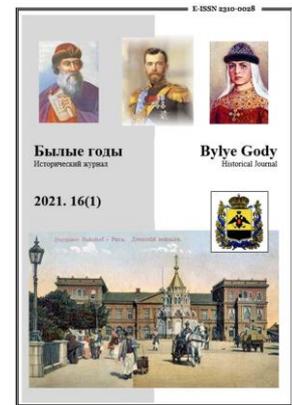


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Mining Industry and Education in the Kingdom of Poland in the second half of the 19th – early 20th centuries

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Abstract

The second half of the 19th century in the Russian Empire was the time of intensive growth of capitalism accompanied by the industrial growth. At the same time, the diversification of industry persisted for a long time: large machine industry coexisted with manufacturing and small-scale (handicraft) production. During the reign of Emperor Alexander III, there was a strengthening of the position of heavy industry, an increasingly widespread use of hired labor and an increase in production and capital. Capitalism established itself as the dominant mode of production. Russia was characterized by strong government interference in the industrial sphere via government lending, government orders, financial and customs policy. This laid the foundation for the formation of the system of state capitalism. The Russian government paid a great deal of attention to the extractive industries. After the accession of the Kingdom (or in Russian terms “Tsardom” – auth.) of Poland to Russia, the rich natural resources of the territory entered the empire. For the effective use of natural resources, it was necessary to study foreign expertise and develop an appropriate training system.

This article is devoted to the study of mining industry and education in the Kingdom of Poland in the second half of the 19th – early 20th centuries. The features of using an industrially important coal formation are considered. Close attention is paid to the history of the foundation and functioning of the Dombrova (nowadays: Dabrowa-Gornicza, Poland) Mining School. The administrative structure of this educational institution, the admission of students and their training are described. The article also connects the development of vocational education with general government policy in the Vistula region and the position of officials and employees in educational institutions. The main historical sources for this article were archival documents from the Russian State Historical Archives (RGIA). In addition, the memoirs of domestic mining engineers whose professional activities were associated with the Kingdom of Poland were studied.

Keywords: Russian Empire, Kingdom (Tsardom) of Poland, Dombrova, mining industry, mining schools, engineering education.

1. Introduction

From the time it became part of the Russian Empire, the Kingdom of Poland obtained a special status. The Polish were initially granted extensive rights in the local legislation and government. However, after the riots of 1830-1831, the Polish Kingdom was equated with other regions of Russia in terms of law and local administration (*Administrativno-territorial'noe ustroistvo Rossii, 2003: 175*). The fact that the Polish territory was now included in the common government system in Russia did, on the one hand, stabilize the situation in the area. On the other hand, it revealed weak points and controversies in the administrative system of the Russian Empire in that period. The Empire's administrative system was, in fact, not well adapted to cope with the fast-growing social and economic modernization (*Liubichanovski, Tropov, 2015: 311*).

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2. Materials and methods

The research is based on materials from the Russian State Historical Archive (RGIA). Documents from fund №37 (“Mining Department”) were analyzed. These archival funds contain materials related to the history of the mining industry and educational institutions of the Russian Empire in the second half of the 19th – early 20th centuries. The authors applied the comparative historical method, comparing various archival documents from fund № 37 (“Mining Department”). As a result, using the example of the leading specialized school in the region, it was possible to identify and describe details of the work of mining technical educational institutions and to trace the development of the issue of training professional personnel and the attitude of the Russian authorities to this problem.

3. Discussion

In historiography, the history of the “Polish question”, its political and economic foundations, and the administrative attempts to strengthen Russian influence in the region undertaken by the central and regional authorities before World War I are receiving increased attention. State support for the Russian population in the Vistula region was expressed with the help of legislative norms and a system of privileges which confirmed the special importance of Russians in the social and political life of the Polish lands. Relocation on business matters was often seen “as a necessary sacrifice in the name of state and national ideas. These ideas were Russification, unification, smoothing of organic, cultural and religious peculiarities of Polish lands, protection and dissemination of Russian ideas, nationality, language, religion and culture” (Vekh, 2013: 210). In Polish society, Russian officials, regardless of their departmental affiliation, were considered “leaders of Russification”. In our article, we will try to show that technical specialists in specialized education remained, first of all, teachers who were responsible for training professional personnel.

The history of the mining industry and education in the Kingdom of Poland in the second half of the of the 19th – early 20th centuries is an important issue within historical science, because it was the region where the educational system of foreign schools of mining was put into practice for the first time. It is thus important to consider that the establishment of mining schools was accompanied by complicated local political situation in the region.

In Russian historiography the history of mining education in the Kingdom of Poland has been touched on only fragmentarily, within works dealing with government education policy in general. One of the first generalizing works on this issue was the “Historical Review of the Activities of the Ministry of Public Education”, compiled by S.V. Rozhdestvensky to mark the centenary of the department. The review represents an official perspective on the development of mining education in the western regions; it is factually substantial, but contains practically no evaluative moments (Rozhdestvensky, 1902).

In research on the Soviet period, the main object of research tends to be the state of affairs in the Russian provinces: the Poles are mentioned only occasionally as one of the peoples oppressed by Tsarism. These narratives are covered in somewhat more detail in generalizing works on the history of Poland, but, as a rule, in a negative way, in the context of the russification and repressive actions of the Russian government in the Kingdom of Poland (Manusevich, 1952).

Modern Russian historiography is also not populated by works focusing exclusively on the history of mining and special technical education in the Vistula region. All this once again emphasizes the relevance of studying this topic as an important component of the history of the domestic mining industry. The research interest in this under-studied stage in the history of specialized education explains the involvement of the authors of this article as the main source of documents from the Mining Department, which at different periods (and under different names) was part of the Ministry of Internal Affairs, the Ministry of Finance, the Ministry of State Property, and finally, the Ministry of Agriculture and State Property.

At the same time, we note that in recent decades, a large number of encyclopedic and generalizing articles have been published on the history of all mining engineering education in the Russian Empire. In them you can find individual stories about the Kingdom of Poland. It is necessary to highlight two fundamental works by a team of authors, edited by Professor V.G. Afanas'ev. On the basis of archival materials, they reveal important aspects from the history of mining education in Russia, using the example of the Mining University (Afanas'ev et al., 2010; Afanas'ev et al., 2019). In those surveys one can find the biographies of brilliant Russian scholars who graduated from the Mining Institute and were sent to the Polish Kingdom to work. This is also the topic of a number of articles by V.G. Afanas'ev (Afanas'ev, 2016: 36-42; Afanas'ev, Voloshinova, 2017: 140-166).

Russian methods of education of mining engineers in the second half of the 19th – early 20th centuries are the topic of works by I.V. Voloshinova (Voloshinova, Mokeev, 2016: 5177-5181). Social and cultural aspects of teaching in the technical schools in the Russian Empire are examined in articles by D.A. Schukina (Schukina, Egorenkova, 2017: 198-206), S.A. Rassadina (Rassadina, 2016: 498-503), V.V. Sharok (Sharok, 2016: 604-607; Sharok, 2018: 281-296) and Y.M. Sishchuk (Sishchuk et al., 2018: 631-637). The importance of the physical and ethical education of the students of technical institutions is the focus of the works by E.A. Izotov (Izotov et al., 2018a: 43-45; Izotov et al., 2018b: 14-16) and I.A. Kuvanov (Kuvanov et al., 2019: 12-14).

4. Results

Mining industry in the Kingdom of Poland. The coal formation was of great industrial importance for the development of the mining industry of the Kingdom of Poland: the deposits of coal located there were used as fuel in metallurgical operations. The formation occupied the southwestern area of the Kingdom of Poland and stretched in a strip along the Prussian and Austrian border, in the Bendinsky and Olkushsky districts of Petrokovskaya governorate, forming a well-known “coal basin” which developed in many places near Dombrova. There were also reserves of iron ore. Mount Dombrova became the center of the coal industry of the entire region (Zhivopisnaya Rossiya, 1896: 405).

Professor Ivan Fedorovich Shreder (1858–1918) was a brilliant scholar and lecturer at the Mining Institute, who dealt with mining in the Polish Kingdom. A student of Professor K.I. Lisenko, he graduated from the Mining Institute with highest grades, after which, in 1885, he started working as an assistant at the analytical chemistry department. I.F. Schreder then defended his thesis and, by 1898, he had been elected to the Council of the Mining Institute as professor of inorganic chemistry and assaying (Morachevsky, 2009: 87).

Having obtained the position of professor, I.F. Shreder had the opportunity to be sent abroad for work. Thus in 1898 he was sent to Scotland and to Austria-Hungary by the Mining Institute. His colleague N.I. Stepanov, who was also from the chemistry department of the Mining Institute, wrote that in those years I.F. Schreder often travelled for work and thus participated in solving some of the most important questions of the mining plant industry (Stepanov, 1926: 96).

The purpose of the trip to Scotland and Austria-Hungary was to find solutions to the economic problems in places such as the Dombrovsky basin, an important area of the Polish Kingdom. It was the location of the biggest metallurgy plants in the Russian Empire, such as the giant plant Huta Bancowa, which produced rails. It was 1846 when the plant, the first of its kind in the country, started producing iron rails for the railway from Warsaw to Vienna. The plant was then abandoned, but in 1877 it was rented by French investors who modernized it to produce modern steel rails, which were purchased by the government (Tarasova, Trinkova, 2012: 145, 149). The Polish rails could compete with Swedish ones, considered the best in Europe.

The turn of the 1880s was characterized by a steady increase in government attention to the development of heavy metallurgy. “In 1882, the range of activities of the mining department was expanded by subordinating to it, in the order of supervision, all metallurgical plants that produced iron, steel and rails, and at the same time, a Geological Committee was established under the department to systematically study the geological structure of Russia, compile and publish a detailed geological map of the state and collecting and compiling collections of rocks and minerals” (Ministerskaya sistema..., 2007, 723).

The Dombrovsky basin initially seemed set to become the biggest raw material base. The local coal, however, according to the professional view, turned out to be raw and thus unfit for coking. For this reason, the rail producing plants had to purchase coke from other regions as, for example, in 1890-1895, when Huta Bancowa bought 10 million tons of coke from Silesia. Due to the high cost of railway transportation, the Polish plants reduced costs buying raw material from Austria-Hungary rather than from Donetsk region in the south of Russia (Pustula, 1958: 86-88). Russian officials were furious about the fact that the Polish plants were using coke from abroad. In that way, maintaining international trade was more efficient than setting up an internal system of import substitution (Khatkov, Boyarko, 2018: 683-692).

As a result, the Ministry of finances declined petitions presented at both sessions (in 1883 and 1885) from mining entrepreneurs from the Polish Kingdom to eliminate the tax for coke from abroad. The ministry introduced a bonus for the first million items (1 item = 16.38 kg) of cast iron produced using local raw materials. They expected coking coal to be found in the territory of the Polish Kingdom. An attempt to do so was made in 1880 in the Bedzin area when French and Italian owned bank gave funds for mining in Seczawa, but the works were stopped due to water flow. During the Third (1893) and the Fourth (1896) Conventions of the Polish professionals of mining industry several mines were considered for the extraction of coking coal. In particular, as hypothesised by the engineer Lempitsky, such coal could potentially be extracted from Flora, Logisza, Grozdec or Count Renard mines. His theory was based on the fact that the bed of the Dombrovsky basin is similar to that of the Ostrawsky basin, which had been developed for coke. The professionals continued to carry out research on where it might be possible to develop coking coal, asking the government for funds, taking into account the fact that there were no problems with that material in the South of Russia (O proizvodstve opytov..., 1900: 397-398).

Due to the failure in finding coking coal deposits, the governmental Mining Department and scientists took particular interest in how the problem is solved abroad. An example was found in Scotland where the coal was also raw. The British had found the solution to the problem and I.F. Shreder was tasked with discovering the technology they were using to melt metal using raw coal. The technology he brought from Scotland, as he reported, could be successfully applied to the mining industry in Poland as well. “During my trip to Scotland I became familiar with the modern method of melting using raw coal. I became convinced that the method was correct. I thought it was necessary to test the technical possibility of melting metal using the raw coal of the Dombrovsky basin” (Shreder, 1902: 1-2).

Later on, Shreder went to Bohemia, in Austria-Hungary, where he visited a plant in Hladno (now called Kladno – auth.). He discovered that the Czech coal, like the Scottish, was very similar to the deposits in

Dombrova. The chemist's experience in mixing coal from Kladno with coke from Westfall produced excellent results. Thus, he came to the conclusion that it was quite possible to substitute at least a proportion of coke for raw coal ([O proizvodstve opytov..., 1900: 392](#)).

On his return, I.F. Shreder made a complete report on the trip. Those papers, together with the documents from other experts, were summarized and then printed in March 1900. Shreder suggested the following three possible solutions for the problem in Dombrov: I) coking the coal of the Dombrovsky basin again; II) coking a mix of Dombrovsky coal with fat coal from the Donetsk region; III) melting metal using raw coal from Dombrova ([O proizvodstve opytov..., 1900: 391](#)). In his view, the second solution was the most efficient one.

Besides Shreder from the Mining Institute, The Dombrovsky basin problem was also an issue for the Polish scholar Swedzinski, who was sent to work in Austria-Hungary. After a trip to the Czech plant in Ostrava, he suggested coking the Polish coal abroad. However, as Shreder reasonably stated, such experiments in foreign plants cost a lot and their owners were not happy to relinquish profits to their competitors ([O proizvodstve opytov..., 1900: 392](#)).

I.F. Shreder came to the conclusion that further experiments with coal from Dombrova would be better done at the Bzinsk plant in Poland, because its construction could be adapted for such experiments with relative ease. To make it suitable, the height of the blast furnace had to be increased, the air-blower modified and the blowing-in of the blast furnace adapted to the use of coke ([O proizvodstve opytov..., 1900: 392](#)). All these modifications could be achieved without destroying the machinery or the plant construction, if the necessary calculations to keep the construction stable were carried out ([Goldobina, 2019: 583-595](#)). The new experiments were supposed to use raw coal. While, on the one hand, I.V. Shreder presumed that the change to coal from Dombrova was inevitable, on the other, he advised carrying out the operation with care, as the Polish plants were already efficient and profitable, so there was no rush for the immediate change in favor of raw coal. The Mining Scientific Committee decided that, considering the importance of the issue, the funds for the experiments must be provided by the State, with the help of local mining entrepreneurs. They focused on the works of engineer Swedzinsky in Dombrov and Tsapek in the Ostrava basin. At the same time I.N. Urbanovich proposed that the engineer Alexander Kandaki (a young graduate of the Mining Institute) should also be sent to Scotland. The purpose of the trip was not only to study the melting of metal using raw coal, but also to invite British professionals to Russia ([O proizvodstve opytov..., 1900: 400-401](#)).

The Western Mining Department, represented by its director Khoroshevsky, decided to commission operations that mixed in Dombrovsky coal at the Huta Bancowa plant, as agreed with Gating, its director. For the plants that would take part in the experiment, Khoroshevsky proposed to apply modern mechanical methods of coal compaction, along with devices for grinding and mixing coal. During a meeting on the question of coking, Khoroshevsky mentioned a proposition to issue a bonus to the plants working with Dombrovsky coal. But because the Mining Department expected coking coal to be discovered in the Dombrovsky basin, that bonus remained only a proposal. Subsequently, Khoroshevsky proposed the bonus again at the Fifth Convention of Mining Industry Professionals of the Polish Kingdom, while Gating expected a refund from the Mining Department should the experiment fail ([O proizvodstve opytov..., 1900: 400](#)).

Shreder's suggestions, along with those from other experts, were sent to the engineers in the Polish Kingdom. The experiment was carried out, as stated, at the Huta Bancowa metallurgy plants and in the laboratory of the Warsaw-Vienna railway. It was expected that both experiments would succeed. However, the Polish engineers made several mistakes and thus the experiment failed. It also turned out that one of the Dombrovsky engineers – Karpinsky – had been quite skeptical toward the whole experiment.

Thus, at the beginning of 1900, the experiments with raw coal were sent back to Shreder in Saint-Petersburg. He was assisted by his colleague, Alexey Ivanovich Stepanov (1866–1937), a talented chemist from the Institute of Technology. Shreder and Stepanov were both students of Professor K.I. Lisenko. Shreder was also assisted by the chemists Gvozdarev and Buradkov. Together with Ivan Fedorovich, Gvozdarev analyzed the samples taken from the Coltness plant in North Lanarkshire, Scotland. The Scottish samples were compared to Polish ones from various mines. I.F. Shreder successfully completed the experiments with Polish coal and came to the strategic conclusion that the use of raw coal from Dombrov was quite efficient. Scientist wrote that the use of raw coal in the blast furnace gave more benefits (compared to coking): for example, release of a large amount of pure flammable gas that could potentially be used to replace steam engines with those that work on gas. He also pointed out that, since raw coal is half the price of coke, such a change could make a substantial difference to running costs. Shreder's conclusions were confirmed by metallurgy engineers from Aachen (Germany) as well as by professors from the Rhine-Westfall Technical University whom he consulted about the issue ([Shreder, 1902: 16-17, 19-20, 27, 39](#)).

Structurally, the management of the Polish mining industry, almost until the beginning of the 20th century, stood out in the system of the Mining Department and central government institutions. In 1870, the Department of Polish Mining Plants was formed (05.05.1870-1891) and entrusted with managing the mining business in the Kingdom of Poland ([Vysshie i tsentral'nye gosudarstvennye uchrezhdeniya Rossii. 1801-1917, 2001: 201, 203](#)). From January 21, 1894, the Mining Council approved assignments for the provinces of Vistula region ([Vysshie i tsentral'nye gosudarstvennye uchrezhdeniya Rossii. 1801-1917, 2001: 207](#)). The reorganization of 1894, in which the Ministry of State Property was

transformed into the Ministry of Agriculture and State Property, had little effect on the central institutions of the mining department. The maintenance salaries were equalized “with the new salaries established for other institutions of the ministry and several positions were formed. For the Mining Council and the Mining Scientific Committee, new regulations were issued to replace those that existed in the Code of Laws, [which were] outdated and incomplete” (*Ministerskaya sistema...*, 2007: 723).

However, there was no transformation of metallurgy or mining of the Dombrovsky basin before WWI. Nevertheless, in 1909, I.F. Shreder continued to write that it was particularly absurd that ore from the south of Russia was being melted in the Polish Kingdom with the use of coke from Germany or Austria (*Shreder, 1909: 97*). But the entrepreneurs decided not to make any changes, due to the fact that metallurgy at that moment was already efficient, even without using Dombrovsky coal.

Mining education in the Kingdom of Poland. Given the availability of mineral resources and the improvement of its use, the question of training professionals for the fast-growing mining industry of the Kingdom of Poland was raised repeatedly.

In 1875, in the Western Mining District of the Kingdom of Poland, readings and talks were arranged for students and trainees who were engaged in mining sciences. In 1881, a group of Polish mining engineers, including Jan Marian Hempel, Vincent Choroczewski, Vincent Kosinski and Stanislaw Kontkiewicz, undertook intensive efforts to open a mining school in the Dombrova area (*Vivat Akademia: 2010, 12*). The tsarist government did not allow them to do this on their own – probably because the Petrokov province of the Kingdom of Poland was not one of the pro-Russian-minded regions. In 1867-1871 (according to the reports of the gendarmerie) 62 officials arrived from Russia, “but less than a third remained in their posts, and even these are in such a position that they do not see a future for themselves here.” Having no means to return, they were forced to remain in the province. In the 1870s a campaign was carried out to “cleanse institutions of the Polish element”, as a result of which the number of Russian employees increased from 5-7 % to 20 % of the total number of officials in the region (*Vekh, 2013: 202*). These measures were carried out sequentially during the judicial reform of 1876, the Russification of primary schools in 1885, and actions to remove Poles from the railways in the 1880s and 1890s (*Vekh, 2013: 202*).

Only in the late 1880s was the question of foundation of mining school finally resolved. The State Council, at meetings of the joint Departments of state economy and laws, considered a presentation by the Minister of State Property, M.N. Ostrovsky, on the establishment of the Dombrovsky Mining School.

On the February 13, 1889, Emperor Alexander III issued a decree (*RGIA. F. 37. Op. 77. D. 536. L. 5*). Dombrova mining school was founded in the same year. The main goal was to train of mine supervisors and heads of plant operators for the mining industry of that district of the Polish Kingdom. According to the Decree of Dombrovsky mining school, the educational institution was attributed to the Ministry of State Property and would fall under the supervision of the Head of State-owned mining plants in the Polish Kingdom. The school was financed by Russian budget (*RGIA. F. 37. Op. 53. D. 3067. L. 15*).

The school was managed directly by its administrator, with the participation of a School Council. The school administrator was appointed by the Minister of State Property from among the most honored engineers. The lecturers and the doctor employed by the school were appointed by the Mining Department, as advised by the Head of State-owned Mining Plants in the Kingdom of Poland. Other staff members were selected by the school administrator directly. It was the administrator who managed all the staff and all departments of the school.

The duties and responsibilities of the administrator were clearly written into the Statute of the Dombrova Mining School, dated January 9, 1890. The administrator was responsible for the welfare and improvement of the educational institution entrusted to him. He was obliged to ensure that an appropriate volume of material was taught at the mining school, that the syllabus was laid out according to the approved programs, and that practical classes were carried out with the greatest benefit for the students. The administrator was also responsible for service and academic discipline, order and serviceability of all educational and economic structures at the school, expenditure of funds according to budget, and the integrity of state property.

Besides that, the administrator was also a lecturer in one of the specific subjects in the school program. He managed the funds commissioned for the school. He had the right to expel students in case of long-term illness, failure to pay tuition fees, or delayed return from vacations. However, students who left the school of their own volition or who had been expelled for one of the above reasons could return during the year to the same grade without sitting exams. Temporary or permanent expulsion for bad behavior had to be approved by the Minister of State Property. Such an issue would first be examined by the School Council and, after all members had been heard, it would be reported in written form to the Mining Department. However, the most important and urgent cases for expelling students for bad behavior fell to the responsibility of the school administrator. If that happened, the student had no chance to enter other schools and all such expulsions were reported to the Minister of State Property (*RGIA. F. 37. Op. 53. D. 3067. L. 20-30*).

Dmitry Mikhailovich Brilkin was appointed the first head of the Dombrova Mining School. A hereditary nobleman, D.M. Brilkin graduated from the Mining Institute in St. Petersburg in 1881. In the 1880s, he served as manager of the Nizhniy Tagil copper and iron mines in the Urals District. Then, from 1887, he served as a mining chief at the Goroblagodatsky factories. Thanks to his successful promotion,

D.M. Brilkin was noted by the management as a talented and capable mining engineer. In 1889, in the rank of collegiate assessor, he became the head of the Dombrova Mining School. According to the unanimous opinion of his students, D.M. Brilkin was not only an excellent specialist and a consummate professional in his field, but also a great friend of young people. He immediately immersed himself in the affairs of the new mining school, accepting the tests of student candidates, and then took personal patronage over the first grade of the new school. In 1896, he was awarded the Order of St. Anna, 3rd degree. His career as an engineer developed further: from 1903 he was made deputy head, and from 1913 head of the Western Mining Administration, chaired the VIII Congress miners of the Kingdom of Poland. In 1906, he received the title of full state councilor, and he held a professorship in Soviet Russia (RGIA. F. 37. Op. 57. D. 458. L. 8).

The administrator was the head of the School Council, which played an important role in the school's management. The Council was composed of two lecturers, two engineers from the Kingdom of Poland, and two members elected from among the local mining entrepreneurs. The school administrator determined, opened and closed the sessions of the School Council. If the head of state-owned plants of the Polish Kingdom was present at the council session, he became its chairman. The issues the Council dealt with were: the admission and expulsion of students; issuing certificates for mine supervisors and heads of factory workers; selecting manuals and distribution of school subjects among the lecturers; and administrative questions concerning the correct education program. A majority of votes was decisive; in case of an even split, the chairman provided a casting vote. A valid session required a quorum that included the administrator or his deputy and at least half the members of the Council (RGIA. F. 37. Op. 53. D. 3067. L. 32-34).

The Dombrova Mining School employed both teachers of specific subjects and of general subjects. The teachers of specialist subjects, such as mineralogy, geology, mechanics, mining and land surveying, chemistry, assaying and metallurgy, were selected mostly from among mining engineers. General subjects were taught by teachers who had such ability for secondary and high schools, supervised by the Ministry of Education. The school doctor taught first aid in case of emergency. The school administrator had to teach at least one of the specialist subjects. One teacher could be assigned more than one subject. Two teachers were considered members of the school staff as they also had particular tasks assigned by the school administrator and the Council. The school doctor had to help students and school staff free of charge, inside and outside school (RGIA. F. 733. Op. 194. D. 1400. L. 28).

Around this time, the Russian Empire's border policy was aimed at financial incentives for the Russian administration at all levels. In 1867, in order to attract Russians to work in the Kingdom of Poland, a system of privileges for Russian officials was approved. They received irrevocable financial assistance from 300 to 1000 rubles (depending on the position), with the condition that officials remain in the service in the Kingdom for at least two years. Every five years the salary for Russian officials was increased by 15 % (for employees of educational institutions – by 25 %). The allowance could not exceed twice the initial salary, and, according to the estimates of the modern researcher, S. Vekh, "the privilege extended only to 30% of the total number of officials serving in this department" (Vekh, 2013: 200). Russian workers could expect accelerated achievement of rank from serving in the periphery, also extended to the Privilinsky region: three years' work in the Kingdom of Poland counted as four years of service in Russia; 25 years of service brought the right to receive a pension.

The first teachers of the Dombrova mining school were S. Kontkiewicz – Polish language, mineralogy and geology; I. Kondratovich – mining; Krusser – Russian language, physics and mathematical sciences; I. Sventokhovskiy – geodesy and mine surveying; and Popov – chemistry and metallurgy. Only two – Krusser and Popov – were full-time. The administrator of the school, D.M. Brilkin taught mechanics and construction art (RGIA. F. 37. Op. 57. D. 458. L. 12).

In the Kingdom of Poland, the authorities tried to maintain the proportions of Russian and Polish teachers in schools: "according to the Warsaw Governor-General, Alexander Imeretinsky, in 1897 ... in schools, for a total of 17,258 teachers and female teachers, there were 6,088 Russians, that is, 35.3 %" (Vekh, 2013: 202).

Let us consider the organization of the educational process. Applicants to Dombrova Mining School had to meet certain criteria. They had to be older than 15 but less than 20 years old. They had to certify they had physical defects that could prevent them from becoming a mine supervisor or head of plant operators. It was also necessary to have knowledge of two grades of a local school or its equivalent. According to point 20 of the Dombrovsky Mining School Statute, those who could demonstrate at least half a year's experience of mine work had an advantage in the application process. This was a particular feature of the Dombrova school: other Russian schools did not require practical experience. Moreover, as correctly stated by D.M. Brilkin, practice is extremely useful as it gives students knowledge that allows them to understand a subject much quicker. Besides that, the students enrolled in the mining school already had an idea about their future job (RGIA. F. 37. Op. 77. D. 536. L. 57). It is important to note that for admission to mining schools in France or Germany, practical experience was an essential requirement.

There were four grades at the Dombrova mining school, and each grade lasted one year. The third and the fourth grades had the highest rank and were divided into two departments: mining and the facility one. For practice, there was also a library and a collection of mineralogy and geology artefacts, thanks to the Mining Institute which, in 1901, donated a portion of its samples to the Dombrova school. This included a

collection of rare but useful mining tools and devices, as well as mechanisms used in ore mining and at the mining plants. The bulk the exhibit was provided by local mine owners, as they were interested in producing well-trained professionals. There was also a chemical laboratory and workshops. Students were free to use the library, collections, materials and tools and all to practice as much as they needed in the laboratory and workshops (RGIA. F. 37. Op. 53. D. 3067. L. 40-45).

The academic year for theory at the Dombrova mining school ran from September 1 to May 31, final exams included. Practical classes started after the exams. At the end of the third grade, during the vacation, students were required to carry out a geodetic survey and engage in no less than six weeks' practical training in a mine or factory, in order to graduate to the fourth grade.

The training at Dombrova Mining School included the following subjects:

1) General subjects – religion (for Orthodox and Catholic students), Russian language, Polish language, arithmetic, algebra, geometry and trigonometry.

2) Specific subjects – basic physics, chemistry, geodesic, mechanics and construction, mineralogy and geology, mining and land surveying, metallurgy and assaying, drafting, basics of accounting and mining law, as well as first aid.

Subjects were taught in Russian, according to the syllabus approved by the Mining Scientific Committee.

Apart from classroom studies, there were mandatory practical classes on chemistry, assaying, mineralogy and land surveying, as well as carpentry, woodworking, blacksmithing, metalwork and the use of plant machinery. The program could be modified only after confirmation from the Mining Department on the request of the School Council. At the end of the school year, the students always had exams (either to pass to the next grade or a final graduation exam). The students who completed the whole course and passed the final exam received, depending on the major they had chosen, the rank of mine supervisor or factory master (RGIA. F. 37. Op. 74. D. 472. L. 55-58).

In 1890, I.N. Durnovo, the Minister of Internal Affairs, allowed the Dombrova Mining School to be designated a second rank educational institution. This meant that students could postpone mandatory military service until the age of 24, the same privilege granted to students of secondary technical schools (RGIA. F. 37. Op. 53. D. 3067. L. 145).

The beginning of the 20th century was a fairly hard time for the Dombrova Mining School. In 1905, due to revolutionary action in the area, the school was closed; it reopened only in 1910. The story of the school was again interrupted by WWI. After Austrian troops entered the area, the studies were suspended. Only after the Great War the school was restored, this time as the State School of Ore and Metallurgy named after S. Staszic (Vivat Akademia: 2010: 14).

5. Conclusion

In the Dombrova basin of the Kingdom of Poland lay a great mining basin with thick layers of coal unique in Russian territory. In the late 19th century, industrialization was developing rapidly in Russia, but the technology needed to mine and use Polish coal was far from perfect. As a result, industrialists in the Kingdom of Poland continued to use German and Austrian coke. They did not dare to make the necessary changes to adapt to Polish raw materials, given the existing profitability of metallurgical production without using Dombrovsky coal. The ignorance of new technologies and the limited use of local coal hampered the development of the mining industry in this region.

Things were much better with the mining education system in this region. From the first decade of its foundation, the Dombrova Mining School was of great importance in training professionals for the mining industry. This fact was underlined several times during the Conventions of the mining entrepreneurs of the Kingdom of Poland. The school was established to train especially lower-ranked mining technicians, in order to replace foreigners, the Germans and the Austrians, who flooded the area. There were no graduates from Russian schools of mines in that region. Before the school was founded, mine supervisors were all selected from among the foreigners who, compared to the mine supervisors from the Lisichansk and the Ural area, had an advantage, as they spoke the local language and were aware of local traditions. In time, graduates from the Dombrova Mining School came to take most of the posts that had previously been filled by foreigners.

References

Administrativno-territorial'noe ustroistvo Rossii, 2003 – Administrative and territorial structure of Russia. History and modernity (2003). Administrativno-territorial'noe ustroistvo Rossii. Istoriya i sovremennost' [Administrative and territorial structure of Russia. History and modernity]. M. 320 p. [in Russian]

Afanas'ev et al., 2017 – Afanas'ev, V.G., Voloshinova, I.V., Druzin, M.V. (2017). Vo glave Gornogo instituta. Direktora uchebnogo zavedeniya (1773-1918) [At the head of The Mining Institute. Managers of the educational institution (1773-1918)]. St. Petersburg. 238 p. [in Russian]

Afanas'ev et al., 2010 – Afanas'ev, V.G., Posina, L.T., Sevastianov, P.L., Voloshinova, I.V., Pliukhina, T.V. (2010). Ocherki istorii Gornogo instituta (1773–1917) [Essays on the History of the Mining Institute (1773–1917)]. St. Petersburg. 185 p. [in Russian]

- Afanas'ev, 2016** – Afanas'ev, V.G. (2016). From the history of mining in Russia: K. Bogdanovich and G. Romanovsky – founders of petroleum geology. *Social Sciences*. 11(1): 36-42.
- Afanas'ev, Voloshinova, 2017** – Afanas'ev, V.G., Voloshinova, I.V. (2017). The Mining Institute and its student Peter Wrangel. *Novyj Istoriceskij Vestnik*. 52(2): 140-166.
- Goldobina et al., 2019** – Goldobina, L.A., Demenkov, P.A., Trushko, O.V. (2019). Obespechenie bezopasnosti stroitel'no-montaznykh rabot pri vozvedenii zdaniy i sooruzhenii [Ensuring the safety of construction and installation works during the construction of buildings and structures]. *Journal of Mining Institute (Zapiski Gornogo Instituta)*. 239: 583-595. [in Russian]
- Vysshie i tsentral'nye gosudarstvennye uchrezhdeniya Rossii. 1801–1917** – Vysshie i tsentral'nye gosudarstvennye uchrezhdeniya Rossii. 1801–1917 [Higher and Central State Institutions of Russia. 1801–1917]. 2001. St. Petersburg. 260 p. [in Russian]
- Izotov i dr., 2018** – Izotov, E.A., Kuvanov, V.A., Korostelev, E.N. (2018). Relationship between teachers' professional motivation and students' motivation for physical training. *Teoriya i praktika fizicheskoy kultury*. 12: 43-45.
- Izotov i dr., 2018** – Izotov, E.A., Soldatova, G.V., Filatov, A.O. (2018). Attitudes to physical education at technical university. *Teoriya i praktika fizicheskoy kultury*. 4: 14-16.
- Khatkov, Boyarko, 2018** – Khatkov, V.Y., Boyarko, G.Y. (2018). Administrativnye metody upravleniya importozameshcheniya defitsitnykh vidov mineral'nogo syr'ya [Administrative methods of management of import substitution of scarce types of mineral raw materials]. *Journal of Mining Institute (Zapiski Gornogo Instituta)*. 234: 683-692. [in Russian]
- Kuvanov et al., 2019** – Kuvanov, Y.A., Ponomarev, G.N., Selyukin, D.B. (2019). Role of academic physical education in higher education system. *Teoriya i praktika fizicheskoy kultury*. 3: 12-14.
- Manusevich, 1952** – Manusevich, A.Y. (1952). Ocherki po istorii Pol'shi [Essays on the history of Poland]. M. 407 p. [in Russian]
- Morachevsky, 2009** – Morachevsky, A.G. (2009). Khimiki Gornogo instituta / Ocherki o khimikakh Rossii [Chemists of the Mining Institute. Essays on the chemists of Russia]. St. Petersburg. P. 87. [in Russian]
- O proizvodstve opytov..., 1900** – O proizvodstve opytov pri domennoi plavke Dombrovskogo uglya [On the experiment on blast furnace melting of Dombrovsky coal]. *Mining journal*. 1900. 3: 392-401 [in Russian]
- Zhivopisnaya Rossiya, 1896** – Zhivopisnaya Rossiya [Picturesque Russia]. 1896. Vol. 4. Part 1. P. 405. [in Russian]
- Pustula, 1958** – Pustula, Z. (1958). Monopolii v metallurgicheskoi promyshlennosti Tsarstva Pol'skogo i ikh uchastie v «Podamete» [Monopolies in the metallurgical industry of the Kingdom of Poland and their participation in «Podamet»]. *Historical Notes. Academy of Sciences of the USSR. Institute of History*. 62: 86-88. [in Russian]
- Rassadina, 2016** – Rassadina, S.A. (2016). Kul'turologicheskie osnovaniya kontseptsii «edutainment» kak strategii formirovaniya obshchekul'turnykh kompetentsii v vuzakh negumanitarnogo profilya [Cultural foundations of the concept of "edutainment" as a strategy for the formation of general cultural competencies in non-humanitarian universities]. *Journal of Mining Institute (Zapiski Gornogo Instituta)*. 219: 498-503. [in Russian]
- RGIA** – Rossiiskii gosudarstvennyi istoricheskii arkhiv [Russian state historical archive].
- Rozhdestvensky, 1902** – Rozhdestvensky, S.V. (1902). Istoricheskii obzor deyatelnosti Ministerstva narodnogo prosveshcheniya 1802-1902 [Historical overview of the activities of the Ministry of Public Education. 1802-1902]. St. Petersburg. 785 p. [in Russian]
- Sharok, 2016** – Sharok, V.V. (2016). Estimation of health hazards of risky behaviors and psychological features related to its degree. *Research Journal of Medical Sciences*. 10(6): 604-607.
- Sharok, 2018** – Sharok, V.V. (2018). Role of socio-psychological factors of satisfaction with education in the quality assessment of university. *International Journal for Quality Research*. 12(2): 281-296.
- Shchukina, Egorenkova, 2017** – Shchukina, D.A., Egorenkova, N.A. (2017). Opyt ritoriki I.S. Rizhskogo (1796) v Gornom universitete: istoriya i sovremennost' [Experience of rhetoric I.S. Rizhsky (1796) at the Mining University: history and modernity]. *Journal of Mining Institute (Zapiski Gornogo Instituta)*. 225: 198-206. [in Russian]
- Shreder, 1909** – Shreder, I.F. (1909). Donetskies kamennye ugli i ikh sostav i svoystva [Donetsk coal and its composition and properties]. St. Petersburg. 97 p. [in Russian]
- Shreder, 1902** – Shreder, I.F. (1902). Shotlandskaya domennaya plavka i vozmozhnost' ee osushchestvleniya na zavodakh Dombrovskogo basseina. Po povodu opytov na zavodakh Huta-Bankova [Scottish blast-furnace smelting and the possibility of its implementation at the plants of the Dombrovsky basin. About the experiments at the Huta-Bankov factories]. St. Petersburg. 102 p. [in Russian]
- Sishchuk et al., 2018** – Sishchuk, J.M., Fedorova, M.A., Tsyguleva, M.V., Vinnikova, T.A. (2018). Distance education opportunities in teaching a foreign language to people with limited health possibilities. *Astra Salvensis*. 6: 631-637.

[Stepanov, 1926](#) – *Stepanov, N.I.* (1926). Khimiya. Leningradskii gornyi institut. Yubileinyi sbornik. 1773–1926 [Chemistry. Leningrad Mining Institute. Jubilee collection. 1773–1926]. Leningrad. P. 96. [in Russian]

[Tarasova, Trynkova, 2012](#) – *Tarasova, V.N., Trynkova, O.N.* (2012). Stanovlenie rel'soprokata v Rossii [Formation of rail rolling in Russia]. *World of transport*. 5. P. 145, 149. [in Russian]

[Ministerskaya sistema..., 2007](#) – *Ministerskaya sistema v Rossiiskoi imperii: k 200-letiyu ministerstv v Rossii* [The ministerial system in the Russian Empire: to the 200th anniversary of ministries in Russia]. Moscow, 2007. 920 p. [in Russian]

[Vekh, 2013](#) – *Vekh, S.* (2013). Russkie v Tsarstve Pol'skom vo vtoroi polovine XIX v. i nachale XX v. [Russians in the Kingdom of Poland in the second half of the 19th century and early XX century]. *Studia Slavica et Balcanica Petropolitana*. 2(14): 198-215. [in Russian]

[Vivat Akademia, 2010](#) – *Vivat Akademia* (2010). Krakow. Nr. 5. pp. 12-14.

[Voloshinova, Mokeev, 2016](#) – *Voloshinova, I.V., Mokeev, A.B.* (2016). Fuel sector development in Russia in the first half of the 20th century. *International Journal of Applied Engineering Research*. 11: 5177-5181.