THE ANCIENT GOLD MINE PERPERIKON NEAR THE VILLAGE OF STREMTSI, KURDZHALI REGION

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ABSTRASCT

Ten kilometers distant and bilaterally aside the road Kurdzhali-Haskovo there are tens of workings penetrating a small hill named Hissar Tepe. The nearest village is Stremtsi. All those workings are ancient adits, shafts, raises and open pit quarries. Until 1980 they have been recognized to be a unique Thracian sanctuary or tomb of a powerful Thracian king. On the 1:25 000 scale topographic and geologic maps they have been wrongly indicated as naturally formed caves. In fact, there are not any carbonate rocks in the Hissar Tepe hill.

Investigations performed from 1980 through 1983 show that Hissar Tepe hill near Stremtsi is built up of diagenetically hardened conglomerates, gritstones and sandstones. Locally they are interbedded with coal-bearing siltstones. All these are river and river-lake sediments of Priabonian age. They are horizontal or almost horizontal. At places vertical displacements at a distance of 0.5-1 m are seen. There are two main areas of concentration of galleries, shafts and raises - one of them on the SE slope and the other in the NW part of the hill. The distribution of most of the underground workings indicate that they follow conglomerate and gritstone layers.

Heavy concentration sampling of soil in the mining area has been performed and each of the samples yielded 20 to 135 grains of pure gold. Due to diagenetic alteration of the rocks all the gold grains are re-crystallized and the sizes are 0.05 to 1 mm. The content of gold in the conglomerates and gritstones is up to 4-5 ppm. Beyond any doubt, the area of Hissar Tepe hill near the village of Stremtsi is a diagenetically altered placer deposit of gold and all of the workings in the area represent a remarkably large in size ancient gold mine. Fragments of ceramics have been found in the mine and they show two ages - 3-4 and 12-13 centuries A.D. There are no data that the mine has been in exploitation later than 14th century.

Four kilometers to the east of the mine there is the old castle Perperikhon, known from Antiquity up to the end of 14th century A.D. Similar are the names of the village and the river near the castle. The etymology of the names shows that they originate from the name perpera - gold coin, emited by Alexii Komnin (1081-1118) in Byzantium. And this is the reason why the name Perperikhon is proposed to name the gold mine and the gold deposit near the village of Stremtsi in SE Bulgaria.

The region of the Eastern Rhodopes is a gratifying and blessed land. We have to go back by centuries and millenniums in order to see it as it was, and what it may be - a centre of large economic and cultural progress, a cradle of flourishing civilizations which have gained world fame and glory. Here, in the BC centuries has arisen the kingdom of Odrisses, who surprise us by their skill to mine ores and metals. This rich in natural resources land has been a stronghold of the might of Sitalk and Seft, of Philip and Alexander of Macedonia, a source of the wealth of Rome and Bysantium, a corner in which swarmed the germs of the creative labour of the Bulgarians and the Bulgarian national spirit. The land of the ancient Odrisses is not just a peculiar crossroad of history and archeology, but also a knot in which are woven many secrets of the geology and the mineral resources of the Bulgarian lands.

The mining was an important profession of the ancient Thracians, could not be explained otherwise this rich archeology of metals and jewelry gold that they have left to us. This was noticed also by their neighbour states. "In the awareness of the Hellines at that time, as well as in earlier times, Thrace always has been a region with rich ore deposits and possibilities for exploitation and export of ores (especially gold, silver and copper ones)", writes V. Velkov (1973). The Hellines appreciated the skill of the Thracians to mine ores and metals, but were not let into the details of this profession. To them however, we owe the written about the mining skill of the Thracians, something that cannot be else but a slender description, missing technological and organizational details. The Thracians did not have writing to leave us descriptions of their professional skills in mining. And may be they did not want to let others in their findings in this craft which nobody can challenge even today. What they have left us, are the numerous old mines, which we find everywhere in our lands. There are so many of them, and they are so impressive in size, that one cannot imagine. But that are remnants of old mines which cannot be noticed and apprecieted by everybody. There are attempts of historians and archeologists, as well as of geologists, mining specialists and metallurgists, to study some of them. However the achieved in this respect successes do not go beyond an initial research phase.

To familiarize with and study adequately the history of the ancient Thracians without acquaintance with their main profession - the mining, is tantamount to absurd. To a great extent this applies also to our knowledge about the metallic and non-metallic raw materials. As far as our knowledge of gold deposits is concerned, this fact deserves stronger words. Provided about gold and its deposits we know as much as the Thracians did, we would save many errors and delusions, we would find a more direct rout to the wealth which is nowadays hidden in the bowels of our lands. During the last decades we made many efforts, but did not reach the desired successes. And we turned out to be only legitimate inheritors of their lands, but not of their prestige in the mining craft. But in the old mines

an enormous information is buried, information that has to be read.

One of the long ago forgotten gold deposits is in the area of the town of Kurdzhali, between the villages of Rani List and Stremtsi, (Fig. 1). The interest toward it was provoked by a publication of B. Deribeev (Newspaper Anteni, 1980).



Figure 1. Location of the object

The organized by the newspaper special expedition that visited the site on 07.08.1980, did credit to the newspaper. In the expedition participated historians, archeologists, journalists. In the capacity geologist and mining specialist took part also the author. The expedition had to examine the object, to decide what it represents, and the newspaper's editors to inform the readers about this decision. The expedition examined the accessible for observation places, but to a final decision it did not come. Only an opinion of the author about what the object could be was expressed, an opinion that needed serious proves. An article with the final opinion that the object is an ancient gold mine appeared after three years of profound research (Atanasov and Yovkov, 1983).

What was known about the object? The place Hissar Tepe is a small hill between the villages Rani List and Stremtsi, (Fig. 2). It is located 10 km away from the town of Kurdzhali, along the road to the town of Haskovo. The asphalt road runs through the very object. There are exits of galleries, shafts and rises on both sides of the road. For the local population that are "the holes" or "the caves". Most frequently is used the name "Dzhenevis Inlar". And indeed, in many cases the investigated structures are considered as naturally formed caves. As such they are indicated also on the topographic and geological maps of the area (Fig. 2). So they are marked in the Tourist Guide for the Kurdzhali region (Strashimirov, 1981, page 85-86). There it is written " At a distance of 9 km (from the town of Kurdzhali, author's note), along the road is the fountain Gazlarchesmesi (The Geese Fountain). Above it, there is a small pine-clad hill. There are man-made caves".

There is a story, that chasing a fox, a hunting dog entered one of the holes, and went out as far as at the village of Shiroko Pole, which is 15 km away from there. For another of the galleries, which represents a perfect water siphon, it is said that behind the water, there is an iron gate guarded by an iron dog, and iron guardsman holding a drawn out sword. Legends. Such a gallery – siphon really exists. At present it is accessible, and is located at approximately 200 m after the Gazlarchesmesi, along the road Haskovo, at 20 m to the right.



Figure 2. Geological map of the area (after D. Minchev et al., 1963, with supplements by the author)

The correct conclusion is that the object represents a large complex of man-made underground and surface workings. An opinion that this is an old mine was voiced even 80-90 years earlier, but it did not find convincing support. It was visited by our and foreign geologists and mining specialists. They however did not find traces of the traditional for the Eastern Rhodopes mineral deposits. And indeed it is so. There are not even traces of lead-zinc, iron and other ores. Absent are also the traditional for this area non-metal mineral resources: trass, talc, asbestos, etc. Then came the categorical, but wrong conclusion that the object is not a mine and remained the curious puzzle, what it is anyway. During the period before 1980 this question interested mainly historians and archeologists. They assume the existence of certain connection between the numerous rock tombs and niches from the Early-Iron epoch, located along the Arda river valley and in other places in the Eastern Rhodopes, with the "underground labyrinths" next to the village of Stremtsi - in the sense that both are deeds of the ancient Thracians, but underline that such thing may not be seen anywhere in Bulgaria. In the publication of B. Deribeev (1980) is assumed that the object represents a rock necropolis of a powerful Thracian ruler or a sanctuary of the Odrisses. It is mentioned that the hill is build up of "volcanic tuff that has cemented gravel and sand in a conglomerate". There is no tuff. The rocks represent strongly

cemented Tertiary clastic rocks belonging to the so called Priabonian coal-bearing group. It is not important that we do not share the conceptions of the author concerning the essence and the purpose of the object. Thanks to him we have a scrupulous description of that "labyrinth of mysterious galleries".

The body of the Hissar Tepe hill is formed of clastic rocks of the intermediate molasse horizon of the Priabonian. In its composition participate continuously and repeatedly alternating poorly sorted and guickly thinning out layers and lenses of conglomerates, gritstones and sandstones. In some places also presence of thin coal-bearing strata and siltstones is observed. The total thickness of the molasse horizon is about 300 m. The sandstones are medium- to coarse-grained, the conglomerates - of medium to large rocks fragments. The fragments are of gneisses, mica schists, amphibolites, diabases, pegmatites. There are plenty of compact gray and milky quartz fragments. The layers and lenses of conglomerates and gritstones are horizontal or almost horizontal. The fragments and grains they contain are very rounded due to prolonged transportation by water. In the crest of the hill, where the numerous and best preserved mine workings are located, the gritstones and the conglomerates are strongly cemented. At the lower levels of the same horizon, the cementing of the rocks is relatively weaker. The deposits of the horizon represent typical river to river-lake sediments. From here came the initial assumption that these are lithified goldbearing alluvium.

In the rocks that build the hill are observed minor faults with amplitude 0.5-1 m, dipping at 80 - 85°. The thickness of the tectonic zones rarely exceeds 10-20 cm. Locally, some of the fractures are filled by interrupted veins of gray or white finegrained guartz. Sulphide mineralization visible to the naked eye is not observed, but the material from and around the tectonic zones after being exposed to air for a longer period obtains a rust-brown colour. The reason is the weakly expressed pigmentation from iron oxides and hydroxides, a result of weathering processes. During the weathering of the rocks inside the mine, on the walls of some of the galleries were formed minor gypsum crusts, up to 0.5 cm thick. Such type of secondary mineralization suggests the presence of primary disseminations of sulphide impregnation of sulphides minerals. The carried out later microscopic and X-ray studies confirmed the presence of fine-grained impregnation of pyrite and marcasite.

It is important to note, that in the geological 1:25 000 map of the object, the crest of the Hissar Tepe hill is given as built up from limestones (Fig. 2), what is not true. There are no limestones, but only sandstones and gold-bearing conglomerates and gritstones. As an underground structure, the mine represents a complicated complex of isolated or mutually connected horizontal, inclined and vertical workings, located predominantly in the crest part of the hill, on an area of about 1 km². On the surface are found several places of especial concentration of galleries, shafts and rises (Fig. 3. (The topographic map and the plans of the underground workings are made by K.Yovkov). Found were more than 30 entrances of horizontal and inclined mine workings, more than 20 vertical workings (vertical shafts and raises), places with remnants from open-pit quarrying of material and old dumpsites with abandoned broken-off material.

The system of mutually connected galleries and raises located on the SE slope of the hill has an impressive appearance (Fig. 3). They enter the massif through 10 adits and reach inside to 60-70m (Fig.4). From them detach a multitude of branches which form a complicated labyrinth. The workings follow mainly the conglomerate and gritstone layers, as well as the fault zones. From the geology of the sedimentary gold deposits is known, that rich in metals and other heavy minerals are usually the lavers of coarse rocks. Many of the galleries are built to follow the faults zones in the rocks. Obviously the tectonized material along the faults facilitated the drowing of the workings. Along them most frequently the connections between the workings on different levels were accomplished. At the same time it was found that partial re-deposition of metals, related to notiseable enrichment of gold occured along the fault zones.

Situation scheme of mine entrances at Hissar Tepe hill



Figure 3. Schematic location of the entrances to the mining workings: A. Shafts; B. Galleries; C. Dump sites with broken-off material; D. Open –cut quarry

The connection of the galleries with the surface was carried out also by building raises up to 10-15m high. The galleries that penetrate deepest into the hill are intentionally barred by broken-off rock material. From the general vew of the mine is visible the desire of its last inhabitants to restrict the access of visitors to the most inner parts of the massif, to where the labyrinth of galleries most probably penetrates. As barriers against penetration most frequently raises were used. Usually they are full with especially prepared broken-off material. The so prepared barriers are a serious obstacle to clear the mine even nowadays.

A typical feature of the horizontal workings is that in their upper parts they are perfectly arcaded. Despite the fact that they pass through coarse-grained and pebbly rocks, the ceilings and the surfaces close to the arch are impressively smooth. Especially impressive in appearance are the arcaded galleries with large cross section, the chamber widenings and the crossing places of several galleries. In these places the arches have a regular oval shape and their surface is plain and smooth. At first glance the smoothing of the arches of the calleries is perceived as a deed of human hand. The truth is that the arcaded shape and the smoothing of the arches is a result of the action of the mining pressure exerted during many centuries. The interesting in this action is that the shearing stresses act through the same cylindrical surface in the same manner through the cementing matrix and through the much harder pebbles of the conglomerate, regardless of whether they are rock fragments or pieces of dense and compact quartz. Due to the action of the mining pressure, the typical for such conditions rock peeling from the walls of the galleries takes place - at the arches and areas close to them. In this



Figure 4. Plan of the mine workings (galleries) in the SE slope of the Hissar Tepe hill

respect the mine is an exceptional object for carrying out observations on the real action of the mining pressure forces during a period or 1000 to 1700 years. This fact is of importance not only for mining experts, but also for specialists from other fields in order to prevent them from wrong conclusions. The floors of the galleries and the lower portions of the walls however have kept the roughness remained from the time of their laying. It is well known, that according the rock mechanics laws, here the forces of the mining pressure do not manifest themselves in rocks with such degree of consolidation. Owing to this reason, the marks of the chisels of the ancient miners are well visible. Their examination certainly would lead to disclosure of interesting data related to the methods and organization of the work of the ancient miners, something important for the archeology, as well as for the history of the mining.

Interesting is the system of shafts, galleries and raises at the NW part of the hill, (Figs. 3, 5 and 6). On a surface of about 100 m² are located 8 shafts which penetrate to a depth of 10-15m. From them, at three levels, are laid horizontal and inclined galleries. Followed are also layers of conglomerates, gravelites and tectonic zones. The galleries built aside of the shafts are also connected, and are in the same manner intentionally blocked by broken-off rock material, either by raises up to the surface, or by careful burying of the very workings. Fig.6 shows the mouth of one of the shafts. In the monolithic and hard rocks around the mouth of this shaft



Figure 5. Plan of the workings (shafts, galleries and rises) in the NW part of the Hissar Tepe hill

hemispheric depressions with diameter 10-15 cm are clearly seen (Fig. 7). Most probably they are remnants of near-shaft structures - nests for pillars for hoisting devices, sheds and other auxiliary surface devices. And maybe this is a system for underground orientation, a plan of the mine, or something else related to it.

The above described two major systems of underground workings - the galleries at the south-eastern slope and the shafts at the north western part of the hill, for the time being are isolated from each other. A direct link between them was not found. Presumably, such underground link between them exists, but has been intentionally blocked. Here is the prove for this. To the system of shafts, galleries and raises goes the whole amount of rain water that is coming from the wide crest of the hill. The rocks are difficult for penetration, and each depression in the rocks is holding the water even during the driest months of the year. As a whole however, the mine remains dry during the whole year. That means, the mine is

ANNUAL University of Mining and Geology "St. Ivan Rilski", vol. 45 (2002), part I G E O L O G Y

Atanasov V. THE ANCIENT GOLD MINE PERPERIKON NEAR THE VILLAGE

adequately drained. The draining of the water probably is accomplished through galleries at lower levels. They have to be searched down the slope, but they are covered by slope embankment.

On the north-western slope of the hill, on a level 25-30 m below the mouth of the shafts, but not less than 200-300 m away from them, there are well preserved old dump-sites with piled broken-off material (Fig. 3). The amount of the material at the largest dump-site was about 3000 m³. This is already rather low down the slope of the hill, and exits of galleries, close to the dump sites, are not seen. It is logic to assume that there are such exits, but they are buried by material from the slope. It is possible that they are the draining units of workings developed around the shafts. It is very possible that the very Gazlarcheshmesi has as a source the draining gallery of the gallery system at the south-eastern slope of the hill. The ancient miners did not have water pumps at their disposal and they have solved the draining problems of their mine on the principle of gravitational self-drying. Surprisingly, this system keeps on working even today, more than 6 centuries after the mine stopped working. And besides Gazlarcheshmesi (which by now is completely distroyed) on the slopes of the Hissar Tepe hill there are catchings of several more water sources. Maybe, together with the Gazlarcheshmesi they are the key of the mine's draining system.



Figure 6. The mouth of one of the shafts at the NW part of the Hissar Tepe hill



Figure 7. Hemispheric depressions in the layer of sandstone at the site close to the main shaft at the NW part of the Hissar Tepe hill.

The available at the dump-sites broken-off material witnesses for a large - scale mining activity in the remote historical past. And this is just a portion of the material excavated from the mine. A large amount of it was transported away and used as pebbly cover of the road Kurdzhali-Haskovo. For this purpose to the dump-sites a special forest road was laid, which exists now. The builders of the road did not realize that they are carrying away material from old dump-sites. Nowadays, when needed, the local inhabitants are using material from the dump-sites for construction purposes. To produce construction material needed for building the asphalt road Kurdzhali - Haskovo the mouths of two galleries on the south-eastern slope of the hill were hurt. Blown up and irretrievably disappeared the first 3-4m of their entrances (Fig.8).



Figure 8. The entrances of galleries No-s 9 and 10 on the south-eastern slope of the Hissar Tepe hill. The original mouths of these galleries were blown up and the obtained material used for pebly cover of the Kurdzhali - Haskovo road.

Special attention deserve two of the galleries at the southeastern slope of the hill. They also belong to the structures envisaged to restrict the access to the mine's inside. They are built as artificial water siphons. In one of them, located near the crest of the hill, the siphon consists of a gallery sloping inside and other sloped gallery laid on a lower hypsometric level. This siphon was discovered by carrying out minor clearings of its almost closed entrance. The other siphon is located considerably lower down the slope and is outside the scope of Fig. 3. It was already mentioned in the legend for the iron gate barrier. The siphon is very well preserved and the portion before the water barrier is easily accessible. It consists of horizontal galleries on two levels, both of them dry. Next follows a vertical shaft full with water. The water is clear. At the bottom of the shaft is visible one more gallery, located on a lower level and also submerged under the water. This structure is suitable for penetration into the mine since evacuation of the water may be easily accomplished.

At the western part of the hill there are few entrances of galleries only. There is however a place of open cut quarry (Fig. 3). In the rocks several benches are formed and terraces of broken off material near to them are made. The benches of the quarry reveal and follow well expressed conglomerate beds.

There is no doubt that the whole system of underground and surface workings represents a very large for the time of its development gold mining complex.

During accomplishing of the mine surveying and geological documentation of the underground part of the complex, in two of the galleries fragments of ceramic utensils were found. The dating indicates two ages - one of between 3rd and 4th century, the other - between 12th and 13th century AD (The age of the ceramics is determined by D. Mitova-Dzhonova).

A purposeful sampling of the soil layer near the entrances of some of the galleries, shafts and raises of the mine was carried out. In all samples grains of native gold were found. In a 20 kg sample, taken near the quarry, (Fig. 3), were found 135 grains of native gold (Fig. 9). The sizes of the grains vary between 0.05 and 1 mm. The larger of them reprecent, intricately branched three-dimensional dendrites, built up of comparatively well shaped gold crystals. Many of the grains are aggregates of gold still not freed from the non-metalliferous minerals and this picture completely corresponds to the local geological situation: a stage of weathering, with not completed disintegration of the rocks and without transportation of the material away from the place of weathering.



Figure 9. Microphotograph of gold grains extracted from the soil layer of the Hissar Tepe hill. Magnification 100 x

An observation of polished sections taken from the Hissar Tepe hill was carried out. In them were also found grains of native gold, with dimensions and sizes as above mentioned. The preliminary sampling of the gold-bearing conglomerates gave gold content from 1-2 to 4-5 ppm. The above stated indicates that the placer gold in the clastic Priabonian rocks near Stremtsi was affected by serious diagenetic alteration. It has caused a general re-crystallization of its grains. Apparently, the extraction of gold from souch ore may by realized by preliminary desintegration. And probably this way of extraction has been used by the ancient miners.

Concerning the essence of the object in study as a manmade creation, a link between it and the old castle Perperikon (Perperakion), located at about 4 km eastwards of Hissar Tepe, should be searched. The castle is situated on a neighbouring hill, next to the village of Gorna Krepost. The names of the river Perperek and the village of Perperek are derivatives of this word. The etymology of the word indicates a connection with the name "Perpera" - name of a gold Byzantine coin from the 11th to 13th centuries. This coin was introduced by emperor Aleksii I Komnin (1081 - 1118), weighs 4.4-4.5 g and is with purity 20.5 carats. It was in use during the Byzantine domination on Bulgaria, but was also in circulation during the Second Bulgarian Kingdom. That is a name which survived the broken thread of the time.

According to the data of B. Deribeev (1980), in the 1891 Year Book of the Odrin Vilayet (Province of the Ottoman Empire), in the section for the Kurdzhali's Kaasa is mentioned that between the villages of Rani List and Stremtsi "are located two underground buildings that are worthwhile to be seen". By these words the Turkish chronicler actually declares that he is not aware about any information related to operation of the mine after the Turkish invasion in our lands. According to the Byzantine chronicler Georgi Akropolit (1217 - 1282), Perperikon was one of the largest fortresses of Achrida (Mora). There is a description of the fortress and the near-by located town of Perperakion made by the Byzantine Emperor Yoan Kantakousin (1347 - 1355). It is obvious that to a certain degree the history of the civilizations around the archeological object Perperikon, located near the village of Gorna Krepost, since pre-historical times is related to the gold mining in the Hissar Tepe hill.

The mine Perperikon is not unique, but is one of the numerous gold mines in the lands of the Thracians, and later, in the Byzantine and Bulgarian lands. After the break-down of the Roman Empire a considerable drop in the ore mining took place. A great number of mines were abandoned. The mining skills of the Thracians were somewhat forgotten. The Thracian tribes rarefied and intermingled with the newly arrived populations in their lands. And it is not before the time of Aleksii I Komnin that Byzantium again becomes a mighty power. Many of the ancient mines were recovered and brought into exploitation. A general upsurge of the mining and production of metals occurred. It is difficult to prove that the mine near Stremtsi was an unique miracle at the Empire. What I know about it at present, does not allow me to support such assertion. Whether there was a break in the ore mining at the Stremtsi mine during the period between the Antiquity and the time of Aleksii I Komnin, for the time being is not clear. There is no doubt however, that this upsurge in the ore mining was not

ANNUAL University of Mining and Geology "St. Ivan Rilski", vol. 45 (2002), part I G E O L O G Y

a privilege of Byzantium only. It is obvious that it affected also the neighbouring Bulgaria. Everyone knows that the Bulgarian king Ivan Asen II also began to make gold coins. And that is a fact which was not profoundly discussed in the Bulgarian history. It is not clear why, but written knowledge concerning the ore mining and gold production during this period and during the time of the First Bulgarian Kingdom is missing. For the time being, this extremely interesting secret is locked within the numerous old mines that can be found everywhere in our lands. Of course one of them is the Perperikon mine near Stremtsi. For this reason, in the paper of Atanasov and Yovkov (1983) was stated that many more secrets are hidden there. It is known that the fortress Perperikon was a reason for disputes between Bulgaria and Byzantium. In the middle of the 13th century it was taken away from Byzantium and conquered by the Bulgarian ruler Mihail II Asen. Actually, what about was the dispute? Was the gold mine near the fortress included in the dispute? Is it just a chance that so many names in the neighbourhod have in their root the word "Perpera"?

There is no doubt that the activity of the mine was ceased just before the coming of the Turks in the Balkan peninsula. It is logical to look for a link between both events. The previous possessor of the mine, Byzantium, obviously did not want to allow the invaders to penetrate in its deepest inside. Before withdrawal he has built the above described barriers of brokenoff rock material, as well as the water barriers - the siphons. There were things left in the most inside parts of the mine, ones that solely he knew about them. Provided this assumption is true, than even now there is available an extremely rich archeological material, carefully hidden by the Empire. There is no other way to explain the building of such complicated system of barriers.

New data about the gold mine near Stremtsi were obtained during the period 1994 through 1998 (Ivanov and others, 1998). By the former Committee of Geology a large-scale geological research programe of drilling, exploration trenches and clearings was accomplished. The opinion of the authors is that the gold mineralization in this place is epithermal in origin, and is closely attached to the faulting of the rocks. It is in the form of ore veins along two main directions of faulting, ore shoots formed on the places of fauld crossings, and metasomatic widenings near to the faults. The sampling of the deposit provided during the exploration programme gave gold content of 0,1 - 8 ppm. The calculated prognostic reserves in terms of amount of gold and silver are 6.992 t and 5.638 t respectively, the average of gold content being 1.03 ppm. The final conclusion for Stremtsi as gold deposit it does not satisfy the conditons to be used as current sourse of commercial ore, but is just a low grade gold occurence. Of course this conclusion is far from the truth. Apparently this is a blazing mistake done by the explorers. They have searched for vertical or almost vertical veins. ore shoots and widenings near to the faults, but here at Stremtsi they have had horizontal and layered ore bodies. This makes a big difference and for this reason the mistake was of the similar degree. The ancient miners did not make such mistakes. There is no evidence for an elapsed large-scale epithermal process after faulting of the rocks. Really there was only a partial re-deposition of gold, that has happened mainly within the limits of the initially formed by sedimentation ore bodies. The consolidation of the rocks and

their lithification is an event that took place before the faulting process.

The accomplishment of a research programme, based on the defended by us concept for a sedimentary gold deposit with horizontal or almost horizontal layered and lens shaped bodies would lead to radically different results. The expectations are to establish more ore reserves with higher metal content. There is no answer to the question: what was the metal content in the ore the ancient miners have produced? They would not be satisfied by a content around 1 ppm.

The idea for vein type, epigenetic hydrothermal mineralization in Stremtsi is shared also by V. Stamatova (1996). This however contradicts the results she obtained for the chemical composition of the gold. Its hallmark is 837.7. According its composition, the native gold from the Stremtsi is within the range hypo- to meso-thermal or is sedimentary (Bilibin, 1955; Petrovska, 1973). But it cannot be hypo or meso-thermal because in the area there are no data for a previous high- or medium-temperature hydrothermal process. At the same time it cannot be epithermal, because its hallmark is above 800, but not below 700. By all signs, the Stremtsi gold deposit corresponds to sedimentary mineralization of alluvial type. It is not logical to assert that it is just an insignificant ore occurrence, neither that is completely exhausted by the ancient miners. It is areal gold deposit that deserves serious examination and competent assessment from geological and archeological points of view. The problems related to it are neither solely geology, nor solely history and archeology - they are both of them.

There is still no evidence for a direct link between the gold mine near Stremtsi and the near fortress Perperikon, but their close neighbourhod and the existence in approximately the same time is obvious. Indisputable is also the closeness in the physical dimensions and the historic significance of both objects. It is difficult to prove that they have existed independent of each other.

And after all that is written here, it is difficult to believe to the information in the newspapers Monitor and Troud, dated 28.02.2002, that a few days ago, a team of archeologists, with leader Nikolai Ovcharov, has discovered the "only antique gold mine in Europe" near the village of Stremtsi, region of Kurdzhali. Indeed, the gold mine is unique, but it is neither the only one, neither the largest, nor the richest one. Only in the Balkans decades of them can be listed. The team of archeologists discovered for itself something that was discovered 22 years earlier and published 19 years ago. Besides, by letter # 374, dated 31.01.1984, of the National Institute for Monuments of the Culture at the former Committee for Culture, the mine is declared to be an archeological Monument of the Culture. Both newspapers have used too strong expressions to make people believe them. "Starting are excavations in the Bulgarian Klondyke of the Antiquity". "From the legendary mines were obtained the largest gold outputs in the Antiquity and the Middle Ages". "The money reform in Byzantium is made by our gold" etc. It is maintained that "the mine is a deed of the Thracian tribe Bessi". It is interesting how the Bessis managed to build a mine in the lands of the Thracian tribe Odrisses. And why should somebody say things that later has to deny by himself?

The studies carried out until now on the ancient mine near to the village of Stremtsi (most of them mainly geological, than historical or archeological) give reason to make the following conclusions:

- 1. The object under study represents a huge for its time mine, and deposit of alluvial gold in the Priabonian conglomerates and gritstones near the village of Stremtsi. Its development is linked with the history of the civilizations around the archeological object Perperikon, near the village of Gorna Krepost - since the time of the Odrisses Kingdom, and probably before this time. It is expedient to designate it as **Perperikon gold mine and Perperikon gold deposit**. It is a Monument of the Culture with international significance which needs additional studies in three main directions.
- As a deposit of alluvial gold in the clastic sediments of Priabonian age, presenting a wide range of non-clarified issues concerning its mineral composition, content of useful components, productive rocks, ore deposition processes, character of diagenetic processes, amount of commercial and non-commercial ore reserves, possibilities to organise current production of gold from the deposit, presence of other gold deposits in the clastic rocks of the Paleogene, presence of river gold in the contemporary alluvium of the river system in the regions of Kurdzhali, Haskovo and other places in SE Bulgaria.
- As a well preserved ancient mine, presenting a wide range of problems concerning the method of cutting the mining workings, technology of ore production and extraction of gold, drying and water draining, history and archaeology of the mine and its connection with the historical fate of the fortress Perperikon near the village of Gorna Krepost.
- As an unique Monument of the Culture, with all problems connected with its clearing, study, restoration and preservation. Subject of preservation is not only the underground part of the mine, but also the surface one: dump-sites, open pits, terraces etc.
- 2. It is obvious that during the last stage of its existence the mine has served also as a hiding place, possessing especially prepared equipment to resist penetration of unwanted visitors. It should be expected that in its inaccessible and liable to clearing part, deep inside the massif, an abundant amount of archeological material is available. The time of transformation the mine into a hiding

place most probably coincides with the decades preceding the arriving of the Turks to the Balkan peninsula.

- It is necessary to carry out a purposeful complex study of the object in geological, archeological and historical aspects.
- 4. It is necessary to provide timely measures to protect the object. To stop the taking away of material from the dump-sites. To stop the development of new quarries for production of stones for construction purposes. To ban visits into the underground part of the mine by speleologists and treasure hunters. Huge damages were inflicted to the mine by military detachments which during the last decades have made many ditches for hiding of people and equipment. Huge damages were inflicted also by the Committee for Geology at the accomplishment of exploration programme during the period 1994 through 1998.
- 5. Even at this early stage of the ancient mine study, the making of a popular science film is appropriate.

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