

# The archival documents of the State Central Mining Archives in Banská Štiavnica related to different kinds of museum collections at home and abroad

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The State Central Mining Archives in Banská Štiavnica (SCMA) supervise about 6 km of archival documents relating to different fields of human activity as well as individual people, phenomena and subjects. Some of these documents may serve for identification or more exact description of different museum objects both in Slovakia and in the world.

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## Samples of minerals and rocks

It is logical that in the special mining archives there are many documents concerning different collections of minerals and rocks. Most materials are in the collection of the Academy of Banská Štiavnica. [The Academy was established by the decision of the ruler Maria Theresia from December the 10th, 1762 and it existed in Banská Štiavnica till 1918. Then it was moved to Hungary (Sopron and Miskolc) where it exists until now.] Its first professor, Nicolaus Joseph von Jacquin [botanist, chemist; Leyden (Holland), 16.2.1727 – Vienna (Austria), 26.10.1817; his father was a Frenchman by origin, who owned a textile manufacture in Leyden], was put in charge of establishing the mineralogical collection, even before the beginning of the teaching. At the expense of the Court Chamber for Mining and Minting in Vienna (CCh), he was charged to collect samples of the domestic and foreign minerals and rocks needed for the illustrative teaching of future students.

In the fund of the Main Chamber Earl's Office in Banská Štiavnica (MChEO), the inventory of Tadeáš Peitner's private collection of c. 2000 minerals, which he sold as a

Copia.

# Catalogus der Peitnerischen Mineralien Sammlung

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Fig. 1. The first page of the inventory of the mineral collection of T. Peitner, 1776.

professor to the Academy of Banská Štiavnica in 1774 is well preserved (Fig. 1). The inventory of the wälsch minerals dates back to 1781. The Secret Court and State Office in Vienna sent it to Banská Štiavnica to enrich the academic collection. This shipment (six boxes of minerals) was to work as the counter-value of the samples of minerals and rocks occurring in the Central Slovakian mining area to the collection of the Prince ruling in Austrian Lombardy, now a part of Italy.

In the second half of the 19th century, Professor Ján Pettko took care of expanding and improving the quality of the collections of mineralogy, palaeontology and petrography. For example, in 1856, he acquired the mineralogical collection of Professor A. Hauch for the Academy, and in 1854 and 1860, he bought minerals from Dr. Anton Krantz from Bonn. The collection of minerals of the Academy of Banská Štiavnica became world renowned through his endeavour.

Except from the partial records in the archival funds, the complete inventory of this mineralogical collection was preserved (for example: SCMA, MChEO, No. 5963, inventory from 1886-1905.) In some inventories, each sample is described in details (including size and collecting locality), categorised into the group according to the kind and class, and each one is given a registration number. These data enable today's users to identify the origin of some old samples. Several significant results, examining these documents, have already been recorded by the colleagues from the Technical University in Miskolc (Hungary), where the remnants of the mineralogical collection of the Mining and Forestry Academy of Banská Štiavnica are now situated.

The large size of some samples enabled the Academy to sell, exchange or giving them as a present to others. For example, in 1851, 50 mineral specimens from Hungary, Bohemia, Gaul, Saxony, Sweden, Norway and North and South America enriched the collection of the Catholic Secondary Grammar School in Banská Štiavnica.

Matters concerning the collecting of minerals in the Central Slovakian mining area were directed (according to the instruction of the Court Chamber of Mining and Minting) by the Main Chamber Earl's Office. The priority was the regular dispatch of precious and unusual minerals to the Natural Science Cabinet (institute) in Vienna. But, for example, in 1775 it organised the assembly of a grand collection for the University in Freiberg (Germany). At the end of 1781 Anton Ruprecht, mining advisor and professor of chemistry, mineralogy and metallurgy, was put in charge of creating a collection of the precious and exceptionally beautiful minerals from the area of Banská Štiavnica, Kremnica and Banská Bystrica for the Natural Science Cabinet in Paris. This was in response to the application of the then director of the Paris Institute, Earl de Buffon [Georges Louis Leclerc de Buffon, French scientist and philosopher; Montbard, 7.9.1707 – Paris, 15.4.1788.] Minerals which the French geologist and mineralogist F.S. Beudant collected for several weeks in the surroundings of Banská Štiavnica were obviously destined for the same natural science cabinet. He was doing this within the framework of his scientific journey around Slovakia in 1818. Several boxes of minerals for "Collegii Jesu Cantabridgiesis" (Jesus College Cambridge) were collected in the Central Slovakian mining area in 1802 by the English traveller and mineralogist Edward Daniel Clark and his companion I.M. Crippson. With the approval of the MChEO, the shipment was sent via Vienna to England on May the 2nd.

The mining region of Central Slovakia was the destination of excursions by numerous other scientists, noblemen and high ranked state officers, as well as common

collectors. Perhaps none of them continued further on or arrived back home without the samples of local minerals and rocks either collected in their own hands or bought. Probably, neither the Dutch travellers L. Boréel and W. van der Pauw left Banská Štiavnica without samples of local minerals. They started their journey to the mining and metallurgical factories in Central Slovakia in October 1801.

Minerals of the Central Slovakian mining area also enriched the private collections of more members of the ruling family of Habsburg. For example, in 1628, Emperor Ferdinand II asked for beautiful samples of the rich gold ore, but he was not completely satisfied with the shipment he received. The samples, though there were lots of them, supposedly contained only a low content of gold. The Court Chamber of Mining and Minting (CCh) determined the bottom level to 12 "lót" (old unit of weight). The delivery was allowed to be supplemented by "handsteins" and ore from the preparation plants. During the ruling of his son, Emperor Ferdinand III, the claim for the delivery of nice crystal ore samples for the imperial "Grote" arrived at the Main Chamber Earl's Office. Even though in August 1642 the office of Banská Štiavnica replied that it did not have any suitable samples at its disposal, obviously it used this opportunity to represent itself as well as its subordinate mining area in front of the Emperor. Emperor Francis of Lorraine, husband of Maria Theresia, was given minerals and samples of ores directly in Banská Štiavnica during his visit in 1751. One archival document, for example, mentions that the samples of Kremnica's ore, rock and various stones were broken and collected in the town and its surroundings in three days by six people, and the total price for collecting, packing and transport of two boxes of different stones to Banská Štiavnica was 10 florins and 52 red cents.

At the beginning of 1763 CCh announced to the Main Chamber Earl and other high-ranking officers in Banská Štiavnica that the Crown Prince Joseph was establishing a collection of samples of ore, minerals and unusual stones. Štiavnica's mining officers therefore had to prepare good samples from the Central Slovakian area and these, provided with the adequate description (kind, collecting locality or mine, content of ore), were sent as soon as possible to Vienna. They were to continue with the collecting of the extraordinary samples from then on. In August 1777, one box of samples was sent from Banská Štiavnica to Vienna for the Archduke Maximilian. This was shortly after his visit to Banská Štiavnica and Kremnica. One year later, the collection of the Archduchess Marie Ann was enriched by ore samples from the production processes in Kremnica and Banská Bystrica. Also other samples, e.g., "Herrengründen Berggrün" from Špania Dolina and "Scheidewasser" ("lúčavka") from Kremnica, were sent to her. Duke Charles of Lorraine also received 19 samples from Špania Dolina, 35 from Kremnica and 77 from the region of Banská Štiavnica in April 1769.

The enduring interest in samples of minerals and rocks also brought certain problems. Some mining officers, especially when operating further from the sight of the MChEO, used the mineral samples for their own enrichment. This, of course, the authorities did not like, because the mining plants were losing the profit from selling "Kristalldruse" (thongs of crystals) and other samples, and the ruler was losing his tax (Frohn, Zehend). To thwart this arbitrary handling with the property of the state, various amendments and regulations were issued. For example in 1780, subordinate officers were threatened that, if they collected the samples without the previous order of the superior authorities and sold them without the appropriate valuation and taxation, they

would be strictly punished, even losing their job. Not to thwart the access to the mining areas, mining works, production buildings and interesting samples of minerals and rocks to the real admirers of mining and nature, they should apply for a special permission of the CCh. Official mineral dealers should also receive a licence to collect or buy minerals in the mining areas. Thus, in 1804, a dealer from Vienna, N. Moravek, gained permission to travel around the mining factories of Hungary and Transilvania (part of Romania). One year later, according to his good reputation and keeping to the terms of payment, the CCh renewed his permission.

The possibility of selling beautiful samples drove even some miners to illegal acts. As an example, consider the case of three contract miners from Kremnica in 1766. For stealing the ore samples from their underground workplace in the Leopold shaft, one of them was punished with 40 strokes by stick, his mining leather apron ('ošliador') was confiscated and he was deprived of the possibility to work at any state owned mining factory. The second got 30 strokes by stick and was prohibited to work at any state owned factory. The third was put in jail for 8 days.

It would be possible to continue in introducing various examples of actions related to collecting, describing and placing as well as selling of samples of minerals and rocks. However, I only wanted to point out the possibilities of using the archival documents for the clarification of different aspects of this problem.

### Models of mines and technical machinery

Models of period objects displayed at museums arouse interest of the lay as well as professional public. The creation of models relating to the Central Slovakian mining region had several reasons. They were created to serve as illustrative aids for understanding already existing objects, but also as a certain vision (e.g., the plan of a new construction solution). The following examples from archival documents will tell us something more about their creators and users (Fig. 2).

The mention of the model of a wind smelting furnace dates back to 1653. Daniel David Mossmann was paid 12 Reichstalers for it. Three models of Štiavnica's mines cost 1039 florins and



Fig. 2. Mining worker by the water column machine in the shaft. Detail from the mining map dating back to the 2nd half of the 18th century.

35 red cents in 1739. They were created by the assistant (adjunkt) of a mining inspector, František Gall. Models of Štiavnica's mines with water pumping machines of J.K. Hell were also created by the mining surveyor J.T. Brinn. He was approved a reward of more than 400 florins by the Court Chamber. On different occasions there were created several models of Hell's water column pumps. In 1745, its inventor Jozef Karol Hell [inventor and constructor; Banská Štiavnica, 16.5.1713 – ibidem, 11.3.1789; he significantly contributed to the development of mining in Banská Štiavnica] received 200 florins as a refund for his expenses connected to the construction of this model. Another model of this machine was constructed by Hell on the occasion of the visit of the Emperor Francis of Lorraine in Banská Štiavnica in 1751. This time he only asked for the repayment of material and metal workers' pay, which was 83 florins. This model was placed in a meeting room of the MChEO where the principle of how this revolutionary invention works was demonstrated to the Emperor. In the same year, 111 florins and 45 red cents were paid for another model of Hell's machine. It was built by Adam Vietor at the suggestion of the Chamber Earl Mayer [Karol Theobald von Mayer, the Main Chamber Earl in Banská Štiavnica in 1747-1749.] The reward represented the sum of purchase expenses for iron and several weeks' pay of the constructor (3 florins per week).

In April 1766, the Rector of a College in Wartberg applied to the MChEO to construct functional models of pump machines; fire machine, air machine and water column machine. He gave as a reason that his office had a duty to enable students to become familiar with solving problems of mechanical and hydraulic machines not only theoretically, but mainly practically, and thus preparing them to be able to perform higher working positions as best as they could.

Several interns arriving in Banská Štiavnica from all parts of Austrian-Hungarian Monarchy to improve themselves in mining used to construct or have constructed different models. Some of them constructed for the reason to be able to recall the individual machines after the arrival to mother or other enterprises, the others used them as designs for improving existing machines. For example, in 1745, the intern J.A. von Steinberg from Idrija (a town in Slovenia with important mercury mines) constructed two models of his own design of the machinery used for economical 24 hours performance of ore crushing ('stupa', 'Puchwerck'). The Earl Ferdinand Ludwig von Harsch, a former advisor in the Bohemian Kingdom who arrived to Banská Štiavnica in 1762 as an intern, had constructed for himself the whole collection of models (e.g., water column machine, air machine and fire machine, "stangenkunst" (water pump), ore treatment devices "stupa", ore washing devices, as well as models of the machinery from the mint in Kremnica, and other mechanisms.) Models had to serve him for providing a thorough knowledge and understanding of how this machinery worked. All models were created at his own expense. Before his departure to Vienna he left some of them in Banská Štiavnica, but he wanted to take others with him. Several problems arose in connection with this, because even after the reduction of their number there were still many. Although they were taken to pieces and thus transported, 14 boxes were necessary to pack them all, and a special cargo carrying horse drawn cart had to be used. As they had to be taken to pieces before the transportation, they were accompanied by a person who was able to reassemble them. Everything turned out well. The shipment for the Earl Harsch left Banská Štiavnica in April 1764 with the regular

"Silberfuhr" and was accompanied by two people; chief engine keeper (Oberkunststeiger) Z. Neuschl and a skilled carpenter. In 1780, another Czech intern, Augustín Wüst, arrived with the design of a new machine for plaiting mining ropes. The Chief Engine Master, J.K. Hell, could not judge from the presented plan and detailed description the working efficiency of this machine. He suggested construction of a model. The keeper of the water pumps of the MChEO, Pototschka, was put in charge for this duty. The professor of mechanics at the Academy in Banská Štiavnica, Ján Selecký, expressed his view concerning Wüst's design. He praised the diligence and inventiveness of the intern, but he confirmed that the machine was very cumbersome and demanded a lot of human work, which is why he improved Wüst's design by his own ideas. These were later incorporated into Pototschky's model according to which a new machine was to be constructed. Professor Selecký also designed the improvements of the rolling machine for the Kremnica's mint. The model, according to Selecký's design, was created by the carpentry master Wallner, from Banská Bystrica. This improved machine, after testing the model, was also proposed for construction. His design that continued was the improvement of the device for vertical transport of ore and water (Gappl). Professors of mechanics were expected to contribute to the improvement of existing technical machinery in different production plants. These professors, as well as those in other branches of study, had to do their best to offer students as much information in their given field as possible. Teaching through the functional models was a very intelligible and effective way.

Not only students of mining and metallurgical branches were in contact with models of buildings and machinery, as shown by the example of the Forestry Institute (Mining and Forestry Academy of Banská Štiavnica). This Institute had its own cabinet of models. It is said that it was lacking mainly the models of different water works. That is why, at the end of 1838, MChEO asked the Office of Saltworks in the Marmaroš region (Ukraine-Romania) for models of water dammed reservoirs for wood transportation (Klause), river retaining devices serving for catching of the floated wood (Rechen), and other devices on river flows. When the office was not able to deliver the required models in one year, professor Feistmantel [Rudolf Feistmantel, Vienna-Ottakring, 22.7.1805 – Vienna, 7.2.1871; 1835-1847 head of the Forestry Institute and Professor of Forestry at the Mining Academy in Banská Štiavnica] suggested that they apply for help from the Mining Management of the region of Banská Bystrica. Some more "Klause" were found at that time in the upper flow of the River Hron. A dismantled model of one such dam construction was created by J. Kartner, master of buildings and "rakes" ('Rechen'; river retaining devices serving to catch the floated wood) in Banská Bystrica, with the help of one joiner. This model, together with the description and notes, was delivered to Professor Feistmantel in April 1840. Fifty florins and 7 1/2 red cents were charged for the material and work.

Construction of models in the Central Slovakian region was the most common, but not the only, way of gaining them for the cabinet of models of the MChEO or for the Academy. Except from the already mentioned efforts to gain models of various water works for the Forestry Institute from Marmaroš, there are more examples. In 1782, CCh sent a detailed description and models of two processing machines to Banská Štiavnica that were sent there for an expert opinion by their creator, A. Schilling, from Kitzbühl in Tyrol (Austria). As they were not usable for practical purposes at

that time, they were placed in the cabinet of models of the MChEO or, possibly, used for teaching at the Forestry Institute. Contrary, the model of a new piston padding which was introduced and successfully used in Příbram (Czech Republic) was sent from Vienna to Banská Štiavnica for the practical use.

Who knows which of these and other models mentioned in archival documents still exist today, and if they do, whether they are correctly specified? In case they are not preserved and there is an interest to construct a model of a certain object from the period of 18th-19th century, you can find help in archives. Besides documents, many historical plans and books are placed there, and a functional model of an old machine can be constructed even today with their help. This is the way the Slovak Mining Museum in Banská Štiavnica enriched its collection of models.

### **Pictures, statues and other artistic monuments**

Banská Štiavnica used to be one of the free royal mining towns. The Main Chamber Earl's Office was the chief office for managing mining enterprises and matters in the Central Slovakian area. The task of the State mining management was to take care of churches, schools and other needs of its employees as well as common miners. Thanks to this, the documents relating to different monuments of art are placed in the mining archives. For example, in the summer of 1744 the picture of John the Baptist was acquired by Štiavnica's office for the church in Kolpachy [Kolpachy, Banský Studenec at present, is a village at 5 km from Banská Štiavnica; it belonged under the Management of the Šášov Chamber Estate.] It was planned for it to be arranged the same way as in the church in Jalná [a village belonging in the 18th century under the Management of the Šášov Chamber Estate.]

The duty of mining offices was to organise processions of miners on the occasion of certain religious holidays. Several problems arose with a local painter Kitsch at the turn of the 1760s-1770s in connection with the preparation of the procession in honour of the Corpus Christi Holiday in Banská Bystrica. He suggested that he would create two altars of his own design for the chamber of Banská Bystrica. As he requested 130 florins for this work, the mining manager Marzani from Banská Bystrica appealed to the painter A. Schmidt to present his own design. Schmidt designed an altar that would look like a gallery. Mining management liked it, but for some reason the plan was not carried out. The painter Kitsch responded again. When he did not get the order even after the repeated offer, he requested his drawings and a financial refund to the amount of 5-6 florins for his drawings of altars and for painting them and travelling costs to Vienna. The decision of the State Management was as follows; to return the drawings to him, but the financial requirement was rejected. The file states as a reason that he could have used the bought colour for another order, for example, for the work at a castle church in Banská Bystrica done in 1772. More written documents and picture from the sphere of church buildings and religious themes can be found in the archives. Plans of churches, altars, altar pictures, bells, statues, plague columns, etc., especially from the Central Slovakian area, but also elsewhere, are preserved (Fig. 3) [for example: the Calvary and the Plague column in Banská Štiavnica, the Holy Trinity column in Kremnica, the altar in Nagymaros (Hungary).]

Portraits of chamber earls belong to another category. They are placed at the

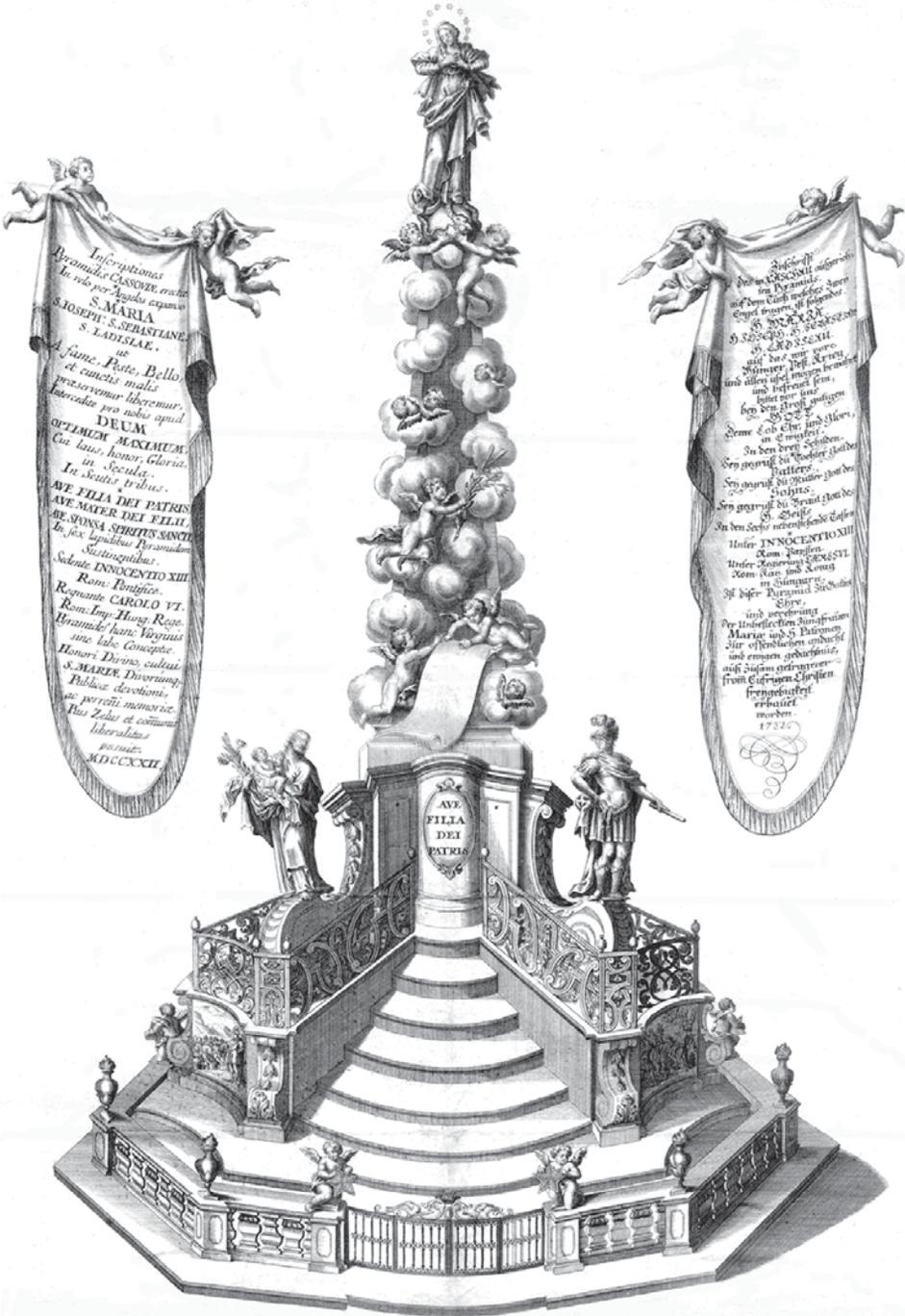


Fig. 3. Plan of the sculpture of Immaculaty built in Košice in 1722. (Gottfried Pfautz)

Slovak Mining Museum in Banská Štiavnica. (This collection has already been presented in a framework of the Heritage Symposium by the author; for example in Leoben in 1995.) Not only documents concerning the life and work activity of pictured chamber earls are placed in SCMA, but also the supporting documents to pictures themselves can be found there as well. For example, a document from 1775 says that after the death of the MChEO director J.A. Adámy, "charming portraits of Lower-Hungarian Main Chamber Earls" were bought from his heirs. They were to be installed at a meeting room of the MChEO and in June the Main Treasury paid 66 florins and 46 red cents to Adámy's heirs.

Grand spaces of the MChEO were decorated with portraits of rulers as well. For example, before the arrival of Francis of Lorraine to Banská Štiavnica in 1751, pictures of Maria Theresia and her husband Francis of Lorraine were displayed at the meeting room of the MChEO. They were painted by J.J. Dollenstein from Vienna. He was paid 213 florins and 20 red cents for them by the Main Treasury in Banská Štiavnica. A portrait of the new Emperor Francis II was delivered from Vienna to Banská Štiavnica on December the 30th. It was determined for the meeting room as well. Its price including the frame and package was 75 florins and 5 red cents. A small piece of paper enclosed with the document (maybe from the author of the picture) says that the portrait had to be placed in a warm room for 14 days until it was completely dry and then egg white was to be applied on it. Rulers are reminded as well by descriptions of arches of triumph built on the occasion of their visits; by shooting targets installed on these occasions for the fun of them, members of their suite or chosen local representatives; by memorial tablets on town buildings and mining workshops, etc.; and by coins and memorial medals with their portraits.

### **Coins, medals and other similar objects**

The archival documentation of common coins, as well as to memorial coins and medals, is very rich (numerous) and diverse in SCMA. It is connected with the hundred-year old activity of the Kremnica mint [the mint in Kremnica was first documented in 1238, and is still operating.] Documents concern the mint devices, preparation of raw materials, engravers of minting devices and other employees, types and resemblance of coins themselves, and their amount, distribution, etc.

On the occasion of the visit of the Emperor Stephan of Lorraine in Banská Štiavnica and Kremnica in 1751, large, medium and small size gold and silver memorial coins were minted which, according to the exact specification determined by CCh, were distributed among the regional and local dignitaries as well as to the mining officers. Different kinds of small coins were determined for workers. Certain problems arose with the minting of the VII-red coin with the portrait of the Emperor. According to the reference of the Main Chamber Earl, it is said that there was no resemblance between the portrait and the emperor, especially the nose was shapeless and very big. Thus the Chamber Earl ordered the smelting of all of the minted coins and in case the engraver of minting devices Sebastián Donner from Kremnica was not be able to repair it, the original was ordered to be destroyed and made again. Six pieces of the VII-red coins were delivered to Banská Štiavnica and were to be placed in the office safe. (Who knows where these unique pieces ended up? Maybe at a museum?)

In 1854, memorial coins were minted on the occasion of the wedding of the Emperor Francis Josef I and Bavarian Princess Elizabeth. Unlike in the past, when jettons were distributed on such occasions, it was agreed that memorial coins would be made (thalers and florins). In February, the Main Coin Office in Vienna asked Kremnica mint for 3000 "hrivna" of pure silver for their production [1 hrivna (marka) = 0.28068 kg; hrivna (marka) – old unit of weight and coin.] Coins were distributed to mining officers according to the size of their income. Memorial coins were minted to commemorate other events as well. For example, in 1766, on the occasion of successful finishing of the hereditary gallery of Emperor Francis.

During the reconstruction of the church in Žarnovica in 1772 [Žarnovica is a village at 19 km from Banská Štiavnica. The Management of the Revište Chamber Estate seated there in the 18th century. An important silver smelting works and a chamber brewery were situated there.] a treasure was found. One hundred and seventy five pieces of old ducats, it is said from the times of the reign of King Zigmund of Hungary [Zigmund of Luxemburg was King of Hungary from 1387 to 1437], were buried not so deep in the ground under the main altar; MChEO offered to buy these ducats from the church at a current price of a foreign currency, that is 4 florins and 18 red coins per piece, which were to be sent for study purposes to Vienna. On the document of the MChEO sent to the CCh should have been the prints of ducats there. On a draft of this document that remained in the archives of the MChEO, only the places of the prints are marked (where the print of the front side and the back side of the ducat was on original).

On the other hand, a document from 1798 provides information about the usage of money without their own value. It mentions an introduction of wooden money tokens used for paying the workers in some mining factories in Spiš [Spiš, a historical area in the north-east part of Slovakia.] These imitations of real (valid) money could only be used in certain shops usually owned by the employer. It is valuable that with this document the whole series of these tokens was preserved.

Work tokens, in its true meaning of the word, were introduced by the Chamber estate in Liptovský Hrádok in 1812. For registering the completed and prescribed work by villeins with a team of horses, it ordered 100 pieces of brass tokens for 4 red coins per piece; to register one-day work with half a team of horses, it ordered 200 pieces of yellow tokens for 3 red coins per piece; and in exchange for one-day work of a villein without a team of horses (manual work), it ordered 700 tokens from tin-plated (white) iron plate for one and half red coins per piece.

Even the fakes of real (valid) money are mentioned in the documents. For example, the skilful smith Juraj Kowatschik from the woodcutter's settlement of Dobroč (now a part of the settlement of Čierny Balog) made in 1817 85 pieces of 20-red coins, also known as money with a head, a portrait of the Emperor. He also successfully exchanged these coins for gold coins of Vienna, but was caught and put in jail.

In May 1745, 1000 pieces of copper plates were made for the Dutch Mint Office (SCMA, MChEO, doc. no. 153/II/1745) in Kremnica mint and in July of the same year, the Mint Office in Kremnica received small and large Dutch melting-pots for the preparation of the mint alloy ("Hollendischen Nürnberger Tägln"). Many documents illustrate the buying of Dutch, English and other foreign coins to gain raw materials for minting Kremnica ducats. In 1802, the buying of Dutch ducats took place to gain gold and silver for minting a significant amount of money needed for the state lottery.

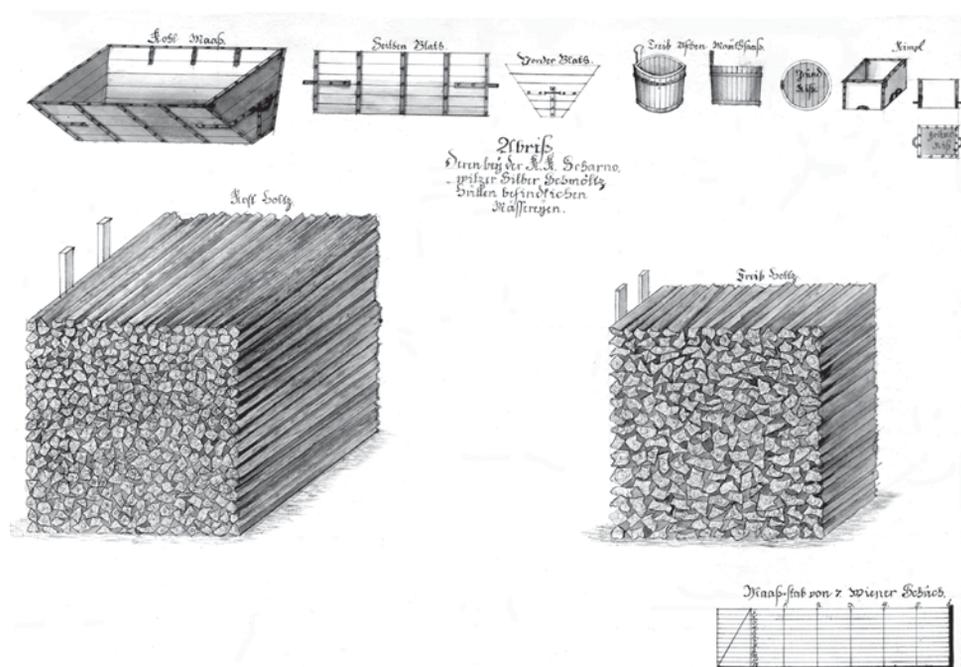


Fig. 4. Measures used at smelting works in Žarnovica (Slovakia). 1775.

### Mining measures, units of weight, and other measuring devices

Special measures and units of weight were used in the mining and metallurgical branches, different ones in individual mining areas. For example, in metallurgy it helped to keep the production processes a secret, but on the other hand it complicated the comparison of the production costs, orientation in the field, mainly the determining of the distances based on mining maps and plans.

To become familiar with the period measures, maps and plans are very helpful. Old units of length can be studied on the basis of illustrated measures and measures marked by words. Units of capacity can be also found in a written and picture form. The document of the MChEO from 1775, about the conversion of measures used in the MChEO district into the Vienna measures was a contribution to this field of study together with the tables and drawings of Professor Tierenberger. Period measuring devices and other surveyor aids are pictured on several separat plans and drawings added to the mining maps. From the documents we can also recognise producers, measure controllers, kinds and amounts of aids used in certain working places, etc. (Fig. 4).

### Working and ceremonial clothing, and working tools of miners and metal workers

When becoming acquainted with objects from a certain period and field, filed and pictorial materials serve the best. In the files, clothing of miners and mining officers is mentioned on the occasion of preparing for the visits of important guests, occasional

processions, official determination of the uniform, etc. For example, the uniforms of the lower ranked mining officers and workers from the Central Slovakian region are described in detail in a document from 1858. Lithographic pictures of miners dressed in these uniforms are enclosed with the document.

Maps and plans from different mining areas are supplemented by pictures of miners, mining keepers, surveyors, etc. Especially when presented in colour, the drawings are of significant value. Persons shown on the maps usually carry in their hands or close to them working tools. Apart from that, special plans of working tools of miners, metal workers and foresters can also be found.

### **Other kinds of museum collections**

Building and technical memorials can be found in SCMA which are administered by museums, other organizations or private persons. Also, documents on municipal and factory clocks, clock masters, musical instruments, pieces of music and their authors, weapons and war fortresses. Archival material preserves different kinds of seals and old postage stamps. Many precious books from different fields of study are registered in inventories of the office and school libraries. Different laboratory devices and tools are drawn in school theses of the students of the Academy. Inventories of medical, butcher's and dairy equipment are registered.