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AN ARCHAEOASTRONOMICAL STUDY REGARDING SOME NECROPOLIS OF THE GUMELNIȚA CULTURE

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1. The Neo-Eneolithic communities-general aspects

The Neo-Eneolithic people have used the astronomical phenomena in order to orientate in time and space, for calculating the ideal weather corresponding to their agricultural occupation, for hunting successfully etc. On the territory of Romania, the orientation in the Neolithic or even in the Eneolithic time was very important for the current activities¹. When we refer to the way of life of the Eneolithic people we could tell that they have practiced the plant cultivation (various species of wheat, barley, millet, lentil, flax etc.), animal breeding (bovines, ovi-caprines, pigs, dogs etc.), hunting, gathering and crafts.

The Neo-Eneolithic settlements had been located in different places, where the environment could assure the necessities of the respective communities.

Therefore, we could find open or fortified settlements, shelters. When successive habitation were situated on the same spot, the tell settlements have appeared, with several stratified habitation levels. This kind of settlement was frequently found in the Gumelnita culture, sometimes being surrounded by defending ditches. These tells have usually reached about 3-4 m in thickness and were identified mostly in the field and meadow regions. Still, the largest tell type settlement is the one from Harsova\(^2\), with a stratigraphy that measured more than 12 m.

Regarding the funerary ritual of the mentioned communities, we could say that both the inhumation and cremation have been practiced in the various material cultures, the burials being usually organized in necropolis. In the inhumation burials, the deceased were often placed in a flexed position, on their right or left side, and more seldom in a supine one. The grave goods usually comprised vessels, adornments (beads made of stone, or shells, bracelets and belt buckles made of Spondylus, different pendants, animal offerings \textit{etc.})\(^3\).

2. The Gumelnita culture – general aspects

This material culture represents the beginning of the Eneolithic from Romania. It emerged at the beginning of the 5\(^{th}\) millennium B.C. and had a duration of about a millennium. It has a wide distribution, with its Northern limit in the Southern part of Bessarabia and its Southern one in the Greek Thrace, reaching close to the Aegean Sea. Its Eastern limit is the Black Sea littoral and the Western one is in Central Bulgaria. For Romania this is one of the most important Eneolithic cultures.

The same like other Eneolithic cultures, the Gumelnita one has its own specific features. Most often, its settlements are of “tell” type, sometimes surrounded by defending ditches. Other locations for settlements are those situated on foothills, fortified islands, or with artificial defending/protecting systems. The Gumelnita communities used to live in the proximity of the water sources and near the natural resources that were easily accessible and exploitable, as the fields for agriculture, cattle breeding, or hunting.

The pottery is usually burnt to the brown, or red color, has different shapes and is decorated with incisions, plastic ornaments, barbotine, or is painted, especially with graphite. The black painting (with graphite) is more frequent, but the white and red colors are also used on the background of the vessels. Another specific feature of this culture is given by the presence of massif axes and the long flint blades (as prestige goods). The bone utensils are also abundant. Many adornments have been processed from bone and shells. Copper has been used both for the different types of massive axes, as well as for some adornments. Gold objects have been also discovered in this culture. The figurines are usually made of clay, but also of bone, marble, or even gold. In a large number could be detected the anthropomorphic, zoomorphic or anthropo-zoomorphic vessels.

Some workshop-dwellings have been discovered in some of the settlements. They account for the practice of some crafts. Therefore, there are settlements with a

\(^2\) Coms\u2620a, 1987, p. 128-136.

\(^3\) Coms\u2620a, 1995, p. 149-152.
specific economic profile, depending upon the environment that needed to be exploited for the community necessities.

3. Funerary characteristics of the Gumelniţa culture

This manifestation belongs to the Eneolithic period, being part of a large cultural complex, called Gumelniţa-Kodjadermen-Karanovo VI. Its specific funerary expression is the necropolis, but also stray burials (i.e. Oinac, Sultana, Curcani, Zimnicea), groups of burials (i.e. Vidra – 3 burials), or human bones depositions have been discovered, some of them inside the settlements (especially skulls, jaws and parts of the lower limbs). The necropoleis are situated outside the habitation space, therefore separated from the settlement. The largest Gumelniţa necropolis from Romania is the one from Vărăştii-Grădiştea Ulmilor (Călăraşi County). This was discovered on an island from the former Boian Lake, in Southern Muntenia, not far from the Danube. The burials have been excavated on a stripe of land along the North-Eastern part of the island, in the North being delimited by the lake’s waters and in its South being a young willow plantation that could not be affected.

The funerary rite and ritual of the Gumelniţa population resemble those of the last phase belonging to the Boian culture: inhumation in a moderately, or stressed flexed position. Regarding the position of the hands, several situations have been found, one of them with both palms under the skull, just as if those individuals would have been sleeping. The interpretations for the flexed position and for the palms under the skull were the following ones:

In the first case, the earth is considered to be the Mother Earth and this is why the deceased should be buried in a fetal position, because it should return to the womb of its mother. Another aspect connected with the Mother Earth is the presence of the female figurines both in the settlements and in the necropoleis of the Gumelniţa culture. They are the expression of the fertility cult, which was rendered sometimes in rather complex contexts.

In the second situation, the deceased falls asleep and awakes in the after world.

Also regarding the funerary ritual, it is interesting to note that both at Vărăştii-Grădiştea Ulmilor (Călăraşi county, Romania) and at Ruse (Bulgaria) some oil lamps have been discovered in some of the burials. Most probably they served for guiding the deceased towards the other realm. It is worth mentioning that all the burials from Vărăştii-Grădiştea Ulmilor with such objects contained strongly flexed skeletons, placed on their left side.

In other burials, items made of copper or gold have been found. Due to the lack of such resources in Muntenia, it was considered that the presence of such goods reflects the intense exchange relations existing between the communities North and

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4 Comşă, 1995, p. 152.
5 Comşă, 1987, p. 150.
8 Comşă, 1995, p. 113-114.
South of the Danube and even with those of the today Serbia. Regarding the Gumelnita communities South of the Danube, if we think just about the necropolis from Varna for instance, we could notice that those communities have used larger quantities of copper and gold for the adornments of their dead, fact which shows their social differentiation.

Yet, if we consider the inner structure of the necropolis from Varasti-Gradiştea Ulmilor (Călăraşi County), besides the single individuals, we could mention few types of burial groups:

- groups of two burials belonging to children;
- groups of two burials belonging to adult-child individuals;
- groups of two burials, each containing one adult;
- a group of three burials with three individuals (2 adults and 1 child), probably parents and their son or daughter.

Anthropologically speaking, the necropolis from Varasti-Gradiştea Ulmilor was a polymorphic one and comprised phenotypical distinctions, rendered by the following anthropological types; Protomediterranoid, Protoeuropoid in its Crô-Magnon variant as well as two brachycranian variants. Anyway, the predominant cranial form is the dolichocranian one.

As the orientation of the deceased is an important aspect of the funerary ritual, we will further present the orientation of the burials belonging to the Gumelnita culture: part of the Durankulak necropolis (Bulgaria), as it comprises also Hamangia burials, the Varasti-Gradiştea Ulmilor, as well as the small necropolis from Dridu (Romania). These cemeteries are interesting when the orientation of their dead is being considered. Would they have similar orientations? But what if their orientation is different, which might have been the cause?

**4. Orientation in the Eneolithic**

The researches show that, in the Romanian Neo-Eneolithic the orientation was based upon the cardinal points, or upon the Sun movement in the sky. In that period this activity had a major importance. The community mentality determined the orientation of the deceased.

The communities for whom the basic occupation was agriculture have mostly used the solar cult and they orientated after the Sun, in the East-West direction. The beginning and ending of a season was connected with the solar movement (or, in some cases, with the heliacal rise of some shining stars). The people had to notice regularly the equinoxes (when the days were equal with the nights) and the solstices (when a day or night was the longest in that year). This is how they could establish the solar arcs (the area described by the rise, or set of the Sun during the year, on the

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11 Comşa, 1995, p. 112.
12 Comşa, 1995, p. 132.
13 Comşa, 2006; Maxim et alii, 2002.
horizon). If a certain population would have used the annual movement of the Sun, then the measured directions would fall within the solar arc.

Besides East and West, the Eneolithic communities could also use other cardinal points, as sometimes we find a North-South orientation. The Neo-Eneolithic North point could have been determined in two specific ways. During the day it could be followed the movement of the Sun and its shadow (at the equinoxes). During the night it could be observed the spot around which the starry sky used to spin (the so-called world pillar). Many Neo-Eneolithic communities who relied upon the concept of world pillar as a major belief were shamanistic ones. In this case, the North point represented the spot that assured the communication with the after world, a task that could have been accomplished just by the shaman. This person, with special powers and abilities, assisted the dead in his transition to the other world and could facilitate the communication with those who were already in that world, for helping the departed to have a safe journey.\textsuperscript{14}

In recent times, the North point is in the direction of the Polaris star, of the Ursa Minor (Smaller Bear) constellation. For instance, in the year of 4800 B.C. the polar star was Edasish (iota Draconis), while in the year of 3000 B.C. the polar star was Thuban, from the Dragon constellation. Situated North from the ecliptic plan, the Dragon is a circumpolar constellation for most of its observers. Draco was one of the 48 constellations charted by Ptolemy and later one adopted in the series of the modern constellations accepted and recognized by the International Astronomical Union. This constellation is widely distributed, covering 1083 square degrees of the sky, but it comprises just 3 shining stars: Thuban (alfa Draconis), Etamin (gamma Draconis) and Rastaban (beta Draconis).

During the mentioned Eneolithic period, in most of the cultures, many necropoleis, burials, settlements, dwellings have been orientated archaeologically speaking, their azimuths distribution shows the features specific to each culture, settlement, or community from that time.

In the Neo-Eneolithic time there were also necropoleis with a different setting of the deceased, according to their rank, age, sex, showing the existence of a strict hierarchy. Sometimes, for instance, men have been buried in a flexed position, on their right side, with a West-East orientation, while women were on their left side, on an East-West direction. Such examples we find in the Bodrogkereszttur and Tisza cultures.\textsuperscript{15} In other situations, within the necropoleis, the deceased could have been arranged according to their social position: the children had been placed in a central position, the same like the women and the old individuals, while the men skeletons have been placed towards the margin of the cemetery.\textsuperscript{16} There are also cases in which the deceased of Mediterranean type were inside the solar arc, while those of Protoeuropean, or Nordic ones were outside of it.\textsuperscript{17}

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\textsuperscript{14} Oakley, 2006, p. 22-24.
\textsuperscript{15} Comșa, 2006, p.161.
\textsuperscript{16} Barlai et alii, 2002.
\textsuperscript{17} Yordanov, 1978; Szűcs-Csillik et alii, 2010a, p. 325.
\end{flushleft}
By the orientation study of a necropolis we could better infer the mentality of that population\textsuperscript{18}. Therefore, by a study and comparison of the orientation in the burials belonging to the Gumelniţa culture we could obtain more information about their mentality. Could this belief regarding the orientation of the dead be different from one community to another?

5. Orientation in the Gumelniţa Culture

Some important aspects regarding the spirituality of the Gumelniţa communities can be traced during the study of their attitude towards the deceased. The dead were grouped in special places (outside the settlements), being known several necropoleis of the vast Gumelniţa range, but there are also exceptions from this rule. The exclusive funerary rite was the inhumation ritual in a moderate or stressed flexed position, usually on the left side, the presence of the offerings, in some cases being modest ones. There are also finds of human skulls under, or around the hearths\textsuperscript{19}.

It is very interesting that compared with the entire population, the number of skeletons from the necropoleis is not proportional and some human bones depositions have been discovered in the settlements\textsuperscript{20}. We could mention here some children skeletons which have been discovered under and between the dwellings\textsuperscript{21}. A child from Hârşova had malformation of the cranial vault\textsuperscript{22} that could lead us to the presumption of the human ritual sacrifices practiced in that culture\textsuperscript{23}.

6. Orientation in the necropoleis from Durankulak, Vărăştí-Grădiştea-Ulmilor, Dridu

The cemetery of Durankulak from today Bulgaria is the largest in the Black Sea region, with 1204 burials, of which the majorities have been assigned to two main chronological periods: Eneolithic and Cooper Age. The cemetery had been used for about 1000 years and was characterized by the abundance of burials and their rich furnishings. The settlement itself has not been completely excavated so that its clear limits could not be established\textsuperscript{24}.

The dead have been laid in the pit extended on their back, or in a flexed position on their left, or right side.

The main orientation of the deceased from the Durankulak cemetery is NS (80%), with a deviation from the main direction of no more than 30°. Orientation is between 330° NNE and 17° NNW\textsuperscript{25}.

In the case of the Durankulak necropolis, the orientation of the skeletons (head position) is clearly to the N.

\textsuperscript{18} Szücs-Csillik \textit{et alii}, 2010b, p. 197.
\textsuperscript{19} Comşa, 1960, p. 5.
\textsuperscript{21} e.g. Comşa, 1987, p. 149; Kogălniceanu, 2001, p. 42.
\textsuperscript{22} Raport, 1995, p. 37; Kogălniceanu, 2001, p. 45.
\textsuperscript{23} Lewis-Williams \textit{et alii}, 1998.
\textsuperscript{24} Todorova, 2002.
\textsuperscript{25} Boyadzhiev, 2010.
At Vărăști-Grădișteea Ulmilor from Muntenia, it was discovered the biggest necropolis belonging to the Gumelnita culture (4600 – 3900 BC) from Romania. The funerary inventory consisted of flint tools, copper pins with rhombic, two-lobe or rhombic plate shaped head, clay artifacts, objects made of bone, shell beads (Dentalium), amber beads, a few golden artifacts. Most skeletons were flexed on their left side. In most cases the hands have been bent from the elbows and laid with the palms in front of their faces. According to Ion T. Dragomir, this is a worshipping gesture, being connected with the solar cult, at least for the cultural aspect Stoicani-Aldeni, a regional variant of the Gumelnita culture.

The investigated part of the necropolis from Vărăști-Grădișteea Ulmilor comprised 126 burials, out of which 118 skeletons have belonged to the Gumelnita culture. The majority of the skeletons have been orientated between 70 and 114 degrees, aspect which correspond to the eastern solar arc. On the normal distribution we can see that many skeletons are situated between the sunrise solstice points.

The East-West astronomical orientation in the Grădișteea Ulmilor Neolithic necropolis is obvious, because it was practiced a form of solar cult: sunrise and sunset was observed within the limits of a burial ritual. Out of the aligned skeletons, a rate of 92% is also inscribed within annual oscillation of the Sun in the azimuth.

A group of 9 burials (8 adults and 1 child) of the Gumelnita culture have been investigated at Dridu (Romania). All skeletons have been discovered in a flexed position, both on the right and on their left side. Those flexed of the left side have been orientated between 23 and 67 degrees, and those flexed on their right were orientated between 100 and 246 degrees. None of these graves had any grave goods. Those burials were probably part of a larger cemetery.

From the astronomical point of view, the small Dridu necropolis is orientated towards the Sun rise.

Studying the funerary practices, we can observe that some social differences existed between communities. For example, within the Gumelnita culture there are necropolises which belonged to very rich communities (Durankulak), rich communities (Vărăști-Grădișteea Ulmilor), with different grave goods, i.e. gold and copper ornaments etc., and communities which deposited almost nothing in their burials (Dridu).

7. Conclusion

The studied orientation of a culture might differ from one community to another, depending upon the main occupation practiced by the respective community and its geographical position. In the case of the Gumelnita culture, when studying the large necropoleis from Durankulak and Vărăști-Grădișteea Ulmilor we

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could notice the total different orientation of the skeletons. In the first case, the skeletons of the Gumelnita culture have a Gaussian distribution to the North, while in the second case their Gaussian distribution is to the East. Therefore, in this latter case, the orientation of the skeletons falls inside the solar arc, towards the East point.

In the case of the Durankulak necropolis we are facing a rich population, who was settled close to the Black Sea. In our point of view, one of the most important occupations of this community was trading. The richness is expressed by the grave goods, which comprise, among the usual items, some gold objects. A community in which some people were very rich and the others were poor, living from fishing or serving the rich had to have a strict spirituality. The knowledge about the sky was important for those who used to sail, for those who practiced agriculture. For the merchants mostly important it was to transport their wealth safely, when crossing the unknown regions. In the history of awareness, the magic was the first which has been developed. The shaman, from the Earth, was the most appropriate person to communicate with the sky, by using the polar star – as a symbol of the sky column (axis mundi). A Northern orientation could be found in several shamanic people\(^{30}\). Many Neo-Eneolithic communities who have the concept of world pillar as a major belief have been shamanic ones. The North point represents the spot where the living people could communicate with the dead ones by the facilities created by the shaman.

In the case of the necropolis from Varasti-Gradiștea Ulmilor and Dridu we are facing populations which had the agriculture as their main occupation. Therefore, they depended upon the seasons and the movement of the Sun in the sky. In this situation, the sky observation was very important as it could provide the forecast signs for beginning, or ending of a stage in the agriculture, or animal breeding. The solar cult, from the spirituality of these populations is mirrored by the orientation of the dead towards the sunrise, in its direction.

The orientation of the skeletons in a certain culture could be changed from one community to another, depending upon the mentality, customs, occupations and other factors which have influenced the respective population.

If we study the Neo-Eneolithic cultures from the archaeoastronomical point of view, we can find new correlations, which can help us for a better understanding of these cultures.

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