



The most significant values  
of the cultural and natural heritage

# KOKINO – A HOLY MOUNTAIN AND AN OBSERVATORY FOR 4000 YEARS



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The most significant values of the  
cultural and natural heritage of  
the Republic of Macedonia

# **KOKINO – A HOLY MOUNTAIN AND AN OBSERVATORY FOR 4000 YEARS**

Jovica Stankovski

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# FOREWORD

## MACEDONIAN CULTURAL AND NATURAL HERITAGE

Throughout the course of history until present days, Macedonian cultural and natural heritage has never been of greater interest to the national and international public as it is today.

Its presentation afore the general public with dedicated promotional publications is one of the tasks of the Directorate for Protection of Cultural Heritage, which deems to showcase the rich treasures of our historical past and the preserved natural landscapes.

Ever since the Palaeolithic and the Neolithic, the Bronze Age and the Iron Age, Antiquity and the Medieval period, all of the great achievements of the civilizations which have dwelt in this land, have been researched and presented for the readers in our country and worldwide.

This edition is a continuation of our intention to widen the access to the cultural and natural heritage for all. In this manner, we believe, everyone can come closer to the significant archaeological monuments, the sacral heritage, the old urban ensembles and the specific natural areas.

By presenting its heritage, the Republic of Macedonia offers its contribution towards the heritage of the world, since these publications aim to preserve the important moments of our history for the future generations.

Eleonora Petrova Mitevskva, PhD

# KOKINO – A HOLY MOUNTAIN AND AN OBSERVATORY FOR 4000 YEARS

## Toward Kokino

At a distance of 9 km northeast of Kumanovo, the highway leading to Bulgaria enters the territory of the municipality of Staro Nagorichane. Here is located a large basalt rock, behind which, from the left side of the main road, starts another asphalt road leading up to the village of Staro



FIG. 1. Kostoperska Karpa, panoramic view

Nagorichane - the centre of the municipality of Staro Nagorichane. This massive volcanic accumulation, known as Kostoperska Karpa (rock) or Zegligovski Kamen (stone), announces the entrance into remarkable scenery by means of its imposing appearance and picturesque display, which, at certain points, seems as if frozen in time and space. By means of field multidisciplinary research, only a fraction of its natural, cultural and historic treasures have been valorised and registered thus far. Kostoperska Karpa is one of the first researched sites in this region. Remains of settlements, necropoles and sacred objects dating from the Neolithic to the Late Middle Ages have been discovered at, and around, its base. Although only a small part of the site has been explored so far, the richness and the exceptional beauty of the archaeological findings, as well as its geographical uniqueness, have inscribed it on the list of monuments protected by law (Fig. 1). Moving towards Kokino and passing by the village of Staro Nagorichane, looking from a distance, one can notice the church of Sv. Gjorgji (St. George), located in the village centre. It dates from the 14<sup>th</sup> century and is also classified as a cultural monument. Behind the last village houses, the road descends towards the valley of the river Pchinja and, following its course, leads to the border with the Republic of Serbia. In order to reach the village of Kokino, this road should be abandoned and one needs to cross over Pchinja, near the village of Dragomance, which is located at only 3 km from Staro Nagorichane. Dragomance is one of the largest lowland villages in the municipality, with fertile fields on the left bank of Pchinja. Further down, the road narrows and winds through the hilly southern slopes of Kozjak, overgrown with low shrub vegetation, where, oftentimes, smaller sheep herds can be seen grazing. In places the pastures touch the small rural groves of rare oak forest, as well as the large complexes of pine forest, planted as part of the intense forestation activities of forty years ago.

From the village of Dragomance to the village of Kokino, there is a twenty minute drive due to the winding narrow road, although the distance is only 10 km. The hill above the village of Kokino, where the large archaeological site is located, is visible almost as soon as the last houses on the outskirts of the village of Dragomance are passed.

## Topography of the site

The site is located on the massive hill called Tatikjev Kamen, at an altitude of 1013 m. Its rocky peak is shaped like a saddle (Fig. 2). Geologically, it is an extinguished volcano on the outskirts of the so-called Kratovo-Zletovo volcanic area. After its final eruption, which occurred millions of years ago, the lava remained petrified and formed grey andensite rocks, which act as a challenge to time with their ridged appearance. The asphalt road that leads up to the village of Arbanashko, as well as the deep valley on its right, encircle it from the south and



FIG. 2. The hill Tatikjev Kamen, village of Kokino, panoramic view



southwest whereas the black road that leads to one of the village neighbourhoods surrounds it from the east. In the north and the northwest, the hill descends steeply into a deep and dry valley. Due to its imposing size and appearance, it dominates the surrounding space. It is inaccessible to the east and west side, where the rocks descend almost vertically. If one excludes the access from the north side, which was built by the prehistoric inhabitants, the top of the hill Tatikjev Kamen can only be reached from the southeast side, where a mild slope descends to its base (Fig. 3).



FIG. 3. Access to the site from the southeast

## Spatial arrangement



FIG. 4. View to the west from the highest point of the site:  
A – marker, B - trench, C - thrones, D - upper platform





FIG. 5. Stone seats, “thrones”, on the lower western platform

The site is very complex, containing many elements, some of which are quite easily visible, while others are not so easily distinguished by the visitor. At the top of the hill, one can instantly notice human intervention in the careful creation of all the elements that constitute this unique site. The visitor can perceive two flattened platforms: *an upper platform* and *a lower platform* (platform I) in whose midst of volcanic rock was carved an assembly of several *stone seats* or stone “thrones” extending in a north-south direction so that the one who sits on them is facing the eastern horizon (Fig. 4, Fig. 5). These two platforms are connected by means of a steep passage that starts as an artificially cut crossing into the rocks on the west side of the upper platform. This manner of shaping the hill was a great building venture for prehistoric inhabitants, though the manner in which the lava poured out, as well as the horizontal and vertical cracks caused by its cooling, greatly facilitated their building efforts.

There are other shapes on the site created by the prehistoric inhabitants, though not easily discernible. Twenty meters southeast of the stone seats was created a small *circular platform* (platform II) or an “astronomical platform”, used to observe the movement of the sun and the moon (Fig. 6). This platform has not been fully preserved. It had a specific access - a steep passage cut into the south-eastern rock. It was named the “passage of the old astronomer” and its existence shows that the one who observed the sun and the moon of platform II of the eastern horizon was allowed to move only in a strictly defined and limited space so as not to desecrate the sacred space intended for performing rituals (Fig. 7).



FIG. 6. Platform II ("astronomical platform"), central observation position



FIG. 7. View to the eastern horizon of platform II, markers for:  
 1. maximum declination of the moon in winter, 2. summer solstice,  
 3. minimal declination of the moon in winter, 4. vernal and autumnal equinox,  
 5. minimal declination of the moon in summer, 6. winter solstice and  
 7. maximum declination of the moon in summer





FIG. 8. Platform III on the northern terrace during cleaning at the archaeological excavations

Another astronomical platform (platform III) was established at the western perimeter of the artificially smoothed terrace located on the northern slope of the site (Fig. 8). Significant quantities of archaeological finds were discovered here.

In addition to these large, and to some extent monumental elements, there are



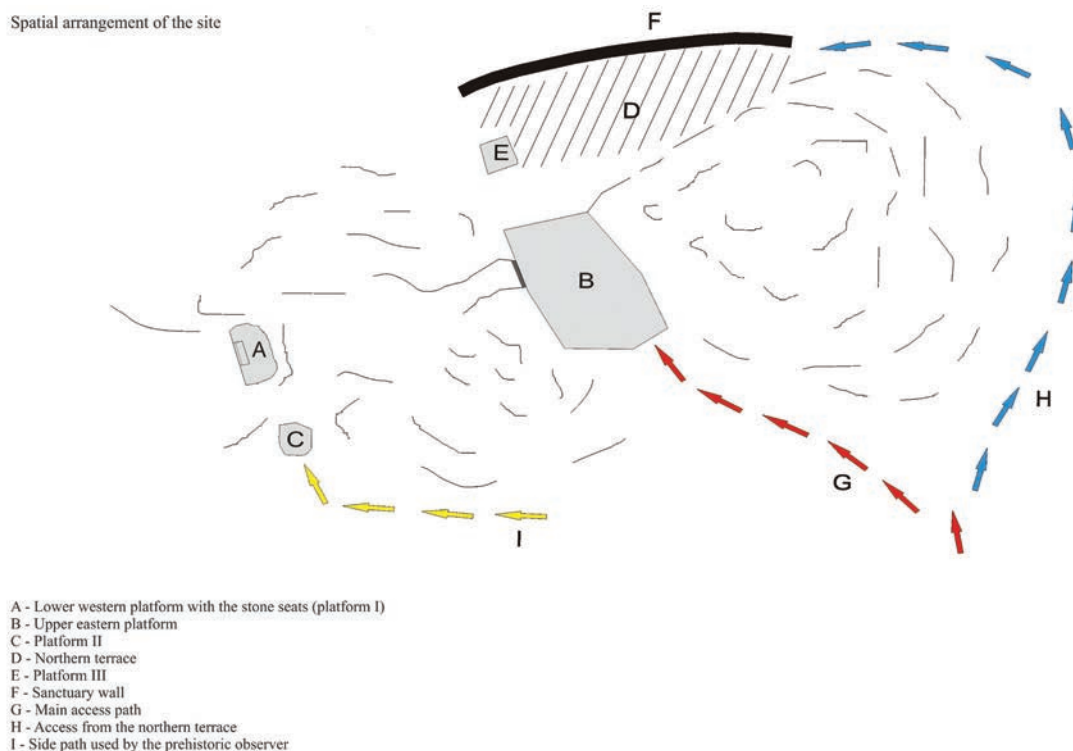
FIG. 9. Ritual pit surrounded by large stone slabs



FIG. 10. Circular stone construction, with a supporting wall to level the terrain



Spatial arrangement of the site



Drawing 1

Drawing 1. Spatial arrangement of the site.

smaller “immovable” archaeological formations. They represented ritual *pits* for placing gifts (Fig. 9), and *circular stone formations* (Fig. 10). Both had a cult function that will be elaborated below.

The whole area was surrounded by a relatively high wall, around 1.20 m wide, visible almost along the entire length (drawing 1). The function of the wall was to mark the holy space, the so-called “Temenos”, which contained the elements that were described above, and separate it from the other “profane” space where cult ceremonies were not performed.

## Research history

The archaeological site of Kokino was discovered by the archaeologist Jovica Stankovski in 2001. The first archaeological excavations at the top of the hill Tatikjev Kamen were conducted at the end of 2001, when the team of the NI Museum - Kumanovo, comprised of Jovica Stankovski - head of excavations, Lenka Trajkovska - archaeologist, Slavica Cvetanovska - architect and Slobodan Zafirovski - photographer, started to excavate the upper flattened area. Even with the initial excavations, judging by the abundance and beauty of the archaeological material, it was clear that it represented an extremely abundant and significant archaeological site. The excavations continued in the spring of 2002, and upon the request of the archaeological team, the first

astronomical measurements were made in the summer and autumn of that year. Since then, research is being conducted continuously each year. The latest astronomical research, carried out on platform III of the north terrace, provided new findings regarding the astronomical activities of the prehistoric observers of the sky. It was revealed that star Aldebaran was observed from this point, and, most likely, the constellation Pleiades and the appearance of the sun during the spring and autumn equinox, as well.

## What precisely is Kokino?

Ever since ancient times, man has been fascinated by the natural forces and elements which he treated as deities: the Sun, Earth, Fire, Water, and Wind. The principal position belonged to the Sun god, who was considered the father of all living beings, and the Earth, who was called the Great Goddess - Mother, patroness of living nature that, after being fertilized by the Sun, brought into the world all living beings and all that surrounds us. People thought that if they complied with these two deities, they would ensure the continuity of life, and that after a long winter, which was a threat to the survival of the community, the rebirth of nature would occur in early spring.

These natural forces were sometimes perceived by people as an inexplicable force without a shape, though they often personified them, giving them a particular shape to make them tangible. One of the shapes attributed to the Great Mother might have been the rock, especially the rocky mountain peak. The crevices in the rock were imagined as openings into her womb. Therefore, during religious ceremonies, people would leave bestowments in the natural crevices of the rocks, or in ones they themselves carved, imagining they were placing gifts in her womb. If the Goddess was satisfied with the gift, she would give multiple quantities of what she was gifted - if a little grain was donated, the crops would be plentiful, if fruit was given, the harvest would be abundant, if a small figurine of a sheep, goat or other livestock was placed, the cattle would be healthy. Some high hills and mountains represented places where ancient man could be closer to the gods and reach them. These mountains were considered sacred mountains. Tatikjev Kamen represents such a sacred mountain or a mountain sanctuary. These mountains and hills most frequently occupied a dominant position in the surrounding space which could be observed within a radius of several kilometres. With its 1013 m above sea level, the summit of Tatikjev Kamen represents such a dominant point. Even today, the visitor who can reach its peak is overwhelmed by the breath-taking view of the beautiful scenery that opens before him. People came here to observe the Sun and the Great Goddess - Mother, and celebrate their Holy Marriage – the moment of their union that enables life on earth. In order to support all this, archaeologists possess abundant evidence to be elaborated below.

## Is Kokino the only holy mountain?

Visitors oftentimes wonder whether Kokino is a unique site. The answer is both, yes and no. It is unique because, thus far, in addition to being the only discovered sacred mountain in the Repub-

lic of Macedonia, it also brings together a variety of archaeological content in one place. It is also unique in being the northernmost geographically discovered sacred mountain. Sacred mountains can be found much farther to the south, on the territory of Greece (especially Crete), as well as on the territory of Bulgaria and Turkey.

## How do we know whether Kokino is a holy mountain?

There is growing evidence which clearly indicates that it is a sacred mountain. First of all, the dominant position of the hill with the impressive peak causes astonishment, even today. Thousands of years ago, when man was in more immediate contact with nature than now, its peak was considered a holy place where the inhabitants of these regions could reach the Sun god and the Great Goddess - Mother.

Furthermore, scientists researching this issue suggest that, oftentimes, in the vicinity of such sacred mountains were located pastures where the settlers brought their livestock to graze. Pastures located around

the sacred mountain were considered a gift from the gods in the immediate vicinity. Even today, upon visiting this site in the spring or summer, one can surely meet a smiling shepherd who still brings his livestock to graze at the same pasture.

The access to the top is another element which favours the interpretation that Kokino is a mountain sanctuary. These sanctuaries are accessible exclusively from the sunlit side. Thus, while moving toward the top to participate in ceremonies that took place during summer, people who used this sanctuary thought that the Sun god is favourably disposed since he illuminated their path. Even today, one can reach the top of Tatikjev Kamen by means of the same passage used by the inhabitants from the past, located on the south-eastern side (Fig. 11).

However, none of these interpretations would make strong evidence unless supported by the great number of discovered archaeological finds. Ever since the first archaeological activities, the excavated artefacts (about 500 kg of pottery fragments!) were an indication that this was an extremely important archaeological site. Nevertheless, despite the extensive archaeological material dated from the Bronze Age (from 2000 to 1200 BC), there are no remains of settlements from that period at Tatikjev Kamen. This leads to the conclusion that Tatikjev Kamen was not a settlement and that those items were brought there with a purpose. They were laid into the ground in a specific manner, representing gifts to the Great Goddess - Mother. The archaeologists discovered the items laid in a particular manner in special formations (pits and circular stone structures).



FIG. 11. The present access to the hill is the same one from the past





FIG. 12. The surrounding wall of the sacred space, reinforced by a supporting wall

All this suggests that Kokino is a mountain sanctuary of utmost significance as it was used for a long time, since the beginning of the Bronze Age (end of 3<sup>rd</sup> millennium BC) until the developed Iron Age (around 800 BC). The wall surrounding the sacred area on the northern slope of the site, which was discovered in nearly its entire length, is further evidence that the area was considered holy. Shrines were often surrounded by this type of wall, whose function was not defensive, but rather symbolic. The wall signified an entrance into a sacred place (drawing 1, Fig. 12).

## Homage to the Great Goddess – Mother



Fig.13. Mug. heavy ware, two handles. Late Bronze Age (14<sup>th</sup> - 11<sup>th</sup> century B.C)

The Great Goddess - Mother, the parent of all living beings, who held the power to restore nature, or stop its cycle, was honoured at Kokino in two ways. Both consisted of offering gifts (everyday and household items) to the Great Goddess - Mother or Mother Earth, in order to ensure the renewal of nature, as well as the continuity and prosperity of the community. The first manner is related to the so-called *ritual pits*, found at the site in large quantities. The inhabit-

ants who used the shrine were searching for natural cracks or crevices in the rock. Afterward, these cracks were shaped by placing smaller stones to create a more oval pit. Lastly, the opening of the pit was lined with larger slab stones or river stones. Geological studies have shown that the stones used for lining the opening of the pit did not



FIG. 14. Ceramic vessel of the type *lamps*, Middle Bronze Age (17<sup>th</sup>-14<sup>th</sup> century BC)

originate from the site, but were, interestingly enough, brought there intentionally. In these shaped structures were placed covenant gifts: sometimes whole pots, other times fragments of previously broken dishes (Fig. 13, Fig. 14), food, loom weights, spindle whorls, fragments of ceramic pots with incorporated furnaces known as movable stoves and spear tips (Fig. 15). Other discovered items include hand wheat grinders,



FIG. 15. Bronze spear, Late Bronze Age (14<sup>th</sup>-11<sup>th</sup> century BC)



FIG. 16. Part of a mould for casting bronze buttons, Late Bronze Age (14<sup>th</sup>-11<sup>th</sup> century BC)

The second type of gift offering was performed in the so-called *circular shapes*. Similar gifts were placed on a circular surface of stacked stones, and were then buried by means of earth and stones, whereby the entire pile acquired the shape of a small tumulus (Fig. 10).

People believed that if they laid the gifts in the womb of the Great Goddess – Mother in this manner, the year would be plentiful, that the Mother, satisfied by the respect given, would yield what she was given multiple times. The vessels, very frequently, contained some food, whereas the cups and funnels were used for the pouring of liquids (Fig. 20). Figurines of animals were placed to ensure the health of the livestock

mortars for pounding grain, a few moulds for casting buttons (Fig. 16), moulds for bronze spears, arrows tips, spikes, knives, needles, bronze axes and pendants, and several ceramic figurines - one small animal, probably an ox, two small human legs with feet and a female torso (Fig. 17, Fig. 18, Fig. 19). Afterward, everything was buried by means of a mixture of soil, smaller stones and clay.



FIG. 17. A mould for casting bronze pendants, Late Bronze Age (14<sup>th</sup>-11<sup>th</sup> century BC)



FIG. 18. A mould for casting arrow tips (14<sup>th</sup>-11<sup>th</sup> century BC)

which was essential to the survival of the people in these agricultural and farming communities. The figurines, which represented parts of a human body, suggest that Tatikjev Kamen was believed to have possessed healing properties, and that if a sick person laid a gift resembling the sick body part, that body part would be healed.



FIG. 19. Ceramic figurines: a) a female torso, b) a small human foot c) a domestic animal (ox?)



FIG. 20. A funnel for pouring of liquids

## The respect toward the Sun god and the celebration of the Sacred Marriage at Kokino

The Sun creates life, fertilizes the Great Mother and allows the fruit of her womb to mature and come into the world. After the long winter, with the help of sunlight, the first trees blossom, the crops sprout and vegetation is renewed. This is the reason why prehistoric man considered the Sun the ultimate deity and tended to its regular celebration. Science has numerous examples of respect toward the Sun across the world. At Kokino, the Sun was respected in addition to the Great Goddess - Mother. There are two pieces of indisputable evidence to support this. The first is a natural phenomenon that occurred in the past, which ancient man interpreted as the emergence of the god himself. This phenomenon occurs at the site in the present, as well. The observer, sitting on the *stone seats* or "thrones" formed into the rock by the prehistoric inhabitants and arranged in a north-south direction, faces the east. The eastern horizon is hidden by rocks that also extend in a north-south direction. Behind them is the upper platform, and above, there is a rock at the highest elevation of the site. People made artificial crevices in these rocky wreaths, as well as a ritual *marker* to indicate the position of the sun (Fig. 4). In the rock situated between the thrones and the platform, was created a *trench* or a narrow passage. The phenomenon that was accompanied by celebrations and ceremonies took place twice a year - in May and



at the beginning of August i.e. nowadays on the 30<sup>th</sup>, or in the case of a leap year, the 31<sup>st</sup> July (due to the phenomenon of precession). At that moment, the rays of the morning sun go through the ritual marker on the rock at the highest point of the site. Then, they go past the right boundary of the artificially cut trench, and as they pass through another notch on the rock that is closer to the thrones, they illuminate a stone seat (the second from left, if we count turned toward the seats) (Fig. 21). Hence, it can be concluded, that prehistoric inhabitants deliberately cut through the rock to achieve that effect at the sunrise of that date. The most deserving member of the social community, such as the tribal elder, the leader or the priest, probably sat on this “throne”. Usually, in prehistoric communities, these functions were performed by the same person, who was also a leader of the mountain ritual. The other stone seats were probably occupied by tribal leaders, and the remaining participants in the ceremony were gathered on the upper platform. The date of this phenomenon is certainly linked to agricultural and farming activities. This period happens to mark the end of the harvest. A popular theory in science is that at the end of the harvest in primitive communities, whether plentiful or not, man should be grateful to the gods that enabled him to provide food for the upcoming winter. This gratitude was expressed by means of celebrations, ceremonies and rituals accompanied by offerings. Part of the harvest was certainly presented as a gift to the gods, as a sign of appreciation, in the hope that it would serve as a reminder for their generosity in the year to come. It is also well-known that the leader of the community was considered a god, in a sense, i.e. a legitimate representative of the main deity on earth. The moment when the Sun god illuminated the face of the leader was perceived as confirmation that the community superior is the rightful leader with the legitimacy to lead the ceremony



FIG. 21. Emergence of the morning sun at the ritual marker in late July



FIG. 22. Illuminating of a stone throne

given by the Sun (Fig. 22). At the same time, the Sacred Marriage i.e. the union of the Sun god with the Great Goddess - Mother was observed at Kokino. It was performed with the mediation of the supreme priest, and was independently celebrated by almost all prehistoric peoples and primitive communities. The sacred marriage was a confirmation that even after the culmination of generosity expressed through the



FIG. 23. A bowl fragment decorated with an incised decoration of wavy lines and presentations of suns

harvest, nature will again continue its cycle and be favourably disposed toward man in the following year.

A unique artefact discovered at Kokino serves as another testimony for the respect toward the Sun. It depicts pottery fragments with extraordinary decoration - engraved suns with rays around wavy lines across the entire surface. This vessel was specifically designed to be left as a gift during one of the ceremonies, since these types of decorations were not found on everyday vessels. The decoration suggests that it was intended as a gift to the Sun (Fig. 23).

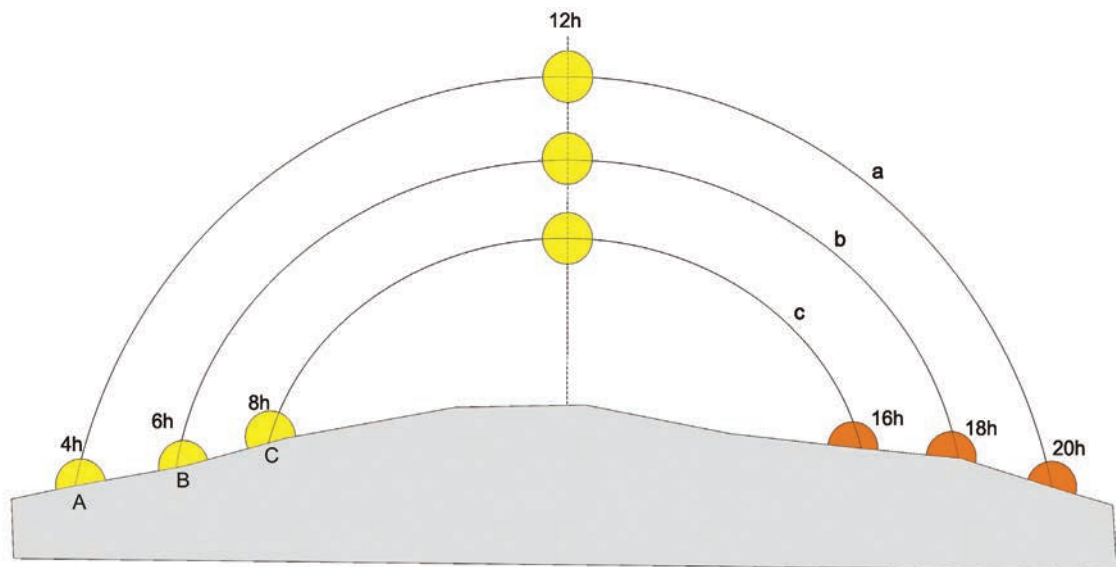
## Sky observation and agricultural activities

The astronomical observations of the sun, moon, a shining star and a constellation are certainly the most fascinating segments of this prehistoric site. They were performed in order to determine the start and duration of the sowing, harvesting and other regular agricultural activities, as well as the activities related to the breeding of domestic animals. To perform these activities, regardless of the community's social development level, a precise calendar was required to determine the best time for their commencement and completion.

## Winter solstice, equinox and summer solstice

Prehistoric people at Kokino were able to determine the summer solstice, winter solstice, as well as the vernal and autumnal equinox by means of constant observation of the sky. In this manner, they created a primitive, but, nevertheless, precise calendar which they used during the performing of agricultural and farming activities. But, before elaborating on these astronomical observations by the ancient spectators of the sky above Kokino, we ought to review the basic rules of the movement of the sun and moon. We say that the sun rises in the east and sets in the west. But, the point of sunrise and sunset is not the same for all days of the year. The sun rises precisely in the east and sets precisely in the west on only two days of the year - the day of the vernal (20<sup>th</sup> or 21<sup>st</sup> March) and the autumnal (23<sup>rd</sup>, or rarely, 24<sup>th</sup> September) equinox. In the days that follow the vernal equinox, the point of sunrise moves northward, reaching the maximum northern divergence from the east-west axis on 21<sup>st</sup> or 22<sup>nd</sup> June. Today, this divergence is 23 degrees and 27 minutes. The sunrise at the point closest to the geographical north marks the longest day of the year, as the sun lingers longest in the sky, creating the largest arch in its movement. At this point of sunrise, the sun seemingly pauses briefly before starting to return to the geographical east. Therefore, the northernmost divergence of the sun is also called "summer solstice" (from the Latin *sol sistere*, meaning "the sun is standing"). The sun will rise at the point of the geographical east on 23<sup>rd</sup> (or 24<sup>th</sup>) September, and already in the following days it will start to rise more and more southerly. The southernmost sunrise is on 21<sup>st</sup> (or sometimes 22<sup>nd</sup>) December (winter solstice). Upon reaching the angle of divergence of 23 degrees and 27 minutes from the east-west axis, the sun begins to return to the geographical east. This illusive movement of the point of sunrise on the horizon is easily noticed, as the movement is repeated every year, and can be used for creating a calendar. If the distinctive points of sunrise during the summer solstice,





- a - The arc described by the Sun in the sky on the 22nd of June
- b - The arc described by the Sun in the sky on the 22.III and 23.IX
- c - The arc described by the Sun in the sky on the 22.XII

**Drawing 2 - The Sun's apparent yearly movement**

Drawing 2. The Sun's apparent yearly movement.



**FIG. 24. Sunrise on the summer solstice marker**



FIG. 25. Sunrise on the winter solstice marker

winter solstice or vernal and autumnal equinox are labelled with appropriate markers on the eastern horizon (points A, B, C - drawing 2), the length of the year can be determined. When the sun rises at the same point again, it means one year has passed. Based on these three reference points, the year can be further divided to make a calendar. These calendars are called solar calendars. At Kokino, there are three stone markers that denote the typical points of sunrise: on the day of the summer solstice (Fig. 24), on the day of the vernal and autumnal equinox and on the day of the winter solstice (Fig. 25). These points are determined by means of observation from the central position of the observatory - platform II (Fig. 6). The marker for the summer solstice is best preserved. The archaeological and astronomical analysis of the appearance of the sun on the summer solstice marker, in the past and today (depending on the so-called precession), specifies the time of the creation of the marker, thus dating the observatory in the 19<sup>th</sup> century BC.

## Kokino with a lunar calendar

The prehistoric inhabitants of Kokino, however, in spite of having determined the three specific points of sunrise, did not create a solar, but rather a lunar calendar, according to the illusive movement of the points of the full moon rising on the eastern horizon. As it is known, the moon has a more complex movement in the sky and the marking of the rising of the full moon on the

eastern horizon is more difficult and requires longer observation. In winter, it follows, roughly, the same illusive path that the sun follows in summer, and in the summer it follows the same path the sun follows in the winter. But, the ancient observers of the skies over Kokino managed to address that problem as well. This was confirmed by means of the stone markers for determining the points of rising of the full moon located around the markers of the summer solstice and the winter solstice. Thus, to the left of the solar marker for the summer solstice was carved a marker for the rising of the full moon in winter when it has a maximum declination, i.e. is at its highest point. To the right of that same marker, was carved a marker for the rising of the full moon when it has a minimal declination, i.e. is at its lowest point in the winter sky (Fig. 7, points 1 and 3; Fig. 26, points 1 and 4).



FIG. 26. The marker for the summer solstice (3), markers for the maximal (1) and minimal declination of the moon (4)

Consequently, two lunar markers are located left and right of the solar marker for the winter solstice, indicating the positions of the rising of the full moon in summer, when it is at its highest or lowest point on the summer sky. The precise craftsmanship of the lunar markers at Kokino attests to the fact that the ancient observers of the sky were well familiar with the cycle which expresses the recurrence, where after a period of 19 years, the same dates in each year correspond to the same phases of the moon. This meant that every 19 years, on the same calendar day, the full moon rises at the same marker at Kokino. Based on these findings was created a



lunar calendar with a cycle of 19 years. According to this calendar, the lunar year lasted for 12 or 13 lunar months, with 29 or 30 days in each month. There were 12 lunar months in each of the 12 lunar years, six of which were winter months, with a length of 29 days, and six were summer months, with a length of 30 days. The seven remaining lunar years were thirteen lunar months long, including six winter months with a length of 29 days in each, and seven summer months, each 30 days long. In order to label and measure the length of the lunar months of 29 and 30 days additional stone markers were created. The marker for measuring the 29-day lunar month was well preserved and made from the same stone block as the marker for the moonrise in winter, on the day of its maximum declination, which recurred every 19 years. The calendar created by the prehistoric people at Kokino started at that point of the moonrise. Twenty-nine days after that, the full moon rose at the marker for measuring the length of the winter lunar month (Fig. 26, point 2). In the first year of the calendar, the length of the 30-day mid-summer lunar month was similarly measured. There are indications that the ancient observers of the sky above Kokino possessed the knowledge to predict the solar and lunar eclipses, as well.

## The Pleiades constellation and the star Aldebaran

The results from the research of platform III, designed for astronomical observations as well, indicated that the ancient observers of the sky followed the movement of the great star Aldebaran,



FIG. 27. Emergence of the sun on the marker for the vernal and autumnal equinox and the positions of Aldebaran, viewed from platform III

and, most likely, the Pleiades star cluster in its vicinity, as well. The Pleiades, which are located in the constellation Taurus along with the star Aldebaran, were probably the most thoroughly observed celestial bodies by all ancient peoples from both hemispheres on Earth. The ancient poet Hesiod in his work "Works and Days", speaks of the Pleiades and their importance in agricultural and other activities of the peoples from the Mediterranean Basin. According to Hesiod, their appearance in the sky in autumn, after the sunset, in the months of October and November, marked the start of the grape harvest, as well as the ploughing and sowing of the earth. There were, undoubtedly, other agricultural and farming activities and ritual events related to the spring showing of Aldebaran and the Pleiades in the sky before sunrise. All these activities were probably associated with the vernal and autumn equinox, as attested by the marker carved for them and located next to the markers for Aldebaran (Fig. 27). Since the positions of the stars, due to their movements and the precession of the Earth's axis, change more dramatically than those of the sun and the moon, in the rocky block across the northern third platform, with appropriate markers, were marked four positions of the appearance of Aldebaran in the period from 1900 to 1500 BC. This suggests that platforms II and III were made, approximately, at the same time.

## Dance, songs, feasts and bonfires

There is undisputable evidence that Kokino is a sacred mountain, an old observatory, a place to celebrate the Great Goddess - Mother, the Sun, their marriage and the end of the harvest, and a place where health for family members and livestock was sought. These ceremonies took place at precisely determined locations at Kokino. They were performed according to the calendar with regard to the movement of the sun and the moon at Aldebaran in the constellation Pleiades. Archaeologists attempted to reconstruct the great festivities and celebrations for expressing gratitude to the gods for their good will that took place at Kokino.



FIG. 28. Cups with burn marks, Early Bronze Age (20<sup>th</sup>-17<sup>th</sup> century BC)

During the ceremonies were lit ritual fires in one or more places, as evidenced by the traces of burns on a large number of ceramic fragments (Fig. 28, Fig. 29). Records show that some vessels were previously broken and then burned. It is well-known that the ancient people believed in the purifying function of fire. Before presented to the gods, the gifts had to be ceremonially cleansed of all negative or “unclean” elements that might have been acquired by means of contact with people. The end of the ceremony was, by no means, accompanied by a feast. The food was prepared on site, as evidenced by the numerous stone hand mills (Fig. 30), mortars and conveyer ovens.



FIG. 29. A deep bowl with a burnt surface, Late Bronze Age (14<sup>th</sup>-11<sup>th</sup> century BC)



FIG. 30. A stone hand mill, Late Bronze Age (14<sup>th</sup>-11<sup>th</sup> century BC)



The celebrations devoted to the primary deities that enable fertility and renewal of nature were accompanied by dance and songs. Prehistoric people were in much more immediate contact with nature than we are today. Joy was expressed through dance, songs and loud music. A large quantity of written and material evidence attests to celebrating the gods by means of dance and songs. Although there is no undeniable evidence, we can assume that, as in ceremonies elsewhere in the Mediterranean Basin, this was the place where dances were performed, music was played on blown instruments, where the sound of songs and goblet drums (tarabuka) could be heard until the sun rose high above Kokino.

## Are there other secrets hidden at the Sacred Mountain?

By no means, there are. Archaeologists have begun to unravel some of them, though certain ones will likely remain unsolved forever. Despite the intensive exploration of the site in recent years, a period of ten years of research is insufficient to tell the whole story of the sacred mountain. Regarding space, many large areas remain unexplored. Are there other megalithic configurations of the sacred ceremonies? Where were the first settlements of the people who used this mountain sanctuary? It is unlikely that all these questions will get a satisfactory answer. Nevertheless, the existing findings regarding the life of the inhabitants of Kokino from the Bronze Age speak of their intense and organized social and spiritual life.

The period of the Bronze Age in Europe is characterized by the rapid and versatile development of society and the emergence of the state as an expression of an organized political community. It is a time of formation of large ethnic groups that will long after have an impact on historical development. However, all communities did not have the same level of social, political and economic development. Cities, fortresses and palaces were established in the southern Aegean space, while further to the north the social order was still tribal. Still, individuals who produced goods of technical and artistic qualities could be also found. Trade and other relations started to develop between the ancient peoples. The prehistoric inhabitants of Kokino did not remain detached from these processes. Several moulds discovered near the sanctuary indicate that the people were familiar with the technique of casting and use of bronze as one of the prerequisites for economic development.

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