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Studies of interconnections between social, technological, economic and cultural forces belong to the trend of modernisation studies in the Russian Empire in the second half of the 19th century. Modernisation implies the establishment and growth of institutions and infrastructures that are examined as a set of communication practices between different actors – the state, experts and various offices. This research is an historical study of interconnections between technologies and society. It is focused on the significance of materiality (namely natural oil resources) in these processes.

Keywords: technology, natural resources, goods, development of infrastructure, institutions.

JEL Classification: Z.

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Introduction

For much of the nineteenth century, Russia saw an intensive development in transport infrastructure and industrial enterprises. Trade turnover increased as well as mobility. The population of cities also increased rapidly. Learned societies and joint-stock companies were established in great numbers. The issue of the extension of trade fleet arose at the same time. The Imperial Society for Promotion of the Russian Trade Shipping (ISPRTS), established in 1873, was aimed to assist this process. Its Central Board was situated in Moscow, coordinating the work of regional divisions in port cities all across the country. In the 1880s, ISPRTS consisted of approximately 1500 members representing different professional groups: military and civil seamen, tradesmen and civil officers, scientific and creative intellectuals.

The analysis of accounts and other documentation of the ISPRTS has helped reveal the positions of the Society members on the issue of the extraction and transportation of crude oil and their role in the development of state policy towards it. The main goal of the research is to determine how and to what degree the Society that did not own oil resources influenced the process of its distribution. Here I present my research findings on the history of the organization of oil and oil products transportation in the Russian Empire and on the role of ISPRTS in solving these issues.

The history of oil production and refining has attracted the attention of historians, economists, as well as oil specialists (engineers, technologists, chemists, etc.) since the last quarter of the 19th century [Sokolovskiy, 1884]. The history of oil production, oil refining and oil export was studied from the point of view of state policy, economy, monopolization processes, and technical development in the Soviet period [Bovykin, 1967];[Nardova, 1974];[D'yakonova, 1980]. Since the 1980s the subject of the research has expanded. Historians turn to the social, and even cultural aspects, of the history of the development of oil resources [Laverychev, 1982]. Modern historiography is characterized by a special attention to the role of foreign capital and its interaction with government structures [Karpov, 2002];[Matveichuk, 2008]; [Fursenko, 2016]. Separately, it is worth highlighting the work devoted to the subject studied in this research - the discussion of the oil issue in 1888 – 1892 [Shuljatnikov, 2016]. The author of the article, VI Shulyatnikov, outlined the main positions of the participants in the discussion. Shuljatnikov singles out ISSRTM as an organization that seriously affected the export policy of the Russian Empire, and concludes that it is necessary to study the history of the Society in more detail.

In this study, the history of oil production and oil exports is considered in a new focus as a specific historical field for the development of public initiative in the Russian Empire in the last quarter of the 19th century.

History of the idea of oil export and oil pipeline in Russian Empire

The issue of oil resources, its extraction and utilisation became topical in the last quarter of the 19th century and various professional and social groups with dissimilar visions engaged in discussion. Some Russian scientists argued for the export of oil and the construction of pipelines to compete with American oil on the global market. They were supported by foreign entrepreneurs engaged in oil extraction in Baku. The initial idea of constructing a pipeline for the transportation of oil from the Absheron Peninsula to the Black Sea was put forward by Dmitry

Ivanovich Mendeleev during a trip to Baku in 1863. He was supported by Vladimir Grigoryevich Shukhov – the future engineer of the first oil pipeline, who later in the 1870s – 1890s constructed a branched system of pipelines in the Baku industrial area. At first, oilmen rejected this proposal as the yearly production was insignificant -5572 tons in 1863. However, the opinion of the most prominent Russian scientist significantly affected the oil industry in Russia. In 1888 Ivan Alexeevich Vyshnegradsky (who proposed a project of the oil pipeline Society in 1887) being a newly appointed Minister of Finance entrusted Mendeleev, his fellow student at Pedagogical Institute and a colleague at the Imperial Russian Technical Society, to prepare materials for the new customs tariff. "The most renowned, undoubtedly unbiased and brilliant defender of the idea" [Dolgorukov,1889] of pipeline construction, Dmitry Mendeleev argued for the pipeline transportation of oil as it could facilitate the establishment of a new oil refinery in Batumi. His notes were published in the newspaper "Novoe Vremya" (The New Time). Mendeleev collected his arguments into a "programme" (as it was called in the periodical press). The programme had four main points. Firstly, in light of the exhaustion of oil wells in Pennsylvania, the idea of prohibiting oil exports to avoid a similar situation in Baku began to circulate in Russian press. Dmitry Mendeleev visited Baku several times and studied its oil deposits. In his notes he persisted from the scholarly point of view that these oil fields would be productive for many decades [Mendeleev, 1881]. Secondly, Mendeleev assumed that "oil processing in Baku [wa]s abnormal..." [Mendeleev, 1881] in reference to local industries that could not deal with the whole volume of extracted oil. That is why he supposed that "the cause of stagnation of industry in Baku lie[d] solely in the shortage of funds for the export of oil products from Baku" [Mendeleev, 1881] and came to the conclusion that the "oil pipeline - [was] the only means to improve technique and oil processing in general" [Mendeleev, 1881]. The theoretical justification of this "programme" was a result of the work conducted by a special commission, the Transcaucasian Pipeline, that was formed by the Imperial Russian Technical Society. Dmitry Mendeleev and the oil entrepreneur, Ludwig Nobel, were the co-chairmen in this commission.

There were a number of opponents to the Baku-Batumi pipeline. Among these were Russian oil refiners (especially local) and local authorities who emphasised the independence (?) of the development of Transcaucasia from Baku oil refineries. But the most important group was the owners of shipping companies that provided the transportation of crude oil and oil products. When mazut (black oil) became a popular low-cost fuel for shipping, all the ship owners opposed the construction of a pipeline. The position of this group of actors was represented by ISPRTS. Discussions about crude oil and oil products, export tariffs, as well as the construction of a pipeline, were at the centre of public discourse: they were discussed in the press, at Stock exchange Committees, oilmen conventions, the Transcaucasian Pipeline commission, the Central Board of ISPRTS sessions and general meetings.

Industrial refinery of crude oil began in the middle of the 19th century. At the same time Baku developed into the largest oil producing area in Russia. At first, government controlled oil wells were leased to individuals for a fixed period of time. Already in the 1860s it became obvious that the "lease system of oil sources utilization is a useless relic of the past and for the development of this branch of industry a completely different organization of oil production is needed" [Shulyatikov, 1889]. The new regulations were approved in 1872 by which all state owned oil wells were sold to private individuals in auction. The first auction took place on the 31 December 1872. The Treasury gained three million rubles instead of a predicted half a million. Intense exploitation of the Baku oil fields began and soon there were established departments and representatives of companies from Sweden, Britain, France, Belgium, Germany and the USA, along with Russian oilmen. The volume of oil extraction in Baku increased from 81 thousand tons in 1875 to 6,9 million tons in 1885. Baku oil accounted for 95% of all oil extracted in Russia. There were more than 80, mostly small, oil refineries in the area by the spring of 1873. The long quest for an optimal method of oil refinery and export began in the 1870s. Oil extraction was growing rapidly, attracting more and more industrialists who had different opinions on the directions and means of crude oil and oil products transportation.

The demand for oil in Baku itself in the 1880s amounted for 5% of the whole production. It was noted at the first oilmen convention in 1884 that the Baku oil industry could have not only national, but also transnational importance if it reaches European markets. The Russian oilmen facilitated shipping through the Caspian Sea. The first venture of transporting oil through the Caspian Sea by tanker was an Astrakhan tradesman, Nikolay Ivanovich Artemyev. He was later followed by Viktor Ivanovich Ragozin, a fellow member of ISPRTS. The exploitation of oilloading tankers positively affected the development of the Caspian trade fleet. The number of cargo and passenger ships was increasing from year to year. Trade was well established with ships arriving at Baku harbour representing nearly 40 countries. The development of the oil industry at Absheron Peninsula led to a significant growth in shipment from Baku harbour. The increase in shipping also led to the expansion? of ports in Baku, Astrakhan, Petrovsk and Krasnovodsk. The Baku trade port had the highest rate of cargo turnover amongst all Russian trade ports due to the transportation of crude oil and oil products. Nevertheless, sea transportation was possible only from March until October and goods that were produced during the rest of the year had to be laid around at the stock. Attempts to reach the Black sea and further into international markets triggered the idea of constructing pipelines. The Transcaucasian railway was completed in 1883 and the issue of a pipeline ceased to be the subject of intense discussions for a short period of time?. When the navigation period finished, railway cisterns were unable to consistently export the growing quantity of oil. In these circumstances, the export of crude oil and oil products were assigned economic value and made them an object of increased attention from oilmen and government officials.

The role of Society in oil pipeline discussions

The main force that united the opponents of an oil pipeline was ISPRTS. In 1888, a year before the escalation of the pipeline issue, Nikolay Artemyev, who was engaged in oil transportation since 1866 and was the first in the world to venture an oil-loaded shipping, appealed to the Board of ISPRTS. In his letter, Artemyev expressed great concern about the project of an oil pipeline and the possibility of customs-free exportation of crude oil. At the time, the Board was represented by three important figures: the Chairman of ISPRTS (from 1887 to 1893), Dmitry Nikolaevich Dolgorukov, who also held the rank of Active State Councillor, Christian Martynovich Waldemar, also a famous public figure who was respected by the trade shipping community and Mikhail Ivanovich Shuliatikov, the head of the Moscow division of the Northern insurance society. Consequently, there were vibrant participants for discussions about oil export and arguments that the export of resources was unprofitable for Russia. These three representatives articulated the position on the construction of an oil pipeline that the whole Society followed: "it is necessary to forbid the export of crude oil and to forbid further postponing of capital collection for the construction of an oil pipeline" [Dolgorukov, 1889]. The

Board also entrusted its member, Viktor Ragozin, in the preparation of a report on this issue and articulating the Board's position in discussion at a General meeting of the Society.

Viktor Ragozin being personally concerned with this issue became one of the public opponents of the oil pipeline construction and crude oil export in general. In the list of ISPRTS members for 1875, Ragozin is listed in both Moscow and Saint-Petersburg's Boards of Society. Since 1864 he was a manager of the shipping company "Druzhina". In the 1870s, Ragozin focussed his attention on Russian oil and facilitated oil-loading shipping along the Volga River. Another important undertaking? was his study of the chemical nature of oil, thus making him the first individual in Russia to produce a lubricant material. At the same time, he was a Speaker of the Nizhniy Novgorod Municipal Duma (Council) in 1871-1874 and a vigorous public figure like so many other industrialists of that time. Ragozin built two oil refineries in Nizhniy Novgorod province and close to Yaroslavl in 1877 and 1879 correspondingly. He followed Mendeleev's advice to organize full processing of oil at his oil refinery on the Volga River to produce not only kerosene but also high quality lubricants. In 1880 he was granted the right to label his products with the Russian state coat of arms that was the highest mark of these commodities. The Saint-Petersburg Technological Institute honoured him with a rare award of a distinguished engineer-technologist [Rummel, 1899]. In 1883 he the The started operations in Baku as a manager of Baku division of "S.M. Shibaev & Co" Partnership.

In 1889 ISPRTS issued volume 32 of its Proceedings entirely devoted to the discussion of oil export and oil pipeline with the following statement: "having a mission of protection of trade shipping interests ISPRTS considers as its sacred duty to pay attention to a great concern that spread nowadays among all the ship-owners both at the Caspian Sea and along the Volga River" [Dolgorukov, 1889]. The issue quotes figures to convince its readers of the harm that might be caused by the export of crude oil: "Caspian and Volga trade fleets carry nearly 80 000 000 poods yearly. The fleet earns from these operations a great sum of 6 ½ million roubles" [Dolgorukov, 1889]. The circle of Society supporters also grew due to the fact that by the late 1880s most steamboats were using oil residues as fuel that, according to Society member Shuliatikov, "amounted in savings on fuel of 7 000 000 roubles… meanwhile these savings allow us to reduce the cost of grain delivery to foreign ports" [Dolgorukov, 1889]. One more argument was the fact that "due to the exceptional abundance of oil cargoes on inner Russian trade routes the new important industry emerged – marine shipbuilding" [Dolgorukov, 1889]. Ragozin, Shuliatnikov and Artemyev also assumed that it was important to save cutting down forests by using alternative oil fuel.

In 1888 the Baku stock exchange committee sent a telegram to the ministers of finance, state property, railways, and internal affairs and to the state inspector, Ober-Procurator of the Holy Synod, and the Chairman of the Committee of Ministers. The telegram expressed concern about Ivan Petrovich Ilimov's petition for the extension of the oil pipeline concession [Ragozin, 1889]. The same year the Astrakhan stock exchange committee appealed to ISPRTS asking to speak out against oil pipeline project arguing that it was supported only by foreign entrepreneurs. That was the starting point in the collaboration between the Society and leading Russian stock markets. The Society's "Proceedings" also mentioned Moscow, Nizhniy Novgorod, Kazan and Saratov stock exchange committees among opponents of oil pipeline construction [Shulyatikov, 1889]. They filed petitions to ministries and also appealed to the IRPRTS. In 1888 Nizhniy Novgorod's stock exchange committee sent a letter of appeal to the Chairman of Society Dmitry Nikolayevich Dolgorukov with an extract shown below:

[The] goals and aims of Your Society are akin to the interests of Nizhniy Novgorod Stock Exchange Committee as it consists primarily of ship and steamboat owners along the Volga River with its tributaries and in the Caspian Sea... Let us hope, Your Excellency, that You will be pleased to allow us appeal to You as the main Defender of Russian industry interests and the leading figure of ISPRTS. Your moral support as the Chairman of Society has already provided and provides in future a beneficial effect on the prosperity of our shipping industry...[Shulyatikov, 1889].

Keeping in mind that the bulk of securities of these stock markets were in government bonds, the government had to consider the position of these actors. In 1888, the Baku and Astrakhan stock exchange committees appealed to Ragozin as ISPRTS members concerned with the Ilimov and Rothschild attempts to increase the export of oil abroad. In its "Note" handed to the Government, ISPRTS used the reasoning of stock exchange committees as a strong argument in favour of Society's position.

In the years 1884 to 1920, oil refinery owners in the Baku industrial area held many conventions which were very influential in solving many questions. The first convention included 199 representatives of industry and the Baku city major mayor? touched upon the issue of the construction of oil pipeline Baku – Batumi. Despite an intention of "thorough and most probably dispassionate discussion" [Despot-Zenovich, 1885] of this issue direct losses of convention members from the construction of oil pipeline played crucial role in the formation of position towards a pipeline. The Report "On the most advantageous conditions of the export of kerosene and lubricant oils abroad" [Despot-Zenovich, 1885] was presented by Ragozin. The title fully reflects its content as the author does not mention the possibility of the establishment of a new industrial area in Batumi due to the construction of an oil pipeline. Report "On the importance of oil pipeline from Baku to one of the ports of the Black sea for the Transcaucasian oil industry" was presented by Konstantin Alexandrovich Iretskiy, a member of a commission devoted to that issue [Despot-Zenovich, 1885]. At the same time Iretskiy was a manager of the Volga-Caspian steamboat partnership "Druzhina" and this fact could not fail to influence his conclusion on behalf of the commission: that the construction of an oil pipeline is untimely before the handling capacity of the Transcaucasian railway was exhausted.

Already in 1877, oil production amounted to 327,6 thousand tons with more than 10 thousand people employed in its transportation [Shammazov 2000]. The extraction of one pood of oil (0,016 of a ton) cost three kopeks but its transportation from the Balakhany oil wells to the Black city (an industrial area close to Baku) cost twenty kopeks. At that moment Ivan Petrovich Ilimov, a Russian chemist who participated in different projects such as the organization of a sulphur acid plant and railway construction, also became interested in the issue of oil transportation in Transcaucasia. In 1878 he tried to draw oilmen's attention to the profitability of the Baku – Batumi pipeline but without success. Ilimov obtained a concession for an oil pipeline but without finances for its construction, he began to disseminate information about his project in publications of the Imperial Russian Technical Society.

The 1880s saw an influx of French capital to Baku. Alphonse Rothschild bought the stock of "Batumi Oil Refinery and Trade Society" in 1886 and established the "Caspian – Black Sea Oil Refinery Society" with capital of six million roubles. The Administration of this Society included A.A. Gukhman, a member of the Baku division of the Imperial Russian Technical Society. In 1887 the Committee of Ministers examined the charter of an oil pipeline Society

which contained a paragraph on the provision of granting to the Society a 60 year privilege for customs free export of oil residues. The project was introduced by the Minister of Government Property, Mikhail Nikolayevich Ostrovskiy, together with Privy Councillor, Ivan Alexeevich Vyshnegradskiy.

After five sessions the Committee made the decision that "if custom fees for the export of oil and oil products are introduced, the petition of the Society about customs free export will remain without any attention" [Ragozin, 1889]. Concerning constant discussions about the necessity of protectionist laws towards oil export this reply to the Society practically meant a ban of customs free export. Thus the idea of an oil pipeline failed. However, a few months later it became known that an "oil pipeline company managed to procure a respite until 12 January 1889 to carry out a revision of a Charter" [Ragozin, 1889]. The instability of government policy towards oil export tariffs and pipeline construction was caused by the ambiguity of the situation. On one hand, the increase of exports might help solve the issue of the overproduction of oil in the Baku area and strengthen Russia's position on the global oil market. On the other hand restrictions of crude oil exports provided Russian ship owners with cheap mazut as a fuel and the absence of a pipeline ensured the development of railroads and trade waterways.

The issue of export tariffs and the construction of an oil pipeline was widely covered in Russian periodical press: "Novoye vremya", "Pravitelstvennyi vestnik", "Moskovskoye obozreniye", and in local press: "Baku", "Caspiy", "Bakinskiy rabochiy". The newspaper "Novove obozreniye" became a vocal opponent of a pipeline. The discussion of oil export was presented as "a lawsuit between Russian people and Ilimov" [Dolgorukov,1889]. It is likely that his oil pipeline concession drew such attention to him. According to communications of newspaper reporters who wished to remain anonymous, "Mr. Ilimov offered Rothschild an oil pipeline concession but Rothschild refused and now Ilimov shows off as an anti-monopolist but actually he offered Rothschild pumping through this pipeline one third or even a half of the whole production". It is impossible to check this information but such kind of suppositions only strengthened a negative image of an industrialist "ready to devastate and kill a developing Russian industry that provides livelihood for millions of Russian people" for profit [Ragozin, 1889]. "Novoye obozreniye" also published Ragozin's replies on Mendeleev's articles (he published them in "Moskovskiye vedomosti" and "Novoye vremya") about the necessity of an oil pipeline. Ragozin wrote: "Mr. Mendeleev and I came to life from the benches of the same faculty; he devoted himself to theory, me – to application" [Ragozin, 1889].

A special note presented to members of the Committee of Ministers by ISPRTS Board expressed arguments for both sides (appeals of stock exchange committees, Ragozin and Shuliatikov reports as well as Mendeleev publications). Despite that fact, the composition of the document was fashioned in the opposition of an oil pipeline and was designed to influence the decision of its construction. This review was published as a separate 300 page brochure in a special issue of the Society's "Proceedings" [Ragozin, 1889]. The Society Board mentioned that regardless of the value of tariffs, foreign entrepreneurs will easily and eagerly pay keeping in mind current fluctuations of the rouble and carry our national wealth abroad. This will inevitably have irreversible reflections on Russian trade fleet [Ragozin, 1889].

ISPRTS had a strong argument: the "projected oil pipeline might devastate and kill a developing Russian industry that provides livelihood for millions of Russian people" [Ragozin, 1889]. Petitions on the construction of a pipeline specified that it will be used to sell "oil residues". That gave Ragozin, Dolgorukov and other members of the Society a reason to argue

their concerns on the unprofitability of the project. It was not specified what is identified as "oil residues" thus a supposition that foreign entrepreneurs will export crude oil under the label of oil residues was reasonable. When the provision of the Committee of Ministers provided a definition in 1889 it was figured out that the export of oil residues is no less pernicious to Russian industrialists as "oil residues", meaning mazut that was widely used as cheap fuel on rail and water ways. The inevitable rise in the price of fuel will have negative effect on cost of transportation of all goods.

It is worth mentioning that in the discussion, issues of tariff policy and oil pipeline construction were not only connected but equated. From the point of view of ISPRTS, both the abolition of fees and the construction of a pipeline had a negative impact on Russian industry – this position was expressed not only in the Society's publications but also in the periodical press. Oilmen who saw the only right way of developing this branch of industry in intense export also connected tariffs and the project of a pipeline. The position of state officials was more complicated; Ostrovskiy, Vyshnegradskiy and Vitte supported the idea of a pipeline but also opposed the abolition or reduction of tariffs on oil export. Thus, there could be no strong alliance between the state and commercial actors conducting a consistent tactic on these related issues. The crucial factor in the fate of an oil pipeline project was a necessity to implement further protectionist policy that protected Russian oil extraction and oil refinery as well as shipbuilding and shipping itself.

The results of discussions

Public opinion and the attitude of government officials towards oil export from Russia resulted in the adoption of a law in 1892 tightening control over foreign activities in the oil industry. On 3 June 1892, Alexander III gave an order "to allow foreign companies and Jews" [Gorodovoe Polozhenie, 1892] to acquire oil fields in possession or utilisation "only with special permission of the Minister of State Properties on agreement with the Ministers of Internal Affairs and Finance and Supreme Commander over Civil Part in Caucasus" [Gorodovoe Polozhenie, 1892]. From 1896 to 1906, instead of an oil pipeline, a kerosene pipeline Baku – Batumi 833 km long was constructed. The diameter of the pipe was 200 mm. An oil pipeline was constructed there only in 1931[Shammazov, 2000]. The Government's decision to construct a kerosene pipeline instead of an oil pipeline from Baku to the Black Sea shore – to transport oil products instead of crude oil – was extremely beneficial for Russian industry.

Members of the Society managed to mobilise and unite in a short period of time a number of private persons and different institutions engaged in the exploitation of oil resources, to attract experts and organise discussion over issues of oil fields exploitation and oil export. The ISPRTS Board elaborated and presented to the government a note that was reinforced by reviews of reputable scientists on crude oil export and thus significantly affected the formation of legislation in this domain. ISPRTS was engaged in the discussion of oil pipeline construction from bottom to the top with the Society Board. The opposing public organisation, the Imperial Russian Technical Society, decided to organize only a special committee devoted to this issue due to the diversity of its activity. Thus the only result of this committee was presented in Mendeleev's publications.

The analysis of heterogeneous sources helps us trace trajectories of Society members' appreciation of the oil export issue and the strategies that helped them achieve the right (from their point of view) solution. ISPRTS was not a solid structure. The personal status of its

members allowed them to influence the solution of a particular question through energetic participation and using personal connections and other organisational resources of the Society. It is worth mentioning that the Society consistently defended the interests of Russian industrialists, namely shipbuilders and ship owners, and constructed its arguments according to such a position. The direct dependence of seafaring on oil resources strengthened the Society's opposition whose profile was not likely to be connected with the oil industry.

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