Megalithic Structures and Dolmen Orientation in Bulgaria

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Abstract

A review of the main types of megalithic and quasi-megalithic monuments in Bulgaria is presented together with maps of their localization. A large and modern data base about the orientation of 110 Thracian dolmens (XII–VII c. BC) is interpreted in detail. The astronomic orientation principle is tested. The azimuths occupy wide sectors in South excluding the generalized north direction, but there is a little evidence for astronomically significant orientations. Looking for additional orientation principles we made a topographic analysis of dolmens. It was found that in numerous cases dolmens are oriented towards some height or peak on which ancient rock-cut sanctuary exists. Another curious principle was observed in a dolmen group in North Sakar Mountain: the neighborhood principle. As a next step the orientation of the dolmens was compared with the orientation of the classic temples under tumuli in the Thracian region (VI c. BC – III c.). The interaction between continuity and evolution is proved: the main dolmen orientation principle – towards the Sun god – has been preserved in the temple orientation in the next epoch.

Keywords: megalithic monument, Thracian dolmen, Sun god, North Sakar Mountain, archaeoastronomy

1. Introduction

Bulgaria has numerous historic monuments from different epochs. The habitation of caves (Magurata, Kozarnika, Bacho Kiro caves etc.) gives the first traces of human life here. Later people started to build their homes – this was the first step of “civil” stone architecture (Durankulak). Achieving a definite level of culture people began to develop also the sacral architecture. The first cult places were the rock-cut sanctuaries. Accumulating technological skills the ancient people in the Balkan Peninsula passed from the rock-cut to megalithic monuments: menhirs (individual, alignments, cromlechs, grids) and then dolmens (single camera, two cameras, eventually with dromos etc.).
The megaliths in West Europe and in Caucasus are rather popular, but the Balkan megaliths are practically still unknown for the wide public. The Balkan megaliths are concentrated in the East and South-East regions of Bulgaria, some dolmens are registered also in North-East Greece and in North-West Turkey. The dolmens are dated only by their last use as funeral places. The official dating so obtained is XII-VII c. BC [1]. The menhirs have not been subject of dating procedures, but in principle they are supposed to be earlier than the dolmens so we can assume as a hypothesis only a dating to XV-X c. BC. Obviously new dating techniques must be applied (e.g. optically stimulated luminescence of the surface stone layer) in order to obtain more reliable data.

In VI c. BC the building of dolmens ceases and the Thracians begin to build more sophisticated stone temples and graves which are covered by tumuli (tumuli or kurgan culture). These new objects are no longer megalithic monuments (relatively big monolithic building units, megaliths) but use a quite different architectural technique (relatively small building units - stone blocks/bricks of rectangular form - microliths). The new technique appears in Thrace under the influence of Ancient Greece and Ancient Persia. The horizontal plans of the temples are similar to the most complex dolmens but there exist also more sophisticated schemes. This type of constructions disappears in the Roman era in III c. AD only, being substituted by the well known roman architecture combining stone with fired bricks and never using tumuli in the temple design [2-4]. In the present study we shall concentrate on the megalithic objects.

2. Megalithic, quasi-megalithic objects and classic Thracian temples in Bulgaria – types and location

In recent time most of the various megalithic and quasi-megalithic objects on the Balkan Peninsula (especially in Bulgaria) were described systematically [5]. We present here a map which gives the picture of their spatial distribution. It is evident that the Balkan megalithic area interacts not only with West Mediterranean culture (Malta etc.), but also with East megalithic centers like Caucasus (West Caucasus dolmens) [6], Armenia (menhirs in Zangezur) [7] and Ural (various kinds of megaliths near Sverdlovsk) [8,9].
2.1. Menhirs and their combinations

Menhirs are found in principle not only as isolated stone blocks but also as combinations of rock pillars fixed into the ground, each combination being planned and interpreted as a common sacral object: alignments, cromlechs and grids.

About 10 individual menhirs survived in Bulgaria [5]. In South Bulgaria: 1 in Sakar Mountain, 4-5 near the town of Haskovo, 1 near the town of Blagoevgrad (South Bulgaria). In North Bulgaria: 4 near the town of Pleven, 1 near the town of Silistra.
About 150 menhirs arranged in disordered groups or in rectangular grids are preserved near the town of Pliska (North East Bulgaria) – the so called “devtash” menhirs (devtash = evil-stone). They have been discovered and published by Karel Shkorpil in 1905 [10]:

We give here some modern photographs of these objects:
Several similar menhir groups exist north from the towns of Edirne and Lalapasa (North Turkey) close to the Bulgarian border.

5 cromlechs are registered in Bulgaria today [5]. The most impressive are two of them: (1) the cromlech at the village Dolni Glavanak (East Rhodope Mountain, found by G.Nehrizov in 1998); (2) the cromlech at the village Staro Zhelezare (North from the town of Plovdiv, found by G.Kitov in 2002, practically destroyed today). Both cromlechs include about 50 menhirs.

The information about all menhirs and combinations still existing in Bulgaria is collected in the following map [13]:
2.2. Dolmens

According to some authors [1, 11, 12] more than 800 such objects survived up to the end of XIX c. Unfortunately, today – at the beginning of XXI c. – our investigations show that not more than 200 of them still exist in acceptable condition, mostly damaged. The rest of the dolmens have been probably destroyed in the beginning of XX c.

The dolmens are the most numerous megalithic structures on the Bulgarian territory and are concentrated in three typical regions: Strandzha Mountain (about 60), Sakar Mountain (about 80) and East Rhodope Mountain (about 40) [5, 13]. Several rock-cut caves (about 50) imitate the structure and the dimensions of the typical dolmens and we call them “rock dolmens” and consider them as quasi-megaliths [5].

The dolmens have different constructions expressed mainly in the plan of the stone blocks supporting the big covering plate.

In Thrace only “camera type” dolmens have been built with a great diversity of constructions:

We give here actual photos of several important relatively good preserved Thracian dolmens:
Dolmen 1, vill. Golyam Dervent, West part of North Strandzha Mnt. Carved front plate. Biggest dolmen in Strandzha Mnt.

Dolmen 2, village Golyam Dervent, West part of North Strandzha Mnt. Carved front plate.
Fragments from the carved front plate of dolmen 2, village Golyam Dervent

Dolmen-sandwich, North Sakar Mnt.

Central part of North Strandzha Mnt.

Best preserved dolmen, Sakar Mnt.

Cist like dolmen, East Rhodope Mnt.

Biggest dolmen in Sakar Mnt.

Double dolmen, Sakar Mnt.
2.3. Stone plates circles

This kind of megalithic structure is probably specific for the Balkan Peninsula. *Cromlech* represents several crude pillars forming a circle which are vertically fixed in the terrain at certain distance between them. *Stone plates circle* means a compact circular fence (around a dolmen or a tomb or a cist burial) which is formed of numerous big stone plates, vertically fixed in the terrain and contacting tightly at their lateral edges. This technique has megalithic character and differs essentially from the dry masonry applied in the numerous ordinary and cyclopic stone walls. The most perfect example of stone plates circle on the Balkan Peninsula is situated in Mycenae and enveloping the famous king’s tombs.

We have registered 6 such objects in Bulgaria till now [5] and their location is shown in the next map [13].

![Stone plates circle around a dolmen near to the village Zhelezino, Ivaylovgrad region (East Rhodope Mnt.)](image)

![Stone plates circle around a cist near to the town of Smolyan (Central Rhodope Mnt.)](image)

2.4. Quasi-megalithic monuments

We introduce the notion “quasi-megaliths” for objects representing *simultaneously* megalithic (spatial combinations of big and crude stone pillars and plates without any layer-over-layer masonry) as well as non-megalithic building techniques (dry masonry of small stone blocks, cyclopic walls or objects *partially* hewn in rocks). We ascertained 9 quasi-megalithic objects in Bulgaria today [5, 13].
We shall mention here the two most impressive monuments of this kind only:

(1) Underground well-temple at Garlo village, near the town of Breznik, West Bulgaria (40 km from Sofia) [14], [15].

(2) Tumulus tomb at Vetren dol village, near the town of Shumen, NE Bulgaria [16]
2.5. Classic Thracian temples under tumuli

The Thracian classic temples are concentrated in three basic regions: (1) around the town of Kazanlak, Central Bulgaria, (2) north-west from the town of Plovdiv, South Bulgaria, and (3) near the town of Ispерих – Sboryanovo Archaeological Preserve, North East Bulgaria. The groups (1) and (2) are connected historically with the kingdom of Odryssian and the group (3) – with the kingdom of Getae. Their horizontal planning is similar to some of the most complicated Thracian dolmens, but the coverage – false cupola and vaults – reminds the monuments in Mycenae.
Together with the plans and photos of the most interesting undertumular temples we show also their territorial distribution in respect to the megalithic areas [3, 4, 18-22].
3. Orientation of megalithic objects

Orientation is basically a geographic characteristic. It obtains an archaeo-astronomical significance only in the cases where the axis of the archaeological object is proved to be connected with the position of some celestial body (Sun, Moon, star, constellation) or with some astronomic phenomena (rise, set or culmination of the mentioned objects).

The first attempts to examine the astronomical properties of very ancient objects are made in West Europe. The famous monuments in Stonehenge and New Grange have acquired already worldwide popularity. Their geometry and orientation are connected undoubtedly and very exactly with a special position of the Sun – the winter solstice Sunrise.

The same feature is realized accurately also in three West European dolmens and it is undoubtedly tightly connected with the corresponding ideology – Labby Rock (inland dolmen A), Faldouet (East-shore dolmen B) and Porz Guen (West-shore dolmen C). These dolmens are very old IV-III mill. BC. In all three examples we observe one and the same point of interest - the Sunrise point on the shortest day of the year, when the Sun stops to decline and is born again. Not the Sunset was important but the Sunrise, the birth of the new Sun-God.

Such facts stimulated a great interest in paleo-astronomical research. Some typical examples for various European monuments are shown here:

Orientations of tumulus-tombs from Los Milares (1) and from Granada (2), Spain [23].

Orientations of two megalithic necropolises in South Iberia [37].
The picture is a little bit disappointing: the orientation of a multitude of similar objects is in no way homogeneous! A significant spread of the individual axes is observed.

We are forced to conclude that in the megalithic epoch: (i) the astronomic orientation principle is not universal in time and in space; (ii) it acts in combination with other considerations; (iii) the orientation process has been technically not very precise.

5. Cults in Thrace as spiritual background for the orientation of megalithic objects

It has been already proven with a high degree of reliability that the Solar Cult is most widely represented in sacred monuments over the territory of ancient Thracia - north and central part of the Balkan Peninsula [26]. Some artifacts originating from V - IV mill. BC allow to be interpreted as solar and lunar calendars: decorated clay figurines from Ovcharovo village near Targovishte, North-East Bulgaria, and golden plates with symbolic scenes from Letnitsa village near Lovech, Central North Bulgaria. Traces from solar cults are detected in numerous ancient rock-cut shrines dated in II mill. BC: Belintash, Harman-kaya and Angel voyvoda in Rhodope Mountain, rock-cut ritual complex in Sliven region in Balkan Mountain.

Solar monuments are found from I mill. BC till the Roman time IV c. AD: Thracian cult buildings, rock-carvings near Burgas, southern Black sea coast, rock tombs near Kavarna, northern Black sea coast, Sarmizegetusa ritual complex in Romania.

In the period XII-VI c. BC in the East part of the Balkan Peninsula a relatively big and multiform megalithic field appears, including several hundreds of dolmens, menhirs, cromlechs etc. The
Thracian dolmens are studied from an archaeoastronomical viewpoint in the beginning of XXI c. [27-31]. As it will be demonstrated in detail further in the present review, they do not demonstrate well defined orientation but they are also directed to the South semi-horizon predominantly, i.e. to the culmination of the sun, to the Sun god in his maximum power.

In the interval V - II c. BC the megalithic technique in Thracia is replaced by skilful masonry of well processed quadrae and of fired bricks. The typical sacred objects created in Thracia are monumental tombs and/or temples under tumuli. As shown by means of photographs and schemes above they combine the horizontal plans of the most developed two-camera dolmens with dromos (the local Thracian tradition) with the older pattern of Aegean vaulted constructions (the Mycenaean tradition) and with the tumular coverage of Scythian origin. [3, 4, 18]. The classic Thracian temples under tumuli from the period V c. BC - III c. AD demonstrate the same predominantly southern orientation of the dromos.

LUNAR OR STELLAR CULTS are not noticeably documented in ancient cult monuments in Thracia with one curious exception - the Baylovo cave near Sofia [26 (1991)]. A good review about the astronomical knowledge in the classical Thracian society from the middle of I mill. BC till the end of the Roman time as described by ancient authors is presented in [26 (1991)].

6. Orientation of menhir grids in Bulgaria

Menhir alignments are described in the literature but they are not preserved in Bulgaria today.

K. Shkorpil [10] reports two kinds of menhir groups in the vicinity of the village of Pliska, NE from Shumen: ordered and disordered groups. The ordered menhirs are located on the terrain as rectangular grids and therefore they could be analyzed as oriented structures.
Grid arrangement of menhirs occurs rather rarely - some examples from UK and France (Brittany) are shown here. Some of the grids are oriented to a tumulus, some – to a dolmen, some - to a kind of cromlech, but some of them do not have any noticeable orientation centre at all (at least survived till modern times).

Menhir grids in UK and France [32]

The menhir grids near Pliska as a specific manner of arrangement are not unique among the menhir areas in the world. However, it is practically impossible to be proved today if the grids around Pliska have had some kind of centers of orientation in the megalithic epoch: the terrain has been cultivated rather long time. The direction of such structures cannot be defined strictly. Let us accept the following convention for the orientation of a grid: from all 4 possible directions of the menhir rows we choose that direction, which is most close to South. Based on such assumption we find that the azimuths of the groups are distributed close to the exact South: 153°, 172°, 180°, 192° and 194°:

This conclusion stays in agreement with the most developed solar cult in Thrace but is not unique in the megalithic world - the “devtash” menhir grids near Pliska are similar to the stone-rows in West Ireland for example:

Orientation of stone-rows in West Ireland [33].
5. Orientation of dolmens in Bulgaria – global picture

A special study of the dolmens’ orientation in Bulgaria, based on published data and schemes only, was undertaken by N. Dermendzhiev in his PhD thesis [34]. He analyzed about 60 dolmens from archaeo-astronomical point of view to verify if they are oriented to some astronomical events (mainly sunrises or sunsets) or not. He concluded that the Thracian dolmens are most frequently oriented towards South in a very wide angular interval and are definitively not directed to sunrise or sunset points. He supposed that this fact reflects some taboo funeral practices.

In order to prove the presence of astronomic elements in the orientation of the dolmens in Bulgaria by direct modern measurements two astronomers from Spain - A.C.González-Garcia and J.A.Belmonte (Autonomous University of Madrid and Instituto de Astrofísica de Canarias) - proposed and supported two expeditions 2006 and 2008. The research team included also investigators from the Bulgarian Academy of Sciences - Dimiter Kolev, Vesselina Koleva (Institute of Astronomy) and Lyubomir Tsonev (Institute of Solid State Physics).

The first expedition in 2006 made a tour over the East and Central parts of North Strandzha (North Strandzha Mnt. lies in Bulgaria and South Strandzha Mnt. lies in Turkey; we divide for convenience North Strandzha Mnt. in East, Central and West part). 31 dolmens were localized and measured. The results were published elsewhere [35]:

![Diagram showing orientation of dolmens in Bulgaria](image)

The long solid lines are the solar limits, while the long dashed lines are the lunar limits. Certain slight concentration to the South-West is noticed. We present some typical examples here:

Dolmens in East part of North Strandzha Mnt.: vill. Brashlyan (left) and Black Sea coast around Primorsko resort (right).
Dolmens in Central part of Strandzha Mnt.: vill. Evrenozovo (left) and Zabernovo (right).

The second expedition in 2008 included West and Central parts of North Strandzha, Sakar and East Rhodope Mountains. 54 dolmens were visited. Combined with the previous 31 dolmens the entire data base increased to the position and the orientation of 31+54=85 dolmens [27, 36]. Here are some typical examples of physical maps where dolmen orientation is plotted:

Orientation of dolmens near vill. Golyam Dervent, West part of North Strandzha Mnt.

Dolmens near the vill. Belevren, Central part of North Strandzha Mnt.
Dolmen group near the vill. Chernichevo, Krumovgrad region (East Rhodope Mnt.)

Orientation of the dolmens near the vill. Zhelezino and Plevun, Ivaylovgrad region (East Rhodope Mnt.).

The cumulative histogram looks as follows:

85 dolmens from the expeditions in 2006 and 2008
There are no dolmens with the entrance facing North, and all dolmens face from exact East to the summer solstice sunset, with a clear concentration toward the South-West, originating mainly from the Strandzha dolmens. Most of the dolmens oriented in East and West correspond to East Rhodope Mnt. and South Sakar Mnt. In total, 74% of the dolmens are outside the solar extremes (rising or setting), which is observed among most megalithic groups in the Mediterranean [23]. Also 67% of the dolmens are outside the lunar extremes.

The third expedition in 2010 covered Sakar Mountain only. 25 new dolmens were registered. So, the data base increased to 85+25=110 dolmens, and this is not the final number. New expeditions are needed to finish this research program. The conclusions became more reliable. The accumulation of new data does not influence noticeably the main impression about the global orientation behavior of the entire dolmen area in Bulgarian territory:


There is a clear maximum at 198°, the extremes of this maximum are around 182° and 225°. The maximum is thus skewed toward the South-West. It is connected with Strandzha dolmens. The dolmens in Sakar Mnt. (as well as in East Rhodope Mnt.) are distributed uniformly:
Conclusions about the global azimuthal distribution:

The global analysis and give us the reasons to make the following observations.

First: Absence of a strongly expressed and astronomically important direction is obvious. It seems not likely that the dolmens have been built according to astronomically noticeable directions (risings or sets of Sun, Moon or some stars). There is only a tendency towards South but it is in no way a binding rule. All dolmens are oriented roughly to the South semi-horizon, i.e. the dolmen builders have tried to keep at least a weak connection with the Sun (Sun-God) when it is relatively high over the horizon.

Second: The maximum in the azimuthal distribution is generated mainly by the contribution of the Strandzha dolmens and it is connected with the Sun highest daily position rather than with Sunrise and Sunset. The orientations of the dolmens in the other two regions (Sakar and Rhodope Mnt.) are spread more or less uniformly between South-East and South-West, without a clearly expressed maximum. In this sense the orientation tendencies in the three geographic regions are different. Therefore the examination of some smaller dolmen areas after the global analysis seems to be desirable and can be recommended.

Third: Examining particular objects we observed drastically different orientations of several very closely located dolmens. This situation cannot be a result of one and the same orientation principle.

Fourth: There is not even a single dolmen oriented between azimuths -60° (or 300°) and 80°, i.e. the North semi-horizon is excluded by the dolmen builders in principle. The purely east orientation is demonstrated very rarely – only by several dolmens in East Rhodope.

Fifth: The study of dolmen orientation has not to be reduced to the global statistics. It is recommended to combine different levels of analysis – global (3 mountains together), regional (each mountain separately) and local (part of a mountain) – in order to derive all possible information. It is very hard, if not impossible, to find out the orientation reasons for each individual dolmen from the ensemble.

In other words, the astronomical orientation of the dolmens in Bulgaria is not categorically expressed. However, such assumption should not be rejected a priori as far as the azimuth sector of the risings and sets of the Sun is wide enough. We have to look for other orientation principles, which are applied together with the basic solar principle.

6. Looking for additional orientation principles

After obtaining the global picture accumulating all data from the three mountains in Bulgaria into a simple histogram we decided to extract more information on a different way – reducing the examined dolmen area and plotting of the dolmen directions on the respective relief-map. In this way we succeeded to find out two additional orientation principles of a lower level. In order to illustrate this methodology we present here the combined orientation-topography scheme of the dolmens in Sakar Mnt. including all registered objects (2008+2010). The resulting picture [30, 36] is rather complex:
6.1. “Sacral topocentric” principle

Sakar Mnt. turns out to be a very interesting region when examined closely. In most cases the dolmens “are looking” at a hill or at a peak located somewhere in the generalized South azimuthal sector. Therefore the key idea of the dolmen builders seems to be based on the special respect to the “peak”, “mountain”, “rock” (some of the peaks are rocky). These topocentric connections show that the astronomical orientation has not been the decisive argument for the megalithic age people when choosing the dolmen orientation. For many dolmens the surrounding landscape offers not one but several hills satisfying the requirement to lie in the generalized south azimuthal sector. The idea “to see” some peak is not sufficient to explain the real orientation of each individual dolmen. Therefore the question why a specific peak has been chosen and not some neighbor of it remains open for the present. We noticed that the “dolmen attracting peaks” contain very ancient rock-cut sanctuaries!

Not all Sakar dolmens are oriented according to the combined “solar & sacral-topographic” principle. However, most of the objects in South Sakar Mnt. satisfy it obviously [27, 36]:

![Map of dolmen orientations and topographic features in Sakar Mnt.](image.png)
Orientation of South Sakar dolmens to sacred peaks: Tekebair and Dervish hill in Sakar Mnt., Prestoy, St. Marina and Sheynovets peaks in East Rhodope Mnt.

*Example A.* The dolmens in *Nachevi châiri* (North Sakar, village Hlyabovo) looking at the nearby hills *Masarliyski vazvisheniya* (450-500 m) above the neighboring village Balgarska polyana. According to our information these hills are not a casual place: big dolmens have existed there in the past times (now destroyed).

*Example B.* A very impressive example offer many dolmens in the West part of South Sakar Mnt. - their “target-peaks” are very distant (more than 50 km!) - *St Marina* (709) and *Prestoy* (610), situated in the Rhodopean ridge called *Gorata* (*The forest*). Recently the archaeologists found there about one hundred rock-cut niches forming the cult centre *Gluhite kamani* from III-II mill. BC.

*Example C.* Sometimes several peaks are collinearly arranged in respect to a given dolmen. For example the orientation axis of the dolmens near the village Cherepovo passes firstly over the peak *Gradishte* (368 m) in Sakar Mnt. itself and than over the much more distant peak *St. Marina* (709 m) in *Gorata* ridge.

*Example D.* The big dolmen in *Byalata treva* is looking at one nameless small peak (665.4 m) in Sakar Mnt., but also at the imposing peak *Sheynovets* (703 m) on the far horizon. Peak *Sheynovets* (703) is situated on the very East end of *Gorata ridge*, but in the vicinity of this peak another big group of rock-cut niches is located which possesses also the characteristics of a typical very old Rhodopean sanctuary.
Example E. Let’s pay attention to the dolmens in the East part of South Sakar Mnt. – around the village Radovets. We find there a group of about 15 small dolmens. From the place where this group is situated one can see two peak zones: (1) In South-West direction - the very distant Rhodopean ridge Gorata and (2) In West direction - the relatively close Monastery Hills (15 km) which form the South foot of the Sakar Mnt. All dolmens near the village Radovets face definitively the Monastery Hills (including Dervish hill) and not Gorata ridge!

Our investigation found out that the sacral relation between the South Sakar Monastery Hills and the Rhodopean ridge Gorata is recorded in the local folklore.

6.2. “Neighbor” principle

Some of the North Sakar dolmens forming the most populated group in the triangle between the villages Bylgarska polyana – Hlyabovo - Sakartsi demonstrate a curious and even more complex orientation behavior. While some of the dolmens are looking at prominent hills or peaks (like both dolmens in the locality Nachevi chairi), other are directed rather to ... another neighboring dolmen! For example, the dolmen in the locality Gaydarova peshtera is oriented almost perfectly to the big dolmen in the locality Byalata treva. The dolmen in the locality Zhelyov dol, south from Sakartsi, is also oriented to the very impressive pair of dolmen-tumuli in the locality Mangara, near the peak Kemiktepe (759.8 m). The dolmens in the locality Mangara have the highest altitude among all investigated dolmens (700-705 m). They are oriented possibly to the peak Taushanbair (594.1), which is more than 100 m lower and is situated about 3 km apart in South direction (it corresponds well to the measured altitude of the horizon of -1° – -2°). The big two-camera dolmen in the locality Byalata treva is directed most probably to the peak 665.4 m, while the second small and poorly preserved dolmen is looking approximately towards both Mangara-dolmens.

When one dolmen is looking at another dolmen the following question arises: Is this a sign for subordinate hierarchic dependence? In such cases we could suppose a temporal sequence in building the respective dolmens – the target-dolmen has to be the earlier one. In the same time the orientation to another dolmen can coincide with the direction to some peak in the landscape. Here once again the question about the choice of the dolmen’s place arises together with the question about the methods to trace the direction if a direct visibility is missing.

Even the combination between astronomical, topocentric and neighborhood arguments cannot explain the cases, where near-by placed and possibly synchronous dolmens are “looking” in quite different directions – like the locality Byalata treva in North Sakar. So we are forced to look for additional orientation principles. Another possible hypothesis could be that the dolmens are oriented according to individual preferences like totem traditions.
Dolmens near the villages Balgarska polyana, Hlyabovo and Sakartsi (North Sakar Mnt.). The vertical black lines denote the south direction; the light-colored arrows denote the magnetic azimuths, the black inclined arrows give the dolmen orientation [27, 36].

The combination of several principles leads us to a new problem - the problem about their hierarchy and also about the possible compromises between them. Based on the entire analysis presented so far we conclude that in situations like the three West European dolmens A, B, C mentioned in the beginning of Sect. 3 we have to be very carefully - we should avoid overestimation of orientations of single dolmens belonging to rather different megalithic areas with different cult background; especially when these dolmens have been mentally separated from the respective ensembles where they belong in principle.

7. Comparison between orientation of dolmens and orientation of classic Thracian temples

In Sections 5 and 6 we proved that it is very fruitful to analyze the dolmens on different levels in space: global, intermediate, local. In a very similar way we tend to suppose that it will be useful if we stratify the total of Balkan dolmens on different levels in time. May be this approach will enable to demonstrate the evolution of the orientation concepts at different stages of the megalithic development.

Unfortunately, we met a serious difficulty here which cannot be overcome in a visible future. For such investigation we need noticeably more exact dating of all Balkan dolmens. The interval for building the Thracian dolmens which is officially accepted today XII-VII c. BC is too wide to give the opportunity for serious research on dolmen evolution. In other words, a new dating offensive from the very beginning is indispensable which has to use modern precise dating techniques like Optically Stimulated Luminescence (OSL) [38-42].
As long as we await the realization of the above described research program (which will not happen in a near future), we decided to look for additional information comparing the orientation histogram of the dolmens from the earlier period XII-VII c. BC as a whole with the orientation histogram of the classic Thracian temples built immediately after the dolmens, i.e. during the later period VI c. BC – III c. AD as a whole. We have some reasons to suppose that both kinds of archaeological monuments (dolmens and classic temples under tumuli) are built by the same ethnic group – Thracians - at consecutive stages of its evolution.

The data about the dromos directions of temples are taken from the literature [17]-[22]. The comparison is extraordinary interesting.

The later (classic temple) histogram helps us to clarify some details in the earlier (dolmen) histogram. We find here some similarities – expression of the cultural tradition, of continuity, as well as some differences – demonstration of cultural development.

Conclusions about the dolmen and temple orientation in Thrace

First: The old megalithic building technique has been replaced by the new microlithic building technique, but the sacral, religious, ideological contents of the temples has been preserved in the new historic epoch. The main principle – orientation mainly to the Sun (Sun-God) in its highest daily position and sometimes to its equinoctial positions - has remained the same in the new epoch! This fact represents convincingly the continuity in the cultural development in Thrace during two consecutive historic periods.

Second: The temple builders have been attracted besides by the Sun highest daily position also by the Sun equinoxes and not by the Sun solstices! These two attractive orientations are present also in the dolmen epoch, but they are not so clearly expressed for two reasons: (a) the lower orientation precision of the dolmen builders; (b) the dolmen builders often combined the main principle (an indispensable but weak connection with the Sun, i.e. orientation to the generalized South) with various additional local non-obligatory considerations (sacred topocentrism, neighborhood etc.) according to a hierarchical scheme which is rather complicated and still not clear enough.

Third: The contrast in the later histogram is stronger in respect to the earlier one - the essential cult ideas (i.e. orientation principles and respective directions) are underlined in respect to the ideas of lower significance. This transformation may be provoked not only by the purely technical elaboration of the orientation skills in the classic epoch but also by the evolution of the cult ideas,
practices, rites etc. The temple histogram is simplified and the really astronomically relevant directions are more clearly outlined. Therefore, the role of the additional, local, secondary orientation principles from the dolmen epoch becomes weaker, the main principle dominates already. The cult to the Sun undergoes an original purification and simplification. This process is a manifestation of the parallel running territorial and economical consolidation of the Thracian tribes which reaches its maximum in the foundation of the Odryssian kingdom (South-East Bulgaria) and Getae kingdom (North-East Bulgaria) about V c. BC.

Taking in mind the canonical and obligatory East orientation of the new Christian temples which appeared in the Balkan Peninsula in Roman times (since IV c.) we have a good reason to conclude that archaeo-astronomical measurement and analysis can give additional specific and useful information about the state and the development of ancient societies.

Acknowledgements

The authors express gratitude to the following institutions and persons for their support: Prof. A.S.González-García (Madrid, Spain); Prof. D. Mitova-Dzhonova, DSc (Sofia, Bulgaria); Mr. Hristo Hristov (Kazanlak, Bulgaria), Mrs. Reni Apostolova and Mr. Filip Apostolov (Shumen, Bulgaria), Mr. Theodor Rokov (Varna, Bulgaria), Mr. Yanko Dinchev (Plovdiv, Bulgaria).

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28.12.2013

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