

ANCIENT ASTRONOMICAL CULTURE IN UKRAINE. 1: FINDS RELATING TO THE PALEOLITHIC ERA

Irina B. Vavilova and Tetyana G. Artemenko

Main Astronomical Observatory of the National Academy of Sciences of Ukraine,
27, Akademika Zabolotnogo St., Kyiv 03680, Ukraine.

Emails: irivav@mao.kiev.ua; tart@mao.kiev.ua

Abstract: In this paper we describe some archaeological finds in the territory of modern Ukraine which are thought to provide evidence of the ancient astronomical culture of our ancestors. These finds date to Upper and Middle Paleolithic times (i.e. 100,000-12,000 BCE).

Among the finds unearthed at the Gontsy and Kiev-Kirillovskaya archaeological sites are mammoth tusk fragments which feature engraved patterns that have been interpreted as tables of lunar phase observations. More remarkable are two mammoth ivory bracelets from the site of Mezin which contain elaborate engraved ornamentation that also has been connected with a lunar calendar. In this paper we also mention astronomical finds at Paleolithic sites on the Crimean peninsula, including the famous solar petroglyph at Chokurcha-1 and a possible 'star map' engraved on a mammoth shoulder bone that was found at Chokurcha-2.

After briefly discussing the problems associated with trying to assign astronomical meaning to these types of archaeological finds, we conclude that a complicated lunar mythology was indeed developed in Paleolithic times.

Keywords: archaeoastronomy; Paleolithic astronomy; Ukraine; ancient lunar-solar calendars

1 INTRODUCTION

During the past 140 years or so a number of remarkable artifacts made from mammoth bones and tusks that reveal the long history of astronomy in Ukraine have been recovered from Paleolithic archaeological sites such as Gontsy, Mezin and Kiev-Kirillovskaya.

Most speculative are fragments of mammoth tusks with engraved patterns on them that have been assigned astronomical meaning. However, it is difficult given our contemporary outlook to try to correctly interpret the astronomical knowledge and beliefs of ancient peoples. Nevertheless, during the 1960s American, Russian and Ukrainian researchers first attempted to establish an interrelation between lunar cycles and systematic grooves or pits on various Eurasian Paleolithic finds (see Abramova, 1962; Frolov, 1965; Marshack, 1964; 1970; Okladnikov, 1967; Rybakov, 1962; Shovkoplyas, 1965).

In two research papers, and a book titled *The Roots of Civilization*, the American archaeologist Alexander Marshack (1918–2004) initiated a 'revolution' in prehistoric archaeology concerning 'lunar notations' on European Upper Paleolithic remains (see Marshack, 1964; 1970; 1972). He was the first to direct attention to the works of Édouard Lartet (1801–1871), the famous French archaeologist and geologist. Back in the nineteenth century, Lartet argued that the geometrical 'patterns' formed by notches, dots and other regular symbols on portable artifacts may have been used by primitive people to register time, especially between periodic natural processes. After studying numerous stones, bones and other finds, Marshack concluded that such patterns possibly were calendar records based on lunar cycles.

Although his conclusions subsequently were not universally accepted by archaeologists and astronomers (e.g. see Elkins, 1996; Robinson, 1992), at the time Marshack's ideas were developed by others, including the well-known Hungarian geologist László Vértes (1914–1968; see Vértes, 1965) and the Russian historian, B.A. Frolov (1939–2005). In 1965 Frolov independently made a detailed study of patterns on nearly two hundred items from Eurasian Paleolithic sites and concluded that elements of the ornaments were characterized mostly by groups of 5, 7, 10, and 14 lines. He put forward the hypothesis that the 'rhythm 7' and 'magic sevens' depicting the allocation of time originated in Paleolithic times (for details see Frolov, 1974; 1992; 2000).

2 ASTRONOMY, AND ARCHAEOLOGICAL FINDS FROM THE PALEOLITHIC ERA

There is abundant evidence that the Paleolithic inhabitants belonged to the genus *Homo sapiens*, and the primitive art of these people is seen on many of the objects that have been excavated at archaeological sites in Europe, including the territory of modern Ukraine (see, for example, Chernysh, 1979; Efimenko, 1953; Frolov, 1971; Okladnikov, 1967; Shovkoplyas, 1965; and Zosimovich, 1992). The more we analyze the diversity of the Paleolithic archaeological finds the more we are convinced that the evidence points to astronomical observations and calendars used in daily life that were part of a 'Paleolithic pre-scientific knowledge base'. However, most of these conclusions have been published by archaeologists, while Ukrainian astronomers by and large have not been involved in these discussions—with the notable exceptions of the isolated studies by Zosimovich (1992), Pavlenko et al. (2006) and Vavilova and

Artemenko (2010). We therefore decided to fill this gap by collecting data on remarkable finds unearthed in Ukraine which appear to give an indication of the astronomical knowledge of our ancient ancestors.

Ukraine is blessed with an abundance of Paleolithic sites. Although mammoth bone huts and other structures and artifacts made primarily from mammoth bones and tusks are known from ancient settlements throughout Eurasia, they are mainly concentrated in the north-western tributaries of the Dnipro River basin and in the Crimea, making Ukraine an ideal area in which to study Paleolithic society. The well-known settlements of Dobranichivka, Gontsy, Kiev-Kirillovskaya, Mezhirich, Mezin, Semenivka and others (see Figure 1) have been dated by ^{14}C isotope analysis to between 27,000 and 12,000 BCE (for details, see Iakovleva, 2005).

2.1 Mammoth Tusk Fragments With Engraved Patterns

2.1.1 The Fragment from Gontsy

The first Paleolithic settlement found in eastern Europe was discovered by G.S. Kyriakov in 1871 on the banks of the Uday River near the village of Gontsy in the Poltava region of Ukraine. In 1873 this site was excavated by F.L. Kaminsky, a teacher and amateur archaeologist. In 1914-1915 the first professional excavations were carried out under the supervision of the well-known Ukrainian archaeologist and historian V.M. Scherbakivski (1876–1957), who was Head of the Archaeological Department at the Poltava Museum from 1910 to 1922. Further excava-

tions followed in 1935, by I.F. Levitski and A.I. Brusov, and between 1977 and 1981 by V.I. Sergin. From 1993 up to the present day extensive excavations have been carried out by a joint Ukrainian-French team led by L.A. Iakovleva (Institute of Archaeology, National Academy of Science of Ukraine) and F. Djindjian (University of Paris). As a result, six mammoth bone dwellings within an area of some 40 × 80 meters have been identified at the Gontsy settlement. Bone and ivory ornaments and red ochre also have been recovered, and specialized working areas for stone, bone and ivory have been identified. This site was occupied at least twice during the Late Upper Paleolithic period, between 14,110 and 14,620 BP at the beginning of the climatic change that marked the end the last Ice Age (Iakovleva and Djindjian, 2005).

Among the unique finds unearthed in the earliest excavations (see Abramova, 1962) is a well-preserved mammoth's tusk fragment covered by a finely-engraved pattern (Figure 2). Subsequently, this pattern was interpreted as representing lunar phase observations. This mammoth tusk fragment no longer exists, and all we have is a sketch and a description made by V.M. Scherbakivski. Our recent conversations with officials at the Poltava Museum confirm that the 'traditional' explanation—that the mammoth tusk fragment was lost in a fire following a WWII bomb attack—is open to question. More likely, it was destroyed earlier, during the Civil War of 1918-1920, or else was taken abroad for safe-keeping when V.M. Scherbakivski emigrated to Prague, the Czech Republic, in 1922.

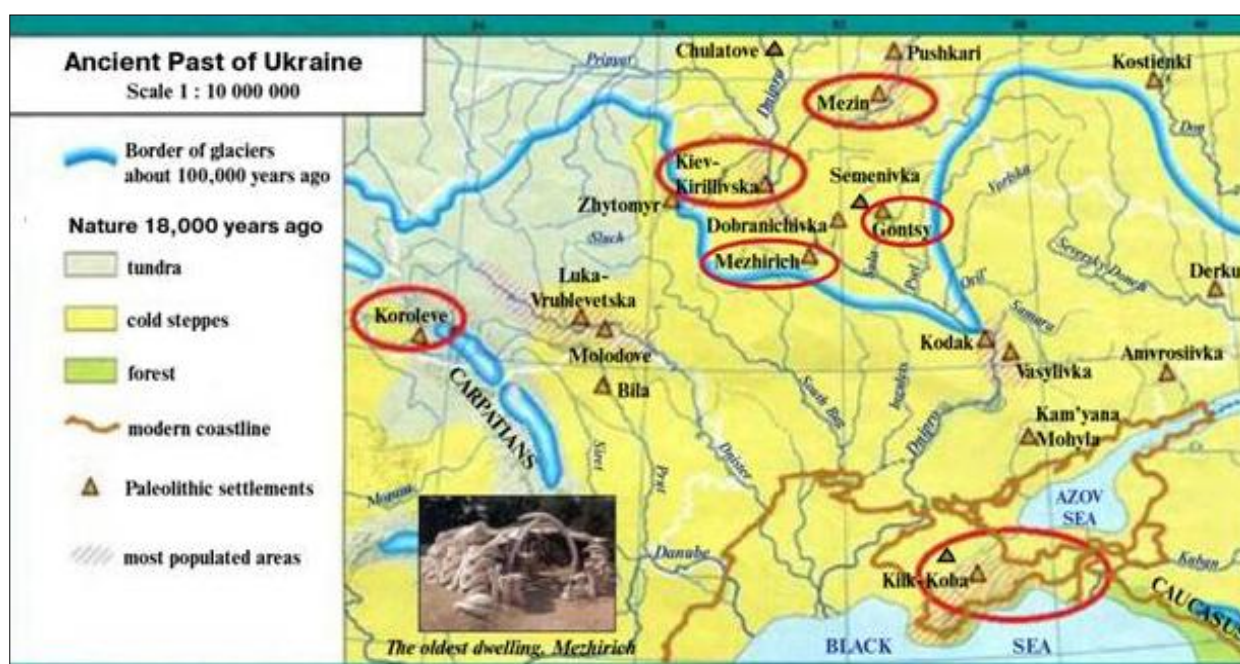


Figure 1: A map showing Paleolithic settlements in the territory of Ukraine, including Dobranichivka, Gontsy, Kiev-Kirillovskaya, Kilk-Koba, Kodak, Mezhirich, Mezin, Molodove and Semenivka (prepared by the authors).

Referring to Figure 2 (lower image) we can see that in the centre of this tusk fragment there is a thin curved line, from which on both sides alternating lines of different length depart at right angles, first a long one and then several very short ones, followed again by another long one and several very short ones, etc., totaling 32 long and 78 short lines (Abramova, 1962). The thoroughness and the depth of the incisions as well as the uniformity of the spacing between the very short notches suggest that the pattern on this mammoth tusk was used to reflect important recurring events. The well-known Russian archaeologist P.I. Boriskovsky (1911–1991), one of the first researchers of this tusk fragment, noted in 1957 that this decorative pattern had a certain logic. Later it was interpreted as a table of lunar cycle observations, where the thin deep line represents the time axis, while the short perpendicular strokes mark the phases of the Moon (Zosimovich, 1992). An interpretation is as follows: Full Moon is marked by a double stroke, while First and Last Quarters and also New Moon are marked by long lines. As for the positions of strokes: one stroke pointing outwards represents the first lunar month; two strokes pointing outwards indicate the second lunar month; the image of the third lunar month is damaged; and four strokes pointing outwards mark the fourth lunar month.

2.1.2 The Fragment from Kiev-Kirillovskaya

Another example of a mammoth tusk with a similar inscribed pattern was unearthed at the Kiev-Kirillovskaya site in Kyiv by the famous Russian-Ukrainian archaeologist of Czech origin, Vikenty Khvoyko (1850–1914), and is described in Khvoyko (1903). This site dates to 15,000 BCE.

In 1893 during the excavation of a 21-m deep cultural layer Khvoyko uncovered a well-preserved collection of artifacts made from mammoth bones, tusks and molars. These items once belonged to at least 50 individuals of different ages. The 30-cm long mammoth tusk fragment with engraved markings is very similar to the aforementioned Gontsy mammoth tusk fragment (see Figures 2 and 3). This also looks to have been used as some sort of astronomical calendar.

So these two Ukrainian examples and similar fragments discovered at other Eurasian sites suggest that Paleolithic man had a knowledge of astronomy and not only marked the changing phases of the Moon but also kept a count of time.

2.2 Engraved Bracelets

The remains of another Upper Paleolithic settlement on the bank of the Desna River near Mezin village in the Chernihiv region (see Figure 1), were found accidentally in 1908, when a hole

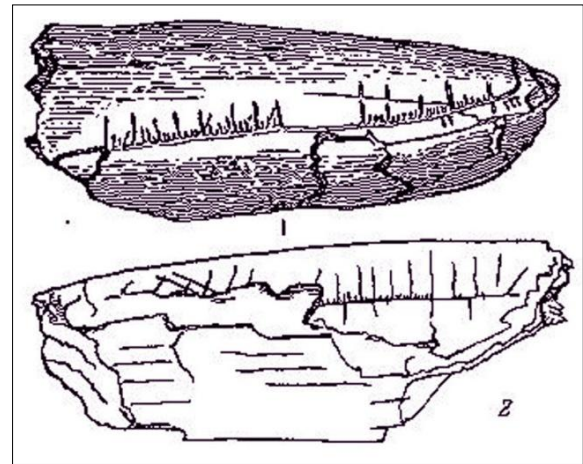


Figure 2: Sketches of the engraved patterns on the mammoth tusk fragments from the Kiev-Kirillovskaya (1, upper) and Gontsy (2, lower) (after Abramova, 1962: Table XXXIX).

was being dug for a cellar. This news immediately was reported at the XIV Archaeological Meeting in Chernihiv in August 1908, but it was not until 1930 that the first excavation of this site took place. Further excavations followed in 1932, 1954–1956 and more recently, making the Mezin settlement (Figure 4) one of the most studied Paleolithic sites in Ukraine.

Among the unique finds from this site were mammoth ivory phallic figurines and birds as well as bones painted with red ochre; a female statuette with a carved double pubic triangle and engraved chevrons; a mammoth ivory needle with an eye engraved with chevrons (e.g. see Shovkoplyas, 1965). This style of decoration is now referred to as 'Mezin art'.



Figure 3: A general photograph (upper) and close-up of the right-hand end (lower) of the engraved mammoth tusk fragment from Kiev-Kirillovskaya (courtesy: National Museum of History of Ukraine, Kyiv; the photographs were provided by the authors).



Figure 4: An artist's reconstruction of the Paleolithic Mezin settlement on the banks of the Desna River (courtesy: V.V. Tarnovsky Chernihiv Historical Museum, Chernihiv, Ukraine; cf. the "Mezin scene" in Jelinek, 1975).

Among the early finds was a 20,000-yr old ornamented bracelet engraved out of mammoth ivory, and a second bracelet was found in 1956. Both have a magnificent design which can be found to this day on the embroidery of Ukrainian costumes. This pattern predates and is similar to the famous Greek 'meander' pattern. These two bracelets have been described by Okladnikov (1967: 102-103; our English translation) as

... authentic masterpieces of the bone-carvers' art, causing surprise due to the fact that they were made with stone instruments, without access to a lathe, drills or chisels ... Bone material for these ornaments had an exceptional aesthetic value ... The aesthetic character of these decorations cannot be denied in cases where they had some magical significance. Neither magic, including the magic of numbers, nor the cult of the ancestors automatically had a direct relation to the rhythmical alternation and the symmetrical arrangement of the ornamentation.

The patterns on the bracelets have been interpreted as depicting lunar calendars based



Figure 5: The coin with an image of the Mezin wide bracelet that was issued by the National Bank of Ukraine in 2006.

exactly on the period of 10 lunar months or 280 days (for details see Abramova, 1962: Table XXXIV; Frolov, 1977; Pidoplichko, 1998; and Vavilova and Artemenko, 2010). Because of its historical importance the Mezin wide bracelet was selected to feature on a new coin, and this was issued by the Bank of Ukraine on 17 February 2006 (see Figure 5).

2.2.1 The Mezin Wide Bracelet

The first of these bracelets (Figure 6) was unearthed in 1912, and has the form

... of a wide and thin bent plate, the external surface of which is covered by the complicated geometrical decorative meander and fir-tree pattern. At the ends of the bangle are three large openings for lacing. The width of the bone plate is 5.3 cm. (Abramova, 1962: 35, cf. Table XXXIV; our English translation).

The pattern on this bracelet was described in detail by Frolov (1977), and he proposed that it may represent a rare example of an ancient lunar-solar calendar. Upon analyzing the decorative pattern (see Figure 7), one finds that

... two reiterating meander groups are divided twice by zones of zigzags. Each of the zigzags consists of 7 lines. We can clearly identify 5 different patterns: A, C, and E in the centre and at the edges of the meander zone; and B and D zones. (Frolov, 1971: 98; our English translation).

This ornamentation of parallel strokes separated in the areas of the zigzags, consists in total of 564 lines (20 lunar months). It is interesting that the number of lines in the central area and in the zigzags is equal to 366, which almost corresponds to one solar year (Zosimovich, 1992: 14). Of course, it could be a simple coincidence, but the conclusion also can be drawn that the

pattern on this bracelet represents an ancient lunar-solar calendar based exactly on the period of 10 lunar months, or 280 days.

2.2.2 The Mezin Composite Bracelet

The second Mezin bracelet, discovered in 1956, is also a remarkable find. As Figure 8 shows, it is composed of five joined mammoth tusk rings (length ~19 cm, width ~1 cm) edged with ornamentation. The external surfaces of the bracelet are covered with a fretwork geometrical pattern in which rows of fir trees are directed to opposite sides and form a clear meander pattern (see Abramova, 1962; 1995; Shovkoplyas, 1965: 104-105).

A pattern is formed as a result of the junctions of the recurring groups of parallel strokes, which are directed at an angle to the edge of the bracelet. Frolov (1977) has interpreted this meander pattern as a primitive calendar (Figure 9) with fertility and crop symbols. His interpretation is as follows. Most groups consist of 14 strokes, although there are groups with 13 and 15 strokes. The directions of the strokes in two adjacent groups differ by 90°. Each part of the bracelet with 27-29 strokes can be interpreted as a calendar of the lunar month. It is possible that the 90° change of direction of the strokes may reflect a lunar disc that is increasing during the first part of the month and decreasing in the second part of the month:

Groups of 14(±1) strokes, which change their direction periodically exactly after this number, could correspond to the same visibility occurrence, in this case with the increasing lunar disc before Full Moon, and with the decreasing lunar disc before the New Moon during the 28-29 days of the lunar month. Obeying this rhythm, two lunar months are 'written' at the edges of plates. As a result all of the days in 10 lunar months could be 'written' on all 5 plates of the bracelet. (Frolov, 1974: 63-64; our English translation).

It is important to emphasize that the base of these possible paleo-astronomical calendars (10 lunar months, or 280 days) coincides with the mean period of pregnancy for women. Many scientists consider that such a period relating to the Moon could have been chosen by pre-historic people as the *obvious* time-measurement unit for long-term observational events. Incidentally, upon studying in detail the ornamentation on both Mezin bracelets, Shovkoplyas (1965) noted that they had specific female attributes. We should note that although other bracelets made from mammoth tusks have been found at Paleolithic sites in Belgium, France and Russia, the Mezin bracelets have no analogues when it comes to their ornamentation.



Figure 6: The Mezin wide bracelet on display at the National Museum of History of Ukraine in Kyiv (the photograph was provided by the authors).

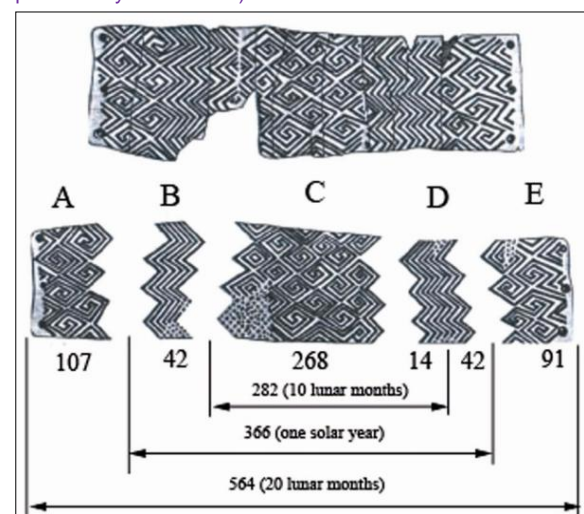


Figure 7: An explanation of the ornamentation on the Mezin wide bracelet as a possible ancient lunar-solar calendar (after Frolov, 1974).



Figure 8: The Mezin composite bracelet is part of the collection of the Institute of Archaeology of the National Academy of Science of Ukraine displayed in the National Science Museum of Natural History in Kyiv (photograph courtesy E. Pichkur).

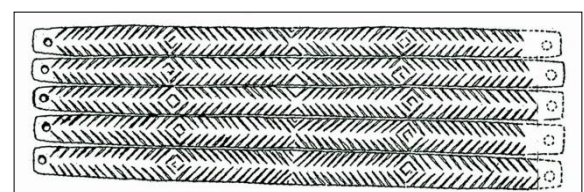


Figure 9: An explanation of the ornamentation on the Mezin composite bracelet as a possible ancient lunar calendar (after Frolov, 1974).

In 1896, Shturcic wrote that history knows of no peoples who cannot define time duration using the Sun and the Moon. But originally they recorded only large intervals, such as a year (the period of a complete 'cycle' of the Sun) or the orbital period of the Moon (which was denoted by its new reappearance and a specific name).

The fixing of such an important number—14—in the form of cuts, nicks, etc. could occur long before the emergence of abstract ideas about it. Frolov (1974: 120-121; our English translation) notes:

The tradition of this "separation" of the monthly lunar cycle onto 2 "vectors" of equal duration and opposite direction is reflected in the ornamentation on the 5 plates of the Mezin composite bracelet. This slender, streamlined pattern with groups of 14 strokes can probably be traced back genetically to the simplest cuts, pits and other marks, the number of which was equal to the number of days in one or two lunar months (see examples from the settlements at Avdeev, Kostenky-1, Malta, Dolni Vestonice, Pshedmosti, etc.). Similar examples in Aurignacian to Magdalenian collections from Western Europe were analyzed in depth by A. Marshack, in Hungary by L. Vrethtes, in Spain by M. Grande ...

So, the transformation from the crude engravings on mammoth tusks to the sophisticated ornamentation on the Mezin bracelets or from 28-dashes-days to 7-ornament elements-days, are two sides of the overall process of learning about the world by artistic and rudimentary mathematical and astronomical means.

3 THE FINDS FROM THE CRIMEAN PENINSULA

The Crimean Peninsula is blessed with an abundance of Paleolithic sites, including Ak-Kaya, Shaitan-Coba, Staro-selie and Volchy (Wolf) Grotto, where Neanderthal families lived between 100,000 and 40,000 BCE. Since their discovery during the first half of the twentieth century these sites have been well described in the archaeological literature (e.g. see Boriskovsky, 1957), but here we will only focus on the two caves at Chokurcha.

The Chokurcha-1 karst cave (Figure 10) is on the banks of the Small Salgir River in the Simferopol district and was named after the village of Chokurcha. Chokurcha-1 dates between 40,000 and 45,000 BCE and as such is the most ancient settlement in Europe with highly aesthetic and scientific examples of ancient art (Efimenko, 1953). The first excavations began there in 1927 by the Soviet geologist P.I. Dvoychenko and a local amateur archaeologist, S.I. Zabnin, who revealed skeletons of Neanderthals, remains associated with their everyday lives (including hunting implements), as well as the bones of ancient animals, some of which are now extinct. Between 1927 and 1929 the well-known Crimean archaeologist N.L. Ernst (1889–1956) studied in detail about 500 finds recovered from the site, including Mousterian microliths, and in 1940-1941 B.I. Tatarinov studied the famous petroglyphs on the walls of the cave, including a 0.5-m image of the Sun with rays, which he interpreted as an object of worship. Unfortunately, during WWII the cave was not pro-



Figure 10: The Chokurcha-1 cave is now a Ukrainian heritage site.

tected, and some of these finds were almost completely destroyed. Today surviving fragments are on display in museums in Simferopol, Odesa and Kyiv. In 2009 this cave was restored, and it is now part of Ukraine's national heritage.

In 1974 a second local cave site, Chokurcha-2, was discovered by A.A. Stolbunov, a teacher who studied local lore, and in 1979 it was professionally described by the well-known Russian archaeologist O.N. Bader (1903–1979). In this second cave a unique collection of miniature images of 'men-birds', 'men-bears' and 'men-mammoths' was found. Among the finds, which are thought to date to about 11,000 BCE, was a mammoth shoulder bone with numerous engraved point marks. In 1979 the astronomer V.M. Chernov studied this object using for comparison the well-known star maps prepared by the famous Russian astronomer Aleksandr A. Mikhailov (1888–1983). After applying corrections for the epoch and other parameters, he

concluded that this was a Paleolithic map of heaven—possibly the oldest one known—and that it contains 102 stars from 17 constellations in the Northern and the Southern sky (Figure 11). The boundaries of the Southern sky region shown on this map were $\alpha = 12^h-21^h$, and to $\delta = -40^\circ$ (see V. Mitrokhin, <http://www.proza.ru/2006/12/21-214>, and Sushko, 1981). Of course, this explanation is speculative and requires additional tests.

Unfortunately, the Chokurcha-2 site was destroyed in the 1970s despite the best efforts of local scientists and respected researchers such as O.N. Bader, L.V. Firsov, A. Marshack, A.P. Okladnikov and A.L. Yanshin, who wrote letters to various governmental institutions in Moscow, Kyiv and Simferopol drawing attention to the archaeological importance of this site. Most of the excavated artifacts were lost, and a full radiocarbon analysis of the site was never carried out.

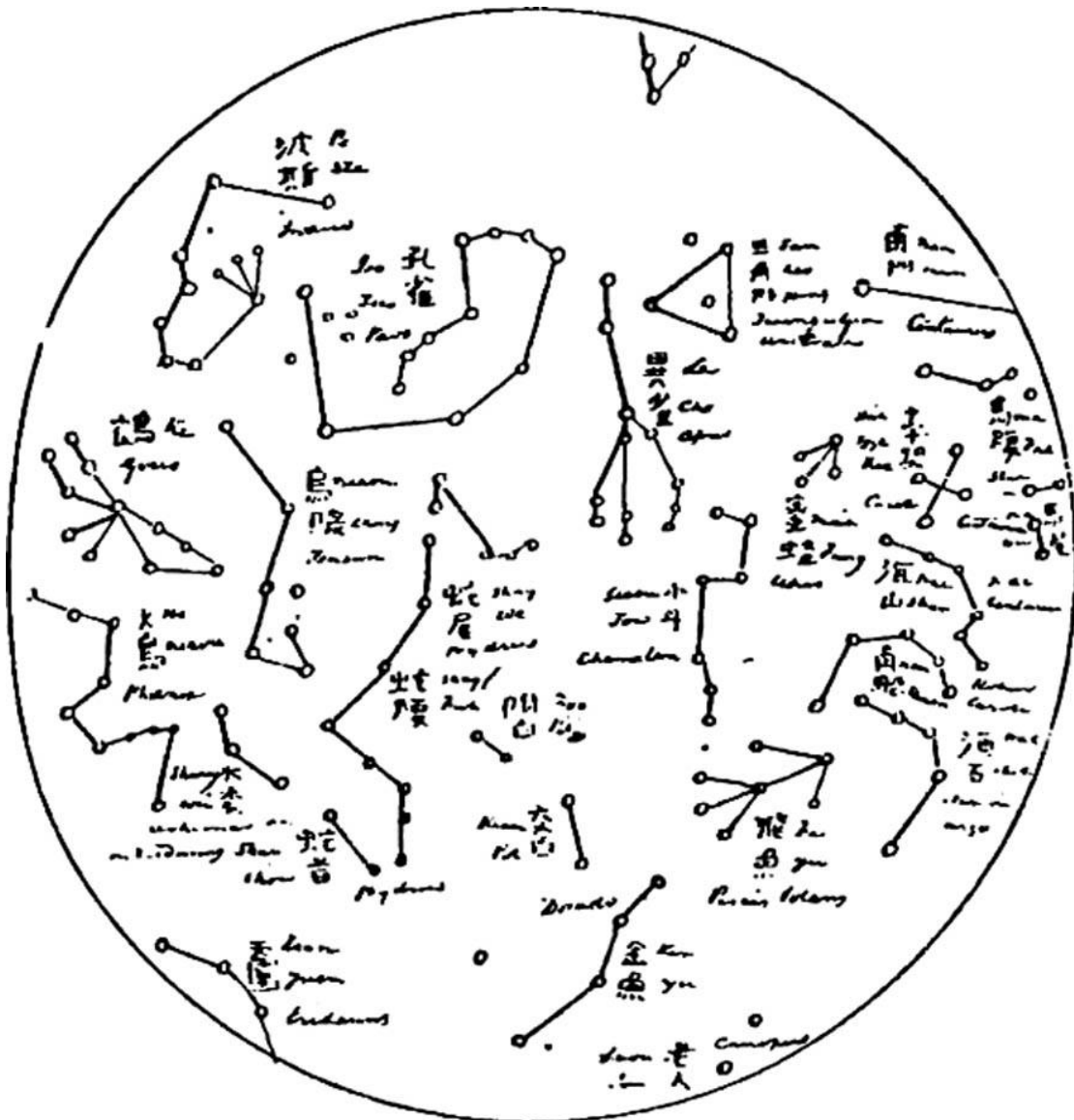


Figure 11: The possible map of the heavens, which was reconstructed by Chernov (1979) after analyzing the engraved point marks (shown here as small circles) on a mammoth shoulder bone that was found at the Chokurcha-2 archaeological site.

4 CONCLUDING REMARKS

In this paper we have described some remarkable finds from Paleolithic sites in Ukraine which may be related to ancient astronomical calendars. Of course, these finds raise many questions, which need to be discussed.

First, we should note that the geometrical ornamentation on these finds, which reaches a maximal complexity with the Mezin bracelets, and in particular the wide bracelet, is not casual. The decoration on these bracelets is so intricate that its preparation required elaborate input, skill, time and mastery in comparison with other artifacts unearthed at these sites. We believe these bracelets reflected valuable elements of ancient knowledge about rhythms of the cosmos and may also indicate that Paleolithic people recognized the 7-day interval between successive lunar phases. We conclude that a complicated lunar mythology originated in, and was utilized during, Paleolithic times.

This conclusion will not be complete without a brief description of conditions of life of our ancestors in those times. We can do this by using the Mezhirich settlement as an example, but before doing so it is as well to remind ourselves about the marked variations in climate that occurred at this time:

The weather of Ice Age Europe was harsh. The Older Dryas period (14,000-13,700 BC) was a variable cold, dry period of Europe

offered an alternation of steppe and tundra environments depending on the permafrost line and the latitude. The Older Dryas period was preceded by the Boiling (14,650-14,000 BC) and followed by the Allerod period (12,000-11,000 BC) during which temperatures in the northern Atlantic region rose from glacial to almost present day level. (Childe, 2009).

The Mezhirich settlement was discovered in 1965 when a farmer began excavating a cellar, and almost two meters below ground level he struck the massive lower jaw of a mammoth with his spade. Further dwellings were uncovered at the Mezhirich site, and these are now believed to be amongst the oldest-known houses in the world; they date to 15,000 BCE. For each house, the roof supports were made up of about three-dozen curved mammoth tusks, some of which were found in their sockets in the skulls during the excavations (see Figure 12). In the late Ice Age mammoth bones served as a viable alternative to wood, stone and clay. They were used for the framework and foundation of these houses, when wood was scarce and there were no available caves.

Similar dwellings have been found at Mezin and other sites, but those discovered at Mezhirich were very well preserved. It has been estimated that the total number of bones incorporated in the structure of a single dwelling must have been derived from a minimum of 95 mammoths. Anal-



Figure 12: One of oldest dwellings discovered at the Mezhirich settlement has been reconstructed by I.G. Pidoplichko and is now on display in the National Science Museum of Natural History in Kyiv.

ysis of the remains in one of the houses identified

... a variety of activity that occurred: stone tool manufacture and repair; use of red and yellow ochre pigment; use of bone needles in sewing; skinning of fox and weasel, leaving the complete skeleton intact; cooking of large and small mammal; use of bones as fuel in the fires; some possible use of berries and seeds. The food remains include mammoth, rhinoceros, horse, bison, hare and birds. (Pidoplichko, 1976: 195).

Among the most interesting finds were: the earliest map in the world, inscribed on a mammoth tusk (see Figure 13), which has been interpreted to show a river with dwellings along the banks; one of the earliest-known musical instruments, which were made of decorated mammoth bones, with a mammoth skull used as a kind of drum-like instrument (Abramova, 1962); an ivory female figurine, which was engraved with a series of straight lines which may have been meant to depict a triangular vulva (perhaps re-engraved a few times), and other straight lines which may represent a simple stick figure with a head and arms. Debates about why the figurine was made and how it was used (if re-engraved it could indicate multiple uses) are continuing. The description of these hand-made items, together with the suggestion of lunar calendars, hypothetically impart cognitive and numbering abilities to our Stone Age ancestors and help dispel the popular perception of Ice Age cave-folk as grunting brutes with little or no intelligence (see Flavin, 2008).

We plan to follow this introductory paper with a second paper documenting later evidence of prehistoric astronomy in Ukraine. It will deal with the *Tripolye Culture*, the stone steles, and an ancient astronomical observatory which has been discovered in Ukraine in recent decades.

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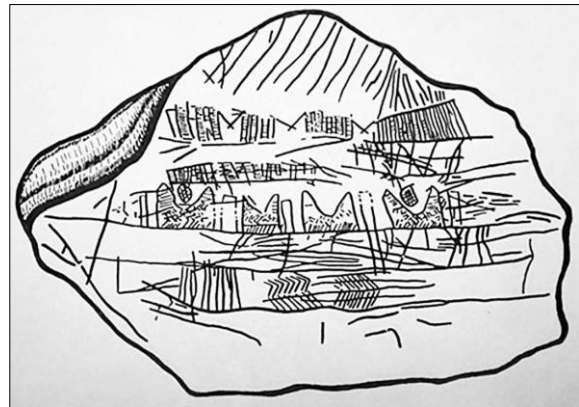


Figure 13: The inscribed mammoth tusk from Mezhirich supposedly containing the earliest-known map in the world (after: <http://donsmaps.com/mammothcamp.htm>).

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Dr Irina B. Vavilova is the Head of the Astro-Informatics Laboratory at the Main Astronomical Observatory, National Academy of Sciences of Ukraine. She is a member of IAU Commissions 28 and 41 and is a European Astronomical Society member. Her interests are in extragalactic astronomy, data analysis and the history of astronomy. She prepared the detailed analysis of the



history of astronomy in Ukraine in the twentieth century through the role of prominent scientists (such as S. Braude, N. Barabashov, A. Orlov, E. Fedorov, A. Severny, S. Vsekhsvyatsky and A. Yakovkin) and their scientific research in the fields of radio astronomy, solar physics, planetary sciences, general relativity, etc. Four Ph.D. theses were defended under her supervision, including one on the history of astronomy by M.A. Balyshv ("The history of scientific research in the life and activity of Otto Ludwigovich Struve (1897–1963)."). Irina is the author of five mono-graphs and textbooks. She has been awarded the State Order of Princess Olga of the 3rd Grade.

Tetyana G. Artemenko is a leading engineer of the Main Astronomical Observatory, National Academy of Sciences of Ukraine. Her research interests are in history of astronomy, including astronomy in Ukraine. She conducted several studies on the role of prominent scientists of Ukrainian descent in the development of astronomical knowledge in the first European universities in the sixteenth and seventeenth centuries (among them Yuri Drohobych (Bologna and Jagellonian Universities), Theophan Prokopovich and Iriney Fal'kovsky (Kyiv-Mohyla Academy) and Jan Latos (Ostroh Academy)), as well as on the impact of Struve's dynasty on astronomical research in Ukraine; she also is a co-author of the database "Astronomers-Ukraine". These studies, and the history of astrometry in Ukraine, are the basis of her Ph.D. thesis, which is in the final stages of preparation.

