PART II:

AN INTRODUCTION TO CLASSIC MAYA INSCRIPTIONS:

MAYA NUMBERS AND THE CALENDAR

The easiest place to start learning about Maya hieroglyphics is also one of the most frequent kinds of hieroglyphs – those that record numbers and the elements of the Maya calendar. Since most Classic inscriptions (at least those on monuments) are narratives of Maya history, there is a lot of attention given to the dates of events, and the dates are recorded in standard ways. Being able to read dates (and the numbers they require) means that at least you can walk up to almost any inscribed monument and read parts of it. Shock and amaze your friends! And this is not just idle knowledge. The key to deciphering any inscription is to work out the chronology of the events recorded and how that chronology is presented. In the methodology that we have developed over the years, the first step in understanding a monumental inscription is to go through it and mark the dates; this reduces the inscription to a series of segments that can then be examined in detail.

The Maya numerical system is not decimal, like ours, but vigesimal, based on twenty as opposed to ten. Instead of counting in units of tens – ten, twenty, thirty, forty, and so on – the Maya count in units of twenty: twenty, forty, sixty, etc. You might think of this best as counting "scores": one score, two scores, three scores, and so on. Where our higher numbers are based on powers of ten – ten (10 or 10^1), one hundred (10 x 10, or 10^2), one thousand (10 x 10 x 10, or 10^3), the higher numbers in the Maya system are based on powers of twenty – twenty (20, or 20^1), four hundred (20 x 20, or 20^2), eight thousand (20 x 20 x 20, or 20^3). This is really more a matter of what numbers are called and which numbers receive special names than it is a matter of any difference in numerical values. A comparison of numbers in the Cholan languages has made it possible to reconstruct (hypothetically) the words for numbers in a the spoken Maya language that was written as Epigraphic Maya. Those reconstructions are listed below. They are very close to the number names in modern Chol (in parentheses), and we often use modern Chol as a guide to what Classic Cholan was like. Note that in modern Chol, numbers from 1-19 have to be accompanied by an element that specifies what kind of thing is being counted (a "numeral classifier"); here we have chosen *p'ejl* 'things'.

Proto-Cholan (and Modern Chol) Number Names

1	jun	(juñ p'ejl)	11	b'uluch	(b'uluch p'ejl)
2	cha'	(cha' p'ejl)	12	lajchan	(lajchäñ p'ejl)
3	'ux	('ux p'ejl)	13	'ux-lajun	('ux-lujuñ p'ejl)
4	chan	(chän p'ejl)	14	chan-lajun	(chäñ-lujuñ p'ejl)
5	ho'	(jo' p'ejl)	15	ho'-lajun	(jo'-lujuñ p'ejl)
6	wäk	(wäk p'ejl)	16	wäk-lajun	(wäk-lujuñ p'ejl)
7	huk	(wuk p'ejl)	17	huk-lajun	(wuk-lujuñ p'ejl)
8	waxäk	(waxäk p'ejl)	18	waxäk-lajun	(waxäk-lujuñ p'ejl)
9	b'olon	(b'oloñ p'ejl)	19	b'olon-lajun	(b'oloñ-lujuñ p'ejl)
10	lajun	(lujuñ p'ejl)	20	jun k'al	(juñ k'al) ("one score")

Fig. II-1. Bar-Dot Numbers

0

The Maya "zero" is an empty shell, suggesting they used shells to make a kind of abacus.

20

A single bead in the "twenties" position equals 20.

An empty shell in the "ones" position equals zero.

40

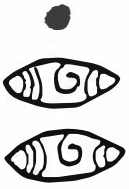
Two beads in the "twenties" position equals 40.

41

40

A single bead in the "ones" position equals 1

400



A single bead in the "400s" position equals 400.

1907

4 x 400 = 1600

15 x 20 = 300

7 x 1 = 7

1907

From there, the landmark numbers are:

40	cha' k'al	120	wäk k'al	200	lajun k'al
60	'ux k'al	140	huk k'al	220	b'uluch k'al
80	chan k'al	160	waxäk k'al	240	lajchan k'al
100	ho' k'al	180	b'olon k'al	260	'uxlajun k'al

and so on until you reach 380, 19 x 20, b'olon-lajun k'al, and then on to the next big landmark number, 400 (20 x 20), jun b'ak' ("one 400;" modern Chol b'ajk').

In between the even-score landmarks, you count towards the next highest one, not from the next lowest one (the prefix 'u-, with a variant y-, turns the number into an ordinal number):

21	jun 'u-cha' k'al	"one in the second score"
22	cha' 'u-cha' k'al	"two in the second score"

all the way to 39, b'olon-lajun 'u-cha' k'al, "nineteen in the second score," and then cha' k'al ("two score," 40). Then 41 is jun y-ux k'al, "one in the third score." and so on.

Bar-Dot Numbers

The real advantage of learning to count like a Maya is that the way numbers are written corresponds to this system, not to our decimal system. In this writing system, a dot stands for the value "one," and a bar stands for "five," so the system is called the "bar-dot number" system. There is no theoretical limit on the size of numbers that can be written this way; they can easily run into the gazillions.

Before getting into the details, let's consider our own system for writing large numbers. It's a kind of "positional notation," in which the position of the integers with respect to others changes their value. A number like 1907, for instance, represents

1 x 1000
9 x 100
0 x 10
7 x 1

OR

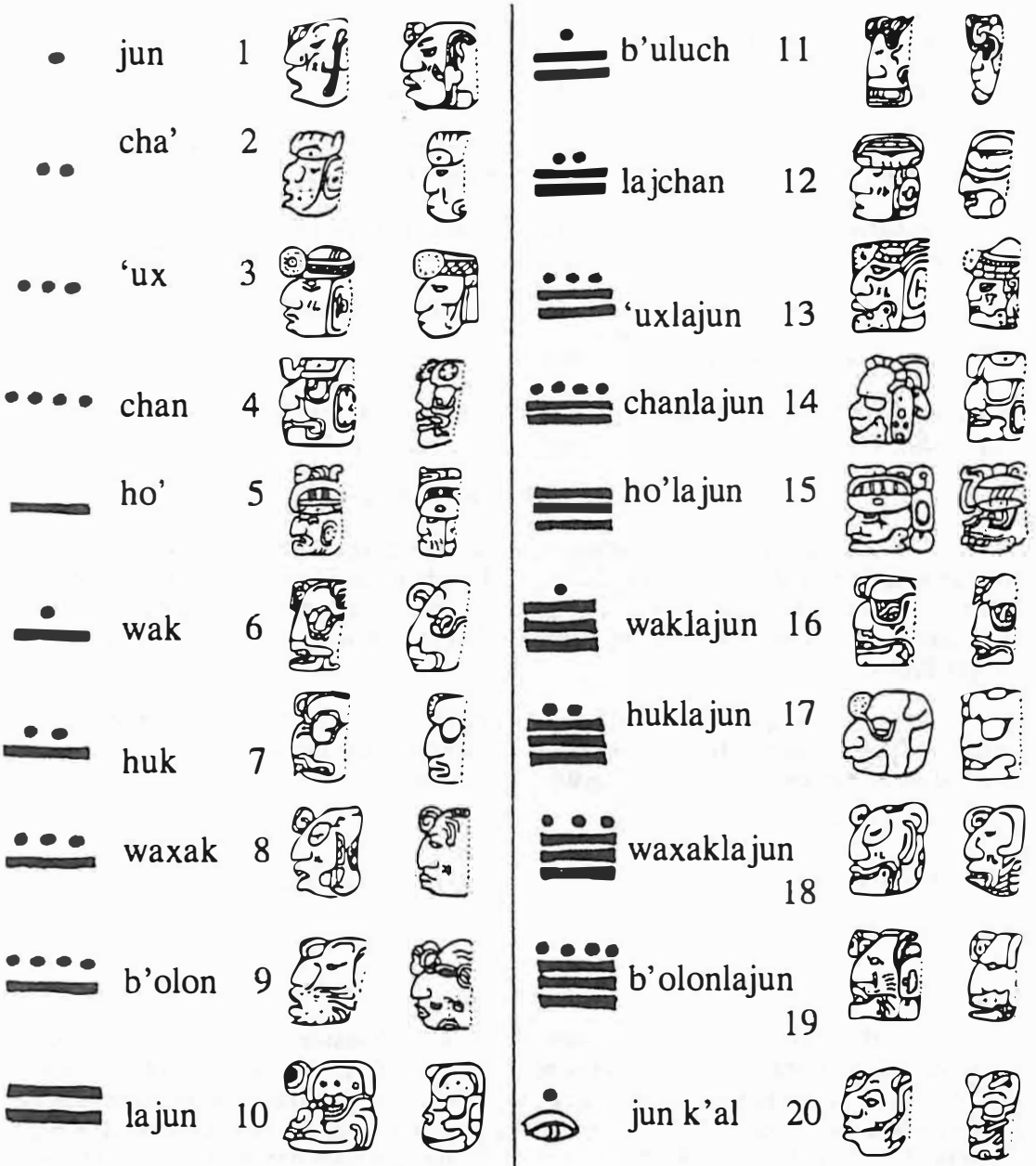
Thousands	Hundreds	Tens	Ones
1	9	0	7

A "one" in the thousands position stands for "one thousand," not for "one." A "nine" in the hundreds position stands for "nine hundred," not for "nine." So the value of an integer depends on its position in the sequence. Now, think of this as a set of boxes, one of which holds the "ones," another holds the "tens," and so on. What can go into any of the boxes is one (and only one) of the integers, 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9. If you "fill up" the ones box with 9, and add one, what do you do to write the result? You put a "zero" in the ones box, and put a 1 in the next box to the left (10, one ten, no ones).

The Maya positional notation works very much like this, but it stacks its boxes vertically, one on top of the other (Fig. II-1). The bottom box holds "ones," the next box holds "twenties," the next box "four hundreds," and so on up as far as you care to go (some texts have as many as 20 boxes!). An empty box ("zero") is represented by an empty shell. We think this is the case because

Fig. II-2. Bar-Dot Numbers and Head Variants

BAR-DOT NUMBERS AND HEAD VARIANTS, ONE THROUGH TWENTY



The number "zero" was probably *mi*, since the "flower" variant is the syllable sign **mi**.

the Maya used shells to hold their beads and bars, making a kind of abacus that would allow them to add and subtract. In the Maya system, 1907 is not thought of as "one thousand," "nine hundred," etc., but is conceived of in terms of twenties: "four 400s," "fifteen twenties," and "seven", or 4 x 400 (chan b'ak'), 15 x 20 (ho'-lajun k'al), 7 x 1 (huk). That is, it will be written using three "boxes," the lower one holding the ones, the next one the twenties, and the top one the 400s (Fig. II-1). And to read this number, you have only to read: chan b'ak', ho'-lajun k'al, huk.

Fancy Ways to Write Numbers

Bar-dot numbers were used when the numbers were to be manipulated – added or subtracted from one another – as in eclipse tables and other astronomical reference works. They are also used frequently in calendric notations (below). In monumental inscriptions, for reasons that will become clear later, the written numbers are never higher than 19. For this set of numbers, there are two very elegant ways of representing the numbers, called (by us, who knows what the Maya called them!) "head variants" and "full-figure variants" (Fig. II-2). Instead of writing the number with boring old bars and dots, we represent the numbers by personifying them, by converting them into images of the (presumed) deities associated with them. Head variants show only the head of the personage; full-figure variants show the whole body, and the body may be engaged in some activity.

Each of the head variants has one or more distinctive features that allow us to recognize them. These features also appear on the full-figure variants. The principal distinguishing features are:

1 The number "one" is represented by the Maize God as a young person, with a lock of hair (or corn silk) falling down his cheek, and a bead on his forehead. (We used to think this was the Moon Goddess, but modern scholars have disputed this identification.)

2 The number "two" is represented by a male with a fist on his head like a headdress, the back of the hand toward the viewer.

3 The number "three" is represented by a head with a headband that usually has a mirror or shiny object affixed to it in front.

4 The number "four" is represented by the Sun God, who is recognized by his square Roman nose, a prominent snaggle-tooth for an incisor, and a "barbel" (like a catfish whisker) coming out of the back of his mouth. He also is cross-eyed, and he often wears his name glyph (k'in) as an earpiece.

5 The number "five" is represented by an old man with no teeth and a wrinkled face; on his head he wears a tun "stone/year" sign as a headdress, perhaps marking the heavy weight of years that he bears.

6 Number "six" has an axe in his eye, a curved wooden handle with a stone blade stuck through it.

7 Number "seven," one of the hardest to recognize, has a spike-like incisor and an eye with a border around it.

8 Number "eight" is another image of the Maize God, but a mature maize god, with the curl of a leaf at his forehead and a skull that often takes on the contours of an ear of corn.

9 Number "nine" is a jaguar, and often has spots and whiskers, as well as a Yax sign on his forehead (a common feature of what is called the "water-lily jaguar").

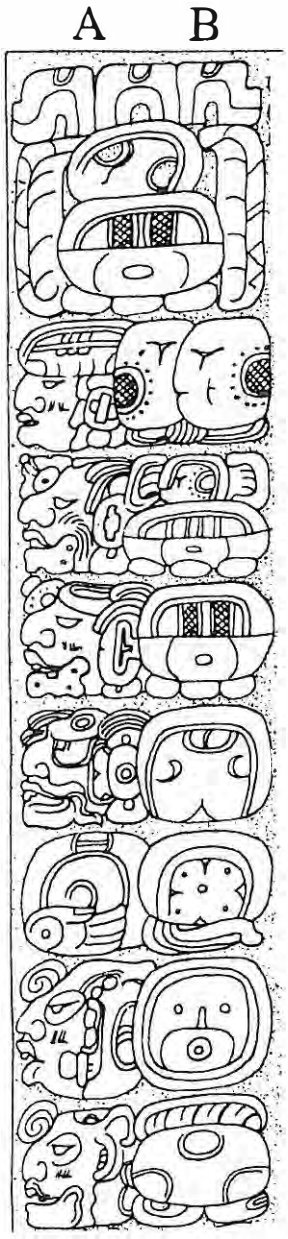
10 Number "ten" is a Death's Head, a skull, with a fleshless lower jaw and often three holes in his skull representing the foramina, small holes where the nerves pass through. Note that lajuñ "ten" is probably based on laj "to end, to die."

11 The number "eleven" is represented by a head with a headdress composed of the Earth glyph (Kaban); the distinctive feature is a dot with a curly tail, perhaps a sprouting seed.

12 Number "twelve" is represented by a head with a Sky (Chan) headdress.

13-19 The remaining numbers are represented by combinations of "ten" (the fleshless jaw) and the numbers 3-9 with their distinctive features.

Fig. II-3. Head and Full-figure Variants, Tablet of the Cross and Palace Tablet, Palenque.



ISIG
12 b'ak'tun
19 k'atun
13 tun
4 winal
0 k'in
8 Ahau
13 Tzec

12.19.13.4.0, 8 Ahau 13 Tzec

ISIG
9 b'ak'tun
10 k'atun
11 tun
17 winal
0 k'in
11 Ahau

9.10.11.17.0, 11 Ahau (8 Mac)

The choice between bar-dot numbers, head variants, and full-figure variants engaged in activities gave the Maya scribes tremendous liberty to play visual games and to convert what might be a simple date into an opportunity to comment on the gods and their interactions. At Palenque we can see good examples of scribal choice on the Tablet of the Cross (head variants of numbers) and the Palace Tablet (Fig. II-3).

The Calendar and the Maya "Fascination with Time"

What do you use numbers for most of the time? Keeping track of time. The Maya were once thought to have a fascination with time, to be concemed with time for its own sake. This view, held by scholars up until just a few years ago, was based on the observation that a considerable part of any Classic inscription is devoted to calendric matters. At the beginning of a monumental inscription a base date is established, and all the other dates in the inscription are linked to that date by precise counts of the intervening time periods. When the mathematics and the calendrics were the only parts of the inscriptions scholars had deciphered, it was easy to believe that the Maya were obsessed with time.

Now that we can read most of the rest of the inscriptions, we know that the elaborate attention that was given to keeping track of time was not an obsession with time but an attempt to keep track of history. The Maya were not so concemed with time in itself, they were interested in keeping track of when events had taken place in order to be precise about their historical records. For this purpose they adopted and elaborated on a wide-spread Mesoamerican calendar. Just how that calendar worked is a topic we will get to below.

The Long Count

In order to anchor their dates in time, the Maya made use of a system that had been used earlier by the Olmecs, the so-called "Long Count" (our term, not the Maya's). By means of this continuous count of days from a specific starting point, the position of any given day can be absolutely determined. In our calendar, we specify what year we are in by counting years from a specific starting point, said to be the birth of Christ. From that point, we simply count the number of years that have passed, and give the year that number, e.g., 2010 AD (Anno Domini 2010, "the year of Our Lord 2010"). The Maya counted days, not years.

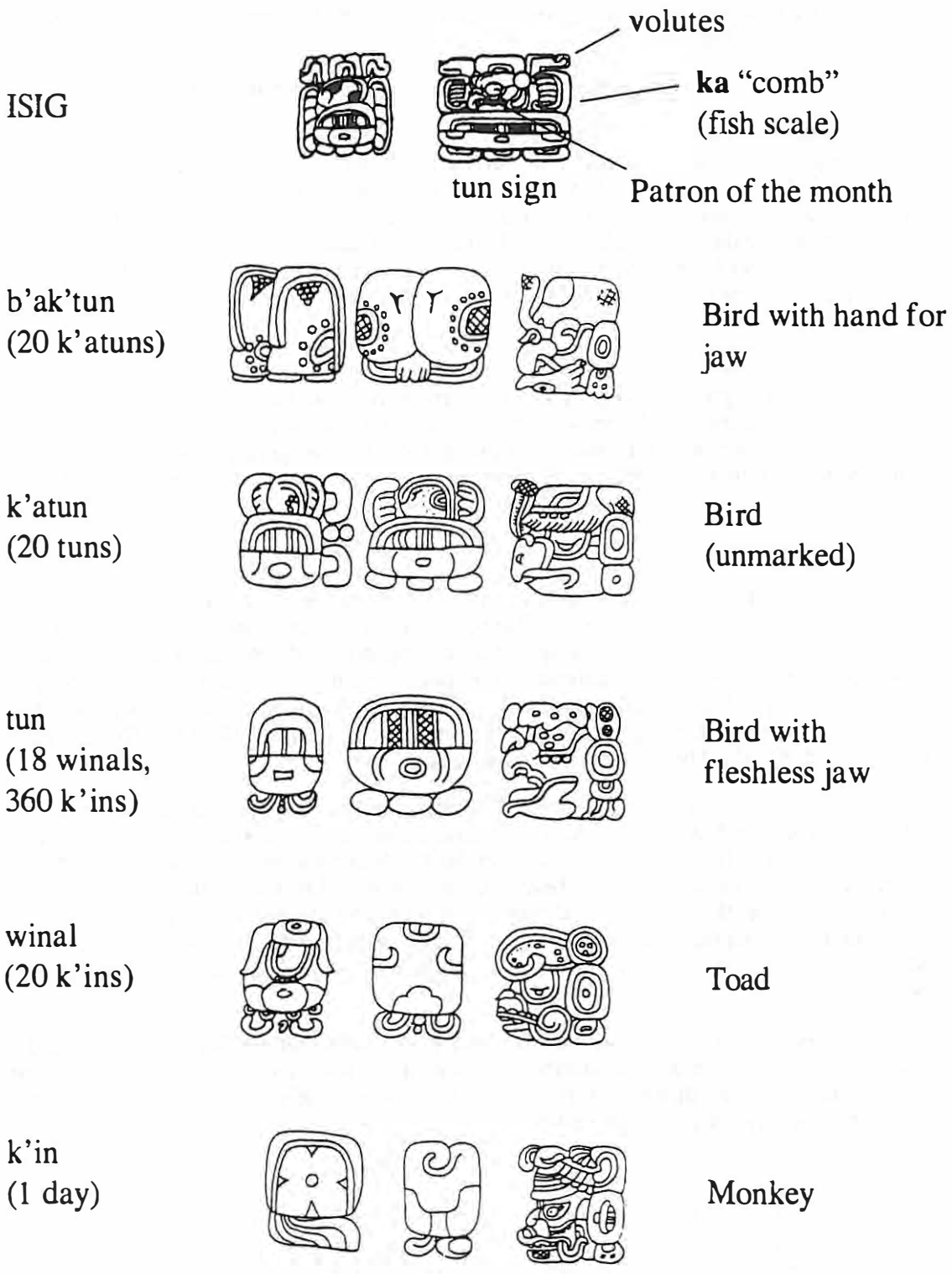
The choice of a starting date for the Mesoamerican calendar count of days was made by the Olmecs before the Maya began to record dates, and we do not know why this particular starting point was chosen. In any case, in our calendar the Maya starting point corresponds to August 13, 3114 BC. Mesoamerican peoples believed that the world had gone through a series of creations, and it may be that this was their calculation of when the present creation began. The hieroglyphic texts that talk about this date do seem to be about the gods setting the world in order (e.g., Quirigua Stela C). It is also the case that only supernaturals are named as actors in dates prior this starting point.

From this starting point, the Maya, like the Olmec before them, counted the days that had elapsed, and gave the unique number to each individual day as its Long Count position. (Our astronomers do something similar with "Julian days.") Of course, the Maya being Maya, they counted these days in groups of twenty.

The Time Periods

We use the Maya words for the time periods they counted (Fig,II-4) because these do not exactly correspond to our units of time. The smallest unit of Maya time is a single day, one **k'in**. Twenty k'in make up a Maya "month," one **winal** (written *uinal* in Colonial sources). The next unit

Fig. II-4. Initial Series Glyphs (ISIG and Time Periods).



up should logically be twenty winals, but in order to create a time period that corresponded roughly to the length of a solar year, Mesoamericans made this next unit only eighteen winals long (360 days): the **tun**. However, the longer periods of time are counted in groups of **twenty**: 20 tuns make a **k'al-tun**, reduced to **k'atun** (7200 days). Twenty k'atuns make a **b'ak'-tun** (144,000 days). (Note that for various reasons some modern scholars use other words for these time periods.)

To fix a date in time, the Maya stated how many b'ak'tuns, how many k'atuns, and how many tuns, winals and k'ins had passed since the starting date. That series of numbers gives the day its unique Long Count position; comparing the Long Count positions of two events tells you which was earlier and which later, and how much time separated the two events. Good for history!

The Initial Series

During the Classic period, it was common practice to start an inscription with a Long Count date that corresponded to the first important event recorded in the inscription, This statement of time periods is called the Initial Series (by us), since it is the first thing on a monument. Each of the time periods being counted was written with a distinctive hieroglyph, and each was accompanied by a numerical "coefficient." The coefficients could be written with bar-dot numbers, head variants or full-figure variants, and of course there were lots of ways to write each time period as well. What makes things somewhat easier is the fact that the time periods are always listed in order of descending size, from b'ak'tuns down to k'ins. Thus, even if a monument is severely eroded and we can only read some of the time periods, we know what they should be by their order. (The Olmec, in fact, did not write the time periods, they only gave the numerical coefficients, in the prescribed order.)

The Initial Series typically begins with a special combination of glyphs called (again, by us) the Initial Series Introductory Glyph (or ISIG). The ISIG (Fig. II-4) has several fixed parts and one variable element. The fixed parts – well, "fixed" is maybe not the right term, considering the scribe had a lot of altematives... The fixed elements are a set of curved shapes called "volutes" on top; a set of two comb-like shapes at the sides (or whole fish!), and a tun sign at the bottom. In the middle, above the tun sign, below the volutes and between the combs is the variable elements, the "Patron of the Month," a glyph that corresponds to the month in which the date falls.

We don't know what all these glyphs symbolize, but the volutes were used by the Olmecs in their Initial Series in just the same place, and the Olmecs placed the actual month date under the volutes, not just the Patron. Some people read the Maya ISIG as *tzikaj tun* "the tuns are counted."

The time periods each have a number of glyphic variants (Fig. II-4), and like the number glyphs these range from an abstract or geometric glyph to head variants and full-figure variants. In their simplest forms, the b'ak'tun glyph is a pair of Cauac (Kawak) signs (see the day names, below). The k'atun glyph is a tun sign below, with two combs bracketing a Cauac sign above. The tun glyph is a tun glyph, probably a slotted drum. The k'in sign is a four-petaled flower, representing the Sun (also *k'in*). The winal glyph is anybody's guess.

In their head- and full-figure variants, b'ak'tun, k'atun and tun are all represented by anthropomorphic birds, the winal is a toad, and the k'in is a spider monkey or the Sun himself.

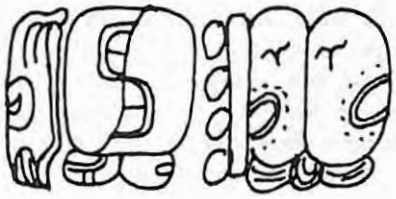
Modern Notation for Long Counts

Archaeologists and epigraphers use a short-hand notation to write Long Counts. Since the time periods always follow in the same order, we simply write the coefficients, separated by periods, without the names of the time periods. Thus, instead of writing "9 b'ak'tuns, 12 k'atuns, 6 tuns, 5 winals and 8 k'ins," we write 9.12.6.5.8.

Fig. II-5. Period Endings

13 b'ak'tuns ended.
(13.0.0.0.0)

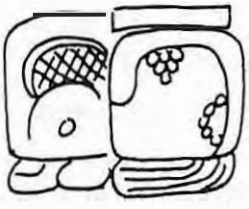
The 14th K'atun ended.
(9.14.0.0.0)



9 b'ak'tuns were completed.
(9.0.0.0.0)

First Quarter K'atun
(x.x.5.0.0)

Half K'atun
(x.x.10.0.0)



Three-Quarter K'atun
(x.x.15.0.0)
"five tuns lacking"

The starting date of the current Maya era was recorded as 13.0.0.0.0, the end of 13 b'ak'tuns (in the previous creation) and the beginning of 13 b'ak'tuns (in the present creation). From this date they began to count anew, and the earliest recorded Maya dates are in the 8th b'ak'tun of the current era, that is, they are after 8.0.0.0.0. For instance, Tikal Stela 29 has an Initial Series of 8.12.14.8.15, and the Leiden Plaque has an Initial Series of 8.14.3.1.2. Most Classic dates fall in B'ak'tun 9, butthe Classic lasted into the 10th b'ak'tun, with Initial Series dates of 10.0.0.0.0 and later. We are now in the 12th B'ak'tun and rapidly approaching a new era that will begin on the next 13.0.0.0.0. The last day of the current b'ak'tun is 12.19.19.17.19, December 22, 2012 (Julian day 2456284).

Period Endings

The ends (or maybe the beginnings) of major time periods, like the end of a k'atun or a b'ak'tun – anniversaries of the Creation date – were special occasions for the Classic Maya, and many monuments were erected to commemorate those dates, called "Period Endings" in the literature (Fig. 9). It became a matter of historical record who was ruler of a site at a Period Ending, a fact that might be recalled centuries later on another monument. At Palenque, for instance, some monuments record the birth and accession dates of the rulers (Tablet of the Cross), some their death dates (Pakal's Sarcophagus), and some pay especial attention to Period Endings (Tablet of the Inscriptions). It is common to mention period endings in accounts of rulers' careers (Tablet of the 96 Glyphs, Palace Tablet, Sarcophagus, etc.). In the peak episode of Pakal's Sarcophagus, his birth and death dates are given as well as the statement "Four were his Period Endings" (i.e., he lived through four k'atun endings, from 9.9.0.0.0 to 9.12.0.0.0).

The Long Counts of all period endings end in a series of zeros, and the lowest and least important period ending is a tun ending, when the coefficients of the winals and kins are at zero, for example, 9.15.4.0.0., the end of the 4th tun of the 15th k'atun of the 9th b'ak'tun. Since there is a tun ending every 360 days, this is not a very important occasion, but there are inscriptions in which such an ending is noted.

A k'atun ending, occurring only once in twenty years (actually, 20 tuns) is a major occasion. It appears to have been the custom that the ruler in power at a k'atun ending would have a monument erected on such an occasion, the image and inscription noting that he carried out the proper ceremonies, usually involving offerings of incense (the so-called "scattering" events).

B'ak'tun endings occur only every 400 tuns, and since the Classic period spanned only a few b'ak'tuns, these are rare occasions. In fact, only the 9th and 10th b'ak'tun endings fall within the Classic period and are commemorated in known hieroglyphic inscriptions. At Palenque, the only ruler known to be associated with a b'ak'tun ending is "Casper" (a nick-name attributed to Floyd Lounsbury, based on the similarity between the ruler's name glyph and a cartoon ghost). Casper was ruler at the 9.0.0.0.0 period ending. The other b'ak'tun endings were either too early or too late to have been recorded.

Calendar Round Dates

The Long Count anchors dates in time, but is not a date in itself. Dates as such come from the so-called "Mayan Calendar." This calendar is actually not limited to the Maya but is shared by the majority of Mesoamerican peoples. Just as the European calendar is shared throughout the Western world across different languages, the Mesoamerican calendar was shared across Mesoamerica, but each language group had its own names for the time periods, days, and months. The Maya actually combined several different calendars in their time-keeping, but the combination that is most common is called the "Calendar Round," which combines a solar calendar with a divinatory almanac.

Fig. II-6. Month Names (the *Haab'*)

Pop

Uo

Zip

Zotz'

Zec

Xul

Yaxkin

Mol

Ch'en

Yax

Zac

Ceh

Mac

Kankin

Muan

Pax

Kayab

Cumku

Uayeb

The *Haab* or Solar Year

The solar calendar, often called by its Yucatec Maya name, *haab'*, is 365 days long and corresponds to the rough length of a solar year. It is the system which most resembles our system of twelve months, which accomplishes the same goal of keeping track of the sun's annual movements and the resulting seasons. This calendar had a practical function and enabled people to plan agricultural activities, knowing, for instance, that the rains could be expected in a given month. The Maya divided the year (that is, the *haab'*), into eighteen "months" (winals) of twenty days each (Fig. II-6). This gives a total of 360 days. In order to bring this calendar into synch with the solar year, they added a five-day period at the end of the twenty months. In 16th century Yucatan, this period was called Wayeb' (*Uayeb*). So, (18 x 20) +5 = 365 days, the length of the solar year. Within each winal, the days are simply numbered, much as we number the days of the month. But the Maya started each winal with the "seating of the month" as the first day, and then followed with days 1-19. This first day is often called ø (zero) in the literature, but the Maya never used the number zero here, and always referred to this day as a "seating," using the same glyphs they used for the "seating" of kings, i.e., their accession to office.

The first month (winal) of the year (haab') is Pop; the name means "mat," the woven reed mat or petate that people sat on. So the image here is that the year begins with its "seating," just as each month begins with its own seating. Pop begins with "the seating of Pop." The next day is 1 Pop, followed by 2 Pop, 3 Pop, 4 Pop, and so on until 19 Pop, the last day of the month. The next day is "the seating of Uo (Wo)," then 1 Uo, 2 Uo, etc.

The names of the months vary somewhat from region to region (and certainly from language to language), but most of the older literature uses the 16th century Yucatec Maya names recorded by Bishop Landa and listed by Thompson (1960) in a rather mixed orthography: Pop, Uo, Zip, Zotz', Zec, Xul, Yaxkin, Mol, Ch'en, Yax, Zac, Ceh, Mac, Kankin, Muan, Pax, Kayab, Cumku, and finally, Uayeb. Some modern authors have modernized the spelling of these names but otherwise left them unchanged: Pohp, Wo, Sip, Sotz', Sek, Xul, Yaxk'in, Mol, Ch'en, Yax, Sak, Keh, Mak, K'ank'in, Muwan, Pax, K'ayab, Kumk'u, and Wayeb (Stuart 2006:81-82). Other scholars, using phonetic clues from the glyphs themselves as well as comparative evidence from Mayan languages, attempt to represent the words the way the Classic Maya might have said them. This results in radical changes like Ik'at for Uo; K'anasiiy for K'ayab; Yaxsihoom for Yax; Wayha'b' for Uayeb, Chaksihoom for Ceh; Chakat for Zip; Kaseew for Zec; Hulohl for Cumku; Tzikin for Xul; Suutz' for Zotz'; Uniw for K'ank'in (Stuart 2006:138-169). Since these new readings are somewhat unstable, changing every time scholars improve their guesses, we continue to use the old Yucatec Maya names, even though we understand that these were not the words used in the Classic period by the Chol-speaking elite.

The names of some of the months have apparent meanings; others have meanings that were lost in antiquity. In the first set, besides Pop "mat," there are Zotz "bat," Yaxkin "new/green sun," Ch'en "cave," Yax "blue/green," and Zac "white." The other words are best taken just as the names of the months, just as we have no idea what some of our month names mean (March, April, May, etc.). Thompson (1960:104-119) discusses what is known about these names.

The name of the final month of the year, the five-day period, Uayeb, means "bed," a sleeping place. Thus at its end the year is put to sleep, just as it was seated at its beginning. This five-day period was the time for special ceremonies, as recorded in the Codices in what are called the New Year's Pages. Some Mayas continue to honor these days. In the Chuj town of San Mateo Ixtatán, Huehuetenango (Hopkins, field notes), the prayermakers go to the crosses on the east edge of town on the first day, cleaning the altars and making offerings and prayers. The next day they go to the north side of town and do the same there; on the following days they repeat their activities in the

Fig. II-7. Day Names (the *Tzolk'in*)

Imix

Ik

Akbal

Kan

Chicchan

Cimi

Manik

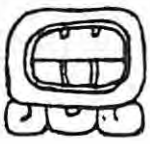
Lamat

Muluc

Oc

Chuen

Eb



Ben

Ix

Men

Cib

Caban

Etz'nab

Cauac

Ahau

west and in the south. On the final, fifth day, they go to the center of the town, the churchyard, and complete the ceremonies of what they call the Five Days (*hoye' k'uh*).

The *tzolk'in* or Sacred Almanac

The second system for reckoning time is not related to the solar year. It is a divinatory almanac called the *tzol-k'in* "sequence of days," and it is related to ritual cycles and the influence of the gods and other supernaturals on the affairs of man. The tzolkin consists of twenty sequential day names which combine with thirteen numbers to create a cycle that repeats every 260 days. Day Names

Each day has a name, just as we have Monday, Tuesday, and so on. But the Maya system has twenty day names, not just seven (Fig. II-7). The names each appear in sequence, and after twenty days the cycle repeats again, and so on ad infinitum. The series of day names (again, following Thompson 1960) is Imix, Ik, Akbal, Kan, Chicchan, Cimi, Manik, Lamat, Muluc, Oc, Chuen, Eb, Ben, Ix, Men, Cib, Caban, Etz'nab, Cauac, Ahau. As with the month names, current scholars have rewritten these names: Imix, Ik', Ak'bal. K'an, Chikchan, Kimi, Manik', Lamat, Muluk, Ok, Chuwen, Eb, Ben, Ix, Men, Kib, Kaban, Etz'nab, Kawak, and Ahaw (Stuart 2006:77-80), or they have substituted reconstructed names: Ajaw for Ahau; Ook for Oc, etc. (Stuart 2006:138-169). As with the month names, we will continue to use the traditional day names here.

Some of these names have transparent meanings: Ik is "wind," Akbal is "night," Kan is "yellow," Chicchan is "deer snake" (a mythological animal), Cimi is "death," Lamat is "Venus," Ix (*hix*) is a kind of jaguar, Caban is "earth," Etz'nab is "flint," Cauac is an old name for the rain god later known as Chac, Ahau means "lord." Some of the other names can be puzzled out, but they are best just taken as the names of the days. Thompson (1960) discusses what is known about them.

Day Numbers

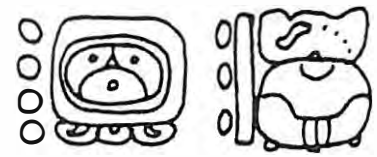
The same day name repeats every twenty days, but it combines with a different number. Each successive day gets a number, and the numbers run from 1 to 13 and then repeat. If today was a 1, tomorrow is a 2, the next day a 3, and so on. The 14th day will be a 1 again. Put together, the day names and day numbers create the tzolkin, a cycle that is 260 days long, and then repeats.

If we start with a day whose number and name are 1 Caban, an arbitrary starting place, the next day is 2 Etz'nab, followed by 3 Cauac, 4 Ahau, 5 Imix, 6 Ik, 7 Akbal, 8 Kan, 9 Chicchan, 10 Cimi, 11 Manik, 12 Lamat, and 13 Muluc; the numbers now repeat: 1 Oc, 2 Chuen, 3 Eb, 4 Ben, 5 Ix, 6 Men, 7 Cib, 8 Caban, 9 Etz'nab, 10 Cauac, 11 Ahau, 12 Imix, 13 Ik, 1 Akbal, 2 Kan, and so on. Note that every time a day name comes back twenty days later, it combines with a different number. This goes on until the day name has combined with each of the numbers, and then, 261 days from the beginning, the initial day name takes the starting number once again. That is, the beating of 20 day names against 13 numbers creates a sequence of 260 days, each of which has a unique combination of the two factors.

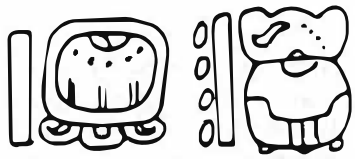
The "Luck of the Day"

Why is 260 days an important cycle? We don't really know, but it has been noted that 260 days coincides closely with the length of human gestation. That might be important because each of the day and number combinations has a different "luck of the day." This is the "calendar" that is used even today by diviners in the Guatemalan Highlands, where the day-keepers regularly cast fortunes for people and give advice based on the combinations of numbers and days. Each day name represents a force to be reckoned with, and the numbers apparently modify the powers of the days. There are days and numbers that are considered more and less favorable to different activities,

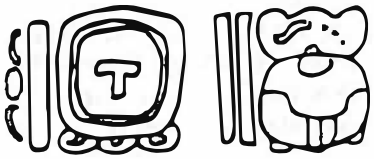
Fig. II-8. Calendar Round Dates for the First Days of this Creation



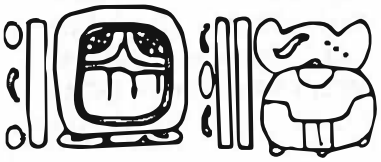
4 Ahau 8 Cumku



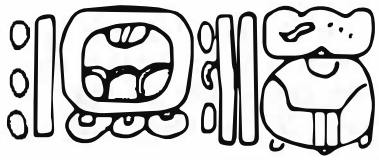
5 Imix 9 Cumku



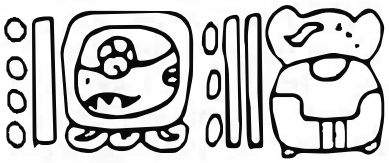
6 Ik 10 Cumku



7 Akbal 11 Cumku



8 Kan 12 Cumku



9 Chicchan 13 Cumku

and the combinations may reinforce or neutralize their powers. Divination is not a simple-minded matter of dealing with good and bad, but with the different qualities of each of the supernatural powers and the different effects each may have on different sorts of affairs. A date that augurs badly for some events may be favorable for others.

Day Names as Personal Names

A widespread practice in Mesoamerica was the use of a person's birth day name and number as a personal name, especially during childhood. In some areas – notably Oaxaca – thesenames were kept throughout life. The characters named in the Mixtec Codices are known by their birth names, such as Eight Deer (8 Manik), the famous Mixtec king who stars in the Codex Nuttall; Eight Deer also has the nick-name "Jaguar Claw," and many other personages in the Codices have secondary names. Incidentally, a study of these names in Oaxaca showed that nobody was ever "born" on a bad day, so we believe that there was some manipulation of the dates, and that people were probably given their names on a chosen day close to their birth date.

In the Maya area, birth dates were not used as personal names, at least not by the elite whose names we read in the inscriptions. We have many instances of rulers taking on new, royal names when they took the throne, but the names they replaced were not calendrical names. For example, Palenque's king K'an Joy Chitam (II) was known as Ox Ch'akan Mat before his accession; Yaxchilan's Shield Jaguar (III) was called Chel Te' as a youth. Neither of these "baby names" is calendrical. On the other hand, several of the characters in Maya mythology have names that are combinations of numbers and words (1 Ixim, 1 Hunajpu, 7 Hunajpu, 1 Batz') and some of these appear to be calendrical (1 Chuen, 1 Death, 7 Death), so the custom was known. In the late Postclassic and Contact period, many of the Maya chieftains in eastern Chiapas, acculturated to the Mexican-influenced Gulf Coast, have calendric names.

The Combination of *Haab'* and *Tzolk'in*

Each day has a number and day name (from the tzolk'in) as well as a position within a month (from the haab'). The combination of the solar year and divinatory almanac dates for a particular day is known in the literature as a Calendar Round date, e.g., the day of Creation, 4 Ahau 8 Cumku and the following days, 5 Imix 9 Cumku, 6 Ik 10 Cumku, 7 Akbal 11 Cumku, and so on (Fig. II-8).

The haab and tzolkin are different in length, one repeating after 260 days and the other after 365 days. In fact, every day in a period of 52 years has a unique combination of tzolkin and haab dates (52 haabs = 73 tzolkin cycles): 4 Ahau 8 Cumku comes again after 52, 104, 156 and 208 years, and every 52 years thereafter. This 52-year cycle is called the Calendar Round, since every 52 years you go around the calendar, so to speak (not that the Maya had round calendars!).

In Classic times, the average life span fort he ordinary person was probably less than this 52 years, although many of the elite lived to a ripe old age (even into the 100s). In an average lifespan, then, a given Calendar Round date would occur only once, so this combination of dates was sufficient for a person to date the events of his or her life without recourse to any other system. For purposes of recording history, however, Calendar Round dates have to be referenced to come other calendrical landmark such as the Long Count, discussed above, or Period Endings, discussed below.

Tying Calendar Round Dates to Absolute Time

Since the same Calendar Round date repeats every fifty-two years, recording history with just those dates would ultimately lead to confusion over which ancient event had preceded or

followed which other events, since it would be uncertain on which of the possible Calendar Round occurrences the events had taken place. Just this sort of confusion occurs in the interpretation of the late historical records of the Books of Chilam Balam, when Long Counts were no longer used. Those records do use an abbreviated system similar to Period Ending anchors called the Short Count, but there is still a degree of uncertainty.

Fixing Dates to the Long Count

There are several ways to tie a Calendar Round date to absolute time. One way is to give the Long Count position of the date, since every day has a unique position in the Long Count (within a span of 13 b'ak'tuns, or 5200 years). The first date of the current era is noted as 13.0.0.0.0, 4 Ahau 8 Cumku (the equivalent of 0.0.0.0.0, for reasons best left unexplained!); the Calendar Round 4 Ahau 8 Cumku occurs again 18,980 days later, on 0.2.12.13.0, then on 0.5.5.8.0, again on 0.7.18.3.0, and so on until the 12.18.6.14.0 4 Ahau 8 Cumku of our era (March 26, 1980). The Long Count figure allows us to place each of these Calendar Round dates in their proper order.

Classic period monuments typically begin with an Initial Series that presents the Long count of the initial date, that is, how many days have elapsed since Creation to bring us to the historical date, the first Calendar Round in the inscription. This information gives us an absolute chronology for the dates mentioned on the monument. Barring eroded or illegible information, there is only one possible interpretation of the dates given. In fact, the early definition of the Classic period was the span of time within which the Maya recorded their dates with the Long Count (from about AD 300 to AD 1000).

Fixing Dates to Period Endings

Another way to tie the Calendar Round dates to absolute time is to relate them to Period Endings, usually k'atun endings, Long Count dates that end 0.0.0, e.g., 9.18.0.0.0, the "end of the 18th k'atun." Since most of Maya history falls in b'ak'tun 9, simply identifying the k'atun places the date securely. A statement like "it was the end of the 18th k'atun" is an unambiguous reference to 9.18.0.0.0.

All Period Endings occur on Ahau days, since the Creation date fell on (4) Ahau, Ahau repeats every 20 days, and all the time periods are even multiples of 20 days long: winals are 20 days long, tuns are 20 x 18 days long, k'atuns are 20 times longer, and so on. Since each Period Ending falls on an Ahau day, it became the custom late in Maya history to refer to the k'atuns simply by their ending date: K'atun 4 Ahau, K'atun 8 Ahau, and so on. This is the time anchor known as the Short Count that was used in the Books of Chilam Balam. Because of the mathematics, successive k'atun endings will fall on Ahau days with numbers that descend by twos: K'atun 8 Ahau is followed by K'atun 6 Ahau, K'atun 4 Ahau, K'atun 2 Ahau, K'atun 13 Ahau, K'atun 11 Ahau, and so on.

(Incidentally, a useful fact to know is that the last digit of the Long Count, the number of single days elapsed, tells you what day name the date will fall on. If the number is 0, the day will be Ahau. If it is 1, the day will be Imix; if 2, Ik; if 3, Akbal, and so on.)

The Supplementary Series

Following the Initial Series and accompanying Calendar Round dates we often find one or more additional sets of chronological information that together are called the Supplementary Series or the Secondary Series. These are not essential, and some sites use some of them more than others. In recording the information, it is common for the Supplementary Series to be written between the two halves of the Calendar Round, following the tzolk'in date and before the haab' date.

Fig. II-9. Lords of the Night

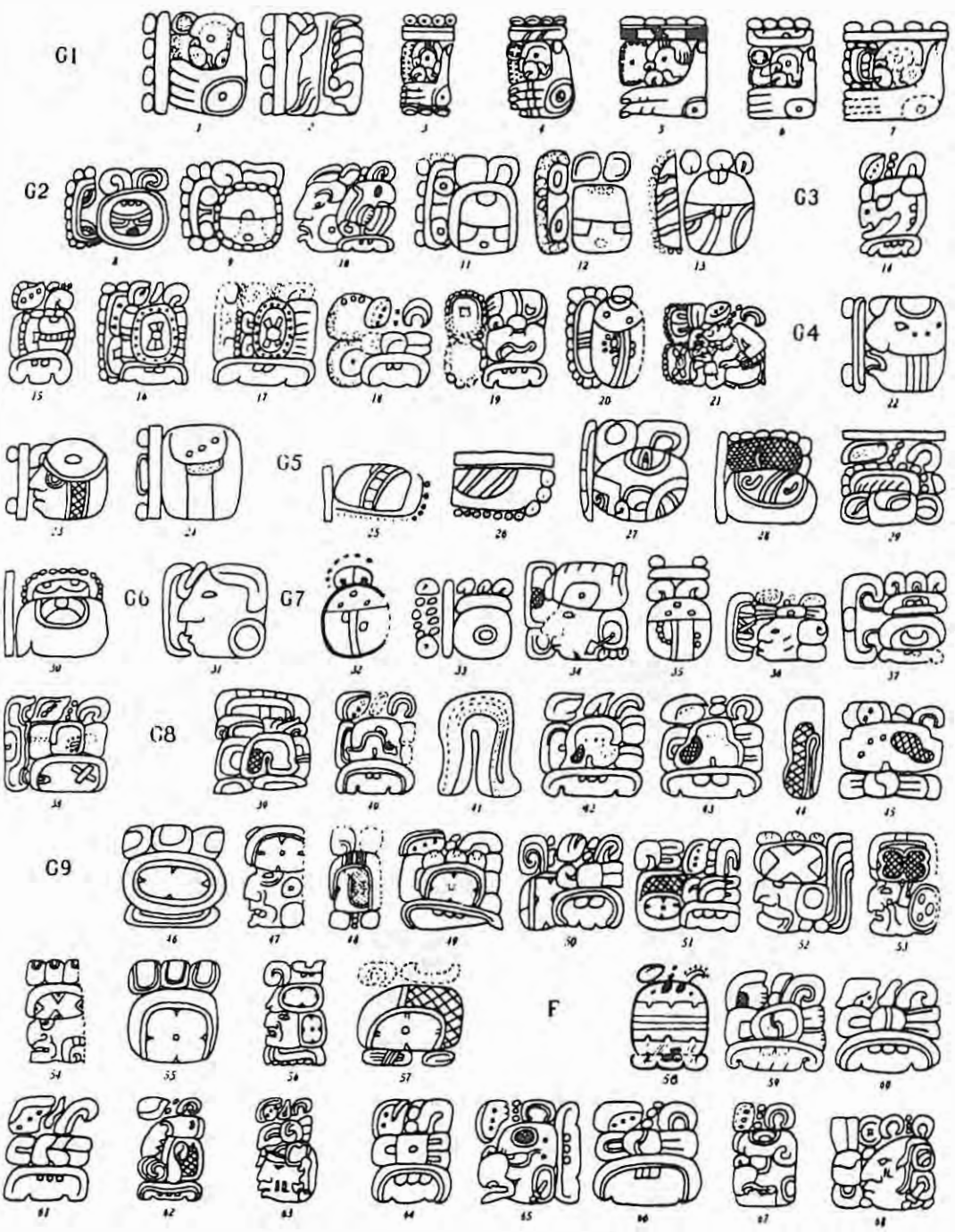


FIG. 34

Thompson (1960:Fig. 34), Glyphs G and F

Fig. II-10. Lunar Series Glyphs

Glyphs D and E: Age of the Moon (days since New Moon)

First Sighting

10 days since the Moon was born

26 days since the Moon came

Glyph C: Number of the Lunation (1-6)

— Moon

2nd lunation

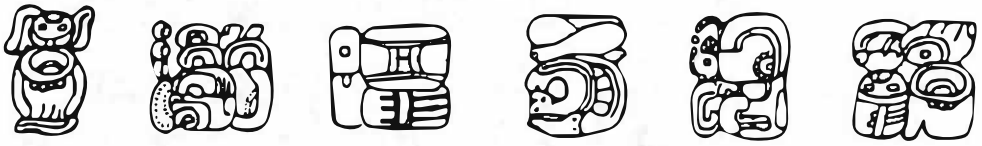
— Skull

4th lunation

— Serpent

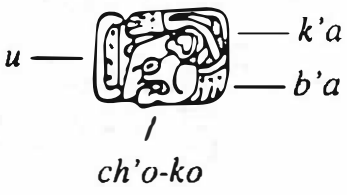
6th lunation

Glyph X: Name of the Lunation



X1 X2 X3 X4 X5 X6

Glyph B: *u (ch'ok) k'aba'*, "[is] its (emergent) name"



Glyph A: Duration of the Lunation (29 or 30 days)

20 + 9

20 + 10

The most common parts of the Supplementary Series are the Lord of the Night and the Lunar Series, as well as an esoteric notation known as the 819-day Count.

Early investigators working on these inscriptions, before their meanings were discovered, assigned letters to the sets of hieroglyphs they could identify as sets, and gave numbers to the variants within each set. For reasons that made sense at the time, they started at the end of the Series and worked towards the beginning, so that the last glyph set in a Secondary Series is the set known as Glyph A, preceded by Glyph B, then Glyph C, and so on to Glyph G, the last (or first!) set of the series. The later discovery of several rare sets of glyphs led to the designations of Glyphs X, Y, and Z, stuck in among the more orderly sets A-G.

Lords of the Night (Glyphs G and F)

Just as the days were ruled over by a set of twenty deities represented by the day names, the nights were ruled over by another set of nine gods, called the Lords of the Night (Fig. II-9). Each successive date was ruled over by the next lord in the sequence, and after nine days the first lord retumed to power. We do not know much about these deities, although it is generally assumed that they are related to the Underworld. The glyphs that represent their names are collectively known as Glyph G, and the different names are usually referred to by the letter G and an arabic number that indicates their order in the sequence: G1, G2, G3, G4, G5, G6, G7, G8, and G9. The Lord of the Night most commonly mentioned is G9. Since G9 was the Lord of the Night on the k'atun ending 4 Ahau 8 Cumku and a k'atun has 9 x 800 days, all k'atun endings fall under G9's domain.

Glyph G, the personal name of the Lord of the Night, is almost always associated with another glyph called Glyph F, which either follows Glyph G or is conflated with it. Various readings have been proposed for Glyph F, which is apparently a verbal phrase meaning something like "was in office," so that the combination of Glyph G and F read "God So-and-so was in office" (on a particular date). The glyphs representing the Lords of the Night usually appear with Initial Series dates, but they may also be used with simple Calendar Round dates, being written between the two parts: 4 Ahau G9 8 Cumku.

A very interesting deviation from tbis pattem occurs on Stela E at Quiriguá (Fig. II-10). The Initial Series on this monument is a k'atun ending, 9.17.0.0.0., which happens to fall on an eclipse date. In the inscription, the Lord of the Night is pulled from his usual place following the day name and placed just ahead of the day name, suggesting that on this date the Lord of the Night took precedence over the Lord of the Day.

The Lunar Series (Glyphs A-E and X)

Long Count dates are often accompanied by information about the state of the moon, in a series of glyphs called the Lunar Series (Glyphs A-E and X). The information given in a complete Lunar Series is: (1) the age of the moon, counting from New Moon, Glyphs D and E; (2) how many lunations have been completed, in a series of six lunations that repeats twice in a year, Glyph C; (3) the name of the current moon, Glyphs X and B, and (4) the length of the current lunation, Glyph A (Fig. II-10).

Glyphs D and E (state the age of the moon in a variety of ways, not all of which have been deciphered by epigraphers. Thompson and other early investigators worked out the structural and mathematical relations between these glyphs and determined the nature of the information that was being given. We now understand that the information is being given in sentences, not just in tabular form.

Fig. II-11. 819-Day Count Expressions from Palenque

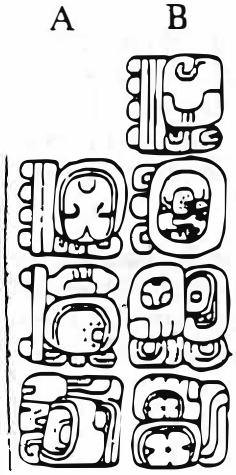
Tablet of the Cross

It had been 0 days and 1 winal
since entered
K'awil (God K)
the South
Place
on 1 Ahau
18 Zotz'

Tablet of the Sun

It had been 11 days, 2 winals,
and 1 tun
since entered
K'awil
the North
on 1 Ik
10 Zec

Tablet of the Foliated Cross



It had been 19 days
and 14 winals since
1 Cauac
7 Yax
when entered
K'awil
the West.

One common way to give the age of the moon, for instance, is to say "it is 10 days since the moon was born," or "it was five days since the moon was born." For the early epigraphers, this was just Glyph 10D or Glyph 5D. Now, although we still assign them the same meaning, we can read the actual words of the statement. The age of the moon can also be stated more poetically: "it was the first sighting of the moon," or "it had been 26 days since the last lunation ended" (that is, the moon is 26 days old).

The statement of the age of the moon on Stela E at Quiriguá, mentioned above, is instructive. In place of any normal statement of age, the hieroglyphs show a darkened moon covering up a sun sign, a rather obvious reference to the solar eclipse.

Glyph C states the series number of the lunation (or perhaps that of the last lunation completed). The glyphic expression, still undeciphered, includes a bar-dot number (from 1 to 6), a variable element not well understood, an extended hand (the "flat hand" that sometimes means "completion"), and the "moon sign," a crescent with three dots angling across between the tips. The little understood variable element has three variables, the head of the moon, a skull, and a stylized serpent.

The numbers run from one to six and then repeat, indicating that there was a cycle of six lunations, and in fact the ends of these cycles correspond to possible eclipse dates, one every six lunar months (either a solar or a lunar eclipse). The variants of glyph C are numbered, 1C-6C.

Glyphs X and B together form a sentence that gives the name of the lunation. We cannot actually read any of the names, and there is no popular tradition of moon names to help us, but we know Glyph X represents a name because Glyph B reads *u k'aba'* "is its name." Corresponding to the six lunar months in a cycle, there are six variants of glyph X, simply numbered X1-X6.

Glyph A gives the duration of the lunation. This is apparently not an observational datum, but reflects a system in which lunations alternate between 29 and 30 days to give an average of 29.5 days, close to the actual length of a lunar month. The glyphs include a full moon sign with a single dot in its enclosure, a convention for the number 20, and a second number, either 9 or 10 (in bar-dot or head-variant form). These represent the duration as either 29 or 30 days long, respectively.

The fact that there are only two variants here, as opposed to the numerous variants in the other positions, is what led the early epigraphers to start here in their investigations into the Supplementary Series; ergo, Glyph A occurs at the end of the sequence.

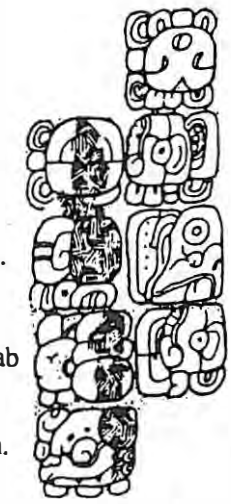
The 819-day Count

The 819-day count is a little understood piece of esoteric chronology. We can read most of the glyphs, but we have no idea what they are talking about. There is a series of sentences featuring God K, K'awil, who is said to move through a series of four quadrants, counter-clockwise. The quadrants are named as East, North, West, and South. The information given is (for the Initial Series date) how many days it had been since God K entered the current quadrant, and the date of that event. Actually, we can't read the event glyph, but "entered" seems to make the most sense; to be safe, we just call this "the 819-day Count verb" (Fig. II-11). Thompson (1960) established that these counts had to do with intervals of 819 days each, and noted that 819 is the product of several numbers of importance to the Maya, namely 7, 9, and 13. He hypothesized that these related to something cycling through the nine levels of the Underworld (the Lords of the Night), seven levels of the earth, and 13 levels of the heavens, the three cycles returning to their starting point after 819 days. He tested various astronomical cycles but was unable to discover any astronomical correlations with these cycles, nor has anyone else succeeded. The meaning of the 819-day count thus remains a mystery.

Fig. II-12. Distance Numbers

PAL Cross U6-T10

T U



It was 1 day, 1 winal,

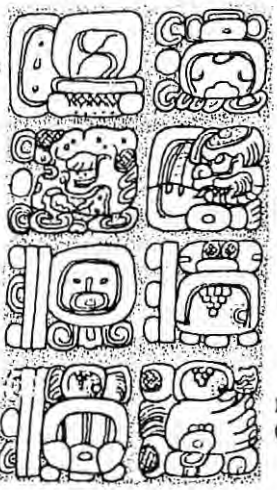
and 1 tun — since the birth

of (titles... — ...titles)

Aj Kul Mo' Nab — and then was born

Kan Balam.

PAL Palace Tablet E15-F18



DNIG: *u tz'akaj* (Time) added segments — for 1 day, 0 winals

and 1 tun (since the last event) — *i uri* and then it came to be

12 Ahau — 8 Ceh

the 11th k'atun. (9.11.0.0.0) — He set the stone (erected the monument).

PAL Palace Tablet M9-N12

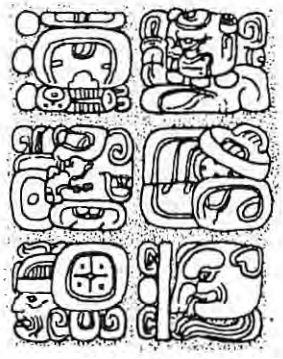
It had been 5 days and 1 winal — since (with respect to) 7 Ahau

3 Cumku — the 1/2 Period Ending (9.13.10.0.0)

and then died — and was buried

K'inich Kan B'alam — Holy Palenque Lord.

PAL Palace Tablet M13-N15



3 days and 5 winals after (**la-ta**) — the death of

White Headband (the king Kan Balam) — and then it dawned

on 5 Lamat — 6 Xul.

It has occurred to us that there might be an earthly institution referenced here, not a supernatural one. First, God K is now known to be the patron of royalty, the symbol of authority – kings hold God K scepters on important occasions. Second, we know from at least late Postclassic times in Yucatan that towns were often divided into four quadrants, through which certain civil positions cycled. Third, in the Codices there are numerous charts that record cycles of time including 9-day intervals, 13-day intervals, etc. Much attention has been paid to unravelling the mathematics of these tables, but their purpose is not known. Our working hypothesis is that all these elements fit together in something like a cargo system in which there are three (or more) ceremonial organizations in each quadrant of a community that celebrate or otherwise function on days separated by intervals of 7, 9, and 13 days. The celebrants of all organizations in a given quadrant begin their activities on the same day; since there are no common factors among the numbers, their celebrations do not coincide for 819 days. After 819 days all the putative cargo groups once again celebrate on the same day, and authority (represented by God K) moves to the next quadrant. There is no way to prove this, of course, but we are supported by one of the most powerful arguments used in Maya epigraphy: It works for me!

Distance Numbers

Once the base date of an inscription has been established by an Initial Series or with a Calendar Round date locked into absolute time by some other mechanism, later dates in the inscription can be referred back to the base rather than being tied to some external time anchor.

The mechanisms for tying dates together throughout a monument usually involve Distance Numbers. Distance Numbers stand between two dates and state the time interval that separates them. They are the equivalent of the italicized phrase in "On July 4, John went to Chicago. *Four days later*, on July 8, he returned." Since the time interval is stated, we can be certain that the July 8 on which John returned was the one four days after the starting date, not the one a year later or ten years later. If the first date is known to be July 4, 1988, we know that the second date is July 8, 1988.

The time periods in the Distance Numbers are written with the same glyphs used in the Initial Series, although the abstract or geometric variants are most commonly used (it's hard to think of an example where head variants or full-figure glyphs are employed; there may not be any). Likewise, the numerical coefficients are almost always expressed in bar-dot numbers.

What is striking about the way the Distance Numbers are written is that the order of time periods is reversed from that used in the Initial Series. That is, the number of days is first, then the months, the tuns, the k'atuns, and so on: k'in, winal, tun, k'atun, b'ak'tun. Second, the glyph for days, k'in, is almost always suppressed, slid behind the winal glyph, with only its coefficient left showing. Visually, it appears that the winal glyph has two coefficients, but the one to the left or above – the one that occupies the upper left corner of the glyph block – belongs to the k'ins, not to the winal.

A Distance Number may be introduced by a verbal expression which means something like "time passed," forming a sentence that reads "time passed for so many days, months, and years..." This verbal expression (Fig. II-12) is known in the literature as the Distance Number Introductory Glyph (DNIG). Various readings have been suggested, but the most commonly accepted is **tz'akaj**; **jelaj** is also a possibility. Both verbs (here in passive forms) refer to extending a series, **tz'ak** by adding segments, **jel** by replacing element after element in a series. A paraphrase might be "days were added for so much time" versus "days replaced each other for so much time."

Other kinds of Distance Numbers occur, although not all of them are traditionally called Distance Numbers. Occasionally there are expressions like "the next day" or "on the third day" which are not written like standard Distance Numbers but which have the same function.

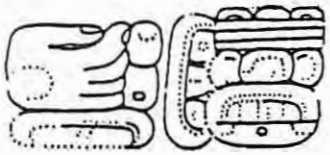
Fig. II-13. Word Order in Sentences

Transitive Sentences

1 Ahau 13 Mac u tal kab' Matawil.
On 1 Ahau 13 Mac he-touched-earth Matawil.
Temporal, Pronoun-Verb-Object, Subject

U ch'am yax tun [name] *Ch'uh Yochib' Ajaw.*
He-set-new-stone Ruler 4, Lord of Piedras Negras.
Pronoun-Verb-Object, Subject

Intransitive Sentences



Ended the 16th k'atun.
Verb-Pronoun (ø), Subject

I uti 6 Etz'nab 11 Yax.
And then it was 6 Etz'nab 11 Yax.
Conjunction Verb-Pronoun (ø), Subject

Neb'i K'inich Pakal.
Died Lord Pakal.
Verb-Pronoun (ø) Subject

Positional Sentences

10 Muluc 17 Uo lik'wan u pasib' yotot Ix Uk.
On 10 Muluc 17 Uo was dedicated the doorway of the house of Lady Xok.
Temporal, Verb-Pronoun (ø), Subject (Possessed Noun Phrase)

Chumlaj ta Ajawle K'inich Aj Kul Mo' Nab'.
Seated as Lineage Lord (was) Aj Kul Mo' Nab'.
Verb-Pronoun (ø), Complement, Subject

Chumwan ta Hun Ix Yol Ik'nal Ch'uh Bak Ajaw.
Seated as Ruler (was) Lady Yol Ik'nal of Palenque.
Verb-Pronoun (ø) Complement, Subject

Equative Sentences

U chan Muluc Ajaw K'an Tok... Kahal.
The captor of Lord Muluc (is) K'an Tok... Chieftain.
Predicate (Nominative), Subject

X4 u ch'uh k'ab'a'.
X4 (is) her holy name.
Predicate (Nominative), Subject

Distance Numbers are often found in association with a following sentence that expresses the occurrence of the date to which the Distance Number leads. These expressions use the verb **ut** "to happen, to come to pass." Thompson (1960:163) thought this was the verb **xok** "to count" and the preposition **ti** "to," meaning "count to (**xok ti**) such and such a date." This turns out to be a confusion of an iguana head (**hu** or **ho**) with a shark (**xok**). The glyph is now thought to be *ut-i*, the past tense (completive aspect) of the verb *ut*, spelled out **u-ti**, The meaning of these expressions is something like "So much time went by; such and such a date came to pass."

Two elaborations on the verb **ut**, one of which identifies a date as having been earlier, the other as being later, were called by Thompson (1960:162-166) the Anterior Event Indicator (AEI) and the Posterior Event Indicator (PEI). We now read these as AEI **ut-i-y(a)**, *utiy* "it had happened" and PEI **i u-ti**, *i uti*, "and then, it happened." The sentences in which these are used can be read something like "After so much time had passed, it came to be the date so-and-so."

Word Order

The order of elements in a hieroglyphic text is directly comparable to the order of words in a sentence, and changes in normal word order are among the most important indicators of informational importance. Normal, expected ("unmarked") word order does not stress any one part of the sentence over another. Unexpected ("marked") word order focuses attention on a particular element within the sentence and thus indicates its increased importance in the development of the narrative. New information is often presented in marked constructions; old information is downplayed and may even be omitted from a sentence in order to highlight what remains. Important new information may be repeated several times, or elaborated on by adding extra bits of new information in each restatement.

Hieroglyphic texts are very poetic in their structure, as are traditional Mayan texts whether they be prayers and rituals or tales of gods and heroes. The grammatical structures which characterize these language styles are formal and constrained. Where our poetry is governed by patterns of rhythm and rhyme, theirs is revealed in patterns of repetition and coupleting in stanza structures and parallel constructions and in word plays of many kinds.

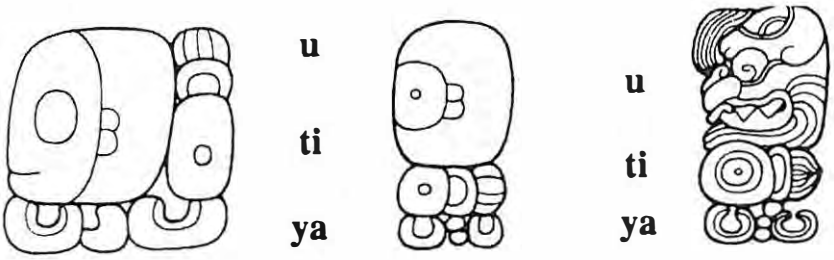
In the hieroglyphic inscriptions (Fig. II-13), normal (expected, unmarked) word order is the same as in modern Chol and most other Mayan languages. This is usually stated to be "verb initial," meaning that in a simple transitive sentence with only three elements – actor (Agent or Subject), action (Predicate or Verb) and recipient of the action (Patient or Object) – the order of these elements is Verb followed by Object followed by Subject, or VOS. That is, a sentence with English word order SVO ("the boy hit the ball") would be rendered as VOS ("hit the ball the boy").

A sentence with an Intransitive or Positional Verb as its predicate would have only two major elements, the Verb and the Subject, VS ("he came," "he sat", that is, "came he," "sat he"). There are other kinds of predicates that are "non-verbal," those that we know as Predicate Nominative (with a noun in place of a verb, "he [is] a man") and Predicate Adjectives, with an Adjective in place of the verb ("it [is] red"). (Note that in Mayan languages, there would be no verb "is" in these sentences, i..e., "man he," "red it"). The order of elements is still Verb(-like thing) initial.

If other sentence elements are added, unmarked order would put them at the end of the sentence: "sat he on the throne," "went he yesterday." But Mayan languages tend not to pile too much information in any one sentence. The preference is to express the elements in a series of sentences. Thus, instead of "Sat he on the throne holding the God K scepter," we would get "Sat he on the throne. Held he the God K scepter."

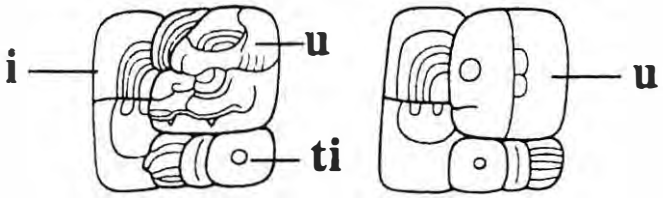
Fig. II-14. The Event Verb **ut** 'to come to pass'

The "Anterior Event Indicator" **u-ti-ya**, *utiy*



Intransitive verb *ut*, completive *ut*-i, perfective *ut-i-y*, *utiy-ø* "it had happened"

The "Posterior Event Indicator" **(i) u-ti**, *(i) ut-i*, *i uti-ø*, "and then it came to pass"



Conjunction *i*, intransitive verb *ut*, completive *ut-i*,
i ut-i-ø "and then, it came to pass"

The Future Conjugation of *ut*, **u-to-ma**, *utom-ø* "it will be"

Intransitive verb *ut*, future *ut-om*,
utom-ø "it will come to be"

In a series of such sentences, it is common for the Subject to be named in the first one, and to be represented only by a pronoun in successive sentences. In discourse analysis terms, in these paragraph-like text segments, the Topic (protagonist) is established early on, and can then go without overt expression (as a pronoun) in later sentences. This allows us to identify the Subject of a sentence where the name or title is not expressed and the pronoun might be ambiguous. This is the same problem that English teachers discuss as the identification of the antecedents of pronouns.

Since most monumental texts are historic in nature, dates are often emphasized, by placing them at the front of the sentences. This manner of placing emphasis is called "fronting," and is a kind of "foregrounding." bringing to the readers attention some sentence element (as opposed to "backgrounding," decreasing the importance of an element). Techniques for foregrounding used in hieroglyphic texts are (1) elaboration, e.g., adding to a ruler's name a series of titles, a parentage statement, etc. (2) fronting or promotion, as discussed above, and (3) the use of marked syntax, unusual grammar or deleted elements.

Events and the Event Line

An "event," very simply, is an incident in the story, an action, a situation, the presentation and description of a character. Usually these are expressed grammatically using verbs or other predicates. In hieroglyphic inscriptions, these verbs include glyphic expressions for birth, capture, accession to office, acts of holding or displaying ritual objects, making offerings, and the dedication of monuments and buildings.

Even a date can be an event, especially if the date represents the completion of a major time cycle (a Period Ending). A Calendar Round (CR) date can function as the subject of certain verbs, like **ut** "come to pass" (in the AEI or PEI). The combination of a numbered Period Ending and a Calendar round also may form a predicated expression; for example, the text of Tikal Stela 22 begins with the verbal expression of the date: "13 Ahau 18 Cumku was the 17th k'atun" (i.e., the 9.17.0.0.0 Period Ending fell on 3 Ahau 18 Cumku, or "On 13 Ahau 18 Cumku the 17th k'atun ended."). The Initial Series itself is probably a series of events forming the background of the events to be reported in the text.

Distance Numbers may also be expressed as events, as discussed above. The function of the Anterior and Posterior Event Indicators was understood early on, but what has been shown more recently is their role, in discourse terms, to mark background versus foreground events on a narrative event line.

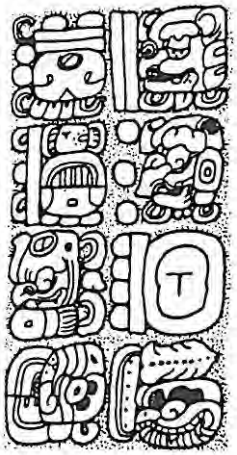
Background and Foreground

The Anterior Event Indicator and the Posterior Event Indicator (AEI and PEI) are inflections of the verb **ut** "to happen, to come to pass," representing the verb phrases **u-ti-y(a)** *ut-i-y* "it had happened" and **i u-ti** *i ut-i* "and then it came to pass" (Fig. II-14). These contrast in two ways; the common tense or aspect inflection on the verbs is the suffix *-i*, marking the events as completed or non-present (completive aspect). The AEI has a further inflection, marking the completed action as prior to another one (about to be mentioned), the suffix **-y(a)**, *-y*. The PEI lacks this suffix, but has a preposed conjunction **i**, read *i*, that we translate "and then" and call the "focus marker." This contrast between the glyphs T126 (**ya**) on the PEI and T679 (**i**) marks the difference between backgrounded information (the former) and foregrounded information (the latter).

If the event verb of the backgrounded event is present (and it is often deleted), then it will also bear the suffix T126. If it is not present, then the event the time is being counted from is usually the last event mentioned. However, the scribes are more inventive than that, and it is not unusual for the event referred to to be an event mentioned much earlier in the text. For this reason it

Fig. II-15. Examples of the Use of the Verb *ut* and the Conjunction *i*.

PAL Cross E10-F13



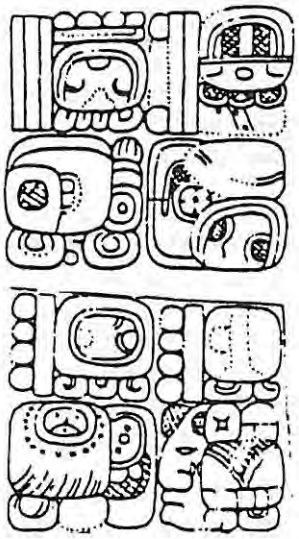
2 days, 12 winals, 10 tuns,

6 k'atuns, and 3 b'ak'tuns

had gone by since 9 Ik

and then was born U Kokan Chan

PNG Stela 1, D2-G2



15 days, 9 winals, and 12 tuns

had gone by (since the last event) and then, it dawned on

9 Chuen 9 Kankin.

Sequestered was Lady Chan Ajaw.

PAL 96 Glyphs E7-H2

u jelaj
Followed in order
(like Venus & the Moon)

5 days, 14 winals,

2 tuns, and 2 k'atuns,

and then it came to be 9 Manik

15 Uo seated as lord
(was K'uk' Balam)

Note that *utiy* "had gone by" is implied
by the suffixation of T126 **ya** to the time periods.

is essential that the chronology of the text be worked out; if the Distance Numbers don't lead to (or from) the right Calendar Round date, something is wrong.

In working out the narrative structure of a text, the backgrounded events must be distinguished from the foregrounded events, because the former are not "on the event line." If the chronology of only those events that are on the event line is considered, then we can understand the narrative structure of the text much better. For instance, a step backwards in time from one event-line event to another signals a break in the text; a new episode is about to begin, and may have a new Topic. But a step back in time from an event-line event to a backgrounded event is insignificant in terms of text structure.

Episodes and Peak Events

Most Classic monumental inscriptions are narrative texts, that is, they tell a story. Maya history is not related as a series of sequential events, but narrated, with all the literary style one might expect from a highly developed civilization. Classic scribes used a variety of devices to make their stories more engaging, and we have learned about many of these by studying the techniques of modern storytellers in the Mayan area; their styles are remarkably similar.

A narrative consists of a series of events. The events are not necessarily related in chronological order, but the time line may go back and forth from later to earlier events and back again. Working out the time line is essential to the understanding a Classic Maya text.

In a long text, there will not only be several events, but some of the events may form paragraph-like sets that we call **episodes.** An episode is composed of a group of events (OK, sometimes only one!) that are tied together by a common time frame within which the events develop, usually sequentially. For any episode, there will be a Topic – a central character or protagonist. This topic should be identified early in the episode, but after that he/she/it may be referred to only by ambiguous pronouns. This presents a problem in "participant tracking," but the rules are straight-forward: if the subject is not specified, it is the same as the topic of the episode. (Warning: For dramatic purposes, the scribe sometimes chooses to suppress the identification of the protagonist until the end of the episode.)

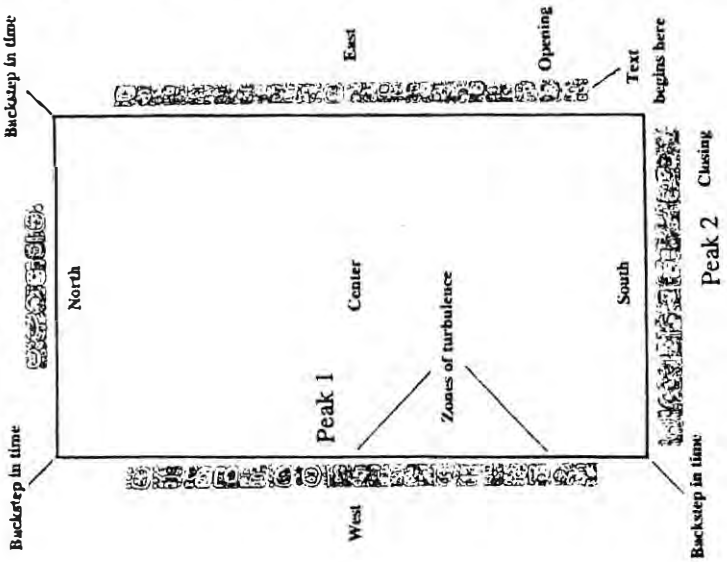
Within an episode, there will be a **peak event**, an event on the event line of the narrative, like the key sentence in a paragraph, the one that tells you what the paragraph is all about. Other events referred to may be background, interesting or necessary additional information that is not on the event line. Among the event-line events in an episode, the peak event should be distinguished by some form of foregrounding – coupleting, elaboration, unusual syntax, etc. Among the various episodes of a text, and usually towards the end of the narration, there will be a **peak episode** containing the most important event in the narration. In hieroglyphic texts, peaks are often preceded by the conjunction *i* "and then..." (Fig. II-15).

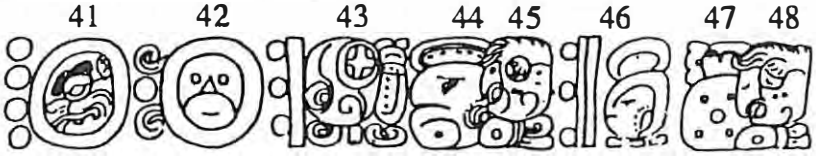
In a sense, all the non-peak events of a text are background to the main event, and they are directly related to that event through a variety of techniques, including temporal connections using Distance Numbers, Calendar Rounds and anniversary expressions, and personal connection via expressions of parentage and ancestry or succession in political rule.

The Zone of Turbulence Surrounding the Peak

It was long recognized by epigraphers that just when a text seemed to be approaching the most important events the text got harder to read. This problem was finally understood only when we brought to the epigraphers' attention some of the observations that had been made from studies of modern storytelling among the Maya and other Mesoamerican peoples. In Mesoamerican

Fig. II-16. Zones of Turbulence Surrounding the Peak

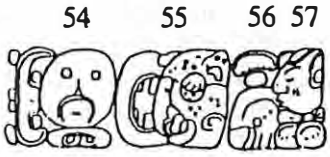




Inserted sentence:
1 Ahau 8 Kayab, tun-seating of Sak K'uk'.

4 Chicchan... ...13 Yax died Sak K'uk'.

West Edge:

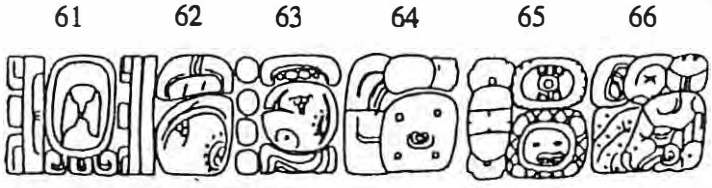


The child of K'an Mo' Hix,
the child of Lady Sak K'uk'

Fronted Parentage Statement; it usually follows the king's name.

South Edge:

on 8 Ahau 13 Pop was born.



On 6 Etz'nab 11 Yax,
4 were his tun-seatings,

and then died K'inich Pakal,
Lord of Lords.

narratives, the linguist Robert Longacre reported, there is a "zone of turbulence surrounding thepeak." That is, at or near the peak event of a narrative, special effects set in. There may be unusual syntax, deletion of seemingly important information, or other deviations from the expected that mark this event as the peak of the narrative.

Two good examples of this zone of turbulence are found on the Sarcophagus Rim inscription from Pakal's tomb at Palenque (Fig. II-16, top). The text reads from the east side of the rim counter-clockwise around the sarcophagus. The first half or more of the inscription (east side, north side, and part of the west side) gives background events, the deaths of a series of Palenque rulers. As we approach the peak event (the death of Pakal), there is first a minor peak, the death of Pakal's mother (who ceded the rule to Pakal) and then the major peak, the death of Pakal.

There are two zones of turbulence. First, two statements about Lady Sak K'uk', Pakal's mother, are intermingled; one is inserted in the middle of the other, making the glyphs impossible to read in sequential order (Fig. II-16, middle). The two sentences are: "[On 9.10.0.0.0] 1 Ahau 8 Kayab [was] her Period Ending" and "[On 9.10.7.13.5] 4 Chicchan 13 Yax died Sak K'uk'." But the order of the glyphs is: "4 Chicchan 1 Ahau 8 Kayab her Period Ending 13 Yax died Sak K'uk'."

Second, the approach of the major peak is signalled by the fronting of Pakal's parentage statement from its normal position after his name to the west edge of the sarcophagus, following his mother's and father's deaths (Fig. II-16, bottom). Until discourse rules were applied to this text, epigraphers tried to connect this parentage statement to Pakal's father, just named. But that meant that K'an Mo' Hix, Pakal's father, was the son of another K'an Mo' Hix and a woman named Lady Sak K'uk', like his wife, and that made no sense at all. The actual peak event, the death of Pakal, is marked by the "focus marker," T769. The last episode of the narrative thus reads "The child of K'an Mo' Hix, the child of Lady Sak K'uk', on 8 Ahau 13 Pop was born. On 6 Edznab 11 Yax, 4 were his Period Endings, and then died Lord Pakal, King of Kings." (Pakal lived through the four Period Endings from 9.9.0.0.0 to 9.12.0.0.0.)

Divisions of the Text

In modern Maya storytelling, new episodes are often introduced by special phrases like "and then," or "so," e.g., Chuj *yuj chi'* "for that reason," Chol *'añ che jiñi*, "and so it was." In the hieroglyphic texts the transition from one episode to the next is most frequently marked by a temporal expression, like a Distance Number to a new date. But there is a variety of devices that can be used. Some texts signal the upcoming peak event by inserting an Initial Series Introductory Glyph and an entire Initial Series with Supplementary Series, in effect beginning the inscription all over again (e.g., Tikal Stela 31, Fig. II-17).

On the Palace Tablet at Palenque (Fig. II-18) two peak events, the accession of K'an Joy Chitam and his last recorded event, the dedication of a structure to house an ancient headdress, marking his return after captivity at Tonina, are introduced by Calendar Rounds followed by Supplementary Series.

Piedras Negras Stela 36 (Fig. II-19) appears at first glance to be a straight-forward text listing sequential events connected by a Distance Number (C3-D3). But it is not at all what it appears. The Distance Number breaks the text; it connects the next event to the final event, forming a section thatis not chronologically connected to the initial segment of the text (A1-D2).

Sometimes the transition to a new episode is marked simply by the introduction of a new Calendar Round, with no Distance Number stated. And there are various ways the Distance Numbers can be phrased, as well: using a DNIG or not, using the suffix **la-ta** on the Distance Number, using phrases like "the next day," and so on.

Fig. II-17. Tikal Stela 31

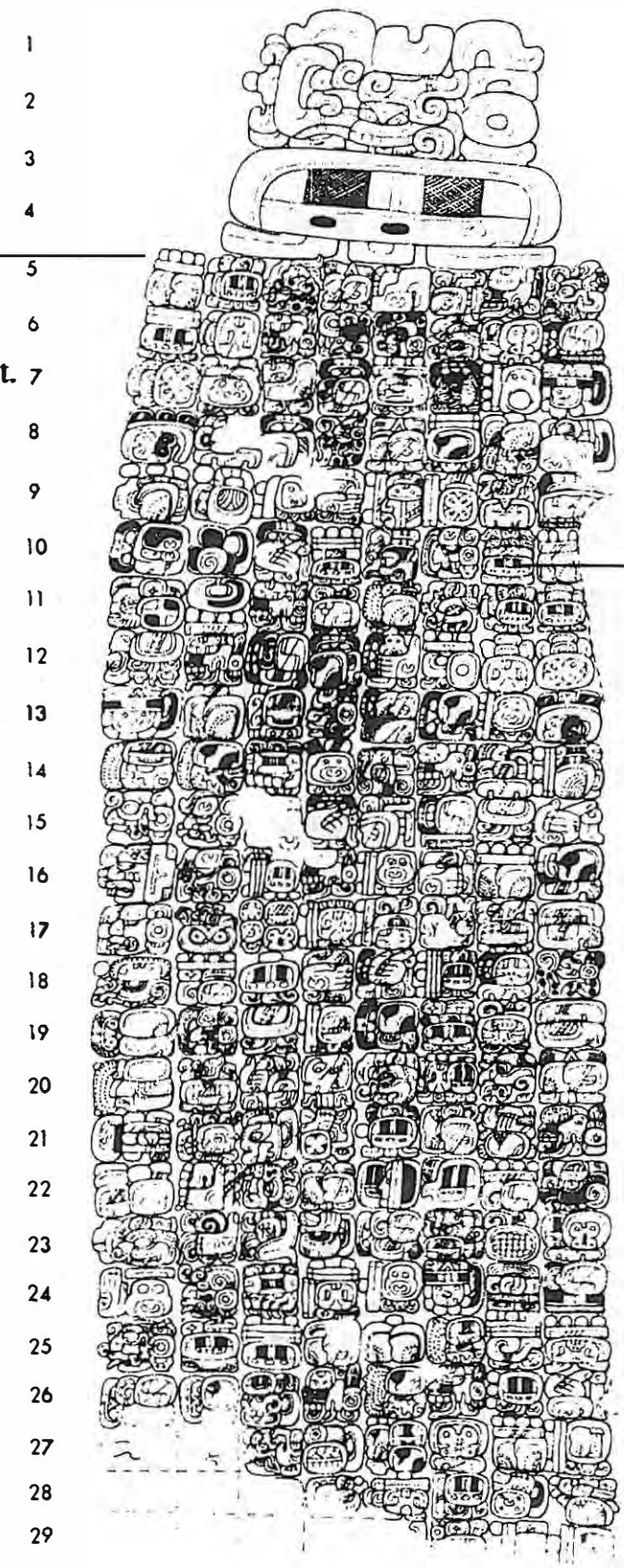


Fig. II-18. Palenque, Palace Tablet

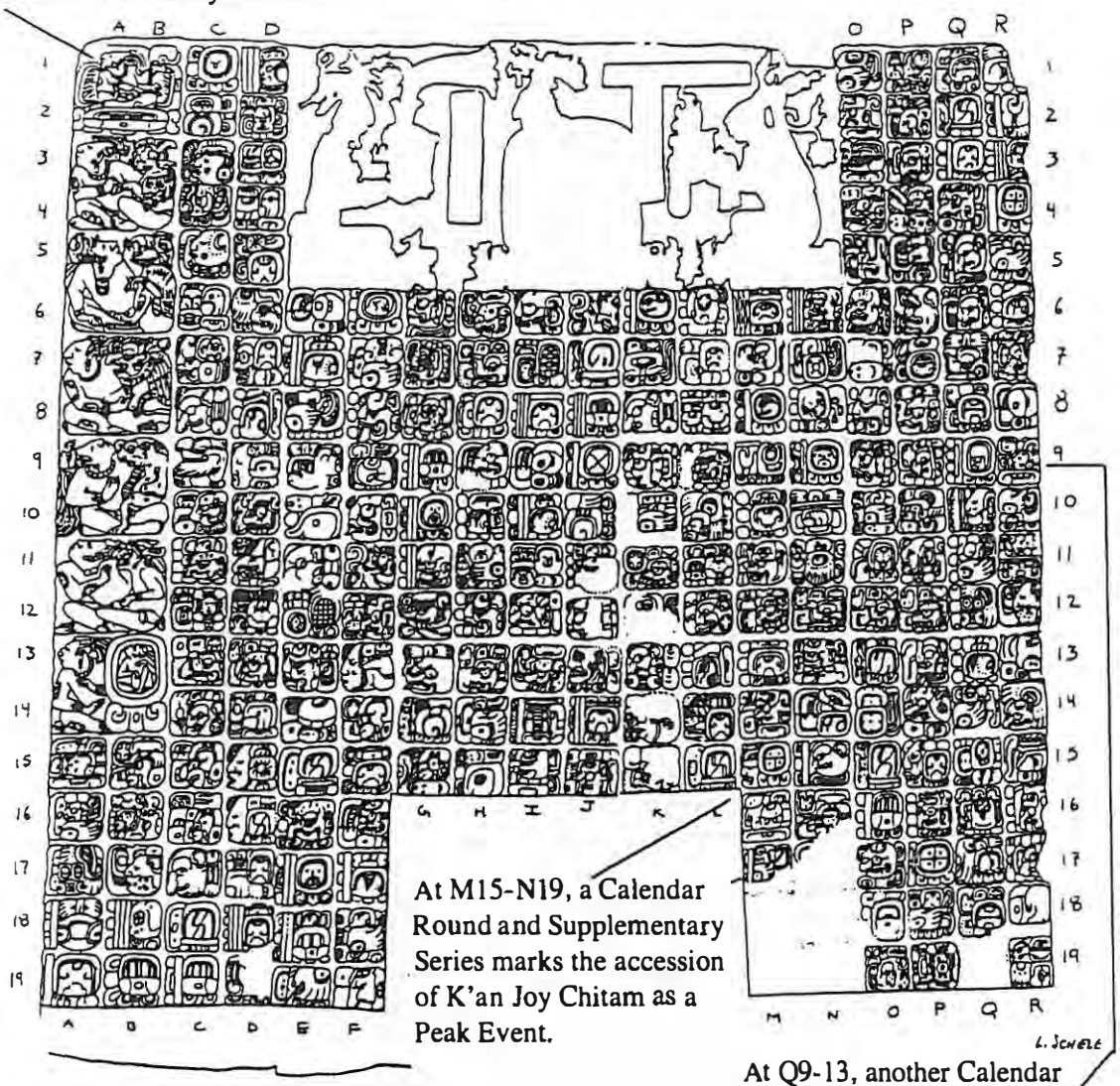
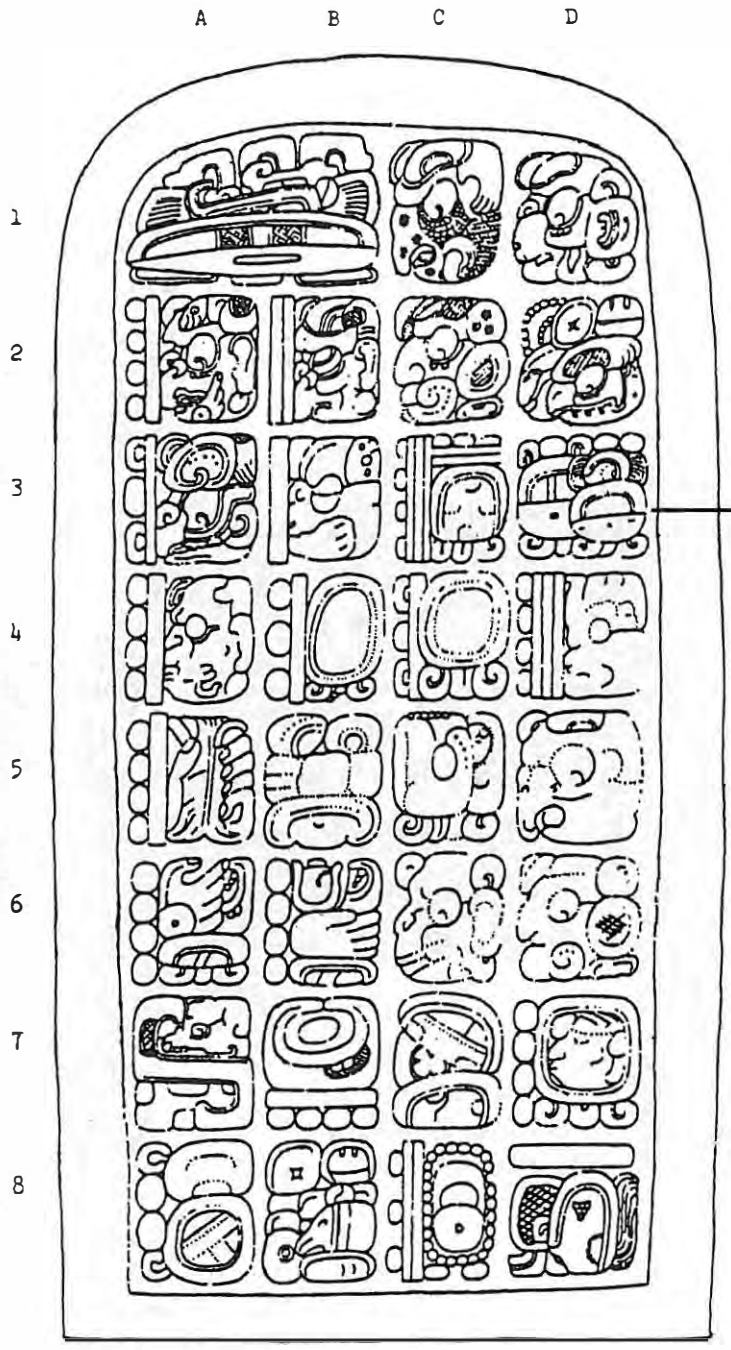


Fig. 19. Piedras Negras Stela 36



The Distance Number does not connect the first event (accession) with the event that follows (birth). Rather, it connects the birth to a Period Ending. The step back to an earlier event, birth, marks a break in the text.

John Montgomery

In the text of the Palace Tablet from Palenque (Fig. II-18), there are five different configurations of Distance Numbers (DNs). The most frequent pattern is typical of Palenque's texts, a Distance Number Introductory Glyph (DNIG) followed by a Distance Number with T126 suffixes, then the Focus Marker-PEI combination, *i uti*, a Calendar Round and an event: "So much time passed, and then it came to be Date X. Event Y happened." But four other patterns occur: (1) DNIG DN *lata*, (2) DN *lata*, (3) DN alone, with T126, and (4) DN-T126 plus the "snake" prefix on the Calendar Round that marks a back reference. This exercise of options probably has a discourse function that we have yet to appreciate.

Understanding the workings of these devices in a text is the key to unravelling the inscription. An essential first step in studying an inscription is to work out its chronology. Every Calendar Round implies an underlying Long Count, and every date in the text must be tied to these time anchors. Within an episode, events are usually related in a continuous, sequentially-ordered time line. But when the time line is interrupted, by backing up in time or by beginning with a new reference point, or even by going forward with no stated connection to the last events, we can consider that a new episode is beginning. A new topic is likely to be introduced, and the syntax and content of the sentences may suddenly change.

These manipulations of the language of the text are not intended to confuse the reader. The purpose of an inscription is to convey information. But information does not have to be presented as a dry list of events. It can be told as an interesting and even engaging story and an illustration of the literary arts of the scribe. The Maya have long been admired for the quality of their architecture, their ceramics, their murals, and other art forms. It is only now that we are beginning to see that the quality of their literature is just as impressive.

The Grammar and Lexicon of the Classic Inscriptions

In order to fully understand an inscription, an acquaintance with the grammar of the Classic language and its vocabulary are obvious assets. There are now a number of introductions to that subject matter available in books and on-line resources. We especially recommend the late John Montgomery's books *How to Read Maya Hieroglyphs* and *Dictionary of Maya Hieroglyphs*, both published by Hippocrene Books, New York. Portions of the latter are also on line at FAMSI's magnificent website (www.famsi.org/mayawriting/dictionary/montgomery/index.html). The FAMSI website also features a very useful study guide by Inga Calvin, a series of lessons that can be downloaded at no cost (www.famsi.org/mayawriting/calvin/). Many other resources are found on the FAMSI site, including Linda Schele's drawings and Justin Kerr's rollout photos of ceramics. FAMSI (the Foundation for the Advancement of Mesoamerican Studies, Inc.) was a major funder of small grants for research in Mesoamerica, and the reports of that research are also available online.

THE COUNTING BOARD

We can simulate the Maya abacus by making a "counting board" that uses drawn boxes instead of shells to create the positions. The board is laid out in boxes that represent the powers of twenty, with the ones at the bottom, and, in our case, the 160,000s (20 x 20 x 20 x 20 x 20, or 20^5) at the top. In order to do addition and subtraction, we lay out a series of columns of boxes, each column or stack representing a different number in our manipulations.

To do addition, there are only two rules to remember: (1) five dots or beads equal one bar, and (2) four bars in one position equals one dot in the next highest position. To do a problem in addition, first think of the number in Maya terms.

Addition. For instance, let's add 873 to 214. Convert 873 to Maya terms: 2 x 400, plus 3 x 20, plus 13. Write that in one of the box stacks: two bars and three dots in the lowest box, three dots in the second box, and two dots in the third box.

Now convert 214: 10 x 20, plus 14. Write that in the second column or stack of boxes: two bars and four dots in the bottom box, two bars in the next highest box.

To add the two numbers, simply push all the bars and dots from one column into the corresponding boxes of the other column. Now you will have four bars and seven dots in the bottom box, two bars and three dots in the second box, and two dots in the top box. Now apply the rules. (1) Five dots makes a bar; the bottom box now should have five bars and two dots. (2) Four bars in one position is equal to one dot in the next highest position. Four of the five bars in the bottom box are removed, and another dot is placed in the next highest box. Now you have:

2 dots in the highest box:	2 x 400	cha' b'ajk'
2 bars and 4 dots in the next box:	14 x 20	chan-lajun k'al
1 bar and 2 dots in the lowest box:	7 x 1	huk.

Or, 800 + 280 + 7 = 1087 (= 873 + 214). Wasn't that fun??!! The key is to think of, and write, the numbers in Maya terms rather than European ones. After all, it's a Maya number system!

Subtraction. Now let's reverse the process. Let's subtract 214 from 1087 (to make it easy). Take from the column with 1087 written in it enough bars and dots to make 214, and put them in the other column. That is, remove 200 (2 bars) from the second level, and 14 (2 bars and four dots) from the bottom level. What's left in the original column is the "remainder," the number we started with, 873. For some operations, if there is not enough in the position you have to take from, you will need to "borrow," e.g., convert a dot in the 20s position to 4 bars in the ones position.

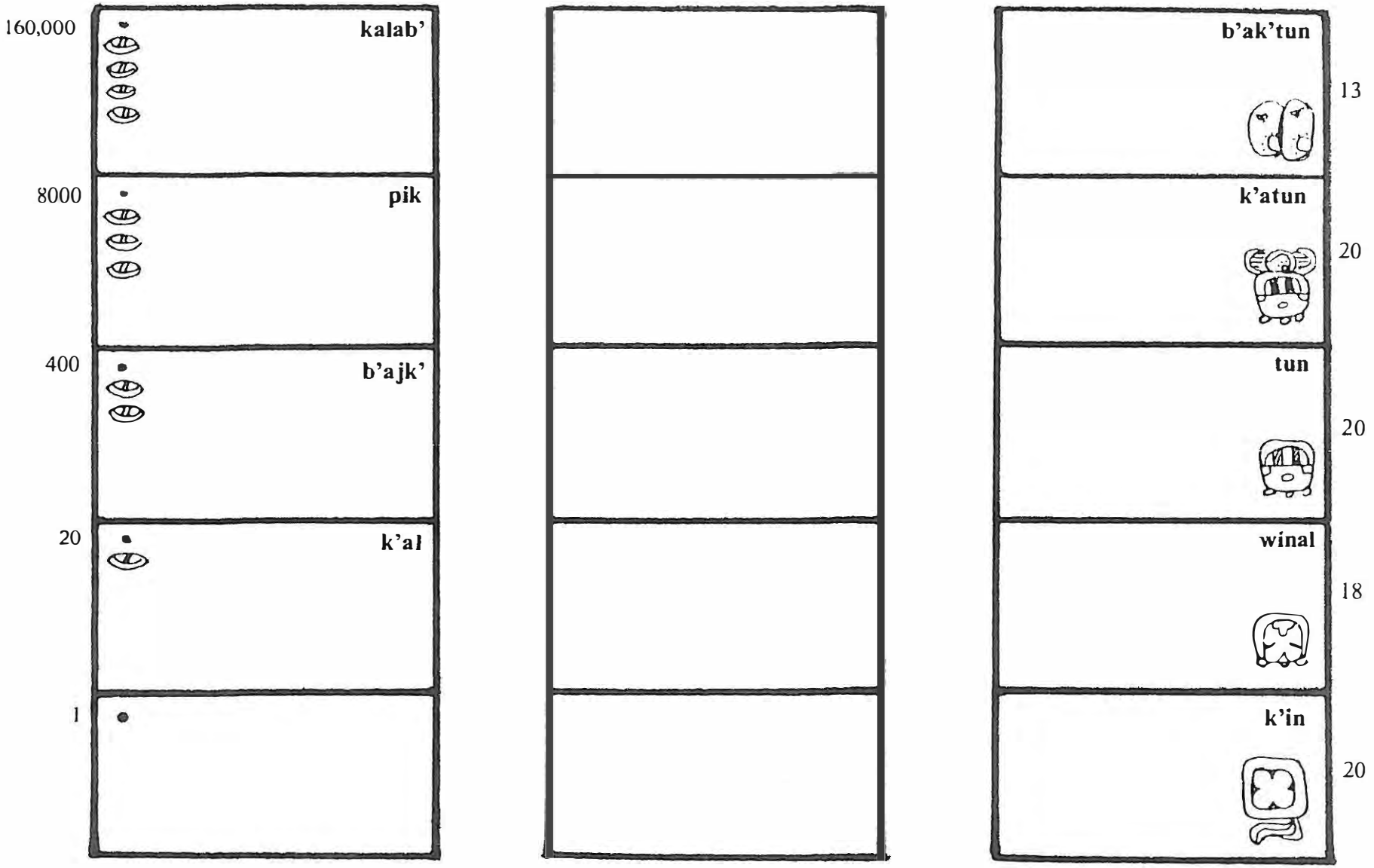


Fig. II-20. A Maya Counting Board