ELECTRYONE

ΗΛΕΚΤΡΥΩΝΗ

ISSN 2241-4061

THE KEROS "DOVE VASE" IS AN EIGHT-YEAR LUNISOLAR CALENDAR

Alexios Pliakos*

pliakosalexios@gmail.com

Abstract: It is widely accepted that all civilizations have used a calendar. To the question: "Did the Aegean, the Minoan and the Mycenean Civilization use a calendar?" the answer is yes. So, have any of those calendars survived and been examined scientifically, and, if so, what kind of calendars are they?" Presumably, most calendars were created on perishable material and thus did not survive. But there are also imperishable materials such as ceramics and stone which were used for the recording of the passage of time. Surviving Megalithic constructions such as Avebury, Newgrange, Stonehenge and others may have functioned partly as calendars. In this paper, after a short discussion on the different types of calendars used in prehistoric times, a unique Aegean lunisolar calendar carved on a block of Aegean marble (dated 2750-2300 BCE) is examined and decoded. This unusual artifact was found in 1964 on the Aegean Island of Keros by the archaeologist Chr. Dumas (1968), who named it "The Dove Vase". This unusual artifact was found in 1964 on the Aegean Island of Keros by the archaeologist Chr. Dumas (1968), who named it

Keywords: Minoan Practical Astronomy, Lunar Calendar, Lunisolar calendar, Minoan one-year Solar Calendar, Minoan four-year calendar, Keros, Dhaskalio.

1. Introduction

The evolution of calendars throughout the ages is of the greatest interest. The stages of this evolution are from the use of a lunar calendar to that of a lunisolar calendar, and then to a one-year solar calendar; there also exists a four-year Minoan solar calendar of about 1550 BC. This uses the same correction as our present-day calendar by the introduction of one day every four years.

a) **The lunar calendar** [1] is based on the counting of 30 and 29 days alternately, i.e., the duration of a lunar month. It is generally agreed that this is the first calendar [1] used, the lunar one. It was used by hunters and gatherers from about 29,000 – 26,000 BCE to 8000/6000 BCE, that is, up to the time when man began to practice agriculture.

b) **The 8-year lunisolar calendar** [2]; in this calendar, months are counted as above, but years are counted based on the time taken for the earth to orbit once the sun; that is, the moon was brought into line with the course of the sun (every 8 solar years), which regulates the seasons. Those calendars were used by farmers etc. from about 8000-6000 to about 2750 BCE. According to my theory the oldest known lunisolar calendar was found in one piece on the Cycladic Island of Keros (2750-2300 BCE). **The decoding of this artifact is the subject of this paper**.

c) **A one-year solar calendar** was used in Egypt from 2750 BCE[3].

d) **The particles of a wooden (?) dissolved artifact** was discovered[4] by Lord Evans at the Palace of Knossos on 1st May 1901. Artist Papadakis reconstructed it nearly. Evans dated it to 1550 BCE and named it "The Royal Game of Knossos" but he did not decode it as a

*pliakosalexios@gmail.com. I am grateful to the President of the Hellenic Academy, Professor A. Kounadis (2017); Professors S. Papamarinopoulos and X. Moussas who encouraged me to insist on my 73 times proven decoding of the Minoan flat kernoi (2300-1100 BC) and this dove vase as calendars.

[1] Nilsson. 1920: 364.

[2] Britannica Ult.Ed. 2011: Lunar, Lunisolar calendar.

[3] Chatley. 1943: 121.

[4] Evans. 1930: vol. III: 387.

calendar but as a game. In the reconstructed artifact the additional 366th day every four years

can be counted as in our present-day 4-year solar calendar which was introduced in the West by Julius Caesar in 46 BC. Minoans proceeded to our 4-year calendars by 1500 years! The decoding was carried out by the present author [5]. There is a fake copy of this Minoan artifact made by E. Gillieron & Son, which was sold to the Metropolitan Museum of New York in 1917; it is numbered 17231 in the collection, but no-one has produced an explanation for this artifact yet. The present author's short decoding of this Minoan artifact is available free on Google under the heading: "The Royal Game of Knossos", 29.3.2018.

1.1. Photograph of the Dove Vase

Part of the explanation of the "Dove Vase" is on Fig. 1. For the detailed decoding, see below.

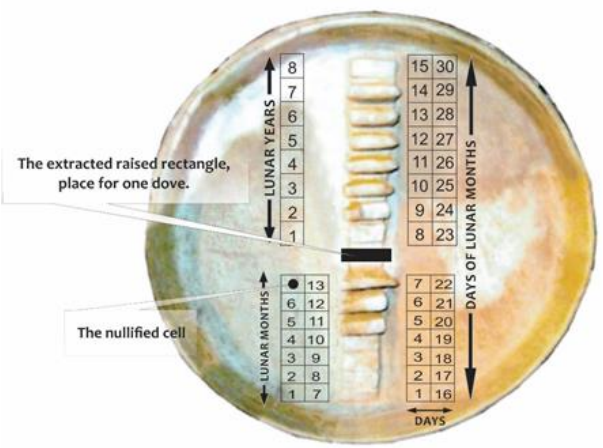


Fig. 1. The Keros Dove Vase made of marble. The eight doves in the upper section are facing left and the seven below facing right, why? mind the extracted raised rectangle place for a dove and the nullified cell in counting lunar months, see below for the explanation. The artifact is in the Cycladic Museum,1st floor, in Athens. The photo was taken by the author.

1.2. Lunisolar calendars

The invention of the lunisolar calendar was a milestone in the evolution of calendars, and it is clearly connected with man's early attempts at cultivation. During this period, the less-evolved tribes, who were still hunters and gatherers, continued to use the lunar

calendar, which was geared to religious needs; probably on the lunar calendar certain days were marked as
feasts and sacrifices to the gods, and these celebrations took place for hunters to gain divine support in their pursuit of ferocious and aggressive animals. The old lunar calendar bore no relationship to the agricultural needs of the new farming tribes, who had, first and foremost, to produce sustenance for the tribe. It is the sun that governs the evolution of plants and animals.

Therefore, there was an urgent need for the priests and the tribes to develop a solar calendar, but without rejecting the lunar calendar because of its religious significance. The religious significance of the calendar is evident from the fact that every new Pharaoh in Egypt was put on oath 'not to change the current calendar.'

[5] Pliakos. 2015: *EIRENE*, vol. I - II: 234, Fig.5, and on GOOGLE 'The royal game of Knossos'.

Certain priests, to synchronize the two calendars lunar and solar, observed the motions of the sun and the moon; they end up with the so-called 8-year lunisolar calendar in which 99 lunar months are counted to a total of 2920.5 days (= 99 lunar months multiply by 29.5 days each). Thus, the lunar religious calendar remained intact. But the above duration is equivalent to 8 solar years counted to a total of 2920 days (= 8 solar years multiply by 365 days each). This arrangement synchronized the counting of lunar months (for religious needs) with the passage of the seasons that 'govern' agriculture and thus the need of the tribe to feed its members.

1.3. Keros-Dhaskalio is an uninhabited island today, in the Cyclades, Greece/Hellas

Keros was connected through a promontory of 80 m. long, to a nearby islet Dhaskalio, (see Fig. 2), in the Early Bronze Age (EBA); it was in use from ca. 2750 BCE to 2300 BCE. In the EBA the site was the world's earliest maritime sanctuary.

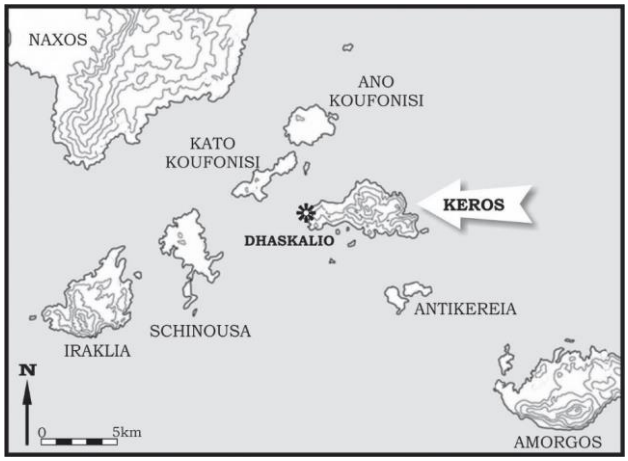


Fig. 2. Keros and Dhaskalio are at the center of the map. Dhaskalio is a small islet, 80m west of Keros. In EBA both were connected by a promontory. That era Keros-Daskalio was the biggest religious maritime center in the Aegean Sea

2. A detailed description of the Dove Vase

The Greek archaeologist, Dumas [6] excavated and described the artifact, naming it the Dove-Vase. He dated it back to 2,800 – 2,300 BCE (Fig. 1). This is a large flat-based (slightly convex) receptacle with a low vertical wall, a narrow protruding base, and an externally thickened mouth rim. Across the center of the vessel stretches a row of flat-sided schematic birds thought to represent doves. These were painstakingly sculpted from a strip of marble reserved while the rest of the interior was hollowed out. The strip of rectangular marble reserved for the curving of the schematic birds was divided into 16 independents rectangular of about: 4.5 cm in length, 1.9 cm in width and 4 cm in height. There is a space of just over 0.5 cm between the 16 places. The sculptor was presumably ordered by the priest in charge to make a lunisolar calendar for the everyday use of the community, in which the number 15 would have been essential, due to the necessity to mark 15 days, i.e. half of a 30-day lunar month. When the priest asked the sculptor where the 30 or the 29 days of a lunar month would be counted in 16 independents rectangular, he would have suggested a break in the middles of the 16 rectangular, i.e., the

[6] Dumas. 19968: 172.

numbered 8th or 9th. The sculptor would have explained to the priest that in that way the calendar would satisfy all the parameters of one 8-year lunisolar calendar, i.e. the 8 lunar years on the upper left side; the 6+7 lunar months on the low left side and the 29 or 30 days (7+8+7+8) of one lunar month (Fig. 1.).

To recapitulate: the artifact is made of one single piece of marble, which is round shaped like a pan. The raised rectangular part along the diameter is divided into 16 easily distinguished places; one of the two middle-ones (the 8th or the 9th) is left blank (i.e., is extracted from the beginning) and on the rest 15 raised rectangles 15 doves have been carved.

On the Dove Vase can be seen (Fig. 1): 7 doves in the lower part facing **in one direction**, one empty dove-space and 8 doves in the upper part facing in the other direction. The reason why the doves are facing in different directions is that they are used for the counting of different time periods, which is also why they are divided into two groups. The 8 doves on the upper left are places used to mark the 8 lunar years; the 7 doves on the lower left, counted as 6+7, are places used to mark the 12 (6+6) or 13 (6+7) lunar months of one lunar month. On thee

Fig. 3. Projection of one of eight doves facing left. The other seven are facing right, why? (See below).

right side, the 15 (7+8) doves or twice that, 30 doves (15+15) are places used to mark the 30 or 29 days of a lunar month, see below. The doves are split in this way to facilitate the understanding of their function. The artifact is like a pan of 39 cm in diameter, with a rim of

5.1 cm in height. The doves are of unequal size being approximately 4.5 cm in length, 1.9 cm in width and 4 cm in height. The distance between the 16 places is about 0.5 cm (Fig. 3.).

The ingenuity and the prophetic spirit of archaeologist Lord Renfrew [7] – although he did not decode the artifact - led him to estimate that: "Due to its great size and the austerity of its composition, the artifact was destined to serve a very exceptional purpose." He added: "Today we may admire the splendid products of Cycladic craftsmanship: the fine pots, the metal weapons, **the marble vessel (**i.e., the Dove Vase**)**, the human figures. But what were they used for? What did they mean?" He continued: "Those questions modern archaeology ought to be able to answer - certainly as far as its function is concerned -, if not necessarily its meaning." The present author, even though he is not an archaeologist, has here attempted to answer Renfrew's questions as regards the Dove Vase. The author's decoding of the Vase, given in general terms above, follows in greater detail below. This artifact is probably the first 8-year lunisolar calendar artifact worldwide in one piece.

Zapheiropoulou [8] also made excavations on the site where she found some broken marble doves (Fig. 3.), of the Dove Vase type, scattered around, meaning that there was at least one more Dove-Vase artifact.

[7] Renfrew. 1991: 95-96.

[8] Zapheiropoulou. 1968b: 97.

3. A model used to explain the functioning of the Dove Vase as a calendar

It is extremely difficult to decode this artifact as a calendar with reference to the artifact alone (Fig. 1.). Therefore, its function will be explained using a schematic model (Fig. 4.). This model shows how the Dove Vase can be read as an 8-year lunisolar calendar. In the following section of this article, two solved exercises (A and B) are provided to aid understanding of the Dove Vase as a calendar.

Let us observe the artifact in Fig. 1 and the analogies with the schematic mode below (Fig.4.). In the model, there are 8 cells numbered from the bottom upwards, 1 to 8 on the upper left-hand side. To understand the decoding, let us call these "***places for marking 8 lunar years***". These places can be marked by using lunar-year pawns. Turning now to the lower part of the model, we find two cell configurations in two low columns of 7 cells. In the left column there are 6 cells numbered, from the bottom upwards, 1 to 6, followed by a black

nullified cell (meaning that this cell is not counted), while in the right column there are 7 cells numbered, again from the bottom upwards, 7 to 13. Let us call all 13 ***cells "places for marking 12 or 13 lunar months"***; these can be marked by using lunar-month pawns. Turning now to the right side of the model, we find two cell configurations in two columns (of 7 and 8 cells twice); in

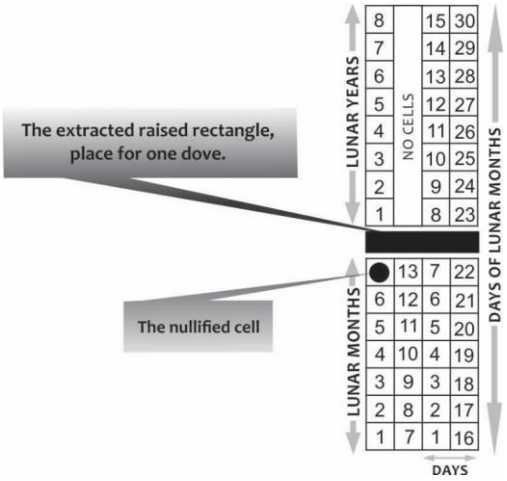


Figure 4. A schematic model invented by the author to explain the calendrical use of the Dove Vase.

The calendar-tender, when phases the nullified cell, asks himself if the current lunar year is the 3rd or the 5th or the 8th and if it is then he counts 13 lunar months that year.

the left-hand column there are 15 cells (7+8), 7 in the lower part and 8 in the upper part, numbered, from the bottom upwards, 1 to 7 and 8 to 15; in the right-hand column there are 15 cells, 7 in the lower part and 8 in the upper part, numbered, from the bottom upwards, from 16 to 30. Let us call these ***"places for marking alternately the 29 and 30 days of one lunar month***". These can be marked by using day pawns.

3.1. The 7+8 and 7+8 right-hand, two semi-columns of cells, as cells to mark the 30 or 29 days of a lunar month

Prehistoric peoples may have realized that two lunar months added up to 59 days (about 59.06 days); they may have decided to consider the odd months as lasting 30 days[9] and the even

[9] Θεοδοσίου, Δανέζης, 1995: 67.

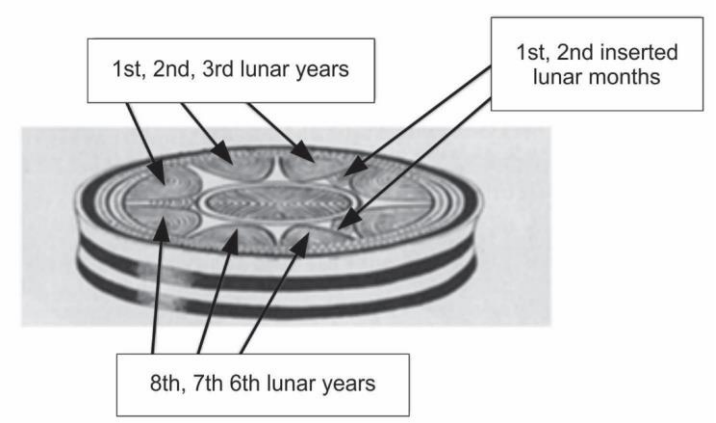


Fig. 5. The lid of the Pyxis; The 8 big parabolas are the 8 lunar years. The 3 small ones are the three inserted lunar months. The Pyxis was found at Palaikastro by Bosanquet[10]; he dated it to LM III.

ones as lasting 29 days (30+29=59). This sequence of 30, 29, 30, 29, 30 … has been found to have been in use in Greece in the classical period[9]. In the artifact, Fig. 1, as well as on its model, Fig. 4, one can clearly see that the 5 phases of the moon are distinguished as follows: In Fig. 3, the first day of the new moon is marked in day-cell no. 1. The first quarter of the moon -- the seventh day -- is marked in the 7th day-cell. The full moon – the fifteenth day -- is marked in day-cell no.15. The third quarter of the moon - the twenty-second day -- is marked in day-cell no.22. The twenty-eighth or the twenty-ninth day of the moon, when it last appears in the sky, are marked in day-cells nos. 28 and 29. The moon does not appear in the sky on the 29th or the 29th and 30th days. These days are marked in day-cells nos. 29 or 29 and 30. The calendar-tender would put one or two day-pawns in the corresponding cells of the 29th or 29th and the 30th days of a lunar month. At the end of the 29th or the 30th day, he would withdraw the 29 or 29 and 30 day-pawns and would start the same process over again for the next lunar month. At the same time, he would put one month-pawn in the next lunar month cell; if the lunar month was the last in a lunar year then the calendar-tender would put one lunar-year pawn in the proper cell of the 8-lunar-years column.

3. 2 The 6 + 7 cells on the lower left-hand places to mark the 12 or 13 lunar months when needed

It is probable that the Aegean leaders/priesthood counted 12 lunar months in one lunar year, which corresponded to 354 days and not to the 365 days which made up one solar year. They probably observed that seasons repeated themselves ca. every 12 lunar months. However, this was not exactly the case, because seasons follow the solar year, which counts 365 days (the real length is about 365.25). Probably, after having made endless observations, the Aegean priesthood or their sky-watchers finally concluded that 99 lunar months and 8 solar years lasted the same time, i.e. about 2,922 days. The synchronization of the 8 lunar years with the 8 solar years was made by adding a 30-day lunar month at the end of the first, third, and eighth lunar years, which counted 12+1 or 6+7 lunar months, (Fig. 4.). This rule is pictured on the lid of a pyxis from Palaikastro found at the cemetery of Aspa [10] (Fig. 5.).

Homer, in the *Odyssey*, T 179, wrote: "Minos had his kingship renewed by Zeus every 9 years", "ΕΝΝΕΩΡΟΣ ΜΙΝΩΣ." In Homeric times, counting started from number one and not

[10]Bosanquet, 1939-40: 38-59.

from zero, as the concept of zero did not then exist[1]. Therefore, the 9 Homeric solar years meant 8 solar years, i.e., Minoans used the 8-year lunisolar calendar, see below.

In the simplified model seen in Fig. 7, lunar months can be counted with month-pawns in the lower columns on the left. Calendar-tenders were presumably given straightforward guidelines:

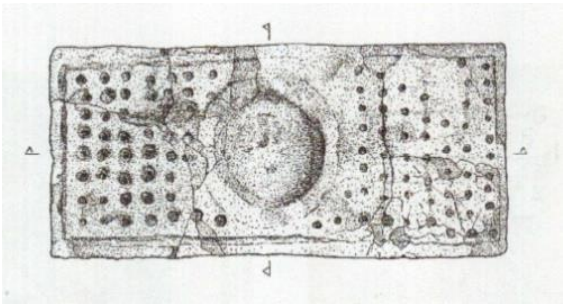


Fig. 6a. The kernos in Heraklion Museum, no. 3587, with 45 cups in 6 columns on the left + 55 cups in 7 columns+ 1 big central cup + 7 separate cups surrounding it, excavated by Karetsou, at Mt. Juktas, Knossos. Permission was given by Al. Karetsou.

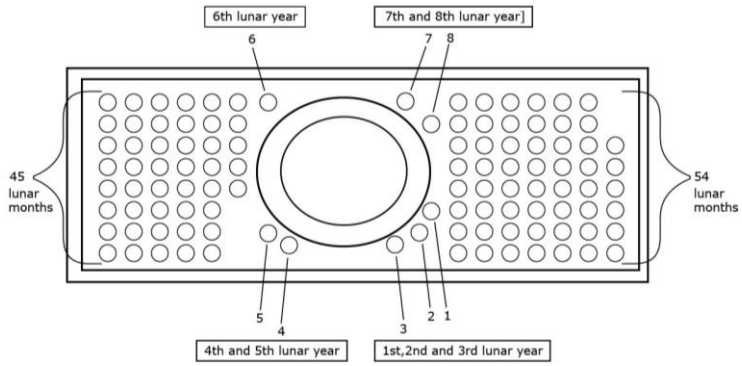


Fig. 6b. Kernos 3587, Heraklion Museum, with the 45+54 similar + 8 separate cups. The center and the right side of the kernos were badly damaged and have been restored by the author to their probable original, meaningful status. This is an 8-year (or 99 lunar months) lunisolar calendar. It shows that an extra lunar month must be inserted at the end of each of the 3rd, the 5th, and the 8th lunar years.

a) at the beginning of each lunar year they had to place one pawn in one of the 8 lunar-year cells in the upper left-hand column, beginning with no. 1; b) at the same time they had to place one pawn in one of the 13 (6+7) lunar-month cells in the lower left-hand columns, beginning with no. 1; c) at the same time, they had to place one pawn in one of the 30 (15+15) lunar day-cells in the right-hand columns starting from no.1; d) In addition to this, they had to insert

one 30-day lunar month, or 29-day month alternately [2], at the end of the 3rd, the 5th, and the 8th lunar years, as a 13th one. This rule is pictured in Fig. 5.

This rule can be seen at work once again in the lunisolar calendars found in Minoan Crete, e.g., the flat stone Minoan kernos which is displayed as no. 3587 in Heraklion Museum (H.M.).

It was excavated in pieces[11] at the Peak sanctuary of Mt. Juktas; the cups were reconstructed

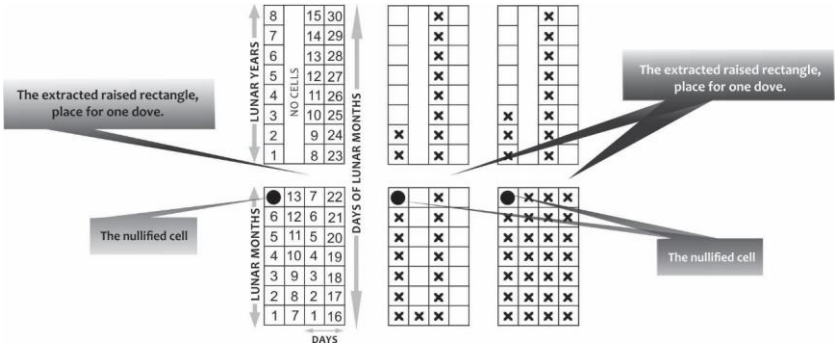
[11] Karetsou, 2012:137-153.

arbitrarily and therefore, it was not decoded (Fig. 6a.). The present author's decoding of 73 Minoan flat stone kernoi (published on the portion of the Center for Hellenic Studies, University of Harvard, at First Drafts@Classics@ on 23-10-19) has given me the possibility to decode this kernos and to rearrange correctly the cups found on the artifact, as shown (Fig. 6b.).

The rule of intercalation 3 lunar months at the predetermined ends of the 3rd, 5th, and 8th lunar years in 8 lunar years is a Minoan invention going back to 1900-1700 BCE (Fig. 4, 6b). The Babylonians also used the system of intercalating 3 lunar months, but these were inserted arbitrarily into the 8 lunar years. Their Minoan type of intercalation was made after the Persian invasion in 539 BCE[12].

3.3 The 8 cells on the upper left-hand side as places to mark the 8 lunar years of an 8-year lunisolar calendar

Each lunar year is marked with a pawn, in the 8 upper left cells, marked nos. 1 to 8 (Fig. 7). After the completion of the first and second lunar years (which are made up of 12 lunar months),



The model of the Dove Vase Calendar A Calendar B

Fig.7. The schematic model of the Dove-Vase is on the left. Two solved exercises, labeled A and B are on the right.

the third (or the fifth or the eighth) lunar-year pawn is placed into the third (or the fifth or the eighth) cell of the same column. This signifies that the calendar-tender will count 13 lunar months in those lunar years. Thus, the 99 lunar months (=8 l. ys. X 12 l. ms. /l. y. + 3 inserted l.ms.), i.e., in order to retain the religious calendar is synchronized with an 8-year solar/seasonal one, i.e. in order to augment agricultural produce. This is what is meant by an 8-year lunisolar calendar [2].

4. How to find the dates marked on the models of the Dove Vase A and B

4.1. What is the current date on above Calendar A, according to the schematic model on the left, Fig. 7?

Analysis: Calendar A. On this calendar, in the top right-hand section, the left of the two columns is marked with 15 X's, denoting that the 15th day of a lunar month has been reached. It is also observed that in the lower part the left-hand part of the artifact is marked with 6 +1

[12] Britannica Ult. Ed., 2011, Babylonian calendar.

X's, denoting that the 7th lunar month has been reached. In the upper left-hand part of the artifact there are 2 X's, denoting that the 2nd lunar year has been reached.

Answer: The current date according to the lunisolar calendar is the 15th day of the 7th lunar month in the 2nd lunar year.

4.2. What is the above current date pictured on the Dove Vase?

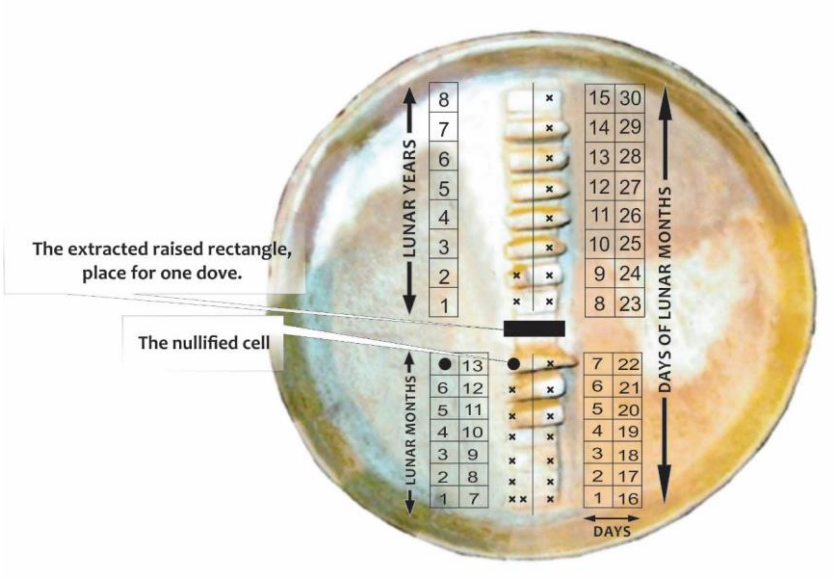


Fig. 8. The current date of the above calendar is the 15th day (on the right side, 15 X) of the 7th lunar month [on the lower left side, (6+1) X] of the 2nd lunar year (on the upper left side, 2 X). The vertical lines are for helping the reader to understand the three locations of the three-time periods, lunar years, lunar months, and days.

4.3. What is the current date on Calendar B, according to the schematic model on the left ?, Fig.7.

Analysis: On this calendar, it is observed that in the right-hand section the columns are marked with 15+7 X's, denoting the 22nd day (=15+7) of a lunar month. We can also see that in the left-hand section the 2 lower columns are marked with 6+7 X's, denoting the 13th lunar month, while the upper left-hand column bears 3 X's, denoting the 3rd lunar year. It is necessary to remember that at the end of the 3rd, 5th and 8th lunar year a 13th lunar month must be added.

Answer: The current date according to the lunisolar calendar is the 22nd day of the 13th lunar month of the 3rd lunar year.

4.4. Is the Dove-Vase the only example of an 8-year lunisolar calendar in one piece in prehistory?

The artifact is known as Dove-Vase is the **oldest example of a lunisolar calendar** found up to now. During the present author's seven years of research on the subject, he has found publications describing nine more kernoi in Minoan Crete (2100-11000 BC). He has decoded these as 99-lunar-month calendars, i.e. as 8-year lunisolar calendars, as follows:

1. 33 similar cups (marked by 3 pawns per cup, indicating 99 lunar months) + 8 separate ones; Gournia, Soles, 1979, 154, Pict.1.

2. 33 similar cups (3 pawns per cup= 99 lunar months) + 1 bigger one; Malia, Chapouthier, 1928, 292-300.

3. 33 similar cups (3 pawns per cup = 99 lunar months) +1 bigger one; Gournia, Soles,1991,48-51, picture 47.

4. 33 similar cups (3 pawns per cup=99 lunar months); Fournou Koryfi, Myrtos, Warren, 1972, 231, no.168, pl. 78b.

5. 33 similar cups (3 pawns per cup=99 lunar months); Knossos, Hillbom,2005, 148, no 46.

6. 48 similar cups +3 separate (48x2+3=99 lunar months); Gournia, Hillbom,2005,145, no 34

7. 99 similar cups + 5 bigger ones; mt. Juktas, Knossos, Karetsou, 2012.

8. 99 similar cups + 8 separate ones; mt. Juktas, Knossos, Karetsou, 2012.

9. 99 similar cups; a Minoan ceramic ship. "Minoan and Greek Civilization", 1992, Private collection of ex-Prime Minister, K. Mitsotakis, p. 106.

The decoding of these 9 kernoi strengthens the theory of the author **that the Minoan flat stone kernoi and similar artifacts, with a predefined number of similar cups, or similar and bigger cups or similar, bigger and separate ones should be decoded as lunar, 8-year lunisolar, one-year Minoan solar calendars or parts of them, as long a a corresponding calendric configuration fitting these can be shown to exist.**

C o n l u s i o n

The artifact known as the Dove Vase, excavated at Dhaskalio, on the Aegean Island of Keros, is not only an 8-year lunisolar calendar but also the oldest artefact of an 8-year lunisolar calendar in one piece worldwide. The artifact was excavated and published by Professor Dumas in 1968 and it was brilliantly commented on by Professor Lord Renfrew in 1991. No scientist has decoded it up to now. It is decoded as an 8-year lunisolar calendar in this paper for the first time.

Bibliography

Bosanquet, R. C. 1939-40. "Unpublished objects from Palaikastro." *BSA 40*, 38-59, London.

Britannica Ult. Ed. 2011. Egyptian solar and Babylonian 8-year lunisolar calendars.

Chatley, H. 1943. "NASA Astrophysics Data System." *The Observatory*, vol. 65, 121.

Dumas, Chr. 1968. "*The N. P. Goulandris Collection of Early Cycladic Art*.", 172.

Evans, A. Sir. 1900. '*Knossos diaries* (notebooks).*'*, London.

Evans, A. Sir. 1930. "*The Palace of Minos.*" Vol. III: 387, London.

Homer. *Od*: T 179. Enneoros Minos; *Il.* A 14. Apollo.

Karetsou, A. 2012. "Two Stone Kernoi from the Juktas Peak Sanctuary." 90. Prehistory Monographs 36 (ed. E. Manzourani & Ph. P. Betancourt). ISTAP. Academic Press, Phil., Penns.

Mitsotakis, K. 1992, ex-Prime Minister, Private Collection, "*Minoan and Greek civilization.",*106, Αθήνα.

Nilsson, M. P.1920. "*Primitive Time Reckoning.*" C.W.C. Gleerup, 364, Lund.

Pliakos, A., 2015, "*Μινωικά Ημερολόγια σε Κέρνους (2300-1100 π. Χ.)",*48, Αθήνα.

Pliakos, A., 2015, "Minoan Solar Calendars Carved in stones and the riddle of kernoi." *EIRENE.* Studia Graeca et Latina, vol. 51, 221-34, Prague.

Pliakos, A., 2016, "The cycles of Saros and of Exeligmos and the long-lasting Minoan Pax", 625, in the International Convention, 'The Ancient Greece and the Contemporary World', Ancient Olympia 28-31 August 2016.

Pliakos, A., 2018, "The decoding of the Royal Game of Knossos", Google, 29.3.

Pliakos, A. 2019, "Minoan flat stone kernoi probably are decoded as either lunar or lunisolar or one-year solar calendars", was published on the First Drafts portion of the Harvard University, Center for Hellenic Stud: First Drafts@Classics@ …….23.10.19.

Renfrew, C. 1991, "The Cycladic Spirit." masterpieces from the N. Goulandris collection, Chapter VIII, 95-96, Athens.

Theodosiou, E.- Danezis E. 1995, *Η Οδύσσεια των ημερολογίων*, Δαυλός, 65, Αθήνα.

Zapheiropoulou, F. 1968b, "Cycladic finds from Keros", *Annals of Archaeology,* 1: 97, Athens.

Με σχόλια [SS1]: Ο εκδότης είναι C.W.K. Gleerup

Με σχόλια [SS2]: Δεν μπορούμε να βρούμε αυτό το άρθρο/βιβλιο

Με σχόλια [SS3]: Δεν μπορούμε να βρούμε αυτήν τη διαδικτυακή πηγή. Προσθέστε το https//

Με σχόλια [SS4]: Προσθέστε ακριβή διαδικτυακή πηγή

Με σχόλια [SS5]: Γιατί στα Αγγλικά;

Με σχόλια [SS6]: Προσθέστε αριθμούς σελίδων άρθρου

Με σχόλια [SS7]: Προσθέστε αριθμούς σελίδων άρθρου

A.P.