

# TRACES OF INDUSTRIAL HERITAGE IN SLOVAKIA – FORGOTTEN TREASURES OF LAND AND HUMAN SPIRIT

EVA KRALOVA, Assoc. Prof., PhD., Faculty of Architecture Slovak University of technology Bratislava; Lecturer. [kralova@fa.stuba.sk](mailto:kralova@fa.stuba.sk)

OLGA KLAKOVA, Dipl. Ing. Arch., Faculty of Architecture SUT Bratislava, Research workplace Banska Stiavnica; Researcher. [olgaklakova@allcomnet.sk](mailto:olgaklakova@allcomnet.sk)

LUBICA DURISOVA, Dipl. Ing. Arch., Faculty of Architecture SUT Bratislava, PhD student [sobica@gmail.com](mailto:sobica@gmail.com)

## 1 INTRODUCTION

Slovakia is a small country in central Europe, which appeared on the map as an independent republic on January 1<sup>st</sup> 2003. Nevertheless, Slovak history can be traced back long before that as part of different countries<sup>1</sup>. Information gathered concerning industrial heritage indicates that inventions in Slovakia have contributed to the progress of our global civilization.

Slovakia is located in the inner arc of the Carpathians (Fig. 2.). Today, Slovakian landscape seems practically untouched by human hand, completely natural, but in reality it is cultivated land. This land was used, cultivated, mined and transformed already very long ago. It is a land, which profile as well as present form was shaped by human activity; namely it served as a food, material and energy reservoir for their intensifying efforts to exploit even the most hidden treasures (Fig. 3). Traces of these processes are nowadays visible only in fragments. Even through isolated and not functioning any more, proofs of these endeavours are yet standing. These landmarks stand still, but to the one who listens, they talk of the accomplishments of human spirit, which cooperated closely with nature and its laws in order to push forwards the frontiers of knowledge and prosperity of mankind.

The preamble of the Charter of industrial heritage<sup>2</sup> defines industrial revolution as rapid progress of social, technical and economical conditions of industrial production. These changes were the result of innovations in energy use, production and trade from middle ages until mid 18<sup>th</sup> century. In this paper, I will mention the initial phase of the industrial revolution, which was taking place in the small area in central Europe in that time period.

## 2 CHARACTERISTICS OF INDUSTRIAL HERITAGE OF SLOVAKIA

Man has shaped the rough natural environment according to his needs for centuries, in some places even for thousands of years. The most common driving force was the satisfaction of requirements for the production of goods, which could be in modern economical terms described as goods with a high added value. Metallurgy and mining are very good examples

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<sup>1</sup> From the 11th to the first half of the 16th century Slovakia was part of the Hungarian kingdom, from 1526 to 1918 it was part of the Austrian-Hungarian Monarchy. Between 1918 and 1993 it was part of the Czechoslovak republic in different political forms. On January 1st 1993 Slovak Republic was declared.

<sup>2</sup> The Nizhny Tagil Charter for the Industrial Heritage was defined at the congress of the International Committee for the reconstruction of industrial heritage (TICCIH) Nizhny Tagil near Moscau in July 2003

of such activities. Mining and metallurgy was always feeding, tantalizing and inspiring people in the hostile mountainous regions of Slovakia. They were the main actors in the transformation of the environment into an industrial landscape (Fig.4), which started in the middle ages.

The foundation and the principles of modern industrial period were laid with the union of work organisation and the deployment of mechanical machines using other energy sources than human or animal labour. This alternative energy source was in the central European region provided by mining and metallurgy of the Carpathians, as will be discussed below in more detail.

The Charter of Nizhny Tagilj<sup>3</sup> defines industrial heritage as a wide range of material and intellectual artifacts, which were “produced because of an industrial process or as a result of it”. Based on the typology used in this Charter, we can discuss industrial heritage in Slovakia divided into several groups and subgroups.

### 3. THE ORGANISATION OF PRODUCTION

The combination of two basically independent industries into one organisational and production unit is a sign of a higher level of organisation of industrial production (concentration). As a result, consortia have been established since the late 19<sup>th</sup> century.

This type first consortia in Slovakia was a Copper enterprise named “Banskobystricky mediarsky podnik“, which was established in 1495 by the representatives of the families Thurzo from Levoca (today Slovakia) and Fugger from Augsburg (today Germany). The Copper Enterprise was for the first 10 years only renting ore mining, but gradually it deprived the indebt miners of their mines. Simultaneously, the enterprise constructed a new metallurgical plant later known as Medeny hamor near to Banska Bystrica and modernised older plants in such a manner, that by 1505 this Enterprise controlled the complete mining and metallurgical industry of Copper, i.e. from mining to processing (Fig.5).

The foundation of the Copper Enterprise started intensive abyssal mining. Newly built galleries and drifts were interconnected and the mining workings were at that time at the top level in Europe (thanks to the abyssal technology, machinery and detailed maps). Afterwards, the ore was processed in one of the metallurgical plants, which can be divided into the following groups:

- a) **smelteries (huty)** i.e. a facility, in which metal was extracted from the ore by heating it according one of the following 3 technologies:
  - melting (subsidiaries in Stare Hory, Harmanec, Revuca, Balaze, Lubietova, Banska Bystrica),
  - refinement of the plants (Mostenica and Tajov )
  - sieving in the metalurgical plants (Mostenica)
- b) **copper forge (medeny hamor)** – established in 1496, served as the only facility for the production of final and intermediate products

The Copper Enterprise Medeny hamor in the city Banska Bystrica (Fig. 6) was until very recently the second oldest operational plant in Slovakia. It existed for four centuries after the end of the original enterprise of Thurzo and Fugger. The production activities ceased in 1996.

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<sup>3</sup> See the 1<sup>st</sup> paragraph of the Charter.

The oldest industrial facility in Slovakia still in operation is the mint in Kremnica (Fig. 7), which was founded in 1328. It cooperated closely with the Copper Enterprise in Banská Bystrica and with the miners from Banská Stiavnica, as the mint was one of the finalizing producers using their metal yield (gold, silver, copper). The facility Medený Hamor from Banská Bystrica supplied copper for silver and gold alloys for coins to the mint until the end of the 15<sup>th</sup> century. After the emperor Maria Teresia established the production of copper coins in 1759, the mint in Kremnica applied the well-known and abundant supplier base for processed copper in Banská Bystrica. This was the main reason for the construction of a rolling mill in Medený Hámor in 1762. Right next to the mill a room was designated to the preparation of small copper plates. Thanks to this process the coin production could be simplified and most of all, the efficiency in both facilities was improved.

The history of the coin production and the work organisation in the mint in Kremnica including its relations in the region is well-documented and accessible to the public in the Museum of Coins and Medals in Kremnica, which belongs to the Slovak National Bank.

#### 4. THE EMPLOYMENT OF MACHINES

As already mentioned above, the employment of high throughput machines instead of man or animal force is an important attribute of industrial work organisation. In the case of Slovak ore mining, this trend became visible first in auxiliary services and energy production, while mining itself remained manual.

After the start of abyssal mining, vertical shafts were equipped with lifting machines for the transportation of ore to the surface. These machines, however, were still powered by horses or oxen. Later in the 16<sup>th</sup> century, animals were gradually exchanged for water drive. Also the unique machines for pumping water from submerged mines, which were invented in the 18<sup>th</sup> century, were powered by water. They were employed first by the mining engineer and inventor Jozef Karol Hell (1713-1789) from Banská Stiavnica. At that time, these engines represented the most economic solution for pumping the concurmining water in the world, which was applied for a whole century. An original engine room of such a water lifting machine can be visited in the complex of the Zigmund mine in Banská Stiavnica.

Concurrently with technological advancements in the world, machines powered by new forms of energy were employed in the mining regions of Slovakia (Fig. 8), too. In 1721 a so-called fire machine invented by Ignatius Potter was used in Nova Bana, what was the first application of a forerunner of the steam engine on the European continent. A fully functional example of such a device is on display in the Mining Museum. As for the electrification, a monument of the first employment of electricity in Slovak mining industry is in the mine Mayer in Banská Hodruša. In an authentic little house above the mine an electric lifting device can be seen, which is still fully operational.

Machines were applied in the premises of ore milling and processing plants, as well as in auxiliary metallurgic industries. In plants named “stupa” productive ore was separated from dead (mute) ore. Simultaneously, the ore lumpiness was adjusted. These plant exploited gravitation for processing the ore. Gradually they also exchanged horsepower for alternative energy sources, mainly water energy. By the end of 18<sup>th</sup> century, there were 35 of such “stupa” plants only in the district of Banská Stiavnica and dozens other were in the regions of Kremnica, Spania Dolina, Banská Bystrica and in east-slovakian region near of Smolník. In the first half of 20<sup>th</sup> century, flotation technology replaced gravitation processing making it obsolete. The old-fashioned plants were abandoned and started to decay. Only very few of them were preserved to the present times. They are either transformed into private houses, e.g. in Stiavnické Bane, or they lie in ruins. The ruins of so-called Horne Stupy are located in the

town Vyhne in the region of Banská Stiaavnica. Another example can be found in the former copper district of Spania Dolina and Piesky near Banska Bystrica. The functional disposition of the plant is still detectable from the torso of a plant in the mine Ludovika, where the room for a water driving wheel with a diameter of 12 m is quite distinctive.

## 5. ENERGY PRODUCTION AND UTILIZATION

The production of efficient and accessible energy for powering mining metallurgic processes determined the pace of economy ever since the 16<sup>th</sup> century not only in the territory of present Slovakia, but in all of the Hungarian kingdom.

For the production of sufficient water resources for ore processing in “stupa” facilities, some artificial reservoirs collecting water were developed. The stream of water, based on the principle of water mil, was found to possess the necessary amount of energy to power the technologies. However, rivers with sufficient flow were only in the valleys far ever from the mountains with mines. Therefore, a method to retain, regulate and utilize rain and melting water, as well as few mountain wells was needed.

Based on this requirement, the construction of a unique mining aquaduct (Fig. 9) was started at the beginning of 16<sup>th</sup> century. The aquaduct transported water from the hilltops of the Lower Tatra (Donovaly, Prasiavá) with an altitude of about 1100 m to the mines in the region of the Špana valley with the altitude 800 m. The water network marked in a map from 1764 has a total length of 26.4 km. The total length of water system was 42 km and it had a capacity of 60 to 90 L per second.

The transported water was applied in a very resourcefully manner. Gradually, it powered several machines in different technologies, i.e. mining machines, gravitation processing (stupa), mills and sawmill in the whole region of Spania Dolina. Water reservoirs (Teichs), which were built in order to maintain a steady flow of water to the individual locations of application, were also preserved up to now.

Another unique water system, which applied the simile principle, was build between the 16<sup>th</sup> and 18<sup>th</sup> century in surrounding of Banska Stiaavnica (Fig. 10). The solution is ever more breathtaking, when considering that it was built practically on the ridge of the watershed of 2 rivers (Hron and Ipel) with practically no surface water. The water reservoirs retained rain and melting water, collected by a network of gullies. Altogether the network included about 60 water reservoirs, from which about 40 were used to power mining, pumping and processing equipment.

Some parts of the system survived until the present, i.e. water reservoirs, gullies and water galleries. The artificial reservoirs (lakes) were created as building earth dams and dry stone pavements in the entrance part. The lakes represent amazing works of architecture in respect to their height and brave slopes. The dam of the lake Rozgrund, which is still serving in perfect conditions, was the steepest dam in the world up to the sixties of 20<sup>th</sup> century. To the present day, 20 lakes from this system were preserved, which serve mostly as tourist attractions and recreational water. A group of 8 lakes in the surroundings of the village Stiaavnické Bane is very interesting: Velka and Mala vindsachtska, Evcka, Bakomi, Kreschengrundska, Velka and Mala richnavska, and the largest lake Pocuvaldo with an area of 12.3 ha. Also the existence of connection galleries between Richnavska and Bakomi should be acknowledged.

A footpath in the woods nearby Spania Dolina is equipped with boards commenting the remaining of this unique water system. The water system in Banska Stiaavnica is an integral

part of the World Heritage site, which was announced an international cultural and natural treasure by UNESCO in 1993.

In comparison to other countries, water energy was widely used in Slovakia until mid 19<sup>th</sup> century, because the operational cost of steam driven engines was still higher than of water engines. An ingenious system of collective and driving gullies, pumps and water galleries made it possible to reuse the retained water multiple times before it was finally released into the river. The water and energy management was, judged by today's standards, highly ecological and sustainable. Both systems described above were operated for several centuries. During this time they did not devastate the environment, but rather valorised it.

Small water electricity plant from the beginning of 20<sup>th</sup> century, found in Jelenec and near Motycky (region of Banska Bystrica), belong without doubt to pioneers in technical equipment. These plant are still fully operational inclusive the original machinery. An other electric power station build up 230 meters underfoot near of the city Kremnica is a technical unique from the beginning of 20<sup>th</sup> century. It is yet operational.

## 6. MEMORY OF SCIENCE AND EDUCATION PROGRESS

As early as 1735 a vocal mining school was founded in Stiavnicke Bane, which started in a new building specially built for it. As a reward for the achievements of the mining school, the emperor Maria Theresa founded a Mining Academy by a decree on 13<sup>th</sup> December, 1752 (Fig. 11). The Mining Academy opened its doors in 1764. It was the first university level educational centre in the field of mining in the world <sup>4</sup>. The Royal Chamber of Mining in Vienna decided for Banska Stiavnica as the location of the Academy, because “in the region of Banska Stiavnica all kinds of mining, processing, metallurgic, pumping, powering and testing devices (water, air and steam powered) are on display, which can be applied for practical demonstrations for the students.” <sup>5</sup> The foremost experts in mining, metallurgy and later also in forestry from all of Europe were lecturing in this Academy. During their stay, the lecturers produced several inventions of international importance. This Academy was preparing mining experts for the whole Austrian-Hungarian Monarchy. The Academy closed its doors in Banska Stiavnica in 1919, when it was moved to Sopron in Hungary as a side-effect of the division of Hungarian kingdom after 1<sup>st</sup> world war. Nevertheless, a very good reputation of the Mining Academy in Banska Stiavnica was spread by its alumni all over Europe and worldwide in the most important mines for whole two centuries.

Three monumental neo-renaissance buildings in the centre of Banska Stiavnica are still reminders of the glorious times of the Academy. The buildings have still an academic function, since a vocal school for industry and forestry is located here. There are still some older townsman's houses <sup>6</sup>, where academics were studying and working before the Academy complex was built.

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<sup>4</sup> The Academy was expended by an Forestry Faculty in 1807, and was later operating under the name Academy of Mining and Forestry in Banská Štiavnica.

<sup>5</sup> Lichner, Marián: Banská Štiavnica. In: *Slovensko v klenotnici UNESCO*, p. 16-17

<sup>6</sup> The so-called Fritz House, which is today occupied by the Central Mining Archive, used to be the Headquarter of the Rector of the Academy. In the Belházy House some laboratories were located. Further the Jorges House and the Vila Fortúna near the Botanic Garden were used by the Academy.

## 7. SPECIALIZED TYPOLOGY OF BUILDINGS AND THE ORGANISATION OF LAND

High requirements for utilisation and effectiveness in the production, gave rise to specialized building. The production buildings, however, are not the only building blocks of an industrial society. The industrial society generated also buildings with other functions with equal importance, which marked the social conditions also in these mining regions. In harmony with the principle of maximum effectiveness of activities, as found in nature, the architecture of all building has gradually created a common typology characteristic for the region. According to their function, the specialized buildings can be divided into several groups:

### 7.1. Mining workings

To these workings belong: surface mines stoles and hereditary stoles, shafts, crosscuts, chimneys, heaps, etc.

The stoles and shafts (Fig. 12) document a deep mining process. A mining stole is a horizontal mining corridor, which was used for delivering ore, waste and material to the surface, for transportation of miners downwards, as well as for draining and ventilation of underground workplaces. Only three underground sectors of mining stoles were open to the public in the discussed region: the mine Bartolomej in an open-air museum, the mine Glanzenberg in the downtown of Banská Stiavnica and a part of the mine Prostredná in Banská Hodruša. The last one was active over 500 years. One part of it was reconstructed in 1992 and opened to the public as demonstration of methodologies applied in building mining workings and stone supports without any binding materials. Other mines survived only rarely. One can resolve only their portals and entrance points on the ground. Examples of such stole portals are: Ján Krstiteľ Prostredná, Zlatý stol, Dolný and Horný prekop to the shaft Lill located in v Banská Hodruša, or Stará stolná Antona Paduanskeho and the stole Jan in Vyhne, stole Denna in the Copper mining region (also known as Cisárska) in Spania Dolina, etc.

The so-called “hereditary stoles”, which were used for draining of mines, had a privileged position among all stoles. Several hereditary stoles survived in the area of Banská Stiavnica, in Kremnica and Spania Dolina, as well as in other areas. The most famous one is in Voznica, called Dedicná stolná cisára Jozefa II. This stole was started in 1782 and finished in 1878. The length of this stole was 21 km. At that time it was the longest mining working on Earth. The underground water from the mines of Banská Stiavnica and Banská Hodruša (the basin of river Ipel’) were transported as far as to the river Hron.

Shafts are also considered landmarks of abyssal mining. They served as ore carriers in the vertical direction. Almost all old shafts are already closed down. We can just guess where they were. The shaft Terezia over Banská Stiavnica is one of those shafts that are still open. The shaft Ondrej, in the complex of the open-air museum, is open as well. Originally they were built as wooden buildings covering the excavation machinery (“gaple” – see also Fig. 8), which were replaced by walled buildings in 19<sup>th</sup> century and first half of 20<sup>th</sup> century. In Kremnica, there are the shafts Ferdinand and Shaft IV noticeable.

The mining heaps were created as a consequence of the ore mining process. They were used for the storage of mute ore. Nowadays, almost all of them are covered in grass or trees. Typical examples of such mining working are heaps near the shafts Terezia, Amalia, Ferdinand, Maria, Maximilian or Zigmund in Banská Stiavnica, heaps near the shaft Lill in Banská Hodruša, heaps near the shaft Kristína in Stiavnické Bane, or a heap near the shaft Maximilian, which became a characteristic part of the panorama of Spania Dolina.

## 7.2. BUILDING FOR THE TECHNOLOGICAL MACHINERY OF PRODUCTION

Here belong: shaft buildings with mining towers, mining machine and water-pump engine halls, subsidiary working spaces, stores of dynamite, central dense-medium washing and crushing plants, smelters, laboratories, etc. Some of these workings was described above in the section 4 (Fig. 9). The others have very special organization for the description here thereat it will be skipped in this paragraph.

## 7.3. Non-productive buildings related to the organisation of production

In this category belong for instance: administration buildings of mining plants, knocking houses, special working rooms (e.g. calibration rooms, mining measurement buildings, etc. – Fig. 13). Some of them are still in good condition, and subsequently used for housing purposes. As an example of such buildings, we can mention: mines inspectorates at Vindšachta by shafts Piarg, Leopold and Magdalena in Stiavnicke Bane. More buildings of this kind are, for instance, in Banska Hodrusa, in Vyhne, or in Kremnica and Kremnicke Bane.

An interesting example of such a building is the Mining Chamber Court (Fig.13). This Chamber was executing the king's competence over the ore production. The most important of their buildings is the so-called Kammerhof (Chamber Court) in Banska Stiavnica. It served as a residence of the Mining Chamber, which was governing the mine, ironworks, mints and mining institute in the central region of Slovakia, in the second half of 16<sup>th</sup> century. Today, it is the residence of the Slovak Mining Museum with several specialized exhibitions on mining and iron production in this area.

The knocking-houses are highly interesting buildings (Fig. 14), which were used for the announcement of the start of a shift for miners. Knocking on a wooden plate was used as the signal. The knocking sound was also used on occasions of celebrations, funerals or as a fire alarm. Following knocking houses survived within the given territory: Banska Stiavnica, Banska Hodrusa, Kremnicke Bane and Spania Dolina. Knocking houses are most valuable buildings worth visiting and at the present usually open to the public.

## 7.4. Unique water management system

This system, which was responsible for delivering energy to mining and metallurgical equipments, was already described above.

## 7.5. Buildings with a social or public function

The following types of buildings belong to this category: votive (religious) objects (Fig. 14), security and area protection systems, miners' community hospitals, etc.

Votive buildings, even through they were sacred and sanctified, were not controlled by ecclesiastical power. They were an expression of the laic need for spiritual safety. A statue or a painting of a patron of the mine was usually located above the portal. Alternatively an individual statue of a saint, a crucifix, or a small chapel used to be near the mine entrance. The miners said their prayers at this location before entering the mine. Examples of such votive architecture close to the mining workings are: entrance to the stole of Jan Krstitel in Banska Hodrusa and Stara stolna Antona Paduanskeho in Vyhne. An individual Pieta statue is standing by the entrance to the stole Birnbaum in Banska Hodrusa. An other statue of Immaculate can be found by Vindsachta in Stiavnické Bane. Cast iron crucifixes survived by the entrance to the stole Prostedna in Banska Hodrusa, by the entrance to the hereditary stole Glanzenberg, by the shaft Maria in Banska Stiavnica, etc. In Spana Dolina is an individual object representing the Sepulchre of Christ.

## 7.6. Organisation of territory

The organisation of territory is an important manifestation of the organisation of life and community in this region since the late 15th century. A regional social system of small communities, with clearly defined mono-functional structure, evolved here long time before any labour colonies were created near the 19th century factories. It was even before the functionalistic theory, so called “zoning theory” was formulated.

The heavy-industry *production zones* (mining and metallurgical) were usually located near the raw material resources – as a typical industrial zone during the period of highly developed capitalism. Close to these zones were employee dwellings – some type of *labour colonies* (Fig. 15) with simple supplementary services (e.g. shops with only essential goods, simple health care centres). The social-economic life, including business and authorities, was centralized in a few towns. There were settled all wealthy mine owners – citizens, mining authority institutions (e.g. chambers, tribunals, etc.), as well as church authority institutions. In these towns, the cultural, social and liberal life, education and the municipal government were concentrated. A conclusive evidence of such organisation of the territory can be found in the current *downtowns* of Banska Bystrica, Banska Stiavnica and Kremnica. Other satellite towns, with similar structure but smaller in size and less important were: Nova Bana, Banska Bela, Lubietova, Slovenska Lupca, etc. There are strictly separated manufacturing and living zones in all of these towns and villages.

A highly *organized transportation system* was complementary to this structure. This system was separated into two divisions. The first division was a company-limited transportation (which was operating in a given economical region), whereas the second division was public and long-distance transport (Fig. 16). A well-preserved system of company owned roads between various mining shafts and processing facilities in Spania Dolina have an authentic route and technical construction up to now. Two crossings between Banska Bystrica and Kremnica were build in this way crossing Kremnica’s mountains in the area of the “Tri krize” called between Velestur and Rudna Polana, and in area of Skalka, where a tunnel with a length of 50 m was built. Nowadays, both of them are used as tourist roads.

The long distance transport roads were placed through the valleys. They were habilitated with the multifunctional road stations offering the services of mail station, accommodation and refreshment for travellers, protected holding of goods. The authentic buildings of such station are in Stare Hory and Straze near of Zvolen. The other, with the function already changed, they are Stampoch by Pukanec, Kozelnik, Radvan and abandoned building of Old Post in Banska Stiavnica.

## 8. Other manifestations of spiritual culture

According to the definition of industrial heritage in the Charter of Nižný Mogil’, all manifestations related to the industrial production or influenced by it, are considered valuable industrial heritage. In the discussed region, such heritage is demonstrated mainly in:

- Ecological relationship of man and environment – this was shortly described in previous sections about engineering and energy production.
- Mutual social relations with original traditions and ceremonies of mining loom
- Manifestation of intangible or tangible art such as the legends and tales, and art objects, such as paintings on glass or wood, needlework, bobbin laces, pictures made of wire, official images, tableware “handstejns”, paved bottles, or medallions

The expressions of art and folklore in this region are numerous. This topic deserves a paper of its own; therefore, I will rather close it here.

## 9. CONCLUSIONS

All workings, mentioned in this paper, are products of eager spirit and hard-working men. They are more or less famous in Slovakia, i.e. mainly to experts, who consider them isolated solitaires documenting local activities in history. In fact these activities were far from local and rather represent a highly coordinated system of industrial production and spiritual efforts. Nevertheless, their contribution to the international progress of human knowledge is often overlooked. It can be the posterior inventions, as well as setting up a system of patent law and the protection of author rights, have caused that the top achievements of the early stage of the forming of our industrial era were forgotten (Fig. 17).

In conclusion, I took the liberty of paraphrasing the words of Marian Lichner, mayor of the town of Banská Štiavnica, which has the status of UNESCO World Cultural and Natural Heritage<sup>7</sup>: „Mining of ore with a high content of precious metals was done in the natural mountain environment of Slovakia for thousands of years Tens tons of gold, thousands tons of silver and ten-thousands of tons of copper left the territory of today’s Slovakia. The treasures of Slovak underground paid for the expenses of the Imperial court, the construction of cities, subsidized science, education and culture, financed the discoveries of new world and paid for wars. The underground fortune is gone. Under the Slovak mountains only an endless web of shafts reminds of the former prosperity of this land of mining and metallurgy, while the memory is gradually fainting away. The wealth of this land is gone and hidden in the bank safes of the world. What is left, is the legacy of a unique and creative spirit able to rise up against the hard rock and merciless nature, the legacy of a smart and brave treasure hunter with a relentless will, faith and harden palms, who was able to conjure marvellous towns on the precipices of hostile mountains.“

Feel free to visit them. All of you are welcome!

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<sup>7</sup> Paraphrase of Lichner, M.: c.d., p. 10, 24