

Old mining and historical mining landscape of Brusno as a part of Geopark Banská Bystrica

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ABSTRACT

The study processes the mining history of Brusno cadastral area and partially evaluates the preserved mining relics in the landscape. Cadastral area of Brusno consists of two municipalities - Sv. Ondrej and Brusno, and it is a part of the Geopark Banská Bystrica. Mining had been developed from the 15th century in relation to the copper and iron ore deposits in the valley of Peklo, which is one of the source areas of the Brusnianka creek. Deposits of these metals in particular brought prosperity to the neighboring municipality of Ľubietová and contributed to its heyday as a free royal city. Mining activities disappeared from the valley of Brusnianka in the early 19th century. One of the significant mining settlements was Bukovec. Small village Bukovec (nowadays called Pohronský Bukovec) had been a center of iron-ore mining until the 19th century.

Key words: Geopark Banská Bystrica, village Brusno, old mining, history mining landscape

INTRODUCTION

Both municipalities, Brusno and Sv. Ondrej, entered the written history in 1424 A. D. in the inventory of the Ľupča castle estate domains. The conscriptor recorded both under one common name, the „*Villa utraque Zenthandras*“, which means “both municipalities of Svätý Ondrej” (St. Andrew).

The original church building already stood in Sv. Ondrej in the 15th century at the site of the existing church. The current church building was built in the 18th century and had been rebuilt several times later. The tower was built on the south side of the church in 1835. The second “church” – the Chapel of St. Anna, was built above the spa area in 1910.

Sv. Ondrej became the administrative center of the “slúžnovský” district within the Zvolenská county in 1860. However, this was only a temporary solution because

in 1878 the office was moved back to Brezno. The district office was located in a two-storey baroque object dated back to the second half of the 18th century (the “slúžnovský” house, notary office), which was built directly below the church. A notary office had been located here after the withdraw of the district office. The two municipalities of Brusno and Medzibrod belonged to the notarial circuit of Sv. Ondrej as well. Since 1892, the building of notary office was shared with the gendarmerie station, which had its headquarters here until 1941, when it was moved to the neighboring Medzibrod. The Boston Hotel, built in 1928 and currently out of service, ranks among the historically significant buildings of Brusno.

Life of the local inhabitants had gradually changed in relation to the construction of spa. Mineral springs in the Brusnianka valley were first documented in writing in 1799. The first bathhouse had been built in

1837 and the first spa season began the following year. The pavilions reached their current appearance during the extensive renovation of the “old Spa” in the 80s of the 19th century. The new pavilion Poľana was opened in 1985 after ten years of construction works. The water from spa mineral springs heals digestive diseases in conjunction with kidney problems, liver, stomach and intestinal disorders. Recently, cardiovascular and physical problems are treated here as well.

Residents of Brusno and Sv. Ondrej municipalities worked mainly as woodcutters, charcoal makers, carters, miners and shepherds. An additional form of livelihood was represented by farming and various handicrafts. Peddling – lace-making became an important form of livelihood, as the gradual decline and disappearance of mining took place in this area. From the second half of the 19th century residents began to work in the steel enterprises of the Horehronie region.

Despite the fact that Brusno laid close to the major centers of the Upper Hungary - Ľubietová and Banská Bystrica (Špania Dolina), it had never become an important mining center. Although the first attempts at extraction of minerals are recorded in writing already in the Middle Ages, the actual beginning of mining in the area of Brusno is recorded in the existing historical documents related to the extraction of metals in the neighboring Ľubietová.

BANSKÁ BYSTRICA GEOPARK

Banská Bystrica geopark was originated in 2006. The district of Banská Bystrica occupies the area 543,1 km². It includes cadastral area of 28 municipalities. The area of the geopark is divided into 5 mining areas (respectively geo-mining areas). In relation to natural, cultural, social and technical potential of the landscape, individual geo-mining areas refer to three categories according to its attractiveness. The first category contains of Starohorsko-špaňodolinská and Ponicko-ľubietovská geo-mining area. These are the cores of the geopark area. Immediately, the core areas are followed by the town of Banská Bystrica, which belongs to the second category. Concerning the landscape potential the third, marginal category includes Brusniansko-bukovecká and Badínsko-tajovská geo-mining area. Banská Bystrica geopark is unique through the concentration of significant natural, historical, mining, geological, mineralogical, relief, technical and cultural objects, which create further ecological and culture-social phenomena. Because of these qualifications and extraordinary values of cultural heritage in the European context, Banská Bystrica has serious preconditions to become a full member of the list of European Geoparks Network. (Weis, 2009; Cimermanová, 2010; Kavčáková, 2010).

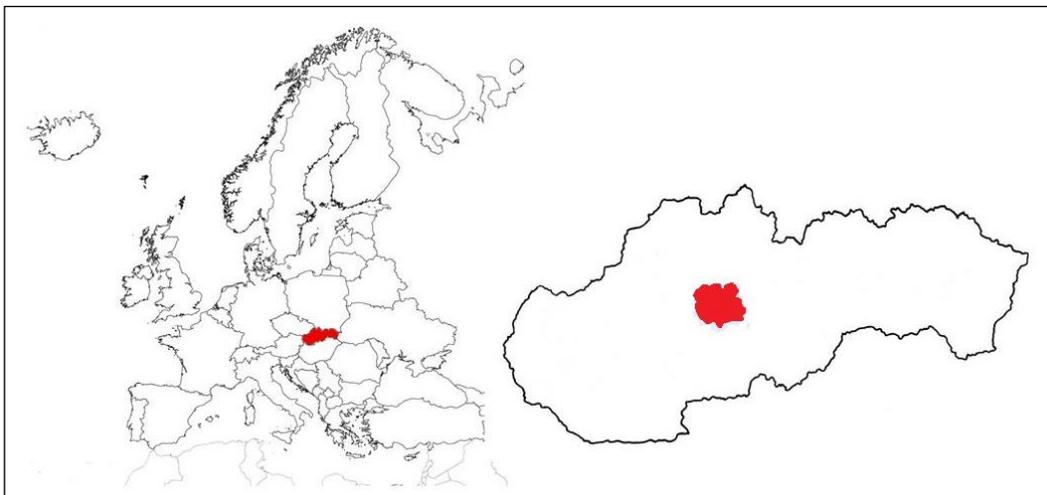


Fig. 1 Location of Geopark Banská Bystrica

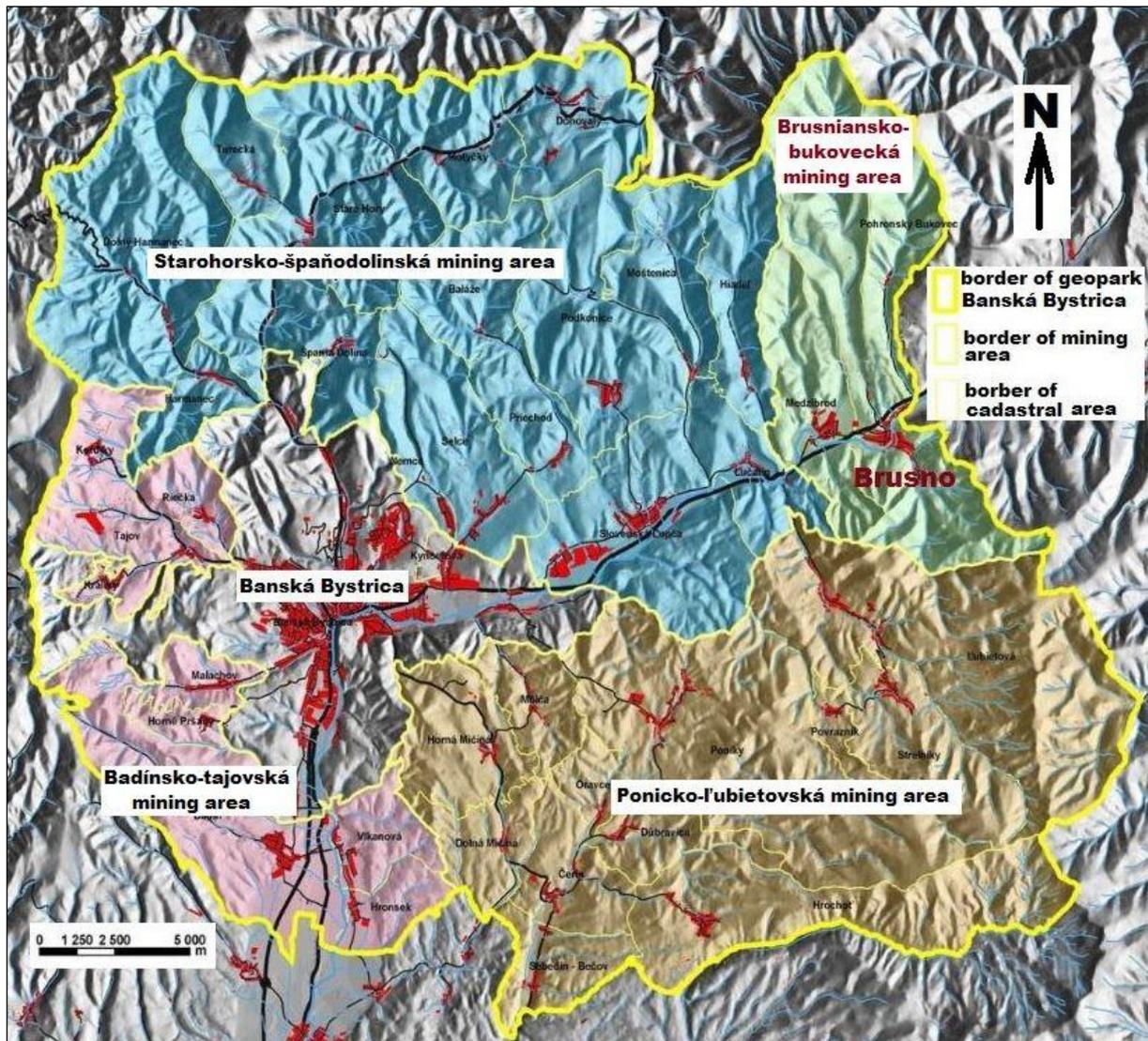


Fig. 2 Map of the studied territory (underlayer map <http://www.sazp.sk/public/index/go.php?id=1208>)

DESCRIPTION OF THE RESEARCH AREA

Brusno municipality is located in the eastern part of the Geopark Banská Bystrica, 20 km north-east from the regional center Banská Bystrica. It lies in its northeastern part, within the Banská Bystrica district. Brusno has a common boundary with Hiadľ and Medzibrod to the west, Ľubietová to the south and Pohronský Bukovec to the east, all of which belong to the Banská Bystrica district. Out of the Brezno district municipalities, it is bordering with Predajná to the south-east and to the east with Nemecká, Ráztoka (approximately 50 m down the Bukovský

creek) and Jasenie. To the north, it has common borders with the municipalities of Liptovská Osada and Liptovská Lúžna, which are a part of the district of Ružomberok in the Žilinský county.

Territory of the Brusno municipality with an area extent of 4351 hectares, consists of two separate cadastral areas - Sv. Ondrej and Brusno, which were merged into a single municipality in 1960. The settlement of (Pohronský) Bukovec belonged to Sv. Ondrej from its earliest beginnings until 1956.

After the merging of Brusno and Sv. Ondrej municipalities, the new municipality was called Hronov (between 1960 – 1974). Recently, the municipality is consisting of

three local parts: Ondrej nad Hronom, Brusno and Brusno kúpele.

The settlement is located in Horehronské podolie on both sides of the river Hron, which divides it into the original municipalities. The northern part - former Sv. Ondrej, is geographically located in the Low Tatras Mts., while the southern part - Brusno is located in the Veporské Mts.

The history of mining of the Brusno municipality landscape was processed in the area of currently existing cadastral area boundaries. These almost precisely correspond to the ridge line of the Sopotnica creek and the lower stream of Brusnianka geomorphological basin. Given the amount of common historical evolution of human activities in the landscape, we have also marginally addressed the cadastral area of today's Pohronský Bukovec – in the valley of the Bukovec creek. Pohronský Bukovec had been a part of Sv. Ondrej municipality until the mid 20th century. The history of mining landscape of the southern part of the selected area was processed following the upper stream of the Brusnianka creek, which is a part of Ľubietová cadastral area.

OLD MINING AND HISTORICAL MINING LANDSCAPE

The first attempts of opencast mining of copper can be assumed in the Iron Age during the presence of Celtic tribes in the area of Horehronie. Slavic population which gradually settled this area, adopted the knowledge of mining and processing of ores from the indigenous people. The underground mining was not known yet and the ore had been mined only in surface stopes (linear pits pursuing ore veins outcomes on the surface) and circular pits (pings), which followed the outcome of ore veins on the surface in lines (ping lines). This hypothesis is supported by well preserved cadastral names around Brusno (Jamy, Na Jamách, Jamešná nowadays in the Ľubietová cadastral area). Surface stopes are preserved in the upper part of the right-hand slope of the Zelená valley and pings are currently legible in the immediate hinterland of the settlement Podlipa in the neighboring valley of Hutná.

On the south side of Ďumbierske Tatry were significant alluvial gold panning sites in the valleys of Jasenianky creek,

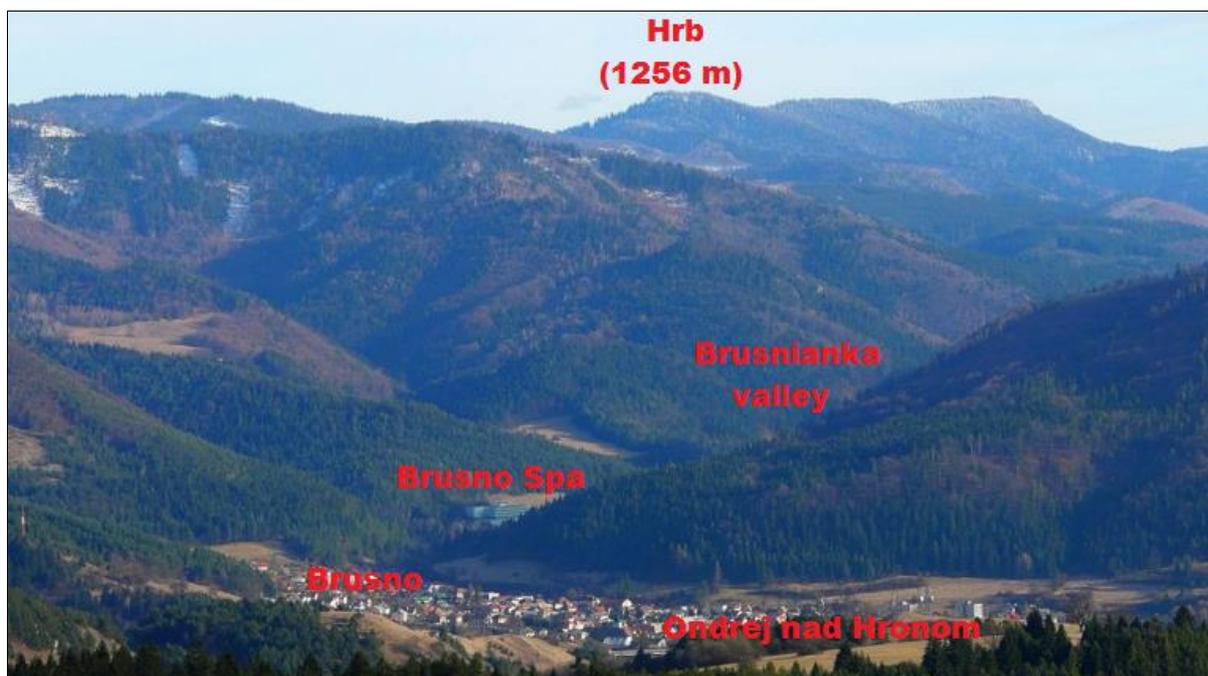


Fig. 3 View from the north on the village Brusno and Brusnianka valley (foto R. Senčák)

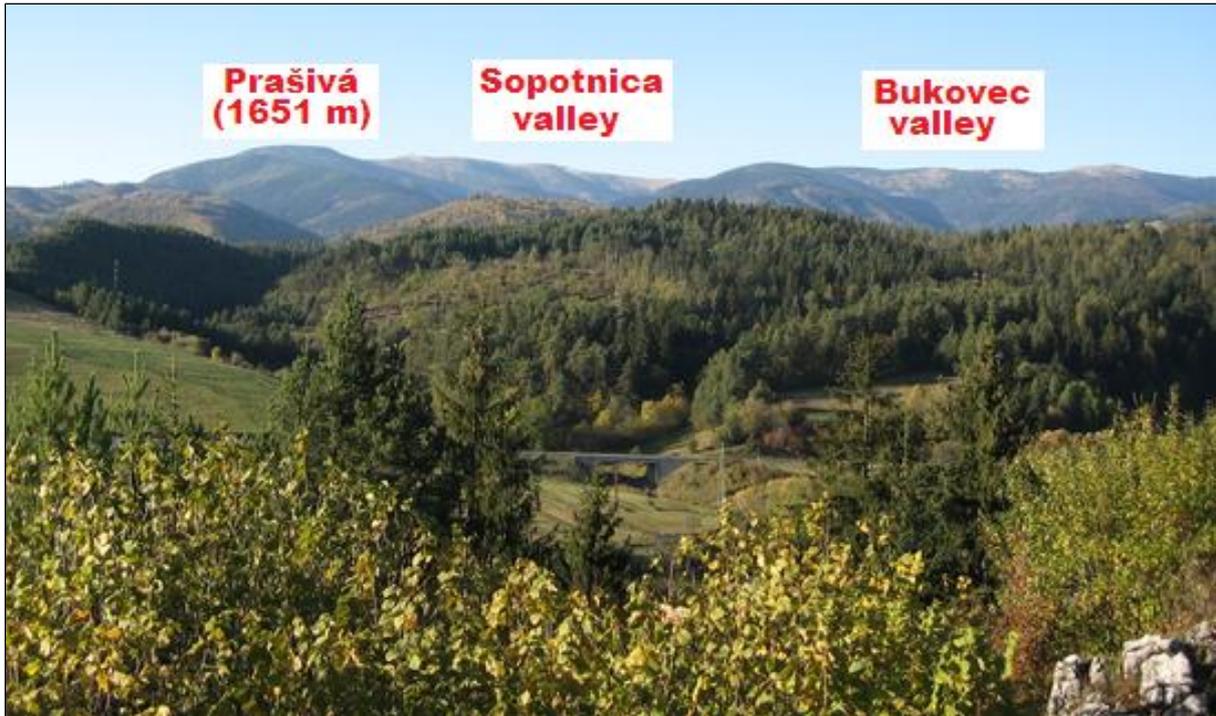


Fig. 4 View from Dubinka (533 m) on mountain ridge of the Low Tatras in 2010

Vajskovský creek and Bystrá creek (Hettler & Pouba, 1951). There had also been attempts to pan for gold in the valley of Sopotnica. Ch. A. Zipser (Zipser, 1817) describes old relics of „sejpa“ hills like remains of gold panning in the valley Sopotnica in the early 19th century. Gold had been panned in the Low Tatras even before the Tatar invasion (Sombathy, 1998).

In today's cadastral area of Brusno the traces of the old underground mining activity retained in the northern part of Sv. Ondrej cadastral area on the southern slopes of the Low Tatras. In the 16th and 17th century miners from Ľubietová rolled and struck the first galleries in the valley of Sopotnica to search for gold and for antimony later as well (Klein, 1942; Hak, 1966). The tunnels were accessible even in the early 19th century (Zipser, 1817). The Jakobi gallery was located in Sopotnička, and two galleries - Ľudivici and Dreifaltigkeit were located in the Ramža valley. Other unspecified galleries are mentioned by Ch. A. Zipser from the eastern side of the Mlynárová mountain ridge and in the Bukovská valley. Relics after the galleries and ore search works from this period stamped on both sides of

Mlynárová crotch are documented in the archives of the former Geofond (Koděra, 1986).

During the survey in 1980 - 1984, carried out by the Geological Survey Spišská Nová Ves for the confirmation of a scheelite mineralization in the area of Ramžené –

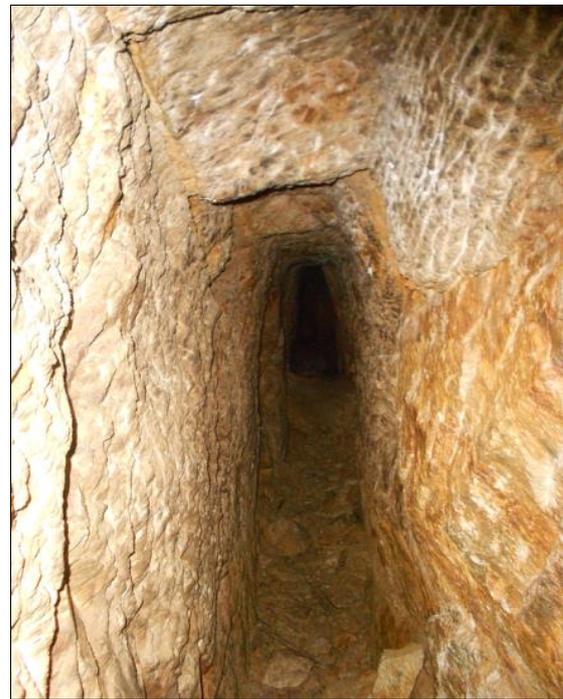


Fig. 5 Medieval mining adit, relic after manual mining in Ľubietová

Bukovská Valley, a number of old mining works had been found on these sites. Old pings, scratches and heaps of relics after extraction in the 16th and 17th century were found in valleys of Sopotnička, Studenec, Ramžené and on the mountain back crotch of Mlynárová (Pulec & Lukáčik, 1980; Pulec, 1983).

We failed to locate these relics during our field survey. This can be attributed to the fact, that an extensive windthrow occurred in this part of the Sopotnica valley, which developed a vast number of windthrow pits and hills.

Iron ore mining based upon siderite veins had been made in the Bukovský creek valley in larger extent from the 15th century. Some attempts on the extraction of copper and silver ores had been made in the first half of the 16th century.

In 1530 these mines were operated by townspeople from Banská Bystrica (Pisoň, 1968). Their owner in 1553 was Mr. Kelement - the rector of the town hospital. Kelement bequeathed his mine shares to the sister of Anton's Schneider (Sartor) wife

and her son with a designation to serve masses for the salvation of his soul (Jurkovič, 1922/2005).

Outside the town of Banská Bystrica in the valley of the Bukovský creek also other mines and one iron smelter without a closer localization were located. They are documented in the year 1563. According to the Commission report, which had been sent from the royal chamber to make an inspection of the Horehronie forests it is known, that its owner was Rafael Steger, pastor from Banská Bystrica (Binder, 1962). The smelter had to be working in this place a long time ago, because it is mentioned in connection with the destruction of forests in the area.

In 1665, the mines were in decline and the city council has set up a report, which assessed the condition of mines and proposed their further management. Mine owners were mostly the German citizens of the city. Mines in Bukovec were operated by a Slovak preacher Michael Furtíni, but he was planning to sell his share. More news about mines in the Bukovská valley



Fig. 6 Forfeited entrances to adit Jeleňacia

are from the urban chronicle of Banská Bystrica from 1669, where the mines are depicted in poor condition and with poor yields. City Council subsequently ordered the main mining chamber master to completely measure the mines. Mines were still out of yields, and in loss and it was also necessary to invest and modernize them. In 1676 significant mining families Kochlatsch and Schmeidl announced an exit from the city mining joint venture. Subsequently, on the 28th January 1676 the City Council closed the mine in the Bukovská valley. This coincides with the end of mining in the Bukovská valley.

The last attempt to reopen mining in the mentioned valley was made under the administration of the city of Banská Bystrica in the years 1751 and 1754. These attempts were not successful, because the mines were still at loss and the city could not agree with the Mining Chamber on buying cheaper wood from the surrounding forests, which would help the mines. Mines in the Bukovská valley were definitively closed down on the 7th September 1759 by the city of Banská Bystrica (Jurkovič, 1922/2005).

The ultimate end of mining in the Bukovská valley was made only in the interwar period of the 20th century, when antimony ores were in the center of attention. Antimony mineralizations had been opened using exploratory galleries. Antimony gold mineralization had been verified in the valley of Seča 1.5 km northeast from Pohronský Bukovec and in the Vrabčovka valley, which lies westerly from the municipality. However, the actual extraction of antimony ore did not develop (Hronček, 2002).

Based on the field research, we have analyzed only one identified historic mining site lying on the right side of the Bukovská valley in a narrow valley of Vrabčovka, entailing into Pohronský Bukovec. The eponymous creek dewatering the mining site flows in as a right tributary of the Bukovský creek. Access to the investigated site is possible after a 100 m walk using a

ravine upstream the Vrabčovka. The ravine is significantly eroded and is currently covered with vegetation.

We have identified three unused mining heaps in the valley of Vrabčovka, which merge into one complex heap object. The older part of the heap was created from the tunnel lying on the right side of the valley. It has a smooth, aligning shape with the dimensions of 10 x 15 m and the front height of approximately 1.5 m. The whole heap was significantly sub-adjusted during wood-logging in the Vrabčovka valley. It was cut through by a forest road and its surface had been leveled to serve as a timber storage. The second part of the heap on the left side of the narrow valley formed by two small slope heaps merged into one heap approximately 20 m long, 8 m wide and 2.5 meters high. Due to the prolonging of gradual slope downwards, the heap merged with the older one at the bottom of the valley. This new heap body dammed the bottom of a 20 m wide valley. The flow of Vrabčovka creek gradually eroded and washed out the heap body. At present, the body of the heap is cut to its original bottom creating a narrow anthropogenic canyon 2 m wide, max 2.5 m deep and 20 m long. The heap is covered with grassy vegetation (considerably dominated by nettle) at the bottom of the valley, while the slopes of the body are gradually covered by beech forest. We have verified the structure of the waste dump material with a probe to find out that it is made up from the finest rock fractions up to the fragments of rock size 3-10 cm.

Three galleries were identified in the surveyed area. The oldest one is a tunnel on the right side of the valley, as evidenced by the rounded edges of a forfeited entrance to the tunnel and the abundance of scrub and tree vegetation. The forfeited entrance to the "Stará" gallery is 15 m long, 5 m wide and only up to 1.5 m deep. Based on the literature and field research, we expect that the "Stará" forfeited gallery had been excavated in a southerly direction under the hill Dubina in the southernmost spurs of the

Tatra crystalline complex for the purpose of iron ore mining. Entrance to the gallery is at an altitude of 555 m a.s.l. We assume that it is a relic of the gallery described by Ch. A. Zipser (Zipser, 1817) in the early 19th century.

Galleries excavated in northern direction on the left side of the valley are younger. They were renewed during the First Czechoslovak Republic period. This assumption is confirmed by the remained mining scratches on the walls, the remains of manual rock disconnection just after entering the tunnel. Entrance to the “Dolná” Gallery is at an altitude of 500 m a.s.l., and to the “Horná” gallery at 555 m a.s.l. The entrance into the “Dolná” gallery is currently cluttered up, the entrance to the “Horná” gallery remained only as an irregular hole with dimensions of approximately 1 x 1 m. Entrance to both galleries on the left side of the valley merged into one extensive depression, which is approximately 15 meters long, 16 m wide and 4 m deep.

“Horná” gallery was excavated in a profile 1.5 m wide and 1.7 meters high. We have described its progress in the underground using the oral history approach. At first, the gallery stretched approx. 100 m horizontally to the north, where it bifurcated into two parts. The left prolongation went northwesterly deeper under the Kyseľová hill. The right prolongation turned to the northeast, and

exited directly on a hillside in the municipality. At present, the output of the gallery has been renovated and is a part of the cellars in the house no. 19. The oral descriptions are supported by the fact that during the second World War II the galleries served as a hideout.

Probably the oldest mining works in the original cadastral area of Brusno historical municipality are located on the northwestern slopes of the Brzáčka hill. Miners from Ľubietovská had been opening barytic mineralization using small galleries in the 17th century. Only the heap material, as a result of these works, was recognizable in the second half of the 80s of the 20th century (Koděra, 1986).

Mining development in the valley of Čierne Peklo (*Schwartyhale, Chyrno Peklo, Höll, Schwarzer Grund*) is recorded as early as the second half of the 15th century. However, mining extraction of a transregional significance was developed long before here, because in 1379 King Ludwig I. promoted the neighboring settlement of Ľubietová to the free mining town (Bolerázsky, 1968; Albertová, 2009).

Brief outline of the mining history in Ľubietová as the main factor of anthropogenic landscape transformations in the Brusnianka valley was processed using the works of A. Bergfest (Bergfest, 1951a; 1951b; 1951c), J. Vlachovič (Vlachovič, 1964) and J. Slaný (Slaný, 1982).

The greatest fame and prosperity of

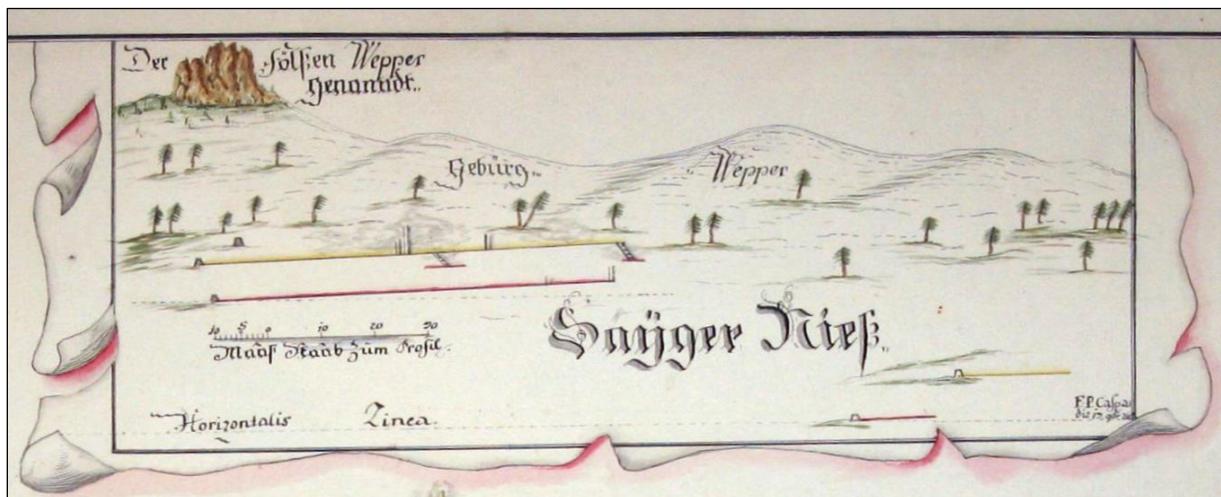


Fig. 7 Cutout of mining map from the early 19th century (State Central Mining Archive in Banská Štiavnica)

Ľubietová had been ensured by the copper ore. Initially, only the richest and easily fusible ores (malachite, tetrahedrite) were mined in several locations. The richest mines lied in the mountain Šutrikovská between the valleys Lander and Grünwasser, today's Podlipa. Further, the copper ore was mined at the site Pod Kolbou, called Svätoduška. Mining flourished in the 15th century. However, these sites are outside the investigated area.

As for the historical mining districts in the Brusnianka valley (Peklo, Svätoduška and Kolba), only the northern part of the Peklo district lies within the administrative area of Brusno. This district is located in the confluence of streams Peklo and Brzáčka. It is neglected in the written sources in terms of mining activities. The deposit lies on the boundary of a Permian layer and orthogneiss. Ore minerals are mainly the chalcopyrite and tetrahedrite. The copper ore had been processed in addition to mining in the locality of Peklo in a number of smelters.

According to the second military mapping from 1846, the site is delineated and named as *Peklo Eisengrube* (Peklo iron mine). One stone house is mentioned in the map description. The mining galleries can not be accurately identified in the field of the reference area. Ján gallery of unknown

depth and diameter is known from mining maps on the right side of the Brzáčka valley (approximately 570 m a.s.l.). Four nameless galleries following several ore veins in a north-south direction, nowadays hardly recognizable in the current terrain, are also known in this mining district. It is only partially possible to identify the "Dedičná" gallery, which had a length of approximately 280 m. Its exit is located at an altitude of 570 m a.s.l. on the right bank of the Peklo creek. Water flowing out of here was occasionally used as a water source.

Mining heaps were located at the Trosky (Peklo) site on the left bank of the Brzáčka creek covering an area of about 350 x 50 m. A smaller area of approximately 80 x 20 m had been occupied by heaps on the right side of the Brusnianka creek, just below the confluence of Brzáčka and Peklo in the current cadastral area of Brusno. These had been created from the smelting waste materials. We classify them as smelting heaps and according to their metallurgical composition as the slag heaps. Their volume, exact composition nor any other further details are not known. The heap material was used for the reinforcement of forest and field roads around Brusno e.g. at the sites Nad Domlynom, Pod Skalou, Na Vřšku, Čierna dolina and elsewhere.

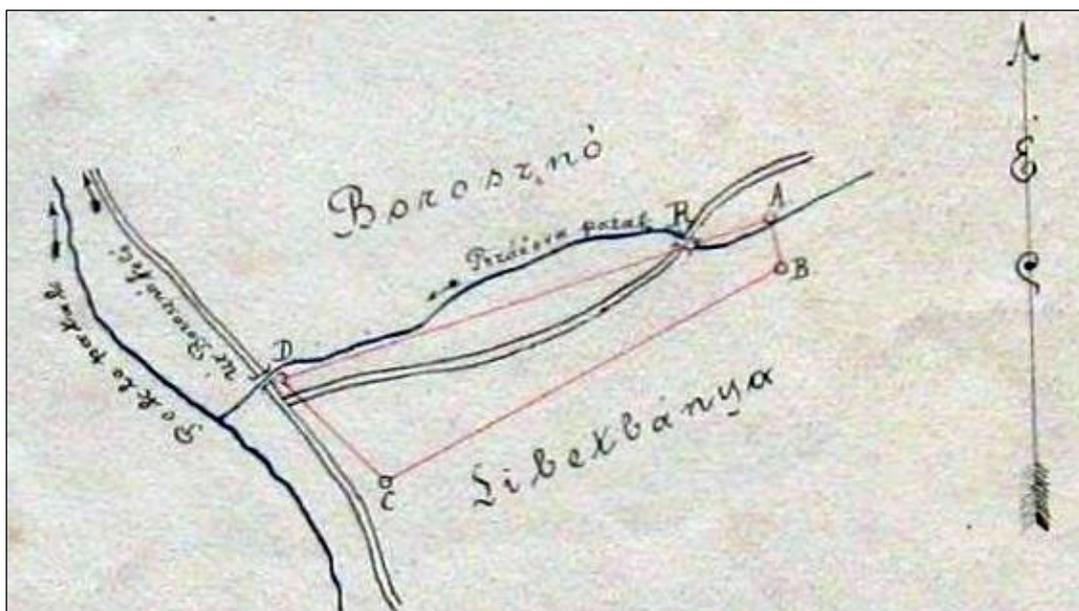


Fig. 8 Mining site map of Peklo from 1907 (State Central Mining Archive in Banská Štiavnica)

The condition and location of the heaps before their redistribution is preserved in the mining map from 1907. It is the only known preserved mining site map of Peklo stored in State Central Mining Archive (ŠÚBA) in Banská Štiavnica in the map fund of the Main Mining Chamber Office. It is a topographic map, which precisely measures the dumps at the Trosky site. The map had been measured and subsequently drawn in Brusno on the 8th October 1907 by mining officers Izidor Muntyán and Karol Marek. According to map the heaps covered an area of 7241 m².

End of the copper and iron mining in the upper part of the Brusnianka valley definitely ended underground mining works in the cadastral area of Brusno. Železiarne Podbrezová conducted survey works at the site Jeleňacia and on the right side of the Brzáčka valley searching for iron ore deposits in the early 20th century. The search had failed and was stopped after one season. Exploration gallery at the Jeleňacia site is currently still visible.

CONCLUSION

The historical economic centrum of Brusno was situated at the confluence of the Brzáčka and Peklo creeks at the site historically called *Peklo* (Hell). This site is called *Trosky* and is located in the cadastral area of Lúbietová (Anonymus, 2004; 2005; Hronček, 2004; Hronček & Liga, 2014; Maliniak, 2009; 2011)

The site was dominated by the iron smelter, followed by a range of economic activities. The construction of the smelter dates back to the 16th century and the smelter had been working intermittently until the 19th century. It had been used for the processing of the iron ore from the area of Kolba, and also from the mining site Peklo, which laid directly in the hinterland of the blast furnace. The hereditary gallery mouthed directly at the smelter and the water flowing out from the gallery was used as the third water energy source. The main

source of water throughout the area were the creeks of Brzáčka (Práčová) and Peklo. The water was brought to the site not only by sluiceways, but due to terrain morphology, through the water pipe system as well.

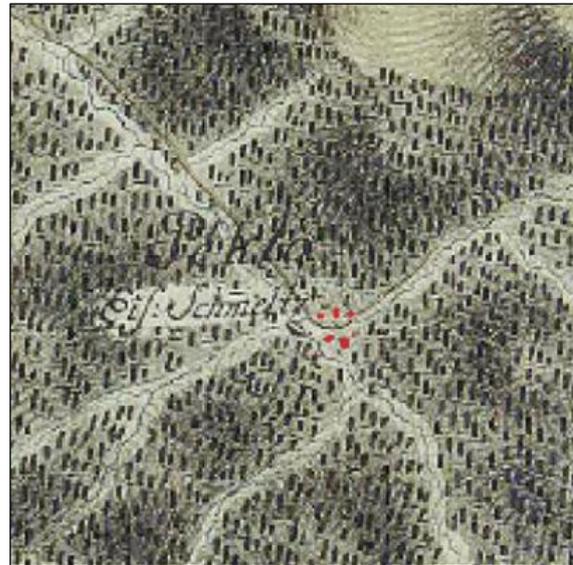


Fig. 9 Trosky on map of 1st military mapping from 1783 (Anonymus, 2004)



Fig. 10 Trosky on map of 2nd military mapping from 1846 (Anonymus, 2005)

The existence of smelters also requested a sufficient fuel base. This was ensured by the surrounding beech forests, where the charcoal was burned at the seasonal charcoal burning sites (called *uhliská*). In the upper part of the valley Peklo and the valley Brzáčová was a dense network of seasonal charcoal burning sites. They were built in areas with roads, which made the transport of charcoal to the smelter possible. The existence of a permanent



Fig. 11 Trosky – place of the former metallurgical dumps



Fig. 12 Trosky – relict of metallurgical dumps

charcoal burning site at the smelter is documented in writing in the 17th century. Here, the timber from inaccessible parts of the side valleys was burned, usually brought to the site by floating or pipelining.

The iron produced was transported to the valley of Brusnianka to the woodraft haven of Brusno, where it was loaded on the rafts. Transport using wagons along the main road leading through the valley of the river Hron was less likely, because the road lying on the right side of the river Hron is complicated due to the flow of the river

Hron, which had not been bridged in the 17th century. A good road was built along the valley of Brusnianka for the transport of the material. The road was led on a wooden bridge structure over the waterlogged floodplain, and over the creek in the narrow part of the valley. Remnants of these structures were still visible in the early 20th century below the Trosky site in the Čertova dolinka valley.

Besides the facilities related to mining and metallurgy, there was also a water-driven saw working at the Peklo site in the

17th century. According to the historical sources, other working activities occurred here as well, whether they were the forest handicrafts – e.g. shingles making, or carpenters who worked for the mining industry, and many others. The existence of permanent settlements of miners, metallurgists, woodcutters, charcoal burners and other craftsmen in this area has not been confirmed yet. However, we can assume the existence of seasonal settlements at least. On the hill Valachovo was a house of the gamekeeper of Ľubietová, who lived there with his family in the 17th century.

We have located an old limestone quarry

on the right slopes of the valley of Brusnianka in the Čertova dolinka valley, which was the source of a quality limestone for the smelter at the Peklo site.

Material formerly creating the objects of various heaps had been mostly used for strengthening forest roads. Their original surface can be reconstructed on the basis of their residual edges. The leaking entrance to the old mining gallery can be well read in the field. During the last field research, we have identified the relics of a sluiceway, which served for the smelting plant for crushing of the mined rock (not evidenced by writing) and also for the water saw eventually.

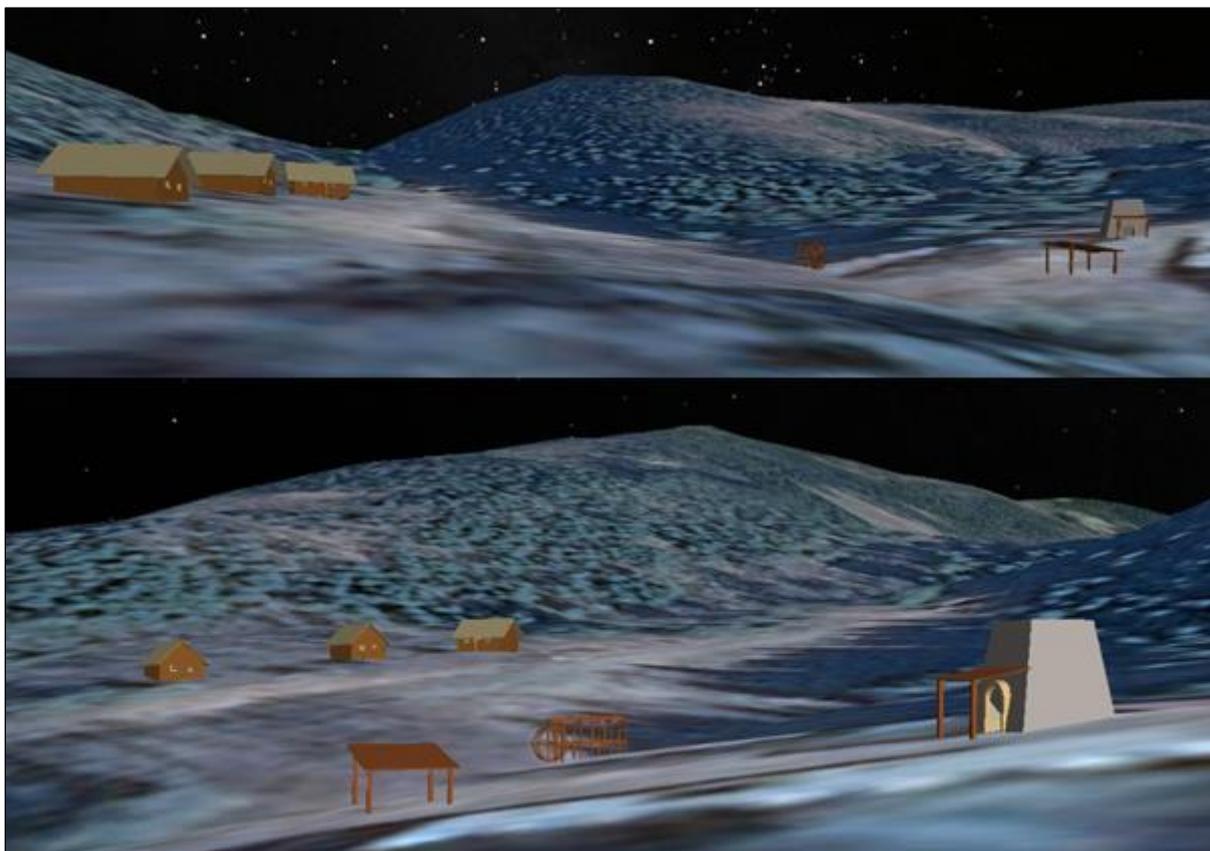


Fig. 13 Visualization of historic objects in locality Trosky in the Peklo Valley, according to the historic research and the field research done to verify the original position of objects at the site. The visualization was made by importing *AutoCAD* drawings to *SketchUP* and next to the *GoogleEarth* application (Hronček & Liga, 2014)

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- The National Archives of Hungary, Budapest
- State Archives (formerly Regional Archives), Banská Bystrica
- Branch Archives (formerly District Archives), Banská Bystrica
- Central State Mining Archive Banská Štiavnica