

SUNRISES AND SUNSETS AT KOGAION

Timotei Ursu¹

Abstract: Proposing a *differentiation* between the utensils (with the results) of the "classical" archaeology and the wide offer for a better research by a cooperation with the pluridisciplinary research, the author exemplifies with some outcomes from his own research (or in a team with different specialities), at the Dacian Sanctuaries from Dealul Gradiste ("Sarmizegethusa Regia"). The results, says the author, could not be acquired by the archaeologists, not only because of their utensils, but essentially because the horizon of research is too large, asking for analysis by many sciences and branches of knowledge in which, usually, the archaeologist is not trained. Former archaeological research concluded that at "Sarmizegethusa Regia" was a fortress and a "Dacian Capital", conclusions which are firmly refuted by the pluridisciplinary investigation. In change, is ignored many evidence which can confirm that at Dealul Gradiste-Muntele Godeanu was the legendary KOGAION mentioned by Strabo.

Keywords: Herodotus, thracians, geto-dacians, hyperboreans, Strabo, Zamolxis, Dicineus, Sarmizegethusa Regia, Gradiste Hill, astronomy, Jordanes, "Sacred Zone", observatory

Many times in books, in university manuals or in media papers the "Father of History"² the old historian Herodotus is quoted with saying (in the Vth century BC), that the nation of *Thracians* is so numerous that it "take the second stand in the World after the Indians". Indeed, in full Halstatt Age, the Thracian many tribes, from the Myssians to Phrygians, from Kingdom of Odrisses to the Kingdom of Burebista, under a name or another, they have dominated the history of South-Eastern Europe. A distinct role in that picture have played - even less quoted - the Northern wing of the Thracians: the *Geto-Dacians* tribes, settled fundamentally North of the Balkan Mountains, along with Danube and Carpathian Mountains, from the current Slovakia to the upper shore of Black Sea and the Caspian Sea.

Sometimes they were nicknamed "Hyperboreans"; but in the last centuries BC their current identity was known under ethnic name GETAE (in the South and East of Carpathian Mountains) and DACIANS inside the Carpathian Arch and in Pannonia. Today the scholars agree it was a single one basic nation, the Geto-Dacians, like the historian Strabo wrote in the Ist century BC³.

Even the references in manuscripts (those preserved through Middle Age copies) are pretty mean regarding to Geto-Dacians, some of the historians -

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²Wikipedia, *Herodotus*, p. 1

³Strabo, *Geography*, 7,5,3

Herodotus, Flavius Josephus, Strabo, Pausanias, etc, all agree about the high spirituality of that people lead by almost legendary rulers like Zamolxis (Salmoxis) and Dicineus (Decaneus). Those rulers have learned their special skills in the ambiguous spiritual arch which starts with the enigmatically Schytian mysteries and ends with the Egyptian famous knowledge.

We have to underline that by "spirituality" almost all the old springs mean *the religion*.

Less remarked side of Geto-Dacian spirituality was another dimension: that of their *scientific knowledge*. But some references for it still exist! In a hand, we have enough material evidence (the Dacian sanctuaries which doesn't look as only sacramental devices); in the other hand, some of the old references invite to a special, a new kind of research. With all respect to the difficult work of the archaeologists, this side is almost impossible to remain for ever under the harshness of archaeological research; not because of scarcity of the material vestiges, but mostly because the archaeologists - educated to do just their specific job - are less trained to understand and to appreciate the astronomical, mathematical, geophysical, *many other dimensions* of the antique knowledge, often sent away as myths and legends!.. In addition, how about some cranks?! Significantly for it are the lines of Hadrian Daicoviciu, an well known archaeologist from the seventh decade of last century, considered then an absolute authority in knowledge on Geto-Dacian society. In one of his books, in the chapter "*The Science of Dacians in the times of Burebista and Decebal*" - he wrote: : "*If I think about the pileats of Burebista - (the noble men from whom the legendary priest Decaneus selected his sacerdots) - I rather see them as some arrogant warriors, rough, and illiterate people, than as great scholars!*"⁴

However, speaking about Geto-Dacians - (and we take them together, *as the same people*, speaking the same language like Strabo said⁵ and, very probably, by the same faith) - there are some important excerpts in the old manuscripts. Besides of their special religious spirituality and their bravery in wars, the authors also talk about Geto-Dacians connection to the best science of that time, and about their spiritual leaders which learned the knowledge in Greek traditions and in the temples of Egypt. There is a very interesting excerpt from "*THE HISTORIES*" of Herodotus, where the famous historian of Vth century BC refers to Salmoxis (Zalmoxe), considered as the first spiritual leader of "Getai" (the Greek name for Getae):

This Salmoxis I hear from the Hellenes who dwell about the Hellespont and the Pontus, was a man, and he became a slave in Samos, and was in fact a slave of Pythagoras the son of Mnesarchos. Then having become free he gained great wealth, and afterwards

⁴ H. Daicoviciu, *Dacii*, Ed. Enciclopedică Română, 1972, p. 290

⁵ *Ibidem*

returned to his own land: and as the Thracians both live hardly and are rather simple-minded, this Salmoxis, being acquainted with the Ionian way of living and with manners more cultivated than the Thracians were used to see, since he had associated with Hellenes (and not only that but with Pythagoras, not the least able philosopher of the Hellenes)..., (...)....but I think that this Salmoxis lived many years before Pythagoras. However, whether there ever lived a man Salmoxis, or whether he is simply a native deity of the Getai, let us bid farewell to him now.)⁶

Alike in fame historian Strabo, after four centuries, wrote:

"...For it is said that one of the nation of the Getæ, named Zamolxis, had served Pythagoras, and had acquired with this philosopher some astronomical knowledge, in addition to what he had learned from the Egyptians, amongst whom he had travelled. He returned to his own country, and was highly esteemed both by the chief rulers and the people, on account of his predictions of astronomical phenomena, and eventually persuaded the king to unite him in the government, as an organ of the will of the gods. (...) This custom even continues to our time; for there is always found someone of this character who assists the king in his counsels, and is styled a god by the Getæ. The mountain likewise [where Zamolxis retired] is held sacred, and is thus distinguished, being named Kogæonus, as well as the river which flows by it; and at the time when Byrebistus, against whom divus Cæsar prepared an expedition, reigned over the Getæ, Decæneus held that honour..."⁷

A special attention we must accord to the next excerpt regarding outstanding *astronomical activities* of Geto-Dacian monks under the teaching of Decaneus, alias Dicineus; the quote is from "GETICA", written in Latin by bishop Jordanes in 551 AD. In that book he put the equality sign between the Old Geto-Dacians and the Goths of his time (after he corroborated much information from the manuscripts than still preserved):

"... He taught them logic and made them skilled in reasoning beyond all other races; he showed them practical knowledge and so persuaded them to abound in good works. By explaining theoretical knowledge he urged them to contemplate the progress of the twelve constellations and the courses of the planets passing through them, and the whole of astronomy. He told them how the disc of the moon waxes and wanes, and showed them how much the fiery globe of the sun exceeds in size our earthly planet. He explained with which name or designations in the arching heavens the three hundred forty six stars hurtle from their rising to their setting. Think, I pray you, what pleasure it was for these brave men, when for a little space they had leisure from warfare, to be instructed in the teachings of philosophy! You might have seen one scanning the position of the heavens and another investigating the nature of plants and bushes. Here stood one who studied the waxing and waning of the moon, while still another investigated solar eclipses and observed how those bodies which rush to go toward the East are whirled around and borne back to the West by the rotation of the heavens. When they had learned the reason, they were at rest. These and various other matters DECANEUS taught (them) in his wisdom and gained marvelous repute among them, so that he ruled not only the common men but their kings"⁸.

⁶ Herodotus. *Histories*, IV,95; English transl. by A.D.Godley

⁷ Strabo, *The Geography*, 7.3.5., Ed. Lacus Curtius, English transl. by H.C.Hamilton

⁸ Jordanes, *Getica*, 69-71 - English transl.by Bedrich Yeat

<p>92 IOANNANDES Macedoniam regna firmaret. Quae tempestate, Dion historiaco dicente, Philippus inopiâ pecunie passus, V. distans a Mœsiae civitate instructis copiis vastare deliberat, quae tunc propter viciniam Tamiari, Gothos erat subiecta. Unde & sacerdotes Gothorū aliqui, illi qui Pii vocabantur, subito patefactis portis cū ciuitatis & vestibus candidis obviam sunt egressi paternis diis, ut sibi propitiū Macedones repellerent, voce supplicis modulantes. Quos Macedones sic fiducialiter sibi occurrere obuenientes, stupetūtos & sibi duci fas est, ab inimicis tenentur armati. Nec mora, acie soluta, quam ad bellū construxerunt, non tantū ab illis ex castris removere, verum etiam & quos fossis fuerunt iure belli ad septem reddiderunt, foedere quieto ad sua reversi sunt. Quē dolens post longam tempus remissioens egressus Gothorum dux Siraicus, et, viciniam illibus congregatis, Atheniensibus in illud bellum adversus Perdicam Macedoniarū regem, quē Alexander apud Babyloniam ministris infidus potans interisit, Atheniensium principibus hereditario iure reliquerat successorem. Magno praesidio hoc inito, Gothi superiores inventi sunt: & sic pro iniuria, quam illi in Mœsia dudum fecissent, istam Graeciam discurrerent, eundem Macedoniam vastaverunt.</p> <p>69 Dehinc regnante in Gothia Borista, Dacicus venit in Gothiam, quo tempore Romanorum Sylla potius est principatu, quem Dacicum suscipiens Borista, dedit ei penē regiam potestatem: cuius consilio Gothi Germaniarum terras (quarum nunc Franci obtruncant de populati sunt) Caesar verò, qui sibi primus omnium Romanum vindicavit imperium, & penē omnem mundum suae ditioni subegit, omniaq; regna perdomuit, adeo ut extra nostram orbem Oceani sui repositas insulas occuparet, & qui nos nomen Romanorum auctu quidem noverant, eos Romanis indutarios faceret; Gothos tamen crebro tentans nequiva subigere, Gais Tiberius iam tertius regnavit. Romanos Gothi tamen suo regno incolunt perleverant, quibus hoc erat salubre, aut commodum, aut votivum, ut quicquid Dacicus eorum consiliarius præcepisset, hoc modis omnibus expetendum, hoc utile iudicantes, effectui manserant. Qui exiens eorum antea sibi in omnibus obedire, & naturalē eos habere ingenium, omni penē philosophia eos instruxit:</p>	<p>DE REBUS OPTICIS. 93 struxit: erat enim huius rei magister. Nam Ethicam eos instruxit, ut barbaricos mores ab eis compelleret: Phisicam tradens, naturaliter propriis legibus vivere fecit, quas usque nunc gentes scriptas, Bellagias nuncupant: Logicam influens, eos rationis supra ceteras gentes fecit experire: Practicam ostendens, in bonis actibus conversari fecit: Theoriam demonstrans, signorum duodecim, & per ea planetarū cursum, omnemq; astronomiam contemplari edocuit. & quomodo lenaris orbis augmentum sustinet, aut patitur detrimenti edocuit: solisq; globum ignem quantum terram orbem in mensura excedat, ostendit: aut quibus nominibus vel quibus signis in eodē polo vergentes aut revergens cœlestis, stella ab oriente in occidentem aut a septentrione, exposita. Quis erat rogo, volentes, ut viderentur, quantum ab arctis quadrilobum usq; vacasset, electis philosophis inbebantur: Videres unam eodē loci positionem, aliam herbarum frugumq; explorare naturas istam hanc commodam incommoda celidatq; illum solis laborem antedec, & quomodo rotas celi caput, retro redacta ad partem occidentem, quoad orientalem plagam ire festinat, ratione accepta quiescere. Hic & alia multa Dacicus Gothi sua peritia tradens, mirabilis apud eos inventur, ut non solum medicis, imo & regibus imperaret. Elegit namq; ex eis tunc nobilissimos prudentiores viros, quos Theologiam instruens, nomina quaedam & facilla venerari iussit, fecitq; sacerdotes, nomen illi Pileatorum contulit, ut retineret, quia operis capibus rana, quos pileos alio nomine ducuntur, mirabant: reliquam verò gentem Capillanos dicentibus, quod nomen Gothi pro magno suscipientes, actus in suis cantionibus remisissent. Decedens verò Dacicus penē pari veneratione habuere Comolicam, quia nos impat erat solentia. His etenim & rex illis, & pontifex ob suam peritiam habebatur, & in sua iustitia populos iudicabat.</p> <p>70 Et hoc rebus excedente humanis, Corillus rex Gothorum in regnum contendit, & per XL. annos in Dacia suis gentibus imperavit: Daciam dico antiquam, quae nunc Gepidarū populi possidere noscuntur. Quae pariter in coelestia Mœsiae trans Danubium corona montium clauditur: duos tantum habens accessus, unum per Bonas, alterum per Tabas. Hanc Gothiam, quam Daciam</p>
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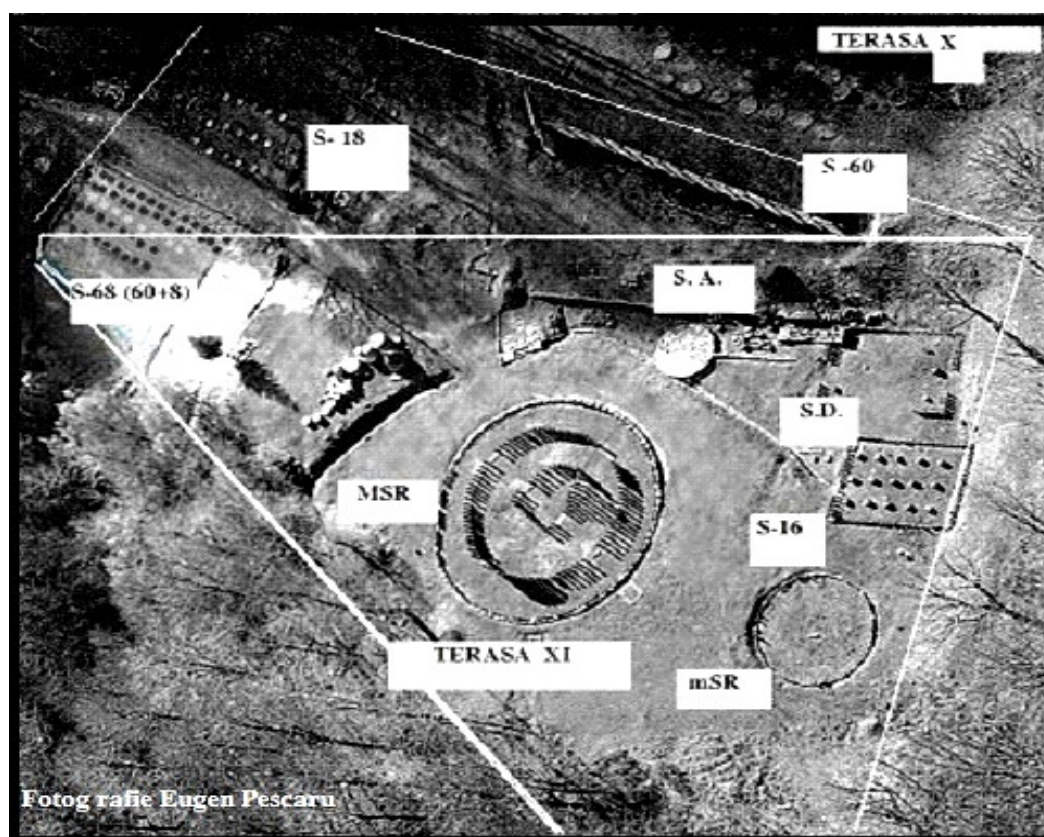
The excerpts 69-71 in *Heringium* Edition of GETICA, printed in 1541 (*Biblioteca Nacional de Madrid*)

This is for what we say: is the time when the investigation of the so called "spirituality of the Geto-Dacians" have to enter in a new era; a time when the investigative utensils are more complicated than those used by archaeology and the traditional historiography. The Dacians vestiges are not only some walls built in "murus dacicus"; not only some ceramics, or jewels, or comparable coins with the Greek, Thracian and Roman originals, which you can take from underground and expose in a museum! The most puzzling issues were, and for many scholars still are puzzling, the *Dacian sanctuaries*. A lot of time and much too simply they were considered, even by very skilled scientists - just some places where the old priests made... sacrifices of animals⁹, not to mention the supposed sacrifices of human beings (that to be... *in line* with the references made in Yucatan, in Middle East or in Asia...!?) Of course, the very old religions used some cruel practices; but what about another dimensions, the *mathematical* and *astronomical*, and *geodetic*, which become visible only to a researcher *who knows some Mathematics and Astronomy and other connected skills*?! Hadrian Daicovicu.- this time with common sense! - had to

⁹ I.H. Crișan, *Spiritualitatea Geto-Dacilor*, Ed. Albatros, Bucharest, 1986, p. 430

admit: "The Archaeology, a trusty guide in decoding the material culture of a people, *cannot go over some limits* when we want to understand their spiritual culture".¹⁰

We invite you to make a few steps on meeting the Dacian sanctuaries by this new way, which is an attribute of pluridisciplinary research, not destined to a single archaeologist (stating "his kingdom over a site"?!), but to analyses of a lot of specialists, by different branch of instruction, equally in right to search and to have their opinion about the vestiges traditionally appreciated only by the archeologists. In this paper, just enumerating a few issues by the kind, I will mention and underline the riches *pluridisciplinary* conclusions coming to supply a new, a much more complete picture of the Geto-Dacian spirituality. (The readers interested for more data can find many details and hypothesis in the book "KOGAION. *Multidisciplinary researches...*"¹¹).



Aerial view of "SACRED ZONE" at Gradiste Hill (*Dealul Gradiste*).

The eight Dacian sanctuaries from the Xth and XIth anthropic terraces. Photo by Eugen Pescaru (2001)

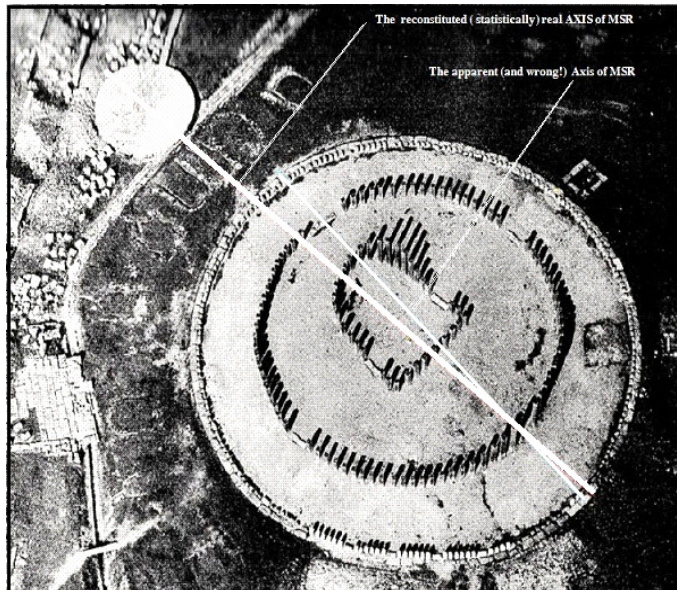
¹⁰ H. Daicoviciu, *op.cit.*, p.266

¹¹ Timotei Ursu, *Kogaion. Cercetari multidisciplinare în munții Orăștiei*, 2010, Ed. DACIA XXI, Cluj-Napoca

Between 1960 – 2000 researchers visiting the Xth-XIth terraces of the archeologic site **GRADISHTE HILL** (DEALUL GRADISTE), from the Mountains of Orastie, South-West of Transylvania - Romania, (a place improperly named by archeologists: “*Sarmizegetusa Regia*”!), have concluded that the Dacian sanctuaries from there - like others Dacian sanctuaries explored in Romania, at **Racos, Pustiosu, Meleia, Costesti, Fetzele Albe, Piatra Craivii**, and so on - are all *astronomically oriented*. Gh.Chisu, the team Bobancu-Samoila-Poenaru, Ioan Rodean, Florin Stanescu, Timotei Ursu, Vasile Dragomir and others, using magnetic compasses and theodolits, concluded that the sanctuaries have a *possible* exact astronomic orientation and hold certain and complex scientific meanings. Almost all the researchers, archaeologists, architects, historians or engineers, (if they have credited or not the fancy hypothesis of a “*Dacian Kingly Capital*” hanging up on the... very top of a mountain ?!), almost all of them have agreed that there, at Dealul Gradiste, was an outstanding *spiritual center*, likely the legendary Kogaion(on) mentioned by Strabo!..

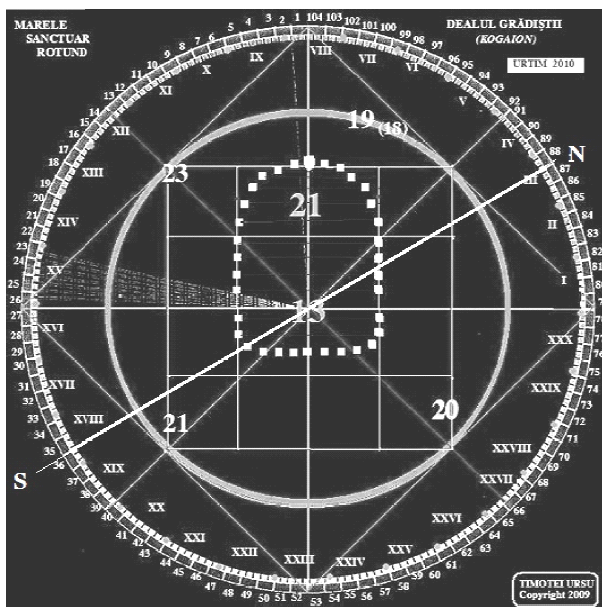
The most puzzling sanctuaries from Gradishte Hill, the round circles from the XIth terrace, were presumed by a few researchers to be *calendars*¹²; but those eight sanctuaries were often considered by archeologists and by a few architects to be just *worship altars* (see Hadrian Daicoviciu, op cit.); or, at the most, the... foundations of some sacred buildings. In my project, “*The Geto-Dacian Numerical System*”, (Bucharest,1983-1984, Association of Romanian Scientists), I have proposed the hypothesis –with some proof - that the group of the three round sanctuaries: the “**Great Round Sanctuary**” (MSR), the “**Small Round Sanctuary**” (mSR) and the “**Andesite Sun**” (S.A.) - work together *like a... real computer* (maybe in a connection with the others sanctuaries from the “*Sacred Zone*”?!); that they are *depositories of numerical codified mathematic means* (a numerical system on the basis of mixed “6”, “17” and “10”); that they are *depositories of the Dacian length modulus*; depositories of *geodetic notions* and of a wonderful *calendar*, etc). Because of an archaeological risky and rough reconstruction of some parts of sanctuaries, and particularly because of a certain (and visible) slide of the XI-th Terrace to the slope of East, only recently we got the outcome of a more accurate, a pluridisciplinary image about the original dimensions, diameters and position of sanctuaries; details which have no special meaning for an archeologists, but are mandatory for a real scientific, multidisciplinary work.

¹² G. Charriere, H. Daicoviciu, Bobancu-Samoilă, I. Rodeanu, C. Bejgu, etc



The longitudinal axis of MSR (The Great Round Sanctuary), wrong reconstructed in 1980 and the correct direction of it “decoded” in 2008. (Aerial picture by Timotei Ursu).

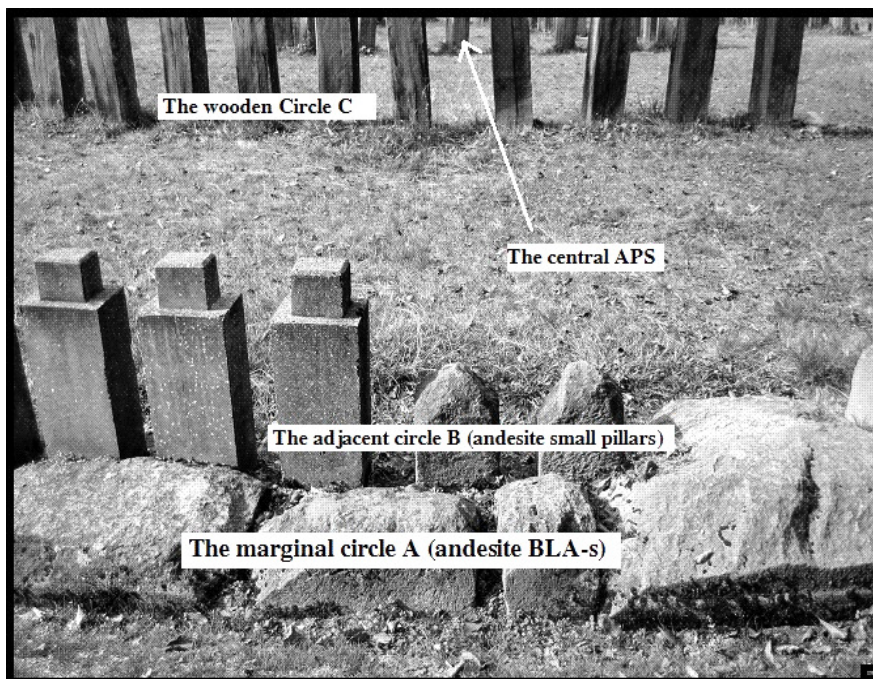
The following astronomical exact orientation should have not be detected without a reconstruction, by a multidisciplinary effort, of the true (or, at least: a *very close!*) innate size of the Great Round Sanctuary. Into the computers were introduced statistical data collected in 1984-1985 and all checked up, again, in 2006 and 2008.



The innate form of Great Round Sanctuary (MSR), made by the computers, (T. Ursu and O.Oprescu, New York,USA; 2009), presented at First edition of *Arheoinvest Congress*, (University of Iassy, 2011)

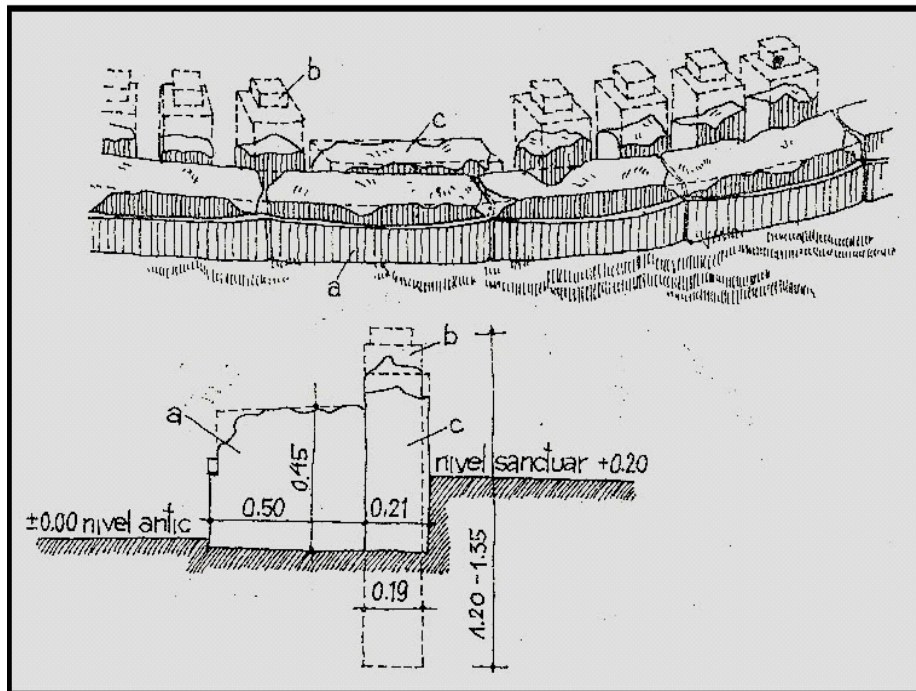
In our research we've encoded "The Great Round Sanctuary" as "**MSR**" (from the initials of the Romanian name: *Marele Sanctuar Rotund*). It is a round-construction erected (probably) between II BC and I AD, likely in successive and different moments. The sanctuary shows today only the relics of the last feature, that of a period close to Roman-Dacian last wars (101-106 AD). The sanctuary has a few surprising likeness with some round sanctuaries from North-West Europe (Avebury, Stonehenge, Newgrange, in England), with "Sun Temple" from Beijing, with Chankillo (Peru), Arkaim (Russia) and Rujm El Hiri (Israel); and could be, actually, a "late echo" of a *Mandala circle archetype* (!!).

MSR had three concentric circles (A,B and C); in the middle is an Apse (a design similar with the sketch of *Stonehenge*). The circles A and B are built with andesite (basalt) stones; circle C and the Apse, with wooden pillars.



The concentric rings of Great Round Sanctuary (MSR)

The outer ring (A) was erected with 104 slabs of andesite, curvy carved in double arch of circle, weighing like 900 kg each. The archaeologists have recuperated 98 of them, enough complete; 6 were replaced with concrete "replicas"). In this A ring all the slabs were thoroughly *carved in double circle-arcs*; 34 slabs still are well preserved and offer a good opportunity to evaluate – statistically - the innate pattern of "the outer slabs". And with those 34 slabs was possible, statistically, a reconstitution in 1984, of the *innate dimension of the sanctuary*.



The outer circles A and B. Perspective view and a vertical section.
A sketch by architect Dinu Antonescu, (1984)

We've encoded the 104 slabs of the marginal circle (A) as “BLA” (from Romanian: “*BLoc din cercul A*”). For the outer dimension of the slabs, the statistical outcome came with an average of **0.8904 m.** (+/- 0.0008 m). Because of the irregular ground motion in over 20 centuries and, consecutive: because the irregular distortion of the ring made by a little sliding of terrace to the cliff, some slabs from the NE and E side of MSR were crashed and pushed away 0.20-0.80 m, detaching the original circumference. The correct original **circumference** we appraised, by totalizing:

$$104 \times 0.8904... \text{ m} = (\text{some}) \text{ } 92.60 \text{ m. to } 92.64 \text{ m.}$$

with a **diameter** of **29.475 to 29.49 m.** (the dimension is close enough to the first appreciation of Constantin Daicoviciu, at the full digging out in 1951: “**29.40 m**”). Afterwards, by my own calculus, at result, I have proposed an **outer diameter** of **29.478 m.** (based on a numerical algorithm), and an **outer circumference** of **92.6080848 m.** with a “**pattern-BLA**” of **0.89012 m.** (What is very important to underline from the start, is that those 104 slabs, and the most components of MSR, were not simply “pieces for a construction”. Vitruvius, the famous Roman constructor says in his book, “*Architecture*” (III, 5-9), that the outer side of a sanctuary has sacred dimensions and placements. The idea is confirmed by our 104 BLAs: their length, their angle to the center, their width, their surface, all are *factors with mathematical assignment* in an outmost **numerical system** to which is dedicated the sanctuary!).

The *numerical* structure of each circle is:

Circle A = an uninterrupted *circle line* of 104 andesite slabs (with no intended intervals between slabs).

Circle B = has 180 small andesite pillars, separated with 30 larger andesite slabs, in 30 circular groups (of 6 pillars each).

Circle C = has 84 pillars of wood, separated in four “quarters” by four slabs-thresholds (the “quarters” comprise are: 19, 20, 22 and 23 pillars)¹³.

The Apse = is built with 34 pillars of wood, separated also - by thresholds – in two numeric groups: 13 and 21 pillars, not at all casual!). The total number of sanctuary pieces is **432**.

The most important conclusion (the first stage of pluridisciplinary study of the Dacian sanctuaries from Dealul Gradishte) is that those circles of MSR work together as a "*slide rule*", transforming numerical amounts *from a system in another* (sexagesimal in "Dacian" or in decimal, or into "trigonometric system", and probably with an applications, also, in the astronomical research).

After a reevaluation of innate size and the oriented position (grid azimuth), the declination of MSR's longitudinal axis (reported to NORTH direction and moving in opposite clockwise way) has an angle of **-58.82352941** degrees... (**-58° , 50' 46.1538"**; **respectively 301° 09' 13,84" West**). Please see I have wrote the decimal fractions with a lot of digits, purposely for making easier a proper verification by whoever want to do it. (Of course, we have to remember: the Dacians scholars did not operate with decimal fractions, but with *mathematical ratio* (ordinal fractions). We write as **58.82352941⁰** ..., but they have used **the proportion**: "1000 : 17" (or: "10³ / 17")

In our research we have placed in parallel a numerical amount, first wrote in our decimal system and then in the "Dacian" one (which resulted from decoding the sanctuaries); and the outcome was, often, amazing!.. It is also important to take notice that in calculus we have not used only the “direct numerical value” but also some *hidden numbers*; for example, in numerical reckoning we did not enter with the *apparent* number **104** (104 slabs), but with *the real number*: **104.04**. Why this number? You'll see, next.

For it, will help to display one of the simply equations which we have resolved by taking in consideration the *multifunctional* value of the MSR numbers.

If multiplying the *total positions* from the Aps (34 pillars + 4 threshold-slabs = **38**) with the *cube of ten* (ten "rays" of the next sanctuary, the Andesite Sun), we'll have:

$$38 \times 10^3 = \text{“38 000”}.$$

If dividing “38 000” with the *apparent 104* number of the BLAs, we'll obtain:

$$38\ 000 : 104 = 365.3846154..$$

¹³ Dinu Antonescu, *Introducere in Arhitectura Dacilor*, Bucharest, 1984 ; also, see: Adriana Rusu-Pescaru, *Sanctuarele Daciei*, Deva, 2005

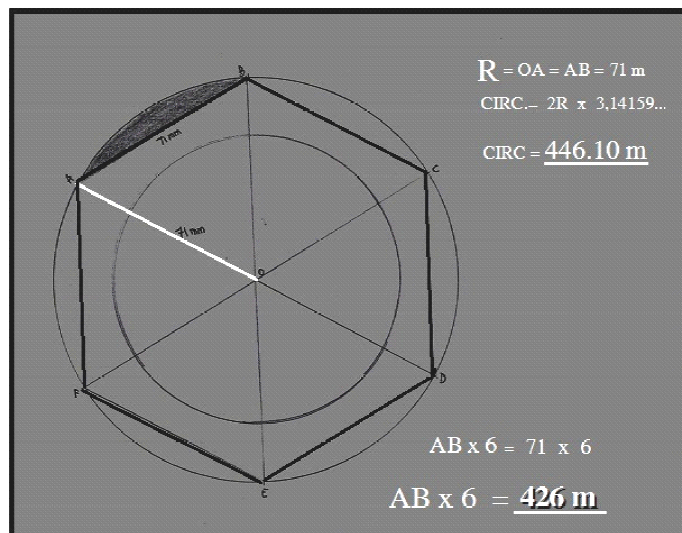
It is a value which suggest the number of the days in one year! (The approximation index, for it, compared with the correct **tropic year**", is... **99.96%**).

Someone should be very-very happy, confident he... discovered an impressive "Dacian Tropic Year"!?... Not yet! Because in almost all our calculus with the "Dacian numerical system" we got a much smaller difference and more exactly results, and because we reached the point to recognize in the "number of BLAs" an essential factor of operations, we have used the... "**104.04**":

$$38\ 000 : 104.04 = 365.2441369..$$

For this value the index of approximation is *only 99,99947 %* reported to the current value of the Tropic Year (365, 242199075 days)!! Of course, immediately you will ask: "*From where came this... 104.04'?! From the same Circle A?!*".

Well, the difference of "0.04" is not the sum of supposed under-millimetre intervals between the slabs! The "0.04 addition" comes as a calculus *between the circumference of a circle with a diameter of 29.478m, with 104 circular segments and the perimeter of the regular polygon with 104 sides, inscribed in the circle (having the same diameter)*. The sanctuary constructors used the "number 104" for the sides of the polygon and "104.04" for the circular segments because - *trigonometrically!* - that is a very... productive proximity (between the "circumference" and the "perimeter"). In fact, the total difference in total length - in the case of the same diameter, 29,478 m - is a perimeter shorter with... *under 5 cm*; and *only 8 mm* the maximum "extention" of the circular segment toward a polygon side (those "marks of the polygon!").



To be easier understandable the difference between the *circumference of a circle* and the *perimeter of a polygon* with the same diameter, we can see the simply design of the polygon with 6 sides, in which all sides are equal to the radius. In this case (with a certain *radius = 71 m*), the total difference in favour of circumference is 20.1 m. The difference will be smaller and smaller by increasing the number of polygon sides!

MSR has an astonishing engineer-design; and *in situ* construction, obviously, not all the elements are perfect. But the constitutive elements are **representing** the "perfect design" proposed! With great results: for example: in their outer sides, the 104 Blas have not only an amazing curved base, but also the marks of *that polygon sides*; and those marks are a certain proof, not so much for the skill of the Dacian stone masons but, first of all, for the outstanding *geometrical and trigonometric knowledge* of those which have designed this jewel of ancient thought: the Great Round Sanctuary!



Can be seen the carved line which was considered (by the archaeologists) *a simply ...'ornamental design'*.

...Here, in this paper I have no full play to demonstrate how we got many complex functions (encoded in MSR!) like the dimension of the very probably "**length-modulus**" used by Dacians (1.734 m), an amazing **Pi constant** (by **3.1416** !) and other functional mathematical constants, used for a lot and wonderful calculations in their numerical system; and, for sure, the short space here is not the good place to try to introduce the reader in the more complicated calculus of the Dacian **calendar**, or in the apparent inexplicable accuracy of their **geodedic and astronomic** measurement... But, to strengthen Jordanes' description of the outstanding men thought by Decaneus into high astronomy, let's talk a little about the *orientation of MSR*. Why? Because the orientation of a sanctuary is the true sign of use of "schrine" for the astronomic research!

Today, at least in the pluridisciplinary research, is not a secret that at Dealul Gradiste was no “fortress” and no “capital of Dacian Kings”! The real military fortified points are those from Blidaru, from Costesti, from Piatra Rosie, Capalna, Cugir and Banitza, all armed **with defending walls**. Dealul Gradiste has many walls, but usually low and protecting only against the... slopes sliding! Yes, in the western side of the “Sacred Zone” there were the walls 7-8 m. high; but those walls protected the terraces *against the cliff*, not against an... *enemy*, (you can imagine an idiot enemy, ready to climb - why through... there ?!! - over 300 m up-the-cliff to... what? To a.. certain death?!...)

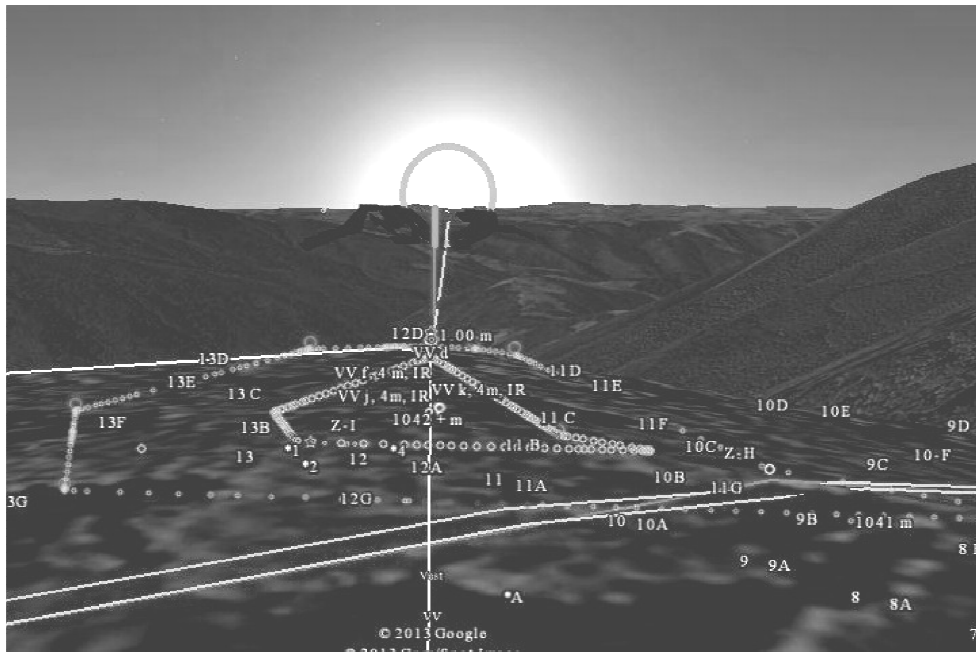
And “*the Dacian capital*”, **the real one**, was located (and we have a lot of proof for it) exactly where Ptolemaios designed it on his map, at South-West from current town of Hateg. There the Roman invaders (and winners of two big wars against King Decebal) have occupied the **fortified kingly town**. Yes, *that one* was really fortified; but, in the same time, “up-dated” as a modern capital, at the level of start in the second century AD). This **up-dating in Mediterranean manner (!)** was done, for sure, with... Roman hand!. For it, Cassius Dio is very explicitly: in Dacia, before the wars between Decebal and Trajan, there were *thousands* of Roman prisoners, many deserters from the Roman Empire and... a lot of “skilled architect-masters with know-how of civil and military construction”, year after year sent to Decebal by Roman emperor Domitian, as a “gift to an ally”¹⁴. The Roman soldiers of Trajan got in and occupied that “up-dated capital” (101 AD). And after 106 AD they will settle comfortably in the.. throne and in the bed and in the bathrooms of Decebal King! Actually, the Romans have had not reason to raise new walls, the walls were there; just a Roman amphitheatre; and... (you can believe it?!) – they kept even the old name: “*COLONIA DACICA SARMIZEGETHUSA*”, only later adding a memorial tail: “*Augusta Ulpia Traiana*”. (Even the name can tell us how the procedure had work!),

But in Orashtie Mountains, into secluded nest of Dealul Gradiste, there was *the heart of Dacian creed*, a hidden place for Dacian treasury, a “sacred ironsmith congregation” and a virtual *Dacian Academia*, improved probably in the time of Decaneus (Deceneu). We guess that the place must have been a very older spiritual center, maybe from the time of Zamolxis (?) and, yes, that monastic center was raised *around of a first astronomical (old) observatory*, located on the top of the hill.

Surrounded in three sides by more high mountains, as an astronomical observation, Dealul Gradiste had a single one “window”, a single opening to the mandatory, VISIBLE HORIZON (to West, 270⁰). Maybe it was enough for a beginning astronomic activity? With this direction, a firmly West point (marked precisely by the sunset at the Vernal Equinox and the Autumnal Equinox), and with a very clean atmosphere around, between the mountains and forests, the old priests and novice astronomers took a fix, a supporting, a “reference” astronomical – orientation point, the West, a point to which to report every night turning of the

¹⁴ Cassius Dio, *Hystoria Romana*, LXVII, 7

firmament... (Maybe regarding those "Hiperboreans" wrote Hecateus, the very old Greek historian quoted by Diodor of Sicilly?!.. They say there was a large fraternity of old learned priests, a full town, which lead their life praising to Apollo as the deity, in a very special location "close to the Sky" and from where "... due to the clear atmosphere of place, you can see mountains in the Moon, like on the Earth"?!...¹⁵



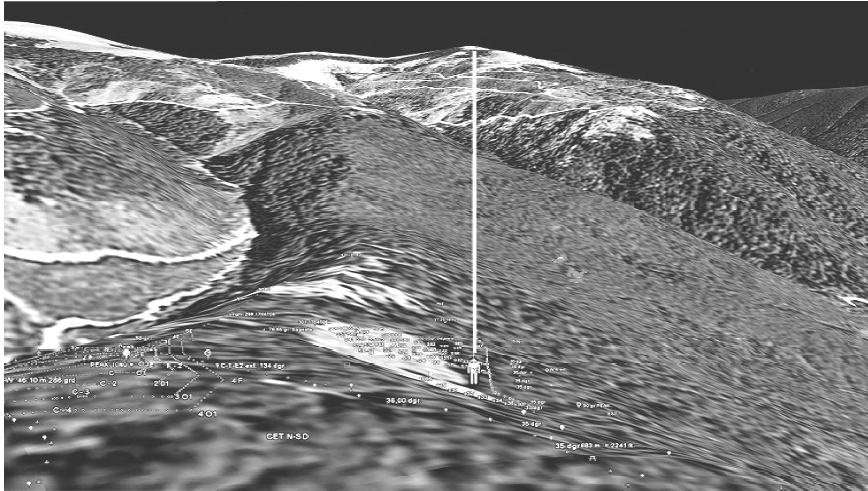
The sunset at Vernal Equinox (21 March), seen on the “visible horizon” from the top of Gradishte Hill.

Our research have tried to prove (and still will do so!) the hypothesis that a new, an excellent new “astronomic observatory of Kogaion”, an *updated* one (and initiated, we guess, by Decaineus in the second half of Ist century BC), an observatory with excellent performances, was raised on **Mount Godeanu**. A very suitable place (at least useful in time of spring-summer-and-fall), because the top - an "aerial" plateau at 1632 m altitude - is open almost 360 degrees around toward the *visible horizon*, on which you can hang *guide marks*!

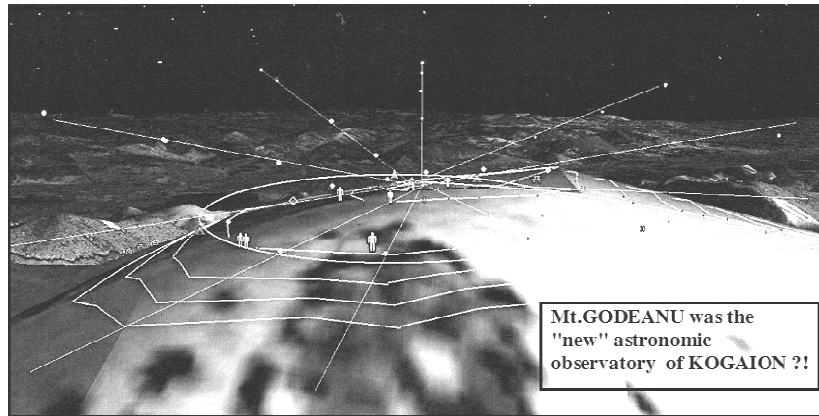
Dealul Gradiste itself is nothing else but a ridge descending from the Muncelu, a shoulder of Godeanu. The two location (“Sacred Zone” and the top of Godeanu), are connected by a visual line of 3 kilometers, On top of Godeanu, exploring directly,

¹⁵ Diodor Siculus, *The Historical Library*, II, XLVII, 1-7

visually, and – by satellite images - with the URTIM procedure¹⁶, we found there some important traces of anthropic activity, 0.30m to 1m underground. Is there, even, the site of a very probable antique tower, crashed down on the slope (the presumed tower for *astronomic research*?! The place *was not* searched sound, yet, by the archaeologists, even repeatedly we have provided them significant spectrograms).

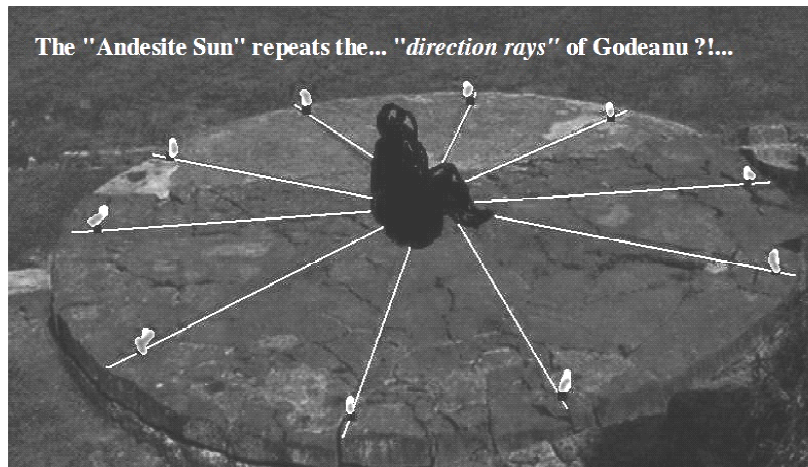


From the “SACRED ZONE” of Gradishte Hill to the top of Godeanu is a “perfect visual line”.
(Today, because of the surrounding forest with high trees,
the Peak of Godeanu is no more visible).

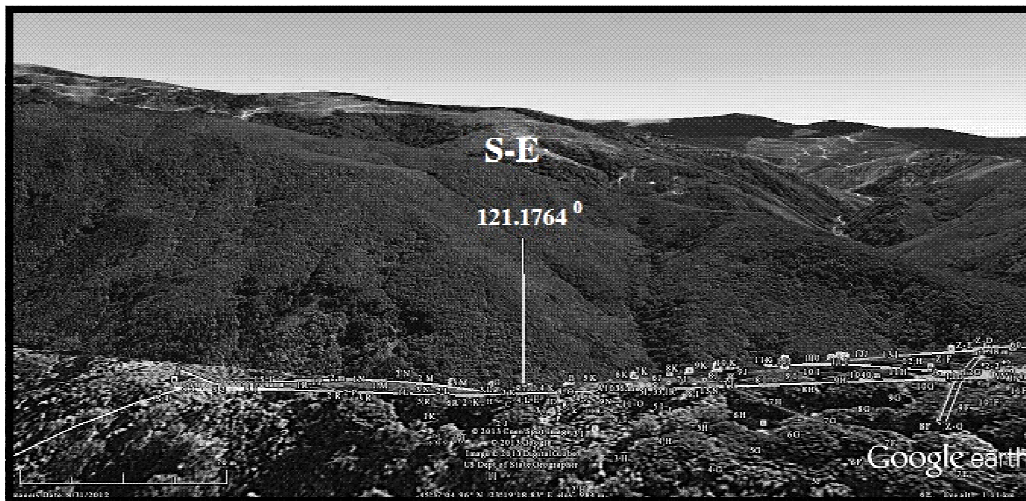


From the top of Godeanu there are 10 possible MARKED DIRECTION,
like an "orientation map"...

¹⁶ *Urtim Procedure* is an original system of the author of the paper, developed to obtain spectral images of the underground, in virtual archaeological sites, sometimes till 4-5 meters deep, and which procedure can identify "antropic burried traces".



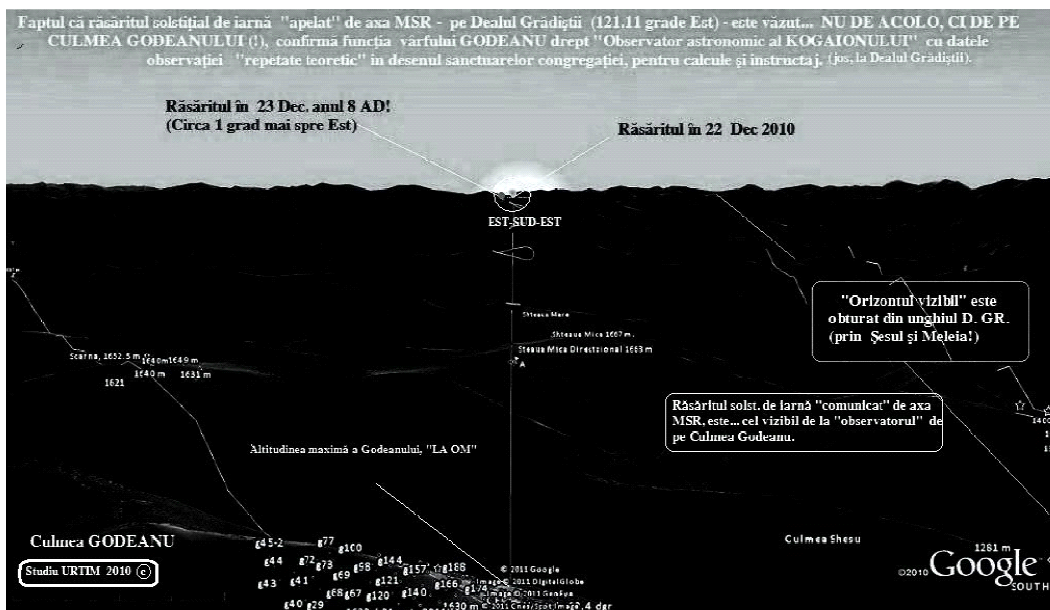
A lot of time persisted the locked up "enigma of downtown Kogaion": when was constructed the Great Round Sanctuary? The archaeologists know very well that it was built on the top of another one, an older "structure"¹⁷; (but to get in touch with that structure, today, should mean to dig again the current MSR; and it was expensive and difficulty "reconstituted" in 1980, for show and for visits of tourists!). Anyway, due to the satellite images provided by Google Earth Pro, today we know that the South-East end of the longitudinal MSR axis points very exactly to the place of *sunrise at Winter solstice (121.1764706°)*. But, because the field of vision from Dealul Gradiste is totally obturated by the nearby mountain called Shesul, taller than Dealul Gradiste with some hundred meters, how the constructors of MSR *should have know the perfect direction* to the "winter solstice sunrise", depending on which was "oriented" MSR, but... *invisible* from there?!



The Great Round Sanctuary cannot see the sunrise depending on which it was built!...

¹⁷ C. Daicovicu and oth, *Archaeologic Report*, in SCIV, II, 1 1951, p. 117

Today, thanks to the satellite images (provided by Google Earth, Geo Eye, NASA and others) we have the answer: the correct direction and angular position for MSR construction, the *orientation of its axis* came – with remarkable accuracy - from the... top of Godeanu! So, taking in consideration that “the new observatory” was considered necessary probably in the time of Decaneaus (at the middle of the Ist century BC), the new construction of “the very skilled MSR” was build latest, in the first years of the First Century AD!..



The 121.1647. degrees inclination of MSR axis, precisely to the point of sunrise at the Winter solstice is seen only from the altitude of Godeanu and it was “communicated” at Dealul Gradiste, very probably, from this new and powerful Dacian *astronomic observatory!*...

A real research of the Geto-Dacian ancient level of knowledge and of a possible Central-European and North-European connections with that “KOGAION”, the area of GRADISTE-HILL and Mount GODEANU, (a “historical treasure” included mostly *theoretically* in the UNESCO’S “protection”!..) is absolute mandatory. From three decades the Romanian authorities and Romanian Ministry of Culture argues with local authorities, who and how to supervise the area. But nothing significant is done – at a central and at the local level - to explore and to save the huge scientific treasure encoded in this KOGAION ! And the World knowledge is mislead (see the VIKIPEDIA!) with outdated and deceitful data offered by past-historic lies (like the one, without any proof, that there was a... “kingly-capital” of a...*tribe of Dacians*, hidden into the... mountains; (and not a real “*Ancient Creed and Science Centre*” (like the latest Lassa, Ushmal, etc.?!...))

A lot of others possible deductions from a new, a very accurate (and very necessary) survey, are in abeyance of a real and authorized multidisciplinary team of scientists, which have to work with a new generation of archaeologists, well organized and without preconceived ideas. The “miracles of Kogaion” are too astonishing, and too important in understating our past, to remain just a personal laboratory of some private, individual people; or, - more critical! – to the shovel mercy of a few old archaeologists passed beyond, which claim - inadmissibly- that sanctuaries of GRADISTE HILL are their “exclusive property” and they must have the last word on it. For the *History of Science*, for the Romanian History and for important economic interest of Romania, “KOGAION” signifies a lot more than...what the shovel, the brush and the wheel-barrow can say!...