

ASTRONOMICAL PRACTICES AND RITUAL CALENDAR OF EURO-ASIAN NOMADS

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While interpreting the tombstones and off-barrow (the term introduced by S. S. Sorokin) edifice of Euro-Asian nomads (deer-shaped stones, stelai, stone monuments, barrow entrances with “mustache”, etc.), investigators traditionally confine their study to describing the ritual actions performed during the burial procedure or while commemorating the deceased (Kiselev 1949: 307–308; Rykov 1936: 115–117; Spitsyn 1948: 158). In the opinion of many scholars, the peculiarities of tomb layout, traces of abundant ritual sacrifice objects, traces of fire with fragments of cremated bones, and burials of a whole horse’s trunk or parts of it, mostly skulls with vertebra and hoofs, found on the territory where such monuments are located, testify to the sacral importance of sanctuaries, which reflect the mythological worldview of their creators (Adzhigaliev 1994: 108–124; Voitov 1996: 71–120; Sorokin 1981; Tivanenko 1994). Until recently, the astronomical function of such monuments has not been taken into consideration in research. Only during the last two decades, a small number were examined using astronomical methods of analysis. Among these are well-known memorials from Altai and southern Siberia dating back to 10th–3rd century BC, as well as the sanctuary on Mount Ocharovatelnaia, ritual centers in the valley of the Chui, Sagly and Iustyd rivers, and the site of Semisart (Marsadolov 1996: 91–95; 2000: 11–14). Direct observations of the sunrise and sunset at such monuments enable to determine the dates close to equinoxes. Among off-barrow memorials, one can discern ridge barrows or barrows with “mustache”. These monuments, unique in their layout, can be encountered over a vast space, ranging from the west to east from the Volga lowland to Altai and from the east to south, from the Urals to Tien-Shan; according to some estimates, their number exceeds 300 (Griaznov 1956: 8–10; Kadyrbaev 1958; 1959; Margulan et al. 1966; Orslanova 1975; Semenov 1988: 98, 103; Beisenov 1996; Liubchanski 1998). Margulan agrees

with authors who consider the barrows with solar “mustache” as having ritual significance, as an edifice erected on the site where a ritual meal or commemoration is held, while A. M. Orazbaev believes that “a complex of barrows with “mustache”” is associated with a ritual sacrifice of horse and the shaman ritual of sun worship” (Orazbaev 1969: 182).

The unique appearance of these barrow complexes and the orientation of the ridges at the eastern part of horizon confirm the hypothesis of their astronomical orientation (Marikovski 1977; 1984). To verify the validity of this hypothesis, the author of this study examined 25 ridge-barrows using astronomical methods of analysis in 1989–1991 and 1997–1998. The results of the investigations, some of which have been published in scientific journals, indicated that almost each one of them reveal the whole set of astronomically significant directions, which are linked with the extreme positions of the sun and the moon on the horizon and their meridian transit (culmination) (Bekbassar 1993, 1996, 1998). Emphasis on the presence of orientation upon the points of sunrise and sunset at the cardinal moments of the annual cycle in the construction of barrows with “mustache”, which date back to the Early Iron Age, to the ancient Turkic period, enables to treat it as the *horizon solar calendar* (Bekbassar 1998, 1999, 2000).

Application of the barrow with “mustache” in the service of a horizon calendar, which is based on tracing the sunrise and the sunset directly over parts of the monument’s structure (the ridges), enables to determine the cardinal dates of the annual cycle, as well as to divide the solar year into two, four or eight equal parts (in the traditional calendar of Kazakhs and other Turkic people, a year is subdivided into four *toksans* – in other words, cycles of “ninety days”, forming a season). In addition to its economic function, it could serve the purpose of determining the dates of ritual activities, associated with the cult of heaven, mountains, the host-spirits of the locality, which were timed to coincide with the astronomically significant dates, such as the equinoxes, summer solstice, as well as the median dates between them. It is noteworthy that the peculiarities of nomadic life brought along the necessity of a temporal break between the burials and the commemoration rituals. This assertion can be illustrated with the following archaeological fact. Dendrologi-

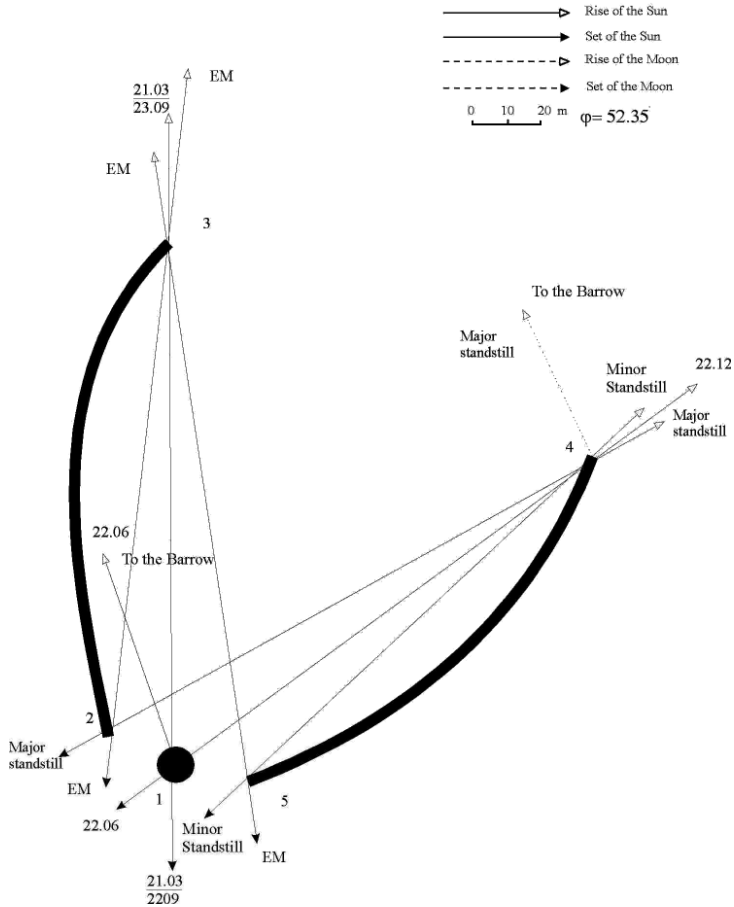


Figure 1. Schematic plan of Acsu 4 mustached barrow.

cal dating of Arzhan barrow indicates that it was erected in August–September 808 BC. In addition, the greatest number of horses, namely 90, were buried in the eastern part of the barrow, whereas the total number of horses under the floor of the central chamber is 180. By counting one horse per day, it may imply that the beginning of the new year for the Saian-Altai nomads coincided with the day of vernal equinox (Marsadolov 2000: 30). This fact may serve as an argument in favour of the idea that commemorative and other fes-

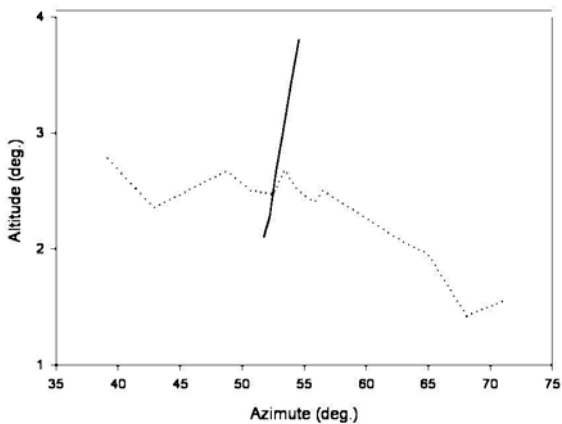


Figure 2. Summer sunrise at Atassu 4. View from cairn 1.

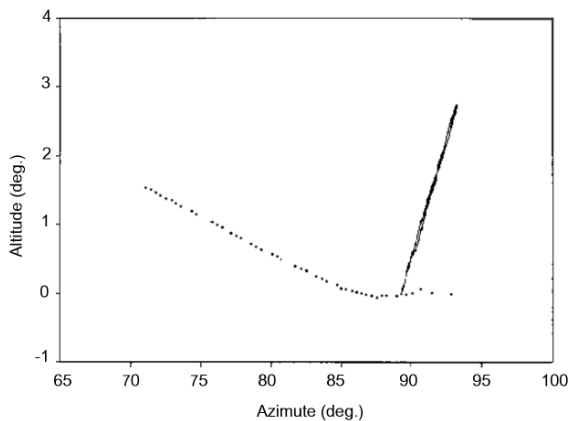


Figure 3. Equinox sunrise at Atassu 4.

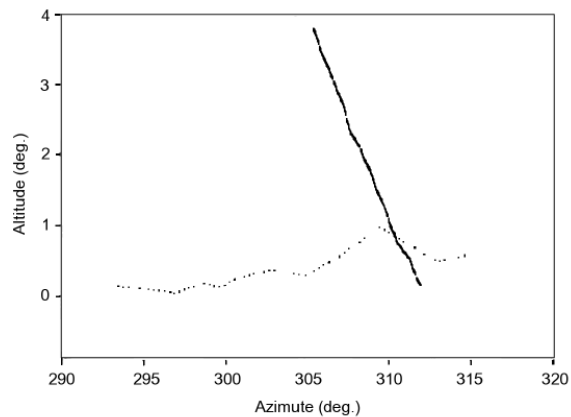


Figure 4. Summer sunset at Akssu 4. Alignment 4-1.



Photo 1. *Mount Atassu. Photo by autor.*



Photo 2. *Equinox sunrise at Atassu. Photo by autor.*



Photo 3. *Equinox sunset at Akssu. Photo by autor.*

tivities could be held on this date. Thus, the problem which is predominant in the current investigation lies in establishing whether the nomads of Euro-Asian steppes could conduct the observation of celestial bodies from the beginning of the Early Iron Age. If so, then which celestial objects and for what purpose? What is the significance of information revealed in the course of archaeoastronomical studies suggesting that the constructors of barrows with “mustache” could be interested in stellar luminaries in the system of religious-mythological views (reconstructed on the basis of other sources, such as zoomorphic art (Raevski 1977; Akishev 1984; Kuzmina 1987: 19; Tivanenko 1989), burial vestments of the Scythians (Lelekov 1987), ancient Turkic runic script (Steblova 1972) and the ethnographic material of Turkic and Mongol people)? Presently, it is difficult to find answers to all these questions. However when dealing with the reconstruction of the astronomical knowledge of the tribes who once populated this vast region, a reasonable combination of archaeological and astronomical methods, similar to the ones listed above and also the incorporation of ethnographic materials pertinent to the mythological conceptions and worldviews and religious beliefs of Euro-Asian nomads, could be very useful. What are the grounds for making presumptions about the existence of astronomical practices among the inhabitants of steppes of Euro-Asia? It seems indubitable that the observations of the sun, the moon, some stars as well as monitoring the rhythms of environment were important at that time for predicting weather, epizoite, the situation of pasture and so forth.

To survive in severe natural-climatic conditions, the people were compelled to adapt to the local topographical and climatic realities and the rhythms of the surrounding world. Owing to longstanding observations of stellar luminaries and the rhythms of nature, the nomads of Central Asia succeeded in elaborating a unique animal calendar of 12-year cycles, based originally on the rhythm of solar activity with its marker related to the apparent motion of Jupiter along the zodiac circle (Vladimirski & Kislovski 1989: 10–12; Zacharova 1963; Karunovskaia 1929).

In addition, the nomads formulated the principles of seasonal locomotion along predetermined routes. The terms and direction of migrations depended on geographical and climatic particularities

of the locale (habitat) of a specific group of nomads. These circumstances played a dominant role in the choice and determined the combination of vertical (in the mountain and foothills regions) and horizontal (meridian) migration routes, typical for the southern region of Russia and Kazakhstan. The moon as a celestial object in all evidence played a major role in the worldview and religious beliefs of ancient people. Its varying appearance – its waxing and waning, and resurrection could prompt the origin of the idea of death and resurrection and life after death. The moon along with the sun was a cultic object of worship among the nomads of Euro-Asia (Dugarov 1991: 159–259). The new moon was especially honored by the Kazakhs: its appearing brought forth prayers and an appeal for prosperity followed (Abishev 1966: 29–30). The inhabitants of Altai observed special days of restriction at the end of a lunar month, associated with certain taboos (Chenchibaeva 1978: 101). Chinese chronicles include an account suggesting that the Huns used lunar calendar and beliefs, similar to the ones described above and connected with phases of the moon, in their everyday life (Bichurin 1950).

The structure of two ridges in the shape of two narrow crescents in the moment of waxing and just before waning, as well as the orientation of the constructed barrows with “mustache” towards the points on horizon corresponding to special moments of its apparent motion in the sky (positions of the high and the low moon during equinoxes and solstices) can be treated as a reflection of the visual representation of the lunar motion in the architecture of the archaeological monument. Moreover, the techniques of predicting lunar eclipses by fixing the directions pointing to the moonrise and moonset in its extreme positions with the aid of megalithic prehistoric monuments has been lively discussed in archaeoastronomical literature. It is widely known that moon eclipses played an important role in the cultures of the Old World in general and in the culture of Euro-Asian nomads in particular. Mt. Ocharovatelnaia, in its anthropomorphic shape (a fish, perhaps, a dragon) devouring the sun or the moon during the sunset close to diurnal equinoxes (Marsadolov 1998: Figures 8,9), which can be observed only at favourable sites, can apparently serve as an illustration of the perception of eclipses among the Turkic people.

No	Direction of observation	Azimuth	Height of visible horizon	Height of the centre of the celestial body	Distance between cairns	Angle width of cairns	Shift of precession. Epoch 2000
1	4-K	42	2.68	3.38	600	2	29.96
2	1-K	53.4	2.68	2.43	600	2	23.84
3	5-3	84.73	0.08	0.5	102	0.34	3.61
4	1-3	90.12	0	-0.57	96	0.34	-0.53
5	2-3	95.82	-0.02	0.38	94	0.34	-3.34
6	5-4	124.37	0.07	0.47	95	0.34	-19.77
7	1-4	130.45	0	-0.57	98	0.34	-23.79
8	2-4	135.63	0.03	0.44	102	0.3	-25.50
9	3-5	264.44	0.17	-0.37	102	0.32	-3.68
10	3-1	270.12	0.23	-0.27	96	2	-0.16
11	3-2	275.73	0.18	0.6	94	0.34	3.97
12	4-5	304.67	0.22	0.65	95	0.34	20.88
13	4-1	309.4	0.97	0.56	98	2	23.29
14	4-2	315.63	0.58	1.08	102	0.3	26.81

Table 1. *Acsu 4 (Koianbai), latitude 52.°35*

In view of the lack of written sources directly pointing to the once existed practice of astronomical observations, the analysis of similar archaeological monuments as objects conveying the coded information of the astronomical knowledge of its creators is an effective way to learn about the mythology and worldview of prehistoric people who once inhabited the Euro-Asian steppes. This is by no means a new approach but scholars are frequently content with the reconstruction of such concepts as the World Mountain, World Tree, threefold vertical and fourfold horizontal model of the world. The issues of space and time in the traditional worldview of the Turkic people, based on ethnographic materials, are well elaborated upon (Sagalaev et al.). It is time to explicate what was the importance of the heaven, the sun, the moon and the stars for a nomad, also the role of astronomical practices in nomadic culture and for what purpose did they conduct their observations.

There are grounds to assume that the fragments of astronomical knowledge of peoples of the Proto-Turkic, Ancient Turkic and subsequent periods were worked out during the early Iron Age at the time of the massive erection of ridge barrows and menhirs. They may be even more deeply rooted in the earlier periods of the his-

No	Mistake in shift	Object	Azimuth position of the celestial body on the horizon. Epoch 500 years.	Horizontal mistake
1	1.2	Rising of high moon	44.3	-2.3
2	1.4	Rising of the sun 22.06	52.7	0.7
3	0.27	Rising of equinox moon	82.2	2.5
4	0.27	Rising of the sun 21.03/23.09	89.2	0.9
5	0.27	Rising of equinox moon	98.9	-3.1
6	0.24	Rising of low moon	122.2	2.1
7	0.22	Rising of the sun 23.12	130.2	0.2
8	0.2	Rising of hing moon	143.2	7.6
9	0.25	Setting of the sun 21.03/23.09	270.5	-6.0
10	1.5	Setting of the sun 21.03/23.09	270.4	-0.3
11	0.27	Setting of equinox moon	277.5	-1.8
12	0.24	Setting of low moon	300.7	4.0
13	1.3	Setting of the sun 22.06	310.23	-0.8
14	0.2	Setting of high moon	319.9	-4.3

tory of Central Asia. Investigations of the monuments from the Stone Age and Bronze Age indicate that such sanctuaries as Savin in the Kurgan District (Potemkina 1998), the Arkaim settlement in Cheliabinsk region (Bystrushkin 1996), the mausoleums of Begaza-Dandybai culture (Margulin 1997) reveal that their architectural layout is oriented towards the points of sunrise and sunset on the cardinal dates of the solar year. What could awake the curiosity of the ancient societies towards heaven and the accumulation of astronomical knowledge? Was it induced by the practical needs of the community, such as the regulation of agricultural works or the necessity to find their transmitters in space and time during seasonal migration? It should be reminded that the work with cattle is restricted in time. In addition, for semi-nomadic people these works are rigorously timed in accordance with the time of migrations (Kuftin 1916). Or was the main motivating factor an astral religion, with its prescription of rites and rituals rigorously distributed over a specific period? When comparing the calendar dates found in the astronomical studies of off-barrow edifices against literary sources including information on ritual calendar, the well-known study by Bichurin is a good starting point (Bichurin 1989), as it deals with

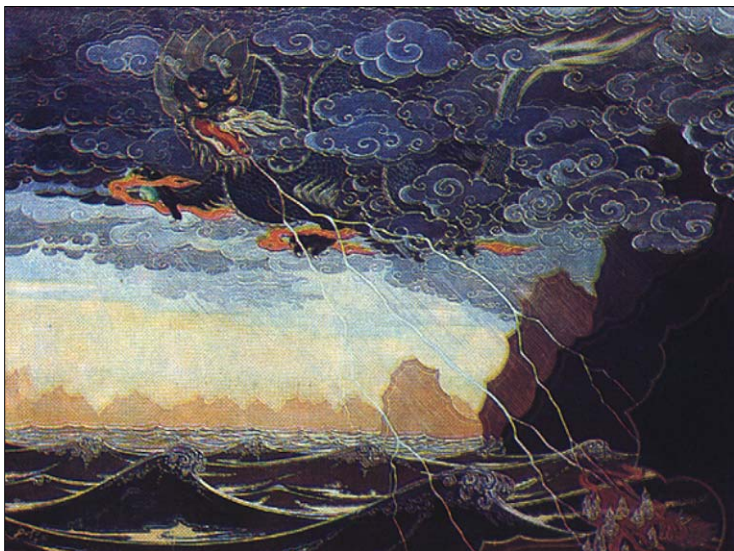


Photo 3. L. D. Dorzhiev. *Thunder smiting an evil spirit.* From private collection of author.

the period of Huns. Data on ritual festivities of the people inhabiting South Siberia, Altai and Mongolia can be found in articles by Alekseev (Alekseev 1978), Diakonova (Diakonova 1971, 1984), Potapov (Potapov 1978a, 1978b), Banzarov (Banzarov 1891: 41–47), Satlaev (Satlaev 1971). We included in our analysis also the data on “stellar calendar” of the Kazakhs (Abishev 1966: 177–181) and the Buriats (Galdanova 1992: 60).

21.03. *Nouruz* – beginning of the New Year in Mithraism, Zoroastrianism. Migration to the spring pastures. Awakening of nature spirits. Opening of the season of worship (sacrifice) to the nature spirits. Spring *tailagan**. Spring quarter. *Tsagan sar**, or ‘the white month’.

07.05. The meeting of the new moon with the Pleiades. An evening (acronyc) low culmination and disappearance of the Pleiades – transition to dairy products, abstinence from meat. The first greenery,



Photo 4. Demonical mergens. Beit (necropolis) in Akmysh region. From private collection of author.

the first thunderstorm, the first cuckoo-call. The beginning of the summer period

22.06. Migration to summer pastures. *Ysiach** – festivities of the first kumiss, or fermented mare’s or camel’s milk. Summer *tailagan**. Games of ‘the white bone’*. Heliacal rise of Orion – the morning chill. Summer quarter.

07.08. Ripening of meadow hay, haymaking. *Mysterium tsam**. Heliacal rise of Sirius – the coldness of water.

22.09. Autumn *tailagan*. The ritual of “*Kocha-kan*”*. Making of felt. The autumn quarter. The opening of the hunting season, sacrifice to nature spirits, guardians of the animals. *Nadom**.

07.11. The meeting of the full moon with the Pleiades. Nature spirits are falling asleep – the end of the season of worship to the nature spirits. The beginning of winter period. Stocking up meat for winter. *Nadom**.

22.12. “*Kantar*”* – a short day. The day augments in a sparrow step.

05.02. The moon during its first quarter is meeting the Pleiades. The months called *Akpan* and *Tokpan*, which symbolise two brothers, is a critical period for cattle breeding.

* *Tsagan sar* – the New Year, new moon in the first month of the spring. Satiated with the number of deeply symbolic ritual actions, their consequential and timely execution according to traditional beliefs meant a promise of the well-being of the man, his family and the whole community. Performing of preventive magic rites like the “turnover of years”, abundant meal, cleaning of the clothes and yurt. New garments, the lighting of icon lamps, sprinkling of milk, the feeding of the fire spirit from a ritual spoon. Ritual meals, fortunetelling and forecasts, magic games, going on visits from one yurt to another, exchange of presents. Sacrifice to the host-spirit of the locality and to tribal ancestors.

* *Tailagan* (from *tailga*) – a sacrifice of a specially selected horse of a specific colour of coat, dedicated to heaven, to Ulgen, the supreme sky god. The sacrifice was executed near the tribal mountain. The mountain should supposedly deliver the offering to Ulgen. *Tailagan* took place three times a year – in spring, summer and autumn.

* *Ysiach* – the festivity of the first kumiss at the beginning of summer after the migration to summer pastures, 20 days prior to the St. Peter’s Day (July 12). It was dedicated to the demiurg called Urun Aiy Toionu and was accompanied by drinking kumiss, praying ceremonies and dances. It was the period of milking mares and the time of the first offering of kumiss to the gods.

* *Nadom* – three sporting games for adult men: horse riding, wrestling and archery. The Mongolians conducted them in the middle or at the end of summer. The offering to the host-spirit of the locality and tribal ancestors were accompanied by various games, open-air parties and contests, held near the mountains. The function of the *nadom* implied unification of the tribes with the spirits of the locality.

* “*Tsagan mod*”- ‘white bone’. A ritual game associated with the cult of fire, fertility and resurrection in nature.

* *Sacrifice to the spirits of nature* – from March 14 till November 15, when they remained awake. They were conducted in special places called *obo*.

* *Altai kunduleging* – a prayer to the mountain, conducted in the first half of May, it was accompanied by cattle offerings. Services were organized also in September. They concluded with sports games, e.g. wrestling and horse riding.

* *Sacrifice and offering of arzhans*, i.e. water from healing springs – in June–July, at the time of budding of leaves; in August–September during the yellowing of leaves.

* *Religious mysterium tsam* belongs among the ceremonial yearly festivities of the adherents of the lama and is tinged with shamanic features. It is held from August 5–10. Religious sacrifice, burning of the figures of spirits, erection of raw-hide tent. Dances, wrestling, archery, horse riding.

* *The rite of wheedling “Kocha-kan”* – following the end of harvesting, in late autumn, at the time of (and in parallel with) *taiylga*.

* *Pozo kochazy* – an autumnal rite accompanying *taiylga*.

* *Tsagalgan* – the first 16 days after the first spring month.

* *Autumnal “hural”* – days of commemoration of the dead, days of transition to winter quarters, the commemorative day of *Tshonkava*, 23–25th day of the first winter moon.

* *Erdyn game* – a relict of a onetime grandiose complex of ritual games, in spring (May), also at the beginning of summer and autumn. It was conducted in a specific place near Lake Baikal. It was accompanied by the ring dance *echor* around a small hill *Erd*, resembling a barrow. To enclose the circle at least 700 participants were needed. This festival was accompanied with games and song contests. *Erdyn* games were timed to coincide with some most important rites entailing offerings, praying services and games. It was exclusively a stock-breeding ritual. Wheedling and invitation of happy fortune was carried out in a special secluded (cultic) place to where intruders and women had no access.

* *Naira* – held in autumn, during making felt. Eating of dairy products (kumiss, arrack), good wishes related to the felt products.

Naira was held at the beginning of winter, in the evening following dinner. Slaughtering of cattle, division of chores of men and women. Dividing the trunk into seven parts. Serving the head to the most respected guests while facing the person, incision in the head. The scull was delivered to the spirit-host of the locality at the *obo* place. Ritual sharing of the bones. Fortune-telling with the shoulder-blade. Eating of the entrails, belief in the reinforcement of human abilities by virtue of eating the organs: heart, liver, etc. Special behavioural rules were observed during *naira*: seating in the yurt – a master of ceremonies was seating in a place of honour, men were seated to the right and women to the left. Singing, good wishes, treating with the aid of the right hand.

CONCLUSION

The study of prehistoric astronomy should not be considered as something odd but just as a complementary method of studying archaeology, which gives the scholars an opportunity to acquire more knowledge about the people who once erected megalithic barrow-type astronomically oriented edifices. The genuine value of the attempts to collect possibly all preserved facts on the astronomical activities of the prehistoric inhabitants of Euro-Asian steppes lies in that they may yield us additional information about the way of life of these people.

Comparing the data about the astronomically significant alignment of ridge-barrows as well as other monuments with literary and ethnographic sources on ritual calendars of Euro-Asian nomads will enable to take a step forward in an attempt to reconstruct the mythology and the worldview as well as the astronomical ideas of the nomads once inhabiting the Euro-Asian steppes.

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