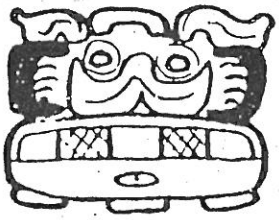
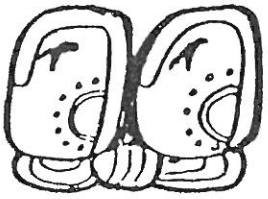
Mayan number hieroglyphs

from "The Mayan Calendar Made Easy" by S. Huff





= A

144,000 days

= 20×20×18×20

(A, B, C, D, E)

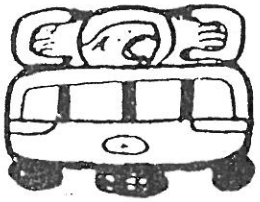
The 1's column

The 20's column

The 360 = 18·20 column

The 7200 = 20·360 column

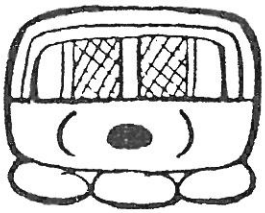
The 144,000 = 20×7200 column



= B

7,200 days

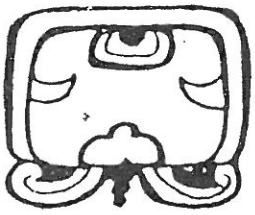
= 20×18×20



= C

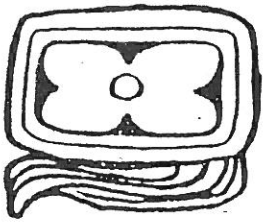
360 days

= 18×20



= D

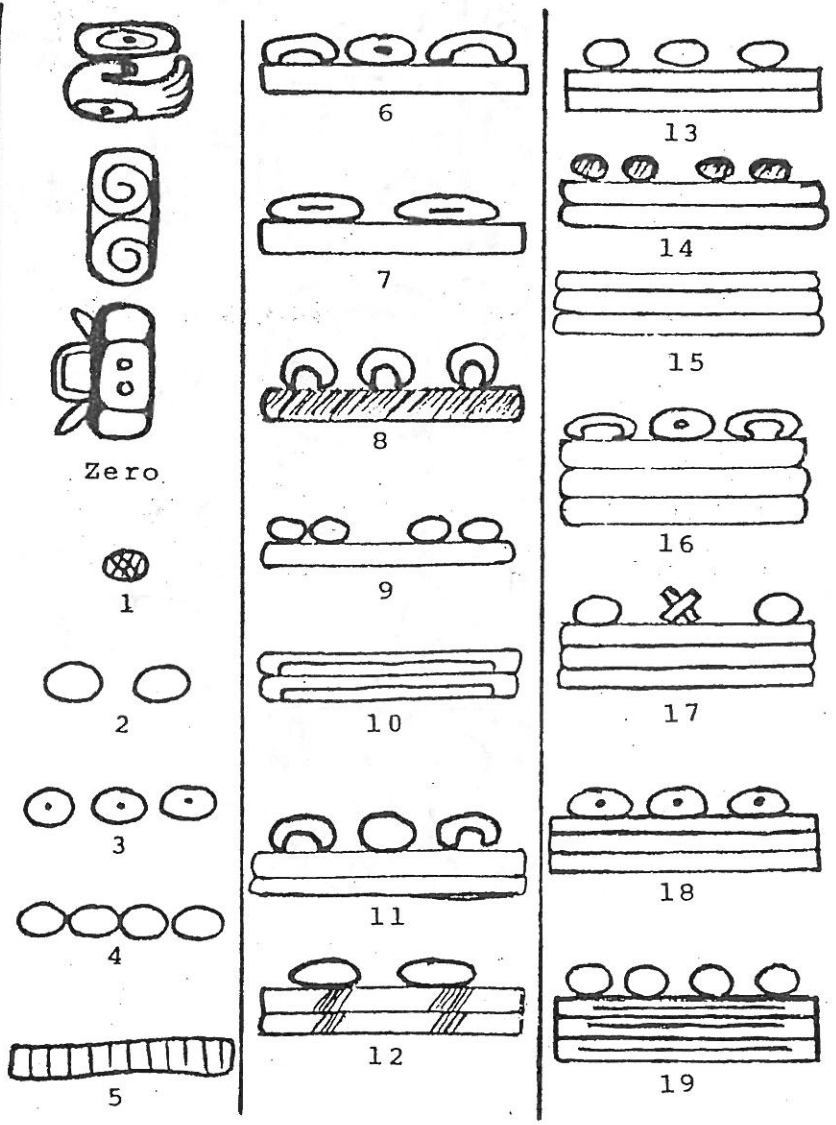
20 days



= E

1 day

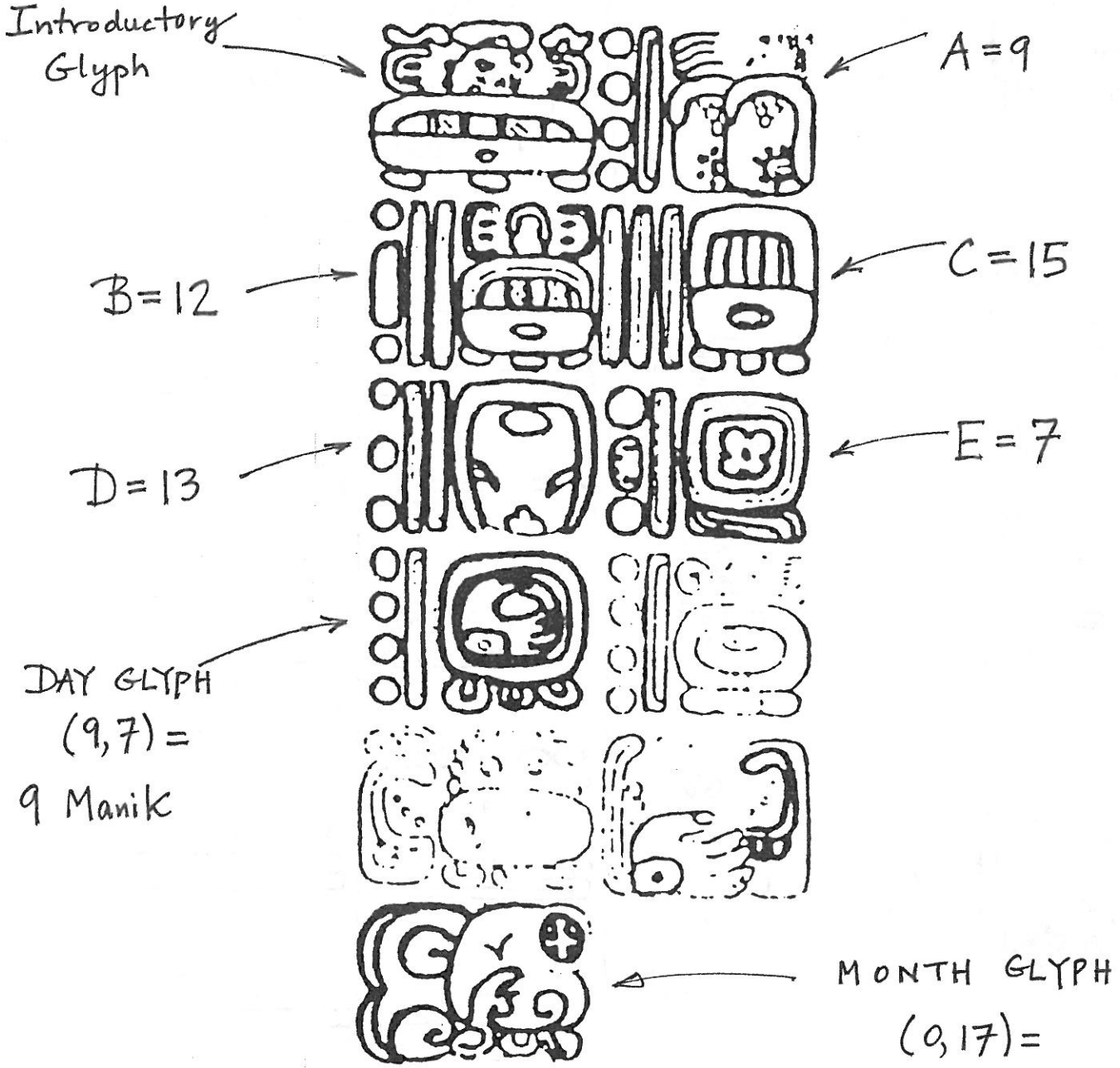
MAYA NUMBERS



Sample Mayan hieroglyph

$(A,B,C,D,E) = (9,12,15,13,7) = 1,388,067$

144,000 · 7200 · 360 · 20 · 1



ENGRG 150 Professor Rand Fall 1994

THE MAYAN CALENDAR

(0,0,0,0,0) corresponds to creation = 11 August 3114 B.C.

(A,B,C,D,E) gives the number of days since creation.

Let F=144000 A+720 B+360 C+20 D+E.

E.g. (9,12,15,13,7) corresponds to F=1388067.

This scheme is obviously inconvenient, so they also developed a system of days and months.

Days are of the form (m,n) where m and n are integers, and $1 \leq m \leq 13$, $1 \leq n \leq 20$. In fact n is actually a name (and has a day glyph).
E.g. (9,7) corresponds to 9 Manik.

The order of the days is: (1,1), (2,2),...,(13,13), (1,14), (2,15),...,(6,19), (7,20), (8,1), (9,2),...,(12,19), (13,20), (1,1),... . The sequence repeats after $260=13 \cdot 20$ days. Creation corresponds to the day (4,20)=4 Ahau, a kind of initial condition for the sequence.

Months are of the form (p,q) where p and q are integers, and $0 \leq p \leq 19$, $1 \leq q \leq 19$. In fact q is actually a name (and has a month glyph).
E.g. (0,17) corresponds to 0 Kayab.
Each month q has 20 days except for the 19th month Uayeb which has 5 days, for a total of $18 \cdot 20+5=365$ days.

The order of the months is: (0,1), (1,1),...,(18,1), (19,1), (0,2),...,(19,2), (0,3),...,(19,18), (0,19), (1,19),...(4,19), (0,1),... . The sequence repeats after 365 days. Creation corresponds to the day (8,18)=8 Cumhu, a kind of initial condition for the sequence.

The hieroglyphs give the date in the form (A,B,C,D,E) as well as the Day date and the Month date. It is a bit of a math problem to find the Day date (m,n) and the Month date (p,q) for a given date F. Here is my solution:

Note: a mod b = remainder of a/b = a − b int(a/b).

m = (F+4) mod 13.

n = F mod 20.

Let x = (F+349) mod 365.

p = x mod 20 − 1.

q = int(x/20) + 1.

E.g., for (A,B,C,D,E)=(9,12,15,13,7), we saw above that F=1388067.

m = 1388071 mod 13 = 1388071 − 13 int(1388071/13) = 9.

n = 1388067 mod 20 = 1388067 − 20 int(1388067/20) = 7.

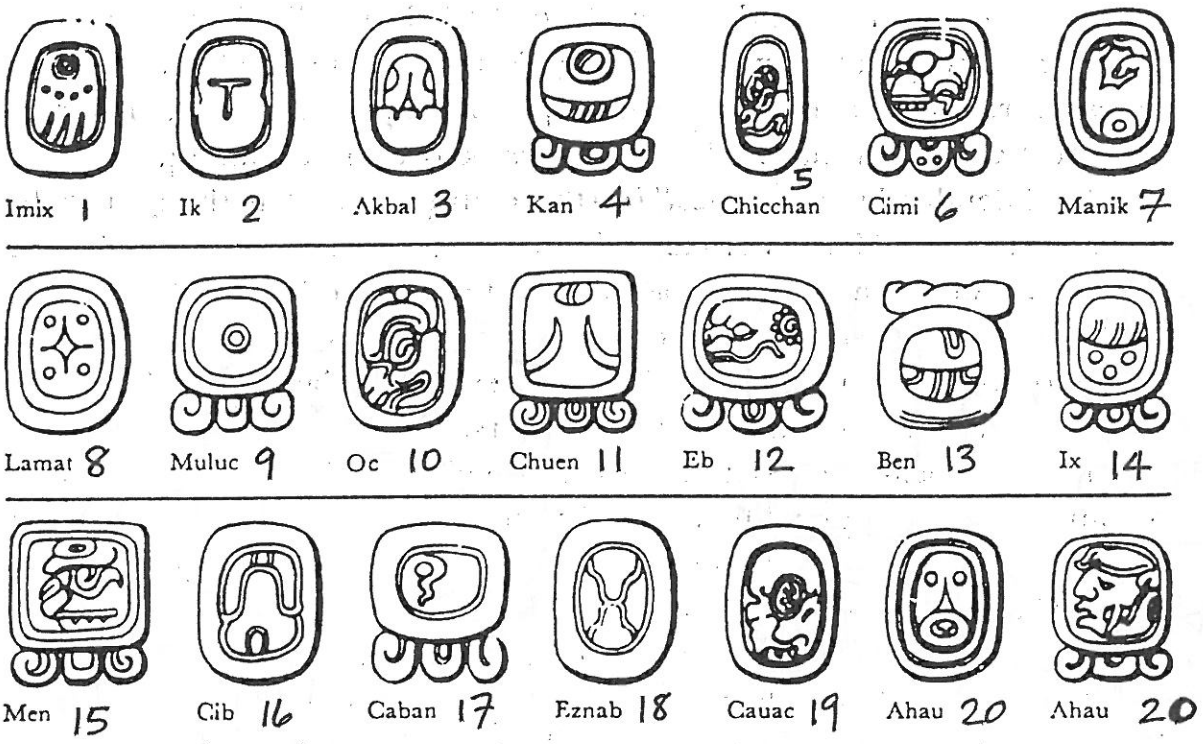
x = (1388067+349) mod 365 = 1388416 − 365 int(1388446/365) = 321.

p = 321 mod 20 − 1 = 0.

q = int(321/20) + 1 = 16 + 1 = 17.

MAYA DAY AND MONTH HIEROGLYPHS

from "The Ancient Maya" by A. R. Lhuillier

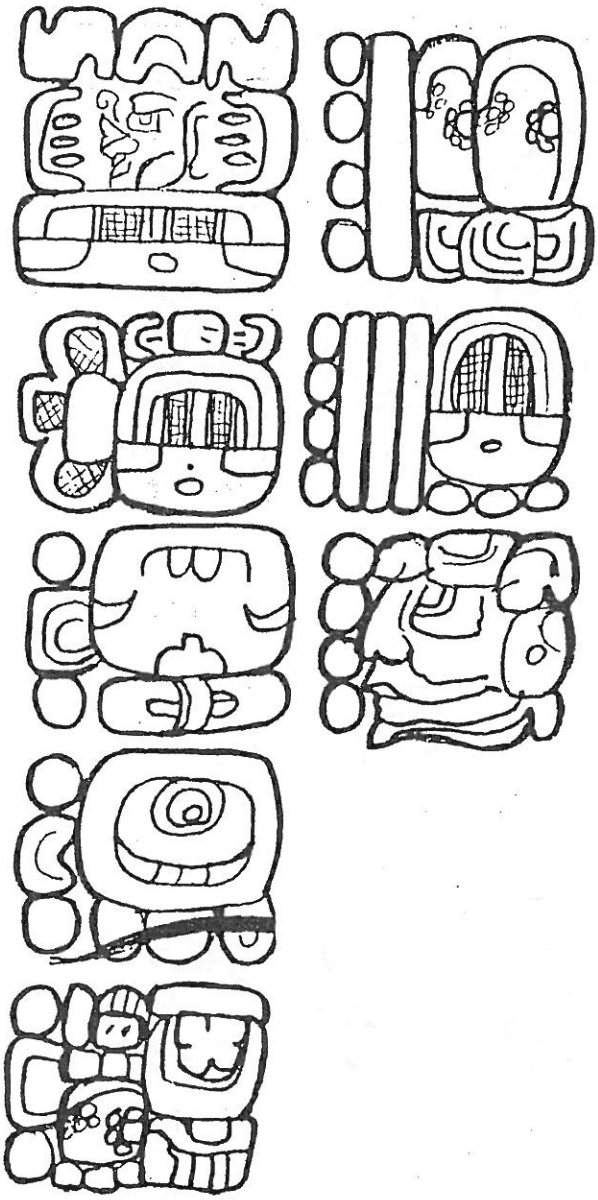


Day glyphs.

Month glyphs.

Two examples of Mayan hieroglyphs

Example 1



Example 2