

Image and Ritual in the Aztec World

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4-Ollin, the Aztec Creation of a Fifth Sun

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Abstract

According to Hans Ludendorff (1930), the Tzolkin/Tonalpohualli of 260 days is a cycle created for the prevision of eclipses because of its congruency with the period of the sun passage on alternative nodes of the moon orbit every 173,333 days. This congruency divides the 260 days cycle in three equal parts (86, 86, 87 days). Moreover, because the real duration of the solar passage on successive nodes of moon orbit is slightly inferior to a third of a double Tzolkin/Tonalpohualli, i.e. 173,1 instead of 173,3, the conjunctions of the Sun and the nodes of moon orbit regress by one day for twenty Tun. It takes then $260 \times 20 = 5200$ Tun for a complete regression of the Sun nodes conjunctions in the 260 days almanac. Ludendorff claims then that the duration of the Long Count is the cycle of correction of the Tzolkin/Tonalpohualli eclipse cycle at long term. Because the three eclipse zones in the 260 days almanac count 35 days each, the remaining three zones safe of eclipses are of 52 days each. Thus, any day of the Tzolkin/Tonalpohualli escaping an eclipse zone will be free of any eclipse danger for 1040 years until it enters the next eclipse zone 52 days further in the almanac ($20 \times 52 = 1040$). The names of the five Suns of Aztec cosmology prove to be arranged in order to show a logical succession of five periods of 1040 years each. Every time a sun's day name enters an eclipse zone, the next Sun's day name enters a new 1040 years epoch free of eclipses. The start of the first sun takes place in the year 3119 B.C., in the same year as the start of the Venus table in the Dresden Codex. All dates fall in accord with the well documented years of the New Fire Ceremony. This is what the present article exposes with some complementary details.

"It is not an exaggeration to call the monolith of the National Museum the most well-known and discussed monument of American antiquity. The circumstance that the 'Aztec Calendar' has always been taken as a singular object, a 'sui generis' artefact, is the principal reason why it has received such different and extravagant opinions."

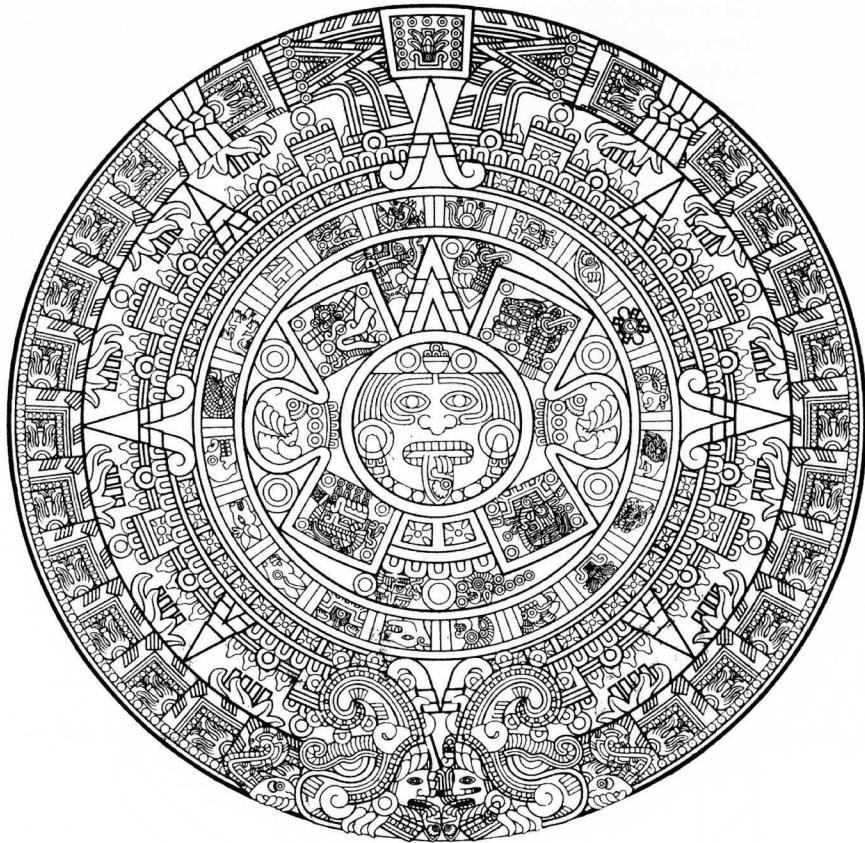
(H. Beyer, 1921)

Although very aware of the danger of tackling such an important monument, Herman Beyer fell in the temptation. I recognize as well the danger of proposing a new reading of that tremendous stone which already received so many. Nevertheless I believe it is good to accumulate the hypotheses, in hope that at last, one day, the truth will appear among them. As I am concerned, I never tried deliberately to "crack" the great mystery of the "Aztec Calendar Stone"; and the solution I propose here came to me in the most unexpected way.

I was revising a fragment of an article by Susan Milbrath, in which she claimed that the Aztecs were afraid that

their world would crash with an eclipse of the Sun on a day 4-Ollin (Milbrath 1980). I decided out of curiosity to investigate when such an eclipse might have happened. I discovered to my great astonishment that such an eclipse did not occur during the whole reign of the Aztecs and moreover that it would have been impossible for a period of 1040 years, starting in 1040 A.D., and approximately until the year 2080 A.D.¹ This was of great interest, because many historical sources place the beginning of the Aztec Fifth Sun about that time, i.e. 1-Tochtli 1038 / 2-Acatl 1039.

Of course, the next step was evidently to look for the situation with the previous four Suns. It appeared that the previous one, 4-Atl, had been free of eclipses from the year zero to the year 1040. And the same happened with the three previous ones, respectively 4-Quiahuitl, 4-Ehecatl and 4-Ocelotl. Thus the first Sun started in the year 3119 B.C., just as the Venus table in the Dresden Codex does. This presented decidedly too many coincidences. And from these observations flows the present proposal of a solution for the dates graved on this monument, which I submit to the sagacity of my colleagues.



The “Aztec Calendar Stone”.

Considering the very important number of interpretations of the monument commonly called *Piedra del Sol* or *Calendario Azteca* — an investigation on Internet gives between hundreds of thousands and a million pages of answers, and printed articles or books count a few hundred! — I hope it will not be an abuse to propose a new one. The unique reason I have decided myself to publish this hypothesis on a monument already so studied and object of numberless discussions, is because I hope a critical examination by my colleagues.

The *Leyenda de los Soles*, the *Historia de los Mexicanos por sus Pinturas*, the *Anales de Cuauhtitlán*, the *Historia Tolteca Chichimeca*, the *Obras Históricas* of Alva Ixtlilxochitl and some other monuments, agree with the mentioned “*Piedra del Sol*” on the number and order of the successive Suns of the Aztec cosmogony. It is possible that this religious cosmogony, which is considered as purely mythical, might represent as well a cosmology, a knowledge of the world or, at least, one of its aspects: its invisible frame, the basic cycle allowing to understand and master the phenomenon of eclipses, the node of Moon orbit. The localization of the zones of

eclipses in the 260 days almanac seems to offer a means of understanding the mechanism of creation and destruction of the successive Suns of the Aztec cosmogony.

THE TZOLKIN AND THE LONG COUNT: A CALCULATOR OF THE NODES OF THE MOON ORBIT.

First of all, we must recall in a short way the fundamental discoveries of Hans Ludendorff:

(1) Ludendorff has demonstrated that the cycle of 260 days constitutes a mechanism for the calculation of eclipses (Ludendorff 1930), because 2×260 make 520 and this last number divided by three gives 173,333 days. 173,333 is the time length separating two successive passages of the Sun by the nodes of Moon orbit. Thus, the days of Sun-Node conjunctions will regress by $2/3$ of the Tonalpohualli at each of the nodal passages of the Sun, and return to the initial points after every third passage, alternatively on one and the other node.

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(2) The Long Count is limited to a sum of 1 872 000 days, or 5200 Tuns of 360 days, that is the sum of $13 \times 20 \times 20 \times 18 \times 20$ days. We could wonder why a twenty based arithmetical system presents two exceptions, one at the second row with 18 and the other at the fifth with 13. This was meant doubtlessly to mark on one side the most practical arithmetical formula approaching the number of days in a solar year, i.e. $(18 \times 20 = 360)^2$, (18×20) , and at the other end, the Tzolkin of 260 days (13×20). But first of all claims Ludendorff, the duration of the Long Count is a measure of the derivation of the Node in the almanac of 260 days. And indeed, because the duration of time between two passages of the Sun by the nodes is slightly inferior to one third of 520 days (173,31 days), the windows of eclipses and the zones free of eclipses will regress very slowly in the almanac. The duration of the Maya era is 13.0.0.0.0, that is to say $13 \times 20 \times 20 \times 18$

$\times 20 = 5200$ Tun, and this is exactly the time it takes for the nodes to regress one turn in the Tzolkin to their initial position.

Of these two points established by Ludendorff we can deduce that, because the Sun and the Moon can be eclipsed up to ± 18 days of the node, it results that in the 260 days almanac, we find three zones of eclipses of 35 days each³ and between them three equidistant zones of 52 days free of eclipses. The central day of the "windows" of 35 days marks the day of the Sun nodal passage. If the moon is full that day, it will certainly be eclipsed; if it is new, in conjunction, it will eclipse the Sun. An eclipse in the neighbourhood of the Node is total, but the more distant it takes place from the node, the lesser its magnitude will be.

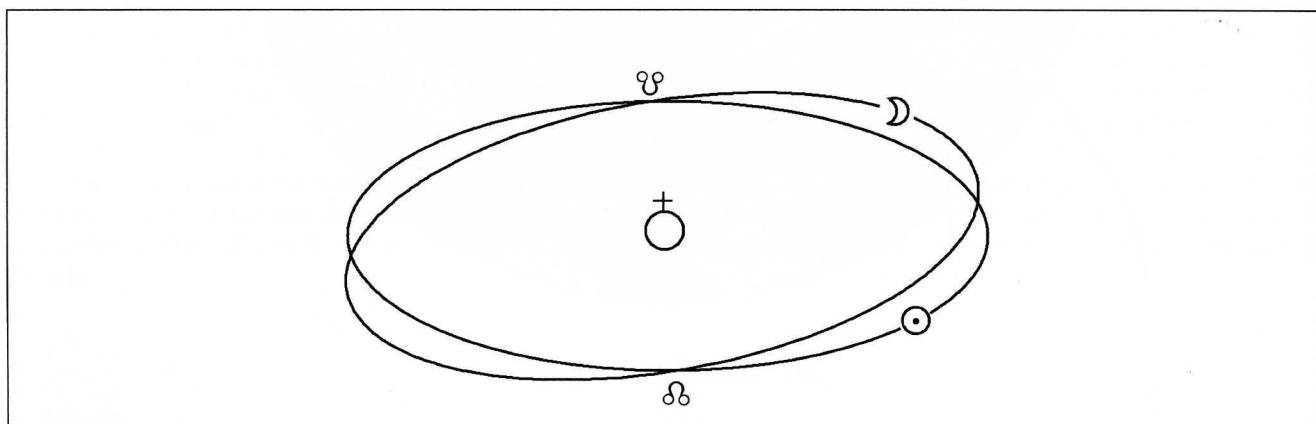


Fig. 1 - The Sun-Moon system. The passage of the Sun from one node to the next takes 173 days.

Out of these three "windows of eclipses", during all the days of the three intermediate zones of 52 days, the occurrence of an eclipse is impossible; it cannot take place. And so, a system with three windows of eclipses separated by three zones of 52 days free of eclipses, turns

once around the 260 days of the almanac in the period of 5200 years. Every 20 years, the whole system moves by one day in the calendar. A given day in the almanac can be eclipsed during 700 years (35×20) and free of eclipses during 1040 years (52×20).

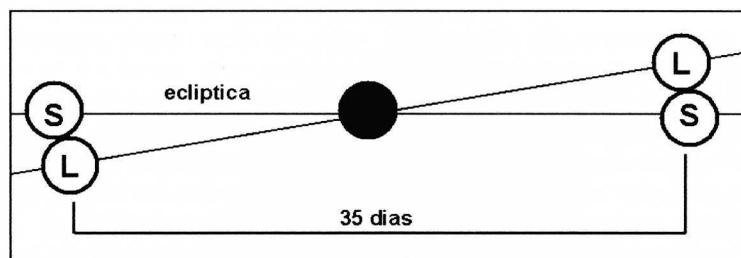


Fig. 2 - A diagram showing the reason why an eclipse window covers 35 days. Because of the inclination of the Moon orbit on the Ecliptic, eclipses can only occur in the limits of ± 17 degrees (days) from the Node. The nearer the Node, the larger the eclipse magnitude; the further away from the Node, the smaller the eclipse. Out of these limits, an eclipse is impossible.

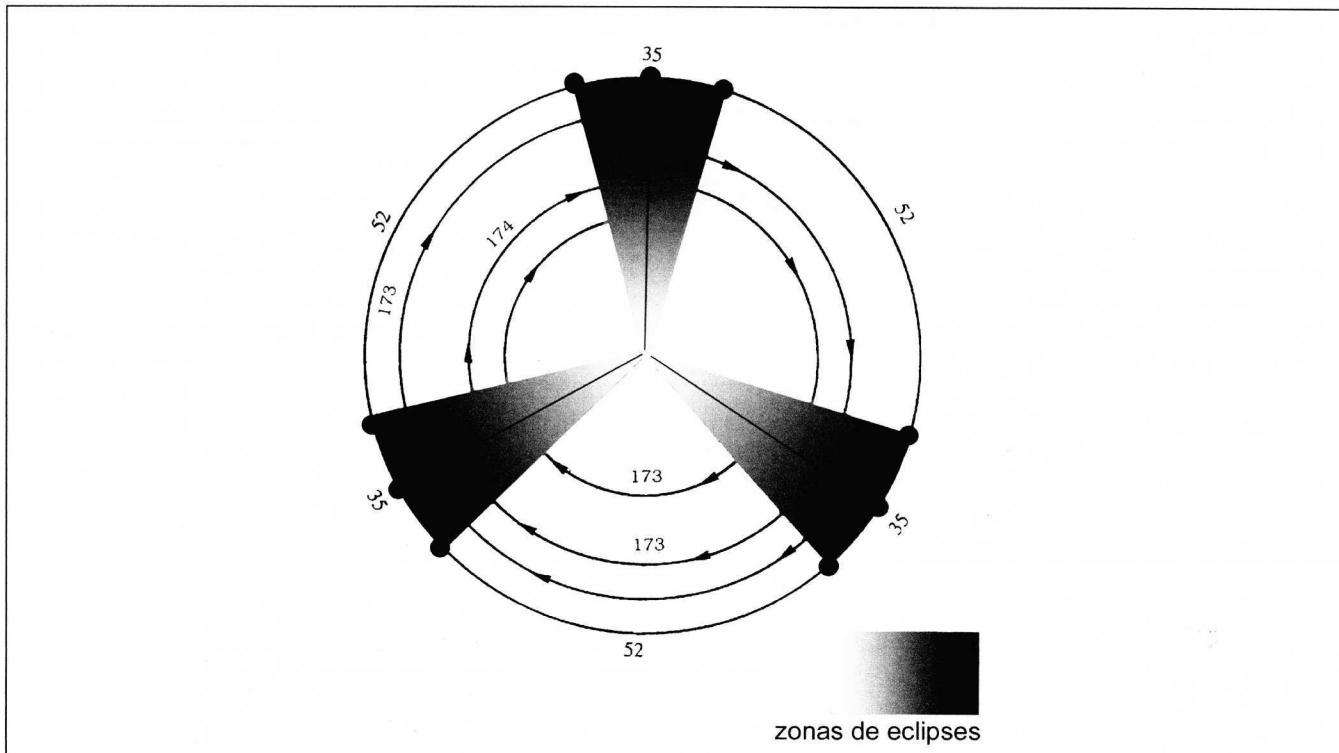


Fig. 3 - Days of the passage of the Sun on the Nodes of Moon orbit situated in the Tonalpohualli, and associated eclipse zones.

THE NEW FIRE CEREMONIES

The ceremonies of the New Fire were celebrated every 52 years, at the congruency of the 260 days and 365 days cycles (Toxiuhmolpilli).

Nevertheless, more ancient and fundamental traditions (Huehueticlitzli) were celebrated at distances of 104 years, when a third cycle came in congruency with the first two: the cycle of Venus, of 584 days ($104 \times 365 = 146 \times 260 = 65 \times 584$).

In all the time of the heroic epoch, when the world was governed by the ancestors and the way of life was frugal, there was an old period of 104 years. It was the double cycle of the Toltec nation (Boturini, XVIII, 1990:224).

This period of 104 years, better expressed as 65 cycles of Venus (65*), is called "Huehueticlitzli", which means an old age, an antiquity. It is the cycle which will interest us here principally.

Mesoamerican traditions used different approximations of the Solar tropical year:

- (1) The Tun of 360 days.
- (2) A year of 364 days (= 13×28 days, probably for a formalized lunar count).
- (3) The Xihuitl of 365 days.

(4) They also knew the quasi exact period of the tropical year, counting one regression of the Xihuitl in the tropical year for a laps of 1508 Xihuitl, equal to 1507 tropical year (Bowditch 1910).

(5) Because the Venus table of the Dresden Codex is a theoretical model, which should be transcribed in terms of exact measures of the Venusian year, we may think that they rounded 65 natural cycles of Venus to 104 Haab/Xihuitl, which would give us a "year" of 364,95 days (Lebeuf 1995:211-287; Lebeuf 2003).

THE TABLE OF VENUS AND THE DEVIATION OF THE NODE OF MOON ORBIT

Depending on the context, it is necessary to translate one of these measures in another, and I believe that the table of Venus of the Dresden Codex, constructed of fragments of 104 Haab/Xihuitl for 65 Venus cycles, is in fact a table indicating units of 65 natural Venus cycles. Further on I shall write 65* and 780* for periods of 65 cycles of Venus (104 'Xihuitl') and 12 x 65 cycles of Venus (1248 'Xihuitl').

If Ludendorff counts 5200 Tun of 360 days, rounding one day of regression of the Node in the Tzolkin/Tonalpohualli for each Katun (20×360), I consider for my part that the measure of one Tun of 360

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days is a practical arithmetical formula which should be converted in terms of Xihuitl and natural cycles of Venus, and thus, I shall accept here the conventional measure of 365 days for the solar year (Xihuitl) and 260 days of regression of the node every 5200 Xihuitl.

The congruency of Venus and the Node of Moon orbit was known for a long time⁴, and I believe the astronomers of Mesoamerica used it for the localization of the node, as the visible aspect of the invisible node. This is what I have defended in other works (Lebeuf 1995; 2003) and that I shall apply here.

The Dresden Codex offers the canonical measures indexed on a day 1-Ahau 18 Kayab of $(36 \times 65^*) + (4 \times 65^*)$; but if, accordingly to the congruency of Venus and

the node every 104 Xihuitl, we calculate 65 natural cycles of Venus⁵, instead of the adjusted canonical measures in entire numbers, we see that 65 synodic cycles of Venus are congruent with 5,5 periods of the synodic revolution of the Node of Moon orbit. This triple conjunction, Sun-Venus-Node, regresses in the Mexican calendar by 5.2 days every 104 Xihuitl⁶, and the Xihuitl itself regresses in the tropical year by 24.8 days during the same period. The sum of these two regressions amounts to almost exactly 30 degrees, that is to say one twelfth part of the ecliptic and, for that reason, every $12 \times 65^* = 780^* = 1247$ tropical years, this triple conjunction will return to the same point in the tropical year. In fact, the figure which interests us is not a conjunction properly speaking, but a regularly symmetrical figure which is shown on figure 4.

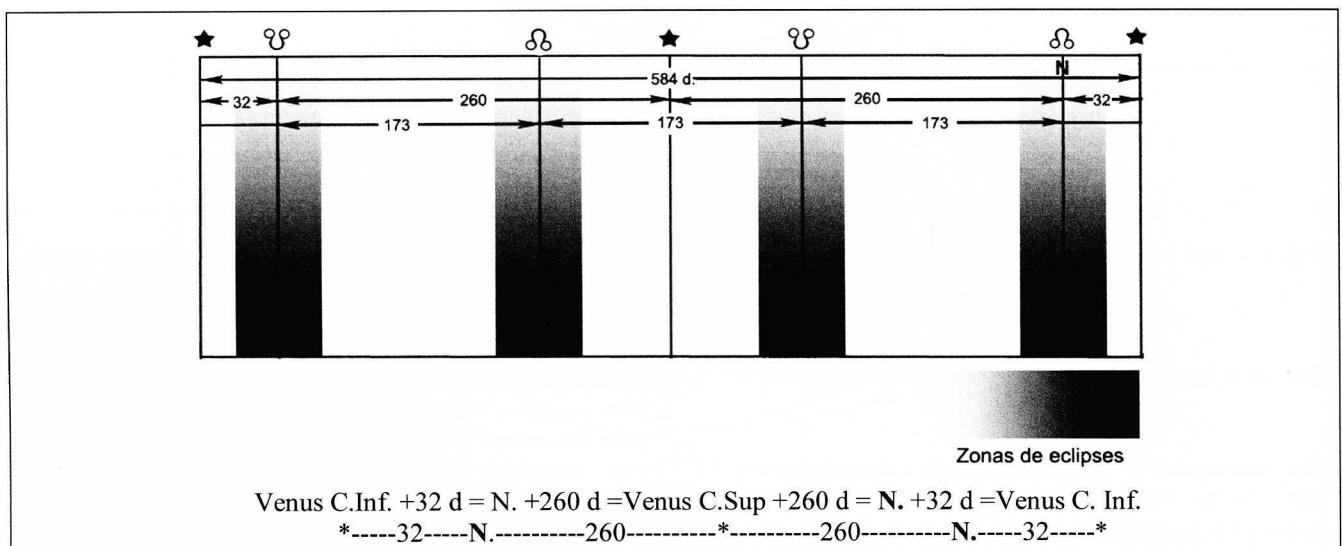


Fig. 4 - Symmetrical order of Venus, the Node and the Sun. N marks the days of Sun-Node conjunctions which are taken in account for these calculations. For example in 19 X 1038, the Sun passed on the Node on a day 1-Cipactli. Every 104 years (65 Venus cycles), a specific phase of Venus is congruent with the passage of the Sun on the Node, forming this regular pattern. All this accord regresses in the Ecliptic by 30 degrees every 104 tropical years, in coincidence with the sequences of the New Fire Ceremonies.

The perfect accord of these three cycles corresponds precisely to the years which appear in the Dresden Codex and other Mesoamerican traditions, corroborated by the colonial sources, for the celebrations of the New Fire Ceremonies (Huehueticliztli). The Dresden Codex starts the Venus count in the year 3119 b.C. and counts 3 periods of 3×12 or 36 periods of 104 "years" (9.9.16.0.0 = 1366560 days), which lead us to the year 623 A.D.

If we consider that 36 periods of the formal cycle of Venus (65 Venus years each) represent three times the regression of the node around the Ecliptic of the Node-Venus system, then, in the year 623 A.D., started the fourth cycle (Sun) of that tradition, always indexed on a day 1-Ahau 18 Kayab:

1st Sun - from 3 VIII 3119 a.C. (= -6.2.0 of the Dresden Codex) until 1873 a.C.

2nd Sun - from 5 X 1873 a.C. until 626 a.C.

3rd Sun - from 7 XII 626 a.C. until 623 A.D.

4th Sun - from 8 II 623 A.D.⁷ (9.9.9.16.0 of the Dresden Codex) until 1870 A.D.

If we accept that system, one Sun (or era) represents the regression of this triple congruency Sun-Venus-Node one turn through the ecliptic, which counts for $12 \times 65^* = 780^*$. This would explain why the Maya (and other cultures before the Aztecs) declared they lived in the fourth Sun, which should then have started in 623 A.D. From the year 623 on, the Dresden Codex offers the detailed inner structure of a 104 years (a 65^*) lapse of

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time, and the fourth multiple of it which leads to the years 727 A.D., 830 A.D., 934 A.D., 1038 A.D.

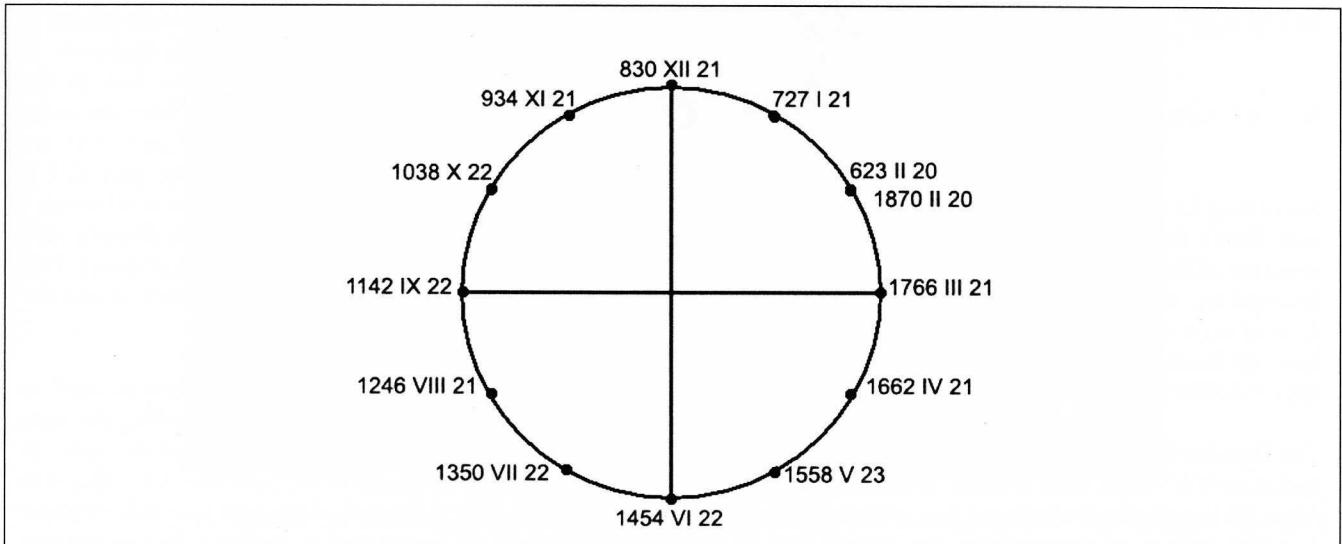


Fig. 5 - The regression of the congruency Node-Sun is of one tropical year for 12 New Fire Ceremonies. $12 \times 65 = 780$ Venus cycles or 1247 tropical years. In the same period the regression in the Tonalpohualli is of 62 days.

In such a system, the fourth Sun of the Mayas should have finished in 1870 A.D., which makes, starting from 3119 a.C., 4 times twelve periods of 104 Xihuitl, or 4992 Xihuitl. In order to fulfil the 5200 Xihuitl of regression in the Tonalpohualli of 260 days, we would have to add two more 104 years periods, or better saying, twice 65 true Venus cycles after the year 1870. This would make the 5200 years cycle finish in 2078 A.D.

Let us remember these eight important dates: 3119 a.C., 1872 a.C., 626 a.C., 623 A.D., 830 A.D., 1038 A.D., 1870 A.D. and 2078 A.D.⁸

THE XOCHICALCO TRADITION

In a previous work I proposed a solution for the dates on the façade of the Temple of the Feathered Serpent in Xochicalco (Lebeuf 1995; 2003), according to which the dates and distances indicated would mark the moments of the passage of the Sun on the node in the years 625 a.C. for 5-Calli; 623 A.D. for 9-Ehecatl; 830 A.D. for 11-Ozomatli, and with a reference to the year 3120 a.C. expressed as a distance of 176 days separating 9-Ehecatl from 2-Ollin, which would have expressed the deviation of the Xihuitl during 3744 Xihuitl, from 3120 a.C. to 623 A.D.⁹. Later I have added to these dates the possibility that 11-Ozomatli could as well signify the passage of the Sun on the Node in 4366 a.C. and indeed the start of that other system, probably of Teotihuacan origin.

The adjustments I made to my first paper of 1995 were

presented in Sibiu (SEAC conference, Rumania) in 1996; at the Congress of Americanists in Warsaw in 2000 and at the INSAP conference in Oxford in 2003¹⁰. A general synthesis of these investigations was published in Cracow (Lebeuf 2003), in which I proposed for the stations meant by the inscriptions in Xochicalco: 11-Ozomatli in 4366 a.C., 13-Tochtli in 3119 a.C., 2-Coatl in 1872 a.C., 5-Calli in 625 a.C., 9-Ehecatl in 623 A.D., 11-Ozomatli in 830 A.D. for the moments of the passage of the Sun by the Node. All these dates, expressed in the Tonalpohualli, are attested in Xochicalco in an undeniable context of New Fire Ceremony. If these hypotheses were to be confirmed, we would have then in Xochicalco a system similar to the one already known in the Dresden Codex, save two differences:

- (1) The dates are those of the real passages of the Sun by the node and not their conventional representations indexed on 1-Ahau as in the Dresden Codex.
- (2) All the system starts one full large cycle of 780*, or 1247 tropical years earlier. The dates of the façade of the Temple of the Feathered Serpent indicate that the base of all chronological calculations was 4366 a.C., that is to say, 1247 years before the 3119 a.C. of the Dresden Codex, with a passage of the Sun on the Node on a day 11-Ozomatli, and successively, by steps of 780*:

18 I 4366 a.C.	- 11-Ozomatli
17 I 3119 a.C.	- 13-Tochtli
17 I 1872 a.C.	- 2-Coatl
18 I 625 a.C.	- 5-Calli
20 I 623 A.D.	- 9-Ehecatl

To which should be added two periods of 65 cycles of Venus in order to complete the 5200 Xihuitl cycle. This leads us to a second Ozomatli, 5200 Xihuitl after, in 19 XI 830 A.D. - 11 Ozomatli.¹¹

RECAPITULATION

According to the method proposed here for the systems used before the Aztec reform (a method supported by the structure of the Venus table in the Dresden Codex and the inscriptions at Xochicalco), we count 5200 "Xihuitl" divided in $(4 \times 780^*) + (2 \times 65^*)$. I write here "Xihuitl" in brackets because in fact it refers to $(5200 \times 365) - 260$ days = $5200 \times 364,95$ days.

The Dresden Codex presents a theoretical model of those cycles with a Venus table indexed invariably on a day 1-Ahau 18 Kayab, for the heliacal rise, without taking note of the deviation of the node in the Xihuitl nor in the tropical year; it is a conventional model.

The tradition of Xochicalco presents the same general structure but with two significant differences:

(1) The tradition of Xochicalco takes in account the deviation of the triple conjunction Sun-Venus-Node in the Mesoamerican calendar, as well as the deviation of the Mesoamerican calendar in the tropical year. It marks

the positions of the Sun on the node by series of $4 \times 780^*$ plus $2 \times 65^*$ and allows to follow and calculate the deviation of the Node and to localize it in the Xihuitl and the tropical year (Lebeuf 1995; 2003). The inscriptions in Xochicalco signalize the same periods and distances as the Dresden Codex for the passage of the Sun on the Node, but according to their real position from the point of view of observation. The steps of 65^* and 780^* are identical in both traditions and in both, the year 623 is prominent. In Xochicalco with the date 9-Ehecatl which I established as equivalent to the 20th of January 623 A.D.¹², as a point of reference for future calculations. This is supported by the prominent role of that date on the site of Xochicalco.

(2) The 5200 Xihuitl of the complete system start in Xochicalco 780^* (1247 tropical years) before the base date in the Dresden Codex. An important date in Xochicalco is 11-Ozomatli of the year 830 A.D., that is to say, $2 \times 65^*$ after 9-Ehecatl of the year 623 A.D. If those two periods of 65 Venus cycles represent the complement of $(4 \times 780^*)$ to fill the large cycle of 5200 Xihuitl, we might think that the start of the large cycle was situated, in the Xochicalco tradition, 5200 Xihuitl before 11-Ozomatli of 830 A.D., that is in 4366 a.C., 1247 tropical years before the start of the Venus count in the Dresden Codex. We can say that they present the same structure but are as a musical accord played in different keys (see figure 11).

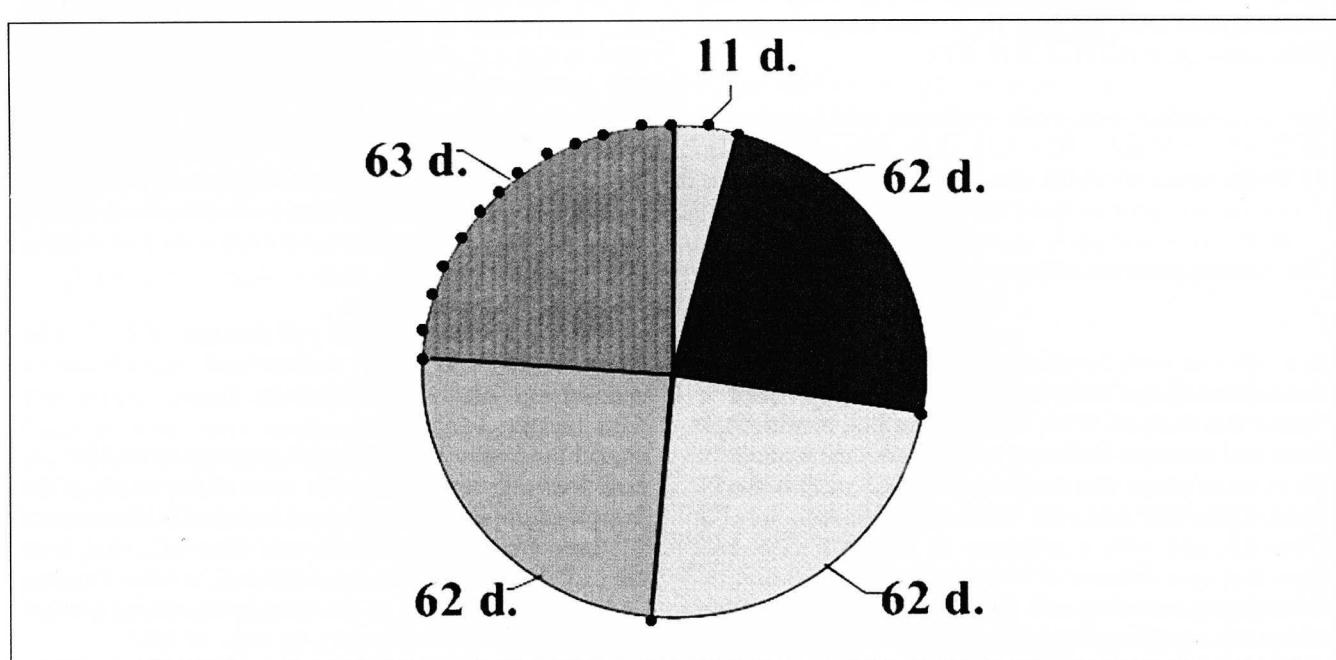


Fig. 6 - The four Suns system of the model preceding the Aztec reform. The duration of one 'Sun' is 12×65 cycles of Venus ($780^* = 1247$ tropical years). The regression of the conjunction of Venus in the Tonalpohualli is of $62/63$ days for each of those 'Suns', each one of twelve New Fire Ceremonies. Four of those 'Suns' plus two periods of 65^* (11 days) corresponds to a complete cycle of the Venus-Node congruences in the Tonalpohualli.

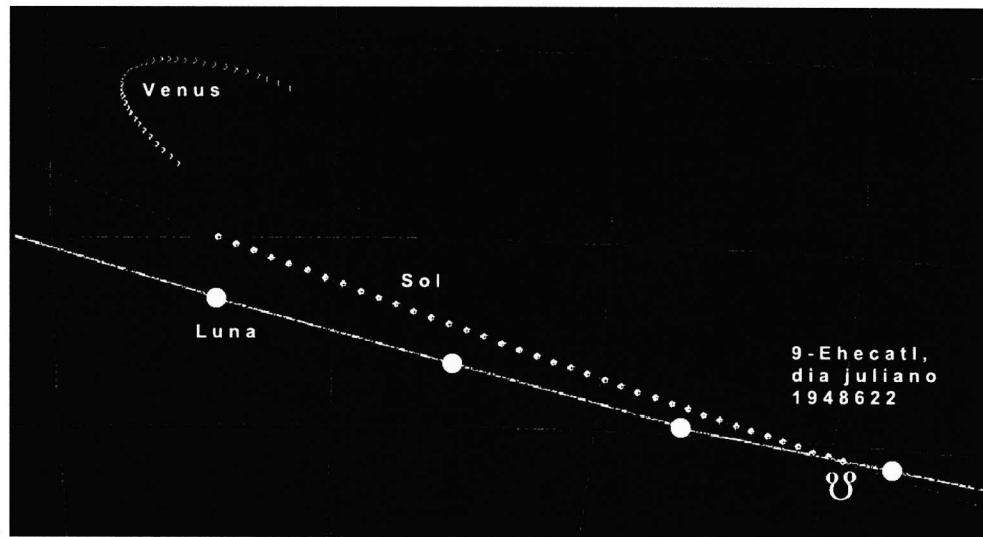


Fig. 7 - 32 days separate the moment of Sun-Node conjunctions and Sun-Venus conjunctions. This situation repeats regularly every 65 cycles of Venus. The figure illustrates the successive positions of Sun and Venus during the 32 days following the day 9-Ehecatl in the year 623.

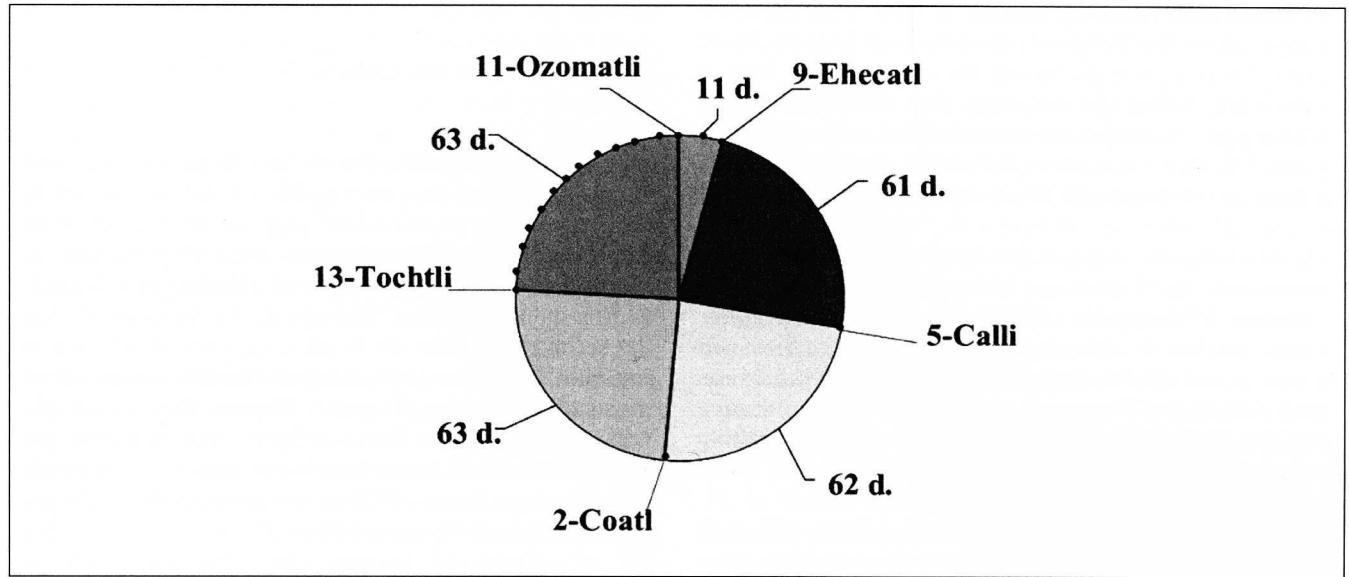


Fig. 8 - The four 'Suns' of Xochicalco. At each New Fire ceremony (104 years), the node and Venus regress by 5,2 days in the Tonalpohualli. That is to say that 50 of those ceremonies correspond to a derivation of 260 days, i.e. a full Tonalpohualli calendar turn, every 5200 years. This situation is illustrated in the inscriptions related to the New Fire Ceremony in Xochicalco.

1038/1039, 4-OLLIN, THE START OF THE HISTORICAL ERA

We shall now examine the date 1038 A.D. which marks the end of the fourth multiple of the detailed table of Venus in the Dresden Codex. This date is often found in Mexican sources. Tomicki points on a noticeable frequency of the mention of years 1038/1039, in relation with the lighting of a great fire, in the 16th century

sources: "The significance of the two dates: 1-Tochtli = 1038 and 2-Acatl = 1039 in the Aztec chronology requires a detailed study". So far, we shall only mention some data justifying our opinion:

(1) Michel Graulich (1987:82-83) signals that in the *Historia de los Mexicanos por sus Pinturas*, where is given a continuous chronology since the beginning of the present era up to the conquest, the end of the previous era

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is situated in the year 1038. The dates are not given as such, but ... "We know that the departure from Aztlan took place in the year 1-Flint, 130 years after the flood; the calculation of the years passed between that moment and the arrival of the Spaniards places 1-Flint in the year 1168" (1987:84,n.22); consequently, $1168 - 130 = 1038$. If the scholar is right, it is worth mentioning that according to the "Historia de los Mexicanos...", the same 1-Tochtli year = 1038 not only finishes the previous epoch, but it also starts the present one with the lifting of the sky and the renovation of the earth. Then, "in the second year after the flood, which was Acatl", that is to say in the year 2-Acatl = 1039, the god Tezcatlipoca-Mixcoatl made a feast to the gods: "and at this occasion took fire from some sticks to which they are accustomed, and it was the origin of making fire with flints, they are some sticks with a heart, and when he had got the fire, took place the feast with many and large fires" (Icazbalceta 1886-92:III:214-215). The feast in question is no other than the first "New Fire", whose cosmological meaning is explained by M. Graulich in the mentioned work (Graulich 1987:102-103).

If we take in account the possibility that the Mexicans displaced the ritual of making a New Fire (as it is suggested by the Telleriano-Remensis Codex), we could think that in a previous period, the ceremony was held in the years 1-Tochtli. Anyway, the "Historia de los Mexicanos..." seems to indicate that for some reason, the years 1-Tochtli / 2-Acatl = 1038/1039 were perceived as a break in the year count which initiated the actual epoch.

(2) We observe exactly the same thing in the dates mentioned by Francisco Chimalpahin in his Third Relation (Chimalpahin 1965). The famous chronicler mentions that in the year 2-Acatl = 1195 – his own correlation – the Mexicans celebrated for the third time their "binding of the years" (p. 69). Of which we deduce that the date 2-Acatl = 1039 was taken as the starting point of the computation¹³.

(3) We find another strange coincidence in the historical notes on the kingdom of Texcoco by Fernando de Alva Ixtlilxochitl (1975:415-521). 1-Tochtli is for the chronicler exactly the date of the fall of Tula, the first centre of civilization, whose inhabitants – those who did not die "peopled thereafter the region around the Laguna of Texcoco, and the coasts of the seas of the North and of the South, and among other places where they settled was also Culhuacan, the capital of the kingdom of the Toltecs who saved themselves". The relation, which contains many chronological references, enables to reconstruct the date 1-Tochtli = 1036 (according to Ixtlilxochitl's correlation) as the start of the rebirth of the Toltecs who "gathered together in Culhuacan and other parts to build large monuments and reconstruct some other places" (Ixtlilxochitl 1975:424). Now, the correlation proposed by Alva Ixtlilxochitl differs from the equivalence 1-Acatl = 1519, normally considered as valid for the Aztecs at the

time of the contact. If we calculate again his Christian dates, the result would place the beginning of Culhuacan in the year 1-Tochtli = 1038.

Could it be then that this date found in various contexts is the trace of some real event of such an importance that it was taken as the start of the present era, or the beginning of the real Culhuacan, the city of Aztec civilization?¹⁴

Jesús Galindo Trejo (1994:108) quotes a passage of Chimalpahin where we read a reference to the year 1-Teepatl 1064: "And by then, twenty five years had passed since the great population of Tollan had got lost, and the Toltecs were dispersed". If we subtract 25 years from 1064, we find once again the key date 1039. Accordingly, Gabriel de Ayala writes: "Year 2-Acatl, 1247, in that year the Aztecs had been four years in Tecpayoacán, there the Mexicans made for the fourth time their 'binding of the years'" (Ayala 1997:401). This brings us once more to the year 1039, as the origin of the comput. It is evident that this date must be of importance for other reasons than mere historical ones, as we know it is the date that marks the end of the Venus table in the Dresden Codex¹⁵.

THE FIFTH SUN OF THE AZTECS

It is then very probable that for the Mexicans, the flood which took away the previous Sun, 4-Atl, is situated in the year 1038, a 1-Tochtli year or a 2-Acatl year. Logically, if the 4-Ollin Sun was created in the year 2-Acatl, then the anterior one, 4-Atl, finished in 1-Tochtli, as it is indicated in the "Historia de los Mexicanos": "in the second year after the flood, which was Acatl, that is to say in 2-Acatl = 1039, the god Tezcatlipoca-Mixcoatl made a great feast to the gods". The new Sun is called 4-Ollin. Although no source affirms explicitly that the Aztecs were afraid to see their world come to an end with an eclipse on a day 4-Ollin, the proposition of Susan Milbrath is perfectly acceptable:

(1) The end of 52 or 104 Xihuitl cycles, as well as the end of the world, in general, were accompanied by tremendous phenomena among which the eclipses played a prominent role. In particular, the Sun 4-Ollin (movement or earthquake) was doomed to disappear in earthquakes, an apocalyptic phenomenon often associated with eclipses.

(2) It is certain that if the Aztecs were able to predict eclipses, they should not have feared to see their world collapse so soon with an eclipse on a day 4-Ollin, because, as we have seen, in accordance with the properties of the 260 days almanac already mentioned, an eclipse on such a day was impossible before long; the Sun could not be situated at less than 17 days of the node on a day 4-Ollin between the middle of the 11th century

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and the end of the 21th century A.D. This evidently does not mean that they could not have threatened of it the populations and organized sacrifices to escape the supposed danger. Moreover, in case the sacrifices would be insufficient, they could have feared such a cosmic disorder that the gods would precipitate the end and anticipate the normal expected date.

At the end of the 11th century, the sun passed on the nodes on the days 1-Cipactli, 8-Miquitzli and 4 Acatl, and so, the day 4-Ollin, which is on the 17th day after the day 1-Cipactli, was reaching the post nodal limit of an eclipse window centered on a day 1-Cipactli. For this reason, the Sun could not be eclipsed on a day 4-Ollin between the 11th and the 21th centuries, a period which includes largely all the Aztec dominion.

If the iconography of the Aztec Calendar Stone makes reference to the eclipses, as Susan Milbrath claims, with excellent reason I think (Milbrath 1995; 1997), it could be only outside the limits of the historical empire of the Mexicas. The 4-Ollin era, the fifth Sun of the Aztecs, is precisely the one in which the Sun could not be eclipsed on such a day. We can then say that the Aztecs had built for themselves a cosmological ideology insuring them an empire of 1040 years during which their Sun, the Sun 4-Ollin, could not be defeated. The period of 1040 years is documented by Cristobal del Castillo, Paso y Troncoso, Chavero, Humboldt, León y Gama, Orozco y Berra, and Palacios: "In this count, is found the great cycle of 1040 years, equal to 20 minor cycles, and this was in accordance with the primitive calendar of 260 days, as $260 \times 4 = 1040$ "¹⁶. All this leads us to accept the year 2-Acatl (1038/40 A.D.) as it is confirmed indeed by many sources.

In that year of New Fire, the Sun passed on the Node on a day 19 IX 1038, very meaningfully, a day 13-Xochitl/1-Cipactli, that is to say the last or first day of the 260 days almanac.¹⁷ On this date, Venus was 32 days before the second inferior conjunction of the regular symmetrical figure described which returns every 104 years, precisely in the years very well attested historically for the ceremonies of the New Fire Ceremonies (see figure 4). Three days later, occurred an eclipse of the Moon, on the 2 IX 1038, and 15 days later, on new moon, the Sun just escaped the eclipse zone, at 17 days off the Node; hardly missing a last possible eclipse on a day 4-Ollin. The Moon was then in conjunction on a Julian day 2100460, the 6 X 1038, or 4-Ollin Year 1-Tochtli, but 17 days off the node is an extreme post nodal position and the eclipse could not occur.

Such coincidences call our attention, because this date seems to constitute a very important rooting in the historical chronology of Mesoamerica. Let us then accept that the Aztec era started in a year 2-Acatl, when the day 4-Ollin started not to be threatened anymore by an eclipse

(probably the 4-Ollin of 9 III 1040 [J.D. 2100980], with the Sun at +17 of the Node).

To discover such a coincidence at the exit of the day 4-Ollin from the eclipse window, precisely in the year which is documented by many sources as the start of the Sun of this name, stimulates of course to investigate if the same situation does not repeat with the other Suns' names.

THE FIVE SUNS OF THE AZTEC COSMOLOGY

If the day 4-Ollin could not be the day of an eclipse from the year 1038/40 A.D., we may look if by chance, in that time, the previous Sun's day name, called 4-Atl, did not finish its career with the contrary situation, that is, the entrance in an eclipse danger zone, an eclipse window, after a period of 1040 years safe of such a possibility on such a day. And indeed, it is the situation for the day 4-Atl of the year 2-Acatl, 208 days before in the chronological linear calendar, but 52 days after in the Tonalpohualli. That day, the localization of the Sun, on 14 VIII 1039, (J.D. 2100772) was -18 days from the Node, and so, was exactly at the prenodal limit.

Let us remember that, according to the Dresden Codex, the maximal acceptable distance between the Sun and the Node is 18 days for an eclipse to occur (Lebeuf 2003), and thus, from the year 1038/9, the day 4-Atl entered in an "eclipse window", in a prenodal position. This means then that the "death" of the Sun 4-Atl coincided with the birth of the Sun 4-Ollin. The possibility that this plan was deliberate is confirmed by the fact that between the successive dates of the five Suns of the Aztec cosmology, we find these same distances. Between 4-Ocelotl and 4-Ehecatl we count 52 days as between 4-Ollin and 4-Atl¹⁸. A date being free of eclipses during $5200/260 \times 52$, or 1040 Xihuitl, it is clear that the beginning of the Sun 4-Atl is located at the beginning of the Christian era. And indeed it is the case, and the day 4-Atl of the year 2-Acatl or the 7th of January of the year 1 A.D. (J.D. 1721432), 379548 days before the start of the 4-Ollin era, we observe similar conditions, or almost identical ones between the Node and Venus: Node 18 and Venus -79, as between their positions in the year 1038 for 4-Ollin with the Sun at 17 days of the Node and Venus at -79.

This fact cannot be casual, because according to the Aztec cosmology, in 1038/39, the four precedent eras had passed, and if we count four times 1040 Xihuitl back in the past, we reach the year 3119/20 a.C., exactly the year in which the Venus table in the Dresden Codex starts as well, in 6.2.0 before 4-Ahau 18 Kayab, start of the Long Count¹⁹. All this seems to refer to a unique tradition, with only a few minor variations of the inner structure. Especially convincing is the fact that the order is strictly

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the same as in the documented sources: 4-Ocelotl, 4-Ehecatl, 4-Quiahuitl, 4-Atl and 4-Ollin.

At the start of the first Sun, 4-Ocelotl year 2-Acatl on 22 VII 3119 a.C., the Sun was at +16 days of the Node; 1040 years later, the 4-Ehecatl day was at +15 days of the Node. We obtain thus the positions:

4-Ocelotl, year 2-Acatl, 22 VII 3119 a.C., Sun-Node + 16; Venus 156

4-Ehecatl, year 2-Acatl, 22 IX 2080 a.C., Sun-Node + 15; Venus 155

4-Quiahuitl,

4-Atl, year 2-Acatl, 7 I 1 A.D., Sun-Node + 18; Venus - 79

4-Ollin, year 2-Acatl, 9 III 1040 A.D., Sun-Node + 17; Venus -79

In the four cases we find the Sun at a postnodal extreme position, and we reach the way out of any eclipse danger zone in which each of the respective day names cannot be the moment of an eclipse. We observe the parallelism between the two couples of dates 4-Ocelotl - 4-Ehecatl and 4-Atl - 4-Ollin, concerning the respective positions of the Node and Venus.

I left apart the day 4-Quiahuitl because this date is irregular and presents a problem. 4-Quiahuitl presents a rupture in this logical set. We could believe in a confusion of the sources; nevertheless, if we could eventually accept a possible confusion in such documents as the Annals of Cuauhtitlan, the Leyenda de los Soles or other written sources of the colonial period, we cannot present such an argument for some of the most prominent stone monuments of Tenochtitlan such as the "Aztec Calendar Stone" among other, where these dates appear.

If we jump systematically by 379548 days (= 1040 Xihuitl minus 52 days) from the initial day 4-Ocelotl, we obtain:

4-Ocelotl, year 2-Acatl, 22 VII 3119 a.C., Sun-Node + 16; Venus +156

4-Ehecatl, year 2-Acatl, 22 IX 2080 a.C., Sun-Node + 15; Venus +155

4-Itzcuintli, year 2-Acatl, 21 XI 1041 a.C., Sun-Node +14; Venus +155

4-Tecpatl, year 1-Tochtli, 22 I 1 a.C., Sun-Node +13; Venus +154

4-Miquiztli, year 1-Tochtli, 24 III 1039 A.D., Sun-Node +13; Venus +154

4-Ocelotl, year 1-Tochtli, 23 V 2078 A.D., Sun-Node +12; Venus +153

Now, if we do the same, but starting from the day 4-Ollin of the year 2-Acatl 1040, we obtain the series:

4-Ollin, year 2-Acatl, 9 III 1040 A.D., Sun-Node +17; Venus -79.

4-Atl, year 2-Acatl, 7 I 1 A.D., Sun-Node +18; Venus - 79

4-Cipactli, year 3-Tecpatl, 7 XI 1040 a.C., Sun-Node +19; Venus -78

4-Acatl, year 3-Tecpatl, 8 IX 2079 a.C., Sun-Node +20; Venus -78

4-Coatl, year 3-Tecpatl, 8 VII 3118 a.C., Sun-Node +21; Venus -77

Such regular and systematic progressions by steps of 379548 days would be ideal, but once more, whichever starting point we choose, when we reach the year 1040 a.C., the obtained dates drift from the ones known by Aztec tradition and monuments. We observe, first of all, that the day 4-Quiahuitl is the first to escape the inner logic of the system, that does not appear, and from then on, the two successive ones differ as well from the documented dates: 4-Ocelotl and 4-Ehecatl in one case, 4-Atl and 4-Ollin in the other, according to the different points of departure we choose.

We can explain the reason why the two dates 4-Tecpatl and 4-Cipactli in one case, 4-Acatl and 4-Coatl in the other of our attempt of regular progression, were rejected: it is because these dates had drifted in the Xihuitl out of the year 2-Acatl and into the years 1-Tochtli and 3-Tecpatl. This was apparently ideologically absolutely unacceptable for the ceremony of the New Fire and the start of their "centuries" in Aztec thought which only agreed with the years 2-Acatl for these celebrations. It was then necessary to correct, or displace these four dates in order to force them into the years 2-Acatl. It seems, moreover, that for formal aesthetic reasons, all the day names had to be indexed on a number four. As a consequence of these manipulations, instead of being regularly spaced at a 52 days distance, the five dates are unevenly situated in the Tzolkin.

With these three restrictive conditions:

1) The best possible postnodal position of the Sun nearest to +18 of the Node;

2) A 2-Acatl year;

3) A day indexed on the number 4.

The only formal possibilities were the following:

Gregorian date	Day of the Tzolkin	Year	Distance Sun - Node
9 VII 3119 a.C.	4-Cipactli	2-Acatl	+3
22 VII 3119 a.C.	4-Ocelotl	2-Acatl	+16
7 I 3118 a.C.	4-Calli	2-Acatl	+12

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9 IX 2080 a.C. 22 I X 2080 a.C. 10 III 2079 a.C.	4-Atl 4-Ehecatl 4-Ozomatli	2-Acatl 2-Acatl 2-Acatl	+2 +15 +11
8 XI 1041 a.C. 21 XI 1041 a.C. 9 V 1040 a.C.	4-Ollin 4-Itzcuintli 4-Quiahuitl	2-Acatl 2-Acatl 2-Acatl	+1 +14 +10
9 VII 1 a.C. 25 XII 1 a.C. 7 I 1 AD	4-Mazatl 4-Cozcahauhtli 4-Atl	2-Acatl 2-Acatl 2-Acatl	+9 +5 +18
9 IX 1039 A.D. 25 II 1040 A.D. 9 III 1040 A.D.	4-Cuauhtli 4-Cuetzpallin 4-Ollin	2-Acatl 2-Acatl 2-Acatl	+8 +4 +17

Table 1 - The table shows that with the three restrictions (year 2-Acatl, day of the Tonalpohualli indexed on a 4, and a postnodal position of the Sun at a 1040 Xihuitl distance), the best possible solutions are precisely: 4-Ocelotl, 4-Ehecatl, 4-Atl and 4-Ollin. The exception appears in 1040 a.C., where 4-Itzcuintli would have been the best but has been replaced by 4-Quiahuitl. The day Itzcuintli probably was eliminated for reasons of ritual and symbolical incompatibility.

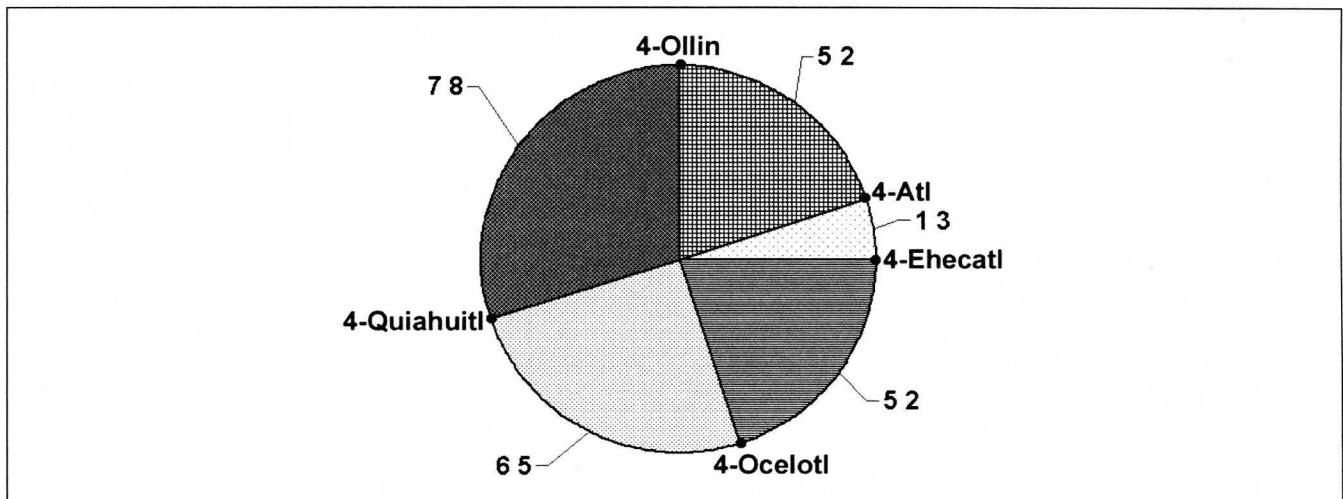


Fig. 9 - Irregular distribution of the names of the five Aztec Suns in the Tonalpohualli.

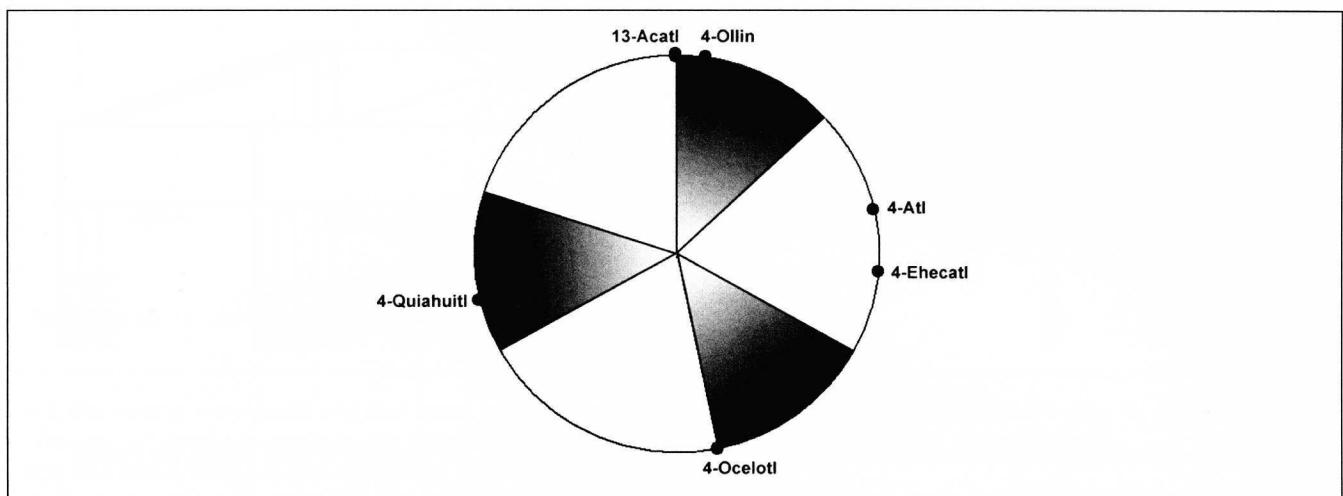


Fig. 10 - Position of the three zones of eclipses in the Tonalpohualli. Notice that when the day 4-Ocelotl comes out of an eclipse zone, the day 13-Acatl enters another one.

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We can understand very easily the reason why the dates 4-Ocelotl, 4-Ehecatl, 4-Atl and 4-Ollin were elected by the Aztecs, as they best respond to the imposed conditions; nevertheless, once more, the day 4-Quiahuitl resists the logical explanation.

The day 4-Cipactli would have been excellent, with the Sun at + 19 of the Node, but unfortunately, a first 4-Cipactli fell in a 1-Tochtli year and the second, 520 days later, fell in a 3-Tecpatl year; two years which had to be excluded, as for the Aztecs, the 2-Acatl years were the only acceptable for ritual and ideological reasons. If we agree with the logic of necessary limitations of a day indexed on number 4 in a year 2-Acatl, and we will extend the margin of the postnodal position of the Sun, then we obtain only two positions:

4-Itzcuintli year 2-Acatl, J.J. 1341533, with the Node at +14.

4-Quiahuitl year 2-Acatl, J.J. 1341702, with the Node at +10.

We must say that both are rather weak, taking in consideration that the eclipse limit is at +17/18 of the Node. And if we had to accept any of them, not having any better option, the 4-Itzcuintli would be the best with a distance of +14 days. Why then was it excluded in favour of 4-Quiahuitl, which is as near as 10 days from the Node? The question seems difficult, but the fact is that such has been the option retained by the Aztec cosmology. Which might have been the reason of this eccentric election of 4-Quiahuitl? The reason was

probably of ritual order, for a symbolical impossibility. It would have been very evident to exclude the day Itzcuintli to celebrate the birth of a new "Sun", because the rebirth of a Sun after the death of the preceding one is always a sign of life, of renovation, of new start. Now, Itzcuintli means a "dog", an animal strongly related to the death. The dog is a mortuary animal which accompanies the dead warriors and the dead in general to the otherworld; it is associated with the ends of cycles, with the dead Sun, the night or the subterranean Sun, with twins and monsters, with sorcery, illnesses, fornication and the Moon (Garza 1997:112-133). According to Beyer, "The interpreter of the Telleriano-Remensis Codex (folio 20) says that the Sun goes to shine in the land of the dead; and so, we can consider the particular disk of dark feathers carried by Xolotl on his back, on page 76 of the Nuttall Codex, as the image of the nocturnal Sun, the Sun of the underworld" (Beyer 1965b:440-443).

So, the date 4-Quiahuitl marks a certain logical rupture in an otherwise remarkably coherent system; nevertheless, it is still an acceptable date for a postnodal position of the Sun, because at subtropical latitudes, eclipses occurring that far of the node are of very small magnitude and are hardly noticeable for common people²⁰. We will especially note that the chronological logical succession of the four Suns of Aztec cosmology presented here comes exactly in the same order as the one attested by historical and archaeological sources, and this excludes any possibility of numerological hazard.

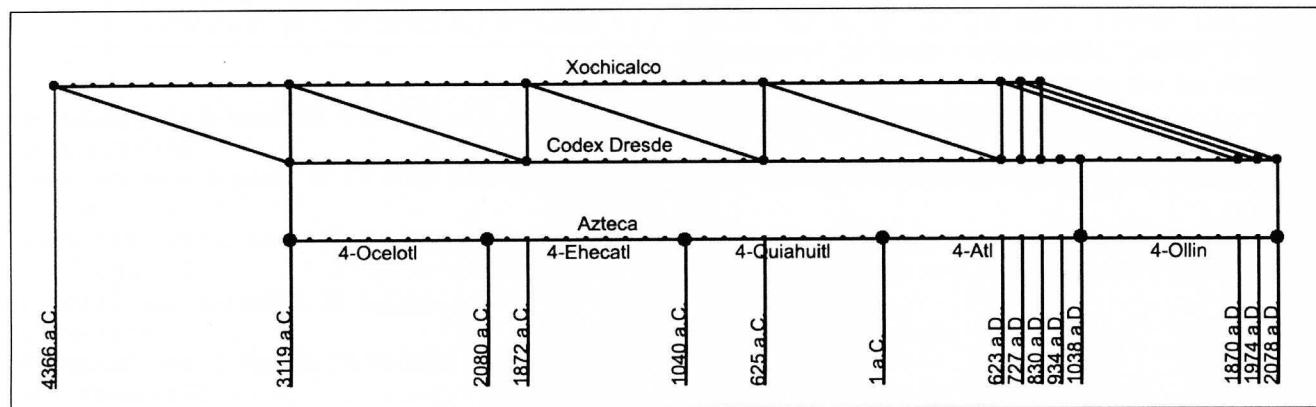
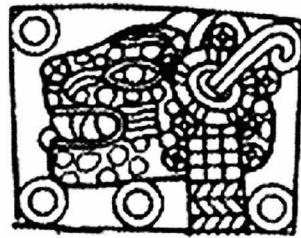


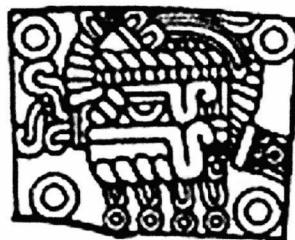
Fig. 11 - Transposition and congruencies of the systems of Xochicalco, of the Dresden Codex and of the Aztecs.



4-Ocelotl



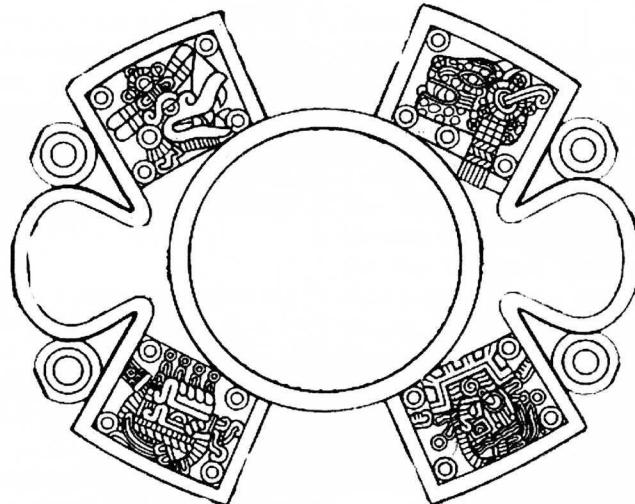
4-Ehecatl



4-Quiahuitl



4-Atl



4-Ollin

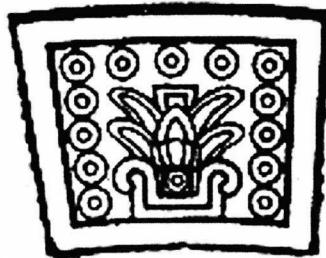
The dates of the “Calendar stone” : A. the names of the four Suns.

THE FOUR SMALL COMPLEMENTARY DATES

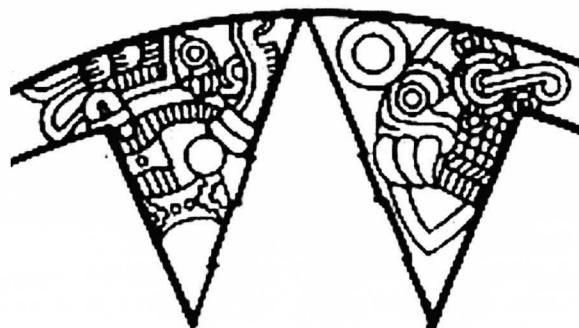
All this seems very good and the inner logic of such a complex set seems to exclude any possibility of thinking that this could be the result of random game, and not the fruit of a deliberate plan. But we still have four other dates of minor size on the relief, which logically, if our premises are good, should be explained in the same context of the localization of the Node of Moon orbit on

the ecliptic and the division of time in steps of eclipse prevision, 65* et 780*. These dates are:

- between the tails of the two serpents: **13 Acatl**
- between the dates 4-Ocelotl and 4-Ehecatl : **1-Tecpatl**
- between the dates 4-Quiahuitl and 4-Atl : **7-Ozomatli** and **1-Quiahuitl**



13-Acatl



1-Tecpatl



7-Ozomatli



1-Quiahuitl

The dates of the “Calendar stone” : B. The dates 13-Acatl, 1-Tecpatl, 7-Ozomatli and 1-Quiahuitl.

Let us first consider the two superior dates 13-Acatl and 1-Tecpatl:

- (1) On 13-Acatl, year 1-Tochtli (J.J. 582056), 6 VII 3120 a.C., the Moon counts 29 days and the distance Sun – Node is -18.
- (2) On 1-Tecpatl, year 2-Acatl (J.J. 582421), 6 VII 3119 a.C., the Sun passes on the Node (distance Sun-Node = 0).
- (3) On 4-Ocelotl, year 2-Acatl (J.J. 582437), 22 VII 3119 a.C., the new Moon counts 29 days and the distance Sun-Node is +16.

On the first of these dates, 13-Acatl, the Sun is at -18 days of the Node; that is to say that the day 13-Acatl enters in an eclipse window after having been free of

eclipses during the preceding 1040 period. We can consider that this date is the last of the preceding cycle of 5200 Xihuitl itself divided in five series of 1040 Xihuitl: it marks the end of the preceding “world” and the absolute start of the present one.

Exactly 365 days after, the Sun passes on the Node on a day 1-Tecpatl, indicating the position of the Node in the Xihuitl at the start of the new era²¹.

And 16 days later, on 4-Ocelotl, the Sun is in a postnodal position, far enough to start the 4-Ocelotl Sun, the first of the new 5200 Xihuitl cycle. This probably indicates that:

- (1) The Sun preceding the 4-Ocelotl Sun was called the 13-Acatl Sun²², the date on which the last Sun of the preceding 5200 Xihuitl cycle had finished. The position of this date in the decorative program of the stone is

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meaningful; it is engraved in-between the tails of the two serpents, that is, the point of their emergence, start of the new set of five Suns.

(2) The day 1-Tecpatl is exactly the day of the passage of the Sun on the Node at the beginning of the new cosmogony of the next 5200 Xihuitl, and we will have to wait for such a laps of 5200 Xihuitl for the Sun to return to the Node on a day 1-Tecpatl, and to return to the same situation as when the 4-Ocelotl Sun inaugurated, in 3119 a.C., the first Sun of 1040 Xihuitl. This first Sun, 4-Ocelotl, started when the Sun was on the Node on a day 1-Tecpatl, and finished 1040 Xihuitl later when the Sun passed on the Node on a day 1-Miquiztli, after a drift of 52 days in the Tonalpohualli.

This remembers us of the ritual dates for the birth and the death of Huitzilopochtli, an avatar of Tezcatlipoca, a lunar figure, a tiger devourer of the Sun. This is exactly what the "Historia de los Mexicanos por sus Pinturas" tells us: at the end of the first Sun, Quetzalcoatl gave him a great stroke with a stick, and he was transformed into a tiger (that is a celestial jaguar, a monster of eclipses). This happened exactly a day 1-Miquiztli of the year 2-Acatl. The death of Huitzilopochtli/Tezcatlipoca in a day 1-Miquiztli would mark his death 1040 Xihuitl after the moment of his birth on 1-Tecpatl in 3120 a.C., when the Sun passed on the Node. The 4-Ocelotl Sun then died to give birth to the 4-Ehecatl Sun. If it is so, the life of Huitzilopochtli could then symbolize different periods of time depending of the context:

- (a) 208 or 52 days of ritual preparation of the sacrificial victim representing him.
- (b) 52 Xihuitl minus 52 days of a human life before his sacrificial death.
- (c) The first of a series of 1040 Xihuitl between 3120 a.C. and 2080 a.C.
- (d) The last 5200 Xihuitl of the present world, which was born when the Sun passed on the node on a day 1-Tecpatl.

And thus, in the context of the division of the present 5200 Xihuitl by periods of 1040 Xihuitl:

- **The first period of 1040 Xihuitl (4-Ocelotl)** is under the sign of Tezcatlipoca. H. Beyer says that the first Sun, 4-Ocelotl, had the smoking mirror of Tezcatlipoca marked on the ear and, according to the tradition, was converted in the Sun. "Se hizo Sol" of that epoch, as explains the *Historia de los Mexicanos por sus Pinturas* (Beyer 1965:177). To this, I would like to add that the sign 1-Tecpatl, which is strictly associated to him, is also marked with the mirror of Tezcatlipoca.

- **the second period (4-Ehecatl)** is under the sign of

Quetzalcoatl: "when fifty and two years had passed, Quetzalcoatl became Sun, and finished to be Tezcatlipoca, because he gave him a great stoke with a stick and made him fall in the water and there he became a tiger"²³.

- **the third period (4-Quiahuitl, but the Sun was then on the Node on 1-Ocelotl)** is under the sign of Tezcatlipoca.

- **the fourth period (4 Atl, but the Sun was then on the Node on 1-Ehecatl)** is under the sign of Quetzalcoatl.

- **the fifth period (4-Ollin or 4-Miquiztli, another postnodal position out of the eclipse window at a 173 days distance)** is under the sign of Tezcatlipoca.

Progressing regularly by 52 days in the Tonalpohualli, we find, for distances of 379548 days:

- 1-Tecpatl 2-Acatl (Julian Day 582421) 6 VII 3119 a.C.
Node 0
- 1-Miquiztli 2-Acatl (Julian Day 961969) 6 IX 2080 a.C.
Node -1
- 1-Ocelotl 2-Acatl (Julian Day 341517) 5 XI 1041 a.C.
Node -2
- 1-Ehecatl 1-Tochtli (Julian Day 1721065) 6 I 1 a.C.
Node -3
- 1-Itzcuintli 1-Tochtli (Julian Day 2100613) 8 III 1039
Node -3
- 1-Tecpatl 1-Tochtli (Julian Day 2480161) 7 V 2078
Node -4

The difference of 4 days for the distance Sun-Node between the 1-Tecpatl day at the beginning of the count and the 1-Tecpatl day at the end, represents the error accumulated during 5200 Xihuitl of a formalised count which accepts a regression of 260 days in the Tonalpohualli for 5200 Xihuitl.²⁴

Considering this regular alternate of eras associated with Tezcatlipoca and Quetzalcoatl, we understand better that Moctezuma II Xocoyotzin could have feared the premature and vengering return of Quetzalcoatl, who had been eliminated in the year 1038²⁵ and was going to bring the end of the Aztec Sun and of the present world, both under the patronage of Tezcatlipoca-Huitzilopochtli according to the Aztec reform of the calendar and their ideology. The three feasts:

- 13-Acatl (end of the last great epoch of 5200 Xihuitl before 3120 a.C.),
- 1-Tecpatl (day of the passage of the Sun on the Node in 3119 a.C. at the beginning of the new "world"),
- 4-Ocelotl (the exit of the eclipse window in that same year, and the name of the first Sun of the present "world"),

are disposed exactly at their right place in the iconographical program of the "Calendar Stone", next to

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the beginning of the movements of the two serpents of time. We may add that the glyph situated in front of 1-Tecpatl represents a royal headdress (*copilli*), without a face but issuing a speech volute. If this has been interpreted frequently as the personal glyph of Moctezuma II, R. Tomicki²⁶ claims that he, Moctezuma, only used it as a sign of his function as the image of the supreme sky god on earth, but this glyph, in fact, refers to the supreme god of the Mexican religion: Ometeotl in his creative or destructive action.²⁷ Chavero was of the same opinion:

"The representation of the god by his royal headdress, or *copilli*, is confirmed by the Piedra del Sol or Calendario Azteca. In fact, in the upper part, above the central figure of the stone, is sculpted the date ce-Tecpatl with its accompanying fire ... (and in note 2): Seler and Peñafiel took the *copilli* for the hieroglyphic sign of Moctezuma. But, made in 1479 and inaugurated in 1481, it has nothing to do with Moctezuma, who did not begin to reign before 1502" (Chavero 1886:278) [...] "The Nahua cosmology is in the first page of the Codex Vaticanus. In the upper part of the painting, we find the creator god; richly dressed, in the royal *icpalli*. Over his shoulder we see the *copilli* of the lords *tecuhtli*, the royal crown is here to signify that he is the principal god, the king of the gods. The interpreter calls this creator god Ometecuhtli, which means: Lord Two" (Chavero 1886:24).

The date 1-Tecpatl, place and moment of the passage of the Sun on the Node of Moon orbit, represents in 3119 a.C., the seat or throne of the supreme invisible god, creator and destructor of the successive worlds, as it is represented by the royal *copilli* without a face. The speech volute expresses the action of this invisible god.

Nevertheless, we would still have to understand the meaning of the two small dates situated on the opposite side of the stone, between the two dates 4-Quiahuitl and 4-Atl, exactly over the serpents heads: these dates are 7-Ozomatli and 1-Quiahuitl.

7-OZOMATLI

First, let us see the date 7-Ozomatli. Let us recall the scheme proposed for the inscriptions on the façade of the Feathered Serpent in Xochicalco. There, the 5200 Xihuitl which run from the 11-Ozomatli of 4366 a.C. to another one in 830 A.D. are divided in $4 \times 780^*$, regressing four times around the ecliptic, a situation which takes us to the day 9-Ehecatl in 623 A.D.; we have to add another two steps of 65^* to complete the 50 great ceremonies the node takes to regress one turn in the Tonalpohualli during 5200 Xihuitl, returning then to the initial date 11-Ozomatli:

11-Ozomatli 4366 a.C. + $(4 \times 780^*) = 9\text{-Ehecatl } 623$

A.D.

9-Ehecatl 623 A.D. + $(2 \times 65^*) = 11\text{-Ozomatli } 830$ A.D.

Although the Aztecs completely reformed the calendar, they thought it was useful to integrate the knowledge acquired in the past (they repeatedly presented themselves as the inheritors, descendants and continuators of the Toltecs), but at the same time, they did everything they could to distinguish themselves from their predecessors, making believe they had reinvented the world.

The traditions of the Dresden Codex and of Xochicalco divided the 5200 Xihuitl in four periods of 780^* , plus $2 \times 65^*$. The Aztecs decided to take the same length of 5200 Xihuitl and cut it in five equal parts of 1040 Xihuitl each²⁸, that is, ten ceremonies of 104 Xihuitl for each of their Suns; and this is how an old tradition, the tradition of the Dresden Codex which counted itself in the fourth era of 1248 Xihuitl, was reformed in such a way that the Aztecs could declare they lived in the fifth Sun, although they had kept the same point of origin as in the Maya tradition: 3119 a.C.

They also introduced another change: the New Fire Ceremonies were not anymore celebrated in the years 1-Tochtli but in the subsequent ones, 2-Acatl. For ideological reasons, the Aztecs did not want, at any rate, to be suspected to be dominated by the Moon, intimately associated to the years Tochtli and the previous political order they had overcome.

After this review we can now return to the date 7-Ozomatli. If the cycle of 5200 years of regression of the Node in the Tonalpohualli was theoretically to finish on the day 1-Tecpatl, 208 Xihuitl before, the Sun-Node conjunction would be on 12-Atl and thus, the limits of the eclipse window would be effectively 7-Ozomatli and 4-Mazatl. Counting then by series of 12×104 Xihuitl, we arrive at the end of the fourth turn of the Sun-Node conjunction after 3120 a.C. The fourth of the Maya eras should have finished in 1870 A.D., with the entrance of the day 7-Ozomatli in an eclipse window. On the day 7-Ozomatli in 1870 A.D.²⁹, the relation of the Sun to the Node is exactly similar to that of the day 13-Acatl in 3119 a.C. or of the day 4-Ollin in 2078 A.D.:

13-Acatl year 1-Tochtli, 6 VII 3120 a.C., Sun-Node -18

7-Ozomatli year 1-Tochtli, 20 VI 1870 A.D., Sun-Node -22

4-Ollin year 2-Acatl, 13 X 2078 A.D., Sun-Node -19

In the same way as 3120 a.C. finished a period of 1040 Xihuitl during which the occurrence of an eclipse was impossible on a day 13-Acatl, and 2078 A.D. finished a 1040 years period during which an eclipse was impossible on a day 4-Ollin, in 1870, the end of the fourth "Sun" of the preceding system, a period of 1040

years was finishing, during which an eclipse was impossible on a day 7-Ozomatli³⁰.

As a complementary indication that these decorations are situated according to this pattern, the two supplementary signs of quincunxes, that I read as twice 104 Xihuitl³¹, are indeed located above this date of 7-Ozomatli (1870 A.D.), which marks the end of the four periods of 780*, $2 \times 65^*$ before the end of the complete set of 5200 Xihuitl in the year 2078.

For reasons of political supremacy, and to rewrite History to their own convenience, a Nahua population grabbed the whole astronomical and calendar knowledge of their predecessors, in particular the Toltecs, but willing at the same time to distinguish themselves, they decided to introduce a change in their own calendar regarding the previous tradition. Inaugurating their own fifth "Sun", they simply moved the beginning of their own count of 416 Xihuitl, so that it would coincide with their own historical accession, in such a way that, contrarily to the Xochicalco or Dresden Codex traditions starting in 623, it would begin in 1038, and so they offered themselves a kingdom of 1040 years during which their Sun, the Sun 4-Ollin of Huitzilopochtli, could not be eclipsed or vanquished.

It is evident that the Aztecs established that initial 4-Ollin in 1038 by a retroactive calculation of mythical and cosmological origin, as, according to the sources, at that time, they had not yet arrived in the lake region.

The same concerns the date 7-Ozomatli, but calculating to establish the end of the fourth Sun of the preceding system in 1870 A.D.

1-QUIAHUITL

The last date which would need an explanation is the 1-Quiahuitl at the inferior left part of the Stone, and we should look for a solution in the same logic of the passage of the Sun on the node, of eclipse limits in the Tonalpohualli on certain significant moments of the Aztec history.

The Sun passed on the Node of the Moon orbit on a day 1-Quiahuitl on the 2 IV 1196, a Julian Day 2157982. That date of 1-Quiahuitl of a year 2-Acatl could be of importance in the history of the Aztecs, as the foundation date of their first establishment in the lake region. Chimalpahin informs in his third relation that the Mexicas celebrated their third ceremony of the New Fire in the year 1195, as if that peculiar date of the New Fire in 2-Acatl 1195/6 was of a specially important meaning.

Nevertheless, it is evident that we cannot accept such a formulation, because the Mexicas arrived in the lake

region more or less around this date, and before that, they had no idea of that ritual. The unique possible interpretation is that the first ceremony of the Aztecs was already the third since their mythical departure in 1038, start of the Sun 4-Ollin. Many sources coincide to place the establishment of the Aztecs around 1195. Ixtlilxochitl informs that the death of the great Tlotzin, in 1194³², was accompanied by great prodigies in the sky, comets and eclipses that were auguring much evil to come. After this death, started many intestine fights:

"And before his death, came the first mentions of the aztlaneas, which we now call Mexicans... when this Lord died, there were great revolts and wars in all his kingdoms, fighting each other ... when a year had passed of the monarchy of Tenancacatzin, and that was in 2-Acatl, and according to us, in 1195 of the incarnation of Christ, our Lord, came the Mexicans, or better, Aztlanos ... When Tenancacatzin was defeated, falling into his nature, Chichimecatl Tecuhtli Aculhua had himself elected by oath..." (Ixtlilxochitl, 1975:309,311,312).

Durán confirms:

"On the year of 1093 after the birth of our Redeemer Jesus Christ, came to this land the nation and congregation of the Mexicas, a people who had came (as all the other nations with which the earth was then populated) from some cavern by the number of seven, and from a land where they had lived, which they called Aztlan" (Durán 1951:III).

The year 2-Acatl 1195 would then be the one in which the Aztecs installed themselves on the land which was to become the centre of their empire. It would not be surprising that such an important historical event could have been marked and consecrated in their cosmology. Moreover, if the two upper dates, which refer to the beginning of time, between the tails of the two serpents of time, make reference to a mythical past, the opposed dates, at the level of the heads of the serpents, could very well reflect some historical events, more recent or yet to come.

This would be the case for the 7-Ozomatli day, which makes reference to the death to come of the fourth Sun of the system in run before the reform; and the date 1-Quiahuitl referring to the first hold of the Aztec territory and their first New Fire Ceremony. These two dates are of historical nature and are thus collocated at the proximity of the serpents' heads. Their size is of minor dimensions than the cosmological ones.

Concerning this proposition of an important ritual and historical date in 1195, we find a meaningful information in the analyse of the ceremonies of decapitation of

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Coyolxauhqui which, as we know, were part of the ceremonies at the end of "centuries" (Toxiuhmolpilli). S. Milbrath considers that the decapitation of Coyolxauhqui had necessarily to take place on the day 20-Tochtli, marking in this way the end of the cycle and the preparation of the ceremonies of the new one with ceremonies of New Fire. The aim would have been to suppress, kill or decapitate the last day of the last year 1-Tochtli of the 52 years cycle. In fact, some sources lead us to the 12th century for the origin of this cult of decapitation (Nicholson et al. 1983:50), to which the archaeological pieces analysed by the authors make reference. Let us look then for Sun or Moon eclipses which could have occurred in Tititl in a year 1-Tochtli at the end of the 12th century, and we find three eclipses of the Moon:

13-Atl 1-Tochtli, 1194 V 13, Moon 14, Node 3. (visible) **JD 2157292.**

8-Miquiztli 1-Tochtli, 1194 XI 6, Moon 14, Node 7. (visible) **JD 2157469.**

13-Ocelotl 1-Tochtli, 1195 IV 3, Moon 15, Node -18. (did not appear) **JD 2157617.**

The eclipse of the day 13-Ocelotl did not occur because the full moon passed hardly beyond the extreme prenodal limit for eclipses³³, but this means then that in that epoch, the day 13-Ocelotl was entering in an eclipse window, and the Aztecs could have desired to get rid ritually of that Ocelotl-tiger, an animal associated with the *tzitzimime*, devourers of the stars by excellence; a danger which was menacing especially the next Sun eclipse, and whose they could have desired to eliminate completely the morbid effect, for example by a decapitation of its theatrical representation. The next eclipse of the Sun on 17 IV 1195 was total in the South East of Asia but invisible in Mexico.

1-Tochtli 20 Tititl year 1-Tochtli, 17 IV 1195, Moon 29, Node -4.

It is probable that thanks to the keen observation of the two visible preceding eclipses of the Moon, it became possible to foresee that, though this eclipse would be of a large magnitude, it would not take place in Mexico. A ceremony of decapitation of the aggressive new Moon would have been very adequate to demonstrate the power of the new ideological order. The eclipse did not occur, although it had been possible to see the last very thin crescent rise in exactly the same place as the Sun, and shortly before, dangerously approaching it. We know that the Aztecs did all they could to supplant the lunar cults by solar ones. This eclipse of the 1-Tochtli 20 Tititl had certainly been predicted for long, and was greatly feared because of its situation at the last day of the last year of the 52 years cycle. Nevertheless, until the last years before the fatidic date, if it was possible to know the eclipse would occur for sure, it was not possible with the primitive tools of Mesoamerican astronomy to make sure

it would be visible in Anahuac or not. Only the observation of the two preceding eclipses in 1194 A.D., and first of all the missed one of the 3 IV 1195, could give enough information on the moment of the full and new Moons to tell if the Sun eclipse of the 17 IV 1195 would take place during the day or the night, and would be visible or not in Anahuac.³⁴ From this moment, it was possible to organize a feast with the representation of a propitiatory sacrifice in order to save the Sun of the supposed danger, decapitating the Moon. A brilliant ideological demonstration, the success of which was insured in advance.

We could not find a better date to inaugurate a ceremony of decapitation of the cycle than a day 1-Tochtli 20 Tititl 1195, which is perfect to serve as the model of all future ones, as, and this is worth of notice, this day is the last one of the last month of the last year of the century, final day of the 20 Tititl, which coincides perfectly with the fact that in the idealized mythical model, the goddess is decapitated in any of her representations, on the last day of the month she rules as patron (Milbrath 1995; Milbrath 1997:195; Sahagún 1950-1982:II:31,155-156). We observe, moreover, that this date (17 IV 1195) coincides very well with the Spanish gloss underlined by Nicholson y Quiñones Keber (1983:50), who place the decapitation of Coyolxauhqui in 1194, a year 1-Tochtli³⁵, prior to the properly speaking New Fire ceremonies that would inaugurate the new year and the new cycle which started for the Aztecs in the year 2-Acatl. It was as well a way of burying the previous tradition of a lunar character who was associated with the years 1-Tochtli in 1091 and 1195. Properly speaking, both the tradition, the "century", the year and the day 1-Tochtli were together decapitated to celebrate the renovation. The subsequent five *nemontemi* would thus have been, in that year, the days of fasting and penitence before the preparation to the great ceremony of the New Fire and, in this case, that ceremony would have taken place in the night from 6-Acatl to 7-Ocelotl, first day of Izcalli of the year 2-Acatl.

All this seems very logical and explains why the Aztecs considered these years 1-Tochtli as little interesting as old Moons, and installed the start of their own count after the destruction of the old system, in the years 2-Acatl. A drama which was played ritually every 52 years, and even better every 104 years, but probably also at other occasions to revive the ideology. It is possible that, if for ideological reasons the Aztecs made their fifth Sun start in 1040, they wanted to present themselves as the direct inheritors of the Toltecs who disappeared at that time:

"This Sun is named Four Movement. We who live today (have) this one, it is our sun, what is here is its signification, because the sun fell into the fire in Teotihuacan. It was the very Sun of Topiltzin, our son, of Tullan, of Quetzalcoatl. Before it was the sun, its name was Nanahuatl" (*Leyenda* 1975:121).³⁶

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The date of their historical appearance takes place 156 Xihuitl later, in the year 1196. That date would have been recorded in the “Aztec Calendar Stone” by the moment of the passage of the Sun on the node on a day 1-Quiahuitl, the seat of the maker of eclipses in 1195.³⁷

THE MESOAMERICAN UNITY OF ASTRONOMICAL TRADITIONS

It is very probable that the numbers and dates of the calendar inscriptions on the façade of the Feathered Serpent in Xochicalco, of the Venus table in the Dresden Codex and of the “Sun Stone”, are built on the same general basic Mesoamerican astronomical and calendar tradition. We encounter a unique tradition that counted one regression of the Node in the 260 days almanac in a lapse of time of 5200 Xihuitl. But this canonical measure is not exact and differs by four days of the truth. In fact, in 5200 Xihuitl, the node regresses only 256 days in the almanac. For this same length of time, the tradition of Xochicalco placed implicitly³⁸ the start and the end of the cycle on the day 11-Ozomatli; between the 11-Ozomatli of 4366 a.C., Node +4, and the 11-Ozomatli of 830 A.D., Node = 0; whereas the tradition of Tenochtitlan placed this regression between 1-Tecpatl 3119 a.C, Node = 0, and 1-Tecpatl 2079 A.D., Node -4. This seems to demonstrate that these two cultures tried to solve in an opposite manner the problem of this difference or error of four days which accumulates between the canonical count and the reality of the observed sky during that period of 5200 Xihuitl. The first started with an error of 4 days to reach exactness at the end, whereas the second started exactly to arrive at the end 4 days before. If this was deliberate, it means they were fully aware of the discrepancy between the model used and the astronomical reality, and consequently, that they knew with very high precision the exact period of the revolution of the Node on the Ecliptic³⁹. It is very probable that the Xochicalco tradition counted backward from the time of the construction of the site, using a canonical regression of 260 days to reach an original 11-Ozomatli with a 4 days error. Centuries later, the accumulation of observations permitted the Aztecs to correct the error and that is the reason why the end of the preceding cycle of 5200 Xihuitl stops on a day 13-Acatl, but the end of the present world of 5200 Xihuitl stops on the day 4-Ollin, 4 days before reaching 13-Acatl again. At any rate, their way of formulating the equation of this problem is of a simplicity which can only be compared to their art of dissimulating their deep and occult interest in the Moon.

SOME DECORATIVE ELEMENTS AND THE MEMORY OF THE PAST

Without pretending to analyse here all the decorative elements of the “Calendar stone”, it is interesting to detect

a composition of signs and numbers which are certainly not casual. If we take the signs known as “blood drops”, we see that they present once more the same structure described above: four groups of three by four, so that each quarter counts twelve signs and altogether it makes 48 “blood drops”. This reflects exactly the model proposed here for the four Suns cosmology previous to the Aztec reform. The “blood drops” interpretation can only refer to sacrifices; each one would then design a New Fire Ceremony. Still, to complete the full regression of 50 ceremonies, we lack two of them. We find them added separately in the upper part of the stone, under the tails of the serpents. The composition is then of $(4 \times 12) + 2$, exactly as in our reconstruction. Associated to these “blood drops”, we see in each quarter of the cycle and next to the serpents of time, three flames, each one marked by four small bars. This leads to a total of 48 again. If in this case, we do not find the two missing units to achieve the total of 50, it is certainly because twice 104 years do not constitute such a group of four ceremonies, or 416 years taken as one unit. This looks normal because Mesoamerican arithmetics did not accept fractions and so we can only find $4 \times 3 \times 4$, that is 48. These groups of 416 years or 260 Venus cycles were known as another major units, especially in the Venus table of the Dresden Codex, where we find the multiples by four of 104 years, which give 416 years from the base 9.9.9.16.0, in 623 A.D., leading to 1038.

We can imagine that a new power imposed certain ritual and ideological conditions and that the old priests were confronted to the necessity of imagining a solution to save their ancient knowledge and traditions. The old way of counting by $(4 \times 12 \times 104) + (2 \times 104)$ was too precious to be forgotten, and they did everything they could to save it, and drawing the “Calendar Stone” they tried to occult it in the decorative program, in a discrete way. This is confirmed by the other circle of decorative elements, that of the quincunxes. This circle is as well divided in four parts and in each of them we count ten quincunxes in a line, and two more for each quarter. This leads us to a total of $4 \times 12 = 48$. The two missing units are marked separately under the central figure. Then, the composition of these 50 quincunxes can be read $(4 \times 12) + 2$, or 5×10 , in order to please everyone.

We can then be quasi certain that here one quincunx means a period of 104 Xihuitl or 65 cycles of Venus⁴⁰. The fact of having associated this Xiuhcoatl (fire serpent) with the cycles of the New Fire Ceremonies (Huehueteotl), and then to the cycles of Venus, invites us to think over the exact nature of both serpents: Quetzalcoatl and Xiuhcoatl.

We could think that the differences found frequently in the literature between Xiuhcoatl (fire serpent) and Quetzalcoatl (feathered serpent), are negligible; they could be the same entity under two different iconographical aspects, covered of feathers or covered of

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flames. In many cases, the flames have been interpreted as feathers or the contrary; for example, the feathers on the serpents in Xochicalco could very well be seen as flames⁴¹. In general we call both of the serpents on the "Calendar Stone" — Xiuhcoatl (fire serpents); nevertheless, if from the mouth of one of them appears the face of Xiuhcoatl, Quetzalcoatl comes out of he second, and this makes a difference. In other words, if it is possible to call both Xiuhcoatl, we would as well be entitled to call them both Quetzalcoatl. M. Graulich calls them both the serpents of time. A. López Austin, who

prefers calling them fire serpent and light serpent, informed me that they are quiet different entities but merge together in Tlahuizcalpantecuhtli, the morning star⁴².

Anyhow, it is meaningful that the stages associated with the Aztec division of time in five Suns are explicitly marked by dates, whereas the ancient division by groups of 780* and 65* appears only discretely in the organization of decorative motives.

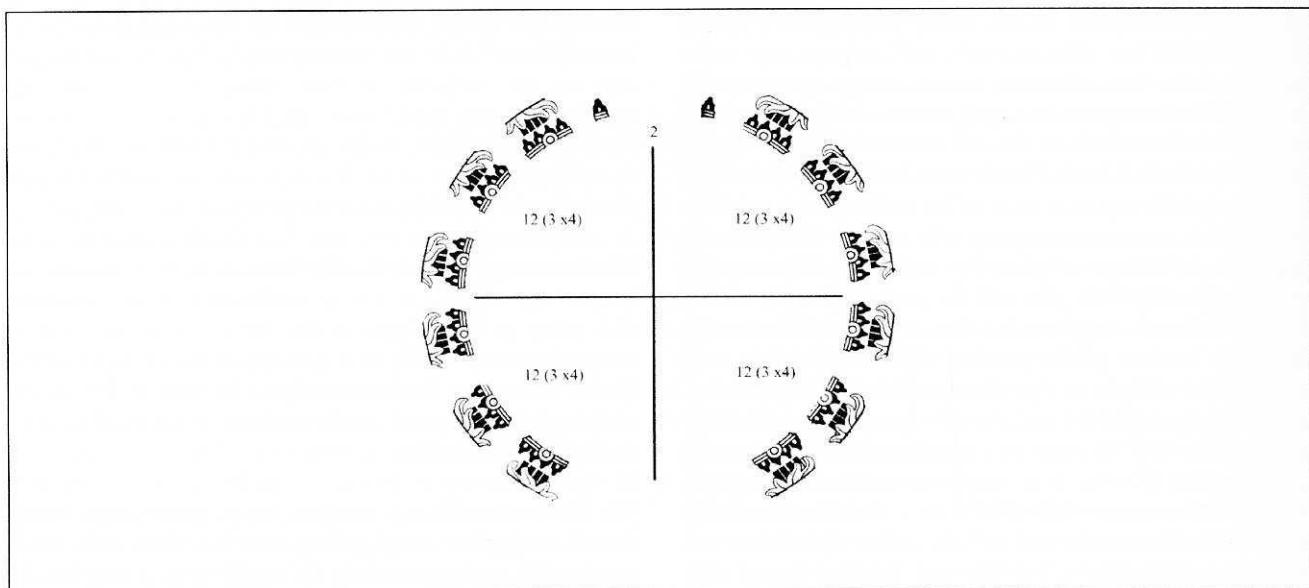


Fig. 12 - $(4 \times 3 \times 4) + 2$, or $(4 \times 12) + 2$ "drops of blood"; $(4 \times 3 \times 4) (4 \times 12)$ "FIRE sticks".

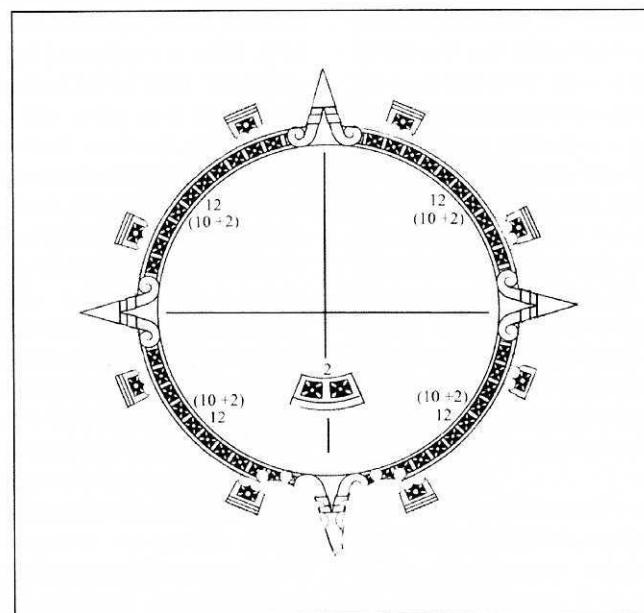


Fig. 13 - $(4 \times 12) + 2$ Quincunxes.

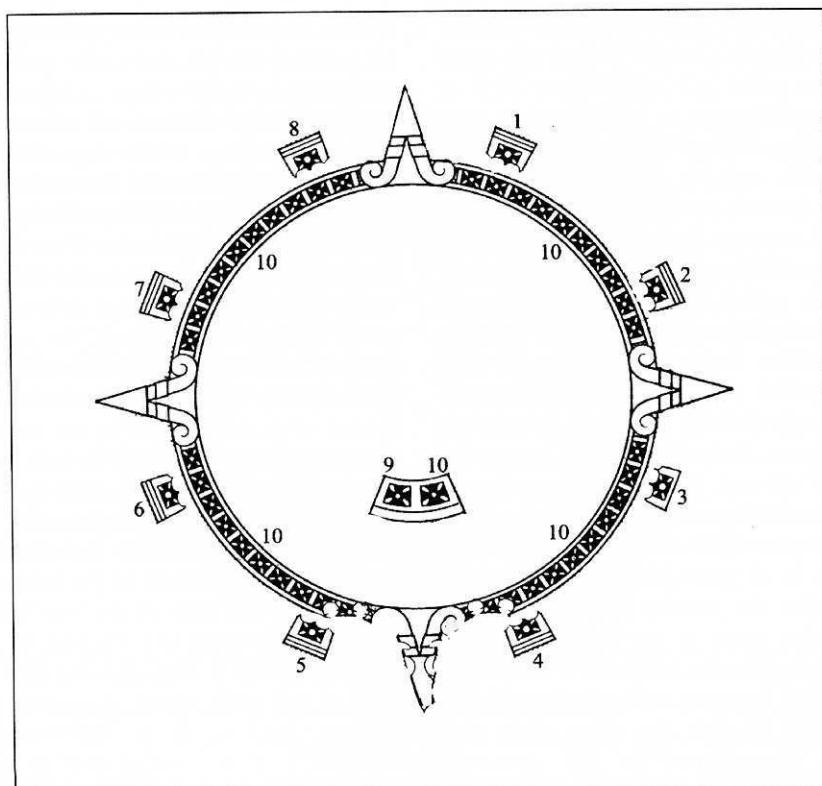


Fig. 14 - 5 x 10 Quincunxes.

CONFUSION OF THE SOURCES

Unfortunately nothing is perfect, and the *Leyenda de los Soles*, which presents the same tradition of the five Suns bearing the same names as those of the Aztec Calendar Stone, presents a new problem. If the hypothesis submitted here of five periods of 1040 Xihuitl each is acceptable, we do not understand why the author of the 1558 manuscript attributes them other durations: 4-Ocelotl 676 years; 4-Ehecatl 364 years; 4-Quiahuitl 312 years and 4-Atl 676 years. It is true that 676 plus 364 equals again 1040, which could indicate a sort of correspondence, but these numbers seem to have been manipulated for reasons I ignore and I have indeed no idea of a solution. We could also argue a confusion of two sources, two distinct traditions of the New Fire. In the Mixteca, it seems the celebrations took place after 80 Xihuitl. And if 13 cycles of 52 Xihuitl give 676 Xihuitl, 13 cycles of 80 Xihuitl sum again 1040 Xihuitl.

It is true that the collection of colonial documents concerning prehispanic cosmological cycles is very confuse and contradictory. And here I have only taken in consideration the information appearing in the "Calendar Stone", where no explicit length of time appear, and which is prehispanic. Nevertheless, we do not have to make a fuss when we do not understand some elements. At times, some very obscure bit of information appear

suddenly logical and very meaningful. At the occasion of a discussion on a rough draft of this paper, Richard Tomicki reminded me that Motolinia, in the 28th chapter of the second part of his "Memorials", agrees with the other authors on the names of the four Suns but curiously writes that the fifth one was called 4-Acatl instead of 4-Ollin. As I claimed that the era 4-Ollin started in the years 1038/1040 with the Sun at +17 days of the Node, this puts the days of nodal sun passages in the Tonalpohualli on the days 13-Ahau/1-Cipactli (day 1), and the two other are then necessarily 8-Miquiztli (day 86) and precisely 4-Acatl (day 173). To put it another way, Motolinia heard that when the postnodal limit falls on 4-Ollin, the Sun is on the Node on a day 4-Acatl, or some other explicative combination putting these two days in relation. He was a bit confused in his relation, and it cannot astonish us much, for the complication of these counts. They are so complicated! Nevertheless, I think this explanation gives justice to Motolinia, and constitutes a new element in favour of the present hypothesis. This simply means that the day 4-Acatl was in the year 1038 A.D., at the start of the fifth Sun, exactly in the same position as the days 9-Ehecatl in 623 A.D. and 1-Tecpatl in 3120 a.C.

Another very confuse information offers as well some elements in the same direction. Boturini, in the Chapter XX of his *Four ages of the world*, writes: "The year 1-Acatl, One Reed, first of the cycle CXXX of the Mexican

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tables, and corresponding to the year 1519 of the birth of Christ, and 6718 of the Creation". This gives 5199 years from the Creation of the world and Adam to the birth of Christ⁴³. Indeed, he confirms that: "We suppose that Christ was born, according to the LXX, in the year 5199 of the Creation and died in the year 5232". Everything is in order, and the year 1519 is indeed a year 1-Acatl in the tradition of Tenochtitlan, and the year 5199 of the Creation is the year zero of the astronomers and the year 1 a.C. of the Christians, and 2-Acatl of the Mexicans⁴⁴. But on page 246, he complicates the problem, writing: "1-Tecpatl, which was the first of the cycle CI and corresponds to the year 5201 of the Creation and the 11th of the birth of the Lord". This is evidently incoherent with the previous statement. If 5199 falls in 2-Acatl, the year 5201 must be 4-Calli and by no mean can be 1-Tecpatl in the same calendar tradition. Moreover, if Christ was born in the year 5199 according to his first statement, how could he be 11 years old two years later in 5201! – Boturini justifies the second affirmation by a trick: "and deducting nine years in my Toltec tables to accord the Indian chronology to the LXX...". It is evident that the author is messed in his notes and calculations, but anyway, if he speaks about the four ages of the world (the ancient tradition), he presents us in fact precious indications about the Aztec five Suns model, and first of all on the first of them. We do not have to worry too much about the fact that he makes the world start 5200 years before Christ, a duration which is the same as that of the Long Count which he seems not to have known at all, because this tradition is confirmed by several authors who knew nothing of the problems of Mesoamerican astronomy⁴⁵. Veytia writes:

"Boturini says in his work that the first Christian Indians, who then understood perfectly their chronology and were studying ours with an outmost curiosity, left us the information that since the creation of the World until the Birth of Christ, five thousand a hundred and ninety nine years had passed, which is the same opinion as that of the *Septuagint*" (Veytia 1944:113).

It seems certain that if the native wise men chronologists recently baptized heard that the *Septuagint* had calculated 5200 years from the creation of Adam until the Birth of Christ, the new Adam, they could only be struck as they knew it was the length of the Long Count of the Maya ancient tradition and the total duration of their five Suns, as we have seen. And I find even more interesting that Boturini affirms the first era was named 1-Tecpatl:

"The first and most important of their epochs was the one of the creation of the world, which they placed under the sign of the first year, Tecpatl, One Flint, the head of their primitive years" (Boturini 1990:240).

This remembers us the 1-Tecpatl sign of the "Aztec Calendar Stone", the day of Sun passage on the Node in

3120 a.C. when the Sun was escaping an eclipse window on a day 1-Ocelotl. It is very probable that Boturini and Motolinia are referring to the same tradition, which neither of them understood well, and that they name the eras by the names of the days of Sun-Node conjunctions as I have proposed for the system used in Xochicalco instead of the postnodal position attested by the Aztec system. For Boturini, the Sun 4-Ocelotl is called 1-Tecpatl, in the same way as for Motolinia the Sun 4-Ollin is called 4-Acatl.

3119 a.C. 4-Ocelotl Node 16 - 1-Tecpatl Node 0
1040 A.D. 4-Ollin Node 17 - 4-Acatl Node 0

Another of the Aztec reforms was to name the eras by the names of non eclipsable days instead of the names of Sun-Node conjunctions and total eclipse possibilities. Moreover, Boturini adds that the fifth era (we do not know where he takes it, as the paragraph on this subject is titled "The four ages of the Sun") had to finish with fire and bears the name of 1-Tecpatl, as the first one: "The V. and last epoch is that of 1-Tecpatl, One Flint, itself the start of the cycle which, according to the opinion of the Indians, had to finish the world in fire" (Boturini 1990:247). It is evident that if the five Suns system counts 1040 years for each Sun, it takes together 5200 Xihuitl, and according to the canonical model, if the Node was on 1-Tecpatl at the beginning, it will have returned to 1-Tecpatl at the end (assuming 260 days of regression for 5200 Xihuitl). We would like to know more about the documents consulted by Boturini and Motolinia. But besides, we find a convergent information in Torquemada, in his chapter about the first creation of the world by Ometecuhtli and Omecihuatl:

"They said that goddess had given birth in the sky to many children, and to a flint knife, which they call Tecpatl in their language, and which astonished all the other gods, her children decided to throw that knife out of heaven, and so they did, and it fell in a certain place on earth, called Chicomoztoc, which means Seven Caves, and a thousand and six hundred gods and goddesses came out of it" (Torquemada 1969:VI:XIX).

What is told here is the first creation of the world, and so it is well possible that the central figure on the "Aztec Calendar Stone", which has a flint knife protruding from the mouth, does not represent at all the face of the Sun as it was often repeated, but rather Omecihuatl, the feminine aspect of Ometeotl. If I mentioned Omecihuatl, it is only as a conceptual example of the feminine part of Ometeotl. In the binary system of thought and the Mesoamerican mythology, every concept is expressed at different levels in a large play of changes, correspondences and metamorphoses. At different textual levels, Ometeotl and Omecihuatl become Oxomoco and Cipactonal, or some other pairs of symbolically complementary simple binary oppositions such as day-night, light-darkness, cold-hot,

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wet-dry, etc. For the specific problem of eclipses, that is to say a problem of light and shadow, we can repeat after many authors that the eclipsed Sun is a Sun of night, or a dead Sun, or a Sun of earth. The contrary of a rising Sun, a new born Sun, daily and glowing. I am not the first to see in the central face of the “Sun Stone” a figure of such nature; see for example Carlos Navarrete and Doris Heyden⁴⁶. Tlaltecuhltli is a devourer of the Sun, and now, thanks to the recent discovery of the monumental representation of Tlaltecuhltli by Jose Alvaro Barrera, we can confirm and precise the identity of the central figure on the “Sun Stone”: it is assuredly Tlaltecuhltli, an earth deity, subterranean, of shadow and death. We find in both representations the same ear jewellery, the same tongue of a flint knife, and first of all the same extremities with claws. In the plays of symbolical resonances, Tlaltecuhltli is the negative form or strength of the supreme creator and destructor of successive worlds represented in his

creative aspect by the speech volute spoken out by the faceless *copilli*, in front of the sign 1-Tecpatl.

In any case, if my interpretation is correct, and this time in a purely Aztec tradition, the calculation of the derivation of the Node of Moon orbit in the Tonalpohualli, and the eclipse calculation, seem to have served as the base of the general calculation of times and constitutes the principal frame of cosmology in Tenochtitlan, as in the other civilizations of ancient Mexico⁴⁷. The fact that this knowledge of the Node, an abstract geometrical point at the cross section of two imaginary lines where the two principal sky gods, Sun and Moon, can be destroyed, constituted the peak of astronomical, cosmological and religious knowledge in Mesoamerica, might seem improbable to many. Nevertheless, if it was the case, we would better understand why this knowledge was kept secretly and transmitted discreetly.

J.D.	Gregorian date	Date of the Tonalpohualli	Year bearers	Distance Sun - Node
202716	1 XII 4159 a.C.	13-Acatl	2-Acatl	+17
582056	6 VII 3120 a.C.	13-Acatl	1-Tochtli	-18
582421	6 VII 3119 a.C.	1-Tecpatl	2-Acatl	0
582437	22 VII 3119 a.C.	4-Ocelotl	2-Acatl	+16
961777	15 III 2080 a.C.	4-Ocelotl	1-Tochtli	-19
961969	6 IX 2080 a.C.	1-Miquitzli	2-Acatl	-1
961985	22 IX 2080 a.C.	4-Ehecatl	2-Acatl	+15
1341325	27 IV 1040 a.C.	4-Ehecatl	1-Tochtli	-20
1341517	5 XII 1041	1-Ocelotl	2-Acatl	-2
1341702	9 V 1040 a.C.	4-Quiahuitl	2-Acatl	+10
1721042	14 XII 2 a.C.	4-Quiahuitl	1-Tochtli	-26
1721065	6 I 1 a.C.	1-Ehecatl	1-Tochtli	-3
1721432	7 I 1 A.D.	4-Atl	2-Acatl	+18
2100772	14 VIII 1039 A.D.	4-Atl	2-Acatl	-18
2100613	8 III 1039 A.D.	1-Itzcuintli	1-Tochtli	-3
2100980	9 III 1040 A.D.	4-Ollin	2-Acatl	+17
2480320	13 X 2078 A.D.	4-Ollin	2-Acatl	-19
2480161	10 X 2079 A.D.	1-Tecpatl	1-Tochtli	-4

Table 2 - Postnodal positions of the Sun. In bold are noted the dates of postnodal positions, escaping an eclipse window for the five eras of the “Aztec Calendar”. The next date marks the prenodal position of the Sun 1040 Xihuitl later, that is to say, the entrance in an eclipse window. The third date marks the date indexed on a number 1, the nearest to a Sun-Node conjunction at the time of the change of “Sun”.

End of the preceding cycle of 1040 Xihuitl	Prenodal passage of the Sun	Sun-Node conjunction	Postnodal passage of the Sun	Correction to fit the date into a 2-Acatl year
	13-Acatl Y. 1-Tochtli 6 VII 3120 a.C. 582056 Node -18	1-Tecpatl Y. 2-Acatl 6 VII 3119 a.C. 582421 Node 0	4-Ocelotl Y. 2-Acatl 22 VII 3119 a.C. 582437 Node +16	
4-Ocelotl Y. 1-Tochtli	13-Cipactli Y. 1-Tochtli	1-Miquitzli Y. 2-Acatl	4-Ehecatl Y. 2-Acatl	

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26 II 2080 a.C. 961777 Node -19	6 IX 2081 a.C. 961604 Node -19	6 IX 2080 a.C. 961969 Node -1	22 IX 2080 a.C. 961985 Node +15	
4-Ehecatl Y. 1-Tochtli 27 IV 1041 a.C. 1341325 Node -20	13-Atl Y. 1-Tochtli 6 IX 1042 a.C. 1341152 Node -20	1-Ocelotl Y. 2-Acatl 5 IX 1041 a.C. 1341517 Node -2	4-Itzcuintli Y. 2-Acatl 21 XI 1041 a.C. 1341533 Node #14	4-Quiahuitl Y. 2-Acatl 9 V 1040 a.C. 1341702 Node #10
4-Quiahuitl Y. 1-Tochtli 14 XII 2 a.C. 1721042 Node -26	13-Ollin Y. 13-Calli 6 I 2 a.C. 1720700 Node -21	1-Ehecatl Y. 1-Tochtli 6 I 1 a.C. 1721065 Node -3	4-Tecpatl Y. 1-Tochtli 22 I 1 a.C. 1721081 Node #13	4-Atl Y. 2-Acatl 7 I 1 A.D. 1721432 Node #18
4-Atl Y. 2-Acatl 14 VIII 1039 Y.D. 2100772 Node -18	13-Coatl Y. 13-Calli 8 III 1038 Y.D. 2100248 Node -22	1-Itzcuintli Y. 1-Tochtli 8 III 1039 Y.D. 2100613 Node -4	4-Miquitzli Y. 1-Tochtli 24 III 1039 Y.D. 2100629 Node #13	4-Ollin Y. 2-Acatl 9 III 1040 A.D. 2100980 Node +17
	7-Ozomatli Y. 1-Tochtli 20 VI 1870 2404234 Node -22			
4-Ollin Y. 2-Acatl 13 X 2078 Y.D. 2480320 Node -19	13-Acatl Y. 13-Calli 7 V 2077 Y.D. 2479796 Node -23	1-Tecpatl Y. 1-Tochtli 7 V 2078 Y.D. 2480162 Node -4	4-Ocelotl Y. 2-Acatl 23 V 2078 Y.D. 2480437 Node #12	

Table 3 - Correspondances of the Node and the dates found on the “Piedra del Sol” of Mexico-Tenochtitlan. The five eras of the Aztec system are in bold: the first time at the beginning of the era (last column), and the second time at the end of the era (first column); the four complementary small dates of the “Aztec Calendar Stone” are in bold italics.

Christian years	Xochicalco Passage of the Sun on the Node of Moon orbit	Dresden Codex Heliacal rise of Venus	Aztec Calendar Stone Sun-Node conjunctions and limits of eclipse windows
4366 a.C.	11-Ozomatli		
3119 a.C.	13-Tochtli	1-Ahau - 6.2.0	13-Acatl -18 1-Tecpatl 0 4-Ocelotl +16
2080 a.C.			4-Ehecatl +15
1872 a.C.	2-Coatl	1-Ahau	
1040 a.C.			4-Quiahuitl +10
625 a.C.	5-Calli	1-Ahau	
1 B.C.			4-Atl +18
623 A.D.	9-Ehecatl	1-Ahau 9.9.9.16.0	
727 A.D.		1-Ahau	
830 A.D.	11-Ozomatli	1-Ahau	
934 A.D.		1-Ahau	
1038 A.D.		1-Ahau	4-Ollin +17
1870 A.D.		1-Ahau	7-Ozomatli -22
2078 A.D.		1-Ahau	1-Tecpatl -4

Table 4 - Years attested in Xochicalco (passage of the Sun on the Node), in the Venus table of the Dresden Codex (heliacal rise indexed on a day 1-Ahau) and on the “Calendar Stone” (prenodal limits, passage of the Sun on the Node and postnodal limits). In italics, the reconstructed logical extensions; marked in grey, the congruences between the three systems. The table shows that the year 3119 a.C. is fundamental in the three systems and constitutes a common base. The date 623 A.D. is important for Xochicalco as well as for the Dresden Codex (end of the third cycle of the Olmec-Mayan system, and of the fourth of the Teotihuacan-Xochicalco convention). The date 1038 is important for the Dresden Codex and for the Tenochtitlan tradition: it marks the end of the fourth multiple of the detailed Venus table in the Dresden Codex and the start of the historical era of the Aztecs, the beginning of the fifth Sun.

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Notes

¹ I use the 584283 Caso equation and all the dates of the European calendar are expressed in the retroactive or proleptic calendar.

² The astronomy of Babylone and India also knows this simplified measure so useful for arithmetical calculation. In that tradition, the division of the tropical year in 360 parts does not indicate days but ‘Sauradina’. A unit of time which is slightly irregular because it represents the motion of the Sun on one degree of the ecliptic.

³ If, in conformity with the norms found in the table of eclipses of the Dresden Codex, I give the limits of eclipse at + and - 18 days, counting 35 days altogether, this is not because of some manipulation of the numbers, but only because it is known that in Mesoamerican arithmetics the limits are included. Here we count 18 days from the central day of the exact passage of the Sun on the Node, first one way and then the other, in such a way that the central day is counted twice. The result is $18+18 = 36$ (-1) = 35. In European terms, we would count a zero central day and 17 days on each side.

⁴ “The double calendar round, which happens also to be the permutation cycle of the Venusian calendar, restores an approximate balance. Indeed, 37960 days are only 5,29 days greater than 219 eclipse seasons. This recession of the eclipse season, in the double calendar round, proves nearly equal to the 5,20 days recession of the actual places of Venus in the formal pattern of the Venusian calendar” (Spinden 1930:49); “Since they knew the recession of Venus revolutions in the annual calendar, it is very probable that they also knew the recession of the nodes in the Tzolkin discussed on pages 90 and 91.

Both are of the same order of magnitude, the former being 5.2 days per pair of Calendar Rounds or per 104 years, while the latter is about 5.1 days for the same period. They recede in almost identical amounts, and we shall make use of this fact later” (Teeple 1930:96).

⁵ It seems to me that we are justified to consider the 5200 Tun of the Long Count as a formal idealized measure of 5200 ‘years’. In fact, in my opinion, it does not represent the Tun (360 days), but neither the Haab/Xihuitl (365 days) nor the tropical year (365,242198 days). It is the equivalent of 50 times 65 natural cycles of Venus (583,921296). In fact, 5200 Xihuitl of 365 days minus 260 days equal 1897740 days, and $1897740/65/50 = 583,92$, a quasi perfect measure of the cycle of Venus. 3250 true Venus synodic cycles make 1897744,2112 days. And this measure represents as well 279 ecliptic regressions of the Node of Moon orbit plus 52,99, which make 5195 tropical years plus 306,53 ($306,53 + 52,99 = 359,53$). As we see, the Sun-Venus-Node is almost perfect; nevertheless, with the Tonapohualli, the measure is a little worse. 1897744,2112 days equals 7299,0162 Tonapohualli, that is to say, 4,21 days too long. This means that during this period of 5200 Xihuitl, the node does not regress of 260 days as the Mexican astronomers probably accepted, but of 255,79 days. It seems they knew this more exact measure very well, as we see that if the previous group of 5200 Xihuitl ended with a day 13-Acatl, the present one had to collapse on a day 4-Ollin, four days before regressing to the original date. The measure of 5200 Tun accepted by Ludendorff would have been even shorter.

⁶ And thus, 260 days for 5200 Xihuitl ($50 \times 5,2 = 260$).

⁷ These dates do not appear in this form, but in the Dresden Codex we find a first date in 3119 a.C. (-6.2.0 days = 2200 days before the base date of the Long Count), a distance of 3×1248 Xihuitl (9.9.16.0.0) which leads us to the year 623 A.D. (9.9.9.16.0), and then the detailed table of 65 Venus cycles, and at last the fourth multiple of it, leading to the years 623 – 727 – 830 – 934 – 1038. Other prehispanic sources (Tenochtitlan, Xochicalco, Mixteca, ...) and the colonial documentation confirms this division of time in series of 65*, congruent with the dates of the Dresden Codex and documented dates of New Fire Ceremonies (such as 1038, 1142, 1246, 1350, 1445, 1558).

⁸ All these dates are modern reconstructions based on the Ahau equation now generally accepted for the Maya calendar. The dates 3119 a.C., 623 A.D., 727 A.D., 830 A.D., 934 A.D. and 1038 A.D. are well accepted (see for example Lounsbury 1978 and 1992). The four dates in italics are logical extensions from the other first three and other indications in the Venus table in the Dresden Codex.

⁹ The regression of the Xihuitl in the tropical year is of 906 days for 3744 Xihuitl, and we can take away twice a turn of 365 days to obtain the distance between the two

dates in the calendar, and where a given date 3744 Xihuitl was situated earlier in the tropical year ($365 + 365 + 176 = 906$ days).

¹⁰ Of these conferences, only the Oxford 2003 INSAP conference has been published; this short presentation in English can be consulted in Lebeuf 2005.

¹¹ All these dates are attested in Xochicalco: 11-Ozomatli (façade of the Temple of the Feathered Serpent); 13-Tochtli (stele 1 Saenz); 2-Coatl (on the erratic bloc associated with a clear representation of the New Fire and the year date 1-Tochtli); 5-Calli (façade of the Temple of the Feathered Serpent); 9-Ehecatl (general and principal decoration of the Temple of the Feathered Serpent).

¹² In the Dresden Codex as the result of $3 \times 780^*$ on 1-Ahau 18 Kayab 9.9.9.16.0 (623 A.D.), a date which corresponds as well to the start of the detailed table of 65 Venus cycles and its fourth multiple ($4 \times 65^*$), and in Xochicalco by the prominent role played by the date 9-Ehecatl to which the whole monument is dedicated, and which marks the day of solar node passage in 623 A.D.

¹³ In fact, this year 2-Acatl only starts on April 18th 1195.

¹⁴ This collection of references concerning the years 1-Tochtli/2-Acatl 1038/1039 was written by Ryszard Tomicki at my request during one of our discussions on the subject. It was previously published in Lebeuf 1995, 2003.

¹⁵ 416 Xihuitl after 9.9.9.16.0.

¹⁶ Chavero quotes Paso y Troncoso on this matter. Although Chavero is generally considered as little serious and reliable, it does not mean that we cannot find in his works very important information which does not appear in other authors. Besides, R. Noriega, another of the little appreciated authors, proposes as well a period of 1040 Xihuitl in his interpretation of the "Piedra del Sol" which, for the main part, refers to the eclipses; unfortunately, it is not possible to understand by which method he reached it, neither what it might serve according to him.

¹⁷ I think that if, traditionally, the Tonalpohualli starts with the day 1-Cipactli, it is precisely because it marks the day of the Sun's passage on the Node of Moon orbit at the beginning of the fifth Sun, the present historical era. The Tonalpohualli being a cycle closed on itself, the first day can be only conventional. The choice of the day 1-Cipactli for the start of the Tonalpohualli only refers to the epoch of the 4-Ollin Sun starting in 1038. Exactly as the first of the whole group of 5200 Xihuitl starting in 3120 a.C. bears the name of the day of Sun-Node conjunction when the Sun reached the postnodal position on a day 4-Ocelotl. We could logically deduce that the successive Suns would use conventional starts of the Tonalpohualli on the days 1-Tecpatl, 1-Miquiztli, 1-Calli, 1-Acatl and 1-Cipactli. Those successive "worlds" or "Suns" change the convention and the points of view. All the vision of the world changes of points of reference and of "patrons".

¹⁸ The dates which appear in these traditions can slightly differ from the true astronomical positions, because we have to consider 1) the eccentric movements of the

ecliptic orbits of planets, 2) the fact that the convention of the regression of the conjunctions Node-Venus counting 260 days for 5200 years differs from the astronomical reality, which is of 256 days only. But these differences should not exceed four days. It is true that the date 4-Quiahuatl presents grave problems because of its 8 days irregularity regarding the norm.

¹⁹ I refer here to the fact that Venus and the Node are congruent every 65^* . Because of this congruency, the Venus table in the Dresden Codex can be considered as a formal table for the calculation of the derivation of the Node of Moon orbit. This would well explain why in the Codex, the Venus table precedes the eclipse table.

²⁰ Further out of the limit of 10 degrees for the distance Sun-Node, solar eclipses are not visible under the tropics but only more to the North or to the South. "Limit eclipses", occurring near to 17 degrees of distance from the Node, are only visible in polar regions.

²¹ Logically, the present "world" was born under the sign 1-Tecpatl, which is exactly what Boturini claims in his very confused notes, as we will see further down.

²² The day 13-Acatl marks then the **last day** of the previous world (and at the same time the birth of the present one), and not the **year of birth** of the new Sun.

²³ *Historia de los Mexicanos* 1965:88. I do not want to enter here into the discussions about the durations of eras according to different sources or traditions, but it could be rather a count of 13 times 80 Xihuitl than of 13 times 52 Xihuitl. This produces as well a count of 1040 Xihuitl. A lapse of time of 80 year seems to appear as well for the Ceremonies of the New Fire.

²⁴ The real regression is of 256 days.

²⁵ Eliminated in 1038 under his historical form of Topiltzin (see Lebeuf 2000). I shall return to this question of the datation of the sacrifice of Topiltzin, the founding act of postclassical dynasties in Mesoamerica.

²⁶ Personal communication.

²⁷ I mentioned in Lebeuf 2003 that the abstract god seems directly associated to the phenomenon of eclipses, precisely because his action is omnipotent although he remains invisible (the Node is the throne of the eclipse agent who can destroy even the two main luminaries).

²⁸ This cycle of 1040 Xihuitl was known by Paso y Troncoso who divided it into 4 periods of 260 years. Chavero also insists in the importance of that cycle but without telling anything of its possible origin.

²⁹ We can notice that this date is separated by 1248 Xihuitl of the same operation in 623/830 A.D. in the equation of Xochicalco ($623/830 + 1248 = 1870/2078$).

³⁰ We find here once more the four days of difference accumulated during 5 millennia by the use of a rounded formal calculation of 260 days of regression in 5200 Xihuitl.

³¹ See further down.

³² In 1194, two Moon eclipses were visible in Tenochtitlan: the 13 V 1194 and the 6 XI 1194.

³³ The eclipse occurred according to modern astronomical tables, but it was of such a small magnitude that it was

not observable.

³⁴ The observation of eclipses of the Sun as well as of the Moon permits to precise the exact moments of conjunctions and oppositions, and to extrapolate at the short run the moments of the next oppositions and conjunctions. Since the observations of 1194, it was evident that the conjunction of 1195 would occur during the night in Mexico and thus would not be observable.

³⁵ This year 1-Tochtli goes from 18 IV 1194 to 17 IV 1195.

³⁶ *Leyenda de los Soles* 1975:121. This reference to Topiltzin associated with the sacrifice of Nanahuatl and the birth of the new Sun 4-Ollin enables us to situate the sacrifice of Topiltzin Quetzalcoatl in 7-Acatl, day of Venus inferior conjunction in 1038.

³⁷ In a first redaction of this text I had interpreted this date of 1-Quiahuitl as 2-Quiahuitl, taking in account a decorative “Chalchihuitl” point touching the sign Quiahuitl as a second unit. This could have marked a 260 days regression starting from 1-Tecpatl. But the observations of my colleagues and friends E. Siarkiewicz, R. Tomicki and J. Mora led me to look for another solution based on the real date 1-Quiahuitl. I feel especially indebted to Jesús Mora who presented me a decisive document in which that date figures in an indisputable context of the feasts of the ends of ‘cycles’, a year bundle with the dates 1-Tecpatl, 1-Miquiztli y 1-Quiahuitl, without any possibility of confusion or double interpretation.

³⁸ The Sun on the Node on a day 9-Ehecatl in 523 A.D. marks the beginning of the fourth cycle of 1248 Xihuítl.

³⁹ An information of the same kind is offered by the regular sequences in Xochicalco: 11-Ozomatl + 455457 days = 13-Tochtli + 455457 days = 2-Coatl + 455458 days = 5-Calli + 455459 days = 9-Ehecatl. From the date 5-Calli, we observe a small progressive correction (1 day more in 5-Calli, and two days in 9-Ehecatl) which derives from the canonical length to fit the observed reality. On the other hand, if the fifth Sun of the anterior “world” of 5200 Xihuítl died with the entrance of the day 4-Ollin in an eclipse window, the end of the present one should finish only on 4-Ollin entering an eclipse window. We meet here again with a correction of the four days of difference between the model and the reality, accumulated in 5200 Xihuítl.

⁴⁰ This motive, called Xihuítl or Chalchihuitl, turquoise or precious stone, makes reference to the time and has been taken in account by several authors. Graulich writes: “Each quincunx represents probably a year, because the turquoise glyph can also be read ‘year’ (Seler 1902-1923:I:191). In the *Codex Borbonicus*, similar glyphs represent braziers, and the priests and the time of the New Fire Ceremony celebrated every 52 years” (Graulich 1997:162). Graulich remarks the homophony with the word “year”, and the association with the Fire and the New Fire in particular, but I think the similar decorations on the “Calendar Stone” represent cycles of 104 years “Huehuétlitzli”, and not cycles of 52 years

“Toxiuhmolpilli”. This would confirm an observation of Taube: “We see on the Bilimek vase two bundles of wood, xiuhmolpilli, coming out of the mouths of the pair of Xiuhcoatl serpents (see Figure9^a). One bundle is clearly marked with the quincunx of turquoise, xihuítl, identifying it as a xiuhmolpilli or bundle of years.” (Taube 1997:134). I would like to remark that only one quincunx is associated to two bundles of 52 years, which makes 104 years as I propose for those on the “Aztec Calendar Stone”.

⁴¹ S. Milbrath (1997:191) also feels uncertain with the identification of a representation in the Codex Borgia: “The Codex Borgia depicts a red and gold Sun disk flanked by bands of water and golden feathers (fire?)”. In addition, the traditional translation of Quetzalcoatl by Feathered Serpent could be abusive or at least too reductive. It could as well be translated as Precious Serpent or Precious Twin. Michel Graulich (1997:172) calls them “Serpent of turquoise or serpent of the year”.

⁴² Alfredo López Austin, personal communication 2001.

⁴³ Or almost 5200 if we consider that this period may start just after the solstice and end with December 25th of the 5199th year.

⁴⁴ In fact this year 2-Acatl goes from February 2nd 1 a.C. until January 31st 1 A.D.

⁴⁵ It is true that authors who were not interested in the Mexican cosmology present the same duration we find in the revelations and visions of Sister Marie Joseph de Agreda: Maria gave birth to the Son of God at midnight, on a Sunday, in the year of the Creation taught by the Church, 5199 (Agreda 1717:107). It is indeed a very curious coincidence that the same year (-1) coincides with a year of New Fire starting also the fourth Sun of the Aztec system. Such coincidences can only lead astray, or at least take us out of the present discussion.

⁴⁶ Navarrete and Heyden 1974:355-376.

⁴⁷ It is possible that the reliefs on the Rocks in Acalpixcan reflect as well the start of the fifth Sun accompanied with eclipse signs: “The site of Acalpixcan is isolated near to the peak and the other reliefs are only lower on the slope of the mountain. These four relief figures are marked on rather large surfaces of the rock and, not distant from each other, they form a series or at least are related (...) the next figure is 1-Cipactli, the third the sign of Quetzalcoatl, the fourth a feline quadruped, probably a jaguar, the fifth a large butterfly” (Beyer 1965a:111).

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