Ore Minerals of the Nitra County acording to Notitia Hungariae historico-geographica by Matthias Bel

Peter CHRASTINA, Katarína RÁCOVÁ*, Robert ŠIMŮNEK**

Universitatea „Sv. Chiril şi Metodie“ din Trnava, Slovacia, Facultatea de Arte
University of Ss. Cyril and Methodius in Trnava, Slovakia, Faculty of Arts
***Universitatea „Filosoful Constantin“ din Nitra, Slovacia, Facultatea de Arte**
Constantine the Philosopher University in Nitra, Slovakia, Faculty of Arts
**** Institutul de Istorie al Academiei de Ştiinţe republica Cehă, Praga, Cehia**
The Institute of History, Czech Academy of Sciences, Prague, Czechia
Personal e-mails: peter.chrastina@ucm.sk, kracova@ukf.sk, r_simunek@lycos.com

Ore minerals of the Nitra County acording to Notitia Hungariae historico-geographica by Matthias Bel

Matthias Bel in his work Notitia Hungariae Novae historico-geographica offered a contemporary view of the status, importance, response and concrete realities of counties of Hungary within the Habsburg monarchy. The study is historical and geographical research history and environmental issues of ore materials, and their extraction in the Nitra County in the first half of the 18th century. Description of the subject contains text "Ore storage yards" in § XII. science section (Membrum primum physicum) of general parts of Notitia of Nitra County in Hungary (1742). The "probe" into Bel's characteristics of this theme we have realized through critical commentary on contemporary texts supplemented by other sources, respectively relevant literature and information obtained by studying geological maps. Specific findings, we finally compared with the results of field research and their own knowledge of the subject. The facts which led M. Bel in a particular article, of course, do not always correspond with the present state of knowledge issues. However, they reflect the contemporary understanding of the ore minerals in the studied area and also bear witness to the creativity and method of this scholar.

Keywords: Matthias Bel, Notitia, Nitra County, ore minerals

Introduction

Matthias Bel's work *Notitia Hungariae Novae historico-geographica* (eng. Historical-geographical knowledge about The new Hungary, further *Notitia*) forms one of the key works of Hungarian baroque historiography (in the broad sense and Slovakia). As a complex and also in each detail it offers the look at realities of Hungarian counties within the Habsburg monarchy. This specificity of Bel's work is important not only for humanities, resp. historical and philological science, but also for other (eg. natural) scientific disciplines. Mechanism of formation (questionnaire method), origin and varying of quality of the information database and editorial changes of *Notitia* documents limit the veracity of facts alleged.[1] Nevertheless, the writings of M. Bel were several times reused[2].

The aim of the study is to present the historical and geographical research in history and environmental issues regarding to ore raw materials and their extraction in the Nitra County in the first half of the 18th century. Description of the subject figures in a paper entitled "Ore storage yards" in § XII. science section *(Membrum primum physicum)* in the general part of *Notitia* of Nitra County in Hungary (1742). Bel's characteristics confronted with

contemporary sources of Slovak mining Archive in Banská Štiavnica (old documents and old maps), based of the geological nature (literature, maps), the results of field research and their own knowledge of the subject.

In the view of the foregoing objective we set up the research questions: Is it possible to reconstruct the occurrence of ore minerals and contexts of their extraction in the Nitra County based on the Bel's text from the first half of the 18th century? Are the Bel's identified realities in cohesion with the current state of knowledge? Working conditions (cognitive, theoretical and methodological) are incorporated as the part in the next section.

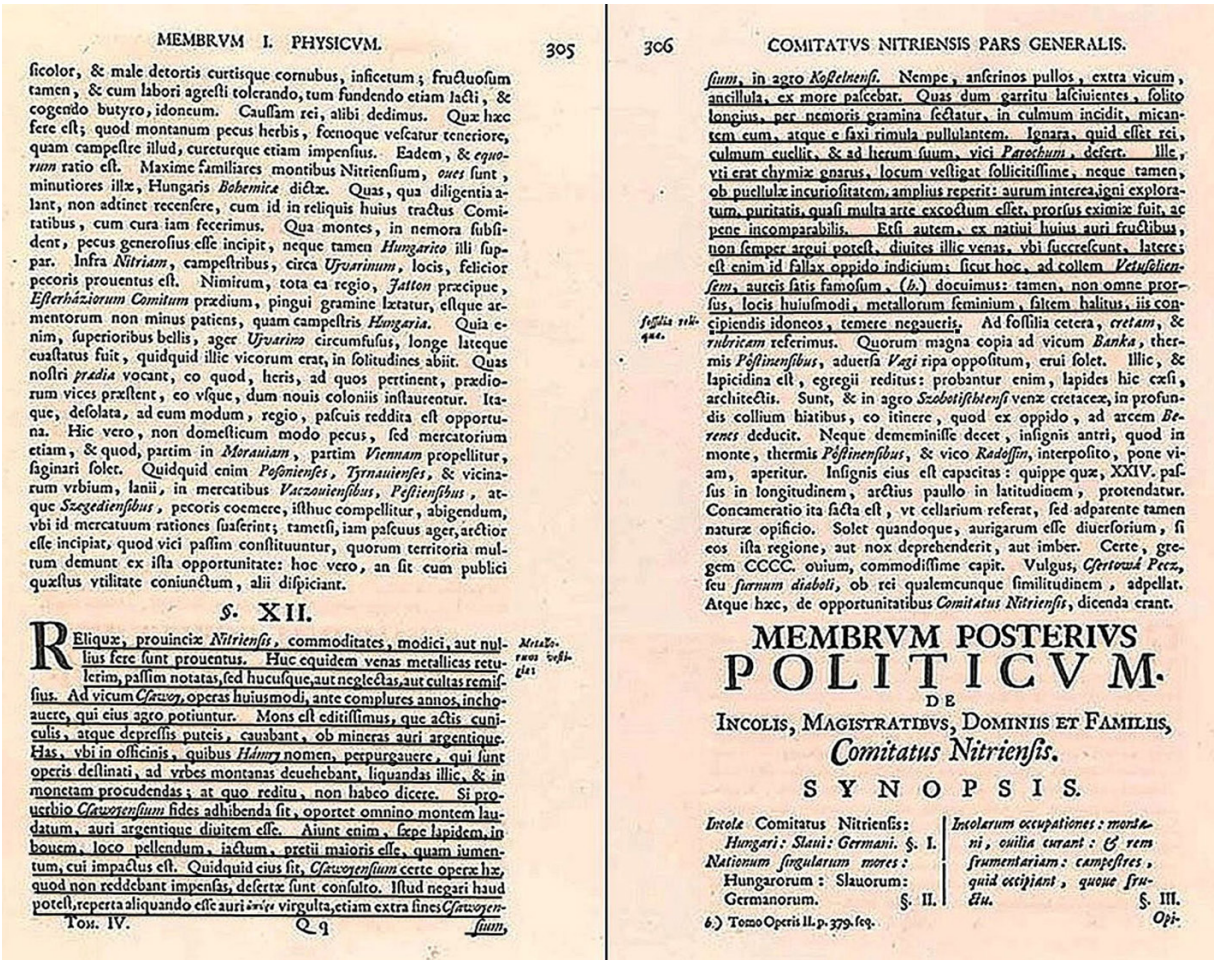
The paper consists of four parts (including introduction and conclusion). The aim of the second chapter is to look closer to the methodology of our research. The third chapter deals with the historical-geographical research and the history of environmental problems and could be considered as the key chapter. We processed it in the form of critical analysis and synthesis of specific countries in § XII. "Nitra" *Notitia* with archival sources, a data base of geological character, the results of field research and their own knowledge of the topic dealt.

Source basis and research methods

In the articles approaching historical and geographical aspects of Bel's description of rivers Myjava and Chvojnica[3], respectively bridges over the Vah, Nitra and Dudváh[4], we stated that the relevant research (not only) of "Nitra" *Notitia* in Slovakia do not to wander adequate attention of researchers from the historic (or natural) science. This could be due to the Bel's inter-disciplinary work, as well as the need to work with the original written in Latin.

Information background of the study was various. The basis was Slovak translation of the text "Ore storage yards" in § XII. *Notitia* of the Nitra County (Fig. 1)[5], in which M. Bel describes the appearance and mining of metal ores in the mountains of Strážovské vrchy (Fig. 2). This affected the search sources and literature, which were used when writing our work.

Fig. 1. Underline text "Ore storage yards" in § XII of the "Nitra" *Notitia.* Source: *http://oldbooks.savba.sk/digi/Lyc_B_VIII_33_IV/LKB_LYC_B_VIII_FOL_2ZZI/SK/1_1_LYC_B_VIII_FOL_2ZZIN00305-306P.htm*



MEMBRVM I. PHYSICVM. 305

sicolor, & male detortis curtisque cornubus, inficetum; fructuosum tamen, & cum labori agresti tolerando, tum fundendo etiam lacti, & cogendo butyro, idoneum. Cauſſam rei, alibi dedimus. Quæ hæc fere eſt; quod montanum pecus herbis, fœnoque veſcatur teneriore, quam campeſtre illud, cureturque etiam impenſius. Eadem, & *equorum* ratio eſt. Maxime familiares montibus Nitrienſium, *oues* ſunt, minutiores illæ, Hungaris *Bohemicæ* dictæ. Quas, qua diligentia alant, non adtinet recenſere, cum id in reliquis huius tractus Comitatibus, cum cura iam fecerimus. Qua montes, in nemora ſubſident, pecus generoſius eſſe incipit, neque tamen *Hungarico* illi ſuppar. Infra *Nitriam*, campeſtribus, circa *Ujvarinum*, locis, felicior pecoris prouentus eſt. Nimirum, tota ea regio, *Jatton* præcipue, *Eſterházíorum Comitum* prædium, pingui gramine lætatur, eſtque armentorum non minus patiens, quam campeſtris *Hungaria*. Quia enim, ſuperioribus bellis, ager *Ujvarino* circumfuſus, longe lateque euaſtatus fuit, quidquid illic vicorum erat, in ſolitudines abiit. Quas noſtri *prædia* vocant, eo quod, heris, ad quos pertinent, prædiorum vices præſtent, eo vſque, dum nouis coloniis inſtaurentur. Itaque, deſolata, ad eum modum, regio, paſcuis reddita eſt opportuna. Hic vero, non domeſticum modo pecus, ſed mercatorium etiam, & quod, partim in *Moraviam*, partim *Viennam* propellitur, ſaginari ſolet. Quidquid enim *Poſonienſes*, *Tyrnauienſes*, & vicinarum vrbium, lanii, in mercatibus *Vaczouienſibus*, *Peſtienſibus*, atque *Szegedienſibus*, pecoris coemere, iſthuc compellitur, abigendum, vbi id mercatuum rationes ſuaſerint; tametſi, iam paſcuus ager, arctior eſſe incipiat, quod vici paſſim conſtituuntur, quorum territoria multum demunt ex iſta opportunitate: hoc vero, an ſit cum publici quæſtus vtilitate coniunctum, alii diſpiciant.

§. XII.

Reliquæ, prouinciæ *Nitrienſis*, commoditates, modici, aut nullius fere ſunt prouentus. Huc equidem venas metallicas retulerim, paſſim notatas, ſed hucuſque, aut neglectas, aut cultas remiſſius. Ad vicum *Cſaweg*, operas huiusmodi, ante complures annos, inchoauere, qui eius agro potiuntur. Mons eſt editiſſimus, quæ actis cuniculis, atque depreſſis puteis, cauabant, ob mineras auri argentique. Has, vbi in officinis, quibus *Hámry* nomen, perpurgauere, qui ſunt operis deſtinati, ad vrbes montanas deuehebant, liquandas illic, & in monetam procudendas; at quo reditu, non habeo dicere. Si prouerbio *Cſawenſium* fides adhibenda ſit, oportet omnino montem laudatum, auri argentique diuitem eſſe. Aiunt enim, ſæpe lapidem, in bouem, loco pellendum, iactum, pretii maioris eſſe, quam iumentum, cui impactus eſt. Quidquid eius ſit, *Cſawenſium* certe operæ hæc, quod non reddebant impenſas, deſertæ ſunt conſulto. Iſtud negari haud poteſt, reperta aliquando eſſe auri ſatis virgulta, etiam extra fines *Cſawenſium*,

Metallorum venæ.

Tom. IV. Q 9

306 COMITATVS NITRIENSIS PARS GENERALIS.

ſium, in agro *Koßelnenſi*. Nempe, anſerinos pullos, extra vicum, ancillula, ex more paſcebat. Quas dum garritu laſciuientes, ſolito longius, per nemoris gramina ſectatur, in culmum incidit, micantem eum, atque e ſaxi rimula pullulantem. Ignara, quid eſſet rei, culmum euellit, & ad lierum ſuum, vici *Parochum*, defert. Ille, vti erat chymiæ gnarus, locum veſtigat ſollicitiſſime, neque tamen, ob puellulæ incurioſitatem, amplius reperit: aurum interea, igni exploratum, puritatis, quaſi multa arte excoctum eſſet, prorſus eximiæ fuit, ac pene incomparabilis. Etſi autem, ex natiui huius auri fructibus, non ſemper argui poteſt, diuites illic venas, vbi ſuccreſcunt, latere; eſt enim id fallax oppido indicium: ſicut hoc, ad collem *Vetuſelienſem*, aureis ſatis famoſum, (*b.*) docuimus: tamen, non omne prorſus, locis huiuſmodi, metallorum ſeminium, ſaltem halitus, iis concipiendis idoneos, temere negaueris. Ad foſſilia cetera, *cretam*, & *rubricam* referimus. Quorum magna copia ad vicum *Banka*, thermis *Peſtinenſibus*, aduerſa *Vagi* ripa oppoſitum, erui ſolet. Illic, & lapicidina eſt, egregii reditus: probantur enim, lapides hic cæſi, architectis. Sunt, & in agro *Szobotiſtblenſi* venæ cretaceæ, in profundis collium hiatibus, eo itinere, quod ex oppido, ad arcem *Berenec* deducit. Neque dememiniſſe decet, inſignis antri, quod in monte, thermis *Peſtinenſibus*, & vico *Radoſſin*, interpoſito, pone viam, aperitur. Inſignis eius eſt capacitas: quippe quæ, XXIV. paſſus in longitudinem, arctius paullo in latitudinem, protendatur. Concameratio ita facta eſt, vt cellarium referat, ſed adparente tamen naturæ opificio. Solet quandoque, aurigarum eſſe diuerſorium, ſi eos iſta regione, aut nox deprehenderit, aut imber. Certe, gregem CCCC. ouium, commodiſſime capit. Vulgus, *Cſertowá Pecz*, ſeu *ſurnum diaboli*, ob rei qualemcunque ſimilitudinem, adpellat. Atque hæc, de opportunitatibus *Comitatus Nitrienſis*, dicenda erant.

Foſſilia reliquæ.

MEMBRVM POSTERIVS POLITICVM.

DE

INCOLIS, MAGISTRATIBVS, DOMINIIS ET FAMILIIS,

Comitatus Nitrienſis.

SYNOPSIS.

Incolæ Comitatus Nitrienſis: *Hungari: Slaui: Germani.* §. I.
Nationum ſingularum mores: Hungarorum: Slauorum: Germanorum. §. II.
Incolarum occupationes: montani, ouilia curant: & rem frumentariam: campeſtres, quid excipiant, quoque fructu. §. III.

b) Tomo Operis II. p. 379. ſeq.

Opi-

The text translation of Bel's original source was supplemented by correspondent documents from years 1737[6] and 1759[7], old local maps of ore district Čavoj from the Slovak Mining Archive in Banská Štiavnica[8] and the plan (map) from Geyer describing the Nitrianske Pravno (1751) from the internet database of Moll's map source collection[9].

Parts of the information sources were obtained from the Geofund digital archive (Archive of the Dionýz Štúr State Geological Institute in Bratislava)[10]. To deeply understand the knowledge we also used other literature[10], internet sources[11] and geological maps of the Strážovské vrchy Mts.[12]. These resources have helped us to clarify other issues with the geological structure of the emphasis on domestic (Čavoj) mining, its history, ore and non-ferrous minerals. The incidence and location of montaneous elements or structures in the landscape were verified by application of the old workings and workings on the map portal of Archives of the Dionýz Štúr State Geological Institute in Bratislava (Geofond registers)[13].

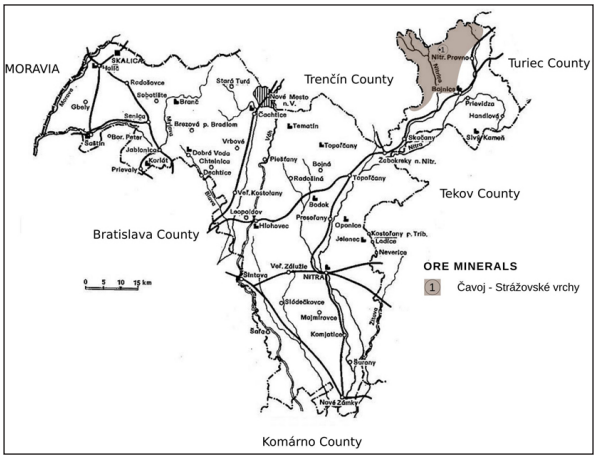


Fig. 2. Nitra County - Strážovské vrchy Mts. and locality Čavoj. Cartographic base: Juraj Žudel, *Stolice na Slovensku (County in the Slovakia)*. Bratislava, Obzor, 1984, p. 80 - modified by Jakub Trojan and Peter Chrastina.

When working with the text of the passage in § XII. we applied "conventional" methods of historical and geographical research (heuristics, critical analysis of the sources, their comparison and interpretation). Broad scope information database produced results of heterogeneous nature. It was necessary to continue with the assessment in relation to the relevant source of criticism. Clarifying some problems allowed us to conduct semi-stationary field research results (method of observation). This focuses on identifying relics of old mine works and their technical background (infrastructure of the montane character). They served as a starting source of old maps. According to the graphic material in the field, we searched for, identified and photographically documented elements and historical landscape structures from the first half of the 18th century that have been preserved within the archetype of the Čavoj montaneous landscapes.

Ore Minerals of the Nitra County in *Notitia* by Matthias Bel

The basis of our study is the text "Ore storage yards" from § XII, in which M. Bel writes following statement:

Ore storage yards: Generally, there are no or just a few benefits within the Nitra County. True, this would be desirable to mention the metallic veins that are known everywhere, but today they have neglected, or which have benefited only sporadically. Near the village Čavoj, many years ago, those who came into the area started to deal with this question. The hill is very steep, they deepen stamping drainage canals and wells. All because of gold deposits and silver storage yards. When the material was harvested, they cleared it in a workshops called Hámry (mills), and shipped [ore] *to mining towns to melt them down and produce coins. However, I do not talk about such income. If we should expressed the Čavoj people credibility by saying, it is necessary to express praise for the hill that is rich in gold and silver. In fact they say that the stone that is thrown into an ox with the intent to spur it often has a higher price than cattle, to which he was voluble. Any of this happened, what is certain is that Čavoj people deliberately left these activities because they did not get back their costs. It can not be denied, because once were found gold áṕúya* [ground floor] *living outside Čavojs territory in Kostolná Ves. Certainly, the young maid had a habit of foraging goose chicks outside the village. When chased by wild geese pastures making noise longer than usual, it fell into scabs who grew up in the interstices of the rock. Not knowing what is that thing, a crust yank and carried him to his master, priest in the village. As he was knowledgeable of chemistry, with riots he attended the place, not because it would be considered that the young maid unreliable, but to track down more. Meanwhile he examined the purity of gold in the fire as if it were rendered in several ways. It was an exceptional and incomparable. Although according to the findings of this natural gold it can not always say that where there is more abundantly appears, hiding the rich deposits - there is in fact such a misleading presumption of town like, how do we convince even in the*

mountains near Zvolen [Borová hora hill] *known threats gold - still would be imprudent not reject the possibility that the metal grains are formed, where appropriate, the precipitated metal fumes."*

In a part entitled *"Metal Deposits"* Bel collect information on deposits of metal ores (gold and silver) in the Nitra County in the first half of the 18th century. From the opening sentence, that the author considers the occurrence of minerals as one of the county *"benefits"*. This advantage, however, was limited by composition and yield of the deposit, as well as by *"neglection"* (bad technical condition) of mining works, *"... in which is mined only sporadically."* For these reasons *have* [ore minerals] *generally little or no benefit* to the economy of a territorial-administrative unit.

Bel considered the *"metal veins that are known everywhere"* as significant, which probably meant the historic sites of polymetallic ores (containing Pb, Zn, Ag, Au et al.) in the mountains of Strážovské vrchy[14]. The mention of *"veins"* adds contexts to occurrence of ore minerals or elements of some metals in the landscape where the vein structure outcrops of crystalline rocks along with core mountains. Among the sites, where the montane activity took place, author mentions only Čavoj (see Fig. 2)[15].

According to the author, ore deposit was *"near the village Čavoj",* known and used *"many years ago."* This figure corresponds to reality. The oldest mining work at sites of surface occurrence of Ag and Pb in Čavoj are associated with mining colonization area, initiated by feudal family Bossányi. Mining of galena (or even lead sulphide, PbS) with the occurrence of silver from solid Jambrišková (725 m above sea level) took place here before 1650. By the end of the 16th century the ore was mined through drilling ping to the surface or near the surface in the east vein called Ferdinand. Later, from the 17th century, a gradual transition to underground mining could be seen.[16]

If we paraphrase M. Bel, the Bossányi family, or *"those who came into the area and got it"*, respectively miners (Chvojnická dolina valley colonists?) *"started this kind of activity* ... [mining lead, silver less] *deal"* before the year 1650.

Later, around 1724, the neglected, unprofitable mines and surface mines in Čavoj and Valaská Belá were tried to regain by Baron von Schmidegg. His effort was not successful[18]. Exploitation of galena containing silver continued at the time of the "Nitra" *Notitia* creation, up until 1746, when it temporarily stopped because of disappointing results. Mining and mining work were restored at the late 50s of the 18th century.

Whole accurate is also Bel's description of the Čavoj bearings that occupies *"the hill"* Jambrišková. The slopes of this massif are inclined from 25 to 30 degrees, which is also found by author *("the hill is very steep")*. Dynamic georelief with steep slopes caused difficulties in collecting excavated muck to soar, a pond (a roaster care?) nn the area of *Hámry*. Places where vein Ferdinand comes to the surface, indicated in Bel's times dumps (pings), tunnels and pits with piles (Fig. 3, 4). This fact is described by M. Bel implicitly: *"... they deepened stamping canals and drainage wells."*

Bel stated toponymum *"Hámry"* is not present in the contemporaneous maps. Location of *"workshops .. which are on the job* [it means shredding and cleaning or washing the muck] *determined ...."* we identify with the areal of so-called Hebenstreit house on the left bank of Jasenina, compared with the crossroads of Gápel and Zliechov[18]. Another location was in Cobrialska valley directly below the mining plant[19]. The drive mechanism was carried by water wheels. The water to drive these devices were supplied with the channels (germ. *Puchwerk*)[20].

The mining infrastructure of the Čavoj bearing in the Bel's times was supported by water reservoir (capital letter "E" on Fig. 3, upper). The main building of the mining infrastructure (germ. *Hauptgrund*) stayed near the brook Jastrabá mouth in to the Jasenina creek. Technical background of the Čavoj ore district were complemented by ore (?) mill and sawmill[21]. Torso of the canal supplying water to the degree in the field of so called *Hauptgrund* upper to the socalled *Hebenstreit house*, was in the first third of the 20th century used as rail vehicle using the railway between Gápel - Zliechov - Ilava.

The mining in Čavoj was based on lead containing silver, zinc, and other metals; gold in the local ores occurs only in a small amount[22]. Therefore we understand Bel's information about locations of *"gold and silver"* implicitly, similarly as well as his assertion that *"... should be explicitly praise the hill behind it, it is rich in gold and silver."* The gold (Au) in the Strážovské vrchy Mts. was mined until the mid of 17th century using the major panning alluvial sediments in the basin of Chvojnica. Exploitation of gold from primary deposits by mining pings and short table were (apparently) subsidiary. The mining works on

the deep mining of ore in the hinterland of Nitranske Pravno shows, for example, part of Geyer map from 1751[23].

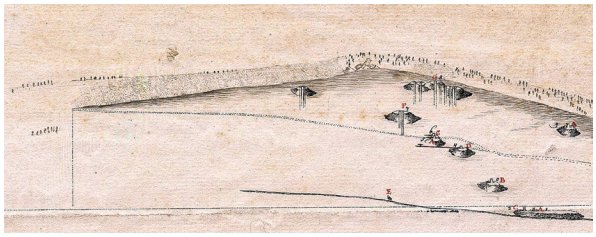


Fig. 3. Upper: front view of the workings and mining infrastructure on the northwest slope of Jambrišková (A – Royal adit, B – Hereditary/Körmendy adit, C – The old adit, D – Adit of Saint J. Nepomucký/Nepomucký adit, E - destroyed Hebenstreit pond, F – Shaft of Holy Trinity/Trinity adit, G – Sunk shaft of Saint Ferdinand, H - ping). Lower: Cross section of Jambrišková (725 m above sealevel) with mining works (state to 1769).
Source: SMA BŠ, CMA BŠ, *Grund*, ref. 8, Idem, *Explication*, ref. 8 - modified by Peter Chrastina.



Fig. 4. Dump of Trinitarian shaft (top left). Below right is a heap of The old or the Royal adit(?).
Photo: Peter Chrastina (XII. 2016)

Bel did not mention the smelter production of lead concentrate. Roasters existence (or several in the area of *Hámry*?) is documented in the report dated 15.11.1737. It finds enough water for the first phase (?) of compacting the lead ores, so called crude detergent (germ. *Roharbeit*). Supply of wood for the particular technological cycle were provided in the near region - especially oak, beech and fir stands[24].

Lead-ore concentrate were *"transported* [for further processing] *to the mining towns"* by vehicles, probably to the Kremnica[25], Banská Štiavnica[26] or to the Žarnovica (new plant was established here in 1740)[27]. In these factories the lead concentrate have been *"...melted"* to get "clean" Ag, resp. Pb. Bel's claim about *"coined* [in Kremnica silver] *coins"*, dinars, dimes, polturs and tolars from Čavoj ore has real basis.

Low metal content of ore vein Ferdinand, irregular mineralization bearing and discipline of the miners caused low economic importance of local mining. Lead production in Hungary, based mainly on resources from Banská Štiavnica were much more plentiful[28]. Bel "*about the* [low] *income*" of the district "*had not to say anything.*" Apparently he broke the nobility of the non-disclosure of information relating to the mining business in Hungary[29]. A few lines below he truthfully states *"... that Čavoj people deliberately left these activities because they are not recovered costs."* As reminiscent of the "good times" the author states the local mining industry and currently known story of the stone, which *"often has a higher price than cattle, to which he was deft."*

Historical mining of ores containing precious metals (mainly Au) is accompanied by an *"outside Čavoj territory"* (ie from the surrounding ore circuit Čavoj) from the field Chvojnica, Malinová (Cach) Nitranske Pravno, Lazany, Poruba, Diviaky nad Nitricou or Valaská Belá village[30]. The gold is gathered here from middle ages[31], panning gold mainly from alluvial deposits in streams. M. Bel, however, explicitly states the *"golden áπύγα* [Greek, Ground floor] [32] ... *living in Kostolná Ves"* that randomly appeared and were found by young girl in the *"forest pastures* ... [in] ... *ligtning interstices of the rock."* In this case, the description of the veins is about precious metal, which along with crystalline rocks come to the surface. Pasture for geese was located in a wooded section of a village or a rural area on the edge of the forest, *"the forest sward."* Situating the story in *"the areas of Kostolná Ves"* has no rational basis. There are only rocks of the central carpathian Paleogene (sandstones, breccias, conglomerates). Therefore potential sources of gold are localized in the area of Suchý and Malá Magura Mts., for example north of Nevidzany[33].

The continuation of the text Bel like warns potential readers against excessive optimism about the availability and reserves of gold in the area of *"town"* Kostolná Ves *"Although, according to the findings of this natural gold can not always say that where there is more abundantly appears, hiding the rich deposits . "* As model states "hill near Zvolen" which is *"known for the gold finds."*

Pleistocene travertine heap with a lake in the area of Borová hora hill (335 m above seal level) on the northern outskirts of the Zvolen city is, of course, without any

mineralization. The Piliny culture settlement of the Bronze Age was found at the top platform at the lake with discoveries of (coils) of gold wires[34]. Bel provides information on sporadic occurrence of gold in the area confirmed traces of mining works in the area of university arboretum, and the name of fluvio-karst cave at the foot of travertine with the historical name "Nahaj baňa."

The erudition of the author reflects sequence outlining the origin of primary gold deposits in the region, *"... nevertheless would imprudent not refuse the possibility that the metal beads arises where suitable metal fumes precipitate."* Au occurrences in Gápel (and around Chvojnica) in the form of hydrothermal veins in the granitoid rocks that M. Bel known as *"rods"*. During the cooling of the melt and fluids containing Au, other minerals in the uppermost parts of the Earth's crust crystallization occurs. This process is characterized by M. Bel reliably: *"... metal grains are formed, where appropriate metal fumes precipitated."*

Incidence data mining and metals (Au, Ag, Pb) do not figure in Považský Inovec in any particular state. They took place in the first quarter of the 18th century (1706, 1720) because mining work on the northeastern slopes of the mountains in the Trenčianska Turná village[35]. In "Nitra" *Notitia* the information about intensive gold panning in the river basin of Livina and Chotia during the Middle Ages[36] is missing.

Conclusion

The aim of the presented study is to discuss historical and geographical research history and environmental issues regarding to ore raw materials, ore extraction in the Nitra County in the first half of the 18th century. Description of the topic is contained in a state called "Ore storage yards" in § XII. natural scientific part (*Membrum primum physicum*) of general part of *Notitia* of the Nitra County in Hungary (1742).

In the meaning of that goal, we designed the two research questions, to stating the following positions:

1. Environmental history issues, respectively the reconstruction framework bearing ore minerals, including in the context of their extraction in the Nitra County, were reconstructed not only by Bel description. Author its interpretation of the metal ores discoveries and their exploitation puts to the contexts given in encyclopedic and polymath terms. Therefore, selected characteristics are often commented "freely" without further clarification. M. Bel for supporting his claims used stories, which have been known for a long time. Therefore, in the interests of explanations the contemporary texts it is essential its comparison with cartographic and written sources and literature. Detailed description of country specific context, events or historical facts should be verified through field research.

2. Bel mentioned realities of ores and reflects the current state of knowledge only partially. Overall, however, it must be admitted that his description is astonishingly accurate. He managed to faithfully (and in accordance with the reality) described vein polymetallic mineralization, including selected elements of montane landscape of Čavoj ore deposits. The share of the lead in metal ore (with an admixture of silver and other elements) to Čavoj deposit was varied, the profitability of mining was and limited. Initial processing of the excavated muck (sorting, crushing, grinding in the ore mill) and subsequent production of lead concentrate and reduction of furnaces are likely to be implemented in the area of Hámry lying in the valley of Jasenina, near the Gápel settlements. Final processing of semi-finished product and production of "clean" Ag and Pb occurred in selected metallurgical enterprises in the central Slovak mining area. They minted silver dimes, silver coins and polturs and tolars from the Čavoj ore in Kremnica mint.

Practically all of ore minerals, which could be found in Strážovské vrchy Mts. in the times of creation "Nitra" *Notitia*, were not rightly considered as gold by the author. For example, he did not mention placer of Au in the Chvojnica river basin, some of which lasted beyond the first half of the 18th century. He also did not issued an opinion on the ore deposits in the northern part of Považský Inovec Mts. or to the apparently forgotten placer of gold in the river basin Livina and Chotina.

The research is not considered as over. The possible further research could be seen in studying of additional sections (paragraphs) of the Natural History section of the General section of "Nitra" *Notitia*.

In addition to the basic (historical-geographic) research, we could use the outputs at popularization of historical science, the teaching of regional history, and in strengthening the identity of the population living on the territory of the former Nitra region[37]. The selected part of the analysis and interpretation of Bel's description of the natural, historical and social phenomena and realities may also be taken into account in environmental planning, or in specific decision-making processes at the municipal and some state administration bodies (Slovak Environmental Agency and others.).

Acknowledgment:

This paper is a part of the outcomes of the research project GAP410/12/G113 (Historical Geography Research Centre), supported by the Grant Agency of the Czech Republic.

Note:

1. See example: Erika Juríková, *Pôsobenie Rehole kazateľov a panien svätého Dominika v Trnave podľa Notície Mateja Bela v konfrontácií s historickou skutočnosťou (Action virgins and the Order of Preachers of St. Dominic in Trnava by Matthias Bel Noticias in the face of historical fact)*. In: *Sambucus. Práce z klasickej filológie, latinskej medievalistiky a neolatinistiky*. Trnava, FF TU, 2005, p. 101-103, 111-112, Ján Tibenský, *O práci, koncepcii, štruktúre a osudoch Belových Notícií (About the work, concept, structure and fate by Bel Noticias)*. In: Ján Tibenský (ed.), *Matej Bel: doba, život, dielo*. Bratislava, Veda, 1984, p. 219, 221.

2. Bel´s Notitias served as a model for the scientific work of J. Seberini (polymath and teacher in Banská Štiavnica) about the history of Hungary (Joannis Severini, *Conspectus historiae Hungaricae in usus praesertim juventutis adornatae. Pars prior.* Posonium, Patzko, 1775).

3. Katarína Rácová, Peter Chrastina, *Myjava and Chvojnica in the Notitia of the Nitra County (historical geographical analysis and interpretation)*. In: *Revista Transilvania*, 8/5-6, 2014, p. 41-50.

4. Peter Chrastina, Katarína Rácová, Vladimír Brůna, *Bridges over the Váh River in the territory of the Nitra County in the first half of 18th century (acording to Notitia hungaraiae historico-geographica by Matthias Bel)*. In: *Revista Transilvania*, 9/6-7, 2015, p. 79-86.

5. Matthiae Bel, *COMITATUS NITRIENSIS, PARS GENERALIS, MEMBRUM PRIUS PHYSICUM, de situ, natura, opportunitatibus Comitatus Nitriensis, § XII*, p. 305-306. Article avilable at the web address: http://oldbooks.savba.sk/digi/Lyc_B_VIII_33_IV/LKB_LYC_B_VIII_FOL_2ZZI/SK/1_1_LYC_B_VIII_FOL_2ZZIN00305-306P.htm (9.9.2016).

6. Slovak Mining Archive in Banská Štiavnica (below SMA BŠ), Archival collection of the Banská Bystrica Mining association (below MA BB), No 551 - *Správa o olovenej rude (The report about lead ore)*, *Informácia o čavojskom revíri (The information about Čavoj mine district),* 28.10.1737, *Správa o stave prevádzok v Čavoji (The report on the status of operations in Čavoj),* 15.11.1737.

7. SMA BŠ, MA BB, No 566 - *Správa o hute v Čavoji (The report about metallurgical plant in Čavoj)*, *Správa o dodávke olovenej rudy do Kremnice (The report about delivery round lead ore to Kremnica),* 24.4.1759.

8. SMA BŠ, Archival Collection of the Central Mining Association Office in Banská Štiavnica (below CMA BŠ), No 09865 - *The mining map from 18th Century*, *Grund und Saiger Ries über die Sawoyer völlige Tag-Riever, samt daselbst allen befindlichen Bley-Werkern und Schurf Pingen* [without scale]. [S.l., s.n.], ca. 1769, No 09866 - *The mining map from 18th Century, Explication/ Uber dießse Grund- und Profill-Riß deren in Csavojer Bley Gebürg befiendlichen alt und neuen Gruben alß* [without scale]. [S.l., s.n.], 11.10.1769.

9. Geyer, *Plan der Ober-Hungrischen Bergstadt Rudna* [without scale]. [S.l., s.n.], 1751. Article avilable at the web address: http://imageserver.mzk.cz/mzk03/001/052/487/2619316556 (19.8.2016).

10. Gejza Holec, *Správa o literárno-historickom výskume rudného baníctva na Hornom Ponitrí (The report about literature-historical research of the Horná Nitra region ore mining)*. Prievidza, Banský výskumný ústav, 1968 (Geofond, No 67236), Stanislav Mikoláš et al., *Záverečná správa z úlohy ČAVOJ - GÁPEL, Ag - Pb - Zn rudy, vyhľadávací prieskum (The final report of the task ČAVOJ - GÁPEL, Ag - Pb - Zn ore, exploration search)*. Spišská Nová Ves; Žilina : Slovenská geológia; PROGEO, 1995 (Geofond, No 82971).

11. Ján Beljak, *Borová hora (The Borová hill)*. Article avilable at the web address: http://www.pustyhrad.com/okolie_borovahora.php (10.7.2016), Juraj Fojtík, *Začiatky banníckeho dolovania na Považskom Inovci, 1765 - 1775 (The origins of the mining in Považský Inovec Mts., 1765 - 1775)*. In: *Zborník Slovenského banského múzea XI*, 1983, p. 117-118, Miroslav Kamenický, *Olovo v hutníctve drahých kovov na strednom Slovensku v 18. storočí (The lead of the noble metal metallurgy in Central Slovakia region in 18th century)*. In: *Acta Historica Posoniensia I. Štúdie z dejín baníctva a banského podnikania*. Bratislava, FF UK, p. 64-68; Idem, *Stredoslovenské striebro a jeho hutnícke spracovanie do konca 18. storočia (The Central Slovak silver and it´s metallurgy processing to end of 18th century)*. Bratislava, VEDA, 1995, Ján Lukačka, *Baníctvo v oblasti stredného a severného Ponitria (The Mining in Central and Nothern Nitra river Region)*. In: *Banské mestá na Slovensku*. Martin, Osveta, 1990, p. 193-195, Martin Števko, Roman Gramblička, Radana Malíková, *Nové údaje o supergénnych mineráloch z polymetalického ložiska Čavoj, Strážovské vrchy, Slovenská republika (New data on supergene minerals from the Čavoj base metal deposit, Strážovské vrchy Mts. (Slovak republic)*. In: *Bulletin mineralogicko-petrologického oddělení Národního muzea v Praze 2015*, 23/1, 2015, p. 63-74, Gusztáv Wenczel, *Magyarország bányászatának kritikai története (The critical history of the Hungary mining)*. Budapest, A M. Tud. Akadémia Könyvkiadó-hivatala, 1880, Peter Zámora (ed.), *Dejiny baníctva na Slovensku, 1. diel, Využívanie nerastných surovín, ťažba rúd, vybraných nerudných surovín a výroba kovov na území Slovenska od počiatkov do roku 1945 (The Slovakia mining history, 1st part, Exploitation of mineral resources, mining ore, selected non-metallic materials and metal production in Slovakia from the beginnings to 1945)*. Košice, Ing. Tibor Turčan - Banská Agentúra, Zväz hutníctva, ťažobného priemyslu a geológie SR, 2003.

11. Pavol Kukučka, *Minerály a horniny Západných Karpát, 10 Strážovské vrchy, Rudná oblasť Čavoj - Chvojnica (The minerals*

and rocks of the Western Carpathians, 10 Strážovské vrchy Mts., Metal deposit district Čavoj - Chvojnica). Article avilable at the web address: http://www.nadler.estranky.cz/fotoalbum/10-strazovske-vrchy/rudna-oblast-cavoj---chvojnica/ (16.8.2016).

12. Michal Maheľ, *Geologická mapa Strážovských vrchov 1 : 50 000 (The geological map of the Strážovské vrchy Mts. 1 : 50 000).* Bratislava, GÚDŠ, 1981.

13. *Staré banské diela a banské diela (Old mining works and mining works).* Article avilable at the web address: http://mapserver.geology.sk/ sbd/ (23.8.2016).

14. Gejza Holec, *Relation*, ref. 10, p. 46-47, Stanislav Mikoláš et al., *Final*, ref. 10, p. 54, Pavol Kukučka, *Minerals*, ref. 11, Peter Zámora (ed.), *Mining*, ref. 10, p. 30.

15. In the first half of the 18th century, mining works were situated in the territory of Temeš, Chvojnica, around Valaská Bela village etc. The closer: *Old*, ref. 13.

16. Gejza Holec, *The Relation*, ref. 10, p. 15-17.

17. This statement reflects the letter dated 28.10.1737. SMA BŠ, MA BB, *Information*, ref. 6. In orignal (German): *„wiewohln unβ dies bedencklich vorkommet, weilen der Unteree Stolln nur 15- und der Obere nur 40. Claffter angetriben - und dannoch ein so schönes bleÿ ärzt in so kurzer Strekhen eroberet worden, warumben der herr Baron v. Schmidegg... .*

18. SMA BŠ, CMA BŠ, *Grund*, ref. 8.

19. SMA BŠ, CMA BŠ, *Explication*, ref. 8. In original (German): *"...3 eysen betehend gewesene."*

20. SMA BŠ, MA BB, *Relation,* ref. 6. In original (German): *„Auch unterhalb des dorffs in einen grundt drey Puchwerckh gestanden... ."*

21. SMA BŠ, CMA BŠ, *Grund*, ref. 8, SMA BŠ, CMA BŠ, *Explication*, ref. 8.

22. Martin Števko, Roman Gramblička, Radana Malíková, *New data*, ref. 11, p. 65, Stanislav Mikoláš et al., *Final*, ref. 10, p. 32, 48, 70, Pavol Kukučka, *The minerals*, ref. 11.

23. Geyer, *Plan*, ref. 9.

24. SMA BŠ, MA BB, *Relation*, ref. 6. In original (German): *„... in dasiger revier sowohl an Puechen, aichen und thanen Waldungen gar nichts ermangelt, auch genuegsames wasser daselbsten... ."*

25. SMA BŠ, MA BB, *Relation about*, ref. 7. In original (German): *„.... Demnach, auf die unteren 25ten clabentis anhero gemachte Vorstellung, kein anstand genohmen würde, hiermit zuerlauben, womit das von dem gewerkhen in Czavoj Joseph Hebenstreiten gegeben und in dortiger Neuhütten aufgeschmolzen bleÿ-ärtz, nach abzug der Schmöltz-Cösten, nach dem anschlüssigen Anschlag außbezahlet, ... daraus gefallene bleÿ aber zu daβiger Saigerung darober behalten, endlich aber daβ Saiger-bleÿ nacher Cremnitz gewöhnlicher mass abgeschickt werden könne ... ."* Kremnica leadworks was a government issue until the end of the 18th century was the largest metallurgical enterprise central Slovak mining area. See Miroslav Kamenický, *The Central*, ref. 11, p. 25.

26. Miroslav Kamenický, *Lead*, ref. 11, p. 65.

27. Miroslav Kamenický, *The Central*, ref. 11, p. 36, Idem, *The lead*, ref. 11, p. 28-31, 42.

28. Peter Zámora (ed.), *The mining*, ref. 10, p. 90.

29. Miroslav Kamenický, *The Central*, ref. 11, p. 10.

30. Gejza Holec, *The relation*, ref. 10, p. 69, Gusztáv Wenczel, *Magyarország*, ref. 11, p. 71.

31. Ján Lukačka, *The mining*, ref. 10, p. 194-195.

32. The Latin original *Notitia* is the term given Greek. Specific reasons unknown.

33. Michal Maheľ, *The geological*, ref. 12.

34. Ján Beljak, *The Borová*, ref. 11.

35. Juraj Fojtík, *The origins*, ref. 11, p. 117-118.

36. Ján Lukačka, *The mining*, ref. 10, p. 193-195.

37. On the issue of identity See Ladislav Lenovský, *Contexts of identity*. In: *Ethnologia Actualis Slovaca*, 6, 2006, p. 12-24.

Bibliography:

Bel, Matthiae. *COMITATUS NITRIENSIS, PARS GENERALIS, MEMBRUM PRIUS PHYSICUM, de situ, natura, opportunitatibus Comitatus Nitriensis, § XII*, p. 305-306. Article avilable at the web address: http://oldbooks.savba.sk/digi/Lyc_B_VIII_33_IV/LKB_LYC_B_VIII_FOL_2ZZI/SK/1_1_LYC_B_VIII_FOL_2ZZIN00305-306P.htm (9.9.2016).

Beljak, Ján. *Borová hora [The Borová hill]*. Article avilable at the web address: http://www.pustyhrad.com/okolie_borovahora.php (10.7.2016).

Fojtík, Juraj. *Začiatky banníckeho dolovania na Považskom Inovci, 1765 - 1775 [The origins of the mining in Považský Inovec Mts., 1765 - 1775]*. In: *Zborník Slovenského banského múzea XI*, 1983, p. 117-128.

Geyer. *Plan der Ober-Hungrischen Bergstadt Rudna* [Without scale]. [S.l., s.n.], 1751. Article avilable at the web address: http://imageserver.mzk.cz/mzk03/001/052/487/2619316556 (19.8.2016).

Holec, Gejza. *Správa o literárno-historickom výskume rudného baníctva na Hornom Ponitrí [The report about literature-historical research of the Horná Nitra region ore mining]*. Prievidza, Banský výskumný ústav, 1968 (Geofond, No 67236).

Chrastina, Peter, Rácová, Katarína, Brůna, Vladimír. *Bridges over the Váh River in the territory of the Nitra County in the first half of 18th century (acording to Notitia hungaraiae historico-geographica by Matthias Bel)*. In: *Revista Transilvania*, 9/6-7, 2015, p. 79-86.

Juríková, Erika. *Pôsobenie Rehole kazateľov a panien svätého Dominika v Trnave podľa Notície Mateja Bela v konfrontácií*

s historickou skutočnosťou [Action virgins and the Order of Preachers of St. Dominic in Trnava by Matthias Bel Noticias in the face of historical fact]. In: *Sambucus. Práce z klasickej filológie, latinskej medievalistiky a neolatinistiky*. Trnava, FF TU, 2005, p. 101-130.

Kamenický, Miroslav. *Olovo v hutníctve drahých kovov na strednom Slovensku v 18. storočí [The lead of the noble metal metallurgy in Central Slovakia region in 18th century]*. In: *Acta Historica Posoniensia I. Štúdie z dejín baníctva a banského podnikania*. Bratislava, FF UK, p. 64-68.

Idem. *Stredoslovenské striebro a jeho hutnícke spracovanie do konca 18. storočia [The Central Slovak silver and it´s metallurgy processing to end of 18th century]*. Bratislava, VEDA, 1995.

Kukučka, Pavol. *Minerály a horniny Západných Karpát, 10 Strážovské vrchy, Rudná oblasť Čavoj - Chvojnica [The minerals and rocks of the Western Carpathians, 10 Strážovské vrchy Mts., Ore mining district Čavoj - Chvojnica]*. Article avilable at the web address: http://www.nadler.estranky.cz/fotoalbum/10-strazovske-vrchy/rudna-oblast-cavoj---chvojnica/ (16.8.2016).

Lenovský, Ladislav. *Contexts of identity*. In: *Ethnologia Actualis Slovaca*, 6, 2006, p. 12-24.

Lukačka, Ján. *Baníctvo v oblasti stredného a severného Ponitria [The mining in Central and Nothern Nitra Region]*. In: *Banské mestá na Slovensku*. Martin, Osveta, 1990, p. 193-195.

Maheľ, Michal. *Geologická mapa Strážovských vrchov 1 : 50 000 [The geological map of the Strážovské vrchy Mts. 1 : 50 000]*. Bratislava, GÚDŠ, 1981.

Mikoláš, Stanislav et al. *Záverečná správa z úlohy ČAVOJ - GÁPEL, Ag - Pb - Zn rudy, vyhľadávací prieskum [The final report of the task ČAVOJ - GÁPEL, Ag - Pb - Zn ore, exploration search]*. Spišská Nová Ves; Žilina : Slovenská geológia; PROGEO, 1995 (Geofond, No 82971).

Severini, Joannis. *Conspectus historiae Hungaricae in usus praesertim juventutis adornatae. Pars prior*. Posonium, Patzko, 1775.

Rácová, Katarína, Chrastina, Peter. *Myjava and Chvojnica in the Notitia of the Nitra County (historical geographical analysis and interpretation)*. In: *Revista Transilvania*, 8/5-6, 2014, p. 41-50.

Slovak Mining Archive in Banská Štiavnica, Archival collection of the Banská Bystrica Mining association, No 551 - *Správa o olovenej rude [The report about lead ore]*, *Informácia o čavojskom revíri [The information about Čavoj mine district]*, 28.10.1737.

Slovak Mining Archive in Banská Štiavnica, Archival collection of the Banská Bystrica Mining association, No 551 - *Správa o olovenej rude [The report about lead ore]*, *Správa o stave prevádzok v Čavoji [The report on the status of operations in Čavoj]*, 15.11.1737.

Slovak Mining Archive in Banská Štiavnica, Archival collection of the Banská Bystrica Mining association, No 566 - *Správa o hute v Čavoji [The report about metallurgical plant in Čavoj]*, *Správa o dodávke olovenej rudy do Kremnice [The report about delivery round lead ore to Kremnica*], 24.4.1759.

Slovak Mining Archive in Banská Štiavnica, Archival Collection of the Banská Štiavnica Central Mining Association Office, No 09865 - *The mining map from 18th Century*, *Grund und Saiger Ries über die Sawoyer völlige Tag-Riever, samt daselbst allen befindlichen Bley-Werkern und Schurf Pingen* [without scale]. [S.l., s.n.], ca. 1769.

Slovak Mining Archive in Banská Štiavnica, Archival Collection of the Banská Štiavnica Central Mining Association Office, No 09866 - *The mining map from 18th century, Explication/Uber dießse Grund- und Profill-Riß deren in Csavojer Bley Gebürg befiendlichen alt und neuen Gruben alß* [without scale]. [S.l., s.n.], 11.10.1769.

Staré banské diela a banské diela [Old mining works and mining works]. Article avilable at the web address: http://mapserver.geology.sk/ sbd/ (23.8.2016).

Števko, Martin, Gramblička, Roman, Malíková, Radana. *Nové údaje o supergénnych mineráloch z polymetalického ložiska Čavoj, Strážovské vrchy, Slovenská republika [The new data on supergene minerals from the Čavoj base metal deposit, Strážovské vrchy Mts. (Slovak republic)]*. In: *Bulletin mineralogicko-petrologického oddělení Národního muzea v Praze 2015*, 23/1, 2015, p. 63-74.

Tibenský, Ján. *O práci, koncepcii, štruktúre a osudoch Belových Notícií [About the work, concept, structure and fate by Bel Noticias]*. In: Tibenský, Ján (ed.), *Matej Bel: doba, život, dielo*. Bratislava, Veda, 1984.

Wenczel, Gusztáv. *Magyarország bányászatának kritikai története [The critical history of the Hungary mining]*. Budapest, A M. Tud. Akadémia Könyvkiadó-hivatala, 1880

Zámora, Peter. *Dejiny baníctva na Slovensku, 1. diel, Využívanie nerastných surovín, ťažba rúd, vybraných nerudných surovín a výroba kovov na území Slovenska od počiatkov do roku 1945 [The Slovakia mining history, 1st part, Exploitation of mineral resources, mining ore, selected non-metallic materials and metal production in Slovakia from the beginnings to 1945]*. Košice, Ing. Tibor Turčan - Banská Agentúra, Zväz hutníctva, ťažobného priemyslu a geológie SR, 2003.

Žudel, Juraj. *Stolice na Slovensku [County in the Slovakia]*. Bratislava, Obzor, 1984.