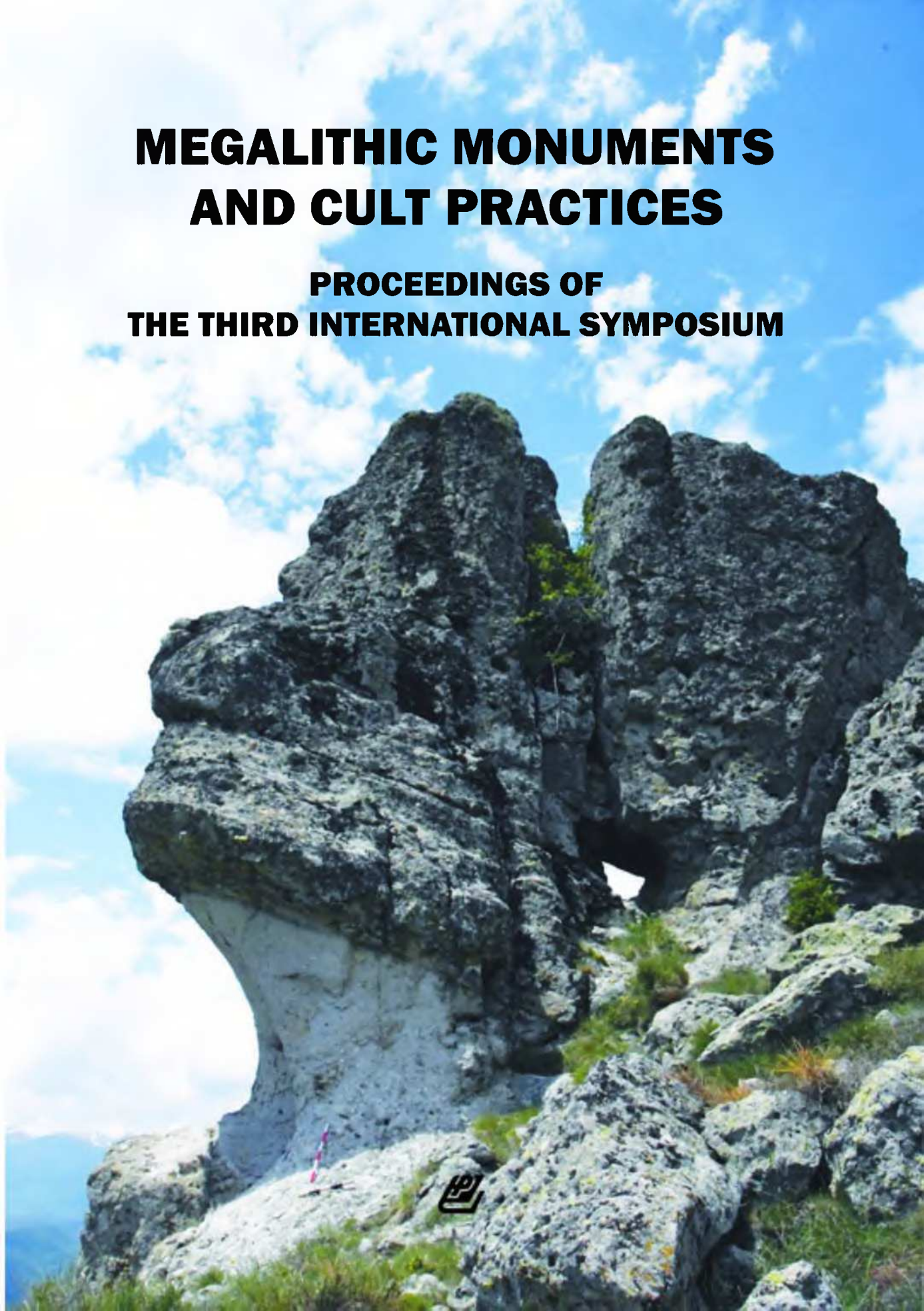
MEGALITHIC MONUMENTS AND CULT PRACTICES

PROCEEDINGS OF THE THIRD INTERNATIONAL SYMPOSIUM



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In honorem annorum LX Vassili Markov
Vivat semperque floreat per multos multosque annos!

MEGALITHIC MONUMENTS AND CULT PRACTICES

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Editors
Dr. Dimitriya Spasova
South-West University "Neofit Rilski",
Blagoevgrad, Bulgaria

Dr. Anton Genov
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Institute of Astronomy and National Astronomical Observatory,
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Prof. Dr. Ivanka Vlaeva
South-West University "Neofit Rilski",
Blagoevgrad, Bulgaria

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On the cover: Mitrovitsa peak sanctuary

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CONTENTS

PREHISTORIC SOLAR OBSERVATORY FROM THE ANCIENT SETTLEMENT OF PETROTA, HELLENIC REPUBLIC

Stavros D. Kiotsekoglou, Penka Maglova, Alexey Stoev

Abstract: The report presents an archaeoastronomical study of a rock-cut monument located on a local hill in a river valley, north of the ancient rock town of Petrota, Evros Prefecture. It consists of a central rock massif (sanctuary dedicated to the Sun god) and a circle of stones with a diameter of 20 meters. In the northeastern and southwestern part of the circle there are segments built with a double row of stones. A morphometric analysis of the rock-cut monument has been conducted. The orientation of the rock carvings was determined. An analysis of their connections with the large rock structures inside the circle and the specific relief of the near and far horizon has been made. The correlation between the individual elements of the sanctuary and the sunrises and sunsets during equinoxes and solstices gives us reason to believe monument is an ancient solar observatory. Gnomonic projections of the elements of the sanctuary on separate parts of the sacred circle make it possible to create a device for determining the moments of the longest and the shortest day of the year. Regular astronomical observations make it possible to divide the time interval into smaller periods and make a calendar structure. The chronological boundaries of existence of the rock sanctuary have been determined around the second half of 3rd millenium BC.

Keywords: Archaeoastronomy, rock-cut sanctuary, prehistoric solar observatory, Great Mother Goddess, Sun God

Introduction

The aim of research in archaeoastronomy is to clearly restore the astronomical knowledge and culture of ancient societies, taking into account the evolutionary factors in the surrounding natural environment. The culture of the rock-cut monuments – archeoastronomical sites covers representatively the Balkan Peninsula and Asia Minor. Numerous megalithic and rock-cut monuments of various kinds have also been discovered on the territory of Greece. The report presents an archaeoastronomical study of a rock sanctuary situated on a local hill in the Rhodopes Prefecture.

The Rhodope Mountains can be considered sacred. The image of the sacred mountain is a creation of man from the most ancient prehistoric times. The Sacred Mountain is a space created to house the

mysterious world of gods and mythical heroes. The image of the sacred mountain invariably includes a combination of several characteristic relief forms – a peak, a stepped slope, a cave, a water basin (spring, lake, river) in the neighborhood. An invariable element of this space are the rock-cut monuments at the top or at the foot of the mountain (Stoev & Stoeva, 2003).

Rock-cut monuments and megaliths are filled with symbolic and astronomical significance, embodying conceptual philosophies about the nature of the world inhabited by various peoples in antiquity. In this sense, the significance of these monuments, apart from an architectural and geographical perspective, is a reflection of a stronger connection with the universe and the spiritual dimensions at that time. Rock-cut monuments, rock tombs and niches, megaliths speak of religious beliefs and ritual activities related to celestial objects and phenomena within the communities themselves (Stoev & Maglova, 2015).

In addition to other things, the rock-cut monuments carry specific astronomical knowledge, a generalized observational synthesis of methods and objects, and sometimes a set of bright and characteristic signs, symbols, key notions that fit into the real cult space. They are both a starting point and a result of cognitive activity performed by the individual and the community in prehistory. The main approach is to bring out memorable spatial features, symbols that not only give an idea of the various celestial objects and phenomena, but also spiritualize them.

In the middle and second half of the XX century there was a transition in understanding the methodological significance of the concept of archaeoastronomy and archaeoastronomical object, which began to be used in various variants in different areas of astronomy in the culture of societies. In this context, the formation of archaeoastronomical hypotheses and methods represents an independent value for astronomy and history, expands their boundaries and transforms the content of prehistoric astronomy (Potemkina, Maglova & Stoev, 2006).

Rock-cut and megalithic objects are increasingly perceived as natural and social phenomena of different nature and genesis, able to create specific observational methods and tools not only in individual

places but also in the world as a whole. These monuments are the united world for prehistoric man in its ecological aspect, in the context of the system-structural relationship between man and nature. Therefore, archaeoastronomy is based on interdisciplinarity, problem-solving and practicality. If there is no transfer of knowledge between the social and natural block and the observational methodology, in prehistory complete spatial images cannot be created on the basis of only fragmented ideas about the world.

The individual astronomical objects (Sun, Moon, planets, stars, etc.), their positions and movements in the celestial sphere are essentially an interpretation of space by the ancient observer. Finally, they become pictures in the mind of ancient man when they pass into the space and structure of the cult. In most cases, the images of the observed astronomical objects are the result of two main processes – purposeful construction of facilities for observation, and reconstruction, identification on the celestial sphere. The relationship between the two processes depends on the positions of the observer – once as an astronomer and then as a priest.

One of the most accepted algorithms for creating rock-cut structures related to astronomical observations of territories includes: definition of celestial objects, phenomena and processes such as astronomical goals, design or building of the "construction" of the astronomical facility and target azimuths, data accumulation from observations, shaping a certain knowledge and obtaining a unified and complete picture of the world. Thus, the obtained astronomical knowledge can be a semantic core for creating a cosmological picture, regional cult and calendar identity in time (Muglova et al., 2007).

Here we present results from the archaeoastronomical investigations of a rock-cut monument connected with the worship of the Great Mother Goddess and the Sun God, situated in the region of the ancient settlement of Petrota, Hellenic republic.

Methodology of Archaeoastronomical Research

The methodology of archaeoastronomical investigation (Stoev et al., 2007) includes:

- determining of the geographic co-ordinates (latitude and longitude) of the rock-cut monument,

determining of the structural elements and orientation of the rock-cut monument,

- preliminary study of the archaeological data obtained from excavations or surface survey,

- preparation of a high precision horizontal and vertical plan of the rock-cut monument,

- measurement of the basic sight directions on its territory,

- making a photo panorama of the local horizon from the place of observation supposed to the ancient observer,

- measuring of the azimuths of characteristic relief marks from the visible horizon line, in order to find their relation to the structural elements and orientations at the investigated site,

- determining of the chronological boundaries of existence of rock-cut monument.

Archaeoastronomical Research of the Petrota Rock-Cut Monument (Prehistoric Solar Observatory)

The prehistoric solar observatory is the first in Greece and Greek Thrace and is situated in the wider area of Klisedzik of Petrota, 1120 m straight from the Metroon (an ancient Greek temple dedicated to the Mother Goddess) of the akropolis of Petrota (Saint George). It was found in January 2019 by the archaeologist of the Laboratory of Folklore and Social Anthropology of the Democritus University of Thrace Stavros Kiotsekoglou (2016) and the photographer and independent researcher Alexander Henig. Archaeological excavations here have not been made. The sanctuary was archaeologically investigated through surface survey technique and the ceramic found show that the most earlier use of the sanctuary is during the Eneolithic Age. Detailed archeological excavations will be made from the Ephorate of Antiquities of Rhodope (Komotini). Results and artifacts will inform us about the period of construction and use of the monument – a fact very important for the worship habits of the inhabitants of the area. An archaeoastronomical research was conducted in October 2019 by Alexey Stoev and Penka Maglova.

Figure 1. Topographic map of the area of the settlement of Petrota (M1:50000) and the ancient Solar observatory at its Northern foot: in the area are found many high rocks, rock groups of rock ridges, a combination of rocks with interesting shapes and orientation and the presence of water from various sources (Image by Alexey Stoev).

The rock-cut monument consists of a central rock massif (sanctuary) and a circle of stones with a diameter of 20 meters. Two segments of the circle are built with a double row of stones. It is located on a local hill in a river valley, North of the ancient settlement of Petrota, Evros Prefecture. In this sense, the rock peak Petrota plays the role of the sacred mountain (as Mount Olympus in Prehistory and Antiquity) for the people who created the rock-cut monument at its foot. The image of the sacred mountain invariably includes combination of several characteristic relief forms – peak, stepped slope, cave, water pool (spring, lake, river) in the neighborhood. On the topographic map of the area of the settlement of Petrota (Fig. 1) is mentioned the ancient Solar observatory located at its Northern foot. Many high rocks, rock groups

of rock ridges, a combination of rocks with interesting shapes and orientation and the presence of water from various sources are found in the area (Fig. 2).

Figure 2. Rock sanctuary with oriented shapes, carvings and additional rock structures (Photo by Alexey Stoev).

Rock-carved and other images (silhouettes) on the horizontal and vertical relief of the central rock massif (the rock sanctuary) are considered iconographic evidence of its sacred character (Fig. 3a). On the upper part of the sanctuary, into the main rock are carved three altars – forms for collecting and pouring liquids (Fig. 3b). Vertical and horizontal niches probably serving for gifts are carved on the southern wall of the rock sanctuary (Fig. 3c).

The main element of the ancient solar observatory (Fig. 4a, b) is the 20-meter circle of approximately one and the same size stones surrounding the rock sanctuary in the center. Some segments of the circle are built with a double row of stones.

Just to the North, within the circle stands a high basic rock. On its south slope one can see carved as cavities the eyes of the Great Mother Goddess (Kiotsekoglu, 2017). They testify the cult to the Great

Earthly Mother Goddess who “dwells” in the rock. Cult places are small sanctuaries spread in the wider area of Klisedzik (small church in Turkish) (Kiotsekoglou, 2018, 2019) with a ritual of hierogamic union between the Great mother Goddess and the Sun God, acting as a phallic equivalent, fertilizing Her with its first rays as a male principal. Apparently this monument bears the sanctity of a sanctuary of the Sun God, next to the ubiquitous Earthly Mother Goddess.

Figure 3a. Rock-carved images on the South-East vertical wall of the sanctuary (Photo by Alexey Stoev).

Twenty meters south of the perimeter of the stone circle is found a megalithic construction of a balanced stone, a possible symbol of sanctity, manifestation of divinity, spiritual symbol, ability of awareness or knowledge of gravity, a magic trick for the mind, a prayer or thought of gratitude as meditation with the deity. As a spiritual symbol, the stone or rock represents that which is eternal or the truth itself. And in some traditions the stones are considered to be individual spirits, or – as in the Jewish mystical traditions – silent beings (Eliade, 1981).

Figure 3b. The upper part of the sanctuary with rock forms carved into the main rock for collecting and pouring liquids (altar) (Photo by Alexey Stoev).

Figure 3c. The vertical southern wall of the rock sanctuary with carved vertical and horizontal niches probably serving for gifts (Photo by Alexey Stoev).

The orientation of the structural elements of the ancient solar observatory and their connection with characteristic points of the local horizon, in which the sun rises or sets during the equinox or solstice, has been also studied during the archaeoastronomical investigation.

The distant horizon in the East-Southeast direction has characteristic features: relatively high peaks, rock formations, ascending and descending slopes of the relief line, etc. (Fig. 5). During the winter solstice, Sun rises above a rock peak visible on the far horizon and a large stone from the circle serves as a close viewfinder (Fig. 5, 4b). The height of the local horizon line rises to a maximum of 2 degrees above the mathematical horizon (the plane perpendicular to the vertical line at the observational point).

Figure 4a. Stones arranged in a circle of approximately one and the same size, except for those in the sector of the Eastern horizon and the stone pointing exactly North. Northeastern part of the circle built with a double row of stones (Photo by Stavros Kiotsekoglou).

Close viewfinder connecting an observer on the rock sanctuary and the rising sun on the northeastern horizon during the summer solstice were also found (Fig. 4b).

Projections of shadows of rock forms of the autochthonous rock relief of the sanctuary after sunrise or before sunset (gnomon projections) make it possible to create a device for determining the moments of the longest and the shortest day of the year – the days of solstices and equinoxes.

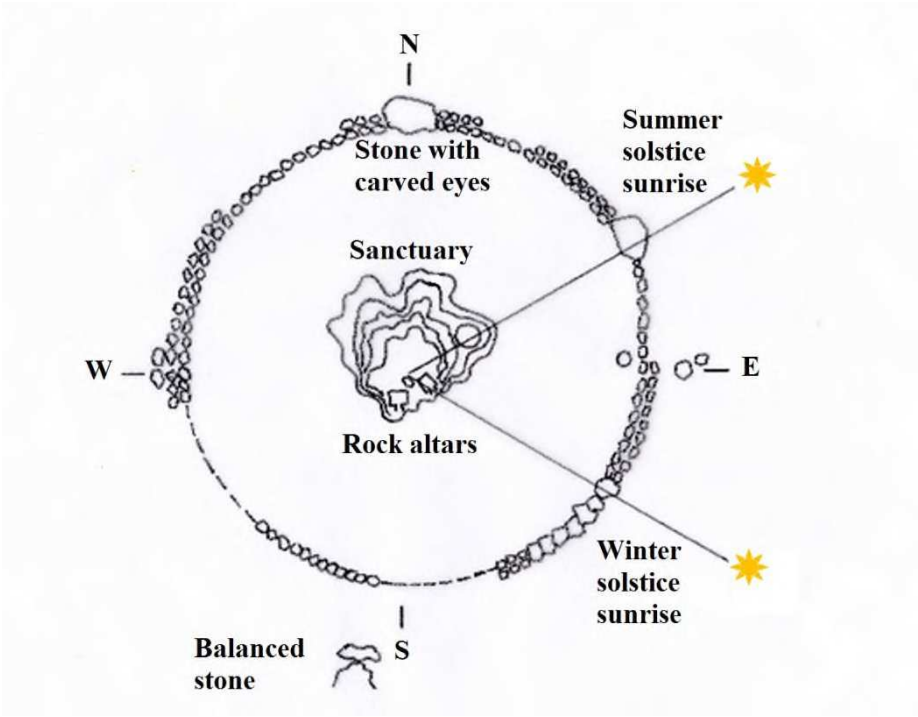

Figure 4b. Plan-scheme of the solar observatory (Made by Alexey Stoev).

The rock peak Petrota is located near the line of the main meridian (North – Zenith – South – Nadir) of the solar observatory. This is the zone of culminations (maximum elevation relative to the horizon) of day and night celestial bodies. Observation of these culminations (Stoev & Varbanova, 1993) allows to determine moments and time periods from the tropical year needed for creation and maintaining of a calendar (Fig. 6).

Figure 5. Sunrise during the winter solstice for an observer located in the central part of the circle – the rock sanctuary. Sun rises above a rock peak visible on the far horizon and a large stone from the circle serves as a close viewfinder (Photo by Alexey Stoev).

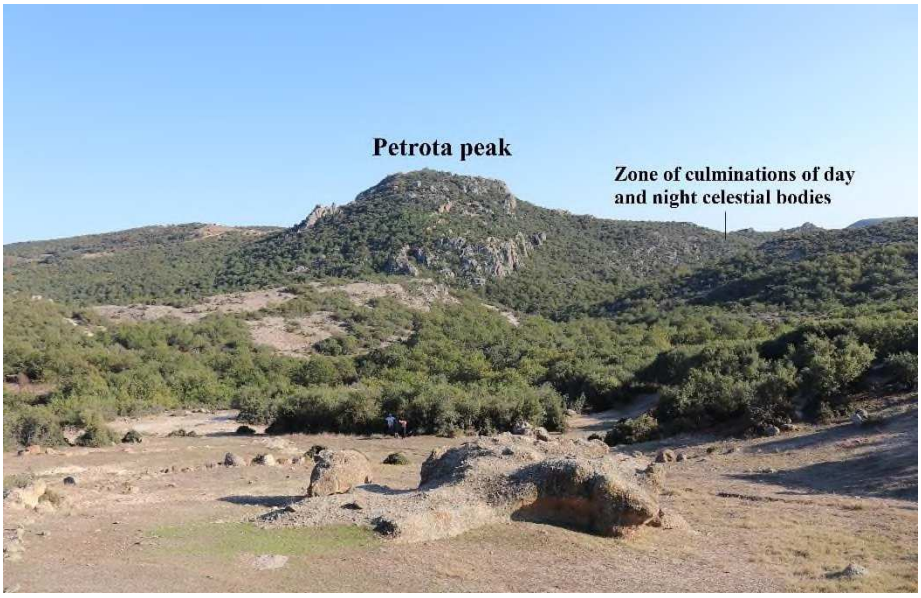

Figure 6. The Petrota rock peak – the zone of culminations of day and night celestial bodies (Photo by Alexey Stoev).

The rock landscape on the territory of Aegean Thrace is an expression not only of nature, but also of myth, culture, history and observational technologies. It is a relief of time and space.

Chronological Boundaries of Existence of the Petrota Solar Observatory

The method developed by Lockyer (Lockyer, 1907) is used to determine the chronological boundaries of the use of the object.

The method consists in measuring the declination and altitude (needed to calculate the azimuth) that the Sun would have at sunrise fixed by the summer or winter viewfinder (the upper end of the disk is taken into account) and the search for such an azimuth in archaic eras. Thus, the archeological monument is dated according to astronomical data.

The azimuth values measured for the summer and winter viewfinders (61° 10', 6 and 122° 27', 4) correspond to those for 2200 BC. The error of 30 arc minutes is within the allowable for visual observations.

Determination of Long Time Intervals (Seasons)

Visual determination of the moments of transition of the sun through the middle of the arc connecting the two extreme azimuths and also called the equinox zone allows to divide the time interval into smaller periods. It is these periods that coincide with the change of seasons.

In that era, they were structured as follows:

A) winter solstice – spring equinox – 89 days.

B) vernal equinox – summer solstice – 93 days.

C) summer solstice – autumn equinox – 93 days.

D) autumn equinox – winter solstice – 90 days.

Total in the year: 365 days

Measuring these relatively even time intervals makes it possible to create a calendar structure that allows the approximate duration of a tropical year to be measured.

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