

HUNGARIAN ARCHAEOASTRONOMICAL RESEARCH I.

Astronomical Relic of the Bronze Age, the Nebra Sky Disk

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I was delighted to read Gábor Sánta's article in the summer issue of the online publication of Hungarian Archaeology about his archaeoastronomical study tour in the vicinity of Halle, Germany. His report clearly demonstrates that German archaeology not only performs archaeoastronomical research at a high level, but also enriches its museum program offerings with its results, maintaining the interest of the general public. Unfortunately in Hungary the official position of archaeological research is for the most part dismissive of archaeoastronomy. However, hopefully sooner or later the domestic results will change the view of this branch of study in a positive direction.

Archaeoastronomy is a branch of the study of archaeology. Genuine results of scientific value cannot be attained in connection with either the prehistory of the Carpathian Basin or of Europe in general without archaeological knowledge. Therefore, archaeoastronomical research involves truly interdisciplinary teamwork; archaeologists do not usually like to delve into problems of mathematics or physics, and while astronomers are able to measure and calculate everything precisely, they have no idea about what social phenomena are revealed through archaeological finds and what kind of scientific knowledge may have been behind these. At the same time it is important for both to be interested in each other's field of study, because only through this is it possible for archaeologists to pose the proper questions and astronomers to interpret the results of their calculations.

In this article I would like to briefly reflect on the German research results related to the designs found on the Nebra sky disk, about which Gábor Sánta wrote.

The Nebra sky disk is a truly extraordinary Bronze Age find. Although it was found on Mt. Mittelberg near the village of Nebra, according to materials analysis the tin needed to make the bronze of the disk and the ore used for the gold leaf applied to the surface originate from a Bronze Age mining site in Cornwall, England.¹ On the basis of the designs and signs found on the surface, the decoration of the disk is clearly related to the sky, referring to visible celestial phenomena (Fig. 1).



Fig. 1: The Nebra sky disk
(photograph: Emília Pásztor)

METHODS FOR STUDYING BRONZE AGE ASTRONOMICAL KNOWLEDGE

If we wish to analyze the designs, or at least identify them with celestial bodies or phenomena seen in the sky, then innumerable questions arise which can only be answered through archaeological knowledge. Was the "astronomical" interest of the people who made it related to the so-called folk astronomy of communities practicing a traditional way of life close to nature or must we compare it with the astronomical knowledge of Mesopotamian civilizations that performed and recorded systematic observations? Did the image of the sky depicted on the disk have a mere decorative function or did it display some kind of special knowledge and carry a specific meaning?

¹ Ehser, A. – Borg, G. – Pernicka, E.: Provenance of the gold of the Early Bronze Age Nebra Sky Disk, central Germany: geochemical characterization of natural gold from Cornwall. *European Journal of Mineralogy* 23 (2011), 895–910.



Fig. 2: Altaic shaman drum. From the figure on page 224 in: Hoppál, Mihály: *Sámánok Euráziában (Shamans in Eurasia)* (Budapest: Akadémiai Kiadó, 2005)

Both ethnographic and historical research shows that in the given period, knowledge provided the possessor with power. Knowledge that was beyond the ordinary or was specialized ensured privileges for its possessors, thereby giving them the right to maintain contact with the transcendental world on behalf of the community. From the presumed time when the disk was manufactured, or rather when it was interred (ca. 1600 B.C.E.), we have not found any evidence that would clearly suggest the existence of a separate social class that was occupied primarily with systematically observing visible celestial events and serving supernatural powers. Nor is there any clear evidence of the existence of separately constructed sacred areas – cultic centers – where systematic lavish sacrificial rites would have been presented to the sky gods. Central Europe in the Bronze Age did not know of or use writing, which would have made it possible to record the observed phenomena, compare the data compiled over a long period and amass a store of knowledge that is not possible through oral tradition.

Therefore, on the basis of our current knowledge we may imagine that the activities of this type performed

by the creators of the disk were based upon the astronomical curiosity of peoples with a traditional way of life close to nature. This curiosity is best characterized by the classification of *folk astronomy*. Folk astronomy differs from astronomy understood in the modern sense, which studies phenomena taking place in space beyond the planet Earth. The former, in addition to actual astronomical events, deals for example with the relative motion and changes of the sun, the moon and the stars, as well as atmospheric phenomena. A portion of the knowledge acquired was used for folk weather predictions, which were needed by both those who cultivated the land and who reared livestock. Since anthropomorphic depictions are quite rare in the Bronze Age archaeological finds of Central Europe, we may hypothesize that during this period it was not gods with human forms that ruled the spiritual world, and contact with supernatural entities was performed by people acting as intermediaries who perhaps are best referred to as shamans.²

What characterizes the method of depiction for folk astronomy? What events and phenomena do they record and how? The greatest numbers of portrayals related to the sky are found on shaman drums of Siberian, Sami and other peoples, which often had exterior surfaces decorated with pictures (Fig. 2). However, these indicate the world view of the shaman and the given community, showing sacred messages from long deceased ancestors, and very few give a scientific depiction of the celestial bodies. While there have been attempts to identify the markings found on Sami drums that hypothetically symbolize constellations, these have not been fully confirmed. A more accurate depiction can be expected from old folk star charts than from the drums, but unfortunately very few of these have survived. The most famous is the depiction of the heavens by the North American *Skidi Pawnee* Indians,³ whose ancestors were believed to be the descendants of the stars. This chart made on elk skin is in the Pawnee collection of the *Field Museum of*

² Pásztor, Emília: Kapcsolat ég és föld között. Megjegyzések a bronzkori 'sámánság' kérdéséhez a Kárpát-medencében (Connection between the Sky and Earth. Observations on the Issue of Bronze Age Shamanism in the Carpathian Basin). In: Czövek, J. – Dyekiss, V. – Szilágyi, Zs.: *Világügyelő. Tanulmányok Hoppál Mihály 70. születésnapjára (Essays Examining the World for Mihály Hoppál's 70th Birthday)* (Budapest: Magyar Vallástudományi Társaság, 2012), 390–416.

³ Chamberlain, Von Del: *When Stars Came Down to Earth: Cosmology of the Skidi Pawnee Indians of North America* (Los Altos: Ballena Press Anthropological Papers, 1982).

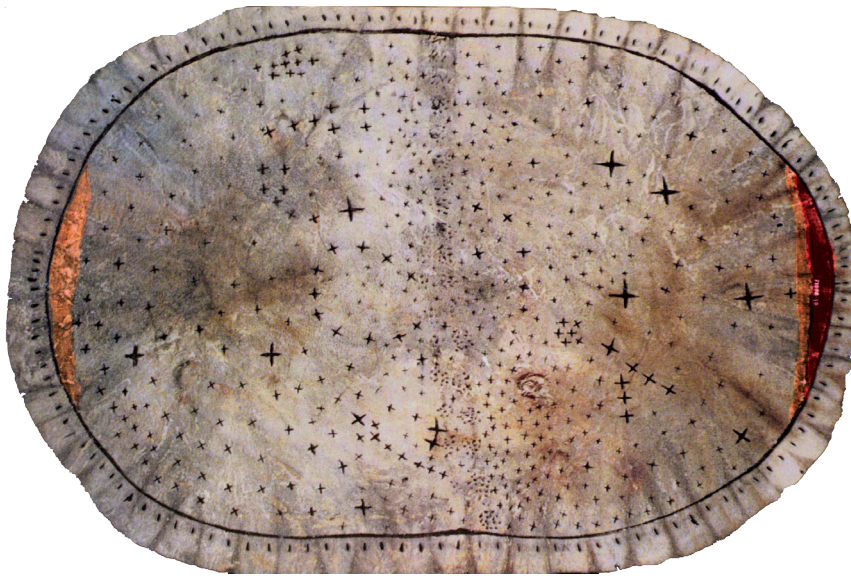


Fig. 3: The nearly 300 year-old Skidi Pawnee Indian star chart. Based on fig. 48 in: Chamberlain, Von Del: *When Stars Came Down to Earth* (Los Altos: Ballena Press, 1982)

Natural History in Chicago, and is full proof that the creators of these types of images did not represent the heavens in a photographic manner (Fig. 3). The “astronomers” of the tribe preserved the chart and for many generations passed this task down to their descendants. While through the aid of its final “keeper” many of the constellations were successfully identified, it also came to light that they primarily depicted those celestial bodies that were considered important on the basis of their beliefs. The rest of the stars represented on the chart were only an indication of the starry sky. The stars that were drawn as larger were not always in reality brighter, in contrast to the practices for modern astronomical charts where brighter stars are indicated by their proportionate size. The larger size of certain stars on the elk skin chart only indicated that they were somehow more important to the tribe. The planet Venus is depicted as two separate stars located rather distant from one another. What is most important is that on the chart they also depicted phenomena that they believed were individual elements of the celestial world, such as the shimmering gold arcs of the sunrise and sunset, which can be seen nearly every day if clouds do not conceal the sun. This outlook and these characteristics helped us, together with the Swedish astronomer Curt Roslund, formulate an interpretation of the designs on the Nebra sky disk that differed from that of the German researchers.

INTERPRETATION OF THE DESIGNS FOUND ON THE DISK

According to our opinion the disk, closely analogous to the symbolic world of the shaman drums, represents the celestial elements that had the greatest importance in the beliefs of the community that created it. It shows the sun or the full moon, the crescent moon, the arc of a rainbow, perhaps the star cluster of the



Fig. 4a: Petroglyphs, Østfold, Norway. Fig. 4b: Danish bronze razor with depictions of boats (Late Bronze Age) (photograph: Emília Pásztor)

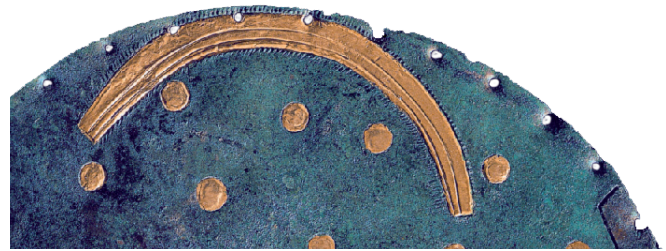


Fig. 5a: Rainbow (photograph: Emília Pásztor)

Fig. 5b: Detail of the Nebra sky disk, the rainbow symbol.

Pleiades (the Seven Sisters) and the golden shining arcs on the eastern and western horizon that precede the appearance of the sun or follow its disappearance. The rest of the gold spots are only there to suggest the star-filled nighttime sky.

The large gold disk probably depicts the sun as opposed to the full moon, because the sun always appears in known depictions of the sky. The arc symbolizing a “solar bark” (without a sun!) (Fig. 5b) according to the assertion of the German research,⁴ cannot be a representation of a boat because it is too symmetrical. There are no contemporary or later depictions of boats where the arc is not flatter, in accordance with reality (Fig. 4a). A hull shape this curved would be structurally unstable and not stay upright in the water. Furthermore, the surface of the curved gold strip is divided into three parallel bands, which may have been to symbolize the three colors of the rainbow that played an important role in later Nordic myths (Fig. 5a and 5b). The tiny grooves that run around the area of the arc (even below the bottom of the boat!) represent the radiance of the rainbow, not the oars of the sailors that are typical elements found in depictions of boats on Danish bronze razors from the late Bronze Age (Fig. 4b). However, in our interpretation the most important difference with the German research deals with determining the role of the gold arcs (one of which is missing) across from one another on the perimeter of the disk. Our position is that similar to the Native American star chart the two arcs symbolize the golden arcs of light seen on the horizon prior to sunrise and following sunset (Fig. 6). These spectacular phenomena in the sky are due to the atmosphere surrounding the Earth, which reflects the light of the sun even before we can see it or after it has disappeared. Since this phenomenon can be seen every day so long as the eastern or western horizon is not obscured by clouds, the people of the Bronze Age may have been justified in believing that they were independent elements of the heavens, just like the moon or the stars.

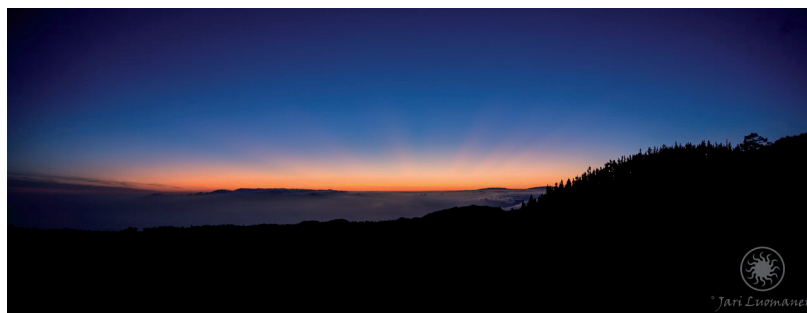


Fig. 6: Golden arc of light on the western horizon
(photograph: Jari Luomanen)

⁴ Meller, Harald (hrsg.): *Der Geschmiedete Himmel. Die weite Welt im Herzen Europas vor 3600 Jahren* (Halle/Saale: Konrad Theiss, 2004).

In contrast to the assertions of the German research,⁵ there is no proof – either ethnographic or ancient historical – that there would be any significance in the relative placement of the representations of celestial bodies that would provide further scientific information. Therefore, these assertions cannot be proven on the basis of the representations found on the archaeological find.

Nor do we have any proof yet that the Bronze Age peoples of Central Europe used a precise lunisolar calendar that was regularly and properly adjusted. This is presumably because they had no need for one. Even the ancient Egyptians first used a lunar calendar, and only later, for administrative reasons, developed a more precise calendar based on the movements of the sun. This is why the first written reference to a combined lunisolar calendar on Babylonian tablets comes so late – from the 7th–6th century B.C. While in many cases peoples following a traditional way of life close to nature determined the best times for certain agricultural and animal husbandry tasks based on the various phases of the moon, the timing was not solely set to the cyclical movement of a celestial body (in general the moon, less often a star), but instead they also paid attention to and noted signs of seasonal changes in nature. They employed a combined system to measure time and the planning of activities, and these did not demand timing that was precise to the day. For example, the North American Thompson and Shuswap native peoples calculated the passage of time by the phases of the moon, and adjusted this on the basis of the annually recurring behaviors of certain animals.⁶ It can be hypothesized that the community that possessed the Nebra sky disk also determined the passage of time according to similar principles.

In summary: The Nebra sky disk was not a calendar, and so it was not a tool to adjust the calendar either. Although it is an extraordinary find, ones of similar significance can be found in Hungary as well; it is just that the Hungarian finds have not received as much publicity. In the next issue I would like to introduce a few of these special finds from the Carpathian Basin that rival the Nebra sky disk.

Hungary is quite rich in archaeoastronomical relics; it is just that their scientific investigation is not supported, and with few exceptions they have not found their way onto the palette of museum program offerings yet. The German precedent clearly shows that there is good cause both to support this kind of research and to present its findings to the public!

RECOMMENDED LITERATURE

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Nebra Disk. In: *Handbook of Archaeoastronomy and Ethnoastronomy*, ed. Ruggles, C.L.N., 1349–1356. Heidelberg: Springer-Verlag GmbH, 2014.

⁵ Schlosser, Wolfhard: Zur astronomischen Bedeutung der Himmelsscheibe von Nebra. *Archäologie in Sachsen-Anhalt* 1 (2002), 21–23; Hansen, Ralph: Sonne oder Mond? Wie der Mensch in der Bronzezeit mit Hilfe der Himmelscheibe Sonnen- und Mondkalender ausgleichen konnte. *Archäologie in Sachsen-Anhalt* 4/2 (2006 [2007]), 289–304.

⁶ Taylor, Bernie: *Biological time* (Newberg, Oregon: The Ea Press, 2004).