9
Ritualistic and Astronomical Cycles

My planets, these live embers of my passion,
These children of my hurricanes of flame,
Flung thro' the night, for midnight to refashion,
Praise, and forget, the splendour whence they came.
—ALFRED NOYES, *Watchers of the Sky*

THE DAYS and the months, the tuns and the katuns, did not march alone through eternity: others marched with them. Gods succeeded one another as rulers of the hours of darkness; the planets and that other wanderer of the sky, the moon, traveled the bourneless road. The Maya sought agreement between these stages of varying length, so that they would know when all the voyagers rested together at the *lub*. In the case of ritualistic groupings, such as that of the lords of the nights, the task was easy; when the unequal revolutions of planets were involved, and when fractions of days frustrated agreement, the task was difficult.

LORDS OF THE NIGHTS

IDENTIFICATION OF THE SERIES

The existence among the Aztec of a group of nine gods who ruled over the nights in sequence has been known for a long time. They are named by Serna (1892, p. 345), who wrote in 1656, and discussed by Boturini (1746, p. 57) and Leon y Gama (1792). The corresponding glyphs were identified at the close of the last century by del Paso y Troncoso in Codex Bourbon and by Seler in other Mexican codices. Slightly more than 30 years later I showed that Glyph G of the lunar series really consisted of nine different glyphs (only eight of them were identified), and that these repeated in sequence and clearly corresponded in function to the nine lords of the nights of central Mexico (Thompson, 1929). It was demonstrated that "in order came the grand Infernal peers." For instance, the commonest of the nine glyphs, the night sun, was found only with days that ended tuns or were removed therefrom by multiples of nine days. Subsequently, Beyer (1936d) identified the eighth form, and in other papers (Thompson, 1935, pp. 84–85; 1940b; 1942; 1944c; and Beyer, 1935b; 1935d) it was established that Glyphs G and F of the lunar series were not truly a part of that series at all because both, or Glyph G alone, could accompany any CR dates, whereas the regular glyphs of the lunar series are found only with IS. Nevertheless, in view of the established custom of speaking of Glyph G of the lunar series, the term will be retained, just as the manifestly incorrect terms Chacmool and Baktun 9 when we mean Baktun 10 have been retained in the literature for convenience.

The employment of Glyph G is of considerable antiquity, for G5 accompanies the IS of the Leiden plaque, and is also found with a CR date on the very early Balakbal 5 (fig. 34,25,26). As is the case with most hieroglyphs, there are personified forms and symbolic variants, although all of these have not been identified. Glyphs G1, G4, and G5 have coefficients, the numbers 9, 7, and 5, respectively. I see no reason for doubting that these numbers form parts of the name glyphs of the gods in question.

IDENTIFICATION OF THE GODS

The names of the nine lords of the nights of the Aztec have been preserved for us by Serna. With necessary and perfectly justifiable corrections in orthography, these are:

Xiuhtecutli	God of fire, year or grass	Bad
Itztli	God of flint	Bad
Piltzintecutli	Lord of the youths or youthful lord	Very good
Centeotl	God of maize, ears of corn, and bread	Very good
Mictlantecutli	God of infernal regions	Good
Chalchihuitlicue	Lady with skirt of jade	Good
Tlazolteotl	Goddess of love	Bad
Tepeyollotl	Heart of the mountains	Good
Quiauitecutli	Lady [Lord] of the rain	Good

The identifications of the deities and the fortune of each night are as given by Serna. The former are quite correct save that Quiauitecutli should be the lord of the rain. Serna notes that *yohua*, "night," was added to the name of each deity when he or she functioned as a lord of the night.

The glyphs of the nine lords as given in the various codices agree with Serna's list, although there are minor variations. Tlaloc, god of rain, is the ninth lord corresponding to Quiauitecutli, which is a designation rather than a proper name.

The glyphs of the Maya lords of the nights do not correspond closely to the Mexican gods. The series presumably starts with G1, which is used with the first day of a tun, and therefore corresponded to 1 Imix, when that day

opened Katun 11 Ahau, the first katun of the round of 13, the katun of the creation.

G1. This glyph invariably has a coefficient of 9. Generally the main element consists of a hand with fingers horizontal and thumb vertical. In the angle between the forefinger and the thumb there is a head (fig. 34,*1–7*). This is generally the head of God C, his features blending with those of a monkey. A circle of dots, partly hidden by his profile, is generally in front of his face, precisely as in Glyph X of the lunar series (fig. 36). In one text (fig. 34,*2*) the head of God C within the angle of the hand is replaced by what is almost certainly a fish grasped by a hand (cf. fig. 30,*60–63*). The connection here probably lies in the fact that God C has a water symbol (circlets, kan cross) before his face, and fish is a symbol for water. This is just one more complication with regard to this very perplexing god.

G2. A few symbolic variants and one head variant of this glyph exist (fig. 34,*8–13*). The most detailed and best preserved example is on the ball-court marker at Chinkultic, with the early IS 9.7.17.12.14 11 Ix 7 Zotz'. Above the main element, a kind of cross between the lower part of the tun sign and the upper part of Imix, there is a double scroll, perhaps a vegetal motif. To the left there is a second prefix, in the form of an arc outlined with small circles, and with more circles within the points of the arc. It has already been noted that outlining with small circles symbolizes water. Mol is an example of this. The head variant is that of a youthful deity without any distinguishing characteristics. On the rather weathered IS lintel of Chichen Itza there is a poor example of Glyph G2 with three circles as a prefix in place of the double scroll. These may be numerical dots, in which case Glyph G2 is associated with the number 3. Thus we have for the identification of this deity: a resemblance to the jade part of the tun sign, scrolls possibly a vegetal motif, a second prefix which probably symbolizes water, and a possible association with the number 3. Three, however, is associated with rain and storms (p. 133), so there is a fair probability that the second lord of the night was a rain deity.

G3. One head variant and several symbolic variants of this form exist (fig. 34,*14–21*). The head is that of a bird which on the strength of its beaked nose and projecting ears can be identified probably as the Moan bird, the bird of the rain clouds. The symbolic variant consists of two ovals with simple designs on the interior, one of which is the propeller sign (cf. fig. 30,*52–54*). These ovals are enclosed on two or three sides with lines of little circles, which, as already noted, usually represent rain. It is therefore fairly evident that Glyph G3 represents some pluvial deity.

G4. Both head variants and symbolic variants of this glyph have been recovered, and to both forms a numerical coefficient of 7 is attached as a prefix. The head is that of a Roman-nosed deity with a prominent oval on the crown of the head (fig. 34,*22–24*). The personified forms are clearly the symbolic elements given head form. The design is rather close to that of the Kan glyph, but none is sufficiently well preserved to make this identification certain. In central Mexico, at least, the number 7 is closely connected with deities of maize (Chicomecoatl, Chicomollotzin, and Chicomexochitl).

G5. Only symbolic forms of this glyph exist. The main element has no outstanding characteristics, and in the most ornate example, Yaxchilan L 48, the interior can be compared only to the last period of Picasso (fig. 34,*25–30*). Characteristic are an oval infix with curved interior lines, and an affix which has a bent line of dots. A numerical coefficient of 5 is always present. The number 5 is associated with the earth monster and with the Mam, the god of the interior of the earth, the conch man (p. 133). Whether Glyph G5 corresponds to him is another matter; on present evidence it can be regarded as no more than a possibility.

G6. Only one moderately well preserved example of Glyph G6 has survived. It is the head of a youngish deity with a bracket in front of his face. There are no outstanding characteristics (fig. 34,*31*).

G7. Both head variants and symbolic variants of this glyph are recorded (fig. 34,*32–38*). One of the heads is surmounted by a hand, although a hand is not visible in the other. The symbolic variant may take one of two forms: it may be a sign closely resembling that for white (cf. fig. 34,*33* and probably *37* with fig. 17,*48–54*), or it may consist of the elements seen in figure 34,*32*, which for clarity I tentatively call the three-circles-and-bundle variant. The pseudo-white symbol and the circles-and-bundle variant may be fused (fig. 34,*35*). In discussing the head which serves as the variable element of the IS introductory glyph corresponding to Pax (p. 116), it was noted that to it were attached various symbols, but those are the same as the elements which appear in Glyph G7, namely, the circles-and-bundle variant which is before the face (fig. 23,*18,19,34*), the pseudo-white symbol, worn as an earplug (fig. 23,*34*), and what is surely the paw of some large animal, probably that of a jaguar, corresponding to the hand of Glyph G7, and worn on the temple of two of the patrons of Pax (fig. 23,*18,20*). We shall find these elements recurring in various combinations to form Glyph X1. It is also noteworthy that the original of the Glyph G7 shown in figure 34,*36* has a distinctly feline appearance, and has a treatment of the area where the lower jaw should be which is reminiscent of that of

the Pax regents. Unfortunately, this glyph is rather weathered, and one can not be certain of details.

Accordingly, it is reasonably certain that the seventh lord of the night is the same deity as the one who presides over the month Pax, and who appears to be a variant of the jaguar god of number 7, or perhaps a puma. The likelihood of this identification's being correct is greatened by the fact that one example of G7 has a coefficient of 7 (fig. 34,*35*), and another example may have the same numerical coefficient, although this might well be a non-numerical prefix (fig. 34,*33*). Seven is the number of the jaguar god, who being a deity of the interior of the earth is eminently suited to be a lord of the night, as was his Aztec counterpart, Tepeyollotl.

G8. Beyer, who first identified Glyph G8, believed that the queer-shaped element was a conventionalized snake (fig. 34,*39–45*); I am of the opinion that it is a section of conch shell (pp. 117, 278). The conch, as a symbol for water in general, came to stand in particular for that primeval body of water in which floated the saurian monster whose back was the earth. By extension, the conch became a symbol of the surface and the interior of the earth (p. 133), and for that reason it is an attribute of several deities who inhabit the interior of the earth, notably the god Mam, lord of the number 5, and Tepeyollotl, the Aztec jaguar god who inhabits the interior of the earth. The conch shell, therefore, as the symbol of one of the lords of the underworld, would be highly appropriate.

G9. The last of the lords of the nights is by far the commonest in the inscriptions because he ruled over the nights of tun endings. Accordingly, he is represented on almost every IS with lunar series commemorating a katun, half-katun, or quarter-katun, and, in addition, by the law of averages occurs on a number of dates that do not end periods. It was the observation of the fact that this deity occurred only on PE and on days removed therefrom by multiples of nine days, that led to the discovery of the lords of the nights. The ninth god is the night sun. Head and symbolic forms are represented in about equal numbers. The main element in the first case is the head of the aged sun god; in the second case it is the kin glyph (fig. 34,*46–57*). Not infrequently half the kin sign, whether the main element of the symbolic form or the headdress of the head form, is crosshatched to indicate blackness. There is also a prefix which usually takes the form of three death eyes or perhaps shells in a row, but sometimes is a vegetal motif.

Black, death eyes, shells, and vegetation are all symbols of the earth or its interior (pp. 189, 280). The presence of one or more of these symbols, therefore, converts the sun god into the night sun, the manifestation of the sun on his nocturnal journey from west to east through the underworld. They correspond to the addition of *yohua,* "night," to the Aztec lords of the nights, as reported by Serna.

Nowhere in the books of Chilam Balam or in any other writings have the names of the lords of the nights been discovered, although there is a bare possibility that they may yet be found in the Ritual of the Bacabs. There are, however, fairly obvious references to the group as a whole. Collectively, they seem to have been known as the Bolon-ti-Ku, "the nine gods," in contrast to the Oxlahun-ti-Ku, "the thirteen gods," who are almost certainly the 13 gods of the days and of the 13 heavens. The struggles between the two groups are recounted briefly in Chumayel (pp. 42, 43), as well as in Tizimin and Mani. This event took place in the interval between the creation of the world and its destruction by flood. The details are not clear, but the nine gods appear to have fought and defeated the 13 gods, and despoiled them of their insignia, a kind of forerunner of the famous plot of Anatole France.

We have no information, such as Serna gives for Mexico, on the influences for good or evil of the Maya lords of the nights.

CORRESPONDENCE WITH MEXICAN SERIES

There is a certain, but far from satisfactory, correspondence between the Maya and Mexican lords of the nights. In several cases the same deity occurs in both lists, but the sequence is not the same, and, in view of the uncertain identifications of the gods in the Maya series, there is little profit in comparing the two groups at the present time.

RELATIONSHIP WITH OTHER COUNTS

A fundamental Maya practice was to bring the various cycles of time into relation with one another, so as to know after what interval the starting points of each would again coincide. The outstanding example of this is the CR which harmonizes the 260 days of the sacred almanac with the 365 days of the vague year.

The Maya were also interested in relating the cycle of the nine lords of the nights with other cycles. So far as the relationship with the LC is concerned the matter was extremely simple, for 360 is divisible by 9, and therefore the starting points of both counts will coincide every tun.

The cycle of 260 days and the nine lords of the nights have no common factor. Accordingly, the starting points of the two series will not coincide until after the lapse of 2340 days (9×260), which is 6.9.0 in Maya numeration. This round of the two counts was of interest to the Maya, and is recorded on Dresden 30c–33c (fig. 62,*1–4*). That

section consists of nine sacred almanacs with 20 major sections, each of 117 days. These in turn are divided into nine subdivisions, of 13 days apiece. The series starts with 11 Ben, passes to 11 Oc, then to 11 Manik and so in order until each day has appeared in the sequence. In that way every day with a coefficient of 11 appears nine times, each time with a different lord of the night. The table closes with God G9 ruling the day 11 Ahau, on the assumption that the series opens with God G1 as ruler. The arrangement is shown in part in Table 15. The accompanying pictures, however, are not vignettes of the nine lords of the nights, but all portray God B. The first four

position of the deity associated with any date will advance one place at each repetition of a CR. Therefore, a CR date if it is accompanied by the corresponding Glyph G is firmly placed in a cycle of nine CR. That is to say, an interval of 1.3.14.9.0 must elapse before the same combination of CR and Glyph G can occur. This fact is of considerable help in restoring damaged IS when Glyph G is legible, and also for placing a CR date in the LC, when Glyph G is present.

The earliest application of this method was to a date on Copan I (Thompson, 1935, pp. 84–85). In that text a position 10 Lamat is linked by a distance number of 10.8

TABLE 15—RELATIONSHIP OF LORDS OF NIGHTS WITH THE 260-DAY CYCLE (DRESDEN 30c–33c)

G1	G2	G3	G4	G5	G6	G7	G8	G9
(east, red)	(north, white)	(west, black)	(south, yellow)					
11 Ben	11 Cimi	11 Cauac	11 Eb	11 Chicchan	11 Etz'nab	11 Chuen	11 Kan	11 Caban
11 Oc	11 Akbal	11 Cib	11 Muluc	11 Ik	11 Men	11 Lamat	11 Imix	11 Ix
11 Manik	11 Ahau	11 Ben	11 Cimi	11 Cauac	11 Eb	11 Chicchan	11 Etz'nab	11 Chuen
11 Kan	11 Caban	11 Oc	11 Akbal	11 Cib	11 Muluc	11 Ik	11 Men	11 Lamat
11 Imix	11 Ix	11 Manik	11 Ahau	11 Ben	11 Cimi	11 Cauac	11 Eb	11 Chicchan, etc.

compartments carry glyphs of the world directions and world colors. These last are combined with the *te* (1) affix, and refer to the world-direction trees (p. 56). Each compartment has the usual four glyphs, the first of which is in each case a highly conventionalized hand in an inverted position (Gates' Glyph 141; p. 266). This glyph, however, appears in several other divinatory almanacs, and therefore can not refer to the lords of the nights. Nevertheless, I think that this arrangement of nine sacred almanacs almost certainly was set down because it harmonized the 260-day sacred almanac with the round of the lords of the nights. Since the above was written Satterthwaite (1947, pp. 24–27) has made the same identification.

Of attempts to relate the lords of the nights with the year of 365 days no record has survived. Again, there is no common factor shared by 365 and 9. Accordingly 3285 days—9.2.5 in Maya notation—would have to elapse before the same lord of the night would again rule over the night of any given month position. Whether the lords of the nights also ruled in sequence over the hours of the night, as Seler thought, is still uncertain. It seems to me that there is a fair possibility that some such system obtained with the god who was ruler of the whole night also reigning (p. 177).

As 9 and 18,980 (the number of days in a CR) have no common factor, a different lord of the night will rule over each repetition of a CR date, and since 18,980 has a remainder of 8 when divided by 9, it is clear that the

to a damaged PE which was almost certainly the end of a Katun 6, 7, or 8. The Lamat date is accompanied by Glyphs G1 and F; the PE, by Glyphs G9 and F. Morley had suggested the reading 9.11.19.15.8 10 Lamat 16 Zotz', but this had to be rejected because it requires Glyph G2. The right solution was 8.6.0.10.8 10 Lamat 16 Pop. The sum of the uinals and kins is 208, and that divided by 9 leaves a remainder of 1, that is to say Glyph G1; the PE was 8.6.0.0.0 10 Ahau 13 Ch'en, which, of course, demands Glyph G9.

A better example is supplied by the elucidation of a date on Tonina 7 (Thompson, 1942). A CR date 11 Manik 15 Mac is accompanied by Glyph G2. The problem is to find its position in the LC. Clearly the inscription fell in Baktun 9. The CR in question occurs in the following positions in that baktun:

$$
\begin{array}{ll}
9.\ 1.13.\ 9.7 & (G7) \\
9.\ 4.\ 6.\ 4.7 & (G6) \\
9.\ 6.18.17.7 & (G5) \\
9.\ 9.11.12.7 & (G4) \\
9.12.\ 4.\ 7.7 & (G3) \\
9.14.17.\ 2.7 & (G2) \\
9.17.\ 9.15.7 & (G1)
\end{array}
$$

The corresponding forms of Glyph G, obtained by taking the remainder after dividing the uinals and kins by 9, are given in parentheses. Clearly the only position in Baktun 9 corresponding to 11 Manik 15 Mac with the required form of Glyph G is 9.14.17.2.7. The sum of uinals and kins is 47, which, divided by 9, leaves a remainder of 2, calling for Glyph G2 as required. Other

examples of the use of Glyph G to place dates in the LC are given in Thompson (1940b, 1942, 1944c) and Beyer (1935b, 1935d, the former published in 1936).

A possible harmonizing of the lords of the nights with the four divisions of the 364-day count is discussed below in reviewing the functions of the 819-day cycle.

GLYPH F

Glyph F of the lunar series is very closely associated with Glyph G. When it is complete in itself it follows Glyph G, but not infrequently the two glyphs are fused. Glyph F consists of a central element, of which both head and symbol forms exist, to which are attached a prefix and a postfix (fig. 34,58–62,64,67). The symbolic form is a tied or knotted cord; the head form varies considerably. In many cases it is a grotesque head with a beaked nose of unusual prominence, but in a number of texts at Yaxchilan a peculiar element, consisting of a grotesque head set on its side, replaces this head.

The prefix, always above the main element, consists of two or three dots in a diagonal line, which are flanked to left by a leaflike element, to right by an inverted crescent. This prefix, with slight variations, is seldom omitted. The postfix, a bracket with a couple of nicks on the base and two or three circlets near the top is tentatively labeled the te (2) affix (p. 282). It is sometimes omitted from the fused G and F glyphs, more rarely from the symbolic variants.

There is a personified form of this postfix in the shape of a youthful head, apparently that of the maize god (p. 283; fig. 34,21,63,68). When the postfix is thus personified it becomes the main element, and the knot becomes a prefix.

On Copan D the full-figure glyph of G9 is rising from the ground. He carries on his back, as his burden, a roll of jaguar skin, indicated by the crosshatched spots and the triangular arrangements of dots as in Ix, the day of the jaguar (fig. 60, Gl B4). I think there can be no doubt that this jaguar bundle represents Glyph F, for it is not part of Glyph G9, and it is in the correct position between Glyph G and the month sign to be Glyph F. Beneath the roll of jaguar skin is a small element which looks rather like the knot, but which, on the evidence of other glyphs, must be something else.

On the mural of House E, Palenque, Glyph F consists of this jaguar bundle as the main element, together with the usual prefix of Glyph F and an obliterated postfix (fig. 34,58). A jaguar skin spread on a throne which is part of the design incised on a shell from Jaina has this same pinked border. The jaguar bundle also occurs as the main element of Glyph F on Tila B. The te (2) postfix is present, but most unusually the flattened fish head serves as prefix, if one accepts Beyer's drawing. The Palenque and Tila specimens indicate that the jaguar skin corresponds to the knotted element. What the connection may be between these two signs is not apparent. The jaguar bundle is rare, but its wide distribution indicates that it is not a local caprice.

The main element of Glyph F, then, may be a knot, a jaguar skin, a head with a large hooked nose, or the head, in a vertical position, of what appears to be a frog. The jaguar, as we have seen (p. 74), symbolizes darkness and the interior of the earth, and I should not be surprised to learn that the jaguar skin represented the starry sky of night. The up-ended head of the frog may also have a nocturnal connection because of its use in the lunar series. Glyph F, because it never appears without Glyph G and is often fused with it (fig. 34,14–17,29,39, 40,42,49 etc.), should explain or amplify the function of Glyph G. The pair should translate "God Gn is the lord of the night," or that he is power, or that he rules the darkness, or words to that effect. The jaguar skin, as a symbol of darkness and the interior of the earth, or, conceivably, the night sky, would fit such an interpretation, but it is not now apparent how the knotted element or the face with the hooked nose could have that meaning. At present, no translation for them can be offered.

THE 819-DAY CYCLE

In five Maya texts the month position is separated from the rest of the IS by the insertion of a parenthetical clause. In four texts and almost certainly in the case of the fifth, which is damaged, a distance number of less than two tuns is subtracted from the IS to reach a day with a coefficient of 1. There are six explanatory glyphs in four of these inserted clauses (only four glyphs survive in one damaged text). Four of these glyphs are the same in the four undamaged texts; two are variables (fig. 35,1–5). In announcing these unusual constructions, I demonstrated that the dates of the parenthetical clauses occurred at intervals of 819 days (Thompson, 1943d).

These IS with their associated dates are:

Palenque 1
A   A1–B5   9.12. 6. 5. 8   3 Lamat   (IS)
     A9–B9   1.10. 1   (subtract)
                   ―――――――――――
A'   A10   9.12. 4.13. 7   1 Manik 10 Pop
     A11–B11   Explanatory glyphs
     B12   Missing. Probably 6 Zac, month of IS

Yaxchilan L 29 and L 30

B	A1–A4	9.13.17.12.10	8 Oc	(IS)
	E1–F1	1. 1.17		(subtract)
B′	E2–F2	9.13.16.10.13	1 Ben 1 Ch'en	
	E3–F5		Explanatory glyphs	
	G1		13 Yax	(month of IS)

Yaxchilan 11 (right and left sides)

C	B′1–B′7	9.16. 1. 0. 0	11 Ahau	(IS)
	C′2–C′3	1. 3. 6		(subtract)
C′	C′4–C′5	9.15.19.14.14	1 Ix 7 Uo	
	C′6–C′9		Explanatory glyphs	
	C′10		8 Zec	(month of IS)

Yaxchilan 1

D	A1–D3	9.16.10. 0. 0	1 Ahau	(IS)
		(1. 1.10)	Presumably on eroded section	(subtract)
D′	E2	(9.16. 8.16.10	1 Oc) 18 Pop	(day sign obliterated)
	E3–F6		Explanatory glyphs	
	E7		3 Zip	(month of IS)

Quirigua K

E	A1–A5a	9.18.15. 0. 0	3 Ahau	(IS)
	A6	10.10		(subtract)
E′	B6b–A7a	9.18.14. 7.10	1 Oc 18 Kayab	
	A7b–C2a		Explanatory glyphs	
	C4		3 Ahau 3 Yax	(day and month of IS)
	D4		Further explanatory glyphs	

Another example may perhaps be added. This differs from the rest in that it does not interrupt the IS but immediately follows the lunar series thereof (fig. 53,*1*):

Palenque Cross

F	A1–A9	12.19.13.4.0	8 Ahau 18 Zec (IS)	
	B13	1.0	(subtract, lunar variant for 20)	
F′	A16–B16	12.19.13.3.0	1 Ahau 18 Zotz'	
	A14–B15		Explanatory glyphs	

There is probably yet another example. This is to be seen on the south panel of the east doorway of Copan T 11. The accompanying date is not preserved, but may have been 9.17.2.10.4 1 Kan 7 Yax. The text is too uncertain to use (fig. 54,*4*). See Addendum, page 296.

In the case of the other texts only that of D′ is clouded because of weathering. However, the month position 18 Pop is perfectly clear, and in view of the parallel cases, the restoration suggested is almost certainly correct. For reasons of brevity it will be assumed that this reading is not open to question.

The explanatory glyphs obviously treat of the same subject, although there are certain differences, owing possibly to the use of variable forms of the same glyph or substitution of another glyph with the same meaning (fig. 35,*1–5*). All five texts include a glyph with a coefficient of 1, which, except in Text A′, occupies the last place, immediately preceding the detached month sign of the IS. This is the head of a rodent with the so-called bone glyph as affix, which forms one of the elements of Glyph B of the lunar series.

The principal features of the various glyphs, numbered in the sequence in which they occur, are as follows:

1. Obviously the same glyph in all cases. In all texts except A′ it, like the month sign Pax, has at the top an opening through which in three cases pass two diverging curls. There is an infix resembling the Chuen sign, and in three cases a lunar infix or postfix. This is Gates' Glyph 92, which occurs very frequently in the codices.

2. In Text B′ this is a kin sign with a half-kin as superfix. In Texts C′ and D′ this is replaced by the head of a god with a Roman nose and with a sign in front. In view of the kin sign in Text B′ these may be portraits of the sun god but they may represent Glyph G6. In Text E′ the second glyph is a cauac sign but the partly obliterated third glyph appears to be the same face with a Roman nose.

3. In Texts C′ and D′ the central element consists of crossed bands. There is a "flame" affix and, in the case of Text C′, what may be a coefficient of 9, but the details are hard to make out, and it is possible that this element is not numerical. One is reminded of the crossed bands in planetary bands. In Text B′ a grotesque head with affix replaces this sign. In Text E′ this glyph appears to be suppressed.

4. In Texts B′–D′ this is the "shell" glyph with arms and legs added, the so-called Glyph Y, which occurs in some lunar series, particularly at Yaxchilan, and which must mean dawn or night (p. 174). The corresponding glyph in Text E′ is largely obliterated.

5. In Texts B′, C′, and E′ this is a grotesque head with a branching flamelike element emerging from the forehead. In Text A′ this same head occurs but not in the correct sequence. In Text D′ a grotesque head can be made out, but it is not possible to say whether the flamelike element is present.

6. This is the "rodent" glyph to which attention has already been called.

In F′ the explanatory glyphs differ from those already discussed. The first is the glyph with Pax and Chuen elements but without a lunar postfix. The second glyph has the branching "flame" element emerging from a glyph which from other examples can be shown to represent the top of the head of the god who normally has this element. The other two glyphs do not figure in the texts already reviewed.

In several of the texts there are supplementary glyphs before or after the parenthetical clauses, to which they appear to be related (fig. 35,6,7). Also, on Quirigua K the Pax-Chuen glyph is repeated, complete with lunar postfix, after the detached conclusion of IS and lunar series.

As in all six texts the day sign coefficient reached by subtraction is 1, the intervals between these positions must be multiples of 13. In days these intervals are 11,466, 15,561, 3,276, 16,380, and 1,433,250, but the highest common factor of these is not 13 but 819. Such a high common factor could hardly be the result of chance; the odds are over a thousand to one against it. This number is composed of 91 × 9, or 117 × 7, or 273 × 3, or 9 × 7 × 13.

The numbers 9, 7, and 13 are of great ritualistic importance. Nine represents the nine underworlds and the nine lords of the nights, seven probably the seven layers of the earth, and thirteen the thirteen heavens. The number 91 is ritualistically and arithmetically important, but its multipliers are four, five, and twenty in Dresden, not nine.

Since 819 is divisible by nine, the same form of Glyph G of the lunar series, G6, is required by all the parenthetical clauses. In this connection it is interesting to note that Texts B, C, and D, all of which are from Yaxchilan, are followed by a glyph with a coefficient of 6. The glyph itself is a simplified face above what is probably a lunar affix. In one case half the face is covered with crosshatching, a symbol for black and presumably, by extension, darkness. (Cf. crosshatching of kin sign when employed as lord of the night, p. 210.) One wonders whether this face with coefficient of 6 can refer to the fact that the sixth lord of the night and underworld rules over the parenthetical dates. It is also worth noting that it was this same sixth lord of the night and underworld who ruled over the opening night of the 13-day week in which 13.0.0.0.0 4 Ahau 8 Cumku fell. His reign started at 12.19.19.17.17 1 Caban 5 Cumku, three days before 4 Ahau 8 Cumku. In fact this 1 Caban 5 Cumku is the starting point of the 819-day cycle.

As only once in every 63 times will a day with a co-

efficient of 1 also mark the start of the 819-day cycle, the fact that this first day with a coefficient of 1 before 4 Ahau 8 Cumku is a base in the 819-day cycle argues strongly for that count's being primarily ritualistic.

The fact that the base of the 819-day cycle falls three days before 4 Ahau 8 Cumku implies that the gods who were in power at the start of the period continued to exercise certain influence throughout its span, thereby giving further scope to the balancing of good and bad influences inherent in the calendarial divination of the Maya. Such a concept certainly existed. On the Mexican tableland the god of the 13-day "week" shared power with the patron of each day until a fresh god of the "week" entered into power with the return of a day with a coefficient of 1. Similarly among the Ixil Maya the yearbearer deity who rules over a year bearer with a coefficient of 1, continues to influence human affairs until, 13 years later, another year bearer with coefficient of 1 enters (Lincoln, 1942, p. 115).

It is obvious that this cycle of 819 days must involve more than a grouping of lords of the skies and underworlds. The number is too high, for after 117 days the cycle would have been completed, each lord of the night would have ruled over a 13-day period. However, only after 819 days would sequences of nine lords of the underworlds, 13 lords of the heavens, and the presumed seven lords of the earth once more coincide. There is no strong evidence for the existence of a group of seven terrestrial deities, but in the account of the creation in Chumayel there is mention of a certain Ah Uuc-Cheknal, "he who fertilizes the maize seven times," who came from the seventh stratum of the earth (or the seven strata of the earth). Since both the group of 13 gods and the group of nine gods bear collective names used in the singular, it is not impossible that Ah Uuc-Cheknal is really the name of a group of seven gods who are associated with the seven layers of the earth. Ralph L. Roys informs me that he sees no valid reason why the Maya text should not be taken to refer to seven deities and seven strata, not necessarily to a single deity from the seventh stratum.

It is possible, therefore, that the 819-day cycle developed from a desire to mark the coincidence of the starting points of these three series of deities. It is also possible, however, that 819 days represent the interval which must elapse before the cycle of nine lords of the nights and that of the 91-day period will again coincide. As we shall see (Chapter 11), the period of 364 days and its four quarters, each of 91 days, were of considerable importance to the Maya, both for calculations and as a handy quartering of the year to indicate approximately equinoxes and solstices. There is some evidence that the 819-day cycle was related in some cases to divisions of

the year, so it is probable that the 91-day interval is one of its components to which the Maya attached importance. The possibility that the 819-day cycle had an astrological or astronomical meaning cannot be overlooked. The cycle is 117 × 7. In 117 the Maya had a good approximation to the synodical revolution of Mercury (115.877 days). Such an approximation would have suited them admirably because it complied with one of their most important desiderata, in that it constituted a re-entering cycle in terms of the 260-day almanac. At the end of 117 days the day coefficient would be the same. However, in order to achieve a return to the same coefficient and day, the 117-day cycle would have as its next highest order 117 × 20; in this case the multiplier of 117 is 7. Therefore, it is clear that any connection with Mercury would be a secondary, not a primary, purpose of this 819-day cycle. Moreover, it is very doubtful that the Maya paid attention to the synodical revolution of Mercury, which is short and difficult to observe accurately.

The position of the parenthetical clauses immediately after or, in one case, in the middle of, the lunar series, and the lunar elements which enter in them suggested the possibility that a lunar meaning might also be involved in this count.

Faced by these astronomical problems, I turned to Dr. Maud W. Makemson, Director of Vassar Observatory, and to Dr. Alexander Pogo, both of whom most kindly undertook the many laborious calculations needed to determine the positions of Mercury and the moon on the various dates in question. Because both specialists possess that rare combination, a mastery of both practical and Maya astronomy, their many suggestions were most useful.

An examination of the positions of Mercury on the 10 dates in question, using the Ahau equation 584,285, produced no pattern. Periodicity would, of course, be absent whatever correlation was used. It was clear that the 819-day cycle did not primarily involve Mercury (Thompson, 1943d, p. 144).

In connection with the possibility that a lunar significance might be attached to this cycle, Dr. Pogo pointed out that 819 days are within a day of 30 sidereal months and at the same time they approximate 27¾ synodical months. After 819 days, therefore, the moon would be in about the same position in relation to the stars but its age would have decreased by one phase. However, Dr. Pogo notes that as 30 sidereal revolutions of the moon are actually 819.65 days and 28 synodical revolutions are 826.86 days, an error will rapidly accumulate. Thus the 819-day cycle could not have been used without correction to calculate the actual positions of the moon against her stellar background, except for relatively short periods.

Again Drs. Makemson and Pogo kindly volunteered

to calculate the positions of the moon on Dates A–E and A'–E' in view of the possibility that the IS in question might record observed positions of the moon with regard to the stars, whereas the parenthetical clauses might record calculated positions in an uncorrected cycle, or, alternatively, the parenthetical clauses might record occasions when the moon was in conjunction with certain important stars, both by observation and according to the uncorrected cyclic reckoning. Again no pattern emerged.

Dr. Makemson has suggested other ways in which the 819-day cycle might have been used. A discussion of these would take us too far afield and, in any case, would come best from her pen.

There remains another line of approach, that of linking the endings of the 819-day periods to the katuns current when the monuments in question were dedicated.

The dedicatory date of the lintels with which Date B' is associated is 9.17.0.0.0. The distance from Date B' to 9.17.0.0.0 is 22,827 days. This is within a day of 197 revolutions of Mercury (22,827.8 days). It is also 773 moons (22,827.15 days), and exactly 62½ solar years. Also 1 Ch'en is a determinant of 18 Cumku: 1 Ch'en + 197 = 18 Cumku (Gregorian correction is 197½ days). The Maya priest may have reasoned more or less as follows:

The 819-day cycle ended 377 days (just one synodical revolution of Saturn) before the IS. As a rule we do not record these cycle endings, but in this case it can be brought into an interesting relation to the dedicatory date, 9.17.0.0.0 13 Ahau 18 Cumku. On both dates there was a new moon, and on both dates Mercury was at the same point in the heavens (maximum eastern elongation). Moreover the sun is just half a revolution away at 1 Ben 1 Ch'en (Date B') from where it will be at 9.17.0.0.0 13 Ahau 18 Cumku. In the first case it is 31 days after the summer solstice; in the second, 31 days after the winter solstice. Finally, 1 Ch'en occupied at Cycle 13 the same position in the solar year that 18 Cumku occupied in the year then current.

The lower part of Palenque 1, on which Date A' is recorded, is missing, but it is probable that the dedicatory date was 9.12.10.0.0 or 9.13.0.0.0. If the latter, a reason for giving the end of the 819-day cycle exists in the fact that 9.13.0.0.0, Date A, and Date A' all have the same moon age, which according to the lunar series was 19 days. Also the moon number of both 9.13.0.0.0 and Date A' would be 5 according to the uniform lunar system, since the interval between them (186 moons) is divisible by 6. The lunar series is not in the uniform system, but records the moon number as 5. It is an interesting possibility, although nothing more, that when Stela 1 was erected Palenque had adopted the uniform system, but

gave the moon age of the IS by the old system, thereby reaching the same moon number and moon age for all three dates. Lastly, 9.13.0.0.0 and the IS (not in this case the parenthetical date) are separated by 13½ solar years (the remainder is 183.8 days), the two dates lying about eight days before the vernal and autumnal equinoxes. The IS is also, as Teeple pointed out, a determinant of 9.13.0.0.0, for by Maya reckoning the sun on 6 Zac at Cycle 13 was in the same position as at 8 Uo in current time. 6 Zac + 187 = 8 Uo (Gregorian calls for a correction of 189 days).

Date C' was a new moon according to Maya calculation. Date C is recorded on this monument as 5 moons 12 days in the uniform system. The distance number of 1.3.6 equals 14 moons and 12 days, thereby indicating a moon age for Date C' of three moons no days. The dedicatory date of this monument is uncertain. The IS falls in Katun 9.17.0.0.0 13 Ahau 18 Cumku, which, as we have already seen, was also the date of a new moon,

rection calls for 209 days). Also 16 Ch'en is the same moon age as 18 Pop, since 207 days is within a third of a day of seven moons (206.7 days). In other words 16 Ch'en is half a year away from 18 Cumku, and 18 Pop is the anniversary of 16 Ch'en placed at Cycle 13, and the two linked dates of 18 Pop and 16 Ch'en have the same moon age. Also God G6 ruled on both dates.

Quirigua K, which carries Date E', has the dedicatory date 9.18.15.0.0. (Date E) as the IS, and the current katun was therefore 9.19.0.0.0 9 Ahau 18 Mol. The interval between Date E' and Katun 19 is 2010 days, which is one day more than five and a half solar years (2008.8 days). The katun ended, according to the correlation here followed, on June 26; Date E' fell on December 24, both dates being a few days after the solstices.

As Date E gives the moon age as 18 days, the moon must have been thought to have been full (15 days old) at Date E'. The moon at 9.19.0.0.0 would have been 17 days old by calculation from either of those points.

TABLE 16—THE 819-DAY CYCLE AND ITS ASSOCIATIONS

TEXT	PARENTHETICAL DATES	KATUN ENDING	INTERVAL IN DAYS	LUNAR ASSOCIATIONS	SOLAR ASSOCIATIONS
A'	9.12. 4.13. 7	9.13.0.0.0	5,493	Same moon age	Half-year advance over IS[1]
B'	9.13.16.10.13	9.17.0.0.0	22,827	Same moon age (new moon)	Half-year advance.[2]
C'	9.15.19.14.14	9.17.0.0.0	7,266	Same moon age (new moon)	None.[3]
D'	9.16. 8.16.10	9.17.0.0.0 } 9.16.8.6.3 }	207	Same moon age	Half-year advance.[4]
E'	9.18.14. 7.10	9.19.0.0.0	2,010	Two days difference in moon age.	Half-year and one day advance.[5]

[1]Date A also same moon age. Solar positions close to equinoxes.
[2]Mercury at same position on both dates. Same god in series of seven.
[3]Same god in series of seven ruled on both dates.

[4]Association is with 9.16.8.6.3 2 Akbal 16 Ch'en, the current determinant of 9.17.0.0.0, but this is not actually given in the text. Same lord of night (G6) ruled both dates. 16 Ch'en + 182 = 18 Cumku.
[5]Solar positions close to solstices. Moon at E' was full.

and furthermore was the third moon. Date C also occurs on Lintels 29 and 30, the dedicatory date of which was certainly 9.17.0.0.0. Accordingly, it is quite probable that 9.17.0.0.0 is the dedicatory date of Stela 11 as well or, failing that, marked the end of the current katun. There is no solar association linking these two dates, but it may be significant that on both dates the first god of the series of seven (terrestrial?) deities was in power.

Yaxchilan 1, which carries Date D', was erected at 9.16.10.0.0 (Date D). The current katun was, therefore, again 9.17.0.0.0 13 Ahau 18 Cumku. There is no direct relation between Date D' (1 Oc 18 Pop) and the katun ending, yet we have seen that solar half-years and the same moon age seem to be the matters which interested the Maya in these particular texts. Half a year back from the current 18 Cumku is 9.16.8.6.3 2 Akbal 16 Ch'en. However, 16 Ch'en is itself the determinant of 18 Pop at that date: 16 Ch'en + 207 = 18 Pop (Gregorian cor-

The precise secondary meaning of the early date (Date F') on the Temple of the Cross inscription is not clear. It is of interest to note that, as pointed out by Teeple several years ago, the IS is a determinant of 9.10.10.0.0 13 Ahau 18 Kankin. This last date, however, can not be connected with Date F', but the correction according to the Gregorian calendar would be 182 days. The Maya reckoned this as 180 days. Furthermore, as Bowditch pointed out many years ago, the early date 1.18.5.3.2 9 Ik 15 Ceh falls at a time when a correction of half a solar year was required. It is, accordingly, possible that this date, indirectly grouped with the series already discussed, is, in some way at present not clear, associated with solar time.

The various associations just discussed are presented in Table 16.

If the above interpretations are correct, the Maya did not bother to record every starting point of the 819-day cycle but only those on which there were lunar or solar

relationships, or both, with the current katun ending, presumably links with the series of nine and 13 gods. As already noted, lunar elements occur in all the parenthetical clauses except Text A'. Text B' has a kin glyph surmounted by a second kin glyph cut in half, conceivably to indicate a solar half-year. The corresponding glyph in the remaining complete texts is the head of a deity, possibly the head of the sun god, although the usual attributes are lacking. Alternatively this head might represent God G6, who reigned over the first night of the 819-day cycle.

The ritualistic cycle of 819 days, therefore, was probably recorded only when its importance was enhanced by associations of an astronomical or calendarial nature with the end of the current katun, possibly only when the sun or moon or both were involved in the computations. The accompanying glyphs tend to bear out this thesis, since both solar and lunar glyphs are recognizable. The period of 819 days not only marked the return to the same starting point of the series of thirteen, nine, and seven deities, probably corresponding to the celestial, infernal, and terrestrial deities, but also embraced the two re-entering cycles, of nine and 91 days. The nine-day cycle, we know, was a nocturnal count. In addition, there is some evidence that this computing year of 364 days, together with its four divisions of 91 days apiece, was connected with the positions of the sun, as Dr. Makemson (1943, p. 217) has pointed out. She also notes that two IS connected with the computing year, namely 8.17.11.1.10 13 Oc 3 Mol and 10.1.1.1.5 13 Chicchan 3 Cumku, reach the autumnal equinox and the winter solstice respectively in the Goodman-Thompson correlation.

THE PLANET VENUS

MAYA AND MEXICAN BELIEFS CONCERNING THE PLANET

Man has ever cherished the beauty of the planet Venus, wondered at its brilliance, and been astonied at its swift wayfaring. Poems, myths, and folk-tales bear witness to the high place that most moving of the stars of dawn and that most splendent lamp of the evening sky holds in our affections.

The Maya, with their deep appreciation of beauty, cannot have failed to see the splendor of the great planet, but their discrimination was warped by the baleful influences which surrounded the person of the stellar god. Our knowledge of the Maya attitude toward Venus is not so full as we would wish, but the pictorial scenes which accompany the Venus tables in Dresden are so similar to those in Mexican codices (Vatican B, Borgia, and Bologna) that we can be certain that the same concepts concerning the god existed in both areas, as first pointed out

by Seler (1904a). Sundry details of the deities in the Dresden table show Mexican influence, but the general concept is Maya.

In Mexican belief Venus was particularly malignant at the moment of heliacal rising. Sahagun (1938, bk. 7, ch. 3) states that the Mexicans shut the doors and windows so that the light of the newly risen planet should not enter the houses, for it was unlucky and was believed to bring sickness. However, on some occasions which depended on the time (the day?) on which Venus appeared, heliacal risings of the planet were of good augury.

In a passage in the Anales de Cuauhtitlan (Codex Chimalpopoca, 1945, par. 51) the various influences are listed:

> They (the old men) knew when he [Quetzalcoatl as Venus] appears, on what number and what particular signs he shines. He casts his rays at them, and shows his displeasure with them. If it [the sign which coincides with heliacal rising] falls on 1 Cipactli, he spears the old, men and women equally. If on 1 Ocelotl, if on 1 Mazatl, if on 1 Xochitl he spears the children. If on 1 Acatl he spears the great lords, just the same as on 1 Miquiztli. If on 1 Quiauitl, he spears the rain, and it will not rain. If on 1 Ollin, he spears the youths and maidens; if on 1 Atl, everything dries up. For that the old men and the old women venerated each of these signs.

Seler (1904a, pp. 384–87), in a fine exhibition of scholarship, compared this passage with the pictorial representations of the revolutions of Venus in the Mexican codices. The five days on which the planet consecutively rose in the cyclic Venus calendar are Cipactli, Acatl, Coatl, Ollin, and Atl. Below are listed the targets of Venus' spear in the pictures which accompany these signs.

Sign	Codex Victim	Anales de Cuauhtitlan
1. Cipactli	Water goddess	Venus spears aged
2. Acatl	Jaguar throne	Venus spears lords
3. Coatl	Various deities	...
4. Ollin	Warriors of jaguar order	Venus spears young
5. Atl	Maize deity with symbols of drought	Drought

The jaguar throne symbolizes chieftainship; the jaguar itself, with the sign Ollin, doubtlessly represents the military order of Jaguars, the young warriors. Indeed, in Borgia the jaguar is replaced with a shield and spears, the symbols of war. In such highly militaristic and masculine cultures as those of central Mexico, it is logical to personify youth as a warrior. A serious discrepancy occurs in the case of 1 Cipactli: according to the Anales de Cuauhtitlan, Venus spears the aged on that day; the codices show him spearing the water goddess, that is to say, drought was to be expected.

In Dresden 46–50 the five sets of pictures accompanying the Venus tables similarly portray the spearing of

victims. These are respectively, an aged deity, a jaguar, the maize god, a frog deity, and a youthful personage, perhaps God R. There can, therefore, be not the slightest doubt that Venus at heliacal rising was regarded by the Maya also as dangerous to sundry categories of humanity and to those forces of nature on which he was most dependent.

In the cycle of myths concerning the life of sun and moon on earth, the Venus god is the older brother of the sun (Thompson, 1930, pp. 119–40). He is described as rather stupid, and very ugly with a heavy beard. He is the patron of the animals of the forest, from which his Kekchi name Xulab (*xul*, animal) derives. Hunters must keep vigil the night before hunting, and offer copal and prayers to him before he rises high above the horizon. In connection with his ill repute in the books of Chilam Balam, it is noteworthy that in this cycle of myths he commits adultery with his sister-in-law, the moon.

The sun and his brother play an important rôle in the Popol Vuh of the Quiche, but according to the extant version the brother becomes the moon. I deem it most probable that this identification with the moon is due to degeneration in the period of Spanish influence which preceded the reduction of the legends of the Popol Vuh to writing. The brother could hardly have been the moon because the Maya almost everywhere regarded and still regard the moon as a woman, the wife of the sun. On the other hand, the cycle of stories clearly belongs with those in which the sun and Venus are brothers, and the moon is the wife of the former. Accordingly, we can be reasonably sure that the brothers of the Popol Vuh legend were in the pre-Spanish version the sun and Venus. Hunahpu was the name of the brother we assume to have become the planet Venus but Hunahpu is the Quiche equivalent of the day 1 Ahau, which is precisely the day sacred to Venus, and, as we shall see, a name for the Venus god in Yucatan.

NAMES FOR THE PLANET VENUS

There are various names in Yucatec for Venus. These include *Nohoch ich*, "great eye," *Chac ek*, "red star," or "giant star," and *Xux ek*, "wasp star." They are listed in the Motul dictionary as morning star, but we are doubtlessly justified in using the more specific rendering of Venus as morning star. The affix for red is almost invariably prefixed to the glyphs for Venus in Dresden. The use of this affix perhaps derives from the fact that red is the color of the east, but more probably it is a rebus for *chac*, "giant," which agrees with the other names. *Nohec* (Manche Chol), *ah no ic* (Yocotan), *mucta canal* (Tzotzil), *niuan canal* (Chuh and Chaneabal), *nim cheuh* (Mam of Tectitan), *nim ch'umil* (Ixil), and *nima*

ch'emil (Quiche of Rabinal) appear to mean "great star," showing how widespread that designation is. Indeed, among the Aztec the name for the planet was *Uei citlalin*, "great star." The Kekchi *cac chaim* probably means "red star," corresponding to the Yucatec *chac ek*. Other names for the morning star, but which might have been applied to whatever planet occupied that position, are the Yucatec *ah zahcab*, roughly corresponding to our "herald of the dawn," and *ah p'iz akab*, "measurer of the night." The latter occurs also in Manche Chol.

None of the early writers gives any direct information on the Venus gods, but it is possible to piece together a number of veiled references in the books of Chilam Balam.

Let us first recall the augury in the first Kaua list of the day Lamat, for that was the day of Venus. It reads: "Drunkard, deformed dog is his prognostic. The head of a jaguar; the rear of a dog. A meddler, a prattler, dishonest in his speech, an experimenter in mutual hatred, a sower of discord." That description exactly fits Lahun-Chan. Roys (1933, p. 101) notes that this name would mean "10 Sky" in Tzeltal, Chontal, and those other languages which often substitute *ch* for the Yucatec *c* (*caan* is "sky" in Yucatec). He points out that the glyph "10 Sky" accompanies the picture of a deity, previously identified by Seler as the Venus god, on Dresden 47, one of the pages dealing with the Venus cycle (fig. 14,*1,2*).

Lahun-Chan has a part in the story of the creation, as narrated in Chumayel (p. 46). We are told that he was envious, ribald, and insolent in his speech, and that sin was in his face and talk. He was forgetful of his father and mother; he walked abroad like one drunk, one without understanding, and there was no virtue in him. Mighty were his teeth (alternative translation, "Great is his madness"); his hands were claws (Roys, 1933, p. 105). Lopez de Cogolludo writes that he had ugly teeth (the spelling Lakunchan in the second and third editions is a misprint). The allusions to his mighty teeth and his claws suggest the jaguar, since the large canine is one of the identifying attributes of the jaguar in Maya art; the other details conform to the prognostication for the day Lamat. Let us see whether we can find any further reference to this unpleasant god.

The katun of the creation in which Lahun-Chan makes his disagreeable appearance is Katun 11 Ahau. Since deities recur at each return of the same katun, one would expect to encounter Lahun-Chan in other references to a Katun 11 Ahau. In a prophecy, which according to Chumayel (p. 64) is for the tenth katun but which Tizimin and Mani assign to the first katun, that is Katun 11 Ahau, there is indirect mention of this god. His head is said to be that of a jaguar, his body that of a dog; his

tooth is long, his body is withered (like that of a rabbit in the Mani version). He is called Ah Chich, "the forceful one," in Mani; "9 Mountains" and Yuma-Une-Tziuit in Chumayel. Roys, who sees references to Quetzalcoatl in this passage from Chumayel, has interesting footnotes to his translation.

In Chumayel, page 87, there is another prophecy for Katun 11 Ahau. This has generally been taken as alluding to the second coming of Quetzalcoatl, but two mentions of a white (or artificial) circle in the sky suggests a reference to Quetzalcoatl as the Venus god. In one case the word for circle is replaced by a large O. The two conflicting sets of ideas can be reconciled: Lahun-Chan, if my thesis is correct, was the original Maya god of Venus; Quetzalcoatl, a later importation perhaps grudgingly accepted by the Maya, was also a deity of that planet. In time, we may suppose, the two were partly fused with resulting allusions to both in the prophecies for Katun 11 Ahau. References were made to Quetzalcoatl in the prophecies because those were partly directed to the new ruling caste with its Mexican affiliations; in Dresden, which was a new edition of a pre-Mexican book, Lahun-Chan seemingly is pictured, and so, too, is Quetzalcoatl.

There is still further proof that this jaguar-faced god, Lahun-Chan, is the Venus god. In almanacs in the books of Chilam Balam the prognostic for 8 Lamat is "jaguar-faced 1 Ahau with the protruding teeth" (p. 299). As Lamat is the day of Venus and as 1 Ahau is the base, the *lubay,* of the Venus cycle, we can rest assured that "jaguar-faced" 1 Ahau is another name for the Venus god, that is to say Lahun-Chan. Furthermore, as we have seen, Hunahpu, "1 Ahau," of the Popol Vuh was in all likelihood the Venus god. Other reasons for associating 1 Ahau with Venus as morning star are noted on page 224.

The picture of Lahun-Chan in the Venus tables (fig. 14,*1*) does not show the features of a jaguar, but his ribs are prominently displayed, reminding one that that is the most salient feature of the glyph of the dog (fig. 14,*10*), whose body he has.

The Venus god as patron of the month Yax is represented either by the Venus symbol or by the head of a dragon which may carry the Venus symbol (fig. 22, *50–59*). Celestial dragons frequently have Venus glyphs on their heads, but as they form the canopy of heaven, it is not unnatural that their function should be emphasized by setting on their bodies the star of dawn and dusk.

It would seem that the Mexicans associated various gods with each of the five appearances of Venus as morning star in the eight-year division, and it is not impossible that the same idea obtained among the Maya. At least, it is clear that the five deities shown in the middle pictures

of the Venus table of Dresden 46–50 represent five distinct manifestations of the god in the act of hurling the shafts of affliction at mankind and his world, but it is possible that five-fold representation is a borrowing from Mexico.

The deity on page 46 has a partially blackened face, but the area around the mouth is white. His features are not unlike those of God D, but I deem the resemblance fortuitous, for the glyph of the god has an Imix sign as prefix, a feature never found with the glyphs of God D (fig. 42,*24*). In fact, Schellhas (1904, p. 34) segregates the examples of this god, to which he assigns the letter L. He is a rare body, appearing only four times in Dresden and not at all in the other codices. Once (p. 14b) he lacks the black coloring, and twice he wears a fish in his headdress. The fish and the Imix prefix to his glyph are probably the clues to his identification, for we have seen (p. 72) that both are primarily symbols of the earth crocodile, and secondary attributes of all deities of the soil and the underworld. The Venus god in some Mexican codices carries death symbols, and Lahun-Chan on page 47 of the Venus tables in Dresden is similarly decked; those I have explained as indicative of his residence in the underworld prior to heliacal rising as morning star. It is, therefore, highly probable that the Imix prefix and the fish similarly record that Venus as morning star has just emerged from the underworld. God L, therefore, can be provisionally identified as one of the manifestations of Venus as lord of the dawn.

The god on page 47 has been identified as Lahun-Chan (fig. 14,*1,2,4*).

The deity on page 48 is clearly an animal. He wears the Mexican *oyoualli* ornament on his breast and in his headdress. This pectoral is carried by certain Mexican gods with animal characteristics, particularly those connected with amusement (the pisote, monkey, etc.), and by the gods of sport, dancing, and amusement, the Macuil gods. His face is black save for a yellow area around his mouth, and a small green oval around his eye; his body is set with circles containing three dots, similar to those usually carried by the frog when it serves as the head form of the uinal. What is probably the same deity is depicted on page 37a of this codex, and this picture has been identified by Seler (1902–23, 4:701) as that of a frog. If this is, indeed, a frog god, I am unable to offer any suggestion for connecting him with Venus. I would be inclined rather to regard the portrait as that of Xolotl, the canine god, and twin brother of Quetzalcoatl.

The god on page 49 is distinguished by a broad black band edged with white, which crosses his face horizontally at the level of the eyes, and a second, narrower one which passes across the upper lip. Horizontal bands on the face are typical of Mexican rather than Maya gods. One can,

accordingly, surmise that it is a deity of Mexican origin. In the lobe of one ear there is a bird and, on the other side of the face at the same level, is a snake, which from its position appears to have emerged from the lobe of the other ear, hidden from sight. The god wears a circular pectoral with a design of linked crescents; his loincloth is of jaguar skin. His foot is painted white. A conch shell may be set in his headdress. This deity, I think, can be identified with some assurance as Quetzalcoatl-Kukulcan. The principal objection to the identification is that Quetzalcoatl is usually provided with vertical, not horizontal, face markings. On the other hand, the bird and snake suggest very strongly Quetzalcoatl's rebus. Furthermore, Sahagun lists among the attributes of Quetzalcoatl the loincloth of jaguar skin and the white sandal. The pectoral is of Mexican design, and something very similar is frequently worn by Quetzalcoatl and one or two other gods; the conch ornament is one of his attributes. Lastly, we know that Quetzalcoatl was the god of the morning star in Mexico, and in view of the very close similarities in the legends and beliefs concerning Venus in both areas, one might well expect to find Quetzalcoatl-Kukulcan in an edition of a Maya codex which is subsequent to the start of the Mexican period. The facial painting may have derived from some local variation of the god in southern Veracruz or Tabasco.

The deity on page 50 is blindfold. This is not a Maya divinity but Ixquimilli, the blindfold god of the Mexicans. Ixquimilli is a shadowy deity, who partakes of the attributes of both Tezcatlipoca and Itztlacoliuhqui. He is the god of the day Atl, and as such he wears the smoking mirror of Tezcatlipoca. As lord of the twelfth week, 1 Cuetzpalin, in Borgia, Bourbon, and Telleriano-Remensis, as well as in the Tonalamatl of Aubin, Ixquimilli wears the hood of Itztlacoliuhqui which curves backward; only in Vatican B, where Ixquimilli is shown as a mummy bundle, is the curved hood missing. On Bologna, page 12, occurs a deity with the curved hood of Itztlacoliuhqui, the bandaged eyes of Ixquimilli, and the facial bands of Tezcatlipoca. Sahagun (1938, bk. 2, ch. 30) says that this hood was called Itztlacoliuhqui, "which means god of frost." One commentator of Telleriano-Remensis remarks that Itztlacoliuhqui is "a star which they say goes backward [a reference to the retrograde motion of a planet?]." Another commentator says he was lord of the frost. In that connection it is important to note that according to the Codex Chimalpopoca (1945, p. 122) Tlauizcalpantecutli, the morning star, lord of the dawn, shot an arrow at the sun to make him move but missed his mark. Thereupon the sun shot at and hit Tlauizcalpantecutli with his spears with red feathering, and immediately "covered his face with the nine skies together, for Tlauizcalpante-

cutli is the god of frost." Lehmann (1906, par. 45) translates this sentence "he threw him face down, on the ground, to the river of the underworld [Chiconauhapan, 'nine rivers'], so Tlauizcalpantecutli is the god of cold." Both translations come from different versions. One has "nine skies," the other "nine rivers," which Sahagun gives as the name of the river of the underworld. The latter seems more reasonable, for the underworld was the place of cold, and Venus spends time there before his emergence as morning star. In view of what has been set forth above, I deem it virtually certain that Itztlacoliuhqui is merely a variant form of Tlauizcalpantecutli, the god of Venus as morning star, and that the concept of lord of frost derives from a natural association of the morning star with the coldness of dawn. I feel, too, that there can be little doubt that the blindfolding is merely an attribute generally added to representations of Itztlacoliuhqui.

Of the five Venus gods pictured in the Venus tables, Lahun-Chan and God L are Maya; the remaining three are almost certainly Mexican. One is probably Quetzalcoatl, another almost surely Itztlacoliuhqui blindfold, and the third, although unidentified, can be attributed to the Mexican pantheon because of the *oyoualli* ornament he wears. We can therefore be reasonably sure that this idea of having five manifestations of the Venus god, one corresponding to each of the five Venus years in a group, derives from Mexico.

GLYPHS FOR VENUS

The hieroglyphs for the planet have been identified with very little doubt, since they occur in profusion on every page of the Venus tables of Dresden. The first form is clearly that of the day sign Lamat without its cartouche (fig. 42,*31*). The design consists of a small rhomboid in the center, and four small circles set in the corners of the glyph. The Venus glyph is differentiated from the Lamat signs by the addition of a squat cross, in the angles of which the circles are set. Yet this is not a fundamental difference, since even in the Lamat glyphs the points of the rhomboid (the "Ich" of the "Ben-Ich" sign) are prolonged so as to produce a cross. The second form of the Venus glyph consists of an inverted *w* with a circle set in each loop (fig. 42,*33*). This form, too, occurs as the day sign Lamat (fig. 7,*57,61*). It has been suggested that it is merely the first variant cut in half. This is plausible, but it should be noted that the end lines of the inverted *w* do not occur in the first variant.

The Venus glyph in the Dresden tables with two exceptions has the prefix for great or red (*chac*) attached to it. This prefix is very seldom found with Venus signs in the inscriptions; an example on Copan T 11 is a rare exception (fig. 54,*5*). In this connection, it is interesting

to recall that the Motul dictionary lists *chac ek*, which could' mean "red star" or "giant star," as one of the names for the morning star. The Venus glyph appears twice in the eclipse tables, both times without the red. The total number of Venus glyphs without prefix or with the *chac* prefix in the codices is 50. There are also half a dozen occurrences of Venus glyphs with quite different affixes, notably the seated man placed upside down (twice in the eclipse tables, once on Paris 4; fig. 42,*32*), a death symbol (Madrid 59c), and with a suffix (Paris 23 and perhaps 5). Once (Dresden 71a) the Venus sign is affixed to a glyph no longer legible.

THE SYNODICAL REVOLUTION OF VENUS

The synodical revolution of Venus averages 583.92 days. It may be as little as 581 or as much as 587 days. The interval of 584 days therefore was a very good approximation to the mean. This number was of prime importance to the Maya because of the facility with which it could be related to the year of 365 days, and to the sacred almanac of 260 days. The common factor of 584 (8×73) and 365 (5×73) is 73. Therefore in 2920 days (5×584 or 8×365) exactly five synodical revolutions of Venus and eight years of 365 days will have completed themselves, and the two periods once again share the same *lub*. A longer period, but an extremely convenient one, is necessary to harmonize the synodical revolution of Venus with the sacred almanac, for the highest common factor is 4. A total of 37,960 days will pass before the two cycles will end on the same day. That number, however, is two CR (5.5.8.0), at which time the vague year of 365 days also ends on the same day. In other words after two CR there will have elapsed 65 synodical revolutions of Venus, 104 years of 365 days and 146 rounds of the sacred almanac. All three periods will reach the *lubay*, "the great resting place," together.

There is no reliable evidence that the Maya were acquainted with the sidereal revolution of Venus or of any other planet.

VENUS TABLES IN CODEX DRESDEN

The tables of Venus in Dresden, identified as such by Förstemann many years ago, apportion the synodical revolution in four uneven divisions of 236, 90, 250, and 8 days. From Mexican sources we know that the period of invisibility at inferior conjunction was reckoned as eight days. It is therefore obvious that the cycle was counted from heliacal rising, four days after inferior conjunction, when the planet is first visible as morning star. To the period of visibility as morning star were assigned 236 days, at the end of which Venus was lost to view in the solar light. In 90 days Venus, continuing its unseen

course, passed through superior conjunction to its second heliacal rising, as evening star. After 250 days as evening star it was once more lost in the sun's rays to pass four days later through inferior conjunction and then, at the end of eight days, to reappear as morning star, thereby completing the revolution of 584 days.

As 584 divided by 20 has a remainder of 4, it is clear that heliacal risings of Venus as morning star can occur only on days at intervals of four days in the official revolution of the planet, but observed risings could occur on any day because actual revolutions of Venus vary in length from 581 to about 587 days. These official days of heliacal rising were Ahau, Kan, Lamat, Eb, and Cib. As 584 divided by 13 has a remainder of 12, it follows that the coefficient of the day increases by 12 (or decreases by 1) at each new heliacal rising. Heliacal risings, therefore, follow in the sequence 1 Ahau, 13 Kan, 12 Lamat, 11 Eb, 10 Cib, 9 Ahau, 8 Kan, etc., an arrangement which greatly simplified calculations.

In the table of Venus which occupies Dresden 46–50 the days on which the revolutions end, and the intervening days of disappearance before superior conjunction, reappearance, and second disappearance occupy the upper compartment of the left half of each page. The material is transcribed in Table 17. The starting point is the end of the table, the day 1 Ahau. The number 236 in line 26 is counted from 1 Ahau to reach 3 Cib, at the left of line 1. This is the day of disappearance. The addition of 90 days (line 26) leads to reappearance as evening star at 2 Cimi (line 1), and 250 additional days carry the count to second disappearance at 5 Cib. Inferior conjunction, four days later, is not noted. Instead, the tally advances eight days (line 26) to a new heliacal rising at 13 Kan (line 1).

The process repeats: Venus passes through the three stages to a third heliacal rising at 12 Lamat (line 1, last column of p. 47), to a fourth at 11 Eb (line 1, last column of p. 48), to a fifth at 10 Cib (line 1, last column of p. 49), and to a sixth at 9 Ahau (line 1, last column of table). Thence the sequence is across the second line, passing through the intermediate points to heliacal risings at 8 Kan, 7 Lamat, 6 Eb, 5 Cib, and 4 Ahau. The series succeeds line by line until the table is completed when the day 1 Ahau is again reached as the date of a heliacal rising (line 13 extreme right), the total of 65 revolutions of the planets having been counted. The series then repeats in the same sequence.

Line 19 gives the totals of days elapsed in the course of the five revolutions comprised in a horizontal line. Line 15, omitted from the table, repeats the same glyph, a hand under shell with lunar postfix (fig. 42,*55*), 19 times. In the last appearance of the glyph the lunar postfix is

TABLE 17—SCHEME OF THE VENUS CYCLE ON DRESDEN 46–50

Line	Cib	Cimi	Cib	Kan	Ahau	Oc	Ahau	Lamat	Kan	Ix	Kan	Eb	Lamat	Etz'nab	Lamat	Cib	Eb	Ik	Eb	Ahau
1	3	2	5	13	2	1	4	12	1	13	3	11	13	12	2	10	12	11	1	9
2	11	10	13	8	10	9	12	7	9	8	11	6	8	7	10	5	7	6	9	4
3	6	5	8	3	5	4	7	2	4	3	6	1	3	2	5	13	2	1	4	12
4	1	13	3	11	13	12	2	10	12	11	1	9	11	10	13	8	10	9	12	7
5	9	8	11	6	8	7	10	5	7	6	9	4	6	5	8	3	5	4	7	2
6	4	3	6	1	3	2	5	13	2	1	4	12	1	13	3	11	13	12	2	10
7	12	11	1	9	11	10	13	8	10	9	12	7	9	8	11	6	8	7	10	5
8	7	6	9	4	6	5	8	3	5	4	7	2	4	3	6	1	3	2	5	13
9	2	1	4	12	1	13	3	11	13	12	2	10	12	11	1	9	11	10	13	8
10	10	9	12	7	9	8	11	6	8	7	10	5	7	6	9	4	6	5	8	3
11	5	4	7	2	4	3	6	1	3	2	5	13	2	1	4	12	1	13	3	11
12	13	12	2	10	12	11	1	9	11	10	13	8	10	9	12	7	9	8	11	6
13	8	7	10	5	7	6	9	4	6	5	8	3	5	4	7	2	4	3	6	1
14	4 Yaxkin	14 Zac	19 Zec	7 Xul	3 Cumku	8 Zotz'	18 Pax	6 Kayab	17 Yax	7 Muan	12 Ch'en	0 Yax	11 Zip	1 Mol	6 Uo	14 Uo	10 Kankin	0 Uayeb	5 Mac	13 Mac
16	N.	W.	S.	E.	N.	W.	S.	E.	N.	W.	S.	E.	N.	W.	S.	E.	N.	W.	S.	E.
17	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
18	Red ⅓	Red ⅓	Red ⅓	Red ⅓	Red	Red	Red	Red ⅓	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red	Red
19	Venus 236	Venus 326	Venus 576	Venus 584	Venus 820	Venus 910	Venus 1160	Venus 1168	Venus 1404	Venus 1494	Venus 1744	Venus 1752	Venus 1988	Venus 2078	Venus 2328	Venus 2336	Venus 2572	Venus 2662	Venus 2912	Venus 2920
20	8 Zac	18 Muan	4 Yax	12 Yax	3 Zotz'	13 Mol	18 Uo	6 Zip	2 Muan	7 Pop	17 Mac	5 Kankin	16 Yaxkin	6 Ceh	11 Xul	19 Xul	15 Cumku	0 Zec	10 Kankin	18 Kayab
21	T	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
22	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen	Winged Chuen
23	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus	Red Venus
24	E.	N.	W.	S.	E.	N.	W.	S.	E.	N.	W.	S.	E.	N.	W.	S.	E.	N.	W.	S.
25	19	4	14	2	13	3	8	16	7	17	2	10	6	16	1	9	0	10	15	8
26	Kayab 236	Zotz' 90	Pax 250	Kayab 8	Yax 236	Muan 90	Ch'en 250	Ch'en 8	Zip 236	Yaxkin 90	Uo 250	Uo 8	Kankin 236	Cumku 90	Mac 250	Mac 8	Yaxkin 236	Zac 90	Zec 250	Xul 8

Page 46　　Page 47　　Page 48　　Page 49　　Page 50

omitted (fig. 42,56). I think there can be little doubt that this is merely a completion sign, the lunar postfix being the rebus for the possessive *u* (p. 188).

Lines 18 and 23 are monotonously filled with Venus glyphs which, with one exception, have a red prefix. The single omission probably has no significance. On page 48, line 23 is omitted, presumably because of lack of space. A glyph resembling the Chuen sign but with various postfixes is repeated across the lower half of each page, except page 47, where its omission is presumably due to lack of space. It appears in lines 21 or 22 (fig. 42,70,71).

Line 14 gives the month positions corresponding to the 65 days recorded at the top. As the table extends horizontally for five Venus revolutions, which equal eight years of 365 days, the month positions follow in sequence, and each is used with all the 13 day signs above it. The table starts with 13 Mac, passes to 4 Yaxkin 236 days later, next to 14 Zac 90 days later, then to 19 Zec 250 days later, and reaches heliacal rising at 7 Xul. Passing through the various stages, heliacal risings are attained at 6 Kayab, o Yax, 14 Uo, and finally, once more, at 13 Mac. Thus, if 1 Ahau 13 Mac marks a heliacal rising, 9 Ahau 13 Mac will again be a heliacal rising, five revolutions later, to be followed after the same interval by 4 Ahau 13 Mac.

Lines 20 and 25 set forth two other sets of month positions, arranged in precisely the same way, but counted respectively from (1 Ahau) 18 Kayab and (1 Ahau) 3 Xul. The manner in which these two series may have been used will be reviewed later. The only major error in the table is o Xul instead of o Yaxkin (p. 50).

Line 16 gives the glyphs for the four world directions in the sequence east, north, west, south, with east corresponding to heliacal rising, so that page 46 starts with north assigned to the disappearance of Venus before superior conjunction, west appropriately to its reappearance as evening star, south to the day of its disappearance in the sun's rays four days before inferior conjunction, and east to its reappearance as morning star. The sequence then repeats on the following pages.

Line 24 repeats the world directions but in the sequence south, east, north, west, with south beneath the dates of heliacal risings after inferior conjunction. It will be recollected that whereas line 19 gives the accumulation of days, line 26 gives the intervals between the points in the synodical revolution. It is therefore probable that the first set of world directions refers to the actual dates of the synodical revolution of the planet; the second set gives the world directions of the intervals between those points. That is to say, heliacal rising after inferior conjunction is assigned to the east, and so, too, are the 256 days during which Venus is a morning star. The day of disappearance before superior conjunction is assigned to the

north, and so are the 90 days of invisibility which follow. Heliacal rising after superior conjunction, when Venus becomes the evening star, is allotted to the west, as are the following 250 days during which the planet is visible in the west. Disappearance and the period of invisibility around inferior conjunction fall to the north.

DIRECTIONAL GODS IN VENUS TABLES

Line 17 is occupied by the glyphs of 20 deities, some of whom are recognizable (fig. 42,*1–20*). These are lettered from A to T. The same series of glyphs, with immaterial variations, is repeated in lines 21 and 22 (the drop to line 22 on pp. 48–50 is due to the winged Chuen glyph being inserted above). However, the twentieth god of line 17 becomes the first god of lines 21 and 22, and the whole series is thereby moved forward a space. This displacement corresponds to the shift in the world-direction glyphs. God A is in the top line associated with the north and disappearance of Venus before superior conjunction; in the lower line he is assigned again to the north, but the association is, I hazard, with the 90 days of invisibility around superior conjunction.

Grouped by directions, these gods are:

East:

D. Almost certainly God A, god of death (fig. 42,*16*).

H. The tun sign in one line; the Cauac element in the other. The two glyphs are more or less synonymous. In both cases there is a coefficient of 4 and the same prefix. The latter glyph, but with a coefficient of 5, is that of God N, the old god. However, on Dresden 4a this same glyph with coefficient of 4 appears above a portrait of an aged god indistinguishable from God N. All in all, it is not unlikely that both glyphs represent God N, or a deity very closely connected with him (fig. 42,*17,22*).

L. The moon goddess, identifiable by the lunar postfix. Save for the two appearances in this table and a third appearance on page 24, which belongs to the ephemeris of Venus, this glyph occurs in only one other place in the codices. That is above one of the pictures in the eclipse tables of Dresden (fig. 42,*18*).

P. The Chicchan god with a coefficient of 1. The Chicchan, it will be recalled, is a celestial serpent (fig. 42,*19*).

T. A long-snouted monster with crossbands in the eye, and a death eye above the root of the snout. The crossbands are absent from the representation on page 24, and not recognizable on the glyph at the start of page 46 (fig. 42,*20*). With crossbands in the eye the glyph appears also in the eclipse tables (p. 56a). Its only other occurrence is on Madrid 71b, where, in a decidedly more conventionalized form, it accompanies one of the compartments of the sacred almanac, that starting with the day 3 Muluc.

These five glyphs follow one another in descending order in column B of Dresden 24a. That page, as already noted, is really a part of the Venus tables, and in the original pagination (p. 24) immediately preceded page 46. The glyphs, as arranged on page 24, take the order: H, L, P, T, D. That is the same as noted above save that D comes at the end of the series, not at the start.

North:

A. A geometric element above a bundle and with a *u* bracket as prefix. The central element has a death eye at top right, and in the center a motif which is similar to the closed eye with eyelashes of the death god (fig. 42,*1*). It is Gates' Glyph 344 and, as he has shown, is of frequent occurrence with varying affixes. Without the bundle it appears on all the Venus pages in apposition to other name glyphs of gods. Sometimes an object which looks like a rope crosses the glyph diagonally. It cannot be assigned to any known deity, although it would appear to represent some god of the underworld.

E. The head of a bird (?) with Etz'nab infix (fig. 42,*2,23*).

I. The glyph of the sun god; God G (fig. 42,*3*).

M. The head variant of the glyph of God B (fig. 42,*4*).

Q. The head of the maize god, God E. On page 24 the head of the maize god, but with a different prefix, appears in Column C (fig. 42,*5,28*).

West:

B. A glyph with a *te* (2) postfix and a prefix which is like that of white save for the addition of two antennae (fig. 42,*6*).

F. A deity with prominent lips and what is probably a death eye on his forehead. He wears a headdress which resembles the "Akbal" sign (fig. 42,*7*). Presumably a god of the underworld. This deity does not appear elsewhere in Dresden, but occurs a few times in Madrid with different affixes, and once with a coefficient of 9.

J. A symbolic glyph with a coefficient of 6. The glyph consists of a yax sign over a hand, like that of Manik (fig. 42,*8*). In the second example a "Ben-Ich" superfix is present. This glyph, in all cases with a coefficient of 6, occurs on Dresden 34c and on Paris 4, 9, and 10 in connection with the Katun regents. On the Santa Rita murals, again with coefficient of 6 and "Ben-Ich" prefix, it is attached to a deity resembling God D who is the regent of Tun 11 Ahau.

N. The head of the god of death with the *il* prefix and eye with loop in it (fig. 42,*9*).

R. The black-headed variant of God D. The black is surely added because the god here rules in the west, with which black is associated (fig. 42,*10*).

South:

C. A head with the red prefix, an oval of dots around the mouth, peculiar curls at the corner of the eye and the Etz'nab sign on the side of the cheek (fig. 42,*11*). One would be inclined to identify this as the head of a deity of sacrifice. Xipe, it will be recalled, is the red god, the god of sacrifice. The head is not uncommon, with varying affixes, in Paris.

G. A composite glyph with a coefficient of 13. The top part of the first glyph is the sign for misfortune; the lower half the sky sign. There is a *te* (3) prefix (p. 285). The second glyph is precisely the same, save that the sky sign is above the misfortune element. The glyph vaguely suggests a deity of the 13 skies or the thirteenth layer of heaven (fig. 42,*12,21*).

K. The glyph is the "Akbal" over serpent scales with "Ben-Ich" prefix above, and another prefix to left (fig. 42,*13*). Could this mean something like night countenance (p. 201)?

O. A well-known head with two volutes emerging from an oval inserted in the forehead. It is the glyph of God K (fig. 42,*14*).

S. A symbolic glyph with a coefficient of 7. The main element resembles Mol, and there is a prefix like that of the month sign Cumku (fig. 42,*15*).

Although many of the deities to which these glyphs pertain cannot at present be identified, the listing of the glyphs by the directions with which they are associated may prove beneficial for later studies. I do not think they are directly associated with the planet Venus. The directional gods are in poor agreement with those given in Landa and on Dresden 25–28. God K is associated with the south on the Venus pages; with the east in the other two sources. The death god is associated with east and west on the Venus pages; with the south in the other two sources. The sun god and God D are associated with north and west, respectively, in all three sources (Thompson, 1934, p. 226).

LONG COUNT POSITIONS OF VENUS TABLES

There are, as we have seen, three sets of month positions running through the Venus revolutions and clearly to be associated with the days given above.

These three sets of month positions end on 1 Ahau 18 Kayab, 1 Ahau 3 Xul, and 1 Ahau 13 Mac; what is undoubtedly the base for a fourth set, the date 1 Ahau 18 Uo, is given on page 24. It is pretty clear that they represent corrections to keep the Venus revolutions in step with the year of 365 days. After the table has been used once, that is to say after 65 synodical revolutions of Venus, the average appearance of the planet at heliacal rising will have dropped back slightly over five days ($65 \times 583.92 = 37954.8$; $104 \times 365 = 37,960$). Thus if heliacal rising fell on 1 Ahau 18 Kayab at the start of the table, it would be expected to fall on 9 Men 13 Kayab at the end, but because there is considerable variation in the length of a synodical revolution of Venus, one cannot say definitely that it would fall on that particular day. It is obvious that the table would accumulate a huge error if one waited until the sixty-fifth revolution fell on 1 Ahau 13 Mac, and a still greater error over thousands of years if one waited until it fell on 3 Xul. Teeple (1926) was the first to tackle this problem. He showed that if the Maya subtracted four days at the end of the sixty-first revolution of Venus, they would again reach 1 Ahau, but with a different month position. Similarly, as a correction of eight days occasionally had to be made, because the error was slightly over five days, not four, the subtraction of eight days at the end of the fifty-seventh revolution of the planet would also lead to 1 Ahau. These four bases would then be connected as follows:

1 Ahau 18 Kayab
  add 4.12. 8.0   57 revolutions of Venus less 8 days
1 Ahau 18 Uo
  add 4.18.17.0 61 revolutions of Venus less 4 days
1 Ahau 13 Mac
  add 4.18.17.0 61 revolutions of Venus less 4 days
1 Ahau 3 Xul
  add 4.18.17.0 61 revolutions of Venus less 4 days
(1 Ahau 8 Ch'en   not recorded)

The table can, of course, be extended indefinitely, with three corrections of four days at the end of 61 revolutions and one correction of eight days at the end of 57 revolutions. This correction of 20 days for 240 revolutions of the planet is remarkably accurate. The true correction should be 19.2 days, an error of less than a day in nearly 384 years.

This reconstruction was a brilliant piece of work on Teeple's part. It is moreover supported by the numbers on Dresden 24, which, as already noted, comes immediately before page 46, the break in the pagination being due to the incorrect arrangement made by Förstemann, and retained ever since.

The table on the right side of the page starts at the bottom right corner, and proceeds to the left and upwards, precisely the reverse of the way we write. Rearranged, with minor restorations and one change (260 days added to 9100), the material is presented in Table 18.

be a correction of about 25 days. If, however, the amended figure of 9360 days is subtracted from 185,120, the result (175,760 days) equals 301 revolutions of 584 days less 24 days, that is to say, four groups of 61 revolutions and one group of 57 revolutions. That is precisely how the correction should be made to achieve the greatest accuracy.

The figure 9360 is my own amendment, for the number is actually written as 9100 (1.5.5.0). However, there are good grounds for supposing that this is incorrect, for every other number of this table is either an exact multiple of 584, or a multiple of 584 with a small correction which is a multiple of 4, made in such a way that the total is a multiple of 260. The figure 9100 is 15×584+340, and, therefore, is far removed from any multiple of 584. In two or three cases in the tables of Dresden there are apparent mistakes which can best be corrected by the addition or subtraction of 260 days. If 260 is subtracted from 9100, the remainder still fails to approximate

TABLE 18—MULTIPLES OF VENUS REVOLUTIONS ON DRESDEN 24

Maya	*Day*	*Days*	*Revolutions of Venus*	
8 . 2.0	9 Ahau	2920	5	
16 . 4.0	4 Ahau	5840	10	
1 . 4 . 6.0	12 Ahau	8760	15	
1 . 12 . 8.0	7 Ahau	11680	20	(3 dots restored in uinal coefficient)
2 . 0 .10.0	2 Ahau	14600	25	
2 . 8 .12.0	10 Ahau	17520	30	
2 . 16 .14.0	5 Ahau	20440	35	
3 . 4 .16.0	13 Ahau	23360	40	
3 . 13 . 0.0	8 Ahau	26280	45	
4 . 1 . 2.0	3 Ahau	29200	50	
4 . 9 . 4.0	11 Ahau	32120	55	
4 . 17 . 6.0	6 Ahau	35040	60	
1 . 6 . 0.0	1 Ahau	9360	16	plus 16 days (260 days added)
4 . 12 . 8.0	1 Ahau	33280	57	minus 8 days
9 . 11 . 7.0	1 Ahau	68900	118	minus 12 days
1 . 5 . 14 . 4.0	1 Ahau	185120	317	minus 8 days
(5).(5). 8.0	1 Ahau	37960	65	
(10).(10).16.0	1 Ahau	75920	130	
(15).(16). 6.0	1 Ahau	113880	195	
(1).(1). 1 .14.0	1 Ahau	151840	260	

The figures in the table are regular multiples of the group of five revolutions of Venus (2920=8×365) with the exception of those in the fourth row. These embody the corrections employed. The 57 revolutions minus 8 days lead from 1 Ahau 18 Kayab to the base 1 Ahau 18 Uo, given at the bottom of this page; the 118 revolutions minus 12 days carry the reckoning from 1 Ahau 18 Kayab to 1 Ahau 13 Mac (57 revolutions with a correction of 8 days plus 61 revolutions with a correction of 4 days).

The figure of 185,120 represents 317 (260 + 57) revolutions less 8 days, but after 317 revolutions there should

a multiple of 584, but if 260 is added, the new figure of 9360 is 16×584+16, the remainder being, as required, a multiple of 4. I shall revert to the discussion of this number.

The question next arises as to what positions in the LC were occupied by these bases. On the left of page 24 there are two IS with the distance number that separates them, expressed as a ring number, that is to say, part of it is encircled.

$$9.9.16. \ 0.0 \quad 4 \text{ Ahau } 8 \text{ Cumku}$$
$$\underline{6. \ 2.0}$$
$$9.9. \ 9.16.0 \quad 1 \text{ Ahau } 18 \text{ Kayab}$$

This means that to a base 6.2.0. before 13.0.0.0.0 4 Ahau 8 Cumku the number 9.9.16.0.0 is added to reach 9.9.9.16.0 1 Ahau 18 Kayab.

The first number is 72 CR, which are equal to 2340 uncorrected synodical revolutions of the planet. During that interval Venus would have moved forward until heliacal risings would be 184 days earlier in the year (24 days correction for 301 Venus revolutions). The accumulated error of 184 days is very close to half a year, but that may be coincidence.

In no correlation so far suggested which is not derived solely from astronomical data does 9.9.9.16.0 coincide with a heliacal rising of Venus after inferior conjunction. In the Goodman-Thompson correlation heliacal rising occurs at about 9.9.9.16.16, that is to say about 16 days later. This error of some 16 days immediately reminds one of the corrected number 9360 days in the table, which equals 16 Venus revolutions and 16 days. If that is added to 9.9.9.16.0 1 Ahau 18 Kayab, one gets a new and correct base for the table, to which groupings of 57 and 61 Venus revolutions can be added as shown below:

A	9. 9. 9.16.0	1 Ahau	18 Kayab
A'	1. 6. 0.0	16 V. R.	+ 16 days
B	9.10.15.16.0	1 Ahau	8 Zac
B'	4.18.17.0	61 V. R.	− 4 days
C	9.15.14.15.0	1 Ahau	18 Zip
C'	4.18.17.0	61 V. R.	− 4 days
D	10. 0.13.14.0	1 Ahau	13 Kankin
D'	4.18.17.0	61 V. R.	− 4 days
E	10. 5.12.13.0	1 Ahau	3 Yaxkin
E'	4.18.17.0	61 V. R.	− 4 days
F	10.10.11.12.0	1 Ahau	18 Kayab
F'	4.12. 8.0	57 V. R.	− 8 days
G	10.15. 4. 2.0	1 Ahau	18 Uo
G'	4.18.17.0	61 V. R.	− 4 days
H	11. 0. 3. 1.0	1 Ahau	13 Mac
H'	4.18.17.0	61 V. R.	− 4 days
I	11. 5. 2. 0.0.	1 Ahau	3 Xul

It will be seen that this table embodies all four of the corrections given in the third row of page 24:

9360 (as amended) is 16 × 584 − 16 = A'
33280 is 57 × 584 − 8 = F'
68900 is 118 × 584 − 12 = F to H or E to G
185120 is 317 × 584 − 8 ⇒ A to G

One may also note, although it may be pure coincidence, that the highest figure in the table clearly restorable as 1.1.1.14.0 (151,840) is the distance between the two positions of 1 Ahau 18 Kayab (A and F).

The positions which end the tables in the codex are 1 Ahau 18 Kayab (A and F), 1 Ahau 13 Mac (H), and 1 Ahau 3 Xul (I), while 1 Ahau 18 Uo (G) is given on page 24.

This, of course, is not the only reconstruction that can be made, but it fits the 11.16.0.0.0 correlation, and it satisfactorily explains the large correction of 317 Venus years minus eight days. One would normally expect 301 Venus years minus 24 days. The drawback to the solution offered is that the bases 1 Ahau 8 Zac, 1 Ahau 18 Zip, 1 Ahau 13 Kankin, and 1 Ahau 3 Yaxkin, are nowhere written. The explanation of this probably lies in the fact that those bases were far in the past when the present edition of Dresden was written. Probably the 1 Ahau 18 Uo base was current when the present edition was produced. The Maya astronomer, accordingly, gave the old base, and with the correction of 185,120 days reached the base then current, and added those which would follow, 1 Ahau 13 Mac and 1 Ahau 3 Xul.

There remains unexplained the reason why a base 9.9.9.16.0 1 Ahau 18 Kayab, with a positive error of some 16 days, was chosen. There are several factors which may have led to its choice. Mrs. Makemson (1943, p. 214) has pointed out that the planet Mars is probably involved. She has shown that the Mars revolution of 780 days is a factor, and also that 9.9.9.16.0 1 Ahau 18 Kayab was just three days before conjunction of Mars with the sun. The synodical revolution of Mars is 779.936 days. The number 780 was therefore a very close approximation, and had the tremendous advantage in Maya eyes that it was a multiple of 260. Thereby the uncorrected Mars cycle would always fall on the same day. A point perhaps of some importance is that with the return of 1 Ahau at the end of each group of 65 uncorrected revolutions of Venus, the lord of the night will be different; only after the 65-year cycle has repeated nine times will the same lord of the night return to power. That is to say, only at the end of 585 uncorrected Venus years will the theoretical date of heliacal rising both fall on 1 Ahau and have the same lord of the night regnant. The interval 9.9.16.0.0, equivalent of 2340 uncorrected Venus years, being four times the lowest common factor, reproduces this condition.

The interval 9.9.16.0.0, accordingly, has a number of properties which gave it importance in Maya eyes. It is the equivalent of:

2340 uncorrected revolutions of Venus (584 days)
3744 uncorrected years of 365 days
5256 cycles of 260 days
1752 uncorrected revolutions of Mars (780 days)
3796 tuns (360 days)
   4 Venus great cycles with same lord of night (341,640 days)

Perhaps the corrections applied to the Venus calendar prior to 9.10.0.0.0 were too great, with the result that the calendar showed a heliacal rising of Venus at 9.9.9.16.0,

whereas it actually took place 16–18 days later. Accordingly the uncorrected date for Venus was first given, and then this was corrected by the addition of 16 Venus revolutions and 16 days. This number of Venus revolutions was chosen because it was the only one which with the addition of 16 days once more brought heliacal rising back to the desired base of 1 Ahau. It also had the property of being equal to 12 synodical revolutions of Mars. The Maya could therefore say: "Mars was in conjunction with the sun at 9.9.9.16.0, when Venus should have been at heliacal rising after inferior conjunction. However, our calculations have been in error. The new base is 9.10.15.16.0 1 Ahau 8 Zac. On that date Mars will again be very near conjunction with the sun, and on the same day there will be a heliacal rising of Venus."

Because of variation in the length of the synodical revolutions of Venus, it would be difficult at first to approximate the true correction. Assume, for instance, that the Maya correction was originally made by dropping 12 days at the end of every 118 Venus revolutions, as given in the list of corrections on page 24. This would have been too much by 2.56 days, and the positive error of some 16 days would have accumulated in about three baktuns. On the other hand, it is possible that there was a shift from heliacal setting to heliacal rising at 9.9.9.16.0. The total error in that case would be only some eight days, and would have accumulated with the same overcorrection in about 30 katuns.

The possibility that the Venus cycle was once counted not from heliacal rising, but from heliacal setting eight days before should not be disregarded. The arrangement of the tables in the present edition of Dresden makes it abundantly clear that the reckoning was then from heliacal rising after inferior conjunction, but it does not necessarily follow that that arrangement had always been in force. The position 1 Ahau and the day Lamat are closely associated with the planet. If heliacal setting was on a day Ahau, heliacal rising would occur eight days later on Lamat. Furthermore, disappearance of the planet seems a trifle more logical as the point to complete the revolution than does the day of reappearance.

These tables demonstrate how accurately the Maya reckoned the synodical revolutions of Venus. With the correction of four days at the end of 61 revolutions repeated four times, and then a correction of eight days at the end of the 57 revolutions they attained a rare precision. For this is a correction of 24 days in 301 revolutions (approximately 480 years), whereas the accumulated error would in reality have been 24.08 days. The tables also demonstrate how important it was to the Maya to associate their various cycles with the sacred almanac so as to find when together they would reach the same *lub*.

In the case of the uncorrected revolution of Venus that was a relatively simple matter, for 65 revolutions of Venus equaled 146 cycles of 260 days, but the corrections had to be made so as to retain that association. This could be achieved only by corrections of four days and its multiples. It was for that reason that a correction of four days was made at the end of 61 revolutions, although a reduction of five days was called for; with an adjustment of five days it would have been impossible to retain 1 Ahau as the base, but that was essential.

The elucidation of the Venus tables illustrates well how one student after the other has taken up the torch of research. Förstemann, Seler, Willson, Teeple, Makemson, Long and I have contributed in varying degree to our present appreciation of this beautiful and subtle product of Maya mentality. Satterthwaite (1947) has shown how the Venus tables are very handy for calculation.

VENUS GLYPHS IN THE INSCRIPTIONS

There are few, if any, references to observed positions of Venus in the hieroglyphic texts of the stelae. If one takes all the Venus glyphs in the inscriptions and computes the positions of the planet, no pattern will emerge whatever correlation is used. Some of those entries, therefore, must be of a ritualistic nature. As I have pointed out, there is no reason to believe that celestial phenomena, save data on the moon, were generally noted in the inscriptions. However, if the current katun was, for example, associated in some way with the planet Venus, then one might reasonably expect to find references to that planet on the monuments dedicated to that katun. The day 1 Ahau, as we have seen, was the day of Venus, it would be natural therefore to make a passing reference to Venus on those katuns that ended on 1 Ahau, particularly if Venus was prominent at the date in question. Two katuns during the Initial Series Period ended on 1 Ahau. These were 9.10.0.0.0 and 10.3.0.0.0.

Three texts commemorate 9.10.0.0.0 1 Ahau 8 Kayab, but two of these are badly eroded. The only one in good condition is the so-called lintel re-used in the hieroglyphic stairway of Naranjo. This carries the following arrangement of dates:

$$
\begin{array}{llll}
9. & 7.14.10. & 8 & 3 \text{ Lamat } 16 \text{ Uo} \\
 & 2. & 5. & 7.12 \\
\hline
9.10. & 0. & 0. & 0 \quad 1 \text{ Ahau } \quad 8 \text{ Kayab}
\end{array}
$$

The distance number reduces to 16,352 which is equal to 28 synodical revolutions of Venus. Furthermore, 41 synodical revolutions of Jupiter reach 16,353.5 days. Therefore, on the two dates both Venus and Jupiter would have been in the same positions in the sky. The presence of a Venus glyph and the fact that a day Lamat

and the day 1 Ahau are involved in the calculation make it fairly certain that the astronomical values of the distance number are not fortuitous.

At both dates, according to the Goodman-Thompson correlation, Venus and Jupiter were morning stars. The former was approximately 40 degrees above the horizon at sunrise; the latter approximately 20 degrees. There was nothing outstanding about the planets on those dates, although sun, Jupiter, and Venus, evenly spaced in the dawn sky, are ever a sight to rejoice one's heart. I think, therefore, the Maya recorded this appearance of the two planets because their thoughts were turned to Venus by the fact that the katun they were commemorating ended on 1 Ahau. Furthermore only after 28 revolutions of Venus and 41 of Jupiter will the cycles of the two planets come within a day or two of coincidence.

Another calculation involving 1 Ahau 8 Kayab occurs in the hieroglyphic stairway, and again a Venus glyph is found with the secondary date:

$$9. 9.18.16. 3 \quad 7 \text{ Akbal } 16 \text{ Muan}$$
$$1. 1.17$$
$$\overline{9.10. 0. 0. 0 \quad 1 \text{ Ahau } \quad 8 \text{ Kayab}}$$

Jupiter, too, appears to be involved, since the interval of 1.1.17 reduces to 397 days, which is slightly less than two days short of a synodical revolution of that planet. Jupiter, therefore, was in approximately the same position at both dates, that is to say, a morning star about 20 degrees above the horizon at sunrise. Venus on the first date was invisible, having passed through superior conjunction about 11 days earlier.

On the Tablet of the Inscriptions at Palenque the date 9.9.2.4.8 5 Lamat 1 Mol is linked with 9.10.0.0.0 1 Ahau 8 Kayab. The interval is 6392 days, which equals 16 revolutions of Jupiter (399.5 days) and 10 revolutions of Venus plus 552 days. Thus Jupiter was in the same position as on the dates discussed. Venus was about 148 days past heliacal rising, just about halfway between heliacal rising and superior conjunction. It is not likely that this interval was chosen because of Venus; there is no Venus glyph in the text, and the period is not an integral number of synodical revolutions of the planet. The second katun to end on 1 Ahau was 10.3.0.0.0 1 Ahau 3 Yaxkin. At 10.3.0.0.0 Venus was within a day or so of superior conjunction in the Goodman-Thompson correlation. According to the reconstructed calendar, this was exactly one CR before 10.5.12.13.0 1 Ahau 3 Yaxkin, the next base for the Venus cycle. As two CR equal 65 Venus revolutions, one CR equals 32½ revolutions. Venus, therefore, at 10.3.0.0.0 1 Ahau 3 Yaxkin was not at heliacal rising, but half a revolution away, that is to say, three or four

days past superior conjunction, at the opposite extreme of the Venus revolution.

The date 10.3.0.0.0 is commemorated by Uaxactun 12. There is at least one Venus glyph in the text, but there is no other date recorded. The same date appears as an IS on Xultun 10. On the front of this monument there is a distance number, and a CR date. The whole is read by Morley as follows:

$$10.1.13. 7.17 \quad 6 \text{ Caban } 10 \text{ Zip}$$
$$1. 6.10. 3 \quad \textit{Add}$$
$$\overline{10.3. 0. 0. 0 \quad 1 \text{ Ahau } \quad 3 \text{ Yaxkin}}$$

The interval reduces to 9563 days, which equal 16 synodical revolutions of Venus plus 219 days and 24 synodical revolutions of Jupiter (398.5 days) less 1 day. Here again, therefore, we find an apparent connection with Jupiter. Venus was very close to greatest elongation, rising about three hours before dawn; Jupiter on the other hand was setting at about 1 A.M. No Venus glyph is recognizable, and it is doubtful that the text treats of that planet.

I think the reason for bringing Jupiter into the discussion lies in the fact that the heliacal rising of Venus prior to 10.3.0.0.0 fell on 10.2.19.3.12 according to the set pattern of the cycle beginning with 10.0.13.14.0 1 Ahau 13 Kankin, and the conjunction of Jupiter with the sun took place around 10.2.19.3.17, some five days later. The close proximity of the conjunction of those two planets with the sun must have interested the Maya in view of the fact that the katun was associated with Venus because it ended on 1 Ahau. This exhausts the recordings of katuns ending on 1 Ahau and their associated dates so far as the Central Area is concerned. There are other examples at Chichen Itza but as the readings are not as yet generally accepted, I do not deem it advisable to prolong this discussion by including them.

I do not propose to discuss at this time all dates with Venus glyphs; in any case that is a problem for an astronomer. As I have already noted, they cannot fall into any regular pattern of heliacal risings or oppositions or points of greatest elongation whatever correlation is used. Furthermore, I feel confident that the Maya did not record such events as eclipses, heliacal risings of planets, equinoxes, or solstices unless there was some special association, actual or ritualistic, to warrant a reference. Even in the cases of katuns ending on 1 Ahau the evidence that any attention was paid to Venus is unsatisfactory. Instead, Jupiter seems to have engaged the attention of the Maya priests. There are a number of cases in which Venus glyphs are combined with other elements, both known and unknown. It is a fair assumption that such glyphs refer to conjunctions of Venus with other

planets or important constellations. A good example is supplied by the Tablet of the 96 Glyphs at Palenque (fig. 55,*1*). Glyph Block F7 shows a Venus glyph and moon glyph with certain affixes. The associated date is 9.16.13.0.7 9 Manik 15 Uo. At that time the moon was about 25 days old; Venus was an evening star, approximately 123 days past heliacal rising in the Goodman-Thompson correlation.

It is suggested elsewhere (p. 233) that the Venus glyph, with a human figure head down as affix, might represent the tzitzimime, demons which were believed by the Mexicans to fall to earth during eclipses.

SUPPOSED CYCLES OF OTHER PLANETS

Tables in Dresden which may refer to other planets are reviewed in Chapter 11. Suffice it at this point to note that there is wide divergence of opinion as to which tables refer to the various planets. I myself do not believe that they are in any way connected with revolutions of planets, but, instead are multiples to be used in connection with the divinatory almanacs which follow them.

SUMMARY

In this chapter are discussed two ritualistic cycles, and one astronomical, that of the planet Venus. The ritualistic cycles are that of the nine lords of the nights, and the 819-day count.

The nine lords of the nights ruled in the same endlessly repeating sequence as many nights. The glyph of the lord of the night usually follows the day sign, and immediately precedes Glyph F. It is known as Glyph G of the lunar series, although it is now realized that it has no direct connection with that series. There are nine glyphs, with both head forms and symbolic forms, each representing a god in the sequence. The Maya lords of the nights correspond loosely with the equivalent group in central Mexico, but the two series are not identical and the gods do not occur in the same order in the two series. The cycle of nine nights is brought into harmony with the sacred almanac of 260 days in Dresden.

As the lengths of the CR and the cycle of the lords of the nights have no common factor, any given CR date will repeat with a different lord of the night until the series is completed, a fact of considerable value in establishing the LC position of such CR dates as are accompanied by Glyph G. Likewise the presence of Glyph G is often a great help in the elucidation of damaged IS.

The Maya had a cycle of 819 days, which appears to have been used to relate the 13 lords of the days, the nine lords of the nights, and, perhaps, the seven lords of the earth to the solar year and to the moon. The ending point of this cycle always fell on a day with a co-efficient of 1. Apparently those ending points of the 819-day cycle which had a solar or lunar relationship to the end of the katun in which the monument was erected were noted; others were ignored. For instance, the ending date of an 819-day cycle which had the same moon age as the end of the current katun or occupied the same position in the solar year, or was distant half a solar year from it might be recorded. Ending dates of the 819-day cycle are accompanied by about five explanatory glyphs which are approximately the same in all examples. The ending dates with their accompanying glyphs are inserted as parenthetical clauses between the day and month signs of the IS.

The planet Venus was of great importance to the Maya as an object both of worship and of astronomical exercises. Among the peoples of southern and central Mexico heliacal rising of the planet after inferior conjunction was regarded as fateful in the extreme: according to the day on which the planet rose, different categories of humanity and nature suffered affliction. It is certain that similar ideas existed among the Maya at the time the present edition of Dresden was written. There can be little doubt that the concepts of Venus, as recorded in Dresden, show profound influences from Mexico. Of the five manifestations of the planetary god, three are almost certainly Mexican; only two are Maya. The 20 directional gods who accompany the Venus tables are discussed.

The synodical revolutions of Venus (approximately 584 days) were related to the 260-day cycle and the year of 365 days in a very simple manner by equating 65 Venus years with 104 years of 365 days (146×260). In that way 1 Ahau, the sacred day of Venus, was retained as the closing day of the cycle. A brilliant system of correcting the small error which accumulated in these tables in such a way as always to retain 1 Ahau as the closing day of the cycle was developed by the Maya and first recognized by Teeple. In the discussion of this method of corrections certain emendations are suggested whereby all the correctional totals in Dresden are utilized, and the corrected bases brought into agreement with the Goodman-Thompson correlation. The principal factor which is new is the utilization of the number 9360 (amended from 9100), which equals 16 revolutions of Venus plus 16 days.

Venus glyphs in the inscriptions are not reviewed in detail because there is full evidence that no pattern of significance will emerge whatever correlation is used. The possibility that attention was paid to Venus on monuments erected to commemorate katuns ending on 1 Ahau is explored. The results are inconclusive. There is a suggestion that several of the associated dates refer primarily to Jupiter.