

**FROM THE HISTORY OF MINING: DEMIDOV'S ACTIVITIES IN THE PUBLICATIONS
OF «GORNYJ ZHURNAL» (1861-1896)**

Yu.S. Kolpasnikova

Scientific advisor professor S.Yu. Kolesnikova

National Research Tomsk State University, Tomsk, Russia

The Demidov dynasty is known not only in Russia but also in Europe and North America due to their metallurgical activities. Demidovs is an example of successful entrepreneurs who built a mining and metallurgical “empire”. The factories belonging to Demidovs had been developing for over two centuries. Activities of dynasty contributed to a huge breakthrough in the metallurgical industry.

The timeliness of this work lies in the fact that the study of pre-revolutionary successful business experience allows to draw conclusions for the conduct of private business nowadays. Moreover, for a modern state the example of interaction between authorities and individuals in the matter of industrial project formation is relevant. Note also that multifaceted activity of Demidovs, which is the object of study in this article, can serve as a motivation for today's entrepreneurs and managers in the field of charity or education.

The purpose of this article is to consider how the periodicals reflected the activities of the Demidov dynasty (on the example of articles in the “Gornyj Zhurnal”).

“Gornyj Zhurnal” is one of the first specialized Russian periodicals in the field of geology, mining and metallurgy. It was founded by Alexander the First in 1825 as a publication of the Mining Accountable Cabinet. The first issue was called “Mining Journal or collection of information about mining and salt business, with new discoveries for science, this subject to the relevant” [6].

With an eye toward to the history of the emergence of Demidov's factories in the Urals, Nikita Demidov, the founder of the dynasty, received Verkhoturksky iron plants on the river Neiva on the 4th March 1702 on the basis of the nominal decree of Peter I. The eldest son of Nikita - Akinfy was engaged in factories in the Urals [4. P.15].

The publication of “Gornyj Zhurnal” on August 1861 contains the article by I. Poletika, which is dedicated to the transfer of Ural state-owned factories into private property by Petr the First. Special attention is given to Nevjanskij plant. The author compares public and private plants. I. Poletika maintained the following: the choice of plant's management system should contribute to the dissemination of mining sphere of industry in the country, specialists and energetic people must manage the factories, and these activities lead to positive results. Given this, it is immaterial will plants be private or public, if they are managed by organized and responsible person. Highlighting the Demidov's private factories, the author focuses on the fact that members of the dynasty clearly knew their duties: delivered to the treasury iron, artillery supplies and weapons, however, had been improving and developing production. Thus, over time, has been the marketing of products abroad, what is the great merit of Demidovs.

Unfortunately, the Russian authorities did not have the permanence of vision in the management of the factories, so factories were transferred to private hands, then they became a state-owned again. Of course, you should not assume that the government factories worked less quality or less productive – far from it. Such control had its advantages – state-owned plants always received an order, scientists, researchers, graduates worked on the manufacture. We mean that the problems with the establishment of a high-quality production arose when the ownership or management changed repeatedly. However, even in such a situation, Demidov found a way to control situation. They are not always worked in harmony with the power (remember only the frequent disagreements between Demidov and V. N. Tatishchev), but even in this case, the production in the factories did not suffer.

Based on the work of I. Poletika, we also indicate the problems that prevented the development of metallurgical production in the country. Firstly, the author notes the lack of specialized mining colleges or the impossibility of entering them many categories of citizens and the lack of literature on mining and metallurgical industry. In addition, the article was published in August of 1861, after the abolition of serfage, so the author mentioned changing the situation of the workers, however, to draw conclusions about the results of the changed situation at the time was still early.

Following the publication in “Gornyj Zhurnal” on Demidov factories that we can consider in this article, dated October 1875. It relates to a new method of producing steel in one of Demidov's factories of Nizhnij Tagil. The case is about Bessemer process (processing of cast iron by the method of blowing air in the converters). The first test of the Bessemer method was carried out on Nizhnesaldinskij plant in 1859, but further research was stopped for a while. However, with the expansion of the Russian railway network and a more detailed acquaintance with the metal, obtained Bessemer process, the leadership of the Nizhnij Tagil factories in the face of P.P.Demidov decided to introduce the Bessemer method on Nizhnesaldinskij plant, thereby creating a “launch factory”. Through of this improvement was established when the steel factory, Terre-Noire in France, a part of the machine was ordered there. In addition, Nizhnesaldinskij plant was equipped with two retorts of the English system. The first test run was carried out under the guidance of a Terre-Noire plant engineer Walton. The publication describes in details the process of metal production and further experiments with metal. Pay attention to the fact that the authors several times note the high quality of metal in Demidovs factories before the introduction of the Bessemer method, and the fact that the production was going “without flaws” [1. P. 121]. The introduction of the Bessemer process made it possible to improve the quality of the metal; the authors call the obtained metal “metal of excellent quality.”

This publication allows assessing the mining activities of the Demidov dynasty from several perspectives – from the point of production quality and terms of introduction of new technologies, from the point of view of using foreign experience and establishing international contacts.

In the publication No. 4 of the “Gornyj Zhurnal” on April, 1896, appears an article “On the transformation of the

Nizhnij Tagil real school in the mining college". The article focuses on the changes, which introduced in college, the new training program, the management of the college and teachers. A very important point in the publication is the fact that the mining college was entirely financed at the expense of factories of P.P.Demidov's heirs. Students of mining college had been doing practical work in laboratories, museums, workshops, factories and mines. In addition, the free school took the children of workers of the factories of Nizhnij Tagil. Students who have completed a full course of study, in turn, were required to spend one year in practical training in their chosen specialty at one of the plants of P.P.Demidov's heirs. Previously, based on information from publication I. Poletika, in this article we drew attention to the lack of specialized educational institutions. As you can see from the release in 1896, the Demidov dynasty undertook control measures not only in matters directly concerning the plants, but also other issues of the industry.

Thus, by analyzing the publication in "Gornyj Zhurnal", note that the activities of Demidovs were aimed at the development of the mining and metallurgical industry. Caring about affluence, Demidovs did not forget about the industry in general, its importance to the state. The industrialists participated in various events to improve production, introduced new equipment and new technologies. Not spared in this finance, they purchased high-quality foreign hardware. Demidovs have established international relations, visited the foreign factories and mines, learning international experience. The representatives of the dynasty contributed to the expansion of specialized educational institutions, the emergence of new schools. In addition, funds received on the Demidovs plants, were used for training workers in foreign factories and other goals. The activity of Demidov dynasty made a huge contribution in economic and social sphere of our country.

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USING A FFT-BANDSTOP-FILTER AT SEISMIC DATA PROCESSING

Kpata Mc Egni Richmond Eloge, A.A. Islyamova

Scientific advisor professor M.M. Nemirovich-Danchenko

National Research Tomsk Polytechnic University, Tomsk, Russia

Development of methodology of detection of fractured (porous) regions in the rocks is always represented an actual problem for a wide range of applied geophysics [1]. In cases where defective regions are multiple fracture zone (fractured zone) are effective electromagnetic and acoustic techniques and combinations thereof. Acoustic methods based on the study of the properties of elastic wave fields in active and passive monitoring of media containing fractured zones used especially widely in mining and in the search for hydrocarbon deposits, and in the latter case, developing a natural acoustic methods (acoustic logging), and seismic methods which use both longitudinal and transverse waves [1]. For the analysis of real seismic sections need to properly use the device processing time series of digital filters. Typically, such processing is performed in the spectral plane. To display the starting number of the Fourier transform to the frequency domain used by us [2] and Prony [3]. An example of operation in the filter window when using the Fourier spectrum.

For Fourier transform limitations associated with the Nyquist theorem and imposed the finite size of the processing units do not allow to extract from the track with any harmonic components, prescribed, frequency. To work around this limitation, the previously applied transform Prony, which is not the spectral transformation in pure form, but is a way of estimation (as a method of least squares) of discrete data using a linear combination of exponential functions. You can then calculate the power spectral density for any Prony frequency. On the basis of this was shown the possibility of allocating fractures in the rock [4]. Below are some details of the implementation task algorithmic filtering.

Here is the basic formula for the direct and inverse Fourier transform.

Under the spectrum of the function $g(t)$ we mean a $G(\omega)$ function associated with $g(t)$ a pair of Fourier transforms [2]

$$\begin{aligned} g(t) &= \frac{1}{2\pi} \int_{-\infty}^{+\infty} G(\omega) e^{-i\omega t} d\omega \\ G(\omega) &= \int_{-\infty}^{+\infty} g(t) e^{-i\omega t} dt \end{aligned} \quad (1)$$

It uses standard notation $\omega = 2\pi f = \frac{2\pi}{T}$,

Where T – the main period of oscillation

Formula (1) contain the variable t . This can be a time, which usually means a (f - frequency temporal dimension with $T-1$), but may be a spatial variable (instead f then write k , is the spatial frequency with the dimension $L-1$).

In both cases - for the Fourier spectrum [2], and for the Prony spectra [3] - there are various aspects in the performance of the actual filter. This paper shows how to correctly apply the band-stop filter when working in Matlab package. Under the band-stop filter is meant the following algorithm : the complex spectrum of several selected frequencies are reset in