

## 1 Learning to Read

STANDING AT THE CORE of the Mayan writing system are the signs for dates from a divinatory calendar that was shared with the rest of Mesoamerica. Each date combines a day number, taken from a repeating series that runs from one through thirteen, with a day name, taken from a series of twenty names that run concurrently with the numbers. Because thirteen and twenty have no common factor, there are 260 possible combinations of number and name.

As a mathematical device and a measure of time, the divinatory calendar has more to do with the human body than with astronomy. A full moon is thirteen days old, as measured from the first appearance of a crescent on the western horizon at dusk, but thirteen is also the number of major points of articulation in the human body: ankles, knees, hips, wrists, elbows, and shoulders, all of which come in pairs, and the neck. The number of toes and fingers is twenty, and  $13 \times 20 = 260$  days—which, by Mayan reckoning, is the ideal interval between the diagnosis of a pregnancy and the birth of a child.

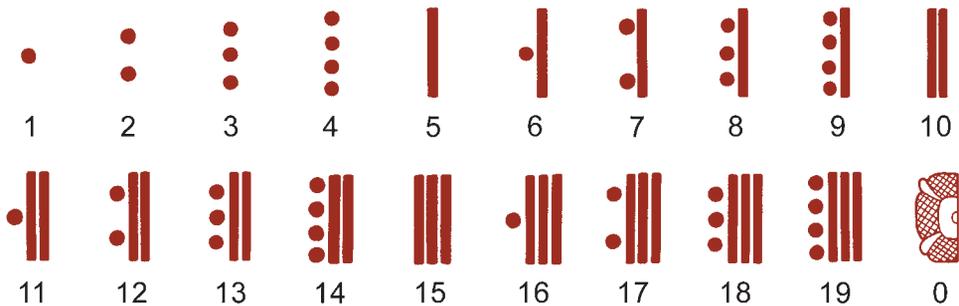
The known history of the Mesoamerican divinatory calendar begins around 700–500 B.C.E., when it made its first appearance at a Zapotec site in the Mexican state of Oaxaca. The Mayan communities of highland Guatemala have never stopped using it, and their version has recently become available in printed appointment books. Ancient texts in the Mayan script nearly always include divinatory dates, and the signs for writing them remained unchanged over a very long period. A Mayan who could read a divinatory date written in 1511, the year in which Spaniards first came ashore in Yucatán, would have had no difficulty reading dates written twelve centuries earlier.

Judging from the evidence of graffiti, Mayans who were marginally literate were able to write divinatory dates, even if they were unable to write anything about the events connected to those dates. During the Classic period, graffiti were commonly incised on the plastered interiors of rooms. Most of these inscriptions are pictorial, but signs from the writing system appear here and there, sometimes rendered in such a sketchy fashion that they look like attempts to imitate writing. The legible inscriptions usually take the form of divinatory dates, often appearing in isolation rather than forming part of a larger text. Here is a date from a wall in the ruins of Tikal, next to a formal version of the same number and name. On the left side of both versions is the number 8, rendered with three dots (each with a value of one) and a bar (with a value of five). The day name is Ajaw, meaning “Lord.” The person who scratched it on the wall left out the oval frame and trefoil device of the formal



version, but this omission does not change the way the date would be read aloud. Instead, the frame and trefoil have a purely semantic function, reminding the reader that the reference is to the day named Ajaw rather than to a person who bears the title *ajaw*.

Numbers in Mayan texts nearly always concern the measurement of time, and like the number 8 in the date above, they are usually written using a bar-and-dot notation system rather than by using signs that correspond to the words of a specific language. I have chosen to translate bar-and-dot numerals with their arabic equivalents, which can also be read in more than one language. The numerals constructed with bars and dots range from 1 to 19, and they are used in combination with signs for zero such as the one included here:



When numbers modify nouns, they are usually prefixed in a vertical position, like the ones shown above, but they can be written horizontally, in which case the dots go above the bars. In the dates inscribed on monuments, a sign in the form of the profiled head of the number's patron deity may take the place of bar-and-dot notation. Here, for example, are the patrons of the numbers eight, nine, and ten. The patron of the number eight is Nal, who is named for an ear of corn. The name of the patron of nine, Yax B'alam or "First Jaguar," includes a play on the sound of the word for the number, which takes the form *b'olon*



in the principal languages of the inscriptions. The patron of ten is Kimi, or "Death," perhaps because *lajun*, the word for the number, suggests *laj*, which means "the end." We do not know whether a person reciting from an inscription with such signs would have named the deities or the corresponding numbers, or both.

Numbers higher than 19 are written using place numeration. Bar-and-dot numbers and zeros (if needed) are arranged in a vertical column, with the values assigned to the places increasing upward. In general, the successive values increase by a multiple of 20 (as contrasted with 10 in a decimal system), but the value assigned to the third place is 360 (an approximation of the solar year) rather than 400. In the fourth and fifth places, the progression returns to multiples of 20, with  $20 \times 360 = 7,200$  in the fourth place and  $20 \times 7,200 = 144,000$  in the fifth. Numbers with as many as five places are usually dates from a calendar known as the long count, which measures the number of days that have elapsed since a hypothetical zero point equivalent to August 11, 3114 B.C.E. in retrospective Gregorian reckoning. In the long-count date at the top of the next page,

taken from an almanac in a book, the lowest of the five places is occupied by a sign for zero that represents an empty shell. Expressed in decimal terms, the value of the highest place in this number is 1,296,000, followed by 64,800 in the fourth place, 3,240 in the third, 320 in the second, and zero in the first and lowest place. The grand total is 1,364,360 days, and the equivalent Gregorian date is February 7, 623 C.E.

	9 x 144,000
	9 x 7,200
	9 x 360
	16 x 20
	0 x 1

In dates from the 260-day calendar, the day names that follow the numbers are written by drawing upon a set of twenty signs that are logographic, which is to say that each of them stands for an entire word. The signs are different from the ones used in other Mesoamerican writing systems, and in that sense they call upon the reader to interpret them as words in a language of the Mayan family. Even so, the signs transcend linguistic differences to the extent that they allow speakers of different Mayan dialects and languages to pronounce some of the names differently, or to use different names in some cases. What holds the set of twenty signs together from one Mayan language to another is their organization in a fixed sequence, which would have made it easy to treat differences in the spoken names as oral variations within a system whose visible expression was uniform. For Mayans learning to write, these signs would have been the closest thing to an alphabet, in that they have a fixed number and a fixed sequence.

In the account of the twenty day names that follows, two versions of each sign are shown. The first one shows the sign as it might appear in a text written with a brush or pen, whereas the second shows the same sign as it might appear when carved. In *italics* after each pair of signs is a translation based on one or more of the Mayan names that we know were assigned to the corresponding day. I give preference to names that could have been used by writers and readers of the Classic period, most of whom used a language belonging to the Ch'olan branch of the Mayan language family. This branch happens to be the one with the least linguistic documentation, so some of the name choices are based on indirect evidence from other Mayan languages.

In the reckoning of long-count dates, periods lasting 360, 7,200, and 144,000 days always begin on a divinatory day with the name that comes first in the following list (but with a variable day number), and they reach completion on a day with the name that comes last.



*Ceiba*. Imix, the name for this day in Yucatekan languages, is an esoteric term for the ceiba or silk-cotton tree, which is the model for the Mayan version of the world tree. In the K'ichean languages of the central Guatemalan highlands, the day name is Imox, meaning “left-handed.”



*Wind*. In all Mayan languages, the name for this day is Ik' or a cognate thereof. The meaning, which extends to “breath,” is the same in all cases as well.



*Night.* In most Mayan languages, the name of this day is Ak'b'al or a cognate thereof, with meanings that extend to “darkness” or “nightfall.” In the languages of Chiapas and western Guatemala, this day was named instead for a god of the slit drum known as Watan or Woton.



*Net.* In nearly every Mayan language, the name of this day is K'an or a cognate thereof, with meanings that include “yellow corn,” and the sign itself may represent a corn kernel. The meanings of the Yucatekan and K'ichean names, respectively K'an and K'at, include a net bag for carrying ears of corn.



*Snake.* Embedded in the Yucatekan name for this day, Chikchan, is the Ch'olan term for “snake,” which is *chan*. The term for “snake” is *kaan* in Yucatekan and *kan* in K'ichean, and the K'ichean name of the day is Kan. The sign (at least in the carved version) represents the profiled head of a rattlesnake.



*Death.* The name is Kimi in Yucatekan and Kame in K'ichean, meaning “death.” Similar names prevail in other Mayan languages, but in Chiapas and western Guatemala, this day takes its name from Tox, a lord of the underworld.



*Deer.* In most Mayan languages, the name of this day means “deer,” but the meaning of the Yucatekan name, Manik', is unknown. The sign is an image of the right hand with the thumb and forefinger drawn together. It can be used as a sign for a syllable, in which case it has the value *chi*, the first syllable in *chij*, the Ch'olan term for “deer.” In both Yucatekan and K'ichean, the term for “deer” is *kej*, and the K'ichean name for the day is Kej.



*Sunk.* The Yucatekan name is *Lamat*, and the verb stem *lam* refers to the sinking of objects in water or below the horizon. In K'ichean, the name is Q'anil, meaning “yellow” or “ripe.” In other contexts, this sign stands for words meaning “star” or “planet.”



*Tribute.* The Yucatekan name is *Muluk*, and *mulb'il* means “tribute” in the sense of tribute payments. The K'ichean name is *Toj*, and the verb stem *toj* means “to pay.” In the K'iche' kingdom, tribute payments were due on days named *Toj*.



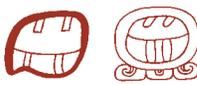
*Dog.* The image in the carved sign is that of a dog, and the K'ichean name for this day is Tz'i', meaning “dog.” The word for “dog” is *tz'i'* in most Mayan languages, including Ch'olan but excluding Yucatekan. *Ok*, meaning “foot,” is the Yucatekan name for the day.



*Monkey.* In nearly every Mayan language, the name for this day is B'atz', which is the term for the howler monkey. The Yucatekan name is Chuwen, a term for "artisan." Throughout the Mayan region, the patron deities of artisans, including writers, were divine monkeys who were twin brothers.



*Tooth.* The image in this sign is that of a skull and jawbone with at least one tooth showing, and early versions depict a toothed jawbone without the skull. Nearly all Mayan names for this day refer to the mouth or teeth, as in the case of Elab' in Tzotzil and Chuj, or they simply mean "tooth," as in the case of K'ichean E'. The Yucatekan name is Eb', meaning "stairway."



*Lack.* The Yucatekan name is B'en, and *b'enel* describes a state of incompleteness. The sign can also be used for a syllable, in which case it has the value *aj*. In K'ichean languages, the name for this day is Aj, meaning "cane stalk."



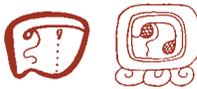
*Jaguar.* In all Mayan languages, the name for this day is Ix or Hix, meaning "jaguar." The image is that of a jaguar's face, with jaguar spots serving to mark the eyes and mouth.



*Bird.* In all Mayan languages other than Yucatekan, the name for this day is Tz'ikin, meaning "bird." The image may be the profiled head of the avian avatar of the god Itzamnaaj, whose name means something like "Far Seer" or "True Magician." The Yucatekan name for the day is Men, and *ajmen* means "worker" or "shaman."



*Honey.* Among the Mayan languages of Chiapas and western Guatemala, the name for this day is Chab'in, which probably derives from Ch'olan *chab'*, meaning "bee," "beehive," or "honey." The Yucatekan name is Kib', meaning "wax," probably referring to beeswax. In K'ichean languages, the name is Ajmak or Ajmaq, meaning "sinner."



*Earth.* The Yucatekan name is Kab'an, meaning "earth," but the K'ichean name is No'j, meaning "thought."



*Blade.* The image is that of the flaked surface of a flint projectile point or knife blade. The Yucatekan name for this day is Etz'nab', which combines *etz'*, meaning "sharpened," with *nab'*, referring to the blade of a weapon. The K'ichean name is Tijax, an esoteric term for a flint knife.



*Thunder.* The names include Chak in Ch'ol, Chawak in Chontal, and Chawuk in Tzotzil, all of which mean "thunder" or "thunderstorm." Yucatekan Kawak and K'ichean Kawuq appear to be

cognate with the Chontal and Tzotzil names, with a predictable consonant change from *ch* to *k*, but their apparent meanings are different. *Kawal* means “pride” in Yukatekan, and *kawuj* means “to dress up” in K’ichean.



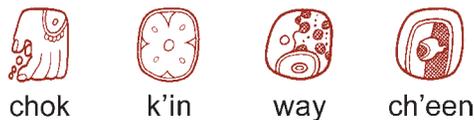
*Lord*. The name is Ajaw in Yukatekan, Ajwal in Ch’olan, and Ajpu or Junajpu in K’ichean. Among the Mayan gods are twin brothers who hunt with blowguns, one of whom is named for this day. In Yukatekan and Ch’olan, he is Jun Ajaw or Jun Ajwal, meaning “One Lord,” whereas in K’ichean, he is known by the name Junajpu, which combines *jun* or “one” with *ajpu*, the term for “blowgunner.”

In addition to the twenty day signs, there are other logographs that number in the hundreds. Some of them, like the day signs, could have been organized into sets. For example, there are signs for the five colors that are associated with the five directions, and they could have been learned in the same order that was followed in a ritual circuit of the directions. Here are the five color signs in their directional order, corresponding (from left to right) to white (north), black (west), yellow (south), red (east), and a range that includes green and blue (center):



These signs are logographs in that they stand for complete words, but instead of standing alone, they are usually prefixed to larger characters that name the objects whose colors are being described.

The logographs for color terms seem arbitrary, though teachers of the writing system may have imparted explanations for their forms. Many logographs offer direct visual clues to their meaning, including some of the day signs. Here are further examples:



The sign for *chok*, meaning “to scatter” or “to sprinkle,” takes the form of a partly opened right hand with objects falling from it. The sign for *k’in*, meaning “sun” or “day,” represents the sun as a flower, with petals that suggest rays while at the same time forming a diagram of the four points at which the sun rises and sets at the solstices. The sign for *way*, referring to a dream or to a person’s spirit companion, is a simplified frontal view of a human face with the left side peeled away to reveal the spotted hide of a jaguar, the most powerful of spirit companions. In the sign for *ch’een*, mean-

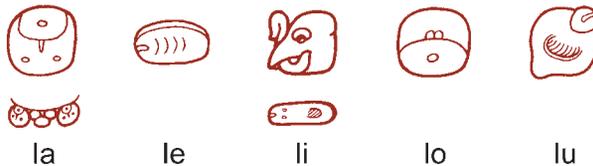
ing “cave,” a disembodied eye, in side view, hovers on the boundary between the inside and outside of a cave, with darkness behind the eye and light in front of it.

In addition to logographic signs, there are signs that stand for individual syllables. Here are some signs for syllables that consist of a vowel alone, without an accompanying consonant:



The smaller signs for *a*, *o*, and *u* in the bottom row are attached to the outer edges of larger characters. They appear here in the orientation they would have on the top edge, but they may be rotated as needed for placement on the left, right, or bottom edge.

The remainder of the syllabic signs stand for the combination of a consonant with one of five vowels. Here, for example, are some signs in which the consonant is *l*:



The signs for *la* and *li* in the second row are attached to the edges of larger characters, and the *le* sign can be attached in this way as well.

Some logographs can serve as signs for syllables. The sound of the word is shortened to its initial consonant and vowel, as in the following examples:



The two signs for the word *nuk*, meaning “large” or “thick,” can also serve as signs for the syllable *nu*. Next come two signs for the word *te'*, “tree,” which can also serve as signs for the syllable *te*. Finally, the sign for *tzih*, meaning “raw” or “new,” can serve as a sign for *tzi*.

Logographs are often complemented with syllabic signs that help the reader by indicating the first and/or last sound of the word in question, as in these characters:



In the first example, the main sign is a logograph for *winik*, meaning “person” or “human being.” The first syllable of *winik* is given by the sign attached to the left edge of the logograph, and the final consonant is indicated by the sign underneath it, which normally stands for the syllable *ki* but is pronounced without its vowel when it comes last in the spelling of a word. In the second example, the main sign is the profiled head of a jaguar, which by itself can serve as a logograph for *b’alam*, meaning “jaguar.” Beneath the head is a sign that normally stands for the syllable *ma* but is here pronounced without its vowel, thus giving the final consonant of *b’alam*.

In the above examples, the vowel that precedes the final consonant is the same as the unpronounced vowel in the syllabic sign that confirms that consonant: *winik* is followed by a sign for *ki*, and *b’alam* is followed by a sign for *ma*. This arrangement is in accordance with a spelling rule that applies whenever the vowel that precedes the final consonant is a plain one. But if that vowel is lengthened or modified in some other way, a sign with a contrasting vowel may be chosen to indicate the final consonant:



The main sign in the first character is a logograph for Chaak, the name of a deity who brings thunderstorms, and the choice of a syllabic sign for *ki* (rather than *ka*) to represent the final consonant confirms that the preceding vowel is a long one (indicated here by a double *a*). The second character begins with a syllabic sign for *cha*, which would ordinarily have a short *a*, but the choice of *ki* to indicate the final consonant calls for lengthening. The resultant word is again Chaak.

As in the second version of Chaak, a writer may choose to spell a word for which a logograph is available with syllabic signs alone. Here is another example:



At left is the logograph for *pakal*, the term for “shield,” followed by a syllabic spelling of the same word that combines three signs (with the vowel of the last one silenced). The twenty day names are never spelled out in this way, nor are their logographs complemented with signs for their first or last syllables.

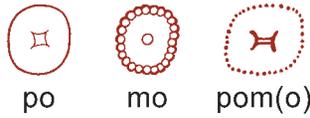
In the spelling of a word that has a repeated sound, the affected syllable may be marked with two dots rather than being written twice:



In the first example, the repetition is indicated by the two dots at the upper right of the second syllabic sign, and the resulting word (with the final vowel dropped) is *tz’unun*,

the term for “hummingbird.” In the second example, the two dots are at the lower left of the first syllabic sign, and the result is *kakam*, a term for “cacao” that has come into English by way of Spanish.

Two syllabic signs may be conflated, creating a single sign with features from each of the original signs:



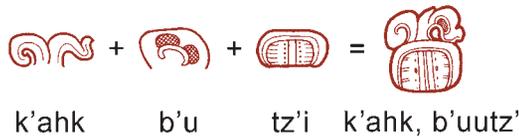
In this example, *po* and *mo* are combined to produce *pom*, the term for copal incense.

When a word is modified by grammatical affixes, the syllabic sign corresponding to a prefix is placed on the top or left side of a character, and a suffix is placed on the bottom or right side. In the following examples, the noun or verb stems to which the affixes are attached are spelled with syllabic signs as well:



The first character combines *u-*, a third-person singular possessive pronoun, with *lak*, “plate,” to produce *ulak*, “his or her plate.” The second character combines *y-*, a third-person singular subject pronoun used before vowels; *ak'*, a verb stem meaning “to give”; and *-am*, a marker of ongoing action. The result is *yak'am*, “he or she gives it.”

Combinations of signs sometimes reflect poetic structure rather than linguistic structure as such. Many passages in Mayan texts take the form of parallel verse, in which words or phrases are organized in pairs or larger groups whose meanings clarify or complement one another. Most pairs require two or more characters, but if they consist of short noun phrases, they may be written with a single character. In this example, the spelling of a pair is accomplished by combining three signs, the first two of which are conflated:

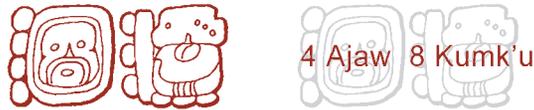


*K'ahk* is “fire,” and the combination of *b'u* and *tz'i* produces the lengthened *u* of *b'uutz'*, “smoke.” The meaning is similar to that of the English phrase “smoke and fire,” but no conjunction is needed when pairing complementary terms in Mayan languages. In these next examples, a pair of nouns is preceded by a modifier that is meant to apply to each of them in turn:



Extending clear across the top of the first character is the third-person singular possessive pronoun *u-*, which applies to both of the nouns below it. Thus, the full reading is *utook'*, *upakal*, “his weapon, his shield.” In the second character, the adjective *k'a* applies to both of the nouns written beneath it, so that the full reading is *k'a ha'*, *k'a wah*, “plentiful drink, plentiful food.”

Poetics and timekeeping come together in one of the commonest pairings, which sets the time of an event by combining dates from two calendars to form what Mayanists call a calendar-round date. The first member of the pair comes from the 260-day calendar, and the second comes from a calendar that tracks a 365-day year. The year is divided into eighteen named periods lasting 20 days each, followed by a final period lasting 5 days. In a date from this calendar, the number of days that have elapsed since the beginning of a period is prefixed to the name of the period. The opening day is the *chum*, or “seating,” of the period, and the remaining days are numbered from one through nineteen. Here is an example of a complete calendar-round date, written from left to right:



In the second part, the prefixed number means that 8 days have passed since the beginning of the 20-day period whose Yukatekan name is *Kumk'u*, meaning “Kiln.” This is the last of the 20-day periods, leaving only 5 days to complete the year. The 4 Ajaw 8 Kumk'u combination happens to coincide with the zero point of the long count. Any given combination recurs once each fifty-two years.

This next pair of phrases, again written with two characters, is from an inscription painted on a vase, composed entirely in parallel verse (see chapter 3 for a fuller account):



The first character combines *u-*, the third-person singular possessive pronoun, with *tz'ib'*, a term for “writing” and other graphic arts. The second character begins with the word *yaal*, in which *y-* is the form the same pronoun takes before a vowel and *aal* means “speech.” Thus, the poet combines the ideas of writing and speaking, both of which belong to the *way* of the remaining sign, which refers to a dream or to a person’s spirit companion. The full reading is *utz'ib'*, */yaal way*, “the writing / the speaking of the dream (or spirit),” referring to the poet’s source of inspiration.

Parallel phrases can occur in groups of three or more, as in this passage from an inscription painted around the rim of a bowl. Together, the four characters identify the mother of the man for whom the bowl was made:



She is first of all K'in Ixik, “Sun Woman,” and the second character elaborates on this idea by calling her Ix Tz'ib' Chan, “Woman Who Inscribes (or Paints) the Sky.” The next character gives her title as Ix Ajaw B'alam, literally “Woman Lord Jaguar.” Ajt'zib'al, in the final position, halts the repetition of *ix* but picks up *tz'ib'* from the second character. *Aj-* is agentive, and *tz'ib'a-* is a verb stem meaning “to inscribe” or “to paint,” converted by the suffix *-l* into a noun for something that has been inscribed or painted, in this case the bowl on which these words are written. Putting the four characters together and remembering that the verb “to be” is usually implicit in Mayan languages, we have something like this:

Sun Woman,  
 Woman Who Inscribes the Sky,  
 Lady Jaguar,  
 she is the one who inscribed this.

When texts consisting of multiple characters occur elsewhere than around the perimeters of ceramic vessels, they are usually divided into rows and columns by an underlying grid that creates spaces of approximately equal size. The columns are in pairs, and the two characters on each row read from left to right. When the bottom row in a pair of columns is completed, the reading continues with the top row in the next pair to the right. Figure 1 shows a passage from a lunar almanac in the Dresden Codex, with eight characters arranged in two double columns. The first character abbreviates a name whose full version is 13 Kan Kuy, “13 Sky Owl,” referring to a constellation and the deity who resides there. On the present occasion, according to the next two characters, the owl is *umuut Uh Ixik*, “the herald of Moon Woman,” which is to say the corresponding stars are rising above the horizon just ahead of the moon. What this event portends is given by the character that comes in fourth

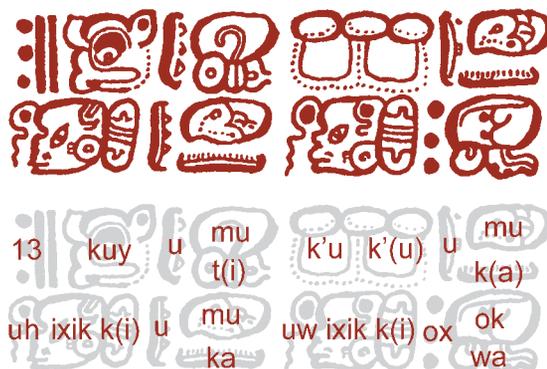


Fig. 1. Passage from a lunar almanac in the Dresden Codex, with eight characters in two double columns. Within a pair of columns, the reading order goes from left to right and top to bottom.

place: *umuuka*, “Something (or someone) is hidden,” or, more ominously, “Someone is buried.”

Next come the characters in the second pair of columns, of which the first three describe an event of the same kind but with a different constellation and a change of wording: *K'uk' umuuk Uh Isik*, “Quetzal brings news of Moon Woman.” The fourth and final character describes the portent: *ax okwa*, in which *ax* is literally “three” but serves as a figure of speech for “several,” and *okwa* is a term for wedding feasts. The portent (*umuuka*) in the first half of this text and the event (*umuuk*) in the second half are spelled in the same way, but the context demands that they be read differently, keeping the final vowel in the first instance and dropping it in the second.

The spelling choices in this passage give birds a visual presence in addition to their verbal presence. The writer could have spelled the word for owl (*kuy*) with syllabic signs but instead rendered it with a logograph in the form of the head of a horned owl. The sign chosen for the syllable *mu* in the spelling of *umuuka* and *umuuk* is the profiled head of a *muut*, a partridge that plays no direct role in this text but is one of the principal birds of omen, warning of unexpected events by suddenly taking flight from its hiding place.

Most texts are accompanied by pictures, and in many cases there are links between the two that call attention to the pictorial aspects of the text and the textual aspects of the picture. Figure 2 shows the almanac passage about Moon Woman and the owl again but this time includes the picture that occupies the space beneath the text. We can see an obvious resemblance between the head of the horned owl in the text and the one in the picture. Both versions show the owl's beak in profile, but its eye is turned to the front and both horns are visible. The owl in the text is *said* to be Moon Woman's herald, whereas the one in the picture is *shown* to be taking flight above her. Moon Woman, like the owl, has the same eye in both places. In her name the sign for *uh*, meaning “moon,” is a kinky strand of hair, and the ends of her longest hairs in the picture are kinky as well. The biggest difference between text and picture is that the text follows the temporal sequence of speech, whereas the picture is organized in space. Even so, the text has a spatial dimension in its placement of the name of the owl above the name of Moon Woman, and the picture has a temporal dimension that reads from top to bottom, with the owl, wings outspread, coming into view ahead of Moon Woman.



Fig. 2. The first part of the text from figure 1, complete with the picture that accompanies it. The red highlighting shows the links between text and picture.