

## PREHISTORIC ORB OF THE WORLD AND LUNISOLAR CALENDAR FROM NAYEVA BRICKYARD NEAR PANČEVO

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**Abstract.** In this paper one deals with and proves by, analysing the symbolic and numerical values the calendar, as a reflexion of a specific cosmogonic and cosmologic constitution of the world, expressed through the mathematical language. The space and time are immanent to the deities of the Sun and the Moon, harmonized in the rhythm which indicates the eternity through cycles. This calendar archeologically dating from the Bronze Age (about 1700 B.C.) originates from the area of Belgrade (Serbia).

The National Museum in Belgrade bought off in 1931 a collection of Bronze-Age objects from Nayeve Brickyard near Pančevo, among them the one which is the subject of our treatise.[1] Rated as a settlement find they were located within the cultural-chronological frame of the Pančevo-Omoljica stage of the Vatin culture group of the Middle-Bronze-Age of the Panonic Basin, which, expressed by absolute dates, is placed in the period around 1700-1500 B. C.[2]

The orb of the world considered here is a full, flat, object, in the shape of a regular circle, with rounded-off rims, 11 cm in diameter, (deviating by 0.2 cm at one place), 0.6-1.4 cm thick.[3] Its two faces are moulded, the front one has a lens shape, the rear one being flat. It is made of finely cleaned earth with mica admixtures, gray-baked, polished, then plastered with a lazur wash of ocher and ocher-orange colour, by which the ornamental messages are complemented. It is ornamented on both sides by the technique of guttering, impressing, puncturing and perforation. How it has been kept, on a supporter, hanged or laid on its rear side, remains uncertain (Fig. 1,2).

The rear side of this orb of the world is put in vertical position by a dark-gray baked triangle, with its vertex turned upward - north (Fig. 1). Accordingly, in conformity with the logic of the natural analogies, the central symbolic presentation on the front side occupies the same position.

On the rear side, in following the object's rim, we see 45 perforations - holes. Inside this circle a cultic picture of the Sun in the form of a heliogram is realized by symbols in two-dimensional presentation. The octogonal emblem, formed by eight garlands, provides a spatial presentation, oriented according to cardinal points, axes and semi-axes of the world. On the outer octogram's side, featured at the cardinal points, are the shoots by twos, touching mutually at the cardinal points, with two circles pointed in their middle on the semi-axes, approaching athetically the returnable springs. Numerically, there are on the octogram  $4 \times 2 = 8$  spirals,  $4 \times 2 = 8$  garlands and  $4 \times 2$  circlets, with points. The spirals and the garlands on the NW axis are indicated with three short gutters in opposite directions; first toward north then toward south.

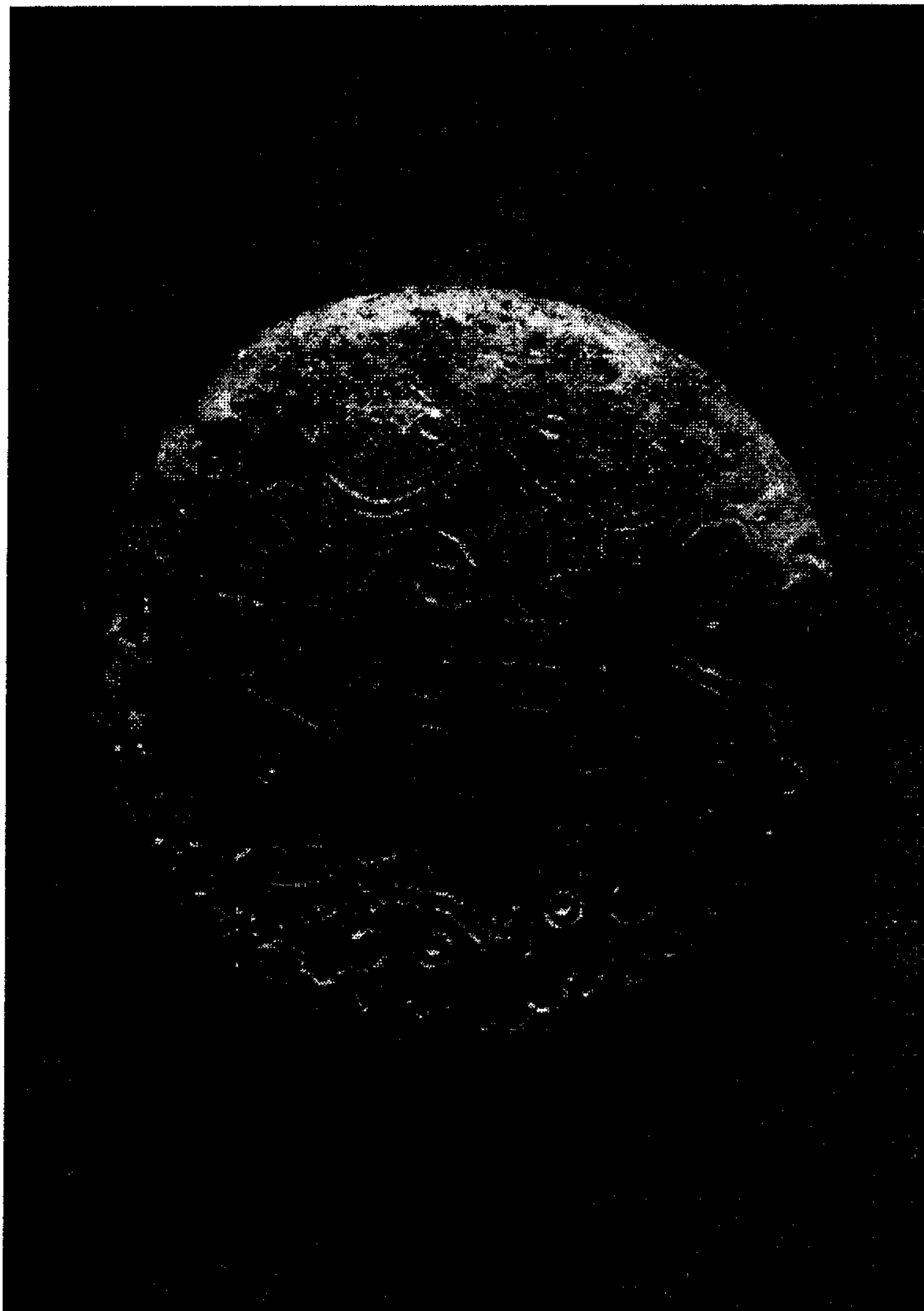


Fig. 1. Rear side of the orb of the world-calendar from Nayeva Brickyard.

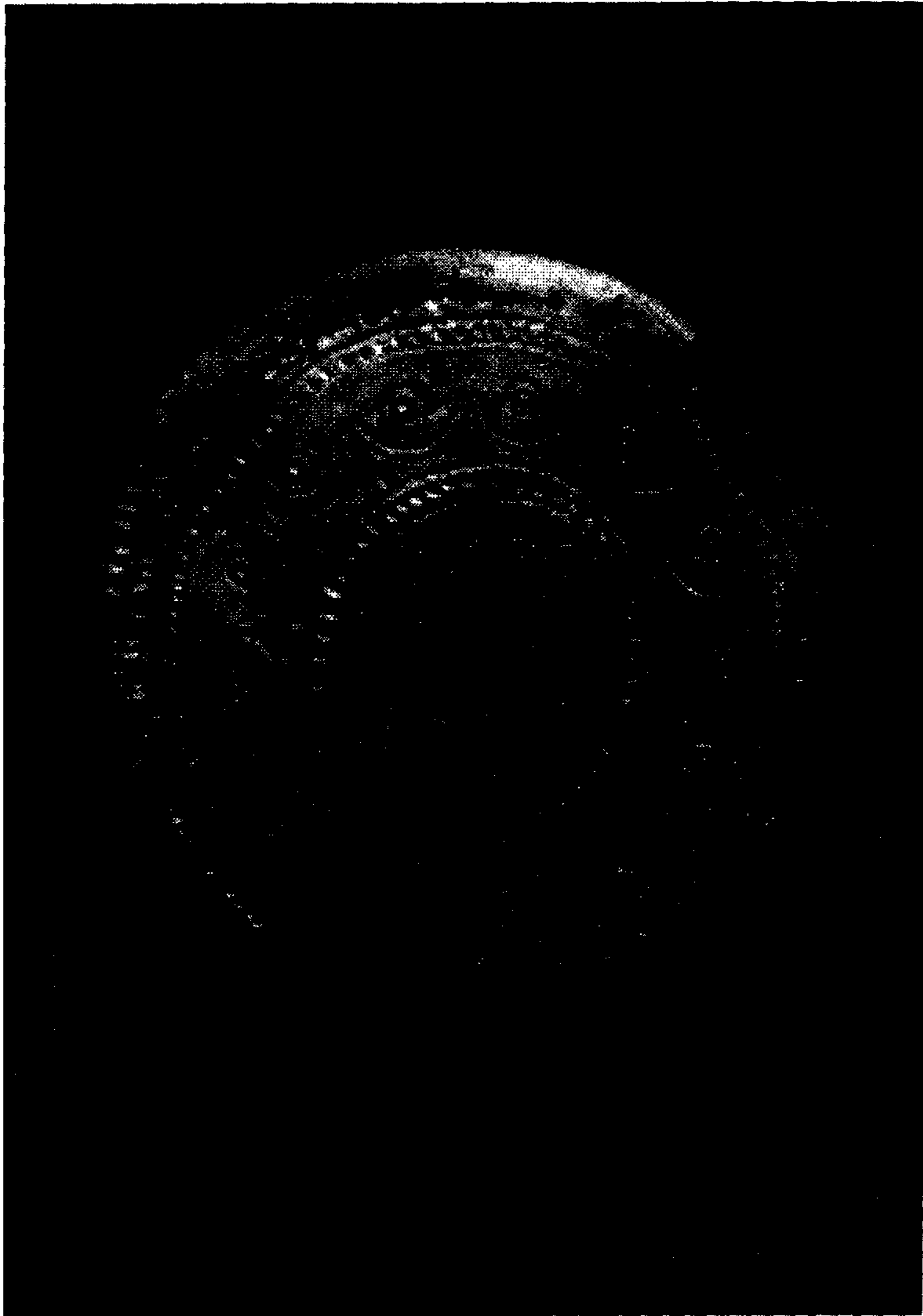


Fig. 2. Front side of the orb of the world-calendar from Nayeva Brickyard.



Inside the octogram, occupying the central position, a tetragram is featured which by the structure of the picture, points out the significance of the orientation realized. Along the middle of the axis of symmetry N-S, a band is situated with four triangles, angles or eight zigzag elements, which to the north and south is roofed by two curls of the facing spirals, turned one toward the other. The curls of the tetragram are in contact with the octogram through two and three shorter grooves along the axis of symmetry, directed toward NW-SE.

The heliogram on the rear side is executed by means of black baked triangle - circle segment, whose basic side (5.5 cm) is the radius of the orb of the world, measuring a sixth of the circle.

The analysis of the heliogram's orientation furnished the values which without any exception are on the axes, while being tiny on the semi-axes ( $1^\circ - 2^\circ$  and  $7^\circ$ ).

The solar symbolics of the exact homologies in nature, presented through the two-dimensional symbolic language, expounds on the heliogram the diurnal and annual apparent path of the Sun by which are determined the world's expanses, days and nights, the time and the times.[4]

The front side of the orb of the world is organized concentrically too (Fig. 2). Around the central field mutually alternating are three belts and two bands, separated by the circular grooves. In the middle of the orb of the world's face is the ellipsoidal field - the Solar disk, with vertically presented symbol of a bird of prey in hovering position, with semi-expanded arms and legs. This harmonic drawing is composed of three zigzag elements, filled with 21 punctures, which also form an angular picture in which the top point is the terminal of the left and the right row. The bird's picture is bordered by a continuous row of 16 concentric circles, followed from the inner side by a chain of 16 garlands. The described emblem is surrounded by the first belt, inside which runs a seventeen piqued zigzag line or 17 angles-triangles, whereby the 4 angles on the NW axis are marked alternately by 6 points so that the first belt might be expressed also as  $13 + 4 = 17$  angular elements and 6 points. There follows the first band with 50 pricks. The next, second belt, contains 13 concentric circles with points in their middle and 13 double garlands on the lower side which is a segmented string and a certain rhythm follows the concentric circles. The concentric circle on the NE axis is indicated by a separate circular groove and the one next to it toward north by a grooved semicircle. The three joints of the garlands around this semi-axis are also indicated each by an incision while the area described around the NE axis is marked by the ochre-orange coat. This belt is bordered by a second band with 116 unevenly distributed pricks. The inner groove of the band is between S and SE sides open, passing by. The third belt, surrounding all, has 45 perforations of which 17 are holes. On the right of NW-SE line there is an interspace filled with 37 pricks, arranged in a numerical rhythm which may be expressed as:  $0 - 3 - 0 - 1 - 0 - 4 - 0 - 1 - 0 - 2 - 0 - 2 - 0 - 3 - 0 - 3 - 0 - 2 - 0 - 3 - 0 - 2 - 0 - 3 - 0 - 3 - 0 - 2 - 0 - 2 - 0 - 1 - 0$  and  $3 + 3 = 6$  shorter incisions on the NE axis. Accordingly there are in the third belt:  $28 + 17 = 45$  perforations and 37 pricks in 16 interspaces, plus 6 shorter incisions.

The world orb's face is also spatially defined: N-S by the position of the bird, which is the Sun's symbol on the disk; NE by the concentric circle with a point in its middle (the point of the summer solstice), is indicated by the special grooving



whereby is emphasized the epiphanic value of this position of the Sun-Deity in its annual path.[5] The joints of the garlands specify the axes of the world with minor deviations, while the concentric circles with the points determine the semi-axes, also with minor deviations except for the SW axis, which is understandable, having regard to the thirteen markings.

Once the northern returning point of the Sun and the one next to it are known having regard to the Sun's direct motion, the months and the seasons are logically determined in their natural sequence. The arrhythmia of the arcs of concentric circles and garlands for half of the arc (the second belt) expresses the dynamics of the days of every month from one new moon to the next, with the corresponding intermediate lunar phases.

The motions of the Sun and the Moon having been brought into harmony by the language of pictorial symbols and numerical values of sacral nature, the orb of the world is to be considered as a calendar.[6] The peoples of the ancient East and Greece begin the month with the new moon, after the sunset, which means that their day also begins in the evening and the shabbatum - full moon, falls 14-15 days thereafter. The New year holiday, by which the new solar cycle begins by overpowering the Chaos, proceeds in cosmogonic details of the recurrent acts of the god Marduk, during the first 11 days of the month Nisan, on which occasion 50 godly names were pronounced.[7]

Through the symbolic and numerical determinateness of the frontside of the orb of the world, the described segments are the bearers of the calendargraphic values.

The solar disk, with the mythical symbolic bird in the centre, marks the position of the Sun-Deity in its victorious glory which it attains on the celestial vault at the time of the summer solstice. The corona - ôrô - the horo wheel dance around the symbolic bird, incorporates into one wreath the Sun's position in space and time, occupied by it in the course of a year, with egress gates, in the continuity of the process of time. The belt of the seventeen-year solar rays, as corona anni, harmonizes the days of travelling of the Sun and the Moon in the sense of an apocatastasis.[8] The second belt with 13 positions of the luni-solar calendar expresses, by the position of the concentric circles and garlands, the beginning and ends of the months and seasons, the rhythm of days in every month as well as the term of the intercalation of the 13th month, its position and duration. The first and the second band, the one with 50 and the second with 116 points, are numerical substitutes of the Divinely; 50 being of the cosmogenic and 116 of harmonic values. The third, last belt, which by its probably coloured filament and knots allowed the marking, following and calculation of the calendar values, indicates the days of one of the Moon's orbital periods, of straightening and harmonization.

The solar tropical year has about 365 and 1/4 days (365 days 6 hours 9 minutes and 9 seconds), being in this calendar something understandable by itself. The Moon, the measurer of weeks and months (*Μην*, *Μηνόσ*) for its synodic orbital period takes about 29 and 1/2 days (about 29 days 12 hours 44 minutes and 3 seconds) and for its sidereal period about 27 days and 1/3 days (27 days 7 hours 43 minutes and 11 seconds), makes different number of days with respect to the solar year.[9] For this reason the luni-solar calendar ought to bring into accord, without remainder, the months with the lunar phases and to keep pace with the solar year so as to have the

holydays and secular needs fall in the same time in the course of year in conformity with the natural phenomena. The calendar (calendarium, nl), the method of time reckoning on the basis of a defined beginning and the length of defined time period, is known with the ancient Egyptians before 2773 B.C. [10]

To the question of how 17 years has been arrived at which in this calendar are harmonizing ones, and not at 19, as its known through Meton one perhaps might answer by the folloing calculus:[11]

The length of the solar year is about 365 days

$$365 \text{ d} : 12 \text{ m} = \text{about } 30.4 \text{ d}$$

$$365 \text{ d} : 13 \text{ m} = \text{about } 28.0 \text{ d}$$

$$365 \text{ d} : 12.5 \text{ m} = \text{about } 29.2 \text{ d}$$

The length of the sidereal month (astronomical) is about 27 days

$$27 \text{ d} \times 12 \text{ m} = 324 \text{ d}; \text{ missing up to } 365 \text{ are } 41 \text{ d}$$

$$27 \text{ d} \times 13 \text{ m} = 351 \text{ d}; \text{ missing up to } 365 \text{ are } 14 \text{ d}$$

$$27 \text{ d} \times 12.5 \text{ m} = 337.5 \text{ d}; \text{ missing up to } 365 \text{ are } 27.5 \text{ d}$$

The length of the synodic month is about 29 days

$$29 \text{ d} \times 12 \text{ m} = 348 \text{ d}; \text{ missing up to } 365 \text{ are } 17 \text{ d}$$

$$29 \text{ d} \times 13 \text{ m} = 377 \text{ d}; \text{ exceeds } 365 \text{ by } 12 \text{ d}$$

$$29 \text{ d} \times 12.5 \text{ m} = 362.5 \text{ d}; \text{ missing up to } 365 \text{ are } 2.5 \text{ d}$$

The length of the sidereal month (in the calendar) is about 28 days

$$28 \text{ d} \times 12 \text{ m} = 336 \text{ d}; \text{ missing up to } 365 \text{ are } 29 \text{ d}$$

$$28 \text{ d} \times 13 \text{ m} = 364 \text{ d}; \text{ missing up to } 365 \text{ is } 1 \text{ d}$$

$$28 \text{ d} \times 12.5 \text{ m} = 350 \text{ d}; \text{ missing up to } 365 \text{ are } 15 \text{ d}$$

In the above survey one is to take notice of the numbers 28 and 29 as well as of the numbers 17 and 12 present in the solar and lunar annual days. In addition to what has already been said, if from annual days of a synodic month - 348 days - are subtracted the annual days of the sidereal month (28 days in the calendar) - 336 days - one obtains the number 12 ( $348 - 336 = 12$ ). The same number is arrived at also by subtracting the difference missing up to the solar year of the same factors:  $29 \text{ d} - 17 \text{ d} = 12 \text{ d}$ .

Since according to our calendar described here there are 28 holes we proceeded from the fact that the sidereal month of 28 days has been equalled with the synodic month of 29 days, which is missing 17 days up to solar year (28 + 17 holes in the 3rd belt).

In dividing the number 50 by 4 phases one gets the number 12.5, which is a hidden number of months in the respective lunar orbital period (the first band). On dividing the number 116 by 4 phases one gets the number 29, which is also a hidden number



of days of the respective lunar orbital period (the second band). The number 29 multiplied by 12.5 months, yields 362.5 days, missing up to 365 are 2.5 days.

The year of 13 months, so many are in our calendar (second belt), involves 17 harmonizing years (first belt), the number 17 being composed of as  $13 + 4 = 17$ .

The solar year of 365 days  $\times 17$  years = 6205 days +4 leap days (in 17 years are 4 leap years) making up 6209 days.

The lunar sidereal year of 364 days  $\times 17$  years = 6188 days. To this number one is to add 1 day for each 17 years (missing up to 365 days) +4 leap days, which yield 21 additional days;  $6188 + 21 = 6209$  days, the same as with the 17 years of the solar cycle. The cycles just referred to are linked to the number 17 in other way too: if from the solar days comprised in 17 years without the leap days, 6205, are subtracted the days of the sidereal month in 17 years, also without the straightening, one obtains the number 17;  $6205 \text{ days} - 6188 = 17 \text{ days}$ .

One must point out yet another connection between the two celestial bodies, the connection relating to the 21 straightening days, how many days there are implied by the Sun's disk - the bird:  $17 + 4 = 21$ . On the other hand on the seventeen day - corona of the Sun four cogs - triangles are marked, we think, as the leap years (the first belt).

The lunar synodic year of 362.5 days multiplied by 17 years yields 6162.5 days. If to 6162.5 days are added 25.5 straightening days, one gets 6188 days, which is the same as with the lunar sidereal year. There by the straightening by 25.5 days is the one pertaining to the sidereal lunar year; 364 days minus 362.5 days yields 1.5 days. By multiplying 1.5 days of the difference by 17 years one obtains 25.5 days, whereby both lunar orbital periods in 17 years are straightened, coming out to 6188 days. Adding to the number 6188 days 21 straightening days in seventeen years - Sun's traveling, one obtains the harmonizing number of 6209 days.

When now the number 6209, arrived at in the way indicated, is theosophically reduced and totalled in the following fashion:  $6209 = 6 + 2 + 0 + 9 = 8 + 9 = 17$ , one obtains the number to which is ascribed the significance of keeper of balance of all that is created, of a harmoniser of spheres and a factor in the alphabet etc. In our calendar this number belongs to the Sun and it is by that number that the Moon's motion is, in the way indicated, brought in harmony.

The calculus laid out above, in which the remainder of hour, minutes and ... are overlooked, certainly leads with time to discordance with the course of the nature. The nuancing, present in the calendar, is an attempt to indicate, by a crude calculation of the omitted hours, that such a calculation existed; the straightening method evidently present in the third belt (in the form of a certain arrangement of the points and holes) must be identified with understanding, provided the knowledge of another science is available.

The sidereal month lasts about 27 and  $1/3$  days. The annual sidereal cycle produces a difference to the solar year of 365 days, of 37 days (the number of points in the third belt between 17 holes). On multiplying 27 days by 12 months one obtains 324 days;  $1/3$  of a day falls in one month; in three months one obtains 1 day, in 12 month 4 days. By summing  $324 + 4$  one gets 328 days, i.e. more accurate length of the sidereal orbital period of the Moon in a year. By subtracting from 365 solar days 328, one



obtains a deficit of 37 days which are to be compensated for this lunar orbital period.

The synodic month lasts about 29 and 1/2 days. By multiplying 29 days by 12 months one gets 348 days; 1/2 day falls in one month; 1 day falls in 2 months, making up in 12 months 6 days. On adding 6 days to 365 days one gets 354 days. There are missing 11 days up to solar year of 365 days; the 6 calculated missing days are indicated by 6 short lines close to 37 points in the third belt of this calendar.

The mutual ratios of the sidereal and the synodic months in a year yield the number of 26 days ( $354 \text{ days} - 328 = 26 \text{ days}$ ), which might be the length of the intercalated 13th month in our calendar. If one approaches the problem of the ratio of the sidereal and synodic months in one solar year also in the following way, one arrives at the same number; if the missing days up to the solar year of the shorter and the longer lunar annual orbital period, are subtracted one from the other and straightened, one obtains  $37 - 11 = 26 \text{ days}$ .

The same problem might be approached by calculating the differences also in the following way: the synodic month lasts about 29 days and 12 hours; the sidereal month lasts about 27 days and 7 hours; as the difference amounts to 2 days and about 1/5 days, we have:  $2 \times 12 = 24 \text{ days}$ ;  $1/5 \times 12 = 2 \text{ and } 1/2 \text{ days}$ . On adding 2 and 1/2 days to 24 one gets 26 and 1/2 days, which might be the length of the harmonizing 13th month.

If the difference were about 2 and 1/3 days, one would obtain the length of the harmonizing month as 28 days ( $2 \text{ days} \times 12 = 24 \text{ days}$ ; 1/3 days in a month yields 4 days in 12 months, therefore  $24 \text{ days} + 4 \text{ days} = 28 \text{ days}$ ). The foregoing presentation leads to the number of days of the intercalated 13th month, 26 or 28 days. With regard to the presence 28 of holes in the third harmonizing belt, which are related also to the number of the calculated, rounded off days of the sidereal month, this might possibly be the adduced number of 28 days.

The attempt to arrive at the number 116 could not be performed consequently; perhaps it has only been approached. By multiplying 1/2 day (the remainder of the synodic month) by 13 months one gets 6 and 1/2 days; by multiplying 6 and 1/2 days by 17 years one obtains 110 and 1/2 days. In a free imaginary combination one perhaps might into this number (which hid the days of synodic month) put in 5 and 1/4 days, the amount which is to be added to the solar year in 17 years. This would then make up about 116 harmonizing days.

The correction of the solar year for the not calculated about 1/4 day (about 365 days and 6 hours) is performed and indicated by 6 points in the wreath symbolizing 17 years. Possible, although not completely coinciding, is the following calculation: to a year there belongs 1/4 day; in 17 years this becomes 4 and 1/4 days. Since there are 4 leap years in 17 years, one day more should be added, which taken together makes up 5 and 1/4 days, i.e. about 6 days.

Interesting is yet another calculation: by multiplying 37 missing days of the sidereal month in a solar year by 17 years, the number 629 is obtained, which by its structure is the same as the harmonizing number 6209 which theosophically reduces to the number 17.

Thereby it is kept in mind that the number carries in itself the Sacrum, accordingly, through the cognition and theosophical expression it is brought into harmony with



the macrocosmos[12]. In this way the Sun's symbol (the bird) is composed of three elements, each one of them constituting the theosophical value:

$$\begin{array}{c} 1 \\ / \quad \backslash \\ 3 \quad - \quad 3 \end{array} ; \begin{array}{c} 1 \\ / \quad \backslash \\ 2 \quad - \quad 2 \end{array} ; \begin{array}{c} 1 \\ / \quad \backslash \\ 4 \quad - \quad 4 \end{array} = 7 + 5 + 9 = 21; 21 = 2 + 1; 2 + 1 = 3.[13]$$

The number of corona,  $16 = 1 + 6 = 7$ , seven is decomposed into  $3 + 4$ . [14]

The number 17, corona anni, is composed of two last digits in the row,  $8 + 9 = 17$ , 17 being the harmonizer of the spheres in the summation:  $1 + 7 = 8$ ;  $8 = 4 + 4$ . [15]

The number 50, being bound to the cosmogenic act, wherewith it is also esoteric, by its amount and configuration, expresses the Sanctity; the rectangle triangle with sides 3, 4, 5, yields by summation:  $3 + 4 = 7$  days;  $3 + 4 + 5 = 12$  months and by squaring all three we obtain the number 50 ( $9 + 16 + 25 = 50$  and  $50 = 5$  or  $2 + 3$ ). [16]

The number 13 reduced yields the number 4 ( $1 + 3 = 4$ ) and the number 116 by the same procedure yields the same ( $1 + 1 + 6 = 8$  and  $8 = 4 + 4$ ). [17]

By presenting the theosophic principles discernible in the numbers of the calendar, through which the cosmogenic and cosmological truths, are expressed we point to its origin and that is the spiritual area of the civilisations of Mesopotamia at the time of king Hammurabi's reign (about 1792 - 1750 B.C.). [18]

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### Footnotes

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