of the Grolier Codex include Thompson 1975; Baudez 2002; Milbrath 2002; and Grube 2012. For arguments in favor of the authenticity of the codex, see, e.g., Carlson 1983; Lee 1985; Stuart 1986; and Karl Taube, cited in Milbrath 2002: 52.



## APPENDICES

## APPENDIX A: ASSORTED TEXTS

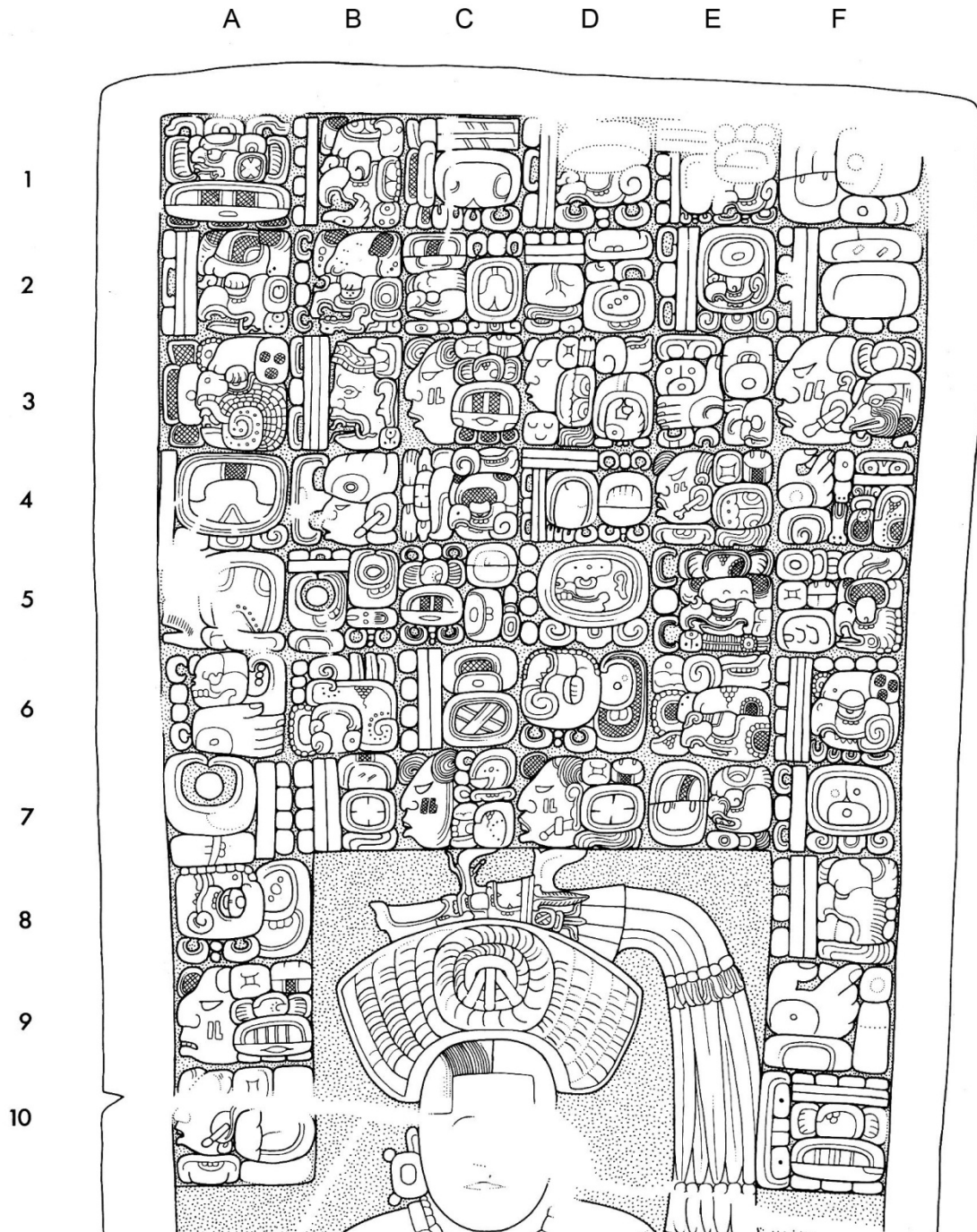


Figure 18: Inscription on the upper section of the back of Stela 3, Piedras Negras, Guatemala (drawing by David Stuart [in Stuart and Graham 2003: 9:27] with slight modifications)

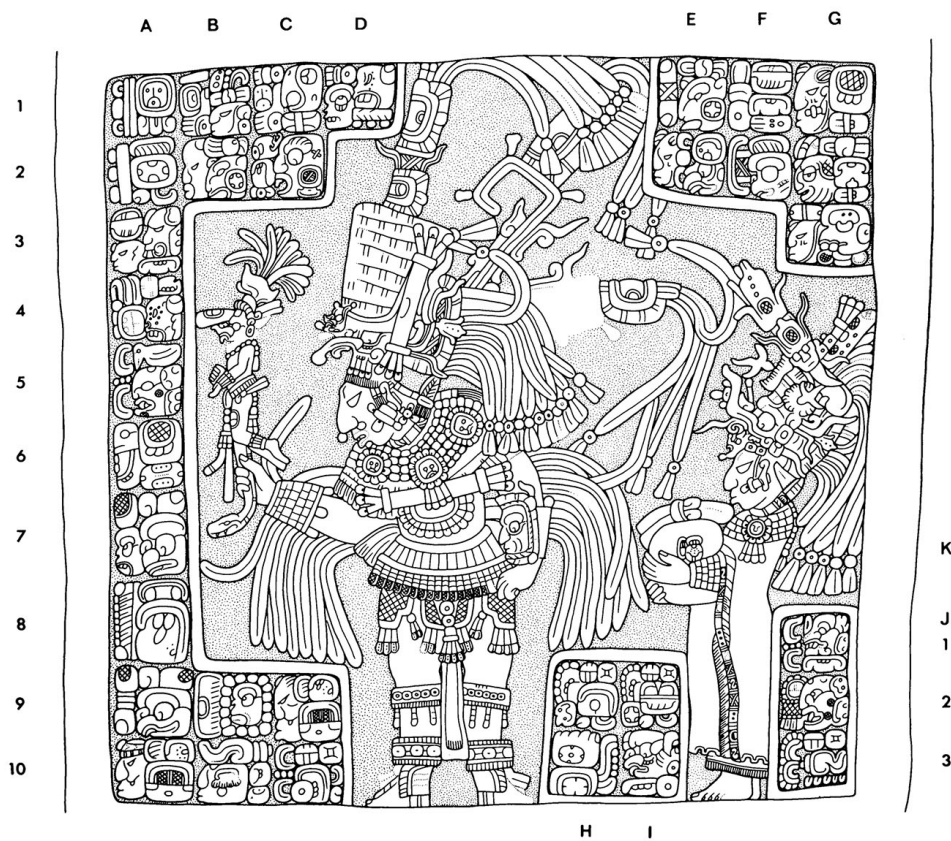


Figure 19: Lintel 1, Yaxchilan, Mexico (drawing by Ian Graham [in Graham and von Euw 1977: 13])

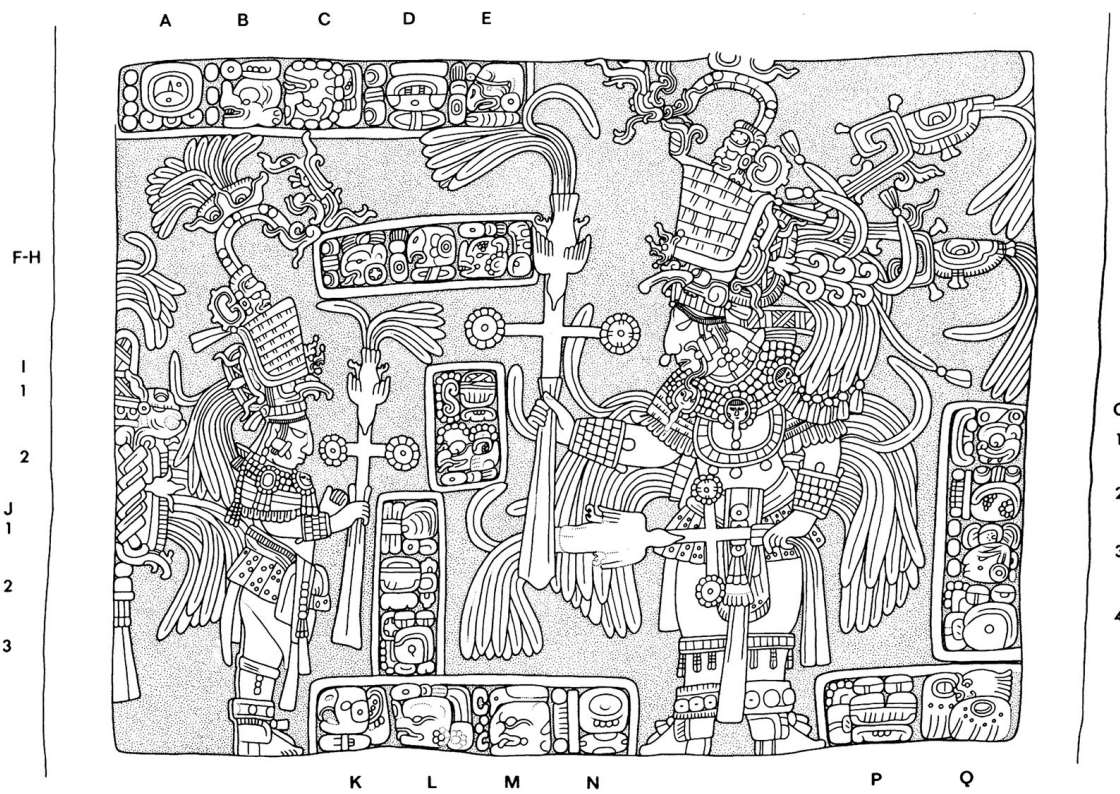


Figure 20: Lintel 2, Yaxchilan, Mexico (drawing by Ian Graham [in Graham and von Euw 1977: 15])

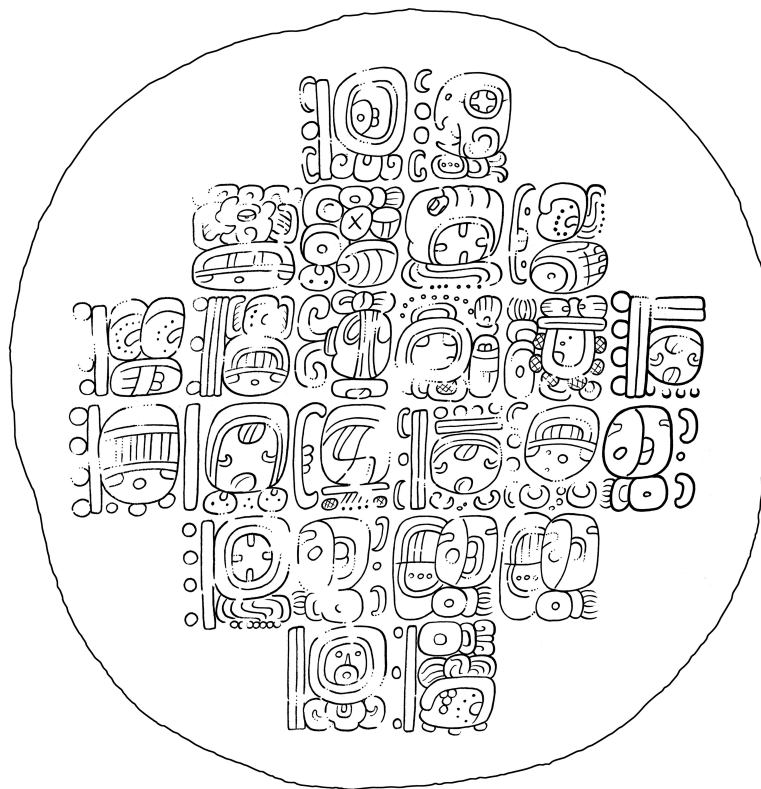


Figure 21: Ballcourt Marker 4, Caracol, Belize (drawing by Christophe Helmke, courtesy of the Tourism Development Project and the Caracol Archaeological Project)

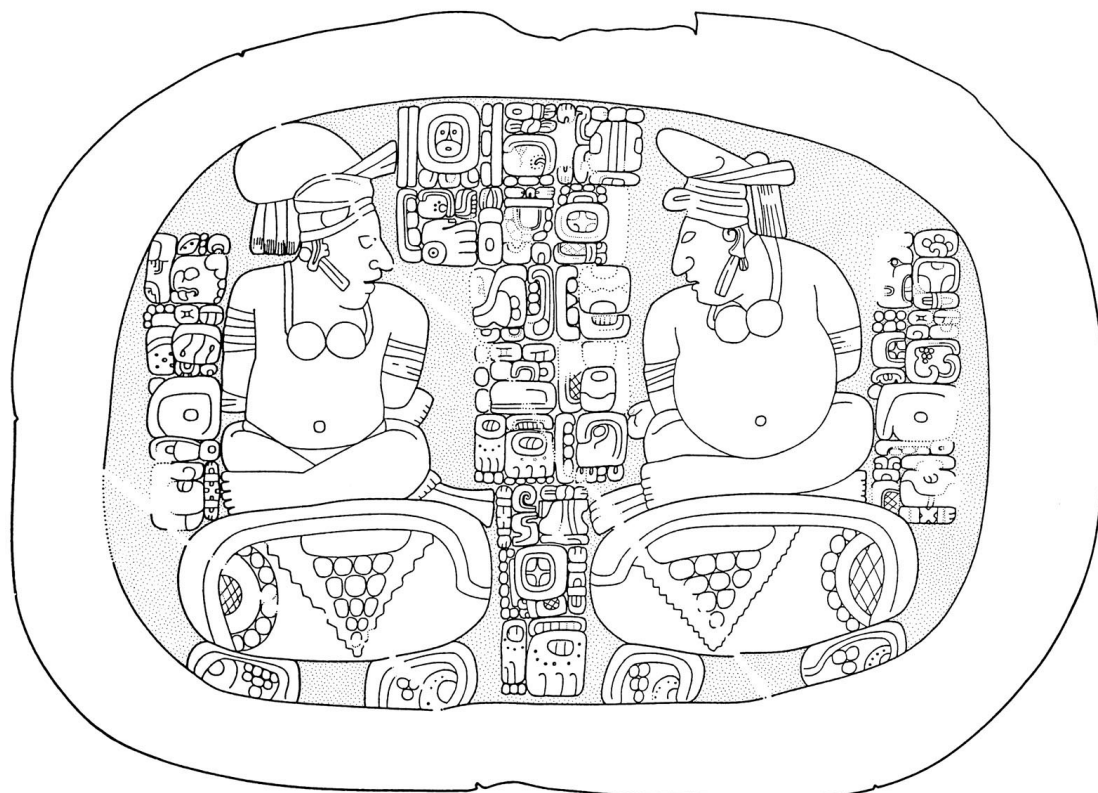


Figure 22: Altar 23, Caracol, Belize (drawing by Arlen Chase, Diane Chase, and Nikolai Grube, with minor modifications)

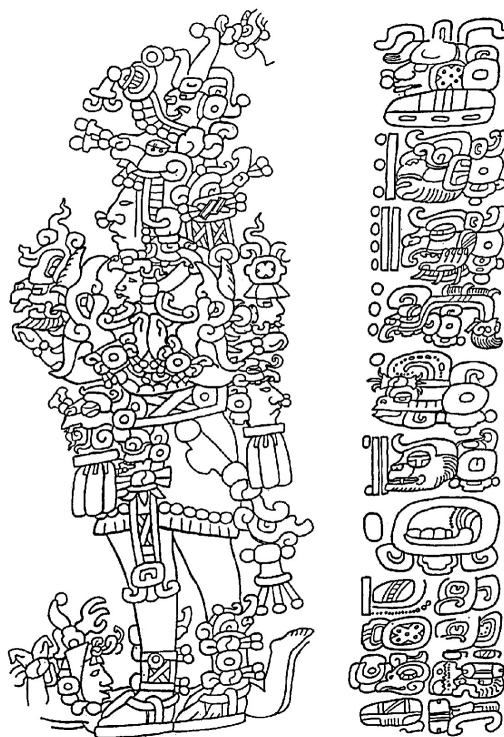


Figure 23: Unprovenanced jadeite celt, the “Leiden Plaque” (drawing by Linda Schele [in Schele 1990: 78])

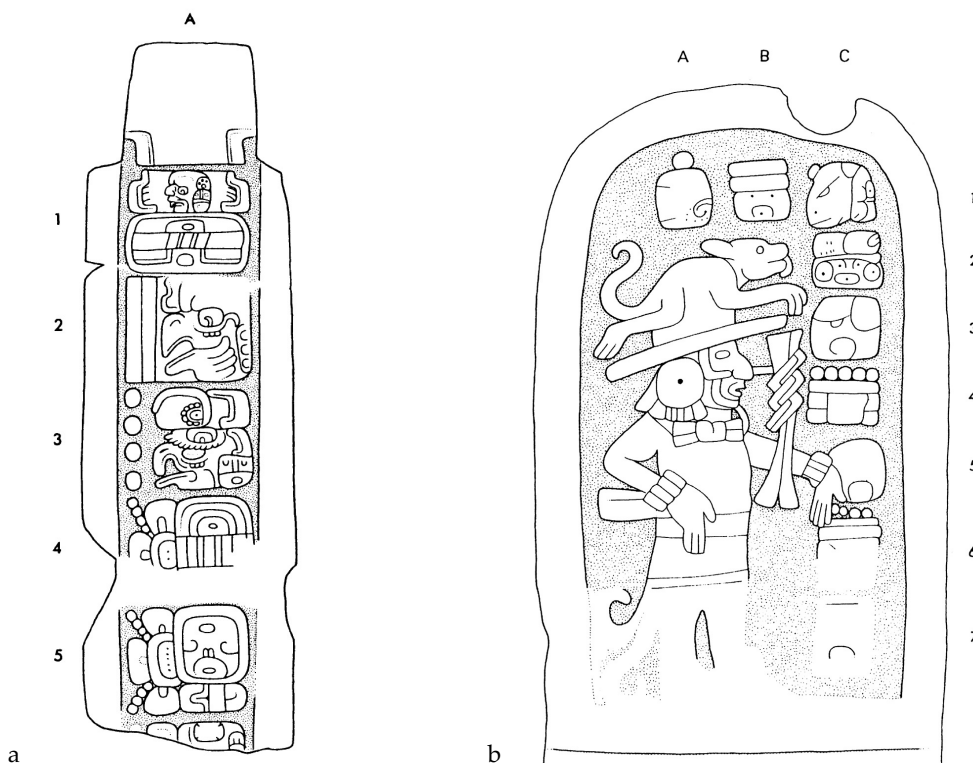


Figure 24: (a) Monument 101, Tonina (drawing by Ian Graham and Peter Mathews [in Graham and Mathews 1996: 2:125]); (b) Stela 6, Itzimte, Mexico (drawing by Eric von Euw [in von Euw 1977: 4:17])

## APPENDIX B: TITLES



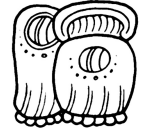





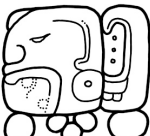

				
<b>AJAW</b> <i>ajaw</i> “lord” (royal title)	<b>a/AJ-WINAK-BAK</b> <i>aj wina[a]k baak</i> “he of 20 (many) captives”	<b>ba-ka-ba</b> <i>ba[ah]kab</i> “head/first of the earth”	<b>ch’a-jo/JOM-ma</b> <i>ch’ajom</i> “man”?	<b>CH’OK</b> <i>ch’ok</i> “youth”
				
<b>KAL?-TE’</b> <i>kall[om]te’</i> (exalted royal title)	<b>ke-KELEM</b> <i>kelem</i> “youth”? “strong”?	<b>K’INICH</b> <i>k’inich</i> “sunny” (name of a deity)	<b>sa-ja-la</b> <i>sajal</i> “noble”?	<b>a/AJ-TZ’IB-ba</b> <i>aj tz’ihb</i> “writer” “painter”

Table 5: Common royal titles

## APPENDIX C: RELATIONSHIP GLYPHS



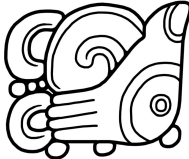

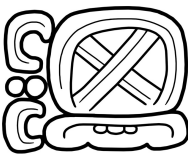
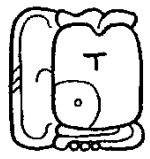
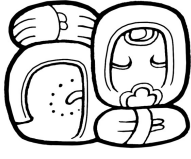
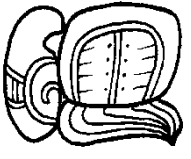

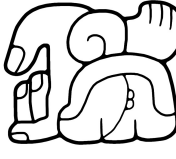


					
<b>yu-ne</b> <i>yune[n]</i> child of father	<b>u-1-ta-na</b> <i>ujuntan</i> beloved; child (metaphoric)	<b>ya-AL</b> <i>yal</i> child of mother	<b>u-MIJIN?-na / u-K’AK’?-?-na</b> <i>u ?...n</i> child of father	<b>ya-AT?-na</b> <i>yatan</i> spouse; companion	<b>yi-cha-ni</b> <i>yichaan</i> maternal uncle
					
<b>su-ku-WINIK-ki</b> <i>suku[n] winik</i> elder brother	<b>yi-tz’i-ni</b> <i>yi[h]tz’iin</i> younger brother	<b>u-KAB-ji-ya</b> <i>ukabjiiy</i> by / by the doing of	<b>ye-TE’</b> <i>ye[h]te’</i> his/her work/doing	<b>yi-ta-ji</b> <i>yitaaaj</i> with(?)	<b>yi-T703v-NAL</b> <i>yichnal</i> in the presence of

Table 6: Relationship glyphs



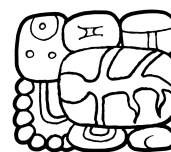
APPENDIX D: CLASSIC MAYA EMBLEM GLYPHS



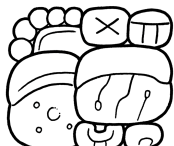
Altun Ha  
YAM?-ni



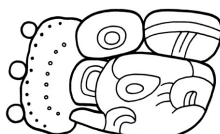
La Florida  
MAN-ni



Quirigua  
UN?



Bital  
bi-TAL



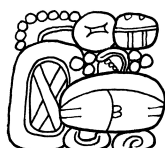
Lamanai  
AHIN?



Seibal  
?



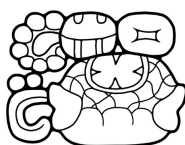
Calakmul  
ka-KAN-la



Machaquila  
?-su



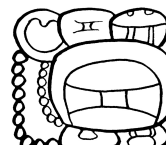
Tikal  
MUT



Cancuen  
ya-AK[K'IN]



Naranja  
SA'



Tonina  
po



Caracol  
K'AN-tu-ma[ki]



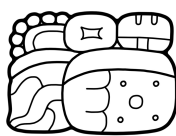
Palenque  
BAK-la



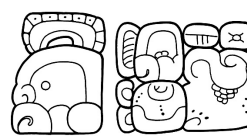
Ucanal  
K'AN-na-[WITZ]NAL



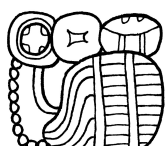
Copan  
?[ku]-pi



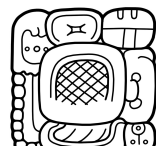
Piedras Negras  
yo-ki[bi]



Xunantunich  
ka-ta-u?-tzi-WITZ



Dos Pilas  
MUT



Pomona  
pa-ka-bu-la



Yaxchilan  
[PA']CHAN-na

Figure 25: Selected Classic Period Emblem Glyphs



Figure 26: Map of the Maya area showing principal archaeological sites

## APPENDIX E: NOTE ON THE CALENDAR

The Maya calendrical system is a rather complex arrangement with a number of overlapping systems. Usually the dates recorded in the inscriptions cover major parts of the texts. Fundamentally, the Maya calendrical system is twofold: it records linear time from a (mythological) zero point (13th of August 3114 BC) onwards (Long Count), and cyclical time with (basically) two calendrical cycles (the Calendar Round, comprised of the Tzolk'in [260 days] and the Haab [365 days]).

### MATHEMATICS<sup>83</sup>

The Classic Maya mathematical system is a vigesimal (base twenty) positional system that was employed throughout Mesoamerica during the Precolumbian times (instead of the common Western decimal [base ten] system). In practice this means that the position shift is made at twenty rather than ten. In the Maya calendrical calculations, however, the Haab coefficient breaks the harmonic vigesimal rule being a multiplication of 18 times 20 rather than 20 times 20. With this exception to the rule the Maya were approximating the closest possible number of days to the solar year (as well being a figure divisible by 20), thereby reaching a compromise of 360 days<sup>84</sup>.

---

#### Vigesimal system applied for calendrical calculations<sup>85</sup>:

---

Formula:		Value (days):	Numbers (days):
1	or	20 <sup>0</sup>	1
20	or	20 <sup>1</sup>	0 – 19
18 X 20	or	18 X 20 <sup>1</sup>	20 – 359
20 X 18 X 20	or	18 X 20 <sup>2</sup>	360 – 7 199
20 X 20 X 18 X 20	or	18 X 20 <sup>3</sup>	7 200 – 143 999
20 X 20 X 20 X 18 X 20	or	18 X 20 <sup>4</sup>	144 000 – 2 879 999
etc.		etc.	2 880 000 – 57 599 999
		etc.	etc.

---

Table 7: Applied vigesimal system for calendrical calculations

<sup>83</sup> Examples of mathematical calculations will be provided during the workshop.

<sup>84</sup> The Haab coefficient (360 days) in the Long Count calendar is not to be confused with the Haab calendar (365 days) in the Calendar Round (see below).

<sup>85</sup> It should be noted here that the coefficient examples in this table run beyond the standard number of coefficients found in most Long Count dates (the first five are/were sufficient to record historical time).











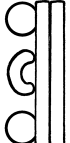




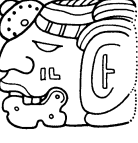

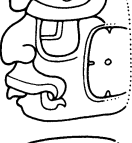

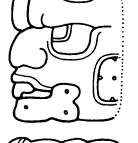
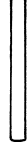
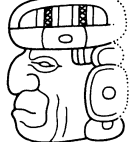




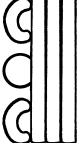


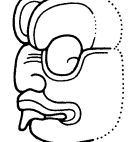
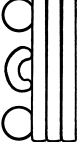







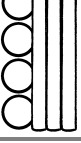
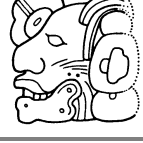
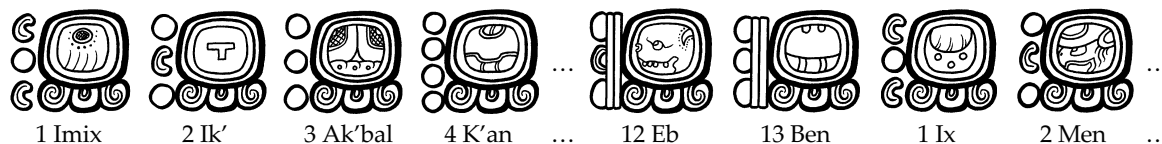
Classic Nº: Maya:	Notational variants:	Head variants:	Classic Nº: Maya:	Notational variants:	Head variants:
0 mih?/ minan?			10 lajun		
1 jun			11 buluch/ buluk		
2 cha'			12 lajunchan?		
3 ux/ ox			13 uxlajun/ oxlajun		
4 chan/ kan			14 chanlajun		
5 ho'			15 ho'lajun		
6 wak			16 waklajun		
7 huk			17 huklajun		
8 waxak			18 waxaklajun		
9 balun?			19 balunlajun?		

Table 8: Classic Maya numerals from zero to nineteen (drawings of the head variants by John Montgomery)

### TZOLK'IN AND HAAB

The Tzolk'in is a cycle of 260 days, made up of the permutation of 13 numbers with twenty named days. The Haab is a (vague) solar year of 365 days, made up of 18 named "months" of 20 days each, with 5 extra days added on at the end of the year. The first day of the Tzolk'in is "1 Imix". The next day is "2 Ik'", the next "3 Ak'bal", and so on, until after 260 different combinations "1 Imix" occurs again.<sup>86</sup>



imix	1	8	2	9	3	10	4	11	5	12	6	13	7
ik'	2	9	3	10	4	11	5	12	6	13	7	1	8
ak'bal	3	10	4	11	5	12	6	13	7	1	8	2	9
k'an	4	11	5	12	6	13	7	1	8	2	9	3	10
chikchan	5	12	6	13	7	1	8	2	9	3	10	4	11
kimi	6	13	7	1	8	2	9	3	10	4	11	5	12
manik'	7	1	8	2	9	3	10	4	11	5	12	6	13
lamat	8	2	9	3	10	4	11	5	12	6	13	7	1
muluk	9	3	10	4	11	5	12	6	13	7	1	8	2
ok	10	4	11	5	12	6	13	7	1	8	2	9	3
chuwen	11	5	12	6	13	7	1	8	2	9	3	10	4
eb	12	6	13	7	1	8	2	9	3	10	4	11	5
ben	13	7	1	8	2	9	3	10	4	11	5	12	6
ix	1	8	2	9	3	10	4	11	5	12	6	13	7
men	2	9	3	10	4	11	5	12	6	13	7	1	8
kib	3	10	4	11	5	12	6	13	7	1	8	2	9
kaban	4	11	5	12	6	13	7	1	8	2	9	3	10
etz'nab	5	12	6	13	7	1	8	2	9	3	10	4	11
kawak	6	13	7	1	8	2	9	3	10	4	11	5	12
ajaw	7	1	8	2	9	3	10	4	11	5	12	6	13

Table 9: Organization of successive Tzolk'in dates

In the Haab calendar each "month" stays in place for twenty days. The first Maya month is Pop, the day after "1 Pop" is "2 Pop", then "3 Pop", and so on, until after 365 days "1 Pop" reoccurs. The beginning of the month was called the "seating" of the month, and after 19 days Pop is completed, and the next month (Wo) is "seated".<sup>87</sup>

### CALENDAR ROUND

The Calendar Round (CR) date records a specific date by giving both its Tzolk'in and its Haab positions, e.g. "6 Etz'nab 11 Yax" (which follows by "7 Kawak 12 Yax", "8 Ajaw 13 Yax", "9 Imix 14 Yax", etc. Since 260 and 365 have a common factor of 5, the minimal time it takes for a particular Calendar Round date to repeat is  $(260 \times 365) / 5$ , or 18980 days, or  $52 \times 365$  days (= approximately 52 years).

### LONG COUNT

The Long Count is a linear<sup>88</sup> calendar with a (mythological) starting point in year 3114 BC in the Gregorian calendar (13<sup>th</sup> of August, according to the modified GMT [Goodman-Martínez-Thompson] correlation constant [584285]). The Long Count calendar resembles our linear calendar with the exception that in the Christian calendar time is computed in *years* whereas in the Maya Long Count time is reckoned in *days*. The Long Count has, therefore,

<sup>86</sup> See

Day Names (Tzolk'in Calendar) below.

<sup>87</sup> See Month Names (Haab Calendar) below.

<sup>88</sup> Even though the Long Count calendar of 13 bak'tuns (pik or pikhaab) is a linear calendar, the Maya probably perceived time as being cyclical in nature. Furthermore, the Long Count calendar can be regarded as a continuation or a recurrence of the previous calendar (or creation), and thus cyclical in nature.

advantages over our system as regards to precision in recording time using only one calendrical system. However, as has been noted, the Maya were keen on employing a number of overlapping calendrical systems to specify a given date in a moment in time<sup>89</sup>. See the section “How to Convert Maya Long Count Dates to Gregorian Dates” for further information.

## INITIAL SERIES

The Initial Series (IS) is a standard calendrical notation, which on an archetypal Maya monument comprises the opening segment of a text. This section is introduced by the Initial Series Introductory Glyph (ISIG), the Long Count (LC), and the Calendar Round (CR). Besides recording the point in time of the first event in the text, the Initial Series also serves as an anchor date for later dates in the monument (recorded thereafter by Distance Numbers).

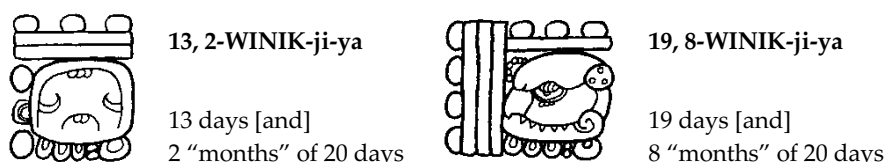
## SUPPLEMENTARY SERIES

A set of usually six or seven glyphs are repeatedly incorporated between the Tzolk'in and the Haab calendars in lengthy monumental Maya texts with Initial series. This group of hieroglyphs is known as the Supplementary Series<sup>90</sup> consisting, for example, of a cycle of 9 days (glyph G) which together with glyph F probably refers to a particular ritual that took place on the recorded date, and a set of glyphs known as the Lunar Series dealing with lunar information (the number of elapsed days since the last new moon [glyphs E and D], the position of a given lunation within a cycle of six lunations [glyph C], the epithet of the lunation or possibly the direction of the rising or setting moon [glyph X], and the modifier [“the young name of”] for it [glyph B], and the number of days [29 or 30] of the current lunation [glyph A]).

## DISTANCE NUMBERS

Distance Numbers (DN) are the intervals between dates in the Maya inscriptions. They are always recorded in reverse order from that of the Initial Series dates. First comes the record of days (*k'in*), then 20-day periods (*winik*), then 360-day “years” (*haab*), and then 20 vague years (*winaakhaab* [“k'atun”]), etc.

Usually, the *k'in* and *winik* coefficients are written in the same glyph, where they are both “glued” to the *winik* sign. Both of them can occupy either the left side or the top of the *winik* sign. However, the *winik* coefficient only takes the same space horizontally or vertically as the *winik* sign, whereas the *k'in* coefficient occupies the whole extent (length or vertical space) of the remaining glyph block. A worthy piece of advice is to look at the upper left corner of the glyph block: whatever number occupies that position is the coefficient of the *k'in* period.



Distance Numbers are usually followed by either “Anterior Date Indicators” (ADI) or “Posterior Date Indicators” (PDI), since they precede an earlier date and a later date, respectively. Now that these signs can be read phonetically, their temporal attributes can be understood in semantic terms based on assessments of their respective grammatical affixes. Thus, the ADI reads *u[h]tiii* (**u-ti-ya**), “it had come to pass” and the PDI reads *iu[h]ti* (**i-u-ti**), which stands for “and then it happened”.



<sup>89</sup> For a revealing example, explore Lintels 29-31 from Yaxchilan.

<sup>90</sup> The hieroglyphs in the Supplementary Series were labeled by early Maya scholars in reverse order from that of their position in the text (due to the fact that the glyphs towards the end of the Series were more consistent than the glyphs in the beginning): G, F, E, D, C, B, A. Later discoveries have added three more glyphs to the inventory: glyphs Z, Y, and X.

POSSIBLE HAAB COEFFICIENTS FOR THE TZOLK'IN DAY NAMES

Tzolk'in:	Possible Haab coefficient:			
Ajaw	8	13	18	3
Imix	4	9	14	19
Ik'	5	10	15	0
Ak'bal	6	11	16	1
K'an	7	12	17	2
Chikchan	8	13	18	3
Kimi	4	9	14	19
Manik'	5	10	15	0
Lamat	6	11	16	1
Muluk	7	12	17	2
Ok	8	13	18	3
Chuwen	4	9	14	19
Eb	5	10	15	0
Ben	6	11	16	1
Ix	7	12	17	2
Men	8	13	18	3
K'ib	4	9	14	19
Kaban	5	10	15	0
Etz'nab	6	11	16	1
Kawak	7	12	17	2

“LORDS OF THE NIGHT” (CYCLE OF 9 DAYS)

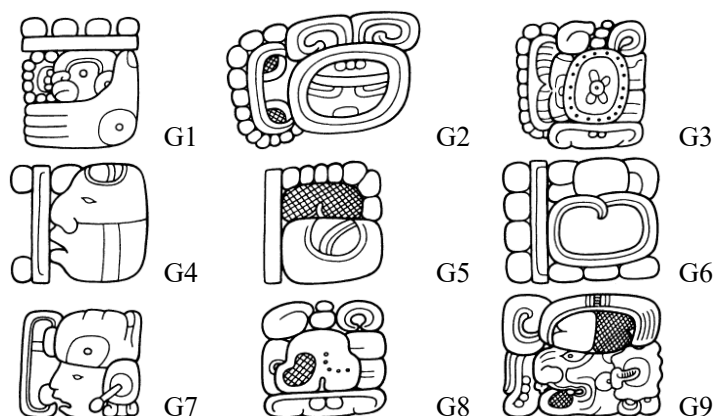


Table 10: Lords of the Night (drawings by John Montgomery)

**AN EXAMPLE OF THE CORRELATION OF THE LONG COUNT,  
TZOLK'IN, HAAB, AND THE LORDS OF THE NIGHT**

9.8.19.17.14	10 Ix	17 Sip	G3
9.8.19.17.15	11 Men	18 Sip	G4
9.8.19.17.16	12 Kib	19 Sip	G5
9.8.19.17.17	13 Kaban	0 Sotz'	G6
9.8.19.17.18	1 Etz'nab	1 Sotz'	G7
9.8.19.17.19	2 Kawak	2 Sotz'	G8
9.9.0.0.0	3 Ajaw	3 Sotz'	G9
9.9.0.0.1	4 Imix	4 Sotz'	G1
9.9.0.0.2	5 Ik'	5 Sotz'	G2
9.9.0.0.3	6 Ak'bal	6 Sotz'	G3
9.9.0.0.4	7 K'an	7 Sotz'	G4
9.9.0.0.5	8 Chikchan	8 Sotz'	G5
9.9.0.0.6	9 Kimi	9 Sotz'	G6
9.9.0.0.7	10 Manik'	10 Sotz'	G7
9.9.0.0.8	11 Lamat	11 Sotz'	G8
9.9.0.0.9	12 Muluk	12 Sotz'	G9
9.9.0.0.10	13 Ok	13 Sotz'	G1
9.9.0.0.11	1 Chuwen	14 Sotz'	G2
9.9.0.0.12	2 Eb	15 Sotz'	G3
9.9.0.0.13	3 Ben	16 Sotz'	G4
9.9.0.0.14	4 Ix	17 Sotz'	G5
9.9.0.0.15	5 Men	18 Sotz'	G6
9.9.0.0.16	6 Kib	19 Sotz'	G7
9.9.0.0.17	7 Kaban	0 Sek	G8
9.9.0.0.18	8 Etz'nab	1 Sek	G9
9.9.0.0.19	9 Kawak	2 Sek	G1
9.9.0.1.0	10 Ajaw	3 Sek	G2
9.9.0.1.1	11 Imix	4 Sek	G3
9.9.0.1.2	12 Ik'	5 Sek	G4
9.9.0.1.3	13 Ak'bal	6 Sek	G5
9.9.0.1.4	1 K'an	7 Sek	G6
...	...	...	...

**HOW TO CONVERT MAYA LONG COUNT DATES TO GREGORIAN DATES**

1. Multiply the numbers in the Long Count calendar by units given in the table below (center column).
2. Add the number of days together. If the Maya Long Count date is, say, 9.15.6.14.6 (9 "bak'tuns", 15 "k'atuns", 6 "tuns", 14 "winals", and 6 "k'ins"): do the following calculations:

Long Count number:	multiplied by:	result:
9	144 000	1 296 000
15	7 200	108 000
6	360	2 160
14	20	280
6	1	6
Maya day number:		1 406 446



3. Add the GMT-correlation constant (584 285) to the Maya day number to give its corresponding Julian Day Number (JDN):

MDN:	GMT:	JDN:
1 406 446	584 285	1 990 731

4. From this JDN, the nearest *smaller* JDN (in the table below) is then subtracted:

year:	JDN:	year:	JDN:
1	1 721 060	1100	2 122 827
100	1 757 585	1200	2 159 351
200	1 794 109	1300	2 195 876
300	1 830 633	1400	2 232 400
400	1 867 157	1500	2 268 924
500	1 903 682	1600	2 305 448
600	1 940 206	1700	2 341 973
700	1 976 730	1800	2 378 497
800	2 013 254	1900	2 415 021
900	2 049 779	2000	2 451 545
1000	2 086 303		*

Julian Day Numbers (JDN) for January 1st in the Gregorian calendar (years AD 1—2000).

JDN #1	JDN #2	remainder:
1 990 731	1 976 730	14 001

5. Calculate the number of (365 day) years and days in the remainder number:

remainder:	days in a (vague) year:	result:
14 001	365	38 years 131 days

6. Take into account the leap days (one every fourth year) and leap centuries (those that are divisible by 400 (i.e. AD 400, 800, 1200, 1600, 2000, etc.) and subtract the number of leap days between AD 700 (closest smaller JDN) and 738 (700 + the division result above):

Closest smaller JDN:	division result:	leap days to be subtracted:	final result:
700	38 years 131 days	-9 days	738 years 122 days

Here the division is 38 years divided by 4 – for which we obtain 9,5. Counting only whole days we thus obtain 9 days to subtract. Maya Long Count date 9.15.6.14.6 corresponds, therefore, to the 122<sup>th</sup> day of the year AD 738; i.e. May 2<sup>nd</sup> AD 738.

**A SHORTCUT GUIDE FOR THE CONVERSION OF  
MAYA LONG COUNT DATES TO GREGORIAN DATES<sup>91</sup>**  
(for Maya date 9.15.6.14.6)

A rough estimate of a Gregorian date can be achieved by adding together the “bak’tuns” (9), “k’atuns” (15), “tuns” (6), “winals” (14), and “k’ins” (6) (=1 406 446), dividing the result by 365 (number of days in a year) ( $\approx 3 853,28$ ) and subtracting 3115 (the beginning of the Maya calendar in year 3114 + year zero) from it (=AD738).

A more accurate approximation can be achieved by using the following formula:<sup>92</sup>

$$(M / 365.25) - 3112.31 = Y$$

In this formula M is computed by adding the “bak’tuns”, “k’atuns”, “tuns”, “winals”, and “k’ins” (as above), and Y will be the year and the fraction of year (approximately).



**Figure 27: Codex style vase from the Late Classic Period  
(photo: Harri Kettunen; courtesy of Kimbell Art Museum)**

<sup>91</sup> The calculation below offers a  $\pm 1$  year rough estimate of a given Long Count date to be utilized in working out the overall time period of a given monument (if knowing the precise Gregorian date is not essential in that particular context).

<sup>92</sup> We would like to thank Mark Matney from the NASA Johnson Space Center in Houston for providing us this formula in 2009.

## PERIOD NAMES

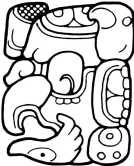
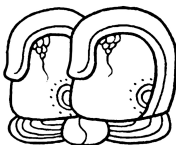

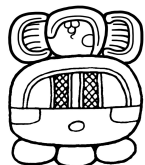



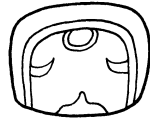


New orthography:	Old orthography:	Classic Mayan:	Period length:	Renditions of signs: head variants <sup>93</sup> & basic forms:	
bak'tun	baktun	<i>pik / pikhaab?</i>	144,000 days (= 20 X 7,200 days)		
k'atun	katun	<i>winikhaab?</i>	7,200 days (= 20 X 360 days)		
tun	tun	<i>haab</i>	360 days (= 18 X 20 days)		
winal	uinal	<i>winik</i>	20 days		
k'in	kin	<i>k'in</i>	1 day		

Table 11: Period names for Long Count dates and Distance Numbers

<sup>93</sup> Head variants modified after Stuart in Stuart & Graham 2003: 26.

### DAY NAMES (TZOLK'IN CALENDAR)
















New orthography:	16th Century Yucatec:	Classic Mayan:	Rendition of signs:
Imix	Imix	Ha'?' / Baah?	
Ik'	Ik	Ik'	
Ak'bal	Akbal	Ahk'ab?	
K'an	Kan	Ohl?	
Chikchan	Chicchan	?	 
Kimi	Cimi	Cham?	 
Manik'	Manik	Chij?	
Lamat	Lamat	Lamaht?	 
Muluk	Muluc	?	 
Ok	Oc	Ook?	 

Table 12: Day names in the Tzolk'in calendar: Imix – Ok (drawings by Mark Van Stone)

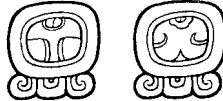

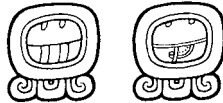







New orthography:	16th Century Yucatec:	Classic Mayan:	Rendition of signs:
Chuwen	Chuen	?	
Eb	Eb	?	
Ben	Ben	?	
Ix	Ix	Hix?	
Men	Men	Tz'ikiin / Men?	
Kib	Cib	?	
Kaban	Caban	Chab?/Kab?	
Etz'nab	Etnab	?	
Kawak	Cauac	?	
Ajaw	Ahau	Ajaw?	

Table 13: Day names in the Tzolk'in calendar: Chuwen – Ajaw (drawings by Mark Van Stone)

### MONTH NAMES (HAAB CALENDAR)

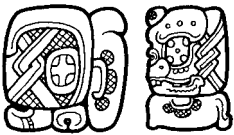





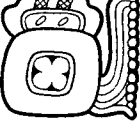
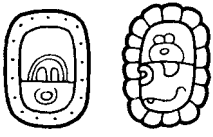

New orthography:	16th Century Yucatec:	Classic Mayan:	Rendition of signs:
Pop	Pop	K'anjalaw?, K'anjalab?	
Wo	Uo	Ik'at, Woh(iil)	
Sip	Zip	Chakat	
Sotz'	Zotz'	Suutz'	
Sek	Tzec	Kasew, Kusew	
Xul	Xul	Chikin?	
Yaxk'in	Yaxkin	Yaxk'in	
Mol	Mol	Mol, Molol, Molow	
Ch'en	Ch'en	Ik'sihom	

Table 14: "Month" names in the Haab calendar: Pop – Yax (drawings by Mark Van Stone<sup>94</sup>)

<sup>94</sup> With the exception of the 2nd "Wo" sign (after Kerr n.d. [K6751]).

New orthography:	16th Century Yucatec:	Classic Mayan:	Rendition of signs:
Yax	Yax	Yaxsihom	
Sak	Zac	Saksihom	
Keh	Ceh	Chaksihom	
Mak	Mac	Mak	
K'ank'in	Kankin	Uniw	
Muwan	Muan	Muwaan, Muwan	
Pax	Pax	Pax	
K'ayab	Kayab	K'anasiy	
Kumk'u	Cumku	? Ohl	
Wayeb	Uayeb	Wayhaab?, Kolajaw	

Table 15: “Month” names in the Haab calendar: Sak – Wayeb (drawings by Mark Van Stone<sup>95</sup>)

<sup>95</sup> With the exception of the 3rd “Muwan” sign (after a drawing by Nikolai Grube [CRC BCM3: D3]).



APPENDIX F: THE LANDA ALPHABET

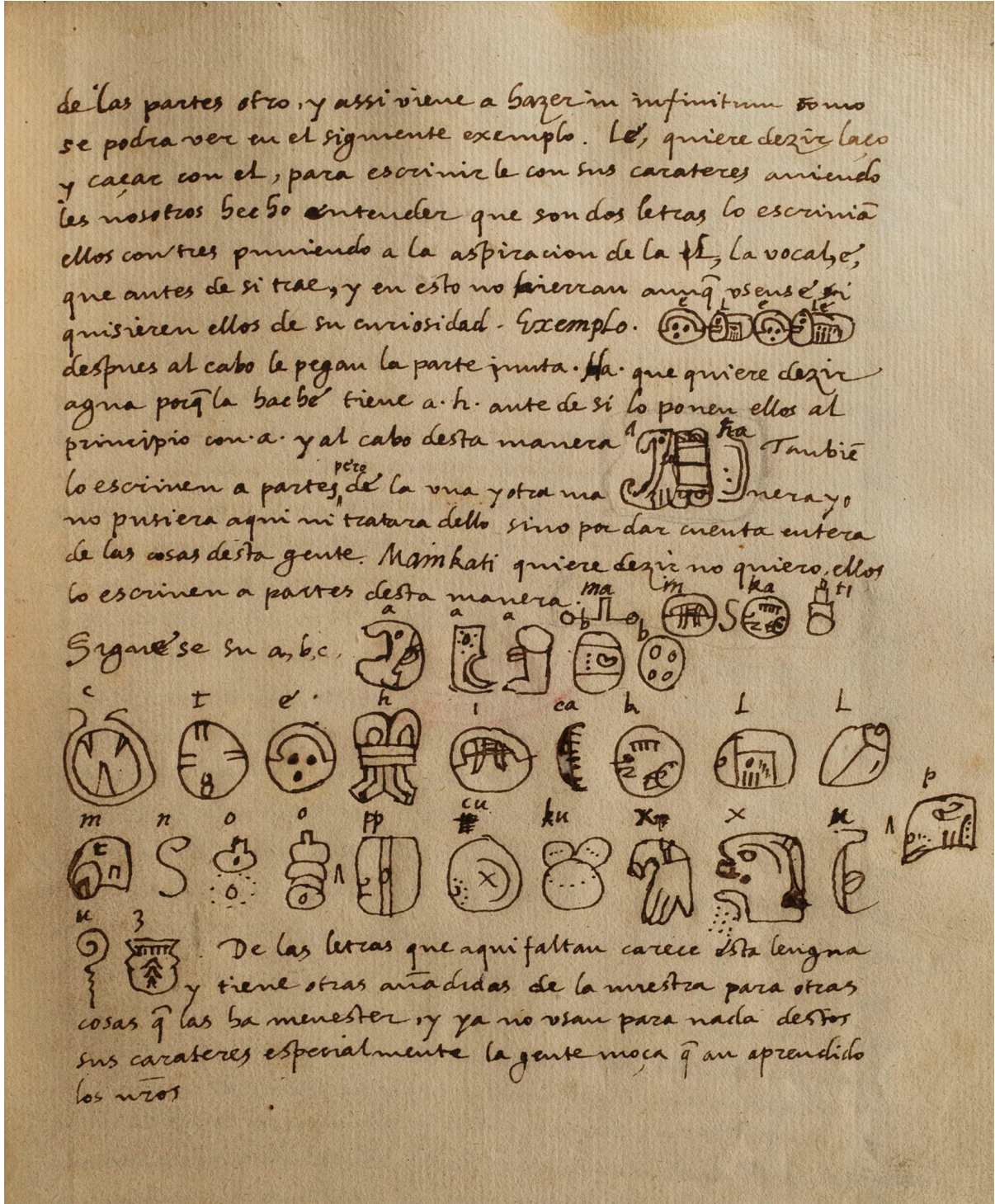


Figure 28: The "Landa Alphabet" on page 45r in the manuscript titled *Relación de las cosas de Yucatán*, ascribed to Diego de Landa (Photo by Harri Kettunen © Real Academia de la Historia, Madrid).



APPENDIX G: TRANSCRIPTIONS<sup>96</sup> OF CLASSIC MAYAN PHONEMES

## Consonants:

	bilabial	alveolar	palato- alveolar	palatal	velar	uvular	glottal
stops/ plosives:							
unglottalized	p	t			k		'
glottalized <sup>97</sup>	p'	t'			k'		
	b						
affricates:							
unglottalized		tz	ch				
glottalized <sup>97</sup>		tz'	ch'				
fricatives/ spirants		s	x			j	h
liquids/ approximants		l					
nasals	m	n					
semivowels	w			y			

Table 16: Classic Mayan consonants

## Vowels:

	front	central	back
high (close)	i		u
mid	e		o
low (open)		a	

Table 17: Classic Mayan vowels

<sup>96</sup> These transcriptions are neither phonetic nor phonemic. Instead, they represent the orthographies used in Maya epigraphy that are based on the new official alphabets for the Guatemalan Mayan languages (*Acuerdo Gubernativo numero 1046-87* [23rd of November 1987]) and its modification (*Acuerdo Gubernativo numero 129-88* [2nd of March 1988]), and its subsequent publication (*Lenguas Mayas de Guatemala: Documento de referencia para la pronunciación de los nuevos alfabetos oficiales*). See also the chapter “Note on the Orthography”.

<sup>97</sup> These can also be labeled as *ejective stops*.

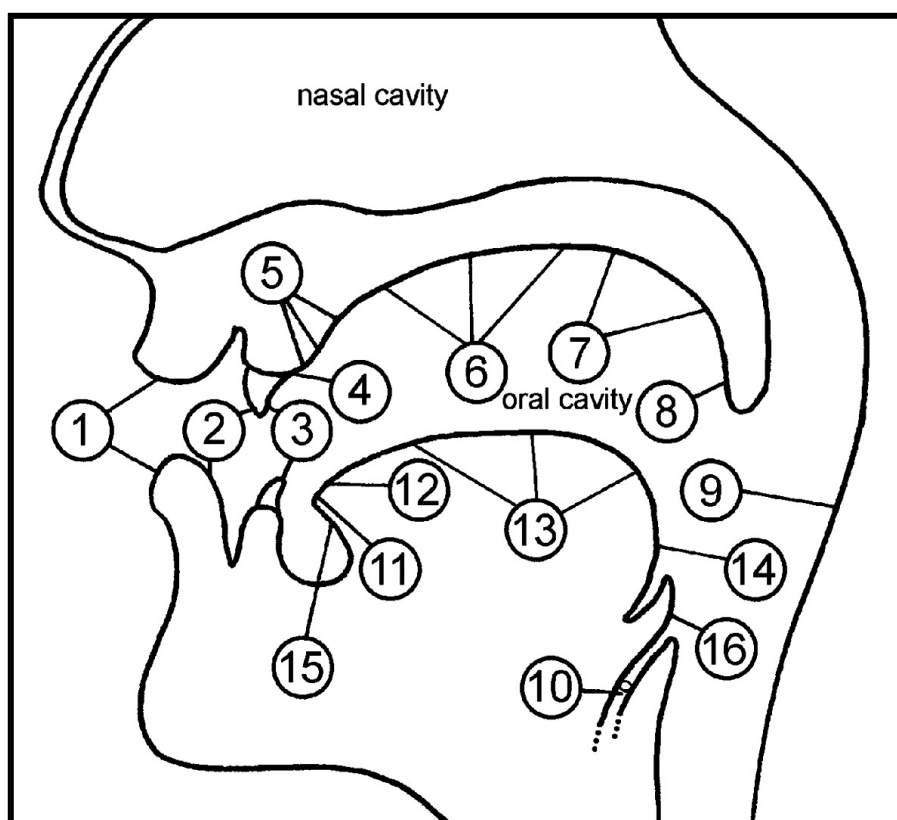
APPENDIX H: ARTICULATION ORGANS AND PLACES<sup>98</sup>

Figure 29: Articulation places

	<b>articulation organs:</b>	<b>Latin terminology:</b>	<b>articulation places:</b>
1	lips	<i>labium, pl. labia</i>	bilabial
2	lower lip & upper teeth		labiodental
3	teeth	<i>dens, pl. dentes</i>	interdental
4	back side of teeth		postdental (dental)
5	alveolar ridge	<i>alveolus, pl. alveoli</i>	alveolar
6	hard palate	<i>palatum durum</i>	palatal
7	soft palate	<i>velum</i>	velar
8	uvula	<i>uvula</i>	uvular
9	pharynx	<i>pharynx</i>	pharyngeal
10	larynx	<i>larynx</i>	laryngeal
11	tip of the tongue	<i>apex</i>	apical
12	blade of the tongue	<i>laminal/ corona</i>	laminal/ coronal
13	dorsum of the tongue	<i>dorsum</i>	dorsal
14	root of the tongue	<i>radix</i>	radical
15	underblade	<i>subdorsum</i>	subdorsal
16	epiglottis	<i>epiglottis</i>	epiglottal

Table 18: Articulation organs and places

<sup>98</sup> Based partly on Iivonen, Horppila, Heikkonen, and Rissanen 2000 with modifications.

## APPENDIX I: SYNHARMONIC VS. DISHARMONIC SPELLING, UNDERSPELLED SOUNDS, AND RECONSTRUCTED GLOTTAL FRICATIVES IN MAYA HIEROGLYPHIC WRITING

The following is primarily based on the foundation work done by Houston, Robertson, and Stuart (1998, 2000), Lacadena and Wichmann (2004), and Lacadena and Zender (2001). All possible misinterpretations are ours, not theirs.

### EXPLANATION OF ABBREVIATIONS:

C	consonant
V	vowel
ABS	absolute
ERG	ergative

Since the pivotal study of phoneticism in Maya hieroglyphic writing by Knorozov (1952) until the latter part of 1990's, the existence of disharmony (disharmonic spelling arrangements) in the Maya script was noticed but left more or less as an open question. In 1980's, the issue was taken under scrutiny by linguists, and some promising results were achieved.

However, no overall satisfying pattern was found to explain all the arrangements until late 1990's and during the past few years. In 1998 Houston, Robertson and Stuart proposed that the disharmonic spellings in the Maya script indicate the presence of preconsonantal glottal fricatives (/h/) as well as complex vowels including: long vowels (VV), glottal stops ('), glottalized vowels (V') and rearticulated glottalized vowels (V'V).

In their original proposal, Houston, Stuart, and Robertson (1998) suggested that there is no distinction made between vowel length, glottalization, and preconsonantal /h/ by means of disharmonic spellings, and that the existence of these three phonemic features are to be reconstructed historically:

$$\begin{array}{l}
 CV_1C / CV_1-CV_1 > \\
 CV_1C / CV_1-CV_2 >
 \end{array}
 \left\{ \begin{array}{l}
 CV_1C \\
 CVVC \\
 CV'C \\
 CVhC
 \end{array} \right\} + \text{historical reconstruction}$$

A later modification by Lacadena and Wichmann (2004) pointed toward an interpretation that complex vowels (complex syllable nuclei) "were distinguished from short vowels in the script [... and] that vowel length and glottal stops were clearly distinguished from one another in the orthography". Lacadena and Wichmann (2004: 103) also proposed that "neither disharmonic nor harmonic spellings indicate a preconsonantal /h/". While the preconsonantal /h/ existed in Classic Mayan (e.g. as a necessary and integral part of passive verbal constructions, see below), in the process of decipherment it must be reconstructed on the basis of historical linguistics.

The rules governing harmonic and disharmonic spelling arrangements as modified by Lacadena and Wichmann (2004) are as follows:

$$\begin{array}{ll}
 CV_1C / CV_1-CV_1 > CV_1C & \\
 CV_1C / CV_1-CV_2 > CVVC & (V_1 = a, e, o, u; V_2 = i) \\
 CV_1C / CV_1-CV_2 > CVVC & (V_1 = i; V_2 = a) \\
 CV_1C / CV_1-CV_2 > CV'(V)C & (V_1 = e, o, u; V_2 = a) \\
 CV_1C / CV_1-CV_2 > CV'(V)C & (V_1 = a, i; V_2 = u)
 \end{array}$$

Table of different arrangements with examples:

Arrangement:	Outcome:	Example:	Transcription:	Translation:
CAC / Ca-Ca	CaC	<b>la-ka</b>	<i>lak</i>	plate
CAC / Ca-Ci	CaaC	<b>ba-ki</b>	<i>baak</i>	captive
CAC / Ca-Cu	Ca'(a)C	<b>ba-tz'u</b>	<i>ba'tz'</i>	howler monkey
CEC / Ce-Ce	CeC	<b>te-me</b>	<i>tem</i>	throne
CEC / Ce-Ci	CeeC?	<b>ke-ji</b>	<i>keej</i>	deer (Yucatec)
CEC / Ce-Ca	Ce'(e)C	<b>ne-na</b>	<i>ne'[h]n</i>	mirror
CIC / Ci-Ci	CiC	<b>wi-tzi</b>	<i>witz</i>	mountain
CIC / Ci-Cu	Ci'(i)C	<b>chi-ku</b>	<i>chi'k</i>	coati
CIC / Ci-Ca	CiiC	<b>yi-tz'i-na</b>	<i>yi[h]tz'iin</i>	younger brother
COC / Co-Co	CoC	<b>yo-po</b>	<i>yop</i>	leaf
COC / Co-Ci	CooC	<b>xo-ki</b>	<i>xook</i>	shark
COC / Co-Ca	Co'(o)C	<b>o-la</b>	<i>o'[h]l</i>	heart
CUC / Cu-Cu	CuC	<b>k'u-hu</b>	<i>k'uh</i>	god
CUC / Cu-Ci	CuuC	<b>mu-chi</b>	<i>muuch</i>	toad
CUC / Cu-Ca	Cu'(u)C	<b>bu-la</b>	<i>bu'ul</i>	bean

Table 19: Examples based on harmony rules according to Lacadena and Wichmann (2004)

One of the (rare) disharmonic patterns in the script is that of CEC / Ce-Cu which is not included in Table 19 above. Lacadena and Wichmann (2004) proposed that this pattern most likely does not belong to the sphere of harmony rules but is rather another example of underspelling.<sup>99</sup> Thus there are two possible outcomes for the following arrangements:

CEC / Ce-Cu	Ce'(e)C	<b>che-bu</b>	<i>che'[eh]b? / chebu[l]?</i>	quill, brush
"	"	<b>te-mu</b>	<i>te'm? / temu[l]?</i>	seat, bench, throne

Examples of exceptions to the "normal disharmonic spelling rules" (=underspelled sounds):

Arrangement:	Outcome:	Example:	Transcription:	Translation:
CAC / Ca-Ce	?	<b>BAK-ke</b>	<i>ba[a]ke[l]</i>	child
VCAC / Ca-Ce	?	<b>AJAW-le</b>	<i>ajawle[l]</i>	lordship, kingdom
CAC / Ca-Co	?	<b>ch'a-jo/JOM</b>	<i>ch'ajol'm</i>	man
CEC / Ce-Cu	?	<b>e-bu</b>	<i>e[h]bu[l]</i>	stair
CEC / Ce-Co	?	---	*not attested*	---
CIC / Ci-Ce	?	---	*not attested*	---
CIC / Ci-Co	?	<b>ti-ho</b>	<i>tihol'</i>	(a toponym)
COC / Co-Ce	?	<b>o-ke</b>	<i>o[ol]ke[l]</i>	foot
COC / Co-Cu	?	---	*not attested*	---
CUC / Cu-Ce	?	<b>u-ne?</b>	<i>une[n]?</i>	baby
CUC / Cu-Co	?	---	*not attested*	---
CUC / Cu-Ca	?	<b>tu-pa</b>	<i>tupa[j]?</i>	earspool

Table 20: Examples of underspelled words

The following sounds are frequently underspelled towards the end of words and in the case of consonant clusters (-C# and -CC-): /l/, /m/, /n/, /h/, /j/, and /'/. Examples of words with underspelled sounds at the end of the word include: **bi** > *bi[h]* ("road"), **chi** > *chi[j]* ("deer"), **sa-ja** > *saja[l]* (title), **tz'u-nu** > *tz'unu[n]* ("hummingbird"), **a-u-ku** > *al[j]uku[l]* (proper name), and **YAX-a** > *Yaxa[l]* ("Yaxha" [toponym]). Examples of words with underspelled sounds in -CC- surroundings (consonant clusters/ double consonants) include: **ja-wa-TE'** > *jawa[n]te'* ("tripod plate"), **bu-**

<sup>99</sup> Moreover, Wichmann reasons that "Possibly a scribe was playing with the conventions and introduced *e-u* as a rule, but we have to consider the possibility that there is a suffix *-u[l]* in play. It is too much to sacrifice the simplicity of the system when there's so few examples and when they could involve underspelled suffixes" (personal communication, 2002).

**ku** > *bu[h]k* (“clothes”), **xo-TE'** > *xo[l]te'* (“staff”), and **ko-ha-wa** > *ko[']haw* (“helmet”), i.e., /l/, /m/, /n/, /h/, /j/, and /' / sounds are underspelled if they precede another consonant.

The variety of different spelling arrangements of a same word serves as a hint towards the interpretation of underspellings. For example, on Lintel 10 (see below) at Yaxchilan the name of a captive (*A[h]kul Mo'*) is written in four different ways:





			
B3a	C3b	F4a	F8
a-AK-MO'	AK-ku-lu-MO'	a-[ku?]lu-MO'	a-[ku?]lu-MO'-o
<i>A[h]k[ul] Mo'</i>	<i>A[h]kul Mo'</i>	<i>A[h]kul Mo'</i>	<i>A[h]kul Mo'</i>
<i>Ahkul Mo'</i>	<i>Ahkul Mo'</i>	<i>Ahkul Mo'</i>	<i>Ahkul Mo'</i>

Table 21: An example of varying spelling of the name *Ahkul Mo'* from Lintel 10, Yaxchilan

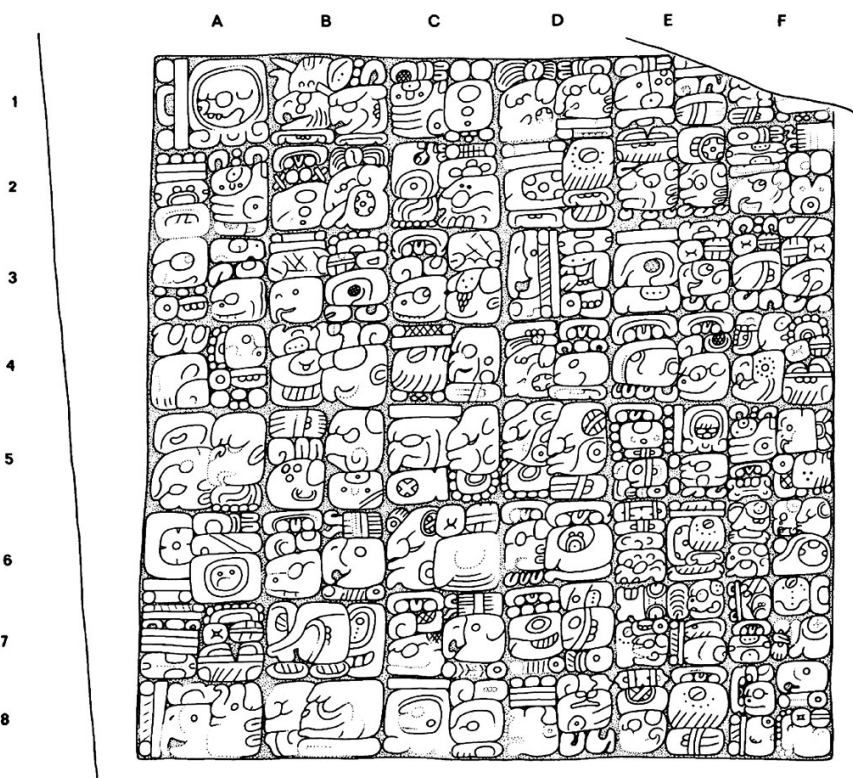


Figure 30: Lintel 10, Yaxchilan, Mexico (drawing by Ian Graham [Graham and von Euw 1977: 31])

It should be noted here that the spelling rules explained above are under constant modifications by the above-mentioned scholars and new adjustments are made annually. Furthermore, there is also disagreement on the basic principles of the spelling rules in the field of Maya epigraphy and, consequently, readers of this volume are advised to follow the current debate and to read forthcoming articles and publications relating to the issue (see also footnote 103).

One of the focal issues and main problems regarding the spelling rules is the partial disagreement of (historical) linguistic data and reconstructed spelling rules. There are a number of examples in the linguistic corpus that seem to contradict the rules described above and different scholars have distinct solutions to these dilemmas (cf. the dictionary towards the end of this volume). The reasons behind the disagreements between the different ‘schools’ of spelling rules are yet to be resolved but most likely a better understanding of the spoken vs. written language of the ancient Maya is to be achieved in the near future.

APPENDIX J: NOTES ON CLASSIC MAYAN GRAMMAR<sup>100</sup>

## CLASSIC MAYAN VOICE SYSTEM

Voice:	Transliteration:	Transcription:	Translation:
active	<b>u-TZUTZ-wa</b>	<i>utzutzuw</i>	he/she finished it
passive	<b>TZUTZ-tza-ja</b>	<i>tzu[h]tzaɟ</i>	it was finished
mediopassive	<b>TZUTZ-yi</b>	<i>tzutz[u]y</i>	it got finished
antipassive	<b>TZUTZ-wi</b>	<i>tzutz[u]w</i>	he/she finished
participial	<b>TZUTZ-li</b>	<i>tzutz[u]l</i>	finished

Table 22: Classic Mayan voice system

## AN ANALYSIS OF CVC TRANSITIVE VERBS:

Voice:	active:	passive:	mediopassive	antipassive:
<b>Transliteration:</b>	<b>u-chu[ku]-wa</b>	<b>chu-ka-ja</b>	<b>chu[ku]-yi<sup>101</sup></b>	<b>chu-ku-wa(?)</b>
<b>Transcription:</b>	<i>uchukuw</i>	<i>chu[h]kaj</i>	<i>chukuy</i>	<i>chukuw</i>
<b>Morphological segmentation:</b>	u-chuk-uw-Ø	chu[h]k-aj-Ø	chuk-uy-Ø	chuk-uw-Ø
<b>Morphological analysis 1:</b>	3SE-capture-THM <sup>102</sup> -3SA	capture-PAS-THM-3SA	capture -THM-3SA	capture-THM-3SA
<b>Morphological analysis 2:</b>	ERG-CV <sub>i</sub> C-V <sub>i</sub> W-ABS	CVhC-aj-ABS	CVC-Vy-ABS	CVC-Vw-ABS
<b>Syntactic roles:</b>	subject-verb-object	verb-object	verb-subject	verb-object
<b>Semantic roles:</b>	agent-verb-patient	verb-patient	verb-patient	verb-patient
<b>Translation:</b>	he captured him	he was captured	he was captured	he captured

Syntactic roles (e.g. subject and object) are morphosyntactical whereas semantic roles (e.g. agent, patient, and instrument) are conceptual:

Sentence:	Syntactic role:	Semantic role:
Alfonso opened the door.	Alfonso = subject door = object	Alfonso = agent door = patient
The key opened the door.	key = subject door = object	key = instrument door = patient
The door opened.	door = subject	door = patient

<sup>100</sup> The following is based on various workshops on Maya writing since 2001, including *Classic Maya Grammar* directed by Alfonso Lacadena and Marc Zender at the 6th European Maya Conference, Hamburg, Germany, December 5th–7th, 2001, and on the workshop *Maya Verbs in Hieroglyphic Texts* directed by Robert Wald at the XXVth Linda Schele Forum on Maya Hieroglyphic Writing at The University of Texas at Austin, March 11th–16th, 2002, and, furthermore, on Lacadena 2000, Wald 1994, and Wald 2000, and personal communication with various scholars.

<sup>101</sup> Not attested.

<sup>102</sup> THM= thematic suffix.

**TRANSITIVE VERBS: (CVC)****(1) ACTIVE:                   ERG-CVC-V<sub>1w</sub>-ABS**

In the active voice, the agent is the subject of the verb, whereas the patient is the object of the verb.

**u-chu-ku-wa**  
*uchukuw*  
 u-chuk-uw-Ø  
 “he/she seized...”

**Example:**           *uchukuw Aj Ukul? Yaxuun Bahlam*  
 “Yaxuun Bahlam seized Aj Ukul”

In the active voice of transitive verbs, the root is preceded by the third-person pronoun **u-** (“he/she/it”), and followed by the syllabic sign **wa** which points to the **-Vw** thematic suffix for active transitive constructions. The **-Vw** represents a vowel resonating the vowel of the verbal root; examples: **u-chok-ow** (“he/she threw it”); **u-tz’ap-aw** (“he/she inserted/planted it”); and **u-but’-uw** (“he/she buried it”). However, in the Maya script the *graphemic* suffix of transitive verbs in active voice is constantly marked with a **wa** syllabogram regardless of the vowel of the verbal root<sup>103</sup>.

**(2) PASSIVE:                   CVhC-aj-ABS<sup>104</sup>**

In the passive voice, the patient becomes the subject of the verb, and the agent is either completely removed or hidden in an oblique (indirect) phrase/clause.

<b>tzu-tza-ja</b> <i>tzu[h]tza</i> tzu[h]tz-aj-Ø “(it) was finished”	<b>tz’a-pa-ja</b> <i>tz’a[h]paj</i> tz’a[h]p-aj-Ø “(it) was planted”	<b>chu-ka-ja</b> <i>chu[h]kaj</i> chu[h]k-aj-Ø “(he/she/it) was seized”
---	---	--

**Example:**           *chuhkaj Aj Ukul? (ukabjiij Yaxuun? Bahlam)*  
 “Aj Ukul? was seized (by the doing of Yaxuun? Bahlam)”

<sup>103</sup> It seems reasonable to argue that the thematic suffix for active transitive constructions is **-Vw** rather than **-V’w**, although Lacadena and Wichmann (2005: 32) state that “[t]he glottal is not straightforwardly reconstructible, but we do note that Chontal has a glottal in its corresponding morpheme **-e’**. This suffix could have developed from **-V’w** by a replacement of the harmonic vowel with *e* and by a loss of the *w*. Even if a glottal stop in the thematic suffix is not reconstructed for proto-Mayan there is still a possibility that it could have been present in proto-Ch’olan as an innovation in this group.” In the current volume the thematic suffix for active transitive constructions is marked as **-Vw** and thus contradicting the harmony rules by Lacadena and Wichmann (see Appendix J). It should be noted here that these harmony rules do not seem to apply uniformly to all verbal cases, along with several other parts of speech. Ancient scribes were – and modern epigraphers are – faced with a challenge in the absence of the **wu** syllabogram which is needed if a word ending in **-uw** is to be rendered (based on harmony rules by Lacadena and Wichmann). Consequently, these harmony rules are far from being seamless. It appears as if the Maya scribes only employed a limited set of final syllabograms without specifically indicating complexity in the root vowel (or any preceding vowel). Statistically, these final syllabograms tend to take primarily /a/, /i/, or /e/ vowels (–Ca, –Ci, and –Ce), and particularly the first two, with /o/ and /u/ (–Co and –Cu), being infrequent. Consequently, it seems that disharmonic spelling by itself does not necessarily denote vowel complexity, and nor does synharmonic spelling always indicate short vowels. The Maya writing system in general is not a sterile and mechanical apparatus (no more than any other writing system in the world) and it should not be forced to fit a fixed pattern of linguistic theory (Kettunen 2009, 2010, 2014).

<sup>104</sup> Note that the (reconstructed) infix **-h-** is the true passivizer, and the **-aj** suffix is solely thematic and derivational (detransitivizer).

**(3) MEDIOPASSIVE: CVC-Vy-ABS**

In the mediopassive voice (middle voice), the agent is completely deleted and is to be understood only in general terms (if indeed at all). The patient becomes the subject of the verb. In other terms, the verb in the mediopassive voice has stative meaning, and the agent (or actor) is not expressed.

<b>TZUTZ-yi</b> <i>tzutzuy</i> tzutz-uy-Ø “got finished”	<b>ju-bu-yi</b> <i>jubuy</i> jub-uy-Ø “got deposed”	<b>chu-ku-yi</b> <i>chukuy</i> chuk-uy-Ø “got caught/seized”
---	--	---

**Example:** *chukuy Aj Ukul*  
“Aj Ukul got caught/seized”

**(4) ANTIPASSIVE: CVC-VVw(?) -ABS (Early Classic)  
CVC-Vw-ABS (Late Classic)**

Antipassive voice is a voice in ergative-absolutive languages, like the Mayan languages, in which a noun phrase has absolutive case instead of the “normal” ergative case. A noun phrase normally having absolutive case is marked as an oblique or an indirect object. The verb in antipassive constructions has formal characteristics of intransitive verbs in Mayan languages. In Maya hieroglyphic writing there are three distinct types of antipassive constructions: (a) absolutive antipassive, (b) object-incorporating antipassive, and (c) agent-focusing antipassive. All of them delete the patient, and therefore leave the agent as the subject of the verb. Antipassives can only be made from transitive verbs (root transitives or derived transitives), and they are all distinguishable morphologically by the absence of the ergative pronoun **u-** and the presence of characteristic suffixes.

<b>TZUTZ-wi</b> <i>tzutzuw</i> tzutz-uw-Ø “he/she finished”
--

**TRANSITIVE VERBS: (non-CVC)**

**ACTIVE VOICE: ERG-VERB-V-ABS**

<b>yi-IL-a</b> <i>yila</i> y-il-a-Ø “he/she saw [it]”	<b>u-TZ'IB-ba</b> <i>utz'i[h]ba</i> u-tz'ihb-a-Ø “he/she wrote/painted [it]”
--	---

**PASSIVE VOICE: VERB-n-aj-ABS**

<b>tz'i-bi-na-ja</b> <i>tz'i[h]bnaj</i> tz'i[h]b-n-aj-Ø “[it] was painted”
---

This construction (save the reconstructed **-h-**) is the one to be found on innumerable texts on Maya polychrome ceramics (note that **-n-** is the true passivizer of non-CVC constructions).



**INTRANSITIVE VERBS**

Intransitive verbs are verbs that do not have a direct object, i.e., verbs that do not need an object or verbs that cannot have an object are intransitive verbs. In Classic Mayan intransitive verbs are derived either from a verbal root or from a noun.

**ROOT INTRANSITIVES: CVC-i-ABS**

<b>hu-li</b> <i>huli</i> hul-i-Ø “he/she arrived (here)”	<b>u-ti</b> <i>u[h]ti</i> u[h]t-i-Ø “it happened”
---	--

**DERIVED INTRANSITIVES: NOUN/ADJ-Vj (-aj/-iij)-ABS**

<b>AK'-ta-ja</b> <i>a[h]k'taj</i> a[h]k't-aj-Ø “he/she danced” < ahk'ot (“dance”) with /o/ syncopated	<b>K'AL HUN-na-ja</b> <i>k'al hunaj / huunaj / hu'naj</i> k'al hun/huun/hu'n-aj-Ø “he/she was crowned” < k'al hun/huun/hu'n? (“crowning”)
---	---

<b>pi-tzi-ja</b> <i>pitzij / pitzaj</i> pitz-iij-Ø / pitz-aj-Ø “he/she played ball” < pitz (“ballgame”)	<b>WITZ-ja/ wi-tzi-ja</b> <i>witzij / witzaj</i> witz-iij-Ø / witz-aj-Ø “it got piled up” < witz (“mountain”)
---	---

**POSITIONALS CVC-l-aj-ABS (Eastern Ch'olan)  
CVC-waan?-ABS (Western Ch'olan)**

Positional verbs refer to physical states or positions, such as standing, sitting, kneeling, hanging, lying down, leaning, bending, and bowing, that human beings, animals, and inanimate objects can assume (Bricker 1986: 29; Lacadena and Wichmann 2002b).

<b>CHUM[mu]-la-ja</b> <i>chumlaj</i> chum-l-aj-Ø “he/she sat”	<b>CHUM[mu]-wa-ni</b> <i>chumwaan</i> chum-waan-Ø “he/she sat”
--	---

Along with positionals, there is a class of verbs can be *derived* from positionals: the *-bu* causative. E.g. *pat-laj* “got made” > *u-pat-bu* “he/she made it” > *u-pat-bu-uj* “he/she has made it”.

**INCHOATIVES**      CVC-aj-ABS  
CVC-Vn-ABS

Inchoative verbs are verbs of “becoming”. They refer to change in the subject, be it accidental, temporary, or permanent. All inchoative verbs are derived from nouns or adjectives.

**AJAW-ni**  
*ajawaan*  
ajaw-aan  
“he became king” /  
“she became queen”

**AFFECTIVES**      (CVC) CVC-l-aj-ABS

Affectives are verbs based on phenomena such as bright lights, loud noises, intense smells, and onomatopoeitic sounds.

**ba-la-ja**  
*ba[ɟ]llaj*  
baj-l-aj-Ø  
“hammering”

**STATIVE PARTICIPLES**      CVC-VI-(i)-ABS

Stative participles are not really verbs, but rather stative adjectives, in any of the Cholan languages.

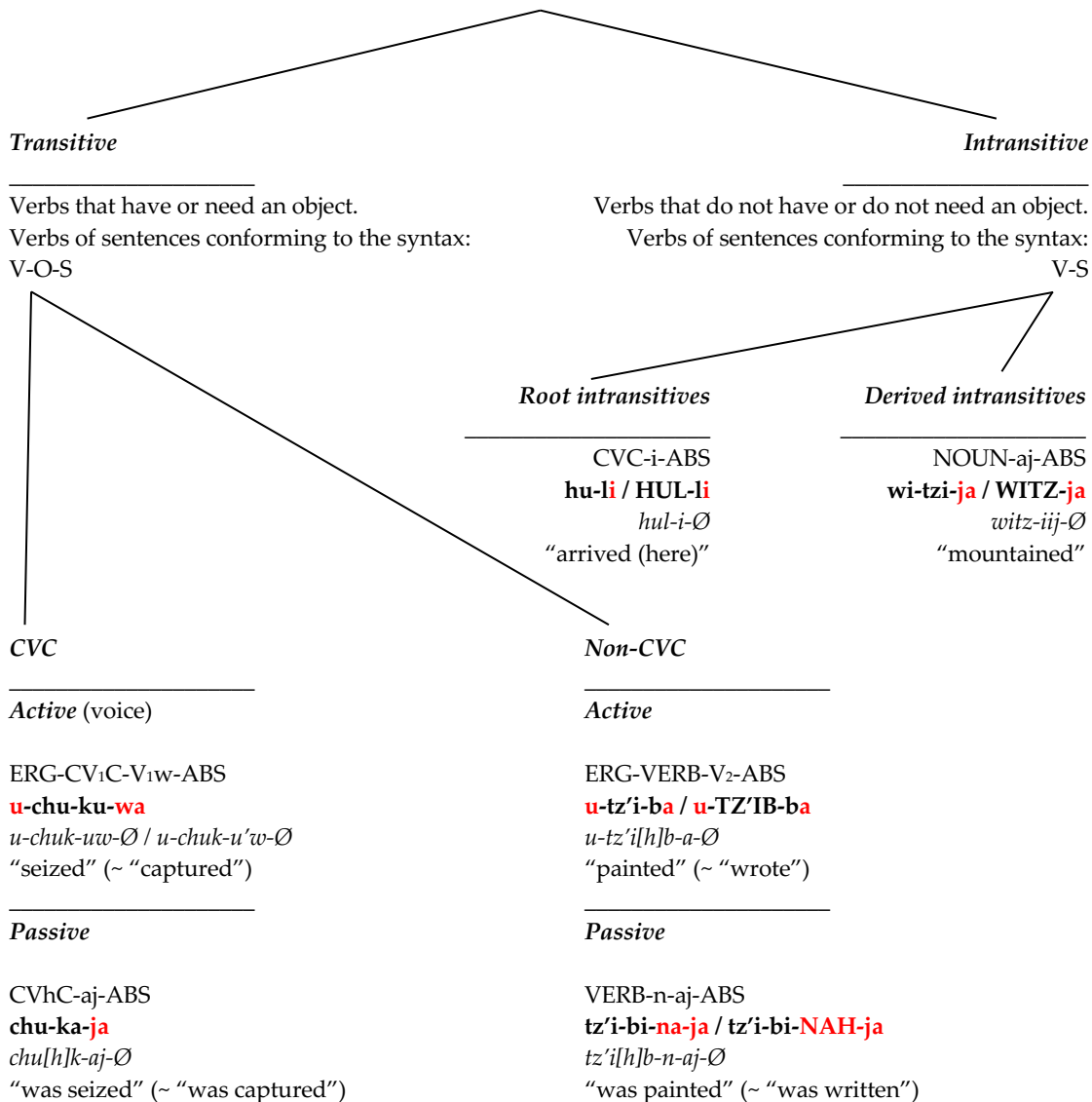
**TZUTZ-li**  
*tzutzul*  
tzutz-ul-Ø  
“finished”

**CHANGE OF STATE VERBS**<sup>105</sup>      CVC-VVy-ABS

<b>K'A'-yi</b> <i>k'a'aay</i> k'a'-aay-Ø “it diminished / terminated / wilted / ended / died”	<b>LOK'-yi</b> <i>lok'ooy</i> lok'-ooy-Ø “he/she left / escaped / fled”	<b>PUL-yi</b> <i>puluuy</i> pul-uuy-Ø “it burned”	<b>T'AB-yi</b> <i>t'abaay</i> t'ab-aay-Ø “he/she ascended”
--	---	--	---

<sup>105</sup> Alfonso Lacadena, personal communication 2010 (Spanish: *verbos [intransitivos] de cambio de estado*).

### Basic Sketch of Classic Mayan Verbs



**Summary<sup>106</sup>:**

- Intransitive (Root Intransitive)	- Transitive – Non-CVC (Active)	- Transitive – CVC (Active)	- Transitive – CVC (Passive) - Derived Intransitive - Inchoative	- Transitive – Non-CVC (Passive)	- Affectives - Positional (East)	- Positional (West)	- Transitive – CVC (Mediopassive)	- Transitive – CVC (Antipassive)
...Ci	...Ca	u ... wa	...ja	...na-ja	...la-ja	...wa-ni	...yi	...wi

<sup>106</sup> NB: Letter C stands for a consonant whereas V represents vowels.

Note: due to the fact that Maya hieroglyphic writing evolved both in time (during 1500 years) and space (in different areas), changes in grammar are apparent:




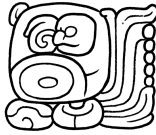
Rendition:	Language:	Transliteration:	Transcription:	Translation:
	? (Late Preclassic)	<b>CHUM?</b>	<i>chu[h]m?</i> <i>chuhm?-Ø</i>	he/she sat
	Classic Ch'olan (Early Classic)	<b>CHUM-ja</b>	<i>chu[h]m[aj]</i> <i>chu-h-m-aj-Ø</i>	he/she sat
	Eastern Ch'olan (Late Classic)	<b>CHUM[mu]-la-ja</b>	<i>chumlaj</i> <i>chum-l-aj-Ø</i>	he/she sat
	Western Ch'olan (Late Classic)	<b>CHUM[mu]-wa-ni</b>	<i>chumwaan</i> <i>chum-waan-Ø</i>	he/she sat

Table 23: Examples of grammatical changes in time and space: *chum-*

In Eastern Ch'olan the phrase "he/she acceded to power" (or "he/she sat into the lordship" or "was seated in the kingdom") is *chumlaj ti ajawil* (or *chumlaj ti ajawilil*) whereas in Western Cholan the phrase is *chumwaan ta ajawlel*.



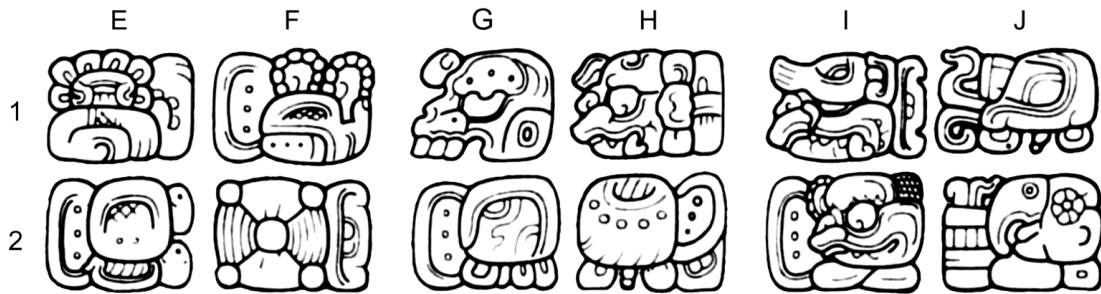
Rendition:	Language:	Transliteration:	Transcription:	Translation:
	? (Late Preclassic)	<b>HUL-ye</b>	<i>hul[ee]y</i> <i>hul-ee-y-Ø</i>	he/she arrived (here)
	Western Ch'olan? (Late Classic)	<b>HUL-li-ya</b>	<i>huliiy</i> <i>hul-ii-y-Ø</i>	he/she arrived (here)

Table 24: Examples of grammatical changes in time: *hul-*

## APPENDIX K: AN EXAMPLE OF HIEROGLYPHIC ANALYSIS

## TRANSLITERATION, TRANSCRIPTION, LINGUISTIC ANALYSIS, AND DIFFERENT STAGES AND VERSIONS OF TRANSLATING A SELECTED PASSAGE (E1 – J2) OF HIEROGLYPHIC STAIR 4, STEP 5, DOS PILAS, PETEN, GUATEMALA

## GLYPHIC CLAUSE:



(drawing by Stephen Houston)

## TRANSLITERATION:

E1: ju-bu-yi / F1: u-to-k'a / E2: u-pa-ka-la / F2: nu-na / G1: JOL / H1: CHAK-ki /  
 G2: u-KAB-[j]ilya / H2: ba-la-ja / I1: CHAN-na / J1: K'AWIL-la / I2: u-CHAN-nu / J2: TAJ-MO'-o

## TRANSCRIPTION:

*jubuy / uto'k' / upakal / nu'n? / [u]jol / cha[h]k /  
 ukabjiy / bajllaj / chan / k'awiil / ucha'n / taj[al] mo'*

## MORPHOLOGICAL SEGMENTATION:

*jub-uy-Ø / u-to'k' / u-pakal / nu'n? / u-jol / chahk /  
 u-kab-Ø-ji-iy / baj-l-aj-Ø / chan / k'awiil / u-cha'n / taj-al / mo'*

## MORPHOLOGICAL ANALYSIS:

*down-THM-ABS / 3SE-flint / 3SE-shield / mediation? / 3SE-skull / (theonym) /  
 3SE-oversee-ABS-ADV.CLT / hammer-AFT-THM-ABS / sky / (theonym) / 3SE-guardian / torch-REL / macaw*

## TRANSLATION I:

*"got downed, (the) flint, (the) shield of 'mediation? (is the) head of Chahk';  
 (it is the) overseeing of 'K'awiil who hammers (in the) sky', (the) guardian of 'Torchy Macaw'."*

## TRANSLATION II:

*"The flint and the shield of Nu'n Ujol Chahk got toppled;  
 it was overseen by Bajlaj Chan K'awiil, the 'guardian' of Tajal Mo'."*

## TRANSLATION III:

*"The military power of Nu'n Ujol Chahk was toppled by Bajlaj Chan K'awiil, the captor of Tajal Mo'."*

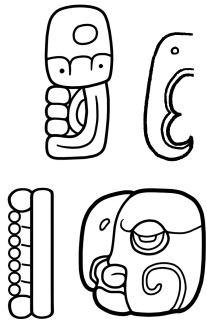
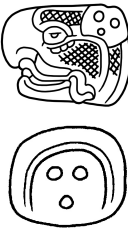
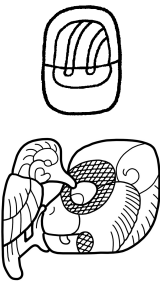
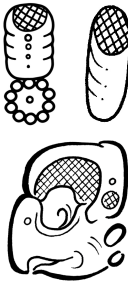
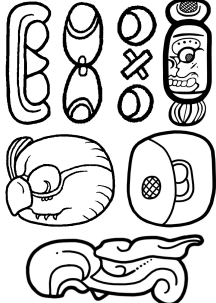
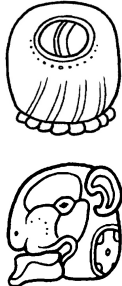



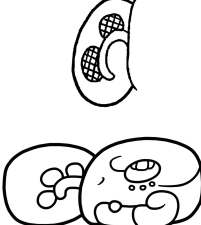
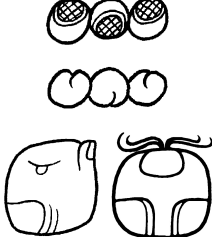
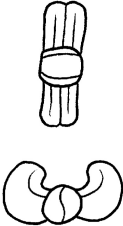

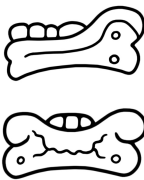






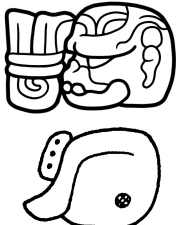




## TRANSLATION IV:


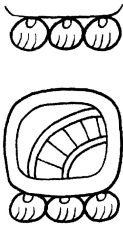


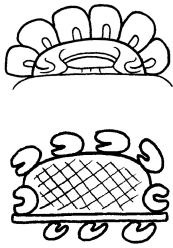


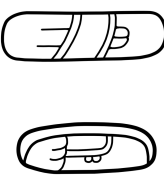
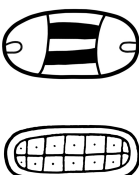






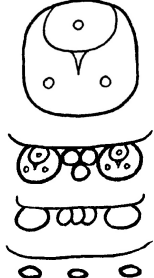
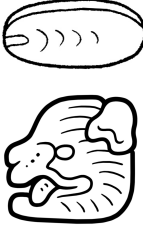
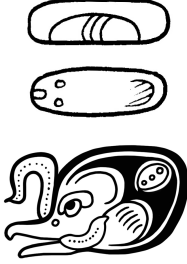
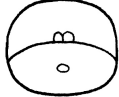

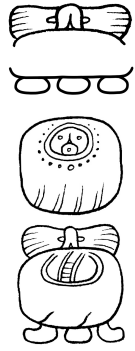


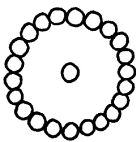

*"The army of Nu'n Ujol Chahk was brought down by Bajlaj Chan K'awiil, the captor of Tajal Mo'."*

## TRANSLATION V:

*"Nu'n Ujol Chahk was defeated by Bajlaj Chan K'awiil."*



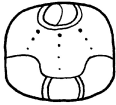






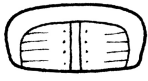











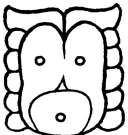











APPENDIX L: SYLLABOGRAM (PHONOGRAM) CHARTS

<p>a</p> 	<p>e</p> 	<p>i</p> 	<p>o</p> 	<p>u</p> 
<p>ba</p> 	<p>be</p> 	<p>bi</p> 	<p>bo</p> 	<p>bu</p> 
<p>cha</p> 	<p>che</p> 	<p>chi</p> 	<p>cho</p> 	<p>chu</p> 
<p>ch'a</p> 	<p>ch'e</p> 	<p>ch'i</p> 	<p>ch'o</p> 	<p>ch'u</p> 
<p>ha</p> 	<p>he</p> 	<p>hi</p> 	<p>ho</p> 	<p>hu</p> 

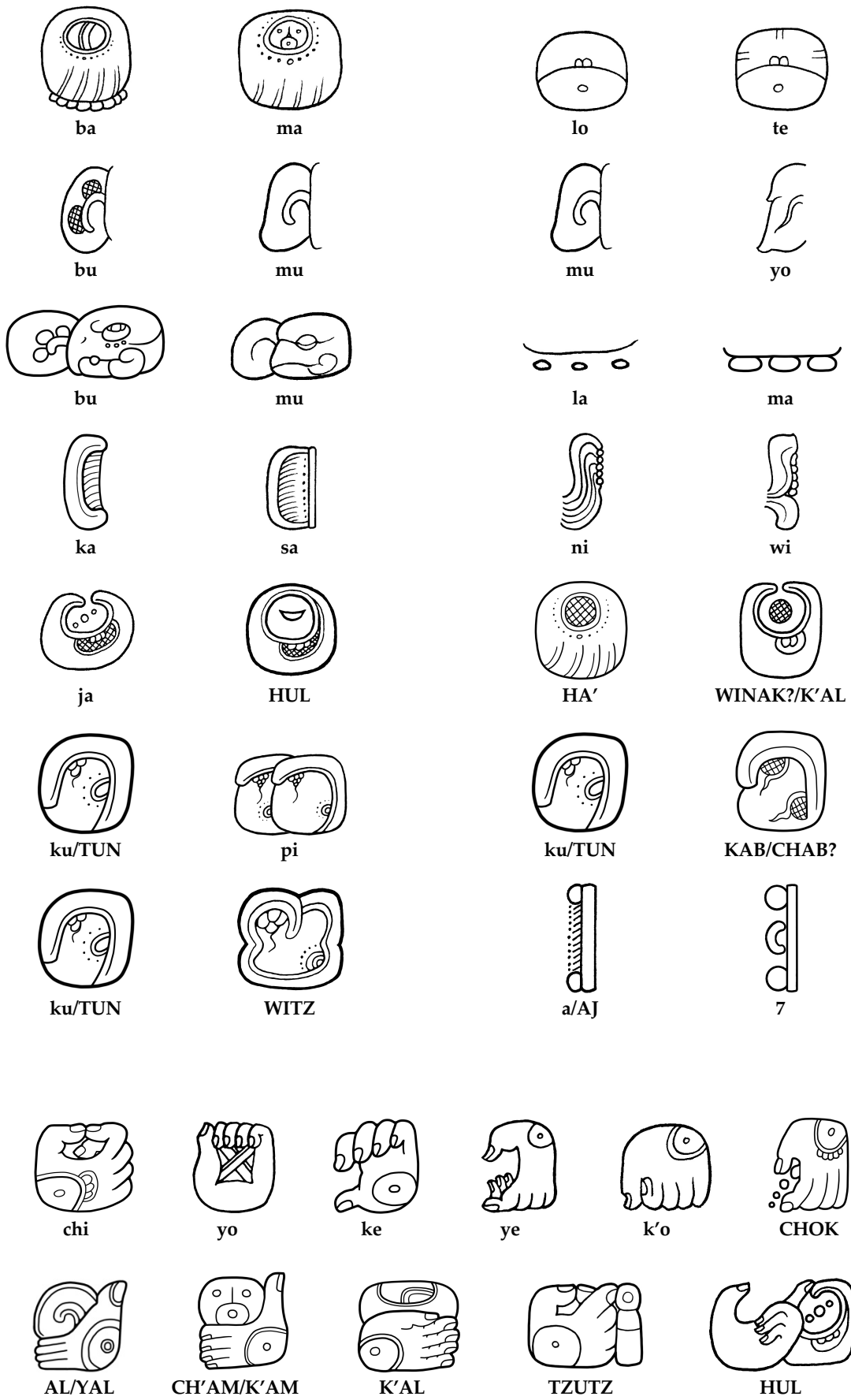
<p>ja</p> 	<p>je</p> 	<p>ji</p> 	<p>jo</p> 	<p>ju</p> 
<p>ka</p> 	<p>ke</p> 	<p>ki</p> 	<p>ko</p> 	<p>ku</p> 
<p>k'a</p> 	<p>k'e</p> 	<p>k'i</p> 	<p>k'o</p> 	<p>k'u</p> 
<p>la</p> 	<p>le</p> 	<p>li</p> 	<p>lo</p> 	<p>lu</p> 
<p>ma</p> 	<p>me</p> 	<p>mi</p> 	<p>mo</p> 	<p>mu</p> 

<p>na</p>	<p>ne</p>	<p>ni</p>	<p>no</p>	<p>nu</p>
<p>pa</p>	<p>pe</p>	<p>pi</p>	<p>po</p>	<p>pu</p>
<p>sa</p>	<p>se</p>	<p>si</p>	<p>so</p>	<p>su</p>
<p>ta</p>	<p>te</p>	<p>ti</p>	<p>to</p>	<p>tu</p>
<p>t'a</p>	<p>t'e</p>	<p>t'i</p>	<p>t'o</p>	<p>t'u</p>





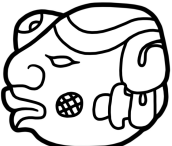




<p>tza</p> 	<p>tze</p>	<p>tzi</p>   	<p>tzo</p> 	<p>tzu</p>  
<p>tz'a</p> 	<p>tz'e</p> 	<p>tz'i</p> 	<p>tz'o</p> 	<p>tz'u</p>  
<p>wa</p>  	<p>we</p> 	<p>wi</p>  	<p>wo</p> 	<p>wu</p>
<p>xa</p> 	<p>xe</p>	<p>xi</p> 	<p>xo</p> 	<p>xu</p> 
<p>ya</p>  	<p>ye</p>  	<p>yi</p>  	<p>yo</p>  	<p>yu</p>  

Note these potentially confusing signs:



## CONCISE DICTIONARY OF MAYA LOGOGRAMS

hieroglyph <sup>107</sup> :	transliteration <sup>108</sup> :	transcription <sup>109</sup> :	translation <sup>110</sup> :	alternative spellings <sup>111</sup> :
	a/AJ	<i>a</i> <i>aj</i>	(1) phonetic sign (2) neutral or male prefix <sup>112</sup>	
	ACH? AT?	<i>ach</i> <i>at / aat</i>	(1) penis	ACH?-cha, AT?-ti, AT?-ta
	AHIN?	<i>ahiin?</i>	(1) caiman (n) (2) large lizard (n)	a-AHIN?-na, AHIN?-na, AHIN?-ni
	AJAW	<i>ajaw</i> <i>ajaww?</i>	(1) lord (n) (2) king (n)	AJAW-wa, a-AJAW, a-AJAW-wa, a-ja-wa
	AJAW	<i>ajaw</i> <i>ajaww?</i>	(1) lord (n) (2) king (n)	AJAW-wa, a-AJAW, a-AJAW-wa, a-ja-wa
	AJAW	<i>ajaw</i> <i>ajaww?</i>	(1) lord (n) (2) king (n)	AJAW-wa, a-AJAW, a-AJAW-wa, a-ja-wa
	AK	<i>a[h]k</i>	(1) turtle (n)	a-ka, a-ku, AK-ka

<sup>107</sup> A given sign represented in this column is only one possible version of different spellings to be found in the Maya hieroglyphic corpus. For example, the word for "lord" or *ajaw* can be rendered in the following ways: **AJAW**, **a-AJAW**, **AJAW-wa**, **a-AJAW-wa**, and **a-ja-wa**. Furthermore, use of different graphic forms yields dozens of possible combinations, each representing distinct collocations (see **alternative spellings** in the rightmost column and see also chapter 7. Logograms). The arrangement of this dictionary is based on alphabetical order of *transcriptions*. When a particular hieroglyph is usually (or always) preceded with a possessive pronoun *u-ly-*, it is placed in parentheses: e.g. *(y)atan*. The alphabetical order thus follows the *stem* of the word rather than the most common (inflected or derived) appearance in the corpus.


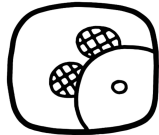







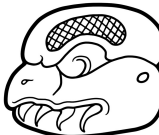
<sup>108</sup> This is a **broad** transliteration that excludes analyzed/interpreted sounds (vowel length, glottal stops, and /h/'s [preconsonantal velar fricatives]) that are not inbuilt/inherent parts of hieroglyphs but were, conversely, indicated by orthography rules, grammatical inflection, and in the case of underspellings, provided by the native reader [see page 63 onwards].

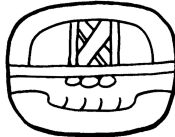

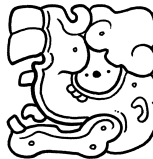

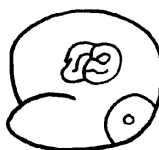




<sup>109</sup> This is a **narrow** transcription including reconstructed sounds (marked by [square brackets]) based either on historical, internal, or paleographic evidence.

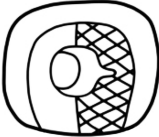


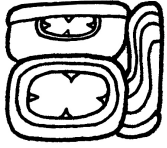
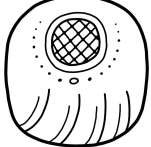



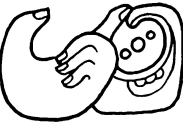

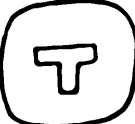
<sup>110</sup> This is really a **gloss** rather than translation (a gloss is a short general translation of a word or morpheme which does not take into account the context in which it occurs). Nonetheless, when several well-attested meanings exist, these are sorted (in the order of numerical ascendancy) from the most literal to the most figurative. The latter do (to a certain degree) take into consideration the various meaning that the contexts of words can potentially imbue them with. Abbreviations of grammatical category follow the expression in (parentheses): adj: adjective, adv: adverb, cn: composite noun, cop: copula, dem: demonstrative pronoun, ip: independent pronoun, iv: intransitive verb, ivd: intransitive verb (derived), n: noun, ncl: numeral classifier, num: numeral, part: particle, poss: possessive prefix, prep: preposition, prpo: pronominal (absolute) postfix, prpr: pronominal (ergative) prefix, pv: positional verb, sp: stative participles, top: toponym, tv: transitive verb, tvd: transitive verb (derived).


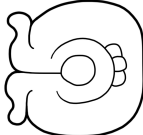





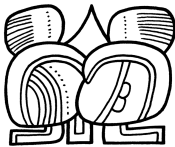

<sup>111</sup> The alternative spellings are based on a study of the corpus of Maya texts as well as on Boot 2009, Lacadena and Wichmann 2004, Lacadena and Zender 2001, and Lacadena (personal communication, 2001–2014).

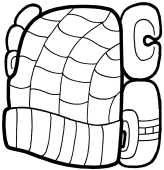


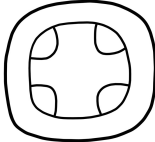

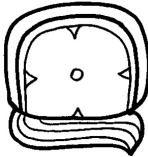


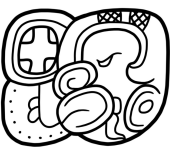
<sup>112</sup> A prefix, proclitic, or classifier denoting person, agent, doer, office, causer, characteristics, or male gender.

hieroglyph <sup>107</sup> :	transliteration <sup>108</sup> :	transcription <sup>109</sup> :	translation <sup>110</sup> :	alternative spellings <sup>111</sup> :
	AK	<i>a[h]k</i>	(1) turtle (n)	<b>a-ka,</b> <b>a-ku</b>
	AK'	<i>a[h]k'ta-</i>	(1) to dance (ivd)	<b>a[AK']-ta-</b> , <b>a-AK'-ta-</b> , <b>AK'-ta,</b> <b>AK'-TAJ-</b> , <b>AK'-TAJ</b>
	AL /YAL	<i>al / yal</i>	(1) to throw (iv) (2) (mother's) son (n)	<b>ya-AL/YAL,</b> <b>ya-AL/YAL-la,</b> <b>ya-la</b>
	(y)a-AT-na	<i>(y)atan</i>	(1) companion (n) (2) spouse? (n) (3) wife? (n)	<b>ya-ta-na,</b> <b>a-AT-na,</b> <b>ya-TAN-li</b>
	BAH ba	<i>ba[a]h</i> <i>ba[aj]</i>	(1) image / portrait (n) (2) self (n) (3) phonetic sign	<b>ba-hi,</b> <b>ba-hi-ja,</b> <b>ba-ji-ja,</b> <b>[BAH]hi</b>
	BALAM	<i>ba[h]lam</i>	(1) jaguar (n)	<b>ba-la-ma,</b> <b>BALAM-la-ma,</b> <b>BALAM-ma</b>
	CHAK-ki	<i>Cha[h]k</i>	(1) Chahk (n) (name of a deity)	<b>CHAK,</b> <b>cha-ki,</b> <b>cha-ka</b>
	CHAK	<i>chak</i>	(1) red (adj) (2) great (adj)	<b>CHAK-ka</b>
	CHAM-mi	<i>cham</i>	(1) to die (iv)	<b>CHAM-mi</b>
	CHAN KAN	<i>chan</i>	(1) snake (n) (2) guardian (n) (see <b>CHAN-nu</b> )	<b>CHAN-na,</b> <b>cha-CHAN,</b> <b>cha-na,</b> <b>ka-KAN</b>









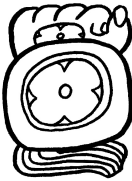
hieroglyph <sup>107</sup> :	transliteration <sup>108</sup> :	transcription <sup>109</sup> :	translation <sup>110</sup> :	alternative spellings <sup>111</sup> :
	CHAN	<i>chan</i>	(1) sky (n) (2) four (nr)	CHAN-na, cha-CHAN, CHAN-na-ni, cha-na
	CHAN-nu	<i>cha'[a]n</i>	(1) master (n) (2) owner (n) (3) guardian (n)	CHAN-na, cha-nu, CHAN
	CHAPAT	<i>chapa[ 'h]t</i> <i>chapa[ ah]t</i> <i>chapa[ h]t</i> <i>chapat</i>	(1) centipede (n) (2) name of supernatural creature	cha-pa-ta, cha-CHAPAT-ti, CHAPAT-tu, cha-pa-tu
	CHOK	<i>chok-</i>	(1) to scatter (tv) (2) to sow	CHOK-ka, CHOK-ko, cho?-ka, cho?-ko
	CHUM[mu]	<i>chum-</i>	(1) to sit down (pv) (2) to be seated (pv)	CHUM
	CHUWAJ ?	<i>chuwaj ?</i>	a deity name (n)	
	CH'AK[ka]	<i>ch'ak-</i>	(1) to cut (tv) (2) to chop (tv) (3) to decapitate (tv)	CH'AK
	CH'AM- K'AM	<i>ch'am-</i> <i>k'am-</i>	(1) to take (tv) (2) to grasp (tv) (3) to receive(tv)	CH'AM, CH'AM-ma, ch'a-CH'AM, ch'a-ma, K'AM-ma?, k'a-ma
	ch'a-CH'AMAK?	<i>ch'amak?</i>	(1) fox (n)	ch'a-ma-ka, CH'AMAK?

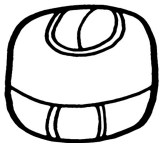



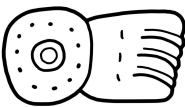

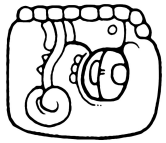
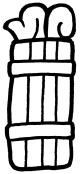


hieroglyph <sup>107</sup> :	transliteration <sup>108</sup> :	transcription <sup>109</sup> :	translation <sup>110</sup> :	alternative spellings <sup>111</sup> :
	CH'EN-na	<i>ch'e'n</i>	(1) cave (n) (2) hollow (n) (3) well (n)	CH'EN, CH'EN-ni, CH'EN-ne
	CH'OK	<i>ch'ok</i>	(1) youth (n) (2) sprout (n) (3) youngster (n)	ch'o-ko, CH'OK-ko
	EK'	<i>ek'</i> <i>eek'</i>	(1) star (n)	e-k'e
	EL-K'IN-ni	<i>elk'in</i>	(1) east (n)	EL-K'IN
	HA'	<i>ha'</i>	(1) water (n) (2) body of water (n) (3) lake (n) (4) river (n)	HA-a, a
	HIX	<i>hi[i]x</i>	(1) ocelot? / margay? (n) (2) a feline	hi?-HIX
	HUN	<i>hu'n</i> <i>hu'un</i>	(1) paper (n) (2) book (n)	HUN-na
	HUN	<i>hu'n</i> <i>hu'un</i>	(1) headband (n) (2) diadem (n)	HUN-na, hu-na
	HUL	<i>hul-</i>	(1) to arrive (here) (iv)	HUL-li, hu-li
	(y)i[chi]-NAL-la	<i>(y)ichnal</i>	(1) with (2) in the company of (cop?)	yi-chi-NAL-la, yi-chi-NAL, yi-chi-na-la, yi-[chi]NAL-la, yi-[chi]NAL, yi-T703v-NAL
	IK'	<i>ik'</i>	(1) air (n) (2) wind (n) (3) breath (n)	





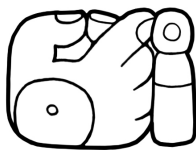
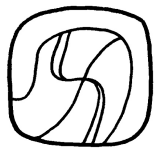


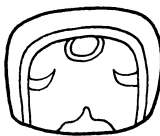

hieroglyph <sup>107</sup> :	transliteration <sup>108</sup> :	transcription <sup>109</sup> :	translation <sup>110</sup> :	alternative spellings <sup>111</sup> :
	IK'	<i>ik'</i> <i>i[h]k'</i>	(1) black (adj)	
	IL	<i>il-</i>	(1) to see (tv) (2) to witness (tv)	<b>IL-la,</b> <b>i-la</b>
	IX IXIK	<i>ix</i> <i>ixik</i>	(1) female/feminine classifier (2) woman (n) (3) lady (n)	<b>i-xi</b> <b>IXIK-ki</b>
	JOL	<i>jol</i> <i>jo'l?</i>	(1) head (n) (2) skull? (n)	<b>JOL-lo,</b> <b>JOL-li,</b> <b>JOL-la,</b> <b>JOL-le</b>
	1-TAN-na	<i>junta[h]n</i> <i>juunta[h]n</i> <i>ju'nta[h]n</i> <i>hunta[h]n</i>	(1) cherished one (n) (2) beloved (n)	<b>1-TAN,</b> <b>1-ta-na,</b> <b>1-TAN-ni</b>
	KAB / CHAB	<i>kab</i> <i>kaab</i> <i>chab</i> <i>chaab</i>	(1) land (n) (2) earth (3) bee (n) (4) honey (n)	<b>ka-ba,</b> <b>ka-bi</b>
	KAL(OM)?-TE'	<i>kalomte'</i>	(1) kalomte' (n) (exalted regal title)	<b>KAL?-ma-TE',</b> <b>ka-lo-ma-TE',</b> <b>ka-KAL?-TE',</b> <b>ka-KAL?-ma-TE',</b> <b>ka-KAL?-ma-TE'-te</b>
	KAL?-ma-TE'	<i>kalomte'</i>	(1) kalomte' (n) (exalted regal title)	<b>KAL(OM)?-TE',</b> <b>ka-lo-ma-TE',</b> <b>ka-KAL?-TE',</b> <b>ka-KAL?-ma-TE',</b> <b>ka-KAL?-ma-TE'-te</b>
	ke-KELEM?-ma ke-KELOM?-ma	<i>kelem</i> <i>kelom?</i>	(1) strong (adj) (2) youth (n) (3) rooster? (n)	<b>ke-le-ma,</b> <b>ke-lo-ma,</b> <b>KELEM?,</b> <b>KELOM?</b>

hieroglyph <sup>107</sup> :	transliteration <sup>108</sup> :	transcription <sup>109</sup> :	translation <sup>110</sup> :	alternative spellings <sup>111</sup> :
	KOHAW-wa	<i>ko'haw</i>	(1) headdress (n) (2) helmet (n)	ko-ha-wa, ko-o-ha-wa, KOHAW
	K'AK'	<i>k'a[h]k'</i>	(1) fire (n)	K'AK'-k'a, k'a-K'AK', k'a-k'a, ²K'AK' / ²k'a
	K'AL-	<i>k'al-</i>	(1) to present (tv) (2) to lift (tv) (3) to bind/fasten (tv) (5) to wrap (tv) (6) to hold (tv)	k'a-la-
	K'AN	<i>k'an</i>  <i>k'a[h]n</i>	(1) yellow (adj) (2) ripe (adj) (1) bench (n) (2) seat (n)	K'AN-na
	K'AWIL	<i>K'awiil</i> <i>K'awil</i>	(1) K'awiil (n) (name of deity)	K'AWIL-la, K'AWIL-li, K'AWIL-wi-la, k'a-wi-la
	K'IN-ni	<i>k'in</i> <i>k'ihn?</i> <i>k'iin?</i>	(1) sun (n) (2) day (n) (3) light? (n)	K'IN
	K'INICH	<i>k'i[h]nich</i>	(1) K'i(h)nich (Ajaw) (name of deity)	K'IN-ni-chi, K'IN-ni-hi-chi, [K'IN]chi-ni
	K'INICH	<i>k'i[h]nich</i>	(1) title (sunny, hot or heated (adj))	K'IN-ni-chi, K'IN-ni-hi-chi
	K'UH	<i>k'uh</i>	(1) god (n) (2) deity (n)	k'u-hu, k'u, K'U'-u



hieroglyph <sup>107</sup> :	transliteration <sup>108</sup> :	transcription <sup>109</sup> :	translation <sup>110</sup> :	alternative spellings <sup>111</sup> :
	K'UH	<i>k'uh[ul]</i>	(1) godly (adj) (2) divine (adj) (3) sacred (adj)	k'u-hu-lu, k'u-ju-lu, K'UH-HUL, K'UH-JUL-lu, K'UH-JUL, K'U'-u-lu, K'UH-hu-lu
	LAKAM	<i>lakam</i>	(1) banner (n) (2) great (n) (3) title (n)	la-ka-ma, LAKAM-ma, LAKAM
	?...n	?...n	(1) child of father (n)	?-na
	MO'	<i>mo'</i> <i>moo'?</i>	(1) macaw (n)	MO'-o, mo-o, mo-o-o
	MUYAL	<i>muyal</i> <i>muyaal</i>	(1) cloud (n)	mu-MUYAL?-la, MUYAL?-ya-la MUYAL?-la, MUYAL?-li
	NAB	<i>naab</i>	(1) waterlily (n) (2) lake (n) (3) sea (n) (4) pool (n)	na-bi, NAB-bi
	NAL	<i>-nal</i>	(1) maize, mazorca (maize ear) (2) place (locative suffix)	na-la, NAL-la, na-NAL
	OCH-chi	<i>och-</i>	(1) to enter (iv)	o-chi, OCH
	OCH-K'IN-ni	<i>ochk'in</i>	(1) 'sun-entry'? (n) (2) west (n)	OCH-K'IN

hieroglyph <sup>107</sup> :	transliteration <sup>108</sup> :	transcription <sup>109</sup> :	translation <sup>110</sup> :	alternative spellings <sup>111</sup> :
	OL	<i>o[h]l</i>	(1) heart (n) (2) portal (n) (3) center (n)	<b>o-la,</b> <b>²o-la,</b> <b>OL-la,</b> <b>(y)o-OL-la</b>
	(y)o-OTOT-ti	<i>(y)otoot</i>	(1) house (2) home	<b>OTOT,</b> <b>OTOT-ti,</b> <b>o-to-ti,</b> <b>yo-to-ti</b>
	PAKAL	<i>pakal</i>	(1) shield (n)	<b>pa-ka-la</b> <b>PAKAL-la</b>
	PAS-	<i>pas-</i>	(1) to awake, dawn (iv) (2) open (iv)	<b>pa-sa-ja,</b> <b>PAS-sa-ja</b>
	PAT-	<i>pat-</i>	(1) to make (pv) (2) to shape/form (pv) (3) to build (pv)	<b>pa-ta-,</b> <b>PAT-ta-,</b> <b>pa-PAT-</b>
	SAK	<i>sak</i>	(1) white (adj) (2) pure (adj)	<b>SAK-ka,</b> <b>SAK-ki,</b> <b>sa-ku</b>
	SIH? SIY?	<i>sih?- siy?-</i>	(1) to be born (iv[d?])	
	TAJ	<i>taj</i>	(1) pine (2) (pine) torch	<b>ta-ja</b>
	TAN	<i>ta[h]n</i>	(1) center (n) (2) in (prep) (3) in the center of (prep)	<b>TAN-na</b>
	TE'	<i>te' te'el</i>	(1) tree (n) (2) wood (n) (3) forest (n)	<b>TE'-e,</b> <b>TE'-le,</b> <b>TE'-e-le</b>

hieroglyph <sup>107</sup> :	transliteration <sup>108</sup> :	transcription <sup>109</sup> :	translation <sup>110</sup> :	alternative spellings <sup>111</sup> :
	TOK'	<i>to[ɔ]k'</i> <i>tol'jk'</i> <i>tok'</i>	(1) chert, flint, chalcedony (n)	<b>to-k'a,</b> <b>to-k'o,</b> <b>TOK'-k'o,</b> <b>to-TOK'</b>
	TUN	<i>tuun</i> <i>tun</i>	(1) stone (n) (2) year (n)	<b>TUN-ni,</b> <b>tu-TUN,</b> <b>tu-TUN-ni,</b> <b>tu-ni</b>
	T'UL?	<i>t'u[h]l?</i>	(1) rabbit, jackrabbit, hare	<b>t'u-lu</b>
	TZAK	<i>tzak-</i>	(1) to conjure (tv)	
	TZUTZ	<i>tzutz-</i>	(1) to end (tv) (2) to complete (tv) (3) to finish (tv)	<b><sup>2</sup>tzu,</b> <b>tzu-tza</b>
	TZ'AK	<i>tz'ak-</i>	(1) to count (tv) (2) to put in order (tv) (3) to increase (tv)	<b>TZ'AK-ka,</b> <b>TZ'AK-a,</b>
	WAJ	<i>waaj</i>	(1) tamale, bread, maize dough (n) (2) foodstuffs produced from maize dough (n)	<b>WAJ-ji,</b> <b>wa-WAJ-ji</b>
	WAY	<i>way / wahy?</i>	(1) <i>way/wahi</i> (n) (2) <i>nawal</i> (n) (3) co-essence, animal spirit companion, alter ego (n)	<b>WAY-ya,</b> <b>WAY-wa-ya,</b> <b>wa-WAY-ya,</b> <b>wa-ya</b>
	WINIK	<i>winik</i>	(1) person (n) (2) man (n) (3) 20-day period (n)	<b>WINIK-ki,</b> <b>wi-WINIK-ki</b>
	WITZ	<i>witz</i>	(1) mountain (n) (2) hill (n)	<b>wi-WITZ,</b> <b>wi-tzi</b>




hieroglyph <sup>107</sup> :	transliteration <sup>108</sup> :	transcription <sup>109</sup> :	translation <sup>110</sup> :	alternative spellings <sup>111</sup> :
	WITZ'	<i>witz'</i>	(1) splash (of water) (n) (2) water spray (n) (3) waterfall? (n)	<b>wi-WITZ'</b>
	XOK	<i>xook</i>	(1) shark (n)	<b>XOK-ki</b>
	YAX	<i>yax</i>	(1) blue-green (adj) (2) clear, clean (adj) (3) first (adj)	<b>ya-YAX,</b> <b>ya-xa</b>

Table 25: Concise Dictionary of Maya Logograms

## A THEMATIC CLASSIC MAYAN – ENGLISH DICTIONARY

## VERBS

Root/stem:	Transliteration <sup>113</sup> :	Transcription <sup>114</sup> :	GC <sup>115</sup> :	Translation <sup>116</sup> :
<i>ah-</i>	<b>a-ha-la</b> <b>a-ha-li</b>	<i>ah-al</i> <i>ah-aal</i>	iv	to create, awaken
<i>ahk'- / ahk'u</i>	<b>ya-k'a-wa</b> <b>ya-AK'-wa</b> <b>ya-k'u-tu-u</b>	<i>y-a[h]k'-aw</i> <i>y-a[h]k'-[a]w</i> <i>y-a[h]k'u-tu'</i>	tv	to give. Note the <i>yahk'utu'</i> example, which renders a noun for “gift”.
<i>ahk't-</i>	<b>a[AK']-ta-ja</b> <b>AK'-ta-ja</b> <b>AK-ta-ji</b> <b>a-AK'-ta</b> <b>AK'-ta</b> <b>AK'-TAJ-ja</b> <b>AK'-TAJ</b>	<i>a[h]k't-aj</i> <i>a[h]k't-aj</i> <i>a[h]k't-aa</i> <i>a[h]k't-al[j]</i> <i>a[h]k't-al[j]</i> <i>a[h]k't-aj</i> <i>a[h]k't-aj</i>	ivd	to dance. Derived from the noun <i>ahk'Vt</i> ( <i>ahk'ot?</i> / <i>ahk'ut?</i> ) for “dance”, in which the (internal) vowel is syncopated in the verbalized form.
<i>ak-</i>	<b>ya-ka-ta-ji</b>	<i>y-ak-t-aa</i>	*	to leave, abdicate
<i>al-</i>	<b>ya-la-ja</b> <b>ya-la-ji</b> <b>ya-la-ji-ya</b> <b>ya-la-[ji]ya</b>	<i>y-al-aj</i> <i>y-al-aa</i> <i>y-al-j-iiy</i> <i>y-al-j-iiy</i>	tv	to say
<i>a'n-</i>	<b>a-nu</b> <b>AN-nu</b> <b>a-AN-na</b> <b>a-AN</b> <b>AN</b>	<i>a'n</i> <i>a'n</i> <i>a[']n</i> <i>a[']n</i> <i>a[']n</i>	iv	to be, exist – used as part of deity impersonation expressions
<i>ahn-</i>	<b>a-ni</b> <b>AN</b>	<i>a[h]n-i</i> <i>a[h]n</i>	iv	to run, walk
<i>at-</i>	<b>ya-ti-ji</b> <b>ya-ta-ji</b> <b>ya-AT-ji</b>	<i>y-at-ij</i> <i>y-at-[ij] / -aa</i> <i>y-at-[ij]</i>	tvd	to bathe
<i>baj-</i>	<b>ba-la-ja</b> <b>BAJ</b>	<i>ba[j]-l-aj</i> <i>baj-[l-aj]</i>		to hammer
<i>bak-</i>	<b>BAK-na-ja</b> <b>BAK-wa-ja</b> <b>u-BAK-wa</b>	<i>ba[a]k-n-aj</i> <i>ba[a]k-w-aj</i> <i>u-bak-[a]w</i>	tv	to make captive

<sup>113</sup> This is a *broad* transliteration that excludes analyzed/interpreted sounds (vowel length, glottal stops, and /h/s [preconsonantal velar fricatives]) that are not inbuilt/inherent parts of hieroglyphs but were, conversely, indicated by harmony rules, grammatical inflection, and in the case of underspellings, provided by the native reader. The alternative spellings are based on a study of the corpus of Maya texts as well as on Boot 2009, Kettunen 2018, Lacadena and Wichmann 2004, Lacadena and Zender 2001, and Lacadena (personal communication, 2001–2014).

<sup>114</sup> This is a *narrow* transcription including reconstructed sounds (marked by [square brackets]) based either on historical, internal, or paleographic evidence.

<sup>115</sup> GC: Grammatical category; Abbreviations: **verbs**: iv: intransitive verb, ivd: intransitive verb (derived), pv: positional verb tv: transitive verb, tvd: transitive verb (derived); **nouns and adjectives**: adj: adjective, cn: composite noun, n: noun; **other**: adv: adverb, ag: agentive, cop: copula, dem: demonstrative pronoun, ip: independent pronoun, ncl: numeral classifier, num: numeral, part: particle, poss: possessive prefix, prep: preposition, pronA: pronominal absolutive suffix, pronE: pronominal ergative prefix.

<sup>116</sup> This is really a *gloss* rather than translation (a gloss is a short general translation of a word or morpheme which does not take into account the context in which it occurs). Nonetheless, when several well-attested meanings exist, these are sorted (in the order of numerical ascendancy) from the most literal to the most figurative. The latter do (to a certain degree) take into consideration the various meanings that the contexts of wordscan potentially imbue them with.

Root/stem:	Transliteration <sup>113</sup> :	Transcription <sup>114</sup> :	GC <sup>115</sup> :	Translation <sup>116</sup> :
<i>bal-</i> / <i>bahl-</i>	<b>ba-la-ja</b> <b>u-ba-la-wa</b> <b>ba-la-ma</b> <b>BALAM-ma</b>	<i>bal-aj</i> <i>u-bal-aw</i> <i>ba[h]l-am</i> <i>ba[h]l-am</i>	tv	to hide, cover
<i>bixan-</i> <i>bih-xan-</i>	<b>[bi]XAN?-na</b> <b>[bi]XAN?-ni-ya</b>	<i>bi[h]-xan</i> <i>bi[h]-xan-iiy</i>	iv	lit. “to ‘road-go’, ‘road-walk’” or “go, travel”. Possible origin from <i>bih-</i> “road” plus <i>-xan</i> “to run, walk”.
<i>bik’-</i>	<b>bi-k’i</b>	<i>bik’</i>	iv	to scribble
<i>buch-</i>	<b>bu-BUCH-wa-ni</b>	<i>buch-waan</i>	pv	to be seated
<i>buk-</i>	<b>bu-ku-yi</b>	<i>buk-uuy</i>	tv	to dress
<i>but’-</i>	<b>u-bu-t’u-wa</b>	<i>u-but’-uw</i>	tv	to fill, cover
<i>butz’</i>	<b>bu-tz’a-ja</b>	<i>bu[h]tz’-aj</i>	*	to (make) smoke
<i>cham-</i> / <i>kam-</i> <i>chim-</i>	<b>CHAM</b> <b>CHAM-mi</b> <b>CHAM-mi-ya</b>	<i>cham</i> <i>cham-i</i> <i>cham-iiy</i>	iv	to die
<i>che’-</i> / <i>cheh-</i>	<b>che-e-na</b> <b>che-na</b> <b>che-he-na</b>	<i>che’-[e]’n</i> <i>che[-e]’n</i> <i>cheh-e’n</i>	tv/iv?	to say, tell
<i>chok-</i>	<b>cho-ko-wa</b> <b>u-cho-ko-wa</b> <b>CHOK-wa</b> <b>u-CHOK-wa</b> <b>u-CHOK-ko-wa</b> <b>u-CHOK-wi</b> <b>u-CHOK-ji</b>	<i>chok-ow</i> <i>u-chok-ow</i> <i>chok-[o]w</i> <i>u-chok-[o]w</i> <i>u-chok-ow</i> <i>u-chok-[oo]w</i> <i>u-chok-[ij]</i>	tv	to scatter, sow, cast
<i>chuk-</i>	<b>chu-ka</b> <b>chu-ka-ja</b> <b>chu[ku]-ja</b> / <b>CHUK-ja</b> <b>chu-ku-ka-ja</b> <b>u-chu-ku-wa</b> <b>u-chu[ku]-ya</b> / <b>u-CHUK-ya</b> <b>chu[ku]-ji-ya</b> / <b>CHUK-ji-ya</b>	<i>chu[h]k-a[j]</i> <i>chu[h]k-aj</i> <i>chu[h]k-[a]j</i>  <i>chu[h]k-aj</i> <i>u-chu[h]k-uw</i> <i>u-chuk-[ii]y</i>  <i>chu[h]k-j-iiy</i>	tv	to capture, seize
<i>chum-</i>	<b>CHUM[mu]-li-ya</b> <b>CHUM[mu]-li</b> <b>CHUM[mu]-la-ja</b> <b>CHUM-la-ji-ya</b> <b>CHUM[mu]-la-ji-ya</b> <b>CHUM[mu]-wa-ni</b> <b>CHUM[mu]-wa-ni-ya</b> <b>CHUM[mu]-ji-ya</b> <b>CHUM[mu]-ja</b>	<i>chum-l-iiy</i> <i>chum-l-i[iy]</i> <i>chum-l-aj</i> <i>chum-l-aj-iiy</i> <i>chum-l-aj-iiy</i> <i>chum-waan</i> <i>chum-waan-iiy</i>  <i>chum-j-iiy</i> <i>chu[h]m-[a]j</i>	pv	to sit
<i>chun-</i>	<b>chu-ni</b>	<i>chun- / -[i]</i>	iv	to sit (variant of <i>chum-</i> )
<i>chun-</i>	<b>chu-ni</b>	<i>chun- / -[i]</i>	tv	to conjure??

Root/stem:	Transliteration <sup>113</sup> :	Transcription <sup>114</sup> :	GC <sup>115</sup> :	Translation <sup>116</sup> :
<i>chuy-</i>	<b>chu-yu</b> <b>u-chu-yu</b>	<i>chuy</i> <i>u-chuy</i>	tv	to weave, sew
<i>ch'ab-</i>	<b>u-ch'a-ba-wa</b> <b>ch'a-CH'AB-wi</b>	<i>u-ch'ab-aw</i> <i>ch'ab-[aa]w</i>	tv	1) to fast, do penance 2) to create
<i>ch'ak-</i>	<b>ch'a-ka-ja</b> <b>CH'AK-ka-ja</b> <b>CH'AK-ka</b> <b>CH'AK</b>	<i>ch'a[h]k-aj</i> <i>ch'a[h]k'-aj</i> <i>ch'a[h]k-a[j]</i> <i>ch'a[h]k-</i>	tv	to chop, axe, and by extension to war, conquest, vanquish
<i>ch'am- / k'am-</i>	<b>ch'a-ma</b> <b>ch'a-CH'AM</b> <b>CH'AM-ma</b> <b>CH'AM-wa</b> <b>CH'AM-wi</b> <b>u-CH'AM-wa</b> <b>CH'AM-ya</b> <b>k'a-ma</b> <b>K'AM</b> <b>K'AM-ma?</b> <b>K'AM-wa</b> <b>K'AM-xa</b>	<i>ch'am</i> <i>ch'am</i> <i>ch'am</i> <i>ch'am-aw</i> <i>ch'am-aaw</i> <i>u-ch'am-[a]w</i> <i>ch'am-[ii]y</i> <i>k'am</i> <i>k'am</i> <i>k'am</i> <i>k'am-aw</i> <i>k'am-ax?</i>	tv	to grasp, take, seize
<i>ch'om-</i>	<b>ch'o-ma</b>	<i>ch'om</i>	tv	to hit
<i>ek-</i>	<b>e-ke-wa-ni-ya</b>	<i>ek-waan-iiy</i>	pv	to place, enter, insert
<i>el-</i>	<b>EL-le</b> <b>EL</b>	<i>el</i> <i>el</i>	tv	to burn, cense
<i>ehm-</i>	<b>e-mi</b> <b>e-mi-ya</b> <b>EM-ye</b> <b>EM[ye]</b> <b>EM-</b> <b>ye-ma-la</b> <b>ye-EM-la</b>	<i>e[h]m-i</i> <i>e[h]m-iiy</i> <i>e[h]m-[e]y</i> <i>e[h]m-[e]y</i> <i>e[h]m</i> <i>y-e[h]m-al</i> <i>y-e[h]m-[a]l</i>	iv	to descend, go down
<i>ham-</i>	<b>ha-ma-li-ya</b>	<i>ham-l-iiy</i>	tv/pv?	to open, untie
<i>hil-</i>	<b>hi-li</b>	<i>hil-i</i>	iv	to rest, end
<i>hul- / (h)ul- / ul-</i>	<b>hu-li</b> <b>HUL-li</b> <b>hu-li-ya</b> <b>HUL-li-ya</b> <b>HUL-ya</b> <b>HUL-ye</b> <b>HUL-le-li-[ji]ya</b>	<i>hul-i</i> <i>hul-i</i> <i>hul-iiy</i> <i>hul-iiy</i> <i>hul-[ii]y</i> <i>hul-[e]y</i> <i>hul-el-ij-iiy</i>	iv	to come/arrive (here)

Root/stem:	Transliteration <sup>113</sup> :	Transcription <sup>114</sup> :	GC <sup>115</sup> :	Translation <sup>116</sup> :
<i>il-</i>	<b>i-la-ja</b> <b>i-IL-ji</b> <b>IL-la</b> <b>IL-ja</b> <b>yi-la-ji</b> <b>yi-li-a-ji</b> <b>yi-li-ji</b> <b>yi-IL-ji</b> <b>yi-IL-la-ja</b> <b>yi-IL-a</b> <b>yi-li-a-lji</b> lya	<i>il-aj</i> <i>il-[ilj]</i> <i>il-alj]</i> <i>il-[aj]</i> <i>y-il-aa</i> j <i>y-il-aa</i> j <i>y-il-[ilj]</i> <i>y-il-[ilj]</i> <i>y-il-aj</i> <i>y-il-alj]</i> <i>y-il-aj-i</i> iy	tv	to see, witness
<i>jal-</i>	<b>JAL</b> <b>JAL-ji-ya</b>	<i>jal-</i> <i>jal-j-i</i> iy	tv	to manifest
<i>jas-</i>	<b>ja-sa-wa</b>	<i>jas-aw</i>	tv	to clear?
<i>jatz'-</i>	<b>ja-tz'a-yi</b>	<i>jatz'-[aa]y</i>	tv	to strike, hit (Note also: <b>ja-tz'o-ma</b> > <i>jatz'-om</i> "striker"
<i>jaw-</i>	<b>ja-wa-TE'</b> <b>ja-TE'</b>	<i>jaw-a[n]-te'</i> <i>ja[w]-[an]-te'</i>	pv	to be with open mouth, gaping mouth
<i>jel-</i>	<b>u-je-le-wa</b>	<i>u-jel-[e]'w</i>	tv	1) to adorn, dress 2) to change, replace
<i>joch'-</i>	<b>jo-ch'a</b> <b>jo-ch'a-ja</b> <b>jo-ch'o</b> <b>jo-ch'o-ja</b> <b>jo-ch'o-ji-ya</b> <b>u-jo-ch'o-wa</b> <b>jo-ch'o-li</b>	<i>jo[h]ch'-alj]</i> <i>jo[h]ch'-aj</i> <i>joch'</i> <i>jo[h]ch'-[alj]</i> <i>joch'-j-i</i> iy <i>u-joch'-ow</i> <i>joch'-ool / -l-i</i>	tv	to drill, drill (fire)
<i>jom-</i>	<b>jo-mo-yi</b>	<i>jom-oo</i> y	tv	sink, destroy, ruin, finish
<i>jop-</i>	<b>jo-po-la-ja</b> <b>jo-po-la</b> <b>jo-po-wo</b>	<i>jop-l-aj</i> <i>jop-l-alj]</i> <i>jop-ow</i>	iv	to stoke, fill
<i>joy-</i>	<b>jo-JOY-ja</b> <b>JOY-ja</b> <b>JOY[jal]</b> <b>JOY-ya-ja</b> <b>JOY[jal-ji-ya</b> <b>[jol]JOY-ji-ji-ya</b>	<i>jo[h]y-[alj]</i> <i>jo[h]y-[alj]</i> <i>jo[h]y-[alj]</i> <i>jo[h]y-aj</i> <i>jo[h]y-[alj-i</i> iy <i>jo[h]y-[alj-ij-i</i> iy	tv	to bind, reveal, debut
<i>jub-</i>	<b>ju-bu-yi</b>	<i>jub-uuy</i>	tv	to topple, fall, bring down, depose
<i>jul-</i>	<b>JUL</b> <b>u-JUL-lu</b> <b>u-JUL-wa</b>	<i>jul</i> <i>u-jul</i> <i>u-jul-[u]w</i>	tv	to pierce, throw (spear, dart, or arrow), hurl
<i>kab-</i>	<b>u-KAB-ji</b> <b>u-[KAB]ji</b> <b>u-KAB-ya</b> <b>u-KAB-ji-ya</b> <b>u-KAB-[ji]ya</b>	<i>u-kab-[ilj]</i> <i>u-kab-[ilj]</i> <i>u-KAB-[i]iy</i> <i>u-kab-j-i</i> iy <i>u-kab-j-i</i> iy	tv	to supervise, oversee
<i>kach-</i>	<b>u-ka-cha-wa</b>	<i>u-kach-aw</i>	tv	to tie, knot



Root/stem:	Transliteration <sup>113</sup> :	Transcription <sup>114</sup> :	GC <sup>115</sup> :	Translation <sup>116</sup> :
<i>kal-</i>	<b>ka-lo-ma</b> <b>ka-[KAL]ma</b> <b>[KAL]ma</b> <b>KAL</b>	<i>kal-om</i> <i>kal-[o]m</i> <i>kal-[o]m</i> <i>kal</i>	tv	to open, hack
<i>kam-</i>	---		---	see <i>cham-</i>
<i>kob-</i>	<b>u-ko-bo</b> <b>u-ko-bo-wa</b>	<i>u-kob</i> <i>u-kob-ow</i>	?	to liken, do things alike, repeat
<i>kohk-</i>	<b>ko-ko-no-ma</b>	<i>ko[h]k-n-om</i>	tvd *	to guard, watch over
<i>koj-</i>	<b>ko-jo-yi</b> <b>i-ko-jo-yi</b> <b>ko-ji-ya</b>	<i>koj-ooj</i> <i>i-koj-ooj</i> <i>ko[h]-j-iij</i>	v*	to go down?
<i>kotz'-</i>	<b>ko-tz'o-la</b> <b>ko-tz'o-ma</b>	<i>kotz'-ol</i> <i>kotz'-om</i>	v*	to roll-up, coil
<i>kuch-</i>	<b>ku-cha-ja</b> <b>KUCH?-chi</b> <b>KUCH?</b>	<i>ku[h]ch-aj</i> <i>kuch-i</i> <i>kuch</i>	tv	to carry
<i>k'a'-</i>	<b>k'a-a-yi</b> <b>k'a-yi</b> <b>K'A'-yi</b>	<i>k'a'-[aa]y</i> <i>k'a[']-[aa]y</i> <i>k'a'-[aa]y</i>	iv	lit. to diminish, terminate, wilt, wither, end, or to die
<i>k'ahk'-</i>	<b>k'a-k'a-bi-li</b>	<i>k'a[h]k'-bil</i>	tv	to burn, braise
<i>k'al-</i>	<b>k'a-la-ja</b> <b>u-K'AL-wa</b> <b>K'AL-ja</b> <b>K'AL-[jil]ya</b> <b>K'AL-wa</b> <b>K'AL-wi</b>	<i>k'a[h]l-aj</i> <i>u-k'al-[a]w</i> <i>k'a[h]l-[a]j</i> <i>k'a[h]l-j-iij</i> <i>k'al-[a]w</i> <i>k'al-[aa]w</i>	tv	to present, raise, bind, fasten, enclose
<i>k'am-</i>	---		---	see <i>ch'am-</i>
<i>k'as-</i>	<b>k'a-sa-ja</b> <b>k'a-sa-ya</b>	<i>k'a[h]s-aj</i> <i>k'as-aj</i>	tv	to break, splinter
<i>k'at-</i>	<b>k'a-ti</b>	<i>k'at-i</i>	tv	want
<i>k'ay-</i>	<b>K'AY</b>	<i>k'ay ~ k'aay ~ k'a'y</i>	iv	to sing
<i>k'ub-</i>	<b>k'u-ba-ja</b>	<i>k'u[h]b-aj</i>	tv	to present, offer, deposit, deliver
<i>k'uh-</i>	<b>K'UH-na</b> <b>K'UH-hu-na</b> <b>K'UH-HUN-na</b> <b>K'UH-HUN</b>	<i>k'uh-[u']n</i> <i>k'uh-u'n</i> <i>k'uh-u'n</i> <i>k'uh-u[']n</i>	tv	to venerate, worship
<i>k'ux-</i>	<b>k'u-xa-ja</b> <b>k'u-xa-ji</b> <b>K'UH-xu-ja</b>	<i>k'u[h]x-aj</i> <i>k'u[h]x-aaaj</i> <i>k'uhx-[a]j</i>	tv	1) to bite (crunchy foods), hurt, torture 2) to end, finish
<i>lam-</i>	<b>la-ma</b> <b>LAM-wa</b> <b>LAM</b>	<i>lam</i> <i>lam-[a]w</i> <i>lam</i>	iv	to sink, decrease, diminish, expire, elapse?
<i>lek'-</i>	<b>u-le-k'a</b>	<i>u-lek'</i>	tv	to elevate

Root/stem:	Transliteration <sup>113</sup> :	Transcription <sup>114</sup> :	GC <sup>115</sup> :	Translation <sup>116</sup> :
<i>lok'-</i>	<b>u-lo-k'o-la</b> <b>u-LOK'</b> <b>lo-LOK'</b> <b>LOK'</b> <b>LOK'-yi</b>	<i>u-lok'-ol</i> <i>u-lok'-[ol]</i> <i>lok'-[ooy]</i> <i>lok'-[ooy]</i> <i>lok'-ooy</i>	iv	to leave, exit, escape, flee
<i>mach-</i>	<b>ma-cha-ja</b> <b>ma-chi-ta</b>	<i>ma[h]ch-aj</i> <i>ma[h]ch-iit / -t-a[j]</i>	tv	to grab
<i>mak-</i>	<b>ma-ka-ja</b> <b>ma-AK-ja-ji-ya</b> <b>ma-ka-xa</b>	<i>ma[h]k-aj</i> <i>ma[h]k-aj-iyy</i> <i>ma[h]k-ax</i>	tv	to cover, close
<i>mak'-</i>	<b>u-ma-k'a</b> <b>u-ma-k'a-wa</b>	<i>u-mak'- / -a[j]</i> <i>u-mak'-aw</i>	tv	to eat (soft foods)
<i>mek'-</i>	<b>u-me-k'e-ji-ya</b> <b>u-me-k'e-ljilya</b>	<i>u-mek'-j-iyy</i> <i>u-mek'-j-iyy</i>	*	to embrace (?)
<i>mis-</i>	<b>mi-si</b>	<i>mis</i>	tv	to clean, sweep
<i>muk-</i>	<b>mu-ka-ja</b> <b>mu-ku-ja</b> <b>u-mu-ku</b> <b>mu-ku-yi</b>	<i>mu[h]k-aj</i> <i>mu[h]k-[a]j</i> <i>u-muk</i> <i>muk-uuy</i>	tv	to bury, inter
<i>na'-</i>	<b>na-wa-ja</b>	<i>na[']-w-aj</i>	tv	to present, reveal
<i>nahb-</i>	<b>NAB-ja</b>	<i>na[h]b-[a]j</i>	iv	to pool (like the sea)
<i>naj-</i>	<b>na-ja-yi</b>	<i>naj-aay</i>	*	to fill (?)
<i>nak-</i>	<b>u-na-ka-wa</b>	<i>u-nak-aw</i>	tv	to fight, battle
<i>nam</i>	<b>NAM</b>	<i>nam</i>		to hide, conceal
<i>nup-</i>	<b>nu-pa-ja</b>	<i>nu[h]p-aj</i>	tv	to join, merge
<i>och- / ok-</i>	<b>o-chi</b> <b>o-chi-ya</b> <b>OCH-chi-ya</b> <b>OCH-chi</b> <b>OCH</b>	<i>och-i</i> <i>och-iyy</i> <i>och-iyy</i> <i>och-i</i> <i>och[-i]</i>	iv	to enter
<i>otoot-</i>	<b>OTOT-NAH-ja</b>	<i>oto[o]t-n-aj</i>	iv	to be housed
<i>pa'</i>	<b>PA'</b>	<i>pa'</i>	iv	to open
<i>pach-</i>	<b>pa-chi</b>	<i>pach-i / pach</i>	tv	to choose, select
<i>pak-</i>	<b>pa-ka-la-ja</b> <b>u-pa-ka-ba</b>	<i>pak-l-aj</i> <i>u-pak-ab</i>	pv	to invert, turn over, face downwards, fold over
<i>pak-</i>	<b>pa-ka-xa</b> <b>pa-ka-xi</b>	<i>pak-ax</i> <i>pak-aax</i>	tv	to return
<i>pak'-</i>	<b>pa-k'a</b> <b>u-pa-k'a</b> <b>pa-k'a-ji-ya</b>	<i>pak'</i> <i>u-pak'</i> <i>pak'-j-iyy</i>	tv	to set, place, dab, plant
<i>pan-</i>	<b>pa-na-wa-ni</b>	<i>pan-waan</i>	pv	to dig (?)
<i>pas-</i>	<b>pa-sa-ja</b> <b>u-pa-sa-wa</b> <b>PAS-sa-ja</b> <b>PAS</b>	<i>pa[h]s-aj</i> <i>u-pas-aw</i> <i>pa[h]s-aj</i> <i>pas-</i>	tv	to awake, dawn, open, reveal, expose, exhume

Root/stem:	Transliteration <sup>113</sup> :	Transcription <sup>114</sup> :	GC <sup>115</sup> :	Translation <sup>116</sup> :
<i>pat-</i>	<b>pa-ta-wa-ni</b> <b>PAT-wa-ni</b> <b>PAT-ta-wa-ni</b> <b>PAT-la-ja</b> <b>PAT-[la]ja</b>	<i>pat-waan</i> <i>pat-waan</i> <i>pat-waan</i> <i>pat-l-aj</i> <i>pat-l-aj</i>	pv	to make, shape, form, build
<i>pat-</i>	<b>u-pa-ti-ji</b> <b>u-PAT-ji</b> <b>u-PAT-ta-wa</b> <b>pa-PAT-ja</b>	<i>u-pat-ij</i> <i>u-pat-[ij]</i> <i>u-pat-aw</i> <i>pa[h]t-aj ?</i>	tv	to make, shape, form, build
<i>pek-</i>	<b>u-pe-ka-ja</b>	<i>u-pek-aj</i>	*	to call/announce?
<i>pet-</i>	<b>PET-te</b> <b>PET-ja</b> <b>PET-ji-ya</b>	<i>pet</i> <i>pe[h]t-[al]j</i> <i>pe[h]t-j-iyy</i>	tv	to make round
<i>pich-</i>	<b>pi-chi</b>	<i>pich</i>	tv	to perforate
<i>pitz-</i>	<b>pi-tzi-ja</b> <b>pi-tzi-la-ja</b> <b>pi-tzi-ji-ya</b>	<i>pitz-iij</i> <i>pitz-iil-[al]j</i> <i>pitz-j-iyy</i>	ivd	to play ball
<i>pok-</i>	<b>u-po-ko-lo</b>	<i>u-pok-ol</i>	tv	to wash, rinse
<i>puk-</i>	<b>PUK</b> <b>PUK-ki</b>	<i>puk</i> <i>puk-i</i>	iv	to scatter, spread (in reference to fire / embers)
<i>pul-</i>	<b>pu-lu-yi</b> <b>PUL-yi</b>	<i>pul-uuy</i> <i>pul-uuy</i>	iv/tv?	to burn, set ablaze
<i>sat-</i>	<b>sa-ta-yi</b>	<i>sat-aay</i>	tv	1) to destroy 2) to loose
<i>sih- / siy-</i>	<b>SIY/SIH-ja</b> <b>SIY/SIH-ya-ja</b> <b>SIY/SIH-ja-[j]ilya</b> <b>SIY/SIH-ji-ja</b>	<i>si[h]y-[al]j</i> <i>si[h]y-aj</i> <i>si[h]y-[al]j-iyy</i> <i>si[h]y-j-iyy</i>	ivd	to be born
<i>sin-</i>	<b>si-na-ja</b> <b>si-na</b> <b>u-si-na</b>	<i>si[h]n-aj</i> <i>si[h]n-al[j]</i> <i>u-si[h]n-al[j]</i>	tv	to extend, spread out
<i>sus-</i>	<b>su-sa-ja</b>	<i>su[h]s-aj</i>	tv	to scrape, peel
<i>tak'-</i>	<b>ta-k'a</b> <b>u-ta-k'a</b> <b>ta-k'a-ni</b>	<i>tak'</i> <i>u-tak'</i> <i>tak'-aan</i>	tv	to plaster, paste
<i>tal-</i>	<b>ta-li</b> <b>ta-li-ya</b> <b>TAL</b>	<i>tal-i</i> <i>tal-iyy</i> <i>tal</i>	iv	to come/arrive (there, i.e. from somewhere else)
<i>tap- / tahp-</i>	<b>ta-pa-la</b>	<i>tap-al / tal[h]p-al</i>	iv	1) to extinguish, douse 2) to decorate
<i>tek'-</i>	<b>te-k'a-ja</b>	<i>te[h]k'-aj</i>	tv	to step on, trample
<i>til-</i>	<b>ti-li-wi</b> <b>TIL-wi</b>	<i>til-iw</i> <i>til-[i]w</i>	iv	to burn, stoke
<i>tihm-</i>	<b>ti-ma-ja</b> <b>u-ti-mi-wa</b> <b>u-ti-mi-je-la</b>	<i>ti[h]m-aj</i> <i>u-tim-[i]w</i>	*	to satisfy, appease, placate

Root/stem:	Transliteration <sup>113</sup> :	Transcription <sup>114</sup> :	GC <sup>115</sup> :	Translation <sup>116</sup> :
<i>tut-</i>	<b>tu-ta-ja</b> <b>tu-tu-yi</b>	<i>tut-aj</i> <i>tut-uuy</i>	tv	to visit, pass by
<i>t'ab-</i>	<b>t'a?-ba-yi</b> <b>T'AB?-yi</b> <b>T'AB?[yi]</b>	<i>t'ab-aay</i> <i>t'ab-aay</i> <i>t'ab-aay</i>	iv	1) to go up, ascend, raise 2) to 'dedicate'
<i>tzak-</i>	<b>u-TZAK-wa</b> <b>TZAK-wa</b> <b>TZAK-wi</b> <b>TZAK-wi-ya</b> <b>TZAK-ja</b>	<i>u-tzak-[a]w</i> <i>tzak-[a]w</i> <i>tzak-[aa]w</i> <i>tzak-[aa]w-[ii]y</i> <i>tza[h]k-[a]j</i>	tv	to grasp, conjure slippery/elusive things
<i>tzik-</i>	<b>tzi-ka-ja</b>	<i>tzi[h]k-aj</i>	tv	to read, count, reckon
<i>tzutz-</i>	<b>tzuz-tza-ja</b> <b>ʔtzu-ja</b> <b>ʔtzu-ji-ya</b> <b>TZUTZ-tza-ja</b> <b>TZUTZ-ja</b> <b>u-TZUTZ-wa</b> <b>u-TZUTZ-yi</b> <b>TZUTZ-yi</b> <b>TZUTZ-jo-ma</b>	<i>tzuz[h]tz-aj</i> <i>tzuz[h]tz-[a]j</i> <i>tzuz[h]tz-j-iiy</i> <i>tzuz[h]tz-aj</i> <i>tzuz[h]tz-[a]j</i> <i>u-tzutz-[u]w</i> <i>u-tzutz-[uu]y</i> <i>tzutz-[uu]y</i> <i>tzutz-j-om</i>	tv	to end, terminate, complete
<i>tz'ak-</i>	<b>u-tz'a-ka-wa</b> <b>u-TZ'AK</b> <b>u-TZ'AK-ka</b> <b>u-TZ'AK-a</b> <b>u-TZ'AK-ka-a</b> <b>u-TZ'AK-bu-ji-li</b>	<i>u-tz'ak-aw</i> <i>u-tz'ak</i> <i>u-tz'ak</i> <i>u-tz'ak-a[']</i> <i>u-tz'ak-a'</i> <i>u-tz'ak-bu-j-il / -buuj-[i]l</i>	tv	to stack, put in order, accumulate, align, arrange
<i>tz'an-</i>			tv	to destroy
<i>tz'ap-</i>	<b>u-tz'a-pa-wa</b> <b>tz'a-pa-wa</b> <b>tz'a-pa-ja</b> <b>tz'a[pa]l-ja</b> <b>tz'a-pa-pa-ja</b> <b>tz'a-pa-[ji]ya</b>	<i>u-tz'ap-aw</i> <i>tz'ap-aw</i> <i>tz'a[h]p-aj</i> <i>tz'a[h]p-aj</i> <i>tz'a[h]p-aj</i> <i>tz'a[h]p-j-iiy</i>	tv	1) to pound into the ground 2) to plant, insert 3) to erect a stela
<i>tz'ay-</i>	<b>tz'a-ya-ja</b>	<i>tz'a[h]y-aj</i>	tv	to come down, win (?)
<i>tz'ihba-</i>	<b>u-tz'i-ba</b> <b>tz'i-bi-na-ja</b> <b>u-tz'i-bi-na-ja</b> <b>u-tz'i-bi-na-ja-la</b>	<i>u-tz'i[h]b-a</i> <i>tz'i[h]b-n-aj</i> <i>u-tz'i[h]b-n-aj</i> <i>u-tz'i[h]b-n-aj-al</i>	iv	to paint / write
<i>ub-</i>	<b>yu-bi</b> <b>yu-bi-la</b>	<i>y-ub</i> <i>y-ub-iil</i>	iv	to hear
<i>uk'- / uch'</i>	<b>u-UK'-ni</b> <b>yu-UK'-bi</b>	<i>uk'-uun</i> <i>y-uk'-[i]b</i>	iv	to drink
<i>uht-</i>	<b>u-ti</b> <b>u-ti-ya</b> <b>UH-ti</b> <b>UH-ti-ya</b> <b>u-to-ma</b> <b>u-u-ti</b>	<i>u[h]t-i</i> <i>u[h]t-iiy</i> <i>uht-i</i> <i>uht-iiy</i> <i>u[h]t-om</i> <i>u-u[h]t-i</i>	iv	to happen, occur

Root/stem:	Transliteration <sup>113</sup> :	Transcription <sup>114</sup> :	GC <sup>115</sup> :	Translation <sup>116</sup> :
<i>ux-</i> / <i>uxul-</i>	<b>u-xu-lu</b> <b>yu-xu-lu</b> <b>yu-xu-lu-ji</b> <b>yu-xu-li</b> <b>yu-xu-lu-li</b>	<i>ux-ul</i> <i>y-ux-ul</i> <i>y-ux-ul-[ij] / -uuj</i> <i>y-ux-uul</i> <i>y-ux-ul-uul</i>	tvd	to carve, incise, sculpt
<i>wa'-</i>	<b>wa-a-wa-ni</b> <b>wa-WA'-la-ja</b> <b>WA'-la-ja</b> <b>wa-WA'-ji-ya</b> <b>WA'-ji-ya</b> <b>WA'-ja</b> <b>wa-[il]ja</b>	<i>wa'-waan</i> <i>wa'-l-aj</i> <i>wa'-l-aj</i> <i>wa'-j-iij</i> <i>wa'-j-iij</i> <i>wa'-[iij]</i> <i>wa[']-iij</i>	pv	to be erect, set upright, propped up
<i>wal-</i>	<b>wa-WAL-la-ja</b> <b>WAL-la-ja</b> <b>wa-WAL-ji-ya</b> <b>WAL-ji-ya</b> <b>WAL-ja</b>	<i>wal-aj</i> <i>wal-aj</i> <i>wal-j-iij</i> <i>wal-j-iij</i> <i>wal-[iij] / wal-[aj]</i>	tv	to set up
<i>way-</i>	<b>WAY-bi</b> <b>u-WAY</b> <b>u-WAY-ya</b> <b>u-WAY-bi</b> <b>u-WAY-bi-li</b>	<i>way-ib</i> <i>u-wa[h]y?</i> <i>u-wa[h]y?</i> <i>u-way-ib</i> <i>u-way-bil</i>	iv	to sleep, dream, transform
<i>we'-</i>	<b>WE'</b> <b>u-WE'-ya</b> <b>u-WE'-ji-ya</b> <b>WE'-ji</b> <b>WE'-i-bi</b> <b>WE'-bi</b> <b>WE'-ma</b> <b>WE'-la</b>	<i>we'</i> <i>u-we'-[e]y / -[iij]</i> <i>u-we'-j-iij</i> <i>we'-eej</i> <i>we'-ib</i> <i>we'-[i]b</i> <i>we'-em</i> <i>we'-el</i>	tv	to eat (maize-based foods)
<i>wi'-</i>	<b>WI'-ja</b>	<i>wi'-[aj]</i>	tv	to eat (in martial expressions). Apparently derived from <i>we'-aj</i> "ate".
<i>witz-</i>	<b>wi-tzi-ja</b> <b>WITZ-ja</b>	<i>witz-iij</i> <i>witz-[iij]</i>	ivd	to stack, pile (like a mountain)
<i>wol-</i>	<b>wo-lo-yi</b>	<i>wol-ooy</i>	tv	to make round, wrap up
<i>xok-</i>	<b>xo-ki</b>	<i>xok-i</i>	tv	to count, read
<i>yal-</i>	<b>ya-la-ja</b> <b>ya-la-ji-ya</b> <b>YAL-la-ja</b> <b>ya-le-je</b>	<i>yal-aj</i> <i>yal-aj-iij</i> <i>yal-aj</i> <i>yal-aj</i>	tv	to cast, throw down
<i>yip-</i>	<b>yi-pi-la-ja</b> <b>yi-pi-ya-ja</b> <b>yi-pi-ya-je-la</b>	<i>yip-l-aj</i> <i>yip-y-aj</i> <i>yip-y-aj-el</i>	iv	to fill
<i>yuhk-</i>	<b>yu-ku-[la]ja</b> <b>yu-ku-no-ma</b> <b>yu-[ku]no</b> <b>yu[ku]</b>	<i>yu[h]k-l-aj</i> <i>yu[h]k-n-om</i> <i>yu[h]k-n-o[m]</i> <i>yu[h]k</i>	tv	1) to join, unite 2) to tremble, quake
<i>yul-</i>	<b>yu-lu</b>	<i>yul</i>	tv	to polish, burnish

## NOUNS AND ADJECTIVES

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>abak</i>	see <i>sabak</i>	---	---	---
<i>ach</i>	<b>ACH?-cha</b>	<i>ach</i>	n	“penis”. Possible Eastern Ch’olan or Yucatecan form.
<i>ahal</i>	<b>a-ha-la</b> <b>a-ha-li</b>	<i>ahal</i> <i>ahaal</i>	n	1) “dawn, creation” 2) “conquest”
<i>ajan</i>	<b>a/AJ-AJAN-na</b> <b>AJAN-na</b> <b>AJAN</b>	<i>ajan</i> <i>ajan</i> <i>ajan</i>	n / theonym	Ajan. Name of God E (Lit. “he of <i>elote</i> ”). Also the head variant for number eight.
<i>ajaw</i>	<b>a-ja-wa</b> <b>a-AJAW-wa</b> <b>a-AJAW</b> <b>AJAW-wa</b> <b>AJAW</b>	<i>ajaw</i> <i>ajaw</i> <i>ajaw</i> <i>ajaw</i> <i>ajaw</i>	n / title	title for “lord, ruler, king” (lit. AG+ <i>speak</i> > “speaker” or more loosely, “orator”)
<i>ajawil</i>	<b>AJAW-wa-li</b> <b>AJAW-li</b>	<i>ajaw-[i]l</i> <i>ajaw-[i]l</i>	n	“lordship, rulership, kingship, or kingdom”
<i>ajawlel</i>	<b>AJAW-le-le</b> <b>AJAW-le<sup>2</sup></b> <b>AJAW-wa-le</b> <b>AJAW-le</b>	<i>ajaw-lel</i> <i>ajaw-lel</i> <i>ajaw-le[l]</i> <i>ajaw-le[l]</i>	n	“lordship, rulership, kingship, or kingdom”
<i>ajawte’</i>	<b>AJAW-TE’</b> <b>AJAW[TE’]</b> <b>ya-AJAW-TE’</b> <b>ya-AJAW[TE’]</b>	<i>ajaw-te’</i> <i>ajaw-te’</i> <i>y-ajaw-te’</i> <i>y-ajaw-te’</i>	cn	title “tree-lord” or “king tree” depending on translation
<i>ajtz’ihb</i>	<b>a/AJ-tz’i-bi</b> <b>ya-tz’i-bi</b> <b>a/AJ-TZ’IB</b>	<i>aj-tz’i[h]b</i> <i>y-a[j]-tz’i[h]b</i> <i>aj-tz’i[h]b</i>	n	“painter, writer, scribe”
<i>ahk</i>	<b>a-ka</b> <b>AK-ka</b> <b>AK</b>	<i>a[h]k</i> <i>a[h]k</i> <i>a[h]k</i>	n	“turtle” – especially the Central American River Turtle ( <i>Dermatemys mawii</i> )
<i>ahkul</i>	<b>a-ku-u-lu</b> <b>a-ku-lu</b> <b>a-ku-la</b> <b>a-ku</b> <b>AK-lu</b> <b>AK-la</b> <b>AK</b>	<i>a[h]k-ul</i> <i>a[h]k-ul</i> <i>a[h]k-ul</i> <i>a[h]k-u[l]</i> <i>a[h]k-[u]l</i> <i>a[h]k-[u]l</i> <i>a[h]k-[u]l</i>	n / top.	1) “turtle” – see above 2) More likely serves as a toponymic expression for “place where turtles abound” used as part of regal anthroponyms
<i>ahkan</i>	<b>[ya]AKAN-na</b> <b>a/AJ-AKAN-na</b> <b>AKAN-na</b> <b>AKAN</b>	<i>y-a[h]kan</i> <i>a[h]kan</i> <i>a[h]kan</i> <i>a[h]kan</i>	n / theonym	1) “roar, groan” 2) theonym for God A’

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>ahk'ab</i>	<b>ya-k'a-ba</b> <b>a-k'a-ba</b> <b>AK'AB-li</b> <b>AK'AB</b>	<i>y-a[h]k'ab</i> <i>a[h]k'ab</i> <i>a[h]k'ab-aal</i> <i>a[h]k'ab</i>	n	1) "night, darkness" 2) when used in possessed couplet construction as the element following <i>ch'ahb</i> "penance" may refer to "strength, potency"
<i>ak' ~ ak'ach</i>	<b>a-k'a-cha</b> <b>a-AK'</b> <b>AK'</b>	<i>ak'ach</i> <i>ak'[ach]?</i> <i>ak'[ach]?</i>	n	"(male) turkey"
<i>ahk'ot ~ahk'ut?</i>			n	"dance"
<i>ahk'(u)tu'</i>	<b>ya-k'u-tu-u</b>	<i>y-a[h]k'-(u)tu'</i>	n / cn	"gift" (lit. "give-thing" analysed as 3SE-give-NOM/INST?)
<i>al</i>	<b>ya-la</b> <b>ya-AL/YAL-la</b> <b>ya-AL/YAL</b> <b>AL/YAL</b>	<i>y-al</i> <i>y-al</i> <i>y-al</i> <i>y-al</i>	n	"child, offspring (of mother)"
<i>a'n</i>	<b>AN</b>	<i>a'n</i>	n	"unripened maize" Used as part of impersonation expressions as a verb <i>a'n</i> "to be, exist" (see verbs for a spelling variants)
<i>anaab / a'naab</i>	<b>a-na-bi</b> <b>ya-na-bi-li</b> <b>ya-a-na-bi-li</b>	<i>anaab</i> <i>y-anaab-[i]l</i> <i>y-al[j]-anaab-[i]l / y-a'naab-[i]l</i>	n	"sculptor" (?)
<i>at ~ aat</i>	<b>AT</b>	<i>at ~ aat</i>	n	"spine, stinger, thorn"
<i>at ~ aat</i>	<b>AT-ti</b> <b>AT-ta</b>	<i>aat</i> <i>at</i>	n	"penis"
<i>atan</i>	<b>ya-ta-na</b> <b>ya-AT-na</b> <b>a-AT-na</b> <b>ya-TAN-li</b>	<i>y-atan</i> <i>y-atan</i> <i>atan</i> <i>y-atan-[i]l / y-atan-[aa]l</i>	n	"spouse, wife, partner"
<i>atot</i>	<b>ya-to-te</b> <b>ya-ATOT-TE(')</b> <b>ya-ATOT</b> <b>ya-ATOT-ti</b>	<i>y-atot-e</i> <i>y-atot-e</i> <i>y-atot</i> <i>y-atoot</i>	n	"house" (as in "home or dwelling") – early reflex of the lexical item, later superceded throughout most of the Lowlands by <i>otoot</i> and <i>otooch</i> in some parts of Yucatan
<i>atz'aam</i>	<b>a-tz'a-mi</b>	<i>atz'aam</i>	n	"salt"
<i>ahin ~ ahiin</i>	<b>a-AHIN-na</b> <b>AHIN-na</b> <b>AHIN-ni</b> <b>AHIN</b> <b>a-hi</b>	<i>ahin ~ ahiin</i> <i>ahin ~ ahiin</i> <i>ahin ~ ahiin</i> <i>ahin ~ ahiin</i> <i>ahi[n] ~ ahi[in]</i>	n	"cayman" ( <i>Crocodylus acutus</i> & <i>C. moreletii</i> )

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>bah</i>	<b>ba-hi</b> <b>ba-hi-ja</b> <b>ba-ji-ja</b> <b>[BAH]hi</b> <b>BAH</b> <b>ba</b>	<i>baah</i> <i>baah-[ii]j</i> <i>baaj-[ii]j / baa[h]-[ii]j</i> <i>baah</i> <i>bah / ba[a]h</i> <i>ba[h] / ba[ah]</i>	n / adj	1) “image, self” which is inalienably possessed. 2) “head” (adj) as a discriminator in titular expressions for highest ranking individuals bearing a particular title 3) used as part of impersonation expressions when suffixed by <i>-il</i> and coupled with the verbal root <i>a'n</i> “to be, exist”
<i>baj</i>	<b>BAJ</b>	<i>baj</i>		“hammer”
<i>baak</i>	<b>ba-ki</b> <b>ba-ki-li</b> <b>BAK-ki</b> <b>ba-ka</b> <b>BAK</b>	<i>baak</i> <i>baak-[i]l</i> <i>baak</i> <i>bak</i> <i>bak / ba[a]k</i>	n	1) “bone, skeleton” inalienably possessed 2) “captive” seized in warfare
<i>bahlam</i>	<b>ba-la-ma</b> <b>BALAM-la-ma</b> <b>BALAM-ma</b> <b>BALAM</b>	<i>ba[h]lam</i> <i>ba[h]lam</i> <i>ba[h]lam</i> <i>ba[h]lam</i>	n	“jaguar” ( <i>Panthera onca</i> ) or feline in general stems; possibly from the verb <i>bal-</i> “to hide” followed by an agentive suffix <i>-am</i> , yielding lit. “hider”.
<i>batun</i>	<b>ba-TUN-nu</b>	<i>batun</i>	n	root of a certain plant (?)
<i>ba'tz'</i>	<b>ba-tz'u</b> <b>BATZ'</b>	<i>ba'tz'</i> <i>ba[']tz'</i>	n	“(black) howler monkey” ( <i>Alouatta pigra</i> )
<i>baax</i>	<b>BAX</b> <b>BAX-xi</b>	<i>ba[a]x</i> <i>baax</i>	n	“quartz”
<i>bay</i>	<b>ba-ya</b>	<i>bay</i>	adj	fat?
<i>bih ~ bij</i>	<b>bi-hi</b> <b>bi-ji</b> <b>bi</b>	<i>bih</i> <i>bij</i> <i>bi[h] / bi[j]</i>	n	“road” compare to <i>sak-bih</i> for lit. “white-road” which is the Classic-period reflex of the causeways known as <i>sakbeob</i> in Yucatan.
<i>bij</i>	<b>ta-ta-bi</b> (K1196)	<i>tat bij</i>	n	“line (of writing)”
<i>bihtuun</i>	<b>bi-TUN-ni</b> <b>[bi]TUN-ni</b>	<i>bih-tuun</i> <i>bih-tuun</i>	cn	lit. “road-stone” refers to plastered/paved surfaces and particular to the playing alleys of ballcourts
<i>bubul</i>	<b><sup>2</sup>bu-lu-HA'</b>	<i>bubul-ha'</i>	n	“water insect”
<i>bubul</i>	<b><sup>2</sup>bu-lu</b>	<i>bubul</i>	adj	cylindrical, like a column
<i>buhk</i>	<b>bu-ku</b>	<i>bu[h]k</i>	n	“cloth, clothes”



Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>bukuutz</i>	<b>bu-ku-tzi</b>	<i>bukuutz</i>	n	used to refer to a particular type of cacao recipe from the region of Acanceh in Yucatan.
<i>bu'ul / bu'l</i>	<b>bu-la</b>	<i>bu'[u]l / bu'l</i>	n	"(black & brown) beans" ( <i>Phaseolus vulgaris</i> )
<i>butz'</i>	<b>bu-tz'a-ja</b>	<i>butz'-aj</i>	n	"smoke" possibly inalienably possessed.
<i>cha'</i>	<b>cha[']</b>	<i>cha'</i>	adv.	"again, another time, for the second time"
<i>chaab</i>	<b>cha-bi</b>	<i>chaab</i>	n	"bee, beehive, honey" see also <i>kab</i>
<i>chaach</i>	<b>cha-chi</b>	<i>chaach</i>	n	"basket"
<i>chahk</i>	<b>cha-ki</b> <b>CHAK-ki</b> <b>CHAK</b>	<i>cha[h]k / chaa[h]k</i> <i>cha[h]k / chaa[h]k</i> <i>cha[h]k / cha[ah]k</i>	n / theonym	1) "rain, rains" 2) theonym for God B see <i>chahuk</i> below
<i>chab</i>	see <i>kab</i>	---	---	---
<i>chahuk</i>	<b>cha-hu-ku</b>	<i>chahuk</i>	n	"thunder" cognate of the entry <i>chahk</i> above
<i>chak</i>	<b>CHAK</b>	<i>chak</i>	adj	1) "red" 2) "great"
<i>chakte'</i>	<b>CHAK-TE'-e</b>	<i>chak-te'</i>	cn	lit. "red tree" for tropical cedar
<i>chakal</i>	<b>CHAK-ka-la</b>	<i>chak-al</i>	adj	lit. "reddish, red-like"
<i>chakjal</i>	<b>CHAK-ja-la</b>	<i>chak-jal</i>	adj	lit. "reddish, reddening" or "rubefy, rubefication"
<i>chakalte'</i>	<b>CHAK-ka-la-TE'</b>	<i>chak-al-te'</i>	cn	lit. "reddish tree" for chicozapote ( <i>Manilkara zapota</i> )
<i>chak ek'</i>	<b>CHAK-EK'</b>	<i>chak ek'</i>	cn	lit. "great star" term for celestial body Venus (♀)
<i>chakat</i>	<b>CHAK-AT-ta</b> <b>CHAK-AT</b>	<i>chakat</i> <i>chakat</i>	n	dance object or possibly the name of dance expressions in the Usumacinta involving the so-called "basket-staff"
<i>chan</i>	<b>CHAN-na</b> <b>CHAN</b>	<i>chan</i> <i>chan</i>	n / num.	1) "sky" 2) "snake" 3) "four"
<i>chanal</i>	<b>CHAN-NAL</b> <b>CHAN-la</b>	<i>chanal</i> <i>chan[a]l</i>	adj	lit. "sky-like" to be understood as "heavenly" or "celestial"
<i>chan ch'e'n</i>	<b>CHAN-na-CH'EN-na</b> <b>CHAN-na-CH'EN</b> <b>CHAN-CH'EN-na</b> <b>CHAN-CH'EN</b>	<i>chan-ch'e'n</i> <i>chan-ch'e'[']n</i> <i>chan-ch'e'n</i> <i>chan-ch'e'[']n</i>	cn	lit. "sky-cave" possibly means "realm, territory" by extension

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>cha'n / chan / chanan</i>	<b>CHAN-nu</b> <b>CHAN-na</b> <b>CHAN</b>	<i>cha'n</i> <i>cha[']n / chan / chan[a]n</i> <i>cha[']n / chan / chan[an]</i>	n	"guardian" read "captor" see also <i>ka'n</i>
<i>chapaht / chapa't / chapaat</i>	<b>cha-pa-ta</b> <b>CHAPAT-ti</b> <b>CHAPAT-tu</b> <b>CHAPAT</b>	<i>chapa[h]t</i> <i>chapa[h]t</i> <i>chapa'[h]t</i> <i>chapa[h]t / chapa[']h[ah]t</i>	n	"centipede" typically refers to supernatural figures that have centipede-like attributes.
<i>chay / kay</i>	<b>cha-ya</b> <b>CHAY / KAY</b> <b>ka-ya</b>	<i>chay</i> <i>chay / kay</i> <i>kay</i>	n	"fish"
<i>che'</i>	<b>che-e</b>	<i>che'</i>	n	"tree" Yucatec reflex of the more common Ch'olan form <i>te'</i>
<i>che'hb / che'hubul</i>	<b>che-e-bu</b> <b>che-bu</b>	<i>che'[h]b / che'[h]bu[l]</i> <i>che'[h]b / che[']h[bu[l]</i>	n	"writing implement, quill pen, stylus"
<i>chel</i>	<b>che-le</b> <b>CHEL?</b>	<i>chel</i> <i>chel</i>	n	"rainbow"
<i>chi'ik / chi'k</i>	<b>chi-ku</b> <b>chi[ku]</b>	<i>chiku['] / chi'[i]k / chi'k</i> <i>chiku['] / chi'[i]k / chi'k</i>	n	"coatimundi, pizote"
<i>chi'</i>	<b>chi</b>	<i>chi[']</i>	n	"mouth" Yucatecan reflex of the Ch'olan term <i>ti'</i> for "mouth, lip, edge"
<i>chi'iltuun</i>	<b>chi-li-TUN-ni</b>	<i>chi[']-[i]l-tuun</i>	cn	"mouth-s'-stone" Yucatecan term that is used to the stone rings or 'hoops' of ballcourts
<i>chich</i>	<b>chi-chi</b>	<i>chich</i>	n	"word, reason"
<i>chih / chij</i>	<b>chi-hi</b>	<i>chih</i>	n	"chicha" alcoholic beverage made from fermented agave plant ( <i>Agave</i> spp.)
<i>chij</i>	<b>chi-ji</b> <b>chi</b> <b>CHIJ</b> <b>CHIJ-ji</b>	<i>chij</i> <i>chij</i> <i>chij</i> <i>chij</i>	n	"deer" specifically a reference to the White-tailed Deer ( <i>Odocoileus virginianus</i> ) see also <i>keej</i> and <i>may</i>
<i>chijil</i>	<b>CHIJ-ji-li</b> <b>chi-ji-li</b>	<i>chijil</i>	adj	deer-like
<i>chik'in</i>	<b>chi-K'IN-ni</b> <b>chi-K'IN</b>	<i>chik'in</i> <i>chik'in</i>	n	"west" – cardinal direction; used only in the Postclassic period in Yucatan, replaces the Classic-period Ch'olan term <i>ochk'in</i>
<i>chi'lam</i>	<b>chi-la-ma</b>	<i>chi[']lam</i>	n	"spokesperson, interpreter"

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>chit</i>	<b>chi-ti</b> <b>chi-ta</b> <b>CHIT?-ti</b> <b>CHIT?-ta</b> <b>CHIT?</b>	<i>chit</i> <i>chiit</i> <i>chit</i> <i>chiit</i> <i>chit / chi[i]t</i>	n	“father, patron” ? cognate of <i>kit</i>
<i>chitam</i>	<b>CHITAM-ma</b> <b>CHITAM</b> <b>chi-ta-ma</b>	<i>chitam</i> <i>chitam</i> <i>chitam</i>	n	“peccary” White-lipped Peccary ( <i>Tayassu pecari</i> ) or Collared Peccary ( <i>T. tajacu</i> ).
<i>chitin</i>	<b>chi-ti-ni</b>	<i>chitin</i>	n	“oven, stove” or possibly “kiln”; seen <i>kun</i>
<i>chiwoj</i>	<b>chi-wo-ja</b> <b>chi-wo-jo</b> <b>CHAK-chi-wo</b>	<i>chiwoj</i> <i>chiwoj</i> <i>chak-chiwo[j]</i>	n	“tarantula” or “great spider”
<i>chubal</i>	<b>chu-ba-la</b>	<i>chub-al</i>	n	type of container for quills, styluses or other writing implements
<i>chuch</i>	<b>chu-chu</b> <b>u-chu-chu</b>	<i>chuch</i> <i>u-chuch</i>	n	“loom, weaving frame”
<i>chumib</i>	<b>CHUM[mu]-bi</b> <b>CHUM[mu-bi]</b>	<i>chum-ib</i> <i>chum-ib</i>	n	“seat, bench” and possibly by extension “throne”. Based on root <i>chum-</i> “to sit” with instrumental suffix <i>-ib</i> .
<i>chuwen ?</i>	<b>CHUWEN?-na</b> <b>CHUWEN?-ne</b> <b>CHUWEN?</b>	<i>chuwen ?</i> <i>chuwen ?</i> <i>chuwen ?</i>	n	“monkey” ? “artisan” ?
<i>ch'ah</i>	<b>ch'a-ha</b>	<i>ch'ah</i>	adj	“bitter” used in reference to atole recipes
<i>ch'ahb</i>	<b>ch'a-CH'AB</b> <b>CH'AB-ba</b> <b>CH'AB</b> <b>CH'AB-li</b>	<i>ch'a[h]b</i> <i>ch'a[h]b</i> <i>ch'a[h]b</i> <i>ch'a[h]b-[i]</i>		1) “penance, fasting, sacrifice” 2) when used in possessed couplet construction as the element preceding <i>ahk'ab</i> “darkness” may refer to “strength, potency”
<i>ch'aaj / ch'aj / ch'ah</i>	<b>ch'a-ji</b> <b>ch'a-ja</b> <b>ch'a-ha</b>	<i>ch'aaj</i> <i>ch'aj / ch'a[a]j</i> <i>ch'ah / ch'a[j]</i>	n	“drop, droplet” possibly a reference to droplets of blood or pellets of incense used in symbolic sowing rituals
<i>ch'aat / ch'at</i>	<b>ch'a-ti</b> <b>ch'a-ta</b>	<i>ch'aat</i> <i>ch'at / ch'a[a]t</i>	n	“dwarf, hunchback”
<i>ch'ahom</i>	<b>ch'a-jo/JOM-ma</b> <b>CH'AH?-ma</b> <b>ch'a-jo/JOM</b>	<i>ch'aj-om</i> <i>ch'aj-[o]m</i> <i>ch'aj-o[m]</i>	n	“young (man), varón”
<i>ch'amak</i>	<b>ch'a-ma-ka?</b> <b>ch'a?-CH'AMAK?</b>	<i>ch'amak</i> <i>ch'amak</i>	n	“fox” ( <i>Urocyon cinereoargentus</i> )

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>ch'e'n</i>	<b>CH'EN-na</b> <b>CH'EN-ni</b> <b>CH'EN-ne</b> <b>CH'EN</b>	<i>ch'e'n</i> <i>ch'een</i> <i>ch'en</i> <i>ch'el' ]n</i>	n	"cave, well, hollow, burrow"
<i>ch'e'nal</i>	<b>[CH'EN]NAL-la</b>  <b>[CH'EN]NAL</b>	<i>ch'el' ]n-al /</i> <i>ch'el' ]n-nal</i> <i>ch'el' ]n-al /</i> <i>ch'el' ]n-nal</i>	n	lit. "cave-like" or "cave-place" for "tomb, sepulcher"
<i>ch'ich' ~ k'ik'</i>	<b>CH'ICH' ~ K'IK'</b>	<i>ch'ich' ~ k'ik'</i>	n	"blood"
<i>ch'o'</i>	<b>ch'o / CH'O'</b>	<i>ch'o['] / ch'o'</i>	n	"rat"
<i>ch'ok</i>	<b>ch'o-ko</b> <b>CH'OK</b> <b>CH'OK-ko</b>	<i>ch'ok</i> <i>ch'ok</i> <i>ch'ok</i>	n	"youngster, sprout"
<i>ch'ok</i>	<b>ch'o-ko</b> <b>CH'OK</b> <b>CH'OK-ko</b>	<i>ch'ok</i> <i>ch'ok</i> <i>ch'ok</i>	adj	"young"
<i>ch'oklel</i>	<b>CH'OK-ko-le-le</b> <b>CH'OK-ko-le</b>	<i>ch'ok-lel</i> <i>ch'ok-le[l]</i>	n	lit. "youth-hood, youngness" or more broadly "youth"
<i>ebe't / ebet</i>	<b>ye-be-ta</b> <b>ye-be-te</b>	<i>y-ebe't</i> <i>y-ebet</i>	n	"messenger"
<i>ehb</i>	<b>e-bu</b> <b>ye-bu</b> <b>ye-ba</b> <b>ye-ba-la</b> <b>EB</b>	<i>e[h]b-u[l]</i> <i>y-e[h]b-u[l]</i> <i>y-e[h]b-a[l] / -a[']</i> <i>y-e[h]b-al</i> <i>e[h]b</i>	n	"stair, ladder"
<i>ehte' / ajte'</i>	<b>ye-TE'-je</b> <b>[ye]TE'-je</b> <b>ye-he-TE'</b> <b>ye-TE'</b> <b>ya-TE'-AJ?</b>	<i>y-ejte'</i> <i>y-ejte'</i> <i>y-ehte'</i> <i>y-e[h]te'</i> <i>y-ajte' (?)</i>	n	"deed, feat" (?) in possessive constructions used to introduce the agent of martial actions; follows the names of captives and introduces that of the captor
<i>ek' ~ eek'</i>	<b>EK'</b>	<i>ek' ~ eek'</i>	n	"star, heavenly body"
<i>ekaatz</i>	<b>e-ka-tzi</b>	<i>ekaatz</i>	n	"load, tribute, bundle"
<i>ek'te'</i>	<b>EK'-TE'</b>	<i>ek'te'</i>	cn	proper name of tree
<i>elk'in</i>	<b>EL-K'IN</b>	<i>elk'in</i>	n	"east" – cardinal direction; used in the Classic period in the Lowlands; replaced by <i>lak'in</i> in the Postclassic
<i>ehmach</i>	<b>EM-ma</b> <b>EM-ma-cha</b>	<i>e[h]m[ach]</i> <i>e[h]mach</i>	n	"raccoon"
<i>emal</i>	<b>ye-ma-la</b>	<i>y-emal</i>	n	"descent, descending"

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>ha' / -a'</i>	<b>HA'-a</b> <b>HA'</b> <b>a</b>	<i>ha'</i> <i>ha'</i> <i>a[']</i>	n	“water” in general and can refer more specifically to fluids, liquids, rivers and lakes as well bodies of water in the broadest sense
<i>ha'al</i>	<b>HA'-a-la</b> <b>HA'-la</b> <b>HA'AL</b>	<i>ha'al</i> <i>ha'al</i> <i>ha'al</i>	n	lit. “water-y” or “water-like” but specifically refers to “rain”
<i>ha'ha'al</i>	<b>HA'-HA'AL</b>	<i>ha'-ha'al</i>	n	lit. “water-rain” or “very rainy” refers specifically to the “rainy season”
<i>haab</i>	<b>HAB-bi</b> <b>HAB[bi]</b> <b>HAB-ba?</b> <b>HAB</b>	<i>haab</i> <i>haab</i> <i>hab / ha[a]b</i> <i>hab / ha[a]b</i>	n	“year (of 365 days)”
<i>haabil</i>	<b>HAB-li</b>	<i>ha[a]b-[i]l / hab-[i]l</i>	n	“time, period”
<i>halaw</i>	<b>HALAW?-la-wa</b> <b>HALAW?-wa</b> <b>ha-HALAW?-wa</b> <b>HALAW?</b>	<i>halaw</i> <i>halaw</i> <i>halaw</i> <i>halaw</i>	n	“ballcourt”
<i>hix</i>	<b>hi[HIX]</b> <b>HIX</b>	<i>hix</i> <i>hix</i>	n	reference to unknown feline possibly to Ocelot ( <i>Leopardus pardalis</i> ) or Margay ( <i>Leopardus wiedii</i> )
<i>huh / juj</i>	<b>hu</b> <b>HUH</b> <b>ju</b>	<i>hu[h]</i> <i>huh</i> <i>ju[j]</i>	n	“iguana” ( <i>Iguana iguana</i> or <i>Ctenosaura similis</i> )
<i>hun / hu'n / huun</i>	<b>hu-na</b> <b>HUN-na</b> <b>HUN</b>	<i>hun / hu'n / huun</i> <i>hun / hu'n / huun</i> <i>hun / hu[']n / hu[u]n</i>	n	1) “bark, paper, book” 2) “headband, headdress” (made of paper)
<i>hunal / hu'nal / huunal</i>	<b>hu-na-la</b> <b>HUN-la</b>	<i>hun-al / hu'n-[a]l</i> <i>hun-[a]l / hu[']n-[a]l</i>	n	“headband, headdress” and by extension “crown”
<i>hut ~ ut</i>	<b>HUT ~ UT</b> <b>u- HUT/UT</b> <b>HUT/UT-tu</b>	<i>hut ~ ut</i> <i>hut ~ ut</i> <i>hut ~ ut</i>	n	“face, visage, eye”
<i>ibach</i>	<b>i-ba-cha</b>	<i>ibach</i>	n	“armadillo” Nine-banded Armadillo ( <i>Dasyus novemcintus</i> )
<i>ich</i>	<b>i-chi</b>	<i>ich</i>	n	“chile” ( <i>Capsicum</i> spp.)
<i>ichaan</i>	<b>yi-cha-ni</b>	<i>y-ichaan</i>	n	“mother’s brother, maternal uncle”
<i>ichon?</i>	<b>ICHON?</b>	<i>ichon?</i>	n	“chest”

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>ichmal</i>	<b>yi-chi-na-la</b> <b>yi-[chi]NAL-la</b> <b>yi-[chi]NAL</b> <b>yi-ICH(ON)?-NAL</b> <b>a-wi-[chi]NAL</b>	<i>y-ich-nal</i> <i>y-ich-nal</i> <i>y-ich-nal</i> <i>y-ich-nal</i> <i>aw-ich-nal</i>	cop.	lit. “front” or “sight-place” or more loosely ‘within sight’ from which we have the meaning of “with” or “in the presence...”
<i>ihch’aak</i>	<b>yi-ch’a-ki</b> <b>ICH’AK-ki</b> <b>ICH’AK</b>	<i>y-i[h]ch’aak</i> <i>i[h]ch’aak</i> <i>i[h]ch’a[a]k</i>	n	“claw”
<i>ihzt’iin / ihtz’in</i>	<b>i-tz’i-na</b> <b>yi-tz’i-ni</b> <b>i-tz’i</b> <b>[I(’)]TZ’I(’)</b>	<i>i[h]tz’iin</i> <i>y-i[h]tz’in</i> <i>i[h]tz’i[n] i[h]tz’i[in]</i> <i>i[h]tz’i[n] i[h]tz’i[in]</i>	n	“younger brother”
<i>ikaatz / ikitz</i>	<b>i-ka-tzi</b> <b>i-ki-tzi</b>	<i>ikaatz</i> <i>ikitz</i>	n	“load, tribute, bundle” or in some cases items of regalia used as tribute
<i>ik’</i>	<b>IK’</b>	<i>ik’</i>	n	“wind, air”
<i>ik’ ~ ihk’</i>	<b>IK’</b>	<i>ik’ / i[h]k’</i>	adj	“black, dark”
<i>itz’aat / itz’at</i>	<b>i-tz’a-ti</b> <b>ITZAT?-ti</b> <b>i-tz’a-ta</b> <b>ITZAT?-ta</b> <b>ITZAT?</b>	<i>itz’aat</i> <i>itz’aat</i> <i>itz’at</i> <i>itz’at</i> <i>itz’a[a]t / itz’at</i>	n	“sage, wise man”
<i>ixik</i>	<b>IXIK-ki</b> <b>IXIK</b> <b>i-IXIK-ki?</b>	<i>ixik</i> <i>ixik</i> <i>ixik</i>	n	“woman, lady”
<i>ixim ~ ixim</i>	<b>i-xi-ma</b> <b>i-IXIM</b> <b>IXIM</b>	<i>ixim</i> <i>ixi[i]m</i> <i>ixi[i]m</i>	n	“maize”
<i>jaahch / jahch</i>	<b>ja-hi-chi</b> <b>ja-chi</b> <b>ja-cha</b>	<i>jaahch</i> <i>jaa[h]ch</i> <i>ja[h]ch</i>	n	‘incised object’ label attributed to carved objects especially those made of shell
<i>jaay / jay</i>	<b>ja-yi</b> <b>ja-ya</b>	<i>jaay</i> <i>jay</i>	n	“bowl”
<i>jalal</i>	<b>JALAL</b>	<i>jalal</i>	n	“reed”
<i>jan</i>	<b>ja-na</b> <b>JAN</b>	<i>jan</i> <i>jan</i>	n	refers to an unidentified type of raptorial bird
<i>janaab</i>	<b>ja-na-bi</b> <b>ja-NAB</b> <b>JANAB</b>	<i>janaab</i> <i>jana[a]b</i> <i>jana[a]b</i>	n	refers to an unidentified type of flower (?)
<i>jawte’ / jawante’</i>	<b>ja-wa-TE’</b> <b>ja-TE’</b>	<i>jawte’ / jawwa[n]te’</i> <i>ja[w]te’ / ja[wan]te’</i>	cn	“tripod plate/vessel” possibly stems from <i>jaw-</i> “agape” with an nominalizing suffix <i>-an</i> followed by a suffix <i>-te’</i>
<i>jinaaj?</i>	<b>JINAJ?-ji</b>	<i>jinaaj</i>	n	“seed, sprout”

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>jol, jool, jo'l</i>	<b>jo-lo</b> <b>JOL-lo</b> <b>JOL-li</b> <b>JOL-la</b> <b>JOL-le</b> <b>JOL</b>	<i>jol</i> <i>jol</i> <i>jool?</i> <i>jo'l</i> <i>jol-e</i> <i>jol</i>	n	"head, skull, cranium"
<i>joy</i>	<b>JOY</b> <b>JOY-ye-la</b>	<i>joy</i> <i>joy-el</i>	n	"debut, presentation"
<i>jub / ju'b</i>	<b>ju-bi</b> <b>ju-ba</b>	<i>juub</i> <i>ju'b?</i>	n	"conch, shell" possibly conch-shell trumpet
<i>juuhch</i>	<b>ju-chi</b> <b>ju-chu</b>	<i>juu[h]ch</i> <i>ju[h]ch</i>	n	"conch shell"
<i>jukuub</i>	<b>ju-ku-bi</b> <b>JUKUB</b>	<i>jukuub</i> <i>juku[u]b</i>	n	"canoe"
<i>juj</i>	see <i>huh</i>	---	---	---
<i>jul</i>	<b>ju-lu</b>	<i>jul</i>	n	"perforator, dart, spear"
<i>julbaak</i>	<b>ju-li-ba-ki</b> <b>ju-lu-BAK</b>	<i>juul-baak</i> <i>jul-ba[a]k</i>	cn	"perforator-bone"
<i>juntan / juntahn</i>	<b>1-ta-na</b> <b>1-TAN-na</b> <b>1-TAN</b>	<i>juntan / juntahn</i> <i>juntan / juntahn</i> <i>juntan / juntahn</i>	n	"cherished, beloved"
<i>ka' / cha' ?</i>	<b>KA' / CHA' ?</b>	<i>ka' / cha' ?</i>	n	"metate"
<i>kaab / kab</i>	<b>ka-bi</b> <b>ka-ba</b> <b>KAB</b>	<i>kab ~ kaab</i> <i>kab</i> <i>kab / ka[a]b</i>	n	"earth, land" with reference to the planetary body "earth" (♀)
<i>kabal</i>	<b>KAB-la</b>	<i>kab-[a]l</i>	adj	"earth-y" meant to be understood as "terrestrial, earthly"
<i>kabal pitziil</i>	<b>ka-ba-la pi-tzi-la</b>	<i>kab-al pitz-iil</i>	cn	lit. "earth-en ballgame- place" or "earth-y ballplay-er" see <i>pitziil</i> and note the example <i>luumil pitziil</i> with similar meaning
<i>kab ~ chab</i>	<b>KAB/CHAB-ba</b> <b>KAB/CHAB</b>	<i>kab ~ chab</i> <i>kab ~ chab</i>	n	"bee, beehive, honey" ( <i>kab</i> in Yucatecan and <i>chab</i> in Ch'olan context)
<i>kakaw</i>	<b>ka-ka-wa</b> <b><sup>2</sup>ka-wa</b> <b><sup>2</sup>ka-ka-wa</b> <b>ka-wa</b> <b>ka</b>	<i>kakaɁw</i> <i>kakaɁw</i> <i>kakaɁw</i> <i>ka[ka]Ɂw</i> <i>ka[kaw]</i>	n	"cacao"
<i>kakawal</i>	<b>ka-ka-wa-la</b> <b>ka-wa-la</b>	<i>kakaɁw-al</i> <i>ka[ka]Ɂw-[a]l</i>	adj	"cacaoey, cacao-like" meant to be understood as 'chocolatey'
<i>kaletuun</i>	<b>ka-le-TUN</b>	<i>kal-e-tuun</i>	cn	"stone-room" or "stone- effigy" (?)

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>kan</i>	<b>ka-na</b>	<i>kan</i>	n	1) "sky"
	<b>KAN-na</b>	<i>kan</i>		2) "serpent"
	<b>ka-KAN</b>	<i>kan</i>		3) "four"
	<b>KAN</b>	<i>kan</i>		
<i>ka'n / kan / kanan</i>	<b>KAN-nu</b> <b>KAN-na</b> <b>KAN</b>	<i>ka'n</i> <i>ka[']n / kan / kan[a]n</i> <i>ka[']n / kan / kan[an]</i>	n	"guardian" read "captor" see also <i>cha'n</i>
<i>kay</i>	see <i>chay</i>	---	---	---
<i>kayom</i>	<b>ka-yo-ma</b>	<i>kay-om</i>	n	"fisherman, fisher" from <i>kay-</i> "fish" plus an agentive suffix <i>-om</i> for "fish-er"
<i>kaywak</i>	<b>ka-ya-wa-ka</b>	<i>kaywak</i>	cn	term of unknown meaning that refers to celts and celt-shaped objects
<i>keej</i>	<b>ke-ji</b> <b>KEJ</b>	<i>keej</i> <i>ke[el]j / kej</i>	n	"deer" especially a reference to White-tailed Deer ( <i>Odolcoileus</i> <i>virginianus</i> ). Yucatec reflex of the Ch'olan term <i>chij</i>
<i>kelem</i>	<b>ke-le-ma</b> <b>ke-le</b> <b>ke-KEL(EM)?</b> <b>KEL(EM)?</b> <b>KEL(EM)?-ma</b>	<i>kelem</i> <i>kel[em]</i> <i>kel[em]</i> <i>kel[em]</i> <i>kelem</i>	adj / n	"strong" or perhaps more peripherically "youth, youngster"
<i>kimiil</i>	<b>ki-KIM-la</b>	<i>kim-iil</i>	n	"death" or more lit. "dead-place"
<i>kit / kiit</i>	<b>ki-ti</b> <b>ki-ta</b>	<i>kit</i> <i>kiit</i>	n	"father, patron"
<i>kiwi'</i>	<b>ki-WI'</b>	<i>kiwi'</i>	n	"achiote"
<i>kobal</i>	<b>ko-ba-la</b>	<i>kobal</i>	n	"atole" (?)
<i>koj / choj</i>	<b>ko</b> <b>KOJ? ~ CHOJ?</b> <b>KOJ?/CHOJ?-ji</b>	<i>kol[j]</i> <i>koj ~ choj</i> <i>koj ~ choj</i>	n	"puma, cougar, mountain lion" ( <i>Puma concolor</i> )
<i>ko'haw</i>	<b>ko-o-ha-wa</b> <b>ko-ha-wa</b> <b>KOHAW-wa</b>	<i>ko'haw</i> <i>kol[']haw / kohaw</i> <i>kol[']haw / kohaw</i>	n	"headdress, helmet" specifically shell-plated helmets introduced from Teotihuacan
<i>kokaaj</i>	<b>KOKAJ?</b> <b>KOKAJ?-ji</b>	<i>koka[a]j</i> <i>kokaaj</i>	n	"eagle" unspecified type
<i>kokan</i>	<b>KOKAN</b>	<i>kokan</i>	n	"stingray spine"
<i>kokom</i>	<b>ko-ko-ma</b>	<i>kok-om</i>	n	"auditor" (?)
<i>kohknom</i>	<b>ko-ko-no-ma</b>	<i>ko[h]k-n-om</i>	n	"guardian" used in specific reference to the guardian patron deities of ancient Copan



Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>kuch</i>	<b>ku-chu</b> <b>KUCH?</b>	<i>kuch</i> <i>kuch</i>	n	“load, burden” or when the term heads compound constructions: “implement that holds something”
<i>kuhkay?</i>	<b>KUHKAY?</b>	<i>kuhkay?</i>	n	“firefly”
<i>kun</i>	<b>ku-nu</b> <b>ku-nu-li</b>	<i>kun</i> <i>kun-[i]l</i>	n	“oven, stove” or possibly “kiln”; see <i>chitin</i>
<i>kutz</i>	<b>ku-tzu</b> <b>KUTZ</b>	<i>kutz</i> <i>kutz</i>	n	“turkey” specifically the Ocellated Turkey ( <i>Agriocharis ocellata</i> )
<i>kuy</i>	<b>ku-yu</b> <b>KUY</b>	<i>kuy</i> <i>kuy</i>	n	“owl” unspecified type of great owl, sometimes bearing affinity to horned owls
<i>k'ab</i>	<b>k'a-ba</b> <b>K'AB-ba</b> <b>K'AB</b>	<i>k'ab</i> <i>k'ab</i> <i>k'ab</i>	n	“hand” sometimes refers to “arm” in persons or “branch” in trees, by extension; inalienably possessed
<i>k'aba' ~ k'aaba'</i>	<b>k'a-ba</b> <b>K'ABA-ba-a</b> <b>K'ABA-a</b> <b>K'ABA-ba</b> <b>K'ABA</b>	<i>k'aba[']</i> <i>k'aba'</i> <i>k'aba'</i> <i>k'aba[']</i> <i>k'aba[']</i>	n	“name”
<i>k'ahk'</i>	<b>k'a-k'a</b> <b>²K'AK' / ²k'a</b> <b>K'AK'-k'a</b> <b>k'a-K'AK'</b> <b>K'AK'</b>	<i>k'a[h]k'</i> <i>k'a[h]k'</i> <i>k'a[h]k'</i> <i>k'a[h]k'</i> <i>k'a[h]k'</i>	n	“fire” ritual fire is at times inalienably possessed
<i>k'ahk'al</i>	<b>K'AK'-la</b>	<i>k'a[h]k'-al</i>	adj	lit. “fire-y, fire-like” or more broadly “fiery, igneous”
<i>k'ahk'nahb</i>	<b>K'AK'-NAB</b>	<i>k'a[h]k'-na[h]b</i>	cn	lit. “fire-pool” meant as “ocean, sea” or large bodies of salt water in general
<i>k'ahk'te'</i>	<b>K'AK'-TE'</b>	<i>k'a[h]k'-te'</i>	cn	name of an unidentified type of plant or tree
<i>k'aal</i>	<b>k'a-li</b> <b>k'a-le</b>	<i>k'aal</i> <i>k'al-e / k'a[a]l-e</i>	n	“room, enclosure”
<i>k'ahm</i>	<b>K'AN-na</b> <b>K'AN</b>	<i>k'a[h]n</i> <i>k'a[h]n</i>	n	“bench, seat, base” refers also to pedestals of stelae, hieroglyphic stairs and plane monuments in general

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>k'ante' / k'ahnte'</i>	<b>K'AN-TE'</b>	<i>k'an-te' / k'ahn-te'</i>	cn	1) name of an unidentified type of plant or tree 2) lit. "bench/seat-wood" refers to a 'seat' or 'bench' made of wood
<i>k'ahntun</i>	<b>K'AN-na-TUN-ni</b>	<i>k'a[h]n-tuun</i>	cn	lit. "bench/seat-stone" refers to a 'seat' or 'bench' made of stone. See also <i>k'ahn</i> for other meanings of the term
<i>k'an</i>	<b>K'AN-na</b> <b>K'AN</b>	<i>k'an</i> <i>k'an</i>	adj	1) "yellow" 2) "ripe"
<i>k'anjäl</i>				"yellowing"
<i>k'at</i>	<b>K'AT?</b>	<i>k'at</i>	n	lit. "clay, ceramic" possibly used in reference to ceramic vessels in general
<i>k'awiil ~ k'awil</i>	<b>K'a-wi-la</b> <b>K'AWIL-wi-la</b> <b>K'AWIL-la</b> <b>K'AWIL-li</b> <b>K'AWIL</b>	<i>k'awiil</i> <i>k'awiil</i> <i>k'awil</i> <i>k'awil</i> <i>k'awiil ~ k'awil</i>	n / theonym	K'awiil (name of deity)
<i>k'ay</i>	<b>ka-yo-</b> <b>K'AY</b>	<i>k'ay-</i> <i>k'ay</i>	n	"song"
<i>k'ayom</i>	<b>k'a-yo-ma</b> <b>K'AY</b>	<i>k'ay-om</i> <i>k'ay-[om]</i>	n	lit. "song-er" for "singer"
<i>k'ew /</i> <i>k'ewel ~ k'eweel</i>	<b>K'EW</b> <b>K'EW-we</b> <b>K'EW-we-la</b>	<i>k'ew</i> <i>k'ew / k'ewe[l]</i> <i>k'ewel ~ k'eweel</i>	n	"pelt"
<i>k'ihn</i>	<b>K'IN</b>	<i>k'i[h]n</i>	n	"heat, wrath"
<i>k'in</i>	<b>K'IN-ni</b> <b>K'IN</b>	<i>k'in</i> <i>k'in</i>	n	"sun, day"
<i>-k'inich</i>	<b>K'IN-ni-chi</b> <b>K'INICH</b>	<i>k'inich</i>	n	"sun" followed by an augmentative suffix -ich yielding lit. "Great Sun" or "Sun-ny" but to be understood as a referent to the solar deity God G otherwise known as <i>K'inich Ajaw</i> in nominal expressions
<i>k'inich-</i>	<b>K'IN-ni-chi</b> <b>K'INICH</b>	<i>k'inich</i>	adj	"sun" followed by an augmentative suffix -ich yielding lit. "Great Sun" or "Sun-ny" but to be understood as "resplendent" in titular expressions

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>k'inil</i>	<b>K'IN-ni-li</b> <b>K'IN-li</b>	<i>k'in-il</i> <i>k'in-[i]l</i>	n	"time"
<i>k'intun</i>	<b>K'IN-TUN-ni</b> <b>K'IN-TUN</b>	<i>k'in-tuun</i> <i>k'in-tuun</i>	cn	lit. "sun-stone" but to be understood as "dry season, drought"
<i>k'oj(baah)</i>	<b>ko-jo</b> <b>k'o-ba</b>	<i>koj</i> <i>k'o[j]-ba[ah]</i>	cn	lit. "mask-self" for "mask"
<i>k'o'b</i>	<b>k'o-ba</b>	<i>k'o'b</i>	n	"hearthstone" in mythological references refers to the one of the three primordial hearthstones
<i>k'uh</i>	<b>k'u-hu</b> <b>K'UH</b> <b>K'UH-li</b>	<i>k'uh</i> <i>k'uh</i> <i>k'uh-[uu]l</i>	n	"god"
<i>k'uhul / k'ujul / k'u'ul</i>	<b>k'u-hu-lu</b> <b>k'u-ju-lu</b> <b>K'UH-HUL</b> <b>K'UH-JUL-lu</b> <b>K'UH-JUL</b> <b>K'U'-u-lu</b>	<i>k'uh-ul</i> <i>k'uj-ul</i> <i>k'uh-ul</i> <i>k'uh-ul / k'uj-ul</i> <i>k'uh-ul / k'uj-ul</i> <i>k'u'-ul</i>	adj	lit. "god-like" to be understood as "godly, divine"
<i>k'uk'</i>	<b>k'u-k'u</b> <b><sup>2</sup>k'u</b> <b>K'UK'</b>	<i>k'uk'</i> <i>k'uk'</i> <i>k'uk'</i>	n	"quetzal" specifically the male Resplendent Quetzal ( <i>Pharomachrus mocinno</i> )
<i>k'uk'um</i>	<b>K'UK'-ma</b> <b>k'u-K'UK'UM</b>	<i>k'uk'[u]m</i> <i>k'uk'um</i>	n	"feather, plumage"
<i>k'uuch</i>	<b>k'u-chi</b>	<i>k'uuch</i>	n	"vulture"
<i>k'uuhutz</i>	<b>K'UH-tzi</b>	<i>k'uuhutz</i>	n	"tobacco"
<i>lak / laak</i>	<b>la-ka</b> <b>LAK?</b> <b>la-ki</b>	<i>lak</i> <i>lak</i> <i>laak</i>	n	"plate, dish" or flat and plane objects in general such as ceramic bricks or even carved bone plaques
<i>lakam</i>	<b>la-ka-ma</b> <b>la-LAKAM-ma</b> <b>LAKAM-ma</b> <b>LAKAM</b>	<i>lakam</i> <i>lakam</i> <i>lakam</i> <i>lakam</i>	n / adj	"banner" / "great" Also as a military and administrative rank/title
<i>lakamtuun</i>	<b>la-ka-ma-TUN-ni</b> <b>LAKAM-ma-TUN-ni</b> <b>LAKAM-TUN-ni</b> <b>LAKAM-TUN</b> <b>LAKAM[TUN]</b>	<i>lakam-tuun</i> <i>lakam-tuun</i> <i>lakam-tuun</i> <i>lakam-tu[u]n</i> <i>lakam-tu[u]n</i>	cn	lit. "banner-stone" or "great-stone" but refers specifically to "stela", or carved erect stone monoliths
<i>lak'in</i>	<b>la-K'IN-ni</b> <b>la-K'IN</b>	<i>lak'in</i> <i>lak'in</i>	n	"east" – cardinal direction; used in the Postclassic period in Yucatan; replaced <i>ochk'in</i> of the Classic period
<i>laatz</i>	<b>la-tzi</b>	<i>laatz</i>	n	"stack, pile"

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>le'</i>	<b>le-e</b> <b>le</b>	<i>le'</i> <i>le[']</i>	n	"noose, lasso"
<i>le'k</i>	<b>le-ku</b>	<i>le'k</i>	n	"calabash" (?)
<i>luk'</i>	<b>lu-k'u</b>	<i>luk'</i>	n	"mud, plaster, stucco"
<i>luum / lu'm</i>	<b>lu-mi</b> <b>lu-ma</b>	<i>luum</i> <i>lu'm</i>	n	"earth, soil"
<i>luumil pitziiil</i>	<b>lu-mi-li pi-tzi-la</b>	<i>luum-[i]l pitz-iil</i>	cn	lit. "earth-en ballgame-place" or "earth-y ballplay-er" see <i>pitziiil</i> and note the example <i>kabal pitziiil</i> with similar meaning
<i>maak</i>	<b>ma-ki</b>	<i>maak</i>	n	"person" Eastern Ch'olan or Yucatecan version of the more common lexical item <i>winik</i>
<i>maax</i>	<b>ma-xi</b> <b>MAX</b>	<i>maax</i> <i>ma[a]x / max</i>	n	"spider monkey" specifically the Central American Spider Monkey ( <i>Ateles geoffroyi</i> )
<i>mam</i>	<b>ma-ma</b> <b>MAM-ma</b> <b>MAM</b>	<i>mam</i> <i>mam</i> <i>mam</i>	n	"maternal grandfather" specifically or "ancestor, venerated elder" generally
<i>ma's</i>	<b>ma-su</b>	<i>ma's</i>	n	"dwarf, goblin"
<i>mat</i>	<b>ma-ta</b> <b>ma-MAT</b> <b>MAT</b>	<i>mat</i> <i>mat</i> <i>mat</i>	n	"cormorant"
<i>ma[h]tan</i>	<b>ma-ta-na</b> <b>ma-ta</b>	<i>ma[h]tan</i> <i>ma[h]ta[n]</i>	n	"present, offering of grace, privilege"
<i>matz</i>	<b>ma-tza</b>	<i>matz</i>	n	"sage, wiseman, learned person"
<i>may</i>	<b>ma-ya</b> <b>MAY?-ya</b> <b>MAY?</b>	<i>may</i> <i>may</i> <i>may</i>	n	1) "deer" specifically the Red Brocket Deer ( <i>Mazama americana</i> ), "deer hoof" 2) "gift, donation, offering" 3) "tobacco" especially the kind that is prepared as a viscous paste and snuffed
<i>mayuy</i>	<b>ma-yu-yu</b> <b>ma-yu</b>	<i>mayuy</i> <i>mayu[y]</i>	n	"mist, fog"
<i>mijiin ?</i>	<b>MIJIN?-na</b>	<i>mijiin ?</i>	n	"child (of father)"
<i>mim</i>	<b>mi-mi</b>	<i>mim</i>	n	"paternal grandmother, maternal great-grandmother"

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>miyaatz</i>	<b>mi-ya-tzi</b>	<i>miyaatz</i>	n / adj	“sage, wiseman, learned person” or “sage, wise, learned”
<i>mo’</i>	<b>mo-o-o</b> <b>mo-o</b> <b>MO’-o</b> <b>MO’</b>	<i>moo’ / mo’</i> <i>mo’</i> <i>mo’</i> <i>mo’</i>	n	“macaw” specifically the Scarlet Macaw ( <i>Ara Macao</i> )
<i>muknal</i>	<b>[MUK]NAL</b>	<i>muk-nal</i>	cn	lit. “bury-place” referring to “burial, tomb, sepulcher”
<i>mukuuy</i>	<b>mu-ku-yi</b>	<i>mukuuy</i>	n	“dove, pigeon”
<i>mut</i>	<b>MUT-tu</b> <b>mu-MUT</b> <b>MUT</b>	<i>mut</i> <i>mut</i> <i>mut</i>	n	lit. “braid, bundle” but apparently is meant to refer to a reed effigy of a crocodile
<i>mu’k</i>	<b>mu-ka</b>	<i>mu’k</i>	n	“omen” see also <i>muut</i>
<i>muut</i>	<b>mu-ti</b> <b>MUT-ti</b>	<i>muut</i> <i>muut</i>	n	1) “bird” 2) “omen”
<i>muwaan</i>	<b>mu-wa-ni</b> <b>MUWAN-ni</b> <b>MUWAN-na</b> <b>MUWAN</b>	<i>muwaan</i> <i>muwaan</i> <i>muwan</i> <i>muwa[a]n / muwan</i>	n	possibly “sparrow-hawk” or “screech-owl” but in most cases appears to refer to a supernatural bird of prey
<i>muyal / muyaal</i>	<b>MUYAL-ya-la</b> <b>mu-MUYAL-la</b> <b>MUYAL-la</b> <b>MUYAL</b> <b>MUYAL-li</b>	<i>muyal</i> <i>muyal</i> <i>muyal</i> <i>muyal / muya[a]l</i> <i>muyaal</i>	n	“cloud”
<i>na’</i>	<b>na</b>	<i>na[’]</i>	n	“lady, mother”
<i>naah</i>	<b>NAH-hi</b> <b>NAH-hi-la</b> <b>NAH</b>	<i>naah</i> <i>naah-[ii]</i> <i>na[a]h / nah</i>	n	“house, structure, building”
<i>nah</i>	<b>NAH</b>	<i>nah ~ naah</i>	adj	“first”
<i>nahb</i>	<b>na-ba</b> <b>NAB-ba</b> <b>NAB</b>	<i>na[h]b</i> <i>na[h]b</i> <i>na[h]b</i>	n	“handspan” used for counting dimensions – particularly the circumference of rubber balls used in the ballgame
<i>nahb</i>	<b>na-bi</b> <b>NAB-bi</b>	<i>na[h]b</i> <i>na[h]b</i>	n	“waterlily” and by extension “pool, lake” in particular and bodies of freshwater in general
<i>nal</i>	<b>na-la</b> <b>NAL-la</b> <b>na-NAL</b> <b>NAL</b>	<i>nal</i> <i>nal</i> <i>nal</i> <i>nal</i>	n	1) lit. “young maize” 2) “north” – cardinal direction; see also <i>xaman</i> 3) locative suffix <i>-nal</i> for “place”

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>naal</i>	<b>na-li</b> NAL	<i>naal</i> <i>na[a]l</i>	n	“native” or person native from a particular area
<i>ne' / neh</i>	<b>NE' / NEH</b>	<i>ne' / neh</i>	n	“tail”
<i>nehn ~ ne'hn</i>	<b>ne-na</b> <b>NE'?-na</b> <b>NEN-na</b>	<i>ne[h]n ~ ne'[h]n</i> <i>ne[h]n ~ ne'[h]n</i> <i>ne[h]n ~ ne'[h]n</i>	n	“mirror” particularly mirror made of iron pyrite or hematite mosaic on slate or wooden backings
<i>nik</i>	<b>NIK?-ki</b> <b>ni-NIK?</b> <b>NIK?</b>	<i>nik</i> <i>nik</i> <i>nik</i>	n	refers to an unidentified type of flower
<i>nikte'</i>	<b>NIK-TE'</b>	<i>nikte'</i>	cn	“mayflower (plumeria)”
<i>noh</i>	<b>NOH?</b>	<i>noh</i>	adj	“great, big”
<i>nohol</i>	<b>no-NOH?-la</b> <b>no-NOH?-lo</b>	<i>nohol</i> <i>nohol</i>	n	“south” – cardinal direction
<i>nuhkul</i>	<b>nu-ku</b>	<i>nu[h]ku[l]</i>	n	lit. “skin, hide” but used in particular to refer to the plaster coating of a building
<i>nu'n</i>	<b>nu-na</b> <b>NUN?</b>	<i>nu'n</i> <i>nu[']n</i>	n	“intermediary, ritual speaker” or refers to someone who “speaks brokenly” (?)
<i>nupul</i>	<b>nu-pu-lu</b>	<i>nupul</i>	adj	familiar?
<i>ochk'in</i>	<b>OCH-K'IN-ni</b> <b>OCH-K'IN</b>	<i>ochk'in</i> <i>ochk'in</i>	n	“west” – cardinal direction; used in the Classic period in the Lowlands; replaced by <i>chik'in</i> in the Postclassic
<i>ook / ok</i>	<b>yo-ko</b> <b>OK-ko</b> <b>OK-ki</b> <b>yo-OK-ki</b>	<i>y-ok</i> <i>ok</i> <i>ook</i> <i>y-ook</i>	n	“dog” but by rebus principle commonly “foot” and by extension “base” or “footing” for inanimate objects in general
<i>okib / ookib</i>	<b>o-ki-bi</b> <b>yo-ki-bi</b> <b>yo-ki-bi-li</b>	<i>ok-ib / ook-[i]b</i> <i>y-ok-ib / y-ook-[i]b</i> <i>y-ok-ib-il / y-ook-[i]b-[i]l</i>	n	lit. “foot-thing” for “pedestal, base” in general and “bench, altar, throne” in particular
<i>ohl</i>	<b>o-la</b> <b>OL-la</b> <b>OL</b> <b>o-la-si</b> <b>o-OL-si</b> <b>OL-si</b>	<i>o[h]l</i> <i>o[h]l</i> <i>o[h]l</i> <i>o[h]l-[i]s</i> <i>o[h]l-[i]s</i> <i>o[h]l-[i]s</i>	n	“heart” inalienably possessed
<i>olom</i>	<b>o-lo-mo</b>	<i>olom</i>	n	“blood, lineage”
<i>o'n</i>	<b>o-na</b>	<i>o'n</i>	adj	“many, much”

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>otoch</i>	<b>yo-to-che</b>	<i>y-otoch-e</i>	n	“house (home, dwelling)”
<i>otoot</i>	<b>o-to-ti</b> <b>yo-to-ti</b> <b>yo-OTOT</b> <b>OTOT-ti</b> <b>OTOT</b>	<i>otoot</i> <i>y-otoot</i> <i>y-otot / y-oto[o]t</i> <i>otoot</i> <i>otot / oto[o]t</i>	n	“house (home, dwelling)”
<i>pa'</i>	<b>pa-a</b> <b>PA'</b> <b>pa</b>	<i>pa'</i> <i>pa'</i> <i>pa[']</i>	n	“ravine, canyon, cleft”
<i>pa'al</i>	<b>pa-a-la</b>	<i>pa'[a]l</i>	n	“lagoon”
<i>paach / pach</i>	<b>pa-chi</b> <b>PACH?-cha</b>	<i>paach</i> <i>pach</i>	n	“back”
<i>paat / pat</i>	<b>pa-ti</b> <b>PAT?</b>	<i>paat</i> <i>pat / pa[a]t</i>	n	“back”
<i>paat pihk</i>	<b>pa-ti pi-ku</b>	<i>paat piik</i>	cn	“backrack”
<i>pakab tuun</i>	<b>pa-ka-ba TUN-ni</b>	<i>pak-ab tuun</i>	n	lit. “face-down-thing stone” or “turned-over-thing stone” refers specifically to “stone lintel”
<i>pakal</i>	<b>pa-ka-la</b> <b>PAKAL-la</b> <b>PAKAL</b>	<i>pakal</i> <i>pakal</i> <i>pakal</i>	n	“shield”
<i>pasil</i>	<b>pa-si-li</b>	<i>pasil</i>	n	“opening, doorway, door”
<i>patah</i>	<b>pa-ta-ha</b> <b>pa-ta</b>	<i>patah</i> <i>pata[h]2</i>	n	“guava” ( <i>Psidium</i> spp.)
<i>patan</i>	<b>pa-ta</b>	<i>pata[n]</i>	n	“tribute, service”
<i>payaal</i>	<b>pa-ya-li</b>	<i>payaal</i>	n	“guide, leader”
<i>pet</i>	<b>PET</b> <b>PET-te</b>	<i>pet</i> <i>pet</i>	adj	“round”
<i>peten</i>	<b>PET-ne</b>	<i>pet[e]n</i>	n	“island”
<i>pibnaah</i>	<b>pi-bi-NAH</b> <b>pi-bi-NAH-li</b>	<i>pib-naah</i> <i>pib-naah-il</i>	cn	lit. “oven-house” refers specifically to “sweatbaths”
<i>pik</i>	<b>pi-ki</b> <b>PIK-ki</b> <b>PIK</b>	<i>pik</i> <i>pik</i> <i>pik</i>	n	“skirt, garment” also refers to the garments or vestments of deity effigies at Palenque
<i>piit ?</i>	<b>PIT?</b> <b>PIT?-ta</b>	<i>pi[i]t ?</i> <i>piit ?</i>	n	“litter” ?
<i>pitz</i>	<b>pi-tzi</b>	<i>pitz</i>	n	“ballgame” also serves as the noun root (subsequent verbalisation) for “to play the ballgame”

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>pitzzil / pitzil</i>	<b>pi-tzi-la</b> <b>pi-tzi-li</b>	<i>pitz-iil</i> <i>pitz-[i]l</i>	n / adj	lit. “ballgame” followed by locative suffix <i>-iil</i> for “ballcourt” or adjective “ballplaying” with abstractive suffix <i>-il</i>
<i>pixom</i>	<b>pi-xo-ma</b>	<i>pix-om</i>	n	“headdress, helmet”
<i>pokol</i>	<b>po-ko-lo</b>	<i>pok-ol</i>	n	“washing implement” specifically ceramic ‘quill-rinsing’ bowl
<i>pom</i>	<b>po-mo</b>	<i>pom</i>	n	“incense” broadly “copal” specifically
<i>poHP</i>	<b>po-po</b>	<i>po[h]p</i>	n	“mat” especially woven mats made from palm leaves and other fibers
<i>puj</i>	<b>pu</b>	<i>pu[j]</i>	n	“cattail reed, bullrush”
<i>polaw ~ pulaw ?</i>	<b>POLAW ~ PULAW</b> <b>POLAW-wa ~</b> <b>PULAW-wa</b>	<i>polaw ~ pulaw ?</i> <i>polaw ~ pulaw ?</i>	n	“sea, body of water”
<i>puutz’</i>	<b>pu-tz’i</b> <b>[pu]tz’i</b> <b>pu</b>	<i>puutz’</i> <i>puutz’</i> <i>pu[utz’]</i>	n	“weaving needle, weaving pin” made of bone; note examples of <i>puutz’ baak</i> for “bone needle”
<i>puw / pu’w?</i>	<b>pu-wa</b>	<i>puw / pu[’]w?</i>	n	“blowgun”
<i>sa’</i>	<b>SA’</b>	<i>sa’</i>	n	“atole, maize gruel”
<i>sabak ~ sibik</i>	<b>sa-ba-ka</b> <b>SABAK ~ SIBIK?</b>	<i>sabak</i> <i>sabak ~ sibik</i>	n	“ink, soot, charcoal” see also <i>abak</i>
<i>sajal</i>	<b>sa-ja-la</b> <b>sa-ja</b>	<i>sajal</i> <i>saja[l]</i>	n	title of unknown meaning
<i>sak</i>	<b>SAK</b> <b>SAK-ki</b> <b>sa-ku</b>	<i>sak</i> <i>saak</i> <i>sa’k ?</i>	adj	“white, pure”
<i>sakal</i>				“whitish, white-like”
<i>sakjal</i>				“whitening”
<i>saklaktuun</i>	<b>SAK-la-ka-TUN-ni</b> <b>SAK-LAK-TUN-ni</b> <b>SAK-LAK-TUN</b>	<i>sak-lak-tuun</i> <i>sak-lak-tuun</i> <i>sak-lak-tu[u]n</i>	cn	lit. “white-plate-stone” or “artificial-plate-stone” refers specifically to a type of stone censer at Copan
<i>sakun</i>	<b>sa-ku-na</b> <b>sa-ku</b>	<i>sakun</i> <i>saku[n]</i>	n	“older brother” see <i>suku’n</i>
<i>sas</i>	<b>sa-sa</b>	<i>sas</i>	n	“stucco, plaster”
<i>sakkab</i>	<b>SAK-KAB-ba</b>	<i>sak-kab</i>	cn	lit. “white-earth” refers to “marl” or “caliche” otherwise known by its Colonial Yucatec reflex <i>saskab</i>



Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>sa'y</i>	<b>sa-yu</b>	<i>sa'y</i>	n	"ant" unspecified type
<i>sayhun</i>	<b>sa-ya-HUN</b>	<i>say-hu[']n</i>	cn	lit. "book-exterior" or more loosely "book covers"
<i>sibik</i>	---	---	---	see <i>abak</i> and <i>sabak</i>
<i>sih</i>	<b>si-hi-ja</b> <b>si-hi</b>	<i>sih[a]j</i> <i>sih ~ sihi[']?</i>	n	1) "gift" 2) offering?
<i>sihom ~ sijom</i>	<b>SIH/SIJ?-ma</b> <b>SIH/SIJ?</b>	<i>sih-[o]m ~ sij-[o]m</i> <i>sih-[om] ~ sij-[om]</i>	n	type of unspecified flower that comes in shades of white, red, yellow and blue-green
<i>sinan</i>	<b>si-na-na</b>	<i>sinan</i>	n	"scorpion"
<i>sitz'</i>	<b>si-tz'i</b>	<i>sitz'</i>	n	"appetite"
<i>suk'in</i>	<b>su-K'IN-ni</b> <b>su-K'IN</b>	<i>suk'in</i> <i>suk'in</i>	n	"lack, deprivation"
<i>suhuy</i>	<b>su-hu-yu</b>	<i>suhuy</i>	adj	"pure, virginal"
<i>sukun</i>	<b>su-ku-na</b> <b>su-ku</b>	<i>sukun</i> <i>suku[n]</i>	n	"older brother" see <i>saku'n</i>
<i>suutz'</i>	<b>su-tz'i</b> <b>SUTZ'-tz'i</b> <b>SUTZ'</b>	<i>suutz'</i> <i>suutz'</i> <i>su[u]tz'</i>	n	"bat" type unspecified
<i>taaj</i>	<b>ta-ji</b>	<i>taaj</i>	n	"obsidian" and implements made of the material
<i>tahn</i>	<b>ta-na</b> <b>TAN-na</b> <b>TAN</b>	<i>ta[h]n</i> <i>ta[h]n</i> <i>ta[h]n</i>	n	1) "within, in the middle" possibly also "in front of" locative preposition 2) "chest" or front medial portion of the body
<i>taj</i>	<b>ta-ja</b> <b>TAJ</b>	<i>taj</i> <i>taj</i>	n	"pine, torch" especially Caribbean Pine also known as <i>Ocote</i> and torches made thereof
<i>tajal</i>	<b>TAJ-la</b>	<i>taj[a]l</i>	adj	lit. "torch-y, torch-like"
<i>tak</i>	<b>TAK</b>	<i>tak</i>	adj	"dry" Used also for plural marker -taak
<i>tahn lamaw</i>	<b>TAN-na-LAM-wa</b> <b>TAN-na-LAM</b> <b>[TAN]LAM-wa</b> <b>[TAN]LAM</b>	<i>ta[h]n lam[a]w</i> <i>ta[h]n lam[aw]</i> <i>ta[h]n lam[a]w</i> <i>ta[h]n lam[aw]</i>	cn	lit. "middle-diminished" for 'half-elapsed' in reference to a calendrical station to ten <i>haab</i> or "tun" evenly (out of twenty)
<i>tat</i>	<b>ta-ta</b>	<i>tat</i>	adj	"thick, fat"
<i>te'</i>	<b>te-e</b> <b>TE'</b>	<i>te'</i> <i>te'</i>	n	"wood, tree" also serves to designate plants in general

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<i>te'el</i>	<b>TE'-e-le</b> <b>TE'-le</b>	<i>te'el</i> <i>te'[e]l</i>	n	lit. "of the tree" or "of the wood" term for "forest, woods"
<i>tem / temul</i>	<b>te-me</b> <b>te-mu</b> <b>te-ma</b>	<i>tem</i> <i>tem / tem-u[l]</i> <i>tem / tem-a[l]</i>	n	"bench" and by extension "throne"
<i>ti'</i>	<b>ti-i</b> <b>TI'</b>	<i>ti'</i> <i>ti'</i>	n	1) "mouth, lips" 2) "opening, orifice, door" 3) "edge, rim"
<i>til</i>	<b>ti-li</b> <b>TIL-li</b> <b>TIL</b>	<i>til</i> <i>til</i> <i>til</i>	n	"tapir" specifically Baird's Tapir ( <i>Tapirus bairdii</i> )
<i>tojol / tojool</i>	<b>to-jo-la</b> <b>to-jo-li</b>	<i>tojol</i> <i>tojool</i>	n	"tribute, payment"
<i>tokal</i>	<b>to-ka-la</b>	<i>tokal</i>	n	"cloud"
<i>to'k' / too'k' / tok'</i>	<b>to-k'a</b> <b>to-k'o</b> <b>TOK'-k'o</b> <b>to-TOK'</b> <b>TOK'</b>	<i>to'[o]k'</i> <i>tok'</i> <i>tok'</i> <i>tok'</i> <i>tok' / to'[o]k'</i>	n	"chert, flint" and implements made of this material
<i>tukun</i>	<b>tu-ku-nu</b>	<i>tukun</i>	n	"dove, pigeon"
<i>tuun / tun</i>	<b>tu-TUN-ni</b> <b>TUN-ni</b> <b>TUN</b> <b>tu-TUN</b>	<i>tuun</i> <i>tuun</i> <i>tu[u]n / tun</i> <i>tun</i>	n	1) "stone" esp. <i>tuun</i> 2) "year (of 360 days)" esp. <i>tun</i>
<i>tunich</i>	<b>TUN-ni-chi</b>	<i>tun-ich</i>	n	"stone" here with an augmentative suffix <i>-ich</i>
<i>tup / tuup / tu'up?</i>	<b>tu-pa</b> <b>tu-pa-ja</b> <b>tu-pi</b> <b>TUP</b>	<i>tup / tu'[u]p</i> <i>tup-aj / tu'[u]p-[a]j</i> <i>tup / tuup</i> <i>tup / tu[u]p / tu'[u]p</i>	n	"earspool, earflare" ear jewelry and adornments in general
<i>t'ul ~ t'uhl</i>	<b>t'u-lu</b> <b>T'UL?</b>	<i>t'ul ~ t'uhl</i> <i>t'ul ~ t'uhl</i>	n	"rabbit, jackrabbit, hare" unspecified type
<i>tzijil / tzih</i>	<b>tzi-ji-li</b> <b>tzi-ji</b> <b>tzi-hi</b>	<i>tzij-il</i> <i>tzij</i> <i>tzih</i>	adj	"fresh, new"
<i>tzu'</i>	<b>tzu</b> <b>TZU</b>	<i>tzu[']</i> <i>tzu'</i>	n	"gourd, calabash" unspecified type but most comparable to bottle gourd
<i>tzuk</i>	<b>tzu-ku</b> <b>tzu[ku]</b> <b>TZUK?</b>	<i>tzuk</i> <i>tzuk</i> <i>tzuk</i>	n	"part, partition, province"
<i>tzul</i>	<b>tzu-lu</b>	<i>tzul</i>	n	"dog" ( <i>Canis familiaris</i> )
<i>tz'am</i>	<b>tz'a-ma</b> <b>TZ'AM?</b> <b>TZ'AM?-ma</b>	<i>tz'am</i> <i>tz'am</i> <i>tz'am</i>	n	"throne, seat"

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<i>tz'i'</i>	<b>tz'i-i</b> <b>TZ'I-i</b> <b>TZ'I'</b>	<i>tz'i'</i> <i>tz'i'</i> <i>tz'i'</i>	n	"dog" ( <i>Canis familiaris</i> )
<i>tz'i'hk</i>	<b>tz'i-ku</b>	<i>tz'i[h]k</i>	n	"clay" and objects made from this material
<i>tz'ihb</i>	<b>tz'i-bi</b> <b>TZ'IB</b>	<i>tz'i[h]b</i>	n	"writing, painting"
<i>tz'ihbaal /</i> <i>tz'ihbal</i>	<b>tz'i-ba-li</b> <b>tz'i-ba-la</b>	<i>tz'i[h]b-aal</i> <i>tz'i[h]b-al</i>	n	"drawing, colour, decoration, embellishment"
<i>tz'ikin</i>	<b>TZ'IKIN</b>	<i>tz'ikin</i>	n	"eagle" type unspecified
<i>tz'unun</i>	<b>tz'u-nu-nu</b> <b>tz'u-<sup>2</sup>nu</b> <b>tz'u-nu</b> <b>TZ'UNUN-nu</b> <b>TZ'UNUN</b>	<i>tz'unun</i> <i>tz'unun</i> <i>tz'unu[n]</i> <i>tz'unun</i> <i>tz'unun</i>	n	"hummingbird" type unspecified
<i>tz'uutz'</i>	<b>tz'u-tz'i</b>	<i>tz'uutz'</i>	n	"coati" specifically the White-nosed Coati ( <i>Nasua narica</i> )
<i>u' / uh / uj / uw</i>	<b>U' / UH / UJ / UW</b>	<i>u' / uh / uj / uw</i>	n	"moon"
<i>uch</i>	<b>u-chu</b>	<i>uch</i>		"opossum" ( <i>Didelphidae</i> spp.)
<i>u'ch' / uch'</i>	<b>yu-ch'a</b>	<i>y-u'ch' / y-uch'-</i>	n	"(head) louse"
<i>u'h / uh</i>	<b>yu-ha</b> <b>u-ha-ja</b> <b>yu-UH-li</b> <b>yu-la-li</b>	<i>y-u'h / y-uh-a[l]</i> <i>u'h-[a]j / uh-aj</i> <i>y-u[h]-[i]l / y-uh-[i]l</i> <i>y-u[h]-[a]l-[i]l</i>	n	"bead, collar, necklace, jewellery"
<i>uku'm / ukum</i>	<b>u-ku-ma</b>	<i>uku'm / ukum</i>	n	"dove, pigeon" type unspecified though prefixed by the color <i>yax</i> "green" which may suggest a Pale-vented Pigeon ( <i>Columba cayennensis</i> )
<i>uk'ib ~ uch'ib</i>	<b>u-k'i-bi</b> <b>yu-k'i-bi</b> <b>yu-k'i-ba</b>	<i>uk'uch'-ib</i> <i>y-uk'uch'-ib</i> <i>y-uk'uch'-iib /</i> <i>y-uk'uch'-[a]b</i>	n	lit. "drink-thing" meant to be understood as "drinking-implement" or "pitcher"
<i>ul~ uul</i>	<b>u-lu</b>	<i>ul ~ uul</i>	n	"atole, maize gruel"
<i>ulum</i>	<b>u-lu-mu</b>	<i>ulum</i>	n	"turkey" especially the Ocellated Turkey ( <i>Agriocharis ocellata</i> )
<i>uun</i>	<b>u-ni</b> <b>UN-ni</b> <b>UN</b>	<i>uun</i> <i>uun</i> <i>u[u]n / un</i>	n	"avocado"
<i>unen</i>	<b>yu-<sup>2</sup>ne</b> <b>yu-ne</b> <b>u-ne</b>	<i>y-unen</i> <i>y-une[n]</i> <i>une[n]</i>	n	"child (of father)"

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<i>usij</i>	<b>u-si</b> <b>u-si-ja</b> <b>u-su</b> <b>USIJ</b>	<i>usi[ij]</i> <i>usij</i> <i>us?</i> <i>usi[ij]</i>	n	“vulture” type unspecified though prefixed by the colour <i>k’an</i> “yellow” as “yellow vulture” which may relate to King Vultures ( <i>Sarcoramphus papa</i> )
<i>ut</i>	<b>yu-ta-la</b> <b>yu-TAL</b> <b>yu-ta</b>	<i>y-ut-al</i> <i>y-ut-al</i> <i>y-ut-</i>	n	“fruit, food”
<i>uut / ut</i>	<b>u-ti</b> <b>UT-ti</b> <b>UT</b>	<i>uut</i> <i>uut</i> <i>u[u]t / ut</i>	n	“face, visage” see also <i>hut</i> ; inalienably possessed
<i>utz</i>	<b>yu-tzi</b>	<i>y-utz</i>	adj	“good”
<i>utzil</i>	<b>u-tzi-li</b> <b>yu-tzi-li</b>	<i>utz-il</i> <i>y-utz-il</i>	n / adj	“good, goodness”
<i>uxul</i>	<b>u-xu-lu</b> <b>yu-xu-lu</b> <b>yu-xu-li</b> <b>yu-xu-lu-li</b>	<i>uxul</i> <i>y-uxul</i> <i>y-uxuul</i> <i>y-uxul-[i]l</i>	n	“carving, sculpture”
<i>waaj</i>	<b>wa-WAJ-ji</b> <b>WAJ-ji</b> <b>wa-WAJ</b> <b>WAJ</b>	<i>waaj</i> <i>waaj</i> <i>wa[a]j / waj</i> <i>wa[a]j / waj</i>	n	“tamale, bread, maize dough” and foodstuffs produced from this dough
<i>wak</i>	<b>WAK</b> <b>WAK[ka]?</b> <b>wa-ka</b>	<i>wak</i> <i>wak</i> <i>wak</i>	n	“centipede” ?
<i>waw</i>	<b>WAW</b>	<i>waw</i>	n	“fresh water turtle” ( <i>Kinosternidae</i> spp.?)
<i>way / wahy?</i>	<b>wa-ya</b> <b>wa-WAY-ya</b> <b>WAY-wa-ya</b> <b>WAY</b>	<i>way / wahy?</i> <i>way / wahy?</i> <i>way / wahy? / wayway?</i> <i>way / wahy?</i>	n	“nawal, co-essence, alter ego” inalienably possessed
<i>way</i>	<b>WAY-ya</b> <b>WAY</b>	<i>way</i> <i>way</i>	n	“cenote”, represents the pincers of an underworld centipede and denotes the surface of the watery underworld; used also to refer to “room”
<i>way</i>	<b>WAY-ya</b> <b>WAY</b>	<i>way</i> <i>way</i>	n	? ( <i>way-haab</i> : reference to the Wayeb at the end of the year)
<i>wayil</i>	<b>WAY-ya-li</b> <b>WAY-li</b>	<i>way-[i]l</i> <i>way-[i]l</i>	n	“room, enclosure”
<i>wayib / wayab</i>	<b>WAY-bi</b> <b>WAY[bi]</b> <b>wa-ya-ba</b>	<i>way-[i]b</i> <i>way-[i]b</i> <i>way-ab</i>	n	lit. “sleep-thing” reference to “dormitories” or a “sleeping quarters” or a domicile

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>we'em</i>	<b>WE'-ma</b>	<i>we'-[e]m</i>	n	lit. "eat" closed off by an agentive suffix <i>-em</i> for "eater"; or more freely an "eating utensil" designation used for a ceramic serving vessel
<i>we'ib</i>	<b>WE'-i-bi</b>	<i>we'-ib</i>	n	lit. "eat-thing" or more freely an "eating utensil"; designation used for a ceramic serving vessel
<i>wi'</i>	<b>WI'</b> <b>wi</b>	<i>wi'</i> <i>wi'</i>	n	"root, tuber" Used also in <i>wi'[il]</i> "last", <i>wi'[alj]</i> "to be nourished", and <i>wi'naal</i> "hunger, famine"
<i>winak</i>	<b>wi-na-ke</b>	<i>winak-</i>	n	"man, person, human" see also <i>maak</i> and <i>winik</i>
<i>winik</i>	<b>wi-ni-ki</b> <b>wi-WINIK-ki</b> <b>WINIK-ki</b> <b>wi-WINIK</b> <b>WINIK</b>	<i>winik</i> <i>winik</i> <i>winik</i> <i>winik</i> <i>winik</i>	n	"man, person, human" see also <i>maak</i> and <i>winak</i>
<i>witz</i>	<b>wi-tzi</b> <b>wi-WITZ</b> <b>WITZ</b>	<i>witz</i> <i>witz</i> <i>witz</i>	n	"mountain, hill"
<i>witz'</i>	<b>WITZ'</b> <b>wi-WITZ'</b>	<i>witz'</i>	n	Witz' (theonym of an aquatic monster); Lit. "sprinkled water"
<i>woj / wooj / wo'j</i>	<b>wo-jo</b> <b>wo-jo-li</b> <b>wo-jo-le</b> <b>wo-hi</b> <b>wo-o-ja</b> <b>wo-ja</b>	<i>woj</i> <i>woj-[i]l</i> <i>woj-[e]l</i> <i>wooj</i> <i>woj / wo'j</i> <i>woj / wo'j</i>	n	"glyph, character" could be extended to "sign" and "grapheme"
<i>wol</i>	<b>WOL</b>	<i>wo[o]l</i>	n	"ball"
<i>xaman</i>	<b>xa-ma-MAN-na</b> <b>xa-MAN-na</b> <b>xa-MAN</b>	<i>xaman</i> <i>xaman</i> <i>xaman</i>	n	"north" – cardinal direction; used in the Classic period in the Lowlands; replaced by <i>nal</i> in the Postclassic
<i>xib</i>	<b>xi-bi</b> <b>XIB</b>	<i>xib</i> <i>xib</i>	n	"person, man"
<i>xoktuun</i>	<b>xo-ko-TUN-ni</b>	<i>xok-tuun</i>	cn	"counting-stone"
<i>xook</i>	<b>XOK-ki</b> <b>XOK</b>	<i>xook</i> <i>xo[o]k</i>	n	"shark" perhaps referring specifically to the species of sharks that live in the Usumacinta
<i>xo(l)te'</i>	<b>xo-TE'</b>	<i>xo[l]te'</i>	cn	"staff, baton"

Root/stem:	Transliteration:	Transcription:	GC:	Translation:
<i>xu'</i>	<b>xu</b>	<i>xu[']</i>	n	unknown type of kind of ant or in this case may qualify the attributes of a type of beetle
<i>xukab / xukub</i>	<b>XUKAB / XUKUB XUKAB / XUKUB-ba xu?-ku-bu (?)</b>	<i>xukab / xukub</i>	n	“deer antler”
<i>xukpi'?</i>	<b>xu?-ku-pi</b>	<i>xukpil[']?</i>	n	dance object or possibly the name of dance expressions in the Usumacinta involving the cruciform and so-called “bird-staffs”
<i>yatik</i>	<b>ya-ti-ki YATIK-ki YATIK</b>	<i>yatik yatic yatic</i>	n	unknown type of flower (?)
<i>yax</i>	<b>ya-xa ya-YAX YAX</b>	<i>yax yax yax</i>	adj	1) “blue-green” 2) “clear, clean” 3) “first”
<i>yaxjal</i>	<b>YAX-ja[la] ya-YAX-ja-la</b>	<i>yax-jal yax-jal</i>	adj	blue
<i>yaxte'</i>	<b>YAX-te-e YAX-TE'</b>	<i>yax-te' yax-te'</i>	cn	lit. “blue-green-tree” specifically refers to the Ceiba tree ( <i>Ceiba pentandra</i> )
<i>yaxun? / yaxu'n? / yaxuun?</i>	<b>ya-xu?-nu ya-xu?-na ya-YAXUN?  YAXUN?  ya-xu?-ni</b>	<i>yaxun? yaxun? / yaxu'n? yaxun? / yaxu[']n? / yaxu[u]n? yaxun? / yaxu[']n? / yaxu[u]n? yaxun? / yaxuun?</i>	n	“cotinga”? specifically the Lovely Cotinga ( <i>Cotinga amabilis</i> )?
<i>yokib</i>	<b>yo-ki-bi</b>	<i>y-ok-ib</i>	n	“canyon, gorge”
<i>yop</i>	<b>YOP</b>	<i>yop</i>	n	“leaf”
<i>yopaat ~ yopat</i>	<b>YOPAT YOPAT-ti</b>	<i>yopaat ~ yopat yopaat</i>	n / theonym	Yopaat (theonym)
<i>yubte'</i>	<b>yu-bu-TE'</b>	<i>y-ub-te'</i>	n	“tribute cloth, tribute mantel”
<i>yuhklaj kab</i>	<b>yu-ku-[la]ja KAB-#</b>	<i>y-u[h]k-laj kab</i>	cn	lit. “earth-shaken” to be understood as “earthquake”
<i>yul / yu'l</i>	<b>yu-lu yu-la</b>	<i>yul yu'l</i>	n	“polished object”
<i>yum</i>	<b>yu-mu</b>	<i>yum</i>	n	“father, boss, patron”

## OTHER PARTS OF SPEECH &amp; GRAMMATICAL AFFIXES

## Adverbs / particles:

<i>bay</i>	<b>ba-ya</b>	<i>bay</i>	adv	indeed?
<i>cha'</i>	<b>CHA'</b>	<i>cha'</i>	adv	second time
<i>ka'</i>	<b>ka</b>	<i>ka'</i>	adv	then
<i>lat</i>	<b>la-ta</b>	<i>lat</i>		until?
<i>ma'</i>	<b>ma / ma-a</b>	<i>ma'</i>	adv	no, not
<i>naach</i>	<b>na-chi</b>	<i>naach</i>	adv	far
<i>sa'miiy</i>	<b>sa-mi-ya / sa-a-mi-ya</b>	<i>sa'miiy</i>	adv	earlier today
<i>xa'</i>	<b>xa</b>	<i>xa'</i>	adv	already, also, again, once more
<i>i</i>	<b>i</b>	<i>i</i>	part	and, and then

## Prepositions:

<i>ti</i>	<b>ti</b>	<i>ti</i>	prep	in, on, at, to, with
<i>ta</i>	<b>ta</b>	<i>ta</i>	prep	
<i>tu</i>	<b>tu / tu-u</b>	<i>tu</i>	prep	(ti + u)
<i>ti'</i>	<b>TI'</b>	<i>ti'</i>	prep	
<i>ichil</i>	<b>i-chi-la</b>	<i>ichiil</i>	prep	in, within

## Pronominal affixes:

<i>in- / ni-</i>	<b>ni</b>	<i>in- / ni-</i>	pronE (1SE)	I/my/mine
<i>a- / aw-</i>	<b>a / a-wV</b>	<i>a- / aw-</i>	pronE (2SE)	you/your/yours
<i>u- / y-</i>	<b>u / yV</b>	<i>u- / y-</i>	pronE (3SE)	he/she/it/his/her/its
<i>ka-</i>	<b>ka</b>	<i>ka-</i>	pronE (1PE)	we/our
<i>i- / iw-</i>	<b>i / i-wV</b>	<i>i- / iw-</i>	pronE (2PE)	you/your/yours (pl.)
<i>u- / y-</i>	<b>u / yV</b>	<i>u- / y-</i>	pronE (3PE)	they/their
<i>-en ~ -e'n ~ -een</i>	<b>Ce-na</b>	<i>-en ~ -e'n ~ -een</i>	pronA (1SA)	I/me
<i>-at / -et</i>	<b>ta / te?</b>	<i>-at / -et</i>	pronA (2SA)	you
<i>-Ø</i>	<b>---</b>	<i>-Ø</i>	pronA (3SA)	he/she/it/
<i>-on ~ -o'n</i>	<b>Co-na</b>	<i>-on ~ -o'n</i>	pronA (1PA)	we/us
<i>-? / -*ox</i>	<b>?</b>	<i>-? / -*ox</i>	pronA (2PA)	you (pl.)
<i>(-o'b)</i>	<b>-Co-ba</b>	<i>(-o'b)</i>	pronA (3PA)	they/them

**Independent pronouns:**

<i>ha'i' / haa'</i>	<b>ha-i</b>	<i>ha'i' / haa'</i>	dem	(3rd person singular demonstrative pronoun: he, she, it, that, this)
<i>ha'</i>	<b>ha-a</b>	<i>ha'</i>	dem	(3rd person singular demonstrative pronoun: he, she, it, that, this)
<i>hat</i>	<b>ha-ta</b>	<i>hat</i>	dem	(2nd person singular demonstrative pronoun: you)
<i>ha'ob</i>	<b>ha-o-ba</b>	<i>ha'ob</i>	dem	(3rd person plural demonstrative pronoun: they, these, those)
<i>hiin</i>	<b>hi-na</b>	<i>hiin</i>	dem	(1st? person singular demonstrative pronoun: I, me)

**Locative affixes:**

<i>-nal</i> <i>-ha'</i> <i>-a'</i> <i>-nib</i> <i>ti'-</i>	<b>-NAL / -na-la</b>	<i>-nal</i>	locative suffix
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**Instrumental suffixes:**

<i>-aab</i>	<b>-Ca-bi</b>	<i>-aab</i>	(an instrumental suffix that derives a noun from a verb)
<i>-ib</i>	<b>-bi / -i-bi</b>	<i>-ib</i>	(an instrumental suffix that derives a noun from a verb)
<i>-lel</i> <i>-uub</i>	<b>-le-le / <sup>2</sup>le</b>	<i>-lel</i> <i>-uub</i>	abstractivizer suffix (an instrumental suffix that derives a noun from a verb)

**Deictic suffixes:**

<i>-ij / -iij</i> <i>-iiy</i> <i>-ijiiy</i> <i>-jiiy</i>	<b>-ji / -Ci-ji</b> <b>-ya</b> <b>-ji-ya / -Ci-ji-ya</b> <b>-ji-ya</b>	<i>-ij / -iij</i> <i>-iiy</i> <i>-ijiiy</i> <i>-jiiy</i>
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**Absolutive suffixes:**

<i>-aj</i>	<b>-ja</b>	<i>-aj</i>	absolutive suffix of (especially) items worn by people
<i>-is</i>	<b>-si</b>	<i>-is</i>	absolutive suffix of body parts



**Partitive possession:**

<i>-el</i>	<b>-e-le / -Ce-le / le</b>	<i>-el</i>		(partitive suffix of body parts)
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**Agentive affixes / gender classifiers:**

<i>aj-</i>	<b>a</b>	<i>aj-</i>	mcl	masculine (male) / neutral classifier
<i>ix-</i>	<b>i-xi / IX / i-IX</b>	<i>ix-</i>	fcl	feminine (female) classifier
<i>-om</i>	<b>-Co-ma</b>	<i>-om</i>	ag	agentive suffix

**Numeral classifiers:**

<i>-bix</i>	<b>bi-xi / BIX</b>	<i>-bix</i>	ncl	numeral classifier: count of 5 or 7
<i>-kul</i>	<b>ku[lu]</b>	<i>-kul</i>	ncl	numeral classifier: count of stones (and, by extension, years?)
<i>-mul</i>	<b>mu-lu</b>	<i>-mul</i>	ncl	numeral classifier: count of stacked objects
<i>-nak</i>	<b>na-ka</b>	<i>-nak</i>	ncl	numeral classifier: count of lower titles
<i>paach / pach</i>	<b>pa-chi PACH?-cha PET</b>	<i>paach pach -pet</i>	ncl	numeral classifier: count of circular objects
<i>-pet</i>	<b>PET</b>	<i>-pet</i>	ncl	numeral classifier: count of circular objects
<i>-pik</i>	<b>pi-ki</b>	<i>-pik</i>	ncl	numeral classifier?: count of 8000 (20 <sup>3</sup> )
<i>-pis</i>	<b>pi-si</b>	<i>-pis</i>	ncl	numeral classifier: count of units of time
<i>-taak</i>	<b>ta-ka / ta-ki / TAK / TAK-ki</b>	<i>-taak</i>	ncl	plural suffix
<i>-tal</i>	<b>TAL / ta-la / TAL-la</b>	<i>-tal</i>	ncl	numeral classifier for ordinal count
<i>-te'</i>	<b>TE' / TE'-e</b>	<i>-te'</i>	ncl	numeral classifier: count of units of time
<i>-tikil</i>	<b>ti-ki-li</b>	<i>-tikil</i>	ncl	numeral classifier: count of people
<i>-tuk</i>	<b>tu-ku</b>	<i>-tuk</i>	ncl	numeral classifier: count of stacks(?)
<i>-tz'ak</i>	<b>TZ'AK / TZ'AK-ka / tz'a-ka</b>	<i>-tz'ak</i>	ncl	numeral classifier: stacked objects
<i>-ye?</i>	<b>ye</b>	<i>-ye</i>	ncl	numeral classifier: count of divine? objects

GLOSSARY OF LINGUISTIC TERMINOLOGY<sup>117</sup>**absolutive**

Absolutive is a grammatical category of NOUNS in ergative-absolutive languages that typically marks the PATIENT in a transitive sentence and the only ARGUMENT in an intransitive sentence. Furthermore, absolutive is less likely to be formally indicated on the noun than ERGATIVE case is.

**accent**

A term principally used to designate a change of pitch indicating that a particular element (e.g. a SYLLABLE) in an utterance is more prominent than others. The word is also used for *accent marks* in writing, and (in everyday language) for diverse accents of different speakers of the same language. See also STRESS.

**active voice**

Normal form of TRANSITIVE verbs declaring that the person or any other entity represented by the grammatical SUBJECT performs the action represented by the VERB.

**adjective**

A word that modifies a NOUN to indicate e.g. its quality (examples: *green, large, ripe, sacred, celestial, new*, etc.).

**adverb**

A word which modifies a VERB, an ADJECTIVE, another adverb, a phrase, a clause, or a sentence expressing a relation in reference to e.g. time, place, number, direction, affirmation, or denial (examples: *then, not, here, far, after, already*, etc.). A useful hint is that basically any word with lexical content that does not clearly fall into the categories NOUN, VERB, OR ADJECTIVE is more often than not considered an adverb.

**affix**

Generally, a dependent (bound) MORPHEME which can be added to a STEM OR ROOT (as PREFIXES, SUFFIXES, OR INFIXES) in the process of forming a complex word (e.g. in the word *disappointment* the prefix is *dis-*, and the suffix is *-ment*). In Maya hieroglyphs affixes can also work as **phonetic complements** or in the case of infixes also as complete words. Contrary to standard practice in linguistics, affixes are subdivided to prefixes (before), superfixes (above), subfixes (below), postfixes (after), and infixes (within) in Maya epigraphy due to the nature of the script.

**affricate**

A complex CONSONANT which is composed of a STOP followed instantaneously by a FRICATIVE. Both the stop and the fricative have generally the same place of articulation. For example, the affricate [č] (or [tʃ]) as the grapheme (DIGRAPH) <ch> in the word “child” consists of an alveolar stop [t] followed by a palato-alveolar fricative [ʃ]. In Mayan languages the affricates behave phonologically as units, and thus cannot be divided into two distinct PHONEMES, i.e. the phonemes in the TRANSITIVE VERB *tzutz* (to end, to complete) are /tʃ/, /u/, and /tʃ/, respectively, whereas in English the sequence of a STOP and a FRICATIVE (i.e. a sound phonetically comparable to affricates) can form two phonemes, as in the word “cats”: /k/, /æ/, /t/, and /s/. In the Classic Mayan there are four affricates, the voiceless <tz> and <ch> (or [tʃ] and [č], respectively), and the glottalized <tzʼ> and <chʼ> (or [tʃʰ] and [čʰ], respectively).

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<sup>117</sup> Based partly on Anttila 1972, Bickford and Tuggy (eds.) 2001, Bricker 1986, 1992, 2000b, Carr 1993, Don, Kerstens, and Ruys 1999, Iivonen, Horppila, Heikkonen, and Rissanen 2000, Kettunen 2002, Kosunen and Väisänen 2001, Lacadena and Zender 2000, Loos, Anderson, Day, Jordan, and Wingate (eds.) 1999, and Nodine 1996. The entries are cross-referenced in the text in SMALL CAPITAL LETTERS. The graphemes are indicated by <angle brackets>, phonemes by /slashes/, and phonetic sounds by [brackets], i.e., for example, the letter “c” in the English word “can” is graphemically written as <c>, phonemically as /k/, and phonetically as [kʰ].

### alveolar

Alveolar sounds are produced by raising the tongue tip (*apex*) or tongue blade (*laminal/ corona*) towards the alveolar ridge. There are seven alveolar sounds (here graphemes) in the Classic Mayan, namely: <t>, <t'>, <tz>, <tz'>, <s>, <l>, and <n>.

### antipassive

Antipassive VOICE is a voice in ergative-absolutive languages (like the Mayan languages) in which the AGENT of the sentence has ABSOLUTIVE case instead of the “normal” ERGATIVE case. A noun phrase normally having absolutive case can be marked as an indirect (or an oblique) object. The verb in antipassive constructions has formal characteristics of intransitive verbs in ergative-absolutive languages.

### argument

A NOMINAL complement of a VERB (e.g. AGENT and PATIENT) which has a semantic role. Semantic roles differ from syntactic roles (e.g. SUBJECT and OBJECT) in a manner that they are conceptual whereas syntactic roles are morphosyntactical:

Sentence:	Syntactic role:	Semantic role:
Lisa opened the door.	Lisa = subject door = object	Lisa = agent door = patient
The key opened the door.	key = subject door = object	key = instrument door = patient
The door opened.	door = subject	door = patient

In Classic Mayan this difference can be seen e.g. in the following sentences:

Sentence:	Syntactic role:	Semantic role:
<i>uchukuw Aj Ukul Yaxuun Bahlam</i> ("Yaxuun Bahlam captured Aj Ukul")	Yaxuun Bahlam= subject Aj Ukul=object	Yaxuun Bahlam= agent Aj Ukul=patient
<i>chuhkaj Aj Ukul</i> ("Aj Ukul was captured")	Aj Ukul=subject	Aj Ukul=patient
<i>chuhkaj Aj Ukul ukabjiiy Yaxuun Bahlam</i> ("Aj Ukul was captured by the doing of Yaxuun Bahlam")	Aj Ukul=subject Yaxuun Bahlam= oblique object	Aj Ukul=patient Yaxuun Bahlam= agent

### aspect

Grammatical category of VERBS or verbal phrases that characterizes the manner in which actions are related to the context internally. The most common aspects are:

- perfective (completive): presents a situation completed (finished) or as a complete whole
- habitual: presents a situation as being habitual, characteristic or repeated
- progressive (continuous): presents a situation as occurring before, after, and during some other situation
- imperfective (used without distinction for both habitual and continuous situations); presents a situation incompleting (unfinished)

All verbs do not have the same aspectual properties and they may, therefore, belong to different aspectual classes. It is still debatable whether aspect (or TENSE for that matter) is present in the Maya hieroglyphic writing.

**assimilation**

A process of fusing one sound to another to facilitate pronunciation. For example, the /n/ in the Yucatec word *chila'n* (interpreter) becomes /m/ before the word *balam* (jaguar), i.e. the /n/ *assimilates* in place of articulation to the following stop /b/. The sounds are thus fused together in pronunciation to yield *chila'm balam* (or: /čila'mbalam/).

**bilabial**

Bilabial sounds are produced by using both lips. In Classic Mayan language there are five bilabial sounds: /p/, /p'/, /b/, /m/, and /w/.

**brackets**

Brackets<sup>118</sup> [...] are used in epigraphic analysis to indicate reconstructed sounds and in *transliterations* to designate infixed syllables or words. In linguistics, square brackets are also generally used for indicating PHONETIC sounds in contrast to PHONEMIC or GRAPHEMIC material (indicated by slashes /.../ and <angle brackets>, respectively), i.e. [t] simply means the *phonetic* sound 't', and /t/ represents the *phoneme* 't' (whether it is pronounced as [t] or as [t<sup>h</sup>]).

**case**

Case is a grammatical category characterized by inflection and determined by the syntactic or semantic role of a noun or pronoun (traditionally the term *case* has been restricted to apply to only those languages which indicate certain functions by the inflection of nouns, pronouns, or noun phrase constituents)

**causative verb**

Causative verb is a verb with an argument that expresses the cause of the action expressed by the VERB: e.g. Christophe *had* Julie excavate a burial. In a certain class of verbs there is alternation between a causative reading and an INCHOATIVE reading: e.g.

inchoative:	The vase <i>broke</i>
causative:	<u>Joe</u> <i>broke</i> the vase

**clause**

A verbal phrase formed together with a nominal or adverbial phrase. Clauses can either be independent or dependent: e.g. in the sentence "I know that you will enjoy deciphering Maya glyphs" the independent clause is "I know (that you will enjoy deciphering Maya glyphs)", which contains the dependent phrase or clause "that you will enjoy deciphering Maya glyphs".

**clitic**

A clitic is a grammatical element which has syntactic and semantic characteristics of a word but cannot occur freely (in SYNTAX) and, therefore, needs a "host" (i.e. a clitic is a bound MORPHEME). Clitics can also attach to inflected words, a fact that distinguishes them from AFFIXES. Clitics are divided into two classes: proclitics and enclitics; proclitics attach themselves before the host word, and enclitics attach themselves after the host. In Maya hieroglyphic writing there are a number of clitics. One of the most common is the temporal DEICTIC (en)clitic *-jiiy* ("ago").

**cocktail party effect**

Binaural hearing (using both ears) helps us to separate interesting sounds from a background of irrelevant noise. In a Maya hieroglyphic workshop where several conversations are taking place, one can focus on ergative patterns or temporal deictic enclitics and ignore discussions relating to leisure activities.

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<sup>118</sup> This is *brackets* in standard American English and *square brackets* in British English.

**cognate**

Sets of words are cognates (in related languages) if they derive from the same original word. Normally cognates have similar PHONOLOGICAL and SEMANTIC structures, but exceptions to this rule are numerous and can only be detected by historical linguistics. The word for “bee” and “honey” is *chab* in Ch’ol, Ch’ontal, Ch’orti’, Ch’olti’, and Tzeltal; *kab* in Yucatec, Lakandon, Itza’, and Mopan; and *kaab* in K’iche’, Kaqchikel, and Tzutujil; but they all stem from Proto-Mayan \*kaab, and they are, therefore, *cognates* of a same word. The longer the distance of related languages is (in time and space) the more easily words of same origin tend to vary. For example, the word for “hundred” varies a great deal in different Indo-European languages through time and space: in Latin it is *centum*, in Greek *hekatón*, in Old Irish *cēt*, in Gothic *hund*, in Swedish *hundra*, in Tokarian *känt*, in Spanish *ciento*, in Sanskrit *śatám*, in Lithuanian *šimtas*, and in Russian *sto*, but they are all cognates of Proto-Indo-European \*kmtóm. Words also change semantically in different related languages, and also inside a language in time: for example, the word *nice* meant *stupid* and *foolish* in the late 13th century English. The word went through a number of changes including *extravagant*, *elegant*, *strange*, *modest*, *thin*, and *shy* ending up to its current meaning in the 18th century. Considering the history of Mayan languages (and reconstructing Classic Mayan or Proto-Mayan languages) one has to consider both phonological and semantic changes in the languages that are not and were no more constant or stable than any other languages in the world.

**consonant**

One of the two significant classes of sounds (besides VOWELS). Consonants are produced by greater constriction or by a complete closure of the airstream in the speech organs than for vowels. The result is either friction or complete obstruction of the air. Generally, consonants do not form syllables alone (without a vowel). In linguistics the capital letter C usually stands for a(ny given) consonant.

**context dependence**

Context dependence means that the interpretation (or translation) of an expression depends on the context in which it is used; be it literary, syntactical or otherwise.

**contrast**

Two sounds contrast (or the PHONETIC distinction is contrastive) if replacing one with the other (in an identical phonetic context) changes the meaning of a given word. For example, /l/ and /r/ are two distinctive PHONEMES in English: if you were to change the /l/ in “lock” to an /r/, you would get a different word, “rock” (in Japanese, for example, there is no distinction between these phonemes). Such pairs of words whose meaning can be contrasted on the basis of a phoneme are called MINIMAL PAIRS. In Classic Mayan there existed phonemic distinctions that are less familiar among native English speakers. One of them is the opposition between (BI)LABIAL, dental/ALVEOLAR, and VELAR STOPS or PLOSIVES (i.e. /p/, /t/, and /k/) on one hand, and GLOTTAL stops or plosives (/p’/, /t’/, and /k’/) on the other (included is also the opposition between words with or without preconsonantal or inter-vowel glottal stops (’). Consider the following examples: *kab* (earth, land) and *k’ab* (hand); *chan* (sky, snake, 4) and *cha’n* (guardian). Another distinction is made between short and long vowels: *nah* (first) in contrast to *naah* (house, structure). Yet another distinction is made between words with or without preconsonantal velar or glottal FRICATIVES: *k’an* (ripe, yellow) and *k’ahn* (stair, bench). In the glyphic texts the vowel length and the preconsonantal velar and glottal fricatives are not directly detectable, and consequently they have to be reconstructed.

**deictic pronoun**

A pronoun whose reference must be fixed through the context of the utterance. See also DEIXIS below:

**deixis**

Elements in a language may have a reference which is dependent on the immediate (generally extralinguistic) context of their utterance. For example, personal and demonstrative PRONOUNS, spatial expressions (e.g. “here” and “there”), temporal expressions (e.g. “tomorrow” and “now”), tense (past, present, etc.), and gestures of the speaker are deictic expressions.

**derivation**

Derivation is a MORPHOLOGICAL practice by which a new word is produced (derived) from another word by affixation, resulting in a change of the meaning of the word. For example, the Classic Mayan word (adjective) *chanal* (celestial) is derived from the word (noun) *chan* (sky). Traditionally derivation is distinguished from INFLECTION although it is not possible to make a clear distinction between the two. However, at least one difference exists: inflection is never subject to changes in category, while derivation typically is.

**digraph**

A set of two letters that form a single sound. The sound value of some digraphs is not easy to work out, but some are more predictable. As a matter of fact, the word “digraph” has a digraph <ph> (pronounced as [f]). In the customary transliteration (and transcription) of Maya hieroglyphs, there are four digraphs: <tz>, <tz'>, <ch>, and <ch'> pronounced as [tʰ], [tʰʰ], [č], and [čʰ], respectively).

**ergative**

Ergative is a grammatical category of NOUNS in ergative-absolutive languages that typically marks the AGENT in a transitive sentence and the only ARGUMENT in an intransitive sentence. Ergative case is more likely to be formally marked on the noun than ABSOLUTIVE case is.

**ergative-absolutive case system**

A term applied in linguistics for a situation in which one case marker or AFFIX is used to mark the only ARGUMENT (i.e. SUBJECT) of INTRANSITIVE verbs as well as the PATIENT of TRANSITIVE verbs, while another case marker or affix is used for the agent of transitive verbs. The former case marker is called the absolutive (ABS), and the latter, the ergative (ERG). In Mayan languages ergative pronouns (pronominal affixes) are used as subjects of transitive verbs and as possessive pronouns (possessors of nouns), whereas absolutive pronouns are used as the objects of transitive verbs and the subjects of intransitives. In Classic Mayan this means that the pronoun (pronominal affix) in sentences like *utz'ihb* (“[it is] his/her writing”) and *utz'apaw* (“he/she inserted/ planted it”), is formally the same /u-/ , but in the first example it is the possessor of a noun (possessive pronoun), and in the second it is the subject of a transitive verb. In Mayan languages ergative pronouns are attached to the root of the verb on its left side (before the verb) whereas the absolutive pronouns are attached to the right side of the verb (after the verb).

**etymology**

Etymology is the study of the historical origin of a word or other linguistic structures. For example, the etymology of the English word “cacao” is in the Spanish “*el cacao*” which was borrowed from Maya “*kakaw*” which is in itself a loanword from Mihe-Sokean languages (“*kakawa*”).

**euphemism**

A euphemism is an expression that is used in place of another expression that is considered to be unpleasant, disagreeable or offensive. For example, expressions like *he checked out*, *he kicked the bucket*, *he's six feet under*, and *he's pushing daisies* can be regarded as euphemisms for the concept of *dying*.

**fricative**

A sound formed by forcing air through a small cavity at the place of articulation. In Classic Mayan there are four fricatives (here written as GRAPHEMES): <s>, <x> (pronounced as /š/), <j> (pronounced as <ch> in Scottish “Loch” or as <j> in Spanish “Juan”), and <h>.

**gender**

See NOMINAL CLASS.

**glide**

A sound produced more or less like a VOWEL but with the distributional properties of a CONSONANT. Glides are more commonly referred to as “semi-vowels” and classified also as approximants. In Classic Mayan there are two glides (or semi-vowels): [j] and [w] (written GRAPHEMICALLY as <y> and <w>, respectively, and pronounced very much like the English phonemes /y/ and /w/ in words like “year” and “wine”).

**gloss**

A short general translation of a WORD or MORPHEME which does not take into account the context in which it occurs.

**glottal**

A sound produced by a constriction in the GLOTTIS (the air passage through the larynx or voicebox between the vocal folds). The two most common glottal sounds are the GLOTTAL stop (or glottal plosive) [ʔ]<sup>119</sup> and the glottal FRICATIVE [h]. A glottal stop involves closure, followed by release, of the vocal cords, whereas a glottal fricative involves close approximation between the vocal cords. In a few English accents, the glottal stop can be heard in words like “bottle” [boʔl], and they often replace syllable final plosives, as in “Scotland” [skoʔlnd], but more commonly in any initial word in a sentence starting with a vowel, and in expressions such as “uh-uh” (colloquial phrase indicating a negative opinion or a refusal) and “oh-oh” (“oops”; colloquial expression referring to an element of surprise).

**glottis**

The aperture between the vocal folds.

**grammar**

The habitual method in which the basic elements of a language are interconnected to create more complex structures, thus enabling thoughts to be communicated according to clear, habitual and systematic configuration.

**grapheme**

A “default” letter in the alphabet or a symbol representing a syllable in a syllabary. For example, in the Maya script the symbol for the syllable **ba** is a single grapheme regardless of the different forms in which it may be written. In Latin alphabet a grapheme is any given letter (or letters) with no direct correspondence to pronunciation. See also DIGRAPH.

**homograph**

A word written exactly the same way as another word with different meaning, and potentially different pronunciation, e.g. *minute* [ˈminit] (a unit of time and angular measurement) and *minute* [mī:nyüt] (of very small size or importance).

**homophone**

A group of letters or (in a broad sense of the definition) a word written differently from another word with same pronunciation, e.g. *right*, *rite*, *wright*, and *write*. Homophones can also be distinguished from homonyms in a sense that homophones represent a group of letters representing the same speech sound, whereas homonyms are words that have the same pronunciation as another, (usually) differently written, word.

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<sup>119</sup> The more appropriate symbol for the glottal stop is a character resembling a question mark but for typographical reasons the symbol <ʔ> is used here instead. This practice is also in keeping with the standards employed by Maya epigraphers generally as well as those formulated and set forth by Guatemalan government accords of 1987 and 1988 (see Note on Orthography at the beginning of this handbook).

**ideographic**

An ideographic orthography is a writing system that represents words and ideas without representing the sounds of a given language. In reality, there are no true ideographic writing systems in the world, and most writing systems employing *prima facie* ideographs are actually operating with logograms (i.e. word signs that do not always have a direct correlation or association with the targeted idea or entity in real life). Words “ideogram” (or “ideograph”) and “logogram” (or “logograph”) are sometimes used indistinguishably but currently the latter is favored in place of the former. A “pictogram” (or “pictograph”), on the other hand, is a sign representing factual and concrete objects or entities: a sign representing a realistic full-figure jaguar (or the head of the jaguar) would be pictographic (if it really denotes to a jaguar), but a sign representing a head of a toad is in effect a logogram if it denotes to the verb ‘to be born’.

**idiom**

An idiosyncratic multi-word expression with a fixed combination of elements recognized as a SEMANTIC unit and typically referring to a colloquial expression (for example “kick the bucket”, “spill the beans”, “hit the road”). The meaning of the idiom cannot usually be directly derived from its elements. See also EUPHEMISM.

**inalienable noun**

A noun which refers to something perceived as essentially and permanently possessed – and is thus compulsorily expressed as possessed. Kinship terms and body parts are traditionally inalienable nouns in Mayan languages.

**inchoative**

An aspectual class of verbs that refers to “becoming”, “appearing” or “beginning”. Inchoatives express the beginning of a state or process, like harden (become hard), die (become dead) or break. They refer to a change in state in the subject, be it accidental, temporary, or permanent. In Mayan languages all inchoative verbs are derived from NOUNS or ADJECTIVES.

**inflection**

One of the major types of MORPHOLOGICAL operations by which an AFFIX is added to a word. An inflectional affix adds a particular grammatical function to a word *without* changing the category of that word. Traditionally inflection is distinguished from DERIVATION.

**intransitive**

Intransitive verbal structures do not have a direct OBJECT, i.e. verbs that do not require or verbs that cannot have a direct object, are intransitive verbs (e.g. “sleep” and “die”).

**labial**

A sound which is produced by a narrowing or closure of the lips. The term is used to refer both to BILABIAL and to labiodental sounds. There are five (bi)labial sounds in the Classic Mayan: [p], [pʰ], [b], [m], and [w], and *no* labiodental sounds (involving a contact between the lower lip and upper front teeth, such as [f] and [v]).

**lexeme**

A term that is used to express the idea that INFLECTED forms of words (which are words themselves) are still variants of one single word. For example, the Finnish words “*käden*” (“hand’s”, “[that] of a hand”), “*kädellinen*” (“one with a hand”, “Primates”), “*käsitellä*” (“manipulate”), and “*käsin*” (“with hands”) are all “variants” of the lexeme “*käsi*” or “hand”.



**lexical ambiguity**

A type of ambiguity that arises when a word has multiple meanings. The Maya word *chan* (sky, four, snake) is often cited as an instance of lexical ambiguity. See also HOMOPHONE.

**mediopassive**

A VOICE that is used in certain languages like Latin, Ancient Greek, and in the Mayan languages. In the mediopassive voice (middle voice), the agent is completely deleted and is to be understood only in general terms or not at all. Instead, the PATIENT becomes the SUBJECT of the verb. In the mediopassive voice the action of the subject is directed towards the subject itself, e.g. (in Classic Mayan): *chukuuy Aj Ukul* ("Aj Ukul got captured").

**metaphor**

A figurative expression which is not to be understood literally (but which refers to certain conceptual similarity), i.e. a metaphor employs an altered but similar concept to another concept or idea, e.g. "At this point I'm really *drained* and *burned up* trying to *absorb* linguistic data".

**metonymy**

A routine in which one word (that is an attribute of another, more complex or an abstract word) is used to stand for another word or concept. For example, in the phrase "The *pen* is mightier than the *sword*" *pen* and *sword* represent writing/publishing and war/military force/violence, respectively. In a same manner, the word *crown* can refer to monarchy or to the royal house (a concept that has metonymic attributes as well) and *window table* can refer to the customers seated on a window table.

**minimal pair**

A set of two words or other structures which differ in meaning and which have only one difference in their sounds. See CONTRAST for further information.

**mood**

A cover term for one of the four INFLECTIONAL categories of VERBS (mood, TENSE, ASPECT, and modality). The most common categories are: indicative (statement), imperative (command), optative (wish), etc. It seems at present that the only mood in the Maya hieroglyphic texts is that of indicative.

**morpheme**

The smallest meaning-bearing unit (minimal grammatical unit), i.e. a word or a part of a word that cannot be divided into smaller meaning-bearing forms. Morphemes are generally either ROOTS or AFFIXES. For example, the word "intoxicated" has four morphemes: the prefix "in-", the root "toxic", and the suffixes "-ate" and "-ed". A Classic Mayan glyphic example of **chu-ka-ja** produces a transcription of *chul[h]kaj* which can be divided into four morphemes: *chul-h|k-aj-Ø* (*chuk*: to seize; -h-: passive marker of CVC transitive verbs; -aj: thematic suffix; and -Ø: third person absolutive pronoun [sign "Ø" represents a "ZERO MORPHEME"]).

**morphology**

A subfield in linguistics that is involved in the study of MORPHEMES, or the internal structure of words.

**morphophonemic**

Relating to the change of one PHONEME to another in particular surroundings. The presence of morphophonemic constructions (morphosyllables) in the Maya hieroglyphic writing system is still debatable. In this volume morphosyllables are not considered part of the description of the Maya writing system (as reconstructions presently favored by the European school of Maya epigraphers are an equally viable solution to the variant processes of

transcription). The reconstructive approach does not require the stipulation of phonetic reversal, a process which is no longer believed to have existed.

### nasal

A feature which characterizes sounds that are produced by lowering the soft palate (velum), allowing the air to escape through the nose. In the Classic Mayan language there are two nasal sounds (nasal consonants): [m] and [n].

### nominal structure

Structures that are grammatically comparable to nouns. Nominal structures include noun STEMS, NOUNS, PRONOUNS, noun phrases and nominal clauses. They are the most fundamental categories for the construction of syntactic arrangements along with verbal structures.

### nominal class

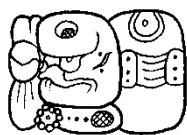
A general term indicating the fact that e.g. NOUNS, VERBS, and PRONOUNS can belong to different MORPHOLOGICAL classes. In quite a few languages nouns fall into two or three classes: masculine, feminine, and neuter, with each of them INFLECTED differently. In English there is no such distinction, and in the Mayan languages the only 'genderized' grammatical class is that of male (masculine) and female (feminine) classifiers that are sometimes (rather inaccurately) referred to as agentives: *aj-* (masculine classifier), and *ix-* (feminine classifier). Neither of these actually refer to the male or female gender *per se*: the masculine classifier is actually a neutral classifier, and it can be found attached to a number of plant and animal names and the feminine classifier can also work as a diminutive. However, when it comes to pronouns, the English language has gender in the third person pronouns ("he", "she", and "it", "his", "her", and "its") but some other languages such as Finnish or the Mayan languages do not. In Classic Mayan the pronoun *u-* (before words starting with consonants) and *y-* (before words starting with vowels) operate both for men and women ("he", "she", "it", "his", "her", and "its"). In Mayan languages, the gender of the person referred to in an utterance has to be indicated otherwise (if needed) stating the gender using classifiers (*aj-* / *ix-*) or nouns such as "man", "father", "woman", "grandmother", etc. This is also the case in Finnish – with the exception that not even masculine or feminine classifiers exist in the language. As a result, the gender of the person one is referring to has to be elucidated through oblique queries.

### noun

One of the major lexical categories: a word that names an entity, whether a person, an object, an idea, or a place. Nouns can function as SUBJECTS or OBJECTS of a VERB.

### number

A linguistic category of NOUNS and PRONOUNS that indicates the quantity of referred individuals. In the Classic Mayan there are two numbers: SINGULAR (sg. or S) and PLURAL (pl. or P) whereof the singular is by far the most common with pronouns. Since the plural SUFFIX is optional in Mayan languages (usually present only when the plural form needs to be emphasized), the absence of plural suffixes is observable also in the script. However, there are some cases in the corpus where the plural suffix *-ob* (*-o'b* / *-oob*) is marked for the demonstrative pronoun *ha'i'* ("that") to yield *ha'ob* (*ha'o'b* / *ha'oob*; "those"), as in the example below from Copan Temple 11<sup>120</sup>:



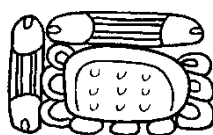
**ha-o-bo**

*ha'ob* / *ha'o'b* / *ha'oob*

*ha'-ob-Ø*

DEM.PRO-PL-3PA

"they are"



**ko-ko-no-ma**

*ko[h]knom*

*ko[h]k-n-om-Ø*

guard-APAS-AG-3PA

"[the] guardians"

<sup>120</sup> We would like to thank Marc Zender for pointing out this reference and providing the linguistic data for it.

Another plural suffix present in the script is that of *-taak*. Its use is limited to persons as in the word *ch'oktaak* (*ch'ok-taak*) or “youths”.

### object

The element that typically refers to the PATIENT in a verbal clause. Verbs and clauses which have an object are TRANSITIVE – those which do not are INTRANSITIVE. In Mayan languages objects usually precede SUBJECTS, i.e. the sentence *uchukuw Aj Ukul Yaxuun Bahlam* would translate to “Yaxuun Bahlam seized Aj Ukul” but in actuality it says: “Seized Aj Ukul(,) Yaxuun Bahlam. Objects can be divided to direct and indirect objects.

### oblique object

An oblique OBJECT is a grammatical relation whose characteristics and behavior are explainable more logically in semantic rather than syntactic terms. In the sentence “Vicky was bitten by a tick” the constituent “*by a tick*” is an oblique object

### onomatopoeia

Onomatopoeia refers to sounds implied by the phonetic quality of the word, or an entity that produces a sound. Words such as “hiss” and “bomb” are onomatopoe(t)ic.

### onomastics

A branch of SEMANTICS, which studies the etymology of proper names (see also TOPONYM).

### onset

An onset is first part of the SYLLABLE preceding the VOWEL.

### orthography

The manner in which the sounds of a given language are represented graphically in writing.

### palatal

A sound which is produced by narrowing or closing the oral cavity by raising the tongue blade towards the hard palate. There was only one (pure) palatal sound [j] (graphemically <y>) and three palato-ALVEOLAR sounds [č], [č'], and [š] (graphemically <ch>, <ch'>, and <x>, respectively) in the Classic Mayan language (based on the pronunciation of modern Mayan languages).

### participle

A nominal form of a verb. Participles can be characterized as being adjectivized verbal forms. They can also be inflected in cases and in some tenses (and also e.g. in passive): e.g.: (1) Mary is *writing* hieroglyphs; (2) Mary has *written* hieroglyphs; (3) These hieroglyphs were *written* by Mary. In Ch'olan languages participles are often referred to as stative adjectives. One of the (stative) participles found in the Maya script is the term *hamliiy* (*ham-l-iiy-Ø*), which can be translated as “it was in an *opened* state”.

### particle

A particle is a word that does not belong to one of the main classes of words. It is also invariable in form. Sometimes also PREPOSITIONS are regarded as particles. The following are examples of English particles: “well”, “oh”, “yes”.

**passive**

Passive VOICE is an INFLECTED (or DERIVED) form of a TRANSITIVE VERB in which the OBJECT of the transitive verb becomes the SUBJECT of the passive, i.e. it indicates that the subject is the patient or recipient of the action indicated by the verb. To follow the previous example (see OBJECT) the sentence *chuu[h]kaj Aj Ukul* would translate to “Aj Ukul was seized”.

**patient**

One type of argument of a VERB. An argument is a patient if the action expressed by the verb is directed at or affects the referent of the argument.

**person**

A grammatical category indicating whether a NOMINAL includes the speaker and/or the hearer. The speaker is called *first person*, the hearer *second person*, and any third party *third person*. Both pronouns and verbs can be labeled as such: e.g. “we” is a *first person plural pronoun* and “goes” is a *third person singular verb*. Most Maya texts were written in *third person singular*.

**phoneme**

The smallest (contrastive) unit in the sound system of a language. A phoneme is a sound which differs from any other sound in a given language (see CONTRAST) producing distinct linguistic units. Distinctions between phonemes are called *phonemic distinctions* (instead of PHONETIC distinctions). Sounds that are pronounced in a different way are *phonetically* different, but if these sounds are not in contrast with each other, the difference is *allophonic*, not *phonemic*. To give an example, in the English language the /p/ sound in the word “pay” [ˈpeɪ] is *phonetically* distinct from the /p/ sound in “play” [ˈpleɪ], because it is aspirated (in contrast to this, if an initial stressed fortis plosive /p, k, t/ is followed within the same syllable by any of the phonemes /l, r, w, j/, there is no aspiration). This difference is not phonemic, but *phonetic*, i.e. the sounds [p] and [p<sup>h</sup>] are *allophones* and they differ from each other only because of the phonetic “surroundings”. See also MINIMAL PAIRS.

**phonetics**

The study of the sounds of language. Phonetics can be further divided into articulatory, acoustic, and auditory phonetics.

**phonology**

The study of how the sounds function and how they are organized in a given language.

**phrase**

A phrase is a SYNTACTIC structure that is composed of more than one word but lacks the SUBJECT-predicate organization that makes a complete CLAUSE.

**plosive**

A sound that is produced by a complete occlusion in the oral (vocal) tract. See also STOP.

**plural**

A class of grammatical forms indicating multiples of NOUNS or PRONOUNS. See NUMBER.

**possessive**

A grammatical case indicating ownership or a relation comparable to ownership. Many Maya words (such as body parts and kinship terms) are INALIENABLY (innately) possessed and cannot stand alone (see the dictionary). See also PRONOUN.

**predicate**

A segment of a CLAUSE expressing something about the SUBJECT (excluding the subject.)

**prefix**

Generally, a bound MORPHEME (or AFFIX) joined to a word on its left side (i.e. preceding the sign). In Maya epigraphy prefixes indicate GRAPHEMIC signs attached to the viewer's left of another sign.

**pronoun**

A word that can substitute for a NOUN or a noun phrase. Several types of pronouns are distinguished in grammars, including: *personal pronouns* (e.g. I, you, he, she), *possessive pronouns* (e.g. your, yours), *demonstrative pronouns* (e.g. this, that), *interrogative pronouns* (e.g. what, who), *reflexive pronouns* (e.g. myself, yourself), etc. Classic Mayan pronouns indicate PERSON, but not GENDER. For example, the Classic Mayan 3rd person singular ergative pronoun "u" can either mean "he", "she", or "it" (or "his", "her", "its"), and the gender can only be detected contextually. In the Classic Mayan script there are three sets of pronouns: (1) personal pronouns, (2) POSSESSIVE pronouns, and rare occurrences of (3) demonstrative pronouns:


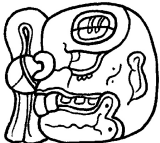

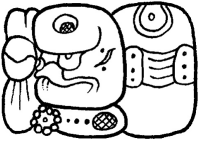
personal and possessive pronouns:		demonstrative pronouns:	
	u u "he, she, it, his, her, its" (before consonants)		ha-i ha'i "that"
	ya <sup>121</sup> y- "he, she, it, his, her, its" (before vowels)		ha-o-ba ha'ob "those"

Table 26: Examples of Classic Mayan pronouns in the hieroglyphic texts

**proto-**

A prefixed word that suggests a supposed "ancestor" of related languages. For example, the ancestor of all the Mayan languages is referred to as Proto-Mayan, and the immediate ancestor of Tzeltalan languages as Proto-Tzeltalan. Comparative historical linguistics is a field engaged in determining what the proto-forms of a given language family were by analyzing series of COGNATE words in attested languages. Reconstructed proto-forms are marked with an asterisk (\*) immediately before the word: e.g. \*k'e'η is a proposed Proto-Mayan form of the Classic Mayan word *ch'e'n* ("cave").

**root**

The base form of a word, which cannot be further analyzed without losing the word's identity. In Mayan languages roots are monomorphemic STEMS that can either be free MORPHEMES (e.g. "sky", "walk", "you") or bound morphemes (e.g. "in-", "pre-", "-ness").

<sup>121</sup> This is only one (graphemic) example of prevocalic personal and possessive pronouns (the **ya**-sign is used with words starting with the vowel /a/). Others are **ye**, **yi**, **yo**, and **yu** with corresponding initial vowels (/e/, /i/, /o/, and /u/, respectively).

**semantics**

The study of meaning in language.

**semivowels**

The sounds [w], [j], [r], and [l], but more commonly only [w] and [j] are referred to as semivowels since they are not easily classified into the categories of CONSONANTS or of VOWELS. See also APPROXIMANTS.

**sentence**

A grammatical unit composed of one or more CLAUSES.

**singular**

A class of grammatical forms indicating only one NOUN or PRONOUN. See NUMBER.

**stative verb**

A VERB that expresses a state of affairs rather than action. For example, the verbs *be*, *have*, and *know* are stative verbs in English.

**stem**

Basic part of a word to which INFLECTIONAL AFFIXES can be attached. For example, the stem of the Maya word *chanal* ("celestial") is *chan* ("sky"). Similarly, the stem of *k'ahk'al* ("fiery") is *k'ahk'* ("fire"). A stem can be either monomorphemic (a.k.a. **root**) or polymorphemic (having more than one morpheme).

**stop**

A type of CONSONANT involving a complete obstruction (closure) of the passage of air at some point through the oral tract followed by a sudden release of the air. In Classic Mayan there are eight stops: /p/, /t/, /k/, /'/, /p'/, /t'/, /k'/, and /b/.

**stress**

The relative prominence of a unit of spoken language that is typically attributed to one syllable in a word. Normally a stressed syllable is pronounced by an increase in articulatory force and at a higher pitch. The stress in Mayan words is typically in the last syllable.

**subject**

A NOMINAL element that refers to the "doer" i.e. the AGENT in the action of the VERB. Subjects can either be NOUNS, PRONOUNS or complex NOMINAL clauses. In Mayan languages subjects follow verbs (and possible OBJECTS) in a verb-object-subject (VOS) order.

**substantive**

A broad classification of words that includes NOUNS and NOMINALS.

**suffix**

A bound MORPHEME (or AFFIX) which attaches at the end of a ROOT or STEM. See also PREFIX.

**syllable**

A minimal unit of organization for a sequence of sounds. Syllable usually comprises of a nucleus (typically a VOWEL or vowels) together with optional initial and/or final margins (typically CONSONANTS). Symbols C (consonant) and V (vowel) are used to express syllabic structures: e.g. the Classic Mayan word “*pakal*” would be transliterated using this notation as: CV.CVC (pa-kal). In contrast to standard method in linguistics, Classic Mayan words are transliterated syllabically on the basis of GRAPHEMIC syllables, i.e. the distinction is made between *pronounced* syllables and *graphemic* syllables. The word *pakal* is thus divided into three graphemic syllables (or syllabograms): **pa-ka-la**, and it can be indicated using both sets of syllabic notations (graphemic and pronounced): CV.CV.CV → CV.CVC (or: CV-CV-CV → CVCVC).

**syncope**

The deletion of a segment in a word. For example, the Classic Mayan INTRANSITIVE verb “to dance” is derived from the noun *ahk’ot* “dance” to produce *ahk’taj* < *ahk’ot* + *-aj* (the phoneme /o/ has thus been syncopeated).

**syntax**

The study of the rules by which words are combined to form phrases, clauses, and sentences.

**tense**

A grammatical category, feature, or expression of the time of a situation relative to some other time (usually associated with verbs). Tense is traditionally classified into past, present, and future. It is still debatable whether tense (or ASPECT) is present in the Maya hieroglyphic writing.

**toponym**

A toponym is a NOUN (or a noun phrase) which is assigned to a geographic location. For example, *Tikal*, *Shite Creek*, *Koiransellaisenoja*, *Naughty Girl Meadow*, *Qaanaaq*, *Nunathloogagamiutbingoi*, *El Pueblo de Nuestra Señora la Reina de los Angeles de Porciúncula*, *Taumatawhakatangihangakoauauotamateaturipukakapikimaungahoronukupokaiwhenuakitanatahu*, and *li* are toponyms.

**transitive**

A verb or a verbal structure which has or requires a direct OBJECT.

**velar**

A sound produced with a constriction formed by raising the back of the tongue (*dorsum*) towards the soft palate (*velum*). There are two clear velar sounds in the Classic Mayan: [k] and [k’], and one sound that is either velar or uvular: [x] (written graphemically as <j> and pronounced as in the Spanish name “Juan”) – not to be confused with the GRAPHEME <x>.

**verb**

A word that designates a situation, an event, or an action. Verbs can typically be inflected in, for example, person, aspect, voice, and tense.

**voice**

A grammatical system of INFLECTIONS of a verb to indicate the relation of the SUBJECT of the VERB to the action which the verb expresses. There are four voices present in the Classic Mayan language: ACTIVE, PASSIVE, mediopassive (or middle voice), and antipassive. For more information, turn into the grammar section on page 71.

**voiced**

A sound that is produced with a vibration of the vocal folds (vocal cords).

**vowel**

One of the two significant classes of sounds (besides CONSONANTS). Vowels are usually pronounced with relatively open configuration of the vocal tract without noticeable obstruction to the free flow of air through the mouth. In contrast to consonants, vowels can form syllables by themselves. There are five vowels (or ten if long vowels are regarded as a distinct set of vowels) in the Classic Mayan language: /a/, /e/, /i/, /o/, and /u/.

**word**

The smallest unit of GRAMMAR which can stand alone as a complete utterance in both spoken and written language. Words are composed of STEMS together with optional AFFIXES.

**zero morpheme**

A zero morpheme ( $\emptyset$ ) is a constituent representing an element at an abstract level but not realized in the utterance (i.e. it has no phonetic appearance in pronunciation nor a graphemic appearance in writing). A zero morpheme thus represents the absence of an expected morpheme. There are a number of zero morphemes in the Classic Mayan language (and, consequently, also in the script). One of the most common is that of the third person singular absolutive (Set B) pronoun, as in the phrase *chum-l-aj- $\emptyset$*  ("he/she sat down") which can be divided into morphemes in the following way: *chum-l-aj- $\emptyset$*  (verbal root + marker of a positional verb + thematic suffix + third person absolutive pronoun).



**ABBREVIATIONS USED IN MORPHOLOGICAL SEGMENTATION AND MORPHOLOGICAL ANALYSIS  
(ADAPTED TO MAYA LINGUISTICS)**

<b>Abbreviation:</b>	<b>Explanation:</b>	<b>Abbreviation:</b>	<b>Explanation:</b>
∅	zero morpheme	PV	positional verb
-	morpheme boundary	REL	relational suffix
1	first person	S	singular
2	second person	SUF	suffix (for unidentified suffixes)
3	third person	THM	thematic suffix
1S	first person singular	TV	transitive verb
2P	second person plural		
3SA	third person singular absolutive		
3SE	third person singular ergative	<i>Other abbreviations:</i>	
A	absolutive	*	reconstructed word or morpheme (in historical linguistics)
ADJ	adjective	*	incorrect word, clause, sentence, etc. (general)
ADV	adverb	C	(any) consonant
AFT	affective	V	(any) vowel
APAS	antipassive voice		
DEM	demonstrative pronoun		
E	ergative	<i>Abbreviations used in Maya epigraphy:</i>	
FCL	female/feminine classifier	ADI	Anterior Date Indicator
INC	inchoative voice	CR	Calendar Round
INS	instrumental suffix	DN	Distance Number
IV	intransitive verb	DNIG	Distance Number Introductory Glyph
IVD	intransitive verb, derived	EG	Emblem Glyph
LOC	locative suffix	IS	Initial Series
MCL	male/masculine/neutral classifier	ISIG	Initial Series Introductory Glyph
N	noun	LC	Long Count Calendar
NCL	numeral/numerical classifier	PDI	Posterior Date Indicator
NUM	numeral	PE	Period Ending
P	plural	PSS	Primary Standard Sequence
PAS	passive voice		

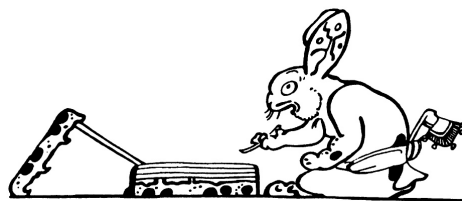


## ILLUSTRATION CREDITS

All drawings by Harri Kettunen unless otherwise indicated throughout this volume or listed below:

Drawings by Christophe Helmke:

- p. 18 **ya-YAXUN?-BALAM** (Yaxchilan, Lintel 43: B2)
  - p. 18 **ya-xu?-nu BALAM-ma** (Najtunich, Drawing 69: A1-A2)
  - p. 18 **ba-ka-KAB** (K7146: A6)
  - p. 18 **ba/BAH-ka-ba** (Denver Panel: pA6b)
  - p. 18 **ba-ka-ba/BAH** (Ek Balam, Mural of the 96 Glyphs: M1)
  - p. 19 **CHAK-ki**
  - p. 20 **CHIJ / KEJ?**
  - p. 50 **Bital EG**
  - p. 50 **Caracol EG**
  - p. 50 **Palenque EG**
  - p. 50 **Seibal EG**
  - p. 50 **Xunantunich EG**
  - p. 50 **Yaxchilan EG**
  - p. 77 **CHUM-ja**
  - p. 77 **CHUM[mu]-la-ja**
  - p. 86 **CHAPAT**
  - p. 86 **CHUWAJ**
  - p. 88 **KAL?-ma-TE'**
  - p. 89 **KOHAW-wa**
  - p. 89 **K'INICH** (postfix)
  - p. 89 **K'INICH** (prefix)
  - p. 90 **K'UH**
  - p. 90 **MO'**
  - p. 90 **OCH-chi**
  - p. 91 **TAJ**
  - p. 93 **WITZ'**
- Syllabary (p. 79 onwards): 3rd **o**; 3rd **ji**; 3rd **jo**; 3rd **mu**; 3rd **sa**; **tzo**; and 2nd **yu**.



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