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Article

Industrial cultural heritage: Transport infrastructure in mines in Slovakia/Hungary at the end of the 19th and the beginning of the 20th century and its presentation in period media

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Abstract: The study deals with the issue of mining transport technology and its use in mines in Slovakia and Hungary at the end of the 19th and the beginning of the 20th century. It focuses on the analysis and comparison of the transport infrastructure used in these mines, either as original Slovak inventions or as products of foreign provenance. The research is based on the analysis of monographic and periodical press production from this period, where these technological achievements were presented and discussed. In addition, the study examines the media presentation of these products in the contemporary traditional periodical press. The findings of the study offer an important historical perspective on the development of mining transport technology and related industries in the region and contribute to the understanding of the media presentation and promotion of mining technology. This research is in line with the objectives of the "CultureMind" project, which focuses on the promotion and promotion of cultural heritage through media and education.

Keywords: mining transport; mining technology; Slovak inventions in mining transport; presentation; media presentation

1. Introduction

The topic of professional mining literature and, within it, mining transport and transport technology in Slovak, or in Slovakia published professional literature is closely connected especially with the Central Slovak mining area and the unique university in the Central European area-the Mining and Forestry Academy in Banská Štiavnica. The concentration of a large number of experts at this technical college had a direct impact on the rapid technical and scientific development in the field of mining and forestry. Despite the decline of mining in the 19th century, we can observe several positive moments of cultural, industrial, and economic development in Banská Štiavnica. For example, the fame of mining towns and the achievements of mining science were presented at world exhibitions in Vienna, Paris, Belgrade, and Budapest. In 1873, a narrow-gauge, originally mining railway was put into operation, connecting the isolated town of Banská Štiavnica with the Kingdom of Hungary. At the above-mentioned educational institution, not only the latest technical improvements invented abroad, but also the achievements of the research of domestic scientists/educators of the Mining and Forestry Academy were implemented into practical activities.

From 1774, when the University of Trnava moved to Budín, until 1914, when the Elizabethan University in Bratislava was established, the Banská Štiavnica Academy was not only the only technical university in Slovakia, but the only university in Slovakia at all. In our study, we will focus on its last two periods-the last years of its

existence (1867–1919). With the Austro-Hungarian settlement, the Hungarian mining and metallurgical industry and with it higher education came under the control of the Hungarian state. The Ministry of Finance, overseeing the academy by providing material conditions but also by teaching reform, enabled the modernization of the institution and the academy flourished. There were important experts and professional publishing activities at the school, respectively its issuance has multiplied compared to other periods. Professors and students played a leading role in the establishment of professional associations and societies, as well as in the establishment and management of professional journals, writing and compiling scientific and expert monographs, changes in the domestic industry and in technical/technological modernization. Over the years, the Academy became the center of Hungarian technical science, the Academy's professors became involved in the work and research projects of the Hungarian Academy of Sciences and made the Academy famous for their work presented in international scientific world. The progressive development of technical sciences at the turn of the 19th-20th centuries was the reason for a reform aimed at adapting teaching to the needs of domestic industry. The study took place in four fields, one of them was the field of mining engineering (Augustínová, 2014; Herčko, 2008; Herčko, 1992; Pőss, 1987; Vozár, 1968; Zsámboki, 2005). This meant that it was necessary to provide professional literature and textbooks to the Academy for its own needs, for which it was absolutely necessary to have a publishing and printing background and a media space for the presentation of contemporary research by mining experts. The printing of scientific and technical literature in our selected period was provided in Banská Štiavnica by Štefan Mihálik, the Joerges family's printing office, which can be considered the "court" printers of the academy, and the book printing of the Selmeczbányai Hiradó (Banskoštiavnické zvesti) magazine (Augustínová, 2014; Repčák, 1948; Valach, 2001; Valach, 1987).

2. Materials and methods

The main research topic is the transport infrastructure in the mines in Slovakia/Hungary at the end of the 19th and the beginning of the 20th century and its presentation in contemporary media. Within it, we have set the following research problems:

- Publications in the academic environment focused on the given issue,
- presentation of the results of research in the field in the Bányászati and Kohászati Lapok (Mining and Metallurgical Letters),
- presentation of research to the wider public in contemporary media.

The objectives of the research are based on the defined research problems, and after answering the following research questions we will be able to consider them fulfilled:

- What scholarly works in the academic environment focus on the transport infrastructure in mines in Slovakia/Hungary in the late 19th and early 20th centuries?
- Which academic educators have addressed the topic?
- How were the results of the research presented in the scholarly journal Bányászati a Kohászati Lapok (Mining and Metallurgical Letters)?

- In which contemporary periodicals were the mentioned results from the researches presented to the wider public?

In obtaining adequate answers to the research questions, we mainly applied historical research methods, which we can define as a set of tools and working procedures used to gain knowledge about the past. First of all, we used the most common method of historical research, namely the direct method, which consisted in obtaining historical facts by direct examination of historical sources in which this information is directly contained. Subsequently, it was necessary to use the indirect method, using secondary sources, based on which we replaced the missing facts with hypothetical or secondary information. We also applied the method of document analysis and within the analysis of the content of media texts we focused on the research sample of preserved copies of period Slovak presses at the turn of the 19th and 20th centuries. We focus on the most important Slovak economic magazine of the 19th century Obzor.

In the presented study, we pay particular attention to the professional literature, which was focused on mining transport, and its response in the media space, in three research lines. First of all, we focus on the works on the subject matter, which were created at the academy and were directly connected to the teachers of the institution, the second line will be focused on the results and presentation of the latest research in professional journals, especially in Bányászati and Kohászati Lapok (Mining and Metallurgical Papers) and the third research area will be the reflection of these researches in the wider print media environment (excluding professional periodicals).

In the first phase of the research, we worked with digitized documents of several periodicals selected on the basis of the Bibliography of Slovak Newspapers and Magazines until 1918 (Potemra, 1958). We also conducted a survey into several other traditional media of the period under study, such as Hlas, Katolícke noviny, Obzor, Pešťbudínske vedomosti, Slovenský denník and Viedenské slovenské noviny. Based on the defined key topics (industry, mining, mining transport, industrial development), we identified the periodicals that showed the strongest connection with the searched for terms. We followed selected titles of the magazine over a longer period of time and subsequently selected key texts in which the topics in question were communicated with regard to the contemporary context of events and the development of society. The ambition of our research was not a comprehensive analysis of all titles of the periodical press in the period in question, we focused our attention on capturing selected phenomena in selected media in the context of the presented issues. Working with period documents has its specifics and for completeness and accuracy we state that the translation of the text into English was approached through the prism of the original in the period language.

3. Results and discussion

A printed book on mining themes with Slovak provenance does not appear until the end of the 18th century. Until then, students and professors mostly used German literature and their own handwritten notes prepared for teaching. After the introduction of Hungarian as the official language of instruction, which took place gradually in the

years 1868–1872, the need to write textbooks and manuals in this language increased, which is also reflected in the printing of professional works.

Gustáv Liskai (1843–1889), a mining and metallurgical engineer, was the first to enter the professional literature in the field of mining transport in the Slovak environment in 1878. In 1873 he became a teacher and director of the Mining School and also worked externally at the Mining and Forestry Academy (Augustínová, 2014; Herčko, 1973; Herčko, 1978). Publication Bányatan (Liskai, 1878) was published with the support of the Ministry of Finance based on Regulation no. 13,304 from 1877. As a main source for writing this work he used notes from Gustav Faller's lectures, works on mining sciences by Viliam Zsigmondy, Heinrich Lottner, Albert Serl, Johann Grimm, Charles Combes, Christopher Traugott Delia and, of course, his own experience and research. In a narrower sense, it divides the science of mining into eleven branches-the science of deposits, the science of mining works and mining machinery and equipment, the science of mining areas and factories, the science of mine safety, mining, ventilation and fresh air supply, mine drainage, mine surveying, mining exploration, mining of raw materials and, finally, mining transport. Liskai considers mining transport to be a separate science and mentions its basic principles, such as that mining transport must be arranged in such a way that its routes are the easiest and shortest, and it is necessary to use devices and machines designed for mining and to transport mined material and there is no need to save on them, because a suitable mode of transport will ultimately bring savings. Among the key themes of this extensive work, which for the most part also includes mining transport, rail transport in mines and outside mines, means of transporting extracted material, cable cars, but also the transport of persons in mines, whether it is a way of digging miners underground, but also the opposite way, from the underground out.

Although Gustav Liskai's publication Mining was published in 1878, it was nevertheless intended for lower mining officials, so it could not meet the expectations of a wider circle of experts. Ľudovít Litschauer (1815–1885), a prominent figure in the field of mining sciences, became the author of the improved manual. From 1840, when he began studying at the Mining and Forestry Academy, he worked in Banská Štiavnica with smaller breaks almost all his life. He completed geology courses with Wilhelm Haidinger in Vienna, study trips in Germany, Austria, the Netherlands and Belgium, and worked for a short time as a mining administrator in the Transylvanian mining districts. Throughout his time at the academy, he devoted himself to writing a modern textbook on mining science, but its final edition and the work associated with its publication remained on the shoulders of his son, who had it printed in Joerges' printing house in years 1890–1892. Litschauer's work Bányamüveléstan (Mining Sciences) (Litschauer, 1891, 1891a, 1894) began to be published in notebooks which, according to contemporary information in the professional press, especially in Bányászati és Kohászati Lapok, were received very lukewarmly by the professional public. This information is also evidenced by the fact that the Association for the Promotion of the Publishing of Mining and Metallurgical Literature, in 1890, when Litschauer's notebooks were already published, published a concurrence for such a book on mining, which would not only serve as a textbook but would also be a guide for the mining practitioner. However, there was no response to the concurrence, and

eventually, after the publication of Litschauer's three-volume publication Mining Sciences, this publication was adopted and used.

Litschauer's expert work in 20 parts and 1714 pages summarizes mining knowledge about mining ore, coal and useful raw materials. It includes the science of deposits, methods of exploration work and deep drilling, techniques of drilling and machine mining, mining methods, transport in mines, securing underground spaces, pumping and drainage of mining waters, ventilation and lighting of mining works, issues of safety in mines and knowledge about mining rescue. This expert book faithfully copies material lectured at the Department of Mining-at that time. Litschauer's work is not only descriptive, but the author also tried to bring practical activities from mining into the work. When we look at the work from today's point of view, we must realize that because his son compiled the work from the notes that remained after him, he did not always know which parts he should bring to the fore, so it often happens that instead of expert topics some other topics are pushed forward usually that are more relevant to the literature and history of mining, and therefore this work is more important today in terms of the history of mining than in the expert field itself.

Even in the first years of the 20th century, we meet Litschauer's work on mining transport, which was published in the extensive edition A magyar bányász-felör könyvtára (Handbook of the Mining Supervisor). However, we must remember that this is not the work of the above-mentioned author, but his son, who continued in his father's footsteps not only in the field of mining literature, but also specifically devoted to mining transport. In this, the 9th volume of the edition, two topics were published, the first dealing with mining transport and was called Szállítás (Transport) (Litschauer, 1901). Gejza Schmidt was originally supposed to write this work, as he was considered the greatest expert in mining transport at that time. However, his work duties did not allow him to devote himself to its compilation, respectively writing, and so the work was realized by Litschauer. He used German and French scholarly works as starting material. Following the basic concepts and general provisions, he dealt with transport within the mine and transport from the mine to external storage areas. In the 19th century, mining transport underwent several changes. In 1825, iron rails were built on wooden sleepers, the carts were pushed first by people, then pulled by a horse, from the end of the century steam locomotive, at the beginning of the 20th century there were locomotives with combustion, petrol or diesel engine. Horizontal transport has been electrified since 1897. Extra draft of this work deals with various ways and solutions of special transport in mines, namely passenger transport. At the turn of the century, the A magyar bányász-felör könyvtára (Handbook of the Mining Supervisor) became a kind of "catechism" of the practical miner, not only in terms of content but also in terms of form, as it provides in the section of questions and answers the latest information on machines, devices and the whole system of vertical and horizontal transport in the mining environment through the transport of the extracted material itself, while not forgetting passenger mining transport.

The second research topic of the study was to find out how and with what mining transport was presented on the pages of the only professional mining magazine Bányászati és Kohászati Lapok (Mining and Metallurgical Papers). Anton Péch, the editor-in-chief of this journal (who can also be considered an excellent expert in the

field of mining science), writes in the introduction to the first issue of this journal, published on 15 January 1868, about the vicissitudes of its creation, because its preparation was the culmination of several years of effort and represents in short what its content and goal should be as follows: "promotion and clarification of the ideas of mining and auxiliary mining sciences-description of interesting facts/phenomena, experiences and experiments, geological descriptions of individual mining areas, characteristics of mining and metallurgical business, machines used in mines , descriptions of mining infrastructure; further information on the most remarkable foreign mines and smelters, inventions, experiences and interesting facts, in addition to the presentation of expert, domestic and foreign literature" (Bányászati és Kohászati Lapok, 1868, p. 1).

After a detailed examination of all volumes from the origin of the magazine until 1918 and subsequently leafing through the last published volume of the magazine from 2021, we can state that Péch's basic idea of the magazine's direction has been fully preserved to this day and has not been fundamentally varied. The magazine has been published continuously for more than 150 years.

In the research of mining transport/infrastructure/technology, we identified 31 important studies in the magazine in the years 1868–1918, which present contemporary modern mining technology of domestic and foreign origin with the authorship of such important experts in this mining industry as e.g., Anton Kerpely, Štefan Farbaky, Anton Péch, Richard Nickmann, W. Pickersgill and others. It is important to highlight some studies/articles, as several of them have significantly influenced the development of mining transport in our territory or clarified its development since its very beginnings. If we categorize the presentation outputs on mining transport in this periodical, we identify the following basic topics: presentation of existing mining transport facilities, mining means of transport in horizontal and vertical transport, safety and mining transport and economic aspects of mining transport.

The first topic is devoted to several studies which come both from our environment and abroad. Leopold Eichel (Eichel, 1883, p. 157) focused on the attachment equipment of mining conveyors, the domain of Štefan Farbaky was to determine the carrying capacity of transport ropes (Farbaky, 1871, p. 110; Farbaky, 1871a, p. 124), Fridrich Gerber (Gerber, 1896, pp. 131–132, 146–147) and Richard Nickmann (Nickmann, 1913, pp. 724–740; Nickmann, 1914, pp. 73–101) presented in their studies the most suitable mining transport regimes and introduced new mining transport equipment, Anton Péch (Péch, 1868, pp. 97–98, 105–106, 111–114, 124–125) devoted himself to the transport baskets. The topic of mining transport safety also resonated in the studies, especially in the articles by A. Kás (Kás, 1892, pp. 267–272) and Juraj Weisz (Weisz, 1898, pp. 155–157). Among the interesting articles dealing with the economics of mining transport, we cannot forget the calculation of the costs of underground horse transport by Matej Hoffmann (Hoffmann, 1913, pp. 603–605) and the comparison of the costs of two different types of transport in the mines by Jozef Szabó (Szabó, 1875, p. 171).

In this part of the research, we presented only a few authors of important and major mining science/transport works, which had a direct impact on the modernization and economics of mining, but they are not the only topics, we can also mention articles

and studies dealing with the history of mining transport, risks associated with gas leaks in mines during transport, equipment presentations-e.g. Karlik's tachygraph and its role in mining transport, or the introduction of new transport mining technology in the Upper Bavarian mining plants Deutsch-luxembzrgische Bergwerke und Hütten A. G.

The basic role of the media, regardless of the period in which they operate, was and is to bring readers information about what is happening in society. The turn of the 19th and 20th centuries was a period of emerging and continuing changes in society, which followed the gradual expansion of the industry and provoked various reactions among the people. The task of the journalists was to present a cross-section of different perspectives on relevant topics, within their possibilities at the time. We also based the third part of the research topic on these principles. We considered in hypothesis whether traditional print (understand not expert) magazines and newspapers published in Slovakia, in some way reflected topics related to mining transport and if not, what were the topics that reflected contemporary achievements of modern science and industry in the field of transport.

We learn about historical events from various period sources, the main characteristics of which are defined by the possibilities of the time. At the turn of the 19th and 20th centuries, newspapers and magazines were a significant type of media, which became mass with the advent of new technologies accelerating their production. There were a limited number of periodicals published in the Slovak language (e.g. in 1918 a total of 23 periodicals were published in Slovak, in 1938 there were 221 titles of Slovak newspapers and magazines (Serafínová, 2005) and in combination with other factors-personnel, financial, distribution limits-media coverage decisive events in the field of mining transport (in the broadest context of industry in general) were not massive. In the media of the time (not in all to the same extent), however, the key topics we observed-the beginning of industry, the development of mining, the construction of mining railways, the invention of electricity-were present in various ranges and forms.

In our research, we will present a survey of several magazines that were published in the period under review, namely the monthly magazine for literature, politics and social issues Hlas, Katolícke noviny, Pešťbudínske vedomosti, Slovenský denník and Slovenské noviny published in Vienna.

Various events covering national events (politics, culture) and other information mapping/commenting on events in a specific area, as well as information of an entertaining or educational nature, were of interest to the contemporary media at the time. As part of our examination of selected periodicals, we identified that industry development-including mining and the gradual construction of railways-was a topic that resonated in the society of that time and was reflected in the pages of the then newspapers and magazines, but not in all and to the same extent.

Primary heuristics proved the absence of these topics in the newspaper/magazine Hlas and Slovenský denník, which we attribute to a different scope of these periodicals and to the missing sections that would represent the industrial background of Slovakia, although we assumed that because they were periodicals that had high costs and were read by broad general public, they would at least marginally reflect some moments/results of the mining work.

In the periodical Katolícke noviny, two topics resonated from our thematic area. The first is the topic of information about mining accidents, which were relatively common in this period, and the second, which was often directly related to the previous topic, emigration and mining accidents in which our Slovak citizens perished (so in 1902 the Pittsburg mine disaster is mentioned (Katolícke noviny, 1902), the Šalgotarjan mine disaster (Katolícke noviny, 1905, p. 16), statistics on the deaths of miners in American mines (Katolícke noviny, 1905a, p. 40), the victims of mining accidents caused by gas explosions and subsequent mine fires, or the flooding of mines with water (Katolícke noviny, 1904, p. 76)). Within Katolícke noviny, we also have emigration statistics at our disposal, which demonstrate the high number of emigrants from Slovakia who were employed in mines. The Hungarian government also published in the newspapers announcements for those planning to move out and obtain a mining profession, warning and persuading emigrants not to succumb to the recruitment of Ecuadorian mine owners, as Austria-Hungary did not have a Ecuadorian consulate and adequate assistance for its inhabitants in case of unforeseen circumstances could not be provided.

In Katolícke noviny, however, we managed to obtain information that our Slovak mining workers also worked in the mines as train drivers in underground mining transport (Katolícke noviny, 1905b, p. 156), but in 1904 the article Occupational sacrifice also describes the classic way of transporting of extracted material and describes it in the following words: "... he listened to how the "trellbung" (rocks being pulled out of the mine) began, because the mine house was built above the shaft. Quickly at the bottom of the shaft they pushed the railway car into the "šálna" (iron basket), they pulled three times the wire of "signal" which struck the bell three times outside..." (Katolícke noviny, 1904a, p. 76).

Most discussed topics in the newspaper Pešťbudínske vedomosti were social issues of miners, protests of miners and the historical development of mining, such as: article on the oldest data on the use of gunpowder in mining.

Slovenské noviny published in Vienna also opened more topics related to mining. The above-mentioned topics of mining accidents resonated here as well, they also informed about professional meetings of mining experts, but new topics of training of mining experts, descriptions of mines abroad and the safety of miners were also discussed.

From our point of view, we must mention the article on the need to modernize mining transport/mining railways, the construction of which requires technically educated people. (Slovenské noviny, 1861, p. 487). About the safety of miners in the underground, respectively About the latest "inventions" in this area, specifically the so-called burner lamp of security, where the periodical describes its development by English engineer Davy. It describes its construction and explains why a mining lamp constructed in this way will help to identify the accumulation of gases in the mine and prevent its explosion (Slovenské noviny, 1861a, p. 259). Almost a quarter of a century later, in 1886, we meet again on the pages of the period press with information about the above-mentioned tool for miners, but now in the magazine Obzor, which we will write about below. The periodical informs and promotes as a novelty the mining burner lamp of safety, which was invented and manufactured by the company

Compagnie Houllére de Bességes in Nimes "which, by its use, is said to eliminate the danger of trapping and firing flammable gases" (Obzor, 1886, p. 47).

As follows from the previous text, we also focused on the most important Slovak economic newspapers of the 19th century, the weekly Obzor (published with breaks in the years 1863–1918), in which the topics we monitored developed from different angles-economic, scientific, political, social impact. The gradual development of industry in the selected period press resonated, for example in Obzor there were sections "Recent Inventions", Craft and Technical Journal, Industrial Journal ..., in which information was published on the most important achievements of the time. In 1884 we find an article that also comments on the "enemies of the Slovak people" describing the Slovak people as "non enlightened mass" and follows: "They are not right. The Slovak people have been involved with industry since forever; they are capable of same culture as a French, English or German people; only the means of education should not be taken away from them. However, it fills us with great sorrow when we see the governments of the named nations are taking care of their people by establishing technical, industrial-merchant-engineering schools, and as our government does almost nothing in this regard, the government neglecting its duty, as evidenced by that the rima-muráň ironworks got into the hands of a foreign element ..." (Obzor, 1884, p. 219).

The Obzor website also writes about the origins of mining and metallurgy: "Metal workers have been called miners (baníci) since forever, based on the holes (mines) from which they exported the ore and sold it to metallurgists. The names preserved in Velká Revúca, such as "na Bane," "Banská," "Bánovo," are innumerable, and seem to not be very different from the "bánov"-mountains that have been cut down. So, the miners dug ore for iron and copper, some silver and gold, and sold it to the metallurgists. The buyers of the raw material, that is, iron, gold, silver and copper ore, have always been called blacksmiths in our country. Such purchased raw material was reworked by blacksmiths in the valleys by the streams in the so-called forges, later in the smitheries. As today, as before, blacksmiths made all sorts of tools, such as swords, arrows, bullets, nails, hoops, hammers, knives, buckles, horseshoes, snaffles, chains, but of course in the beginning in the primitive form. As time, culture, industry, and needs progressed, the agility, beauty, sharpness, and design of the tools have improved. In the beginning if we combine the miner, metallurgist and blacksmith into one person, we have the picture of a primitive iron industry" (Obzor, 1884, p. 220). In the Crafts and Technology Gazette in 1881, information was given about the electric railway as an important invention that could cause a "complete overthrow of the railway service", as until then fire or steam was used to power the wagons, but "now thunder lightning enters the service of movement of railway trains or the electric force, which already in the telegraph, most recently but also in the electric light works wonders and miracles." (Obzor, 1881, p. 116).

The reader has learned in many articles about how exceptional the railways are, as well as how they "laughed at mechanical engineer Stephenson in England" in 1826 after setting up the first coal-fired railway at a mine, (Obzor, 1881, p. 117) but also that not everyone took a positive view of the spreading railways: "the railways took a lot of earnings on imports of livestock, salt, tobacco, wine, merchant goods ..." (Obzor, 1884, p. 173). Concerns have been raised that the realization of the railways will be

connected with loss of trade and craft in the areas outside of large cities, that "the railways will suppress the sources of modest pensions" and that a whole range of "horrible similar ideas are hurting the patriotic heart, as experience teaches that underdeveloped districts are taken advantage of by large cities with their workshops with which working human hands are simply not able to compete; Experience has shown that the railway network only lifts those regions where steam is used, which are rich in all kinds of factories and in which large exports are thus secured ..." (Obzor, 1883, p. 2). Other views have also been presented which have emphasized the importance of railway transport-its efficiency, speed, usefulness, but also a kind of educational impact: "That exactness affects people. (...) Where there are railways, the people think far more precisely." (Hlas, 1898, p. 173).

In 1886, readers in the Recent Inventions section learned that "J. Stephen in Edinburgh devised a way to reach an individual over a common telephone wire" (Obzor, 1886, p. 46). The magazine also provided information on the importance and need for electricity with regard to future generations: "The Štiavnické tajchy (mining water reservoirs) are drying up, wind and water mills are disappearing, and steam engines are rising in their place, because their power, extracted by coal, is more comfortable and cheaper. However, fears that the coal mines will be depleted are entirely justified, and even if we do not live to see it, there will come a time when the coal will be relatively expensive, and the force exerted by it will be forced to give way to the other. Today we can say with certainty that the power is electricity ..." (Obzor, 1883, p. 83). And elsewhere it tries to convince as follows: "When Londoners cook without heating, i.e. without wood, without coal, only with the help of electric power-when many cities, public and private apartments are lit by the same power: who will be so stubborn not to believe in the proven research of M. Deprez?" (Obzor, 1883, p. 23).

Due to the lower periodicity, it is not possible to speak of news that would bring up-to-date information at such a speed as is natural at present, but for the population of the time, the media in their form were the only way to find news out (albeit over time about the details of more highlights). Most of the published materials were created in a descriptive, sometimes commentary manner. A significant refreshment was the material, which went beyond the framework of the then media texts. In Obzor there was published in 1883 an extensive report about a visit to the salt mine in Velička. As stated in the article, on 03 July 1883 "... huge salt mines near the Galician town of Vielička will be under beautiful lighting, for an entrance fee of 2 zlotys open to the audience" (Obzor, 1881a, p. 23) and for this reason a 6-member group from Slovakia, from Dol. Kubín went on inspection of this "magical work of mining industry". From the report we learn about the feelings of a man who takes the elevator for the first time: "all of us they have put into an iron, wire-covered cage, like we were wild beasts" (Obzor, 1881a, p. 23), but also about the feelings of the majestic space created by human hands: "until we finally arrived into one hole-I can't name it a hall-of such enormous proportions that its borders could barely catch up to my eyes" (Obzor, 1881a, p. 23).

The problems associated with the construction of mines and the already mentioned mining accidents were a frequently mentioned topic. The year 1879, for example, was extremely difficult for mining. Already during the first three months of

the year, four major mining accidents in Banská Štiavnica, Teplice, Vielička and Bleiberg occurred. The magazine gives a description of the town of Bleiberg (literally: Lead Hill)-these were 2 towns (large villages) in Carinthia, while "one is inhabited by the Germans, the other by the Slovaks; but they are all miners or workers at the mills and smelters heating the lead. They are the richest lead mines in Europe; namely in Bleiberg, Germany, where the accident took place, there are 50 still-worked and 400 ancient abandoned lead mines. The number of miners alone exceeds 700." (Obzor, 1879, p. 60).

It is possible to point out the important place played by contemporary newspapers and magazines in the presentation and discussion of mining transport technology and its use in Slovakia and Hungary at the end of the 19th and the beginning of the 20th century. These media, in particular the weekly Obzor, the Katolícke noviny and the Viennese Slovenské noviny, provided a variety of information on the topics covered, including accounts of events and entertainment of an entertaining nature. Key topics were presented in these periodicals with varying degrees of prominence, with some periodicals devoting almost no coverage to them. For example, in the Katolíčky noviny these topics appeared more in the form of travel-related stories, while in the Slovenský denník they were also considered in the context of the political situation at the time. In 1918, information appeared in the Slovenský denník, highlighting the acute need to maintain the performance of mines and railways. "In order to avoid supply and economic panic, a violation of regular economic life in general, the Czechoslovak Socialist Council demands that workers not leave work, especially that mines and railways remain in full performance only so that the people of the Czechoslovak state can be protected from scarcity and hardship." (Slovenský denník, 1918, p. 2).

4. Conclusions

In the conclusion of the article, we point out the importance of mining literature and period media in the context of promoting cultural heritage and its media presentation, which is the main goal of the CultureMind project. The origins of specialist mining literature in Slovakia did not come from Slovak authors, but rather from foreign authors, mainly from the German language environment. A significant step in the development of this sector was the establishment of a mining school in the 18th century and later a mining academy, which enabled the development of domestic authors and an increase in the production of specialist literature in the field of mining transport.

We record the increased production of professional literature and thus also expert literature in the field of mining transport only after the introduction of the Hungarian language as a lecturing language at the Mining and Forestry Academy, when the need for textbooks in Hungarian language was established, before that German and Latin textbooks which were published abroad were used. Leading representatives of the mining expert literature, mostly professors of the Banská Štiavnica Academy, focused mainly on compiling review works that covered the basic scientific disciplines of mining in its entirety. We encounter works of a compilation nature, but also with original works that reflected the state of mining science and its latest research and

advances in the Central Slovak mining area, but also in Slovakia in general. Ľudovít Litschauer, mentioned by us, is one of the most productive authors who have devoted himself to the comprehensive processing of mining science. The literature on mining transport in the monographic work was on the fringes of the attention of experts in Austria-Hungary, compared to work on mining surveying, mining factory design, mining history, mining law and mining administration. We can highly appreciate the specialized magazine Mining and Metallurgical Letters, which provided strict scientific information on mining underground and surface transport and presented the latest discoveries and achievements in this area. In the period under review, the Slovak traditional period media adequately (also in the context of their focus and possibilities of the time) reflected historical events associated with the development of industry, mining and metallurgy and related transport opportunities, which in the period focused mainly on railway transport. However, it also had a direct impact on the development of horizontal and vertical underground and surface mining transport. Due to the fact that the introduction of various technological innovations, the achievements of the time, we encounter different reactions in society, even in the media, it is possible to notice contributions that have both positive and negative views that stemmed from fears of unknown.

It should be mentioned that the teaching at the academy and the practical activities of the miners were also supported by the literature collected and preserved by the library of the Mining and Forestry Academy. On the basis of its still preserved fund (at the universities in Miskolc the fund of the mining part has been preserved, at the University of Sopron its forest part has been preserved) we can reconstruct which works influenced the development and teaching of mining science. Among the rarest are the Latin editions of Agricola's De re metallica from 1556 and its German mutation from 1557. The beginnings of mining literature are represented by the works of the so-called Mining preachers and chroniclers, such as Johann Mathesius, Peter Albinus, G. Meyer and Ch. Melzer. From the modest production of the 17th century, these are the works of the classics of mining literature, Georg Engelhardt Löhneyss and Balthasar Rössler. From the period before the organized teaching of mining science, the library preserves several works that have made progress in mining, although their authors are not mining experts, but a doctor and Franz Ernst Brückmann, who is the author of three-volume mining geography and an encyclopaedic work dealing with mining machinery Henninga Calvöra. From the production of the 18th century, we can mention the works of David Kellner, Johann Gottlob Lehmann, Adolf Beyer, the mining lexicon of Karel Friedrich Zeisig, but there are also works that were created at the Banská Štiavnica Academy. Special mention should be made of the first modern textbook on mining by Pierre Matthiae Charles Combes, a professor at the École des Mines in Paris, the magnificent 21-volume mining and metallurgical encyclopaedia by Franz Ludwig Cancrin, published between 1773 and 1791. with a specific branch of mining, so the library also contains a professional publication on mining transport by Carl Friedrich Böhmer from 1791. The library, of course, also owns and preserves the work of Slovak/Hungarian experts, who already published their work in the 19th and 20th centuries in Slovakia. Current expert information was also provided by the yearbooks of mining academies, such as yearbook of the Freiber Academy (since 1830), or a joint project of mining academies in Banská Štiavnica, Loeben and Příbram

Berg- und Huttenmännischen Jahrbuch (since 1851) and articles and studies published in them were the basis for several works of Slovak/Hungarian experts.

The study presents the results of historical research that is focused on transport infrastructure in mines in Slovakia and in Hungary in the late 19th and early 20th centuries. An important dimension of the study is the presentation of contemporary technologies in the field of industrial cultural heritage in the media at that time. This approach to the topic explores in more detail the historical information about technologies with regards to their perception and acceptance by the media at the time. It also enables the transfer of this knowledge to contemporary practice in the field of the presentation of (industrial) cultural heritage.

In the context of the "CultureMind" project, which aims to strengthen the synergy between educational, cultural and media activities in a digital society, this research is an important contribution to a better understanding and promotion of cultural heritage, especially in the field of mining transport, through the analysis of contemporary media and specialist literature.

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