

# BIRTH OF THE FIRST OIL INSTITUTE IN TRANSCAUCASIA

(article dedicated to the 100<sup>th</sup> anniversary of the establishment: 1920-2020)

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**Abstract.** This article shows the origins and activities of the first technical institute of Transcaucasia over the past hundred year. Over its century-old history, the institute has transformed from a small educational centre into the largest industrial university in the former USSR, and then in the independent Azerbaijan. It trained and graduated several tens of thousands of highly qualified engineers, candidates and doctors of sciences. Former students of the Baku Institute can be found in all the republics of the former USSR, and on almost all continents: in Europe, Asia, Africa and Latin America.

**Keywords:** first oil institute in Transcaucasia, polytechnic institute, specialised scientists, graduates.

**Rezumat.** Articolul prezintă originile și activitățile primului institut tehnic al Transcaucaziei în ultima sută de ani. De-a lungul istoriei sale vechi de un secol, institutul s-a transformat dintr-un mic centru educațional în cea mai mare universitate industrială din fosta URSS, și apoi din Azerbaidjanul independent. A instruit câteva zeci de mii de studenți și a le-a conferit titluri universitare de ingineri, candidați și doctori în științe de înaltă calificare. Foștii studenți ai Institutului Baku pot fi găsiți în toate republicile fostei URSS și pe aproape toate continentele: în Europa, Asia, Africa și America Latină.

**Cuvinte-cheie:** primul institut de petrol din Transcaucazia, institut politehnic, oameni de știință specializați, absolvenți.

## Contents

1. Introduction
  2. Main part
  3. Interesting facts
  4. Conclusion
- References

## 1. Introduction

The article provides a brief overview of the first oil institute in the Trans-Caucasus [6]: its establishment and further development. It is shown that from a small higher technical educational institution created on the basis of a technical school that existed in Baku until 1920, it turned into one of the leading oil institutes of the former USSR, and then of the independent Azerbaijan. Now (since September 2015), the Baku Polytechnic Institute is named the Azerbaijan State University of Oil and Industry. Among the representatives of the institute with stages abroad were professors and lecturers who held leadership positions there (advisers, deputy deans, heads of departments). For a century of existence, the teaching staff of the Baku Institute has participated in scientific internships, conferences, symposia and congresses in almost all countries of the world – USA, UK, Canada, France, Germany, Holland, Italy, Finland, Romania, Poland, Hungary, Bulgaria, Tunisia, Japan, Turkey, India, Vietnam, Indonesia, China.

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## 2. Main part

The origins of this unique university go back to the XIX-th century, when the Baku дума (n.r. - national leading body), on the 10-th of November 1887, decided to establish the first technical school in Baku, which was further approved by the Caucasus education division of the Russian Empire, on April 26 1888. According to this regulation, the school consisted of four classes and workshops: carpentry, joinnery, forge and fitting shops. In the curriculum, on a daily basis, three hours were allocated to general subjects and seven hours to learning the handicraft.

The handicraft school was transformed in 1896 into Baku lower technical school, where 124 students were studying by the end of 1900 [1]. During that period (1899 ÷ 1901), the growing oil industry needed new technical personnel.

It is appropriate to note that during the above-mentioned period more than 97·% of oil had been produced in southern regions of the Russian Empire (basically in Baku). It is obvious that Azerbaijan was the homeland of the first “oil boom” in the world. In 1901, almost 11.4 millions tons of oil were produced in Azerbaijan, while the overall production of oil in Russia was 11.9 millions tons, i.e. Azerbaijan’s share constituted 95·% of oil production in Russia and more than 50·% in the world [2].

All these, eventually, led to a decision of Russia’s Ministry of Public Education to transform, in July 1903, the lower technical school into a secondary one, which started functioning in January 1905. In 1910, the mechanics department of the school was consisting of technical oil and electro-mechanics divisions. Besides, low industrial education institutions were functioning within the school with fitter-turning and embossed divisions and sculpture-stonemason training workshop. Moreover, in 1912, an electricity and handicrafts division was established in the handicraft school.

In 1916, the number of students studying in this school was 494. Among them there were 20 Azerbaijanies. In the middle of 1918, the technical school was reorganized into the polytechnic school, with 188 students (36 were Azerbaijanies), which were studying in its all three departments: oil industry, electro-mechanical and architectural-construction.

From the very beginning, the idea to establish the university had been founded on the plan to transform the existing above-mentioned polytechnic school in Baku [4]. A special session on the establishment of the first technical university in the republic took place in May 1920 on the initiative and under the leadership of Dadash Buniatzade, people’s commissioner on education. Later on, on the 12-th of November 1920, People’s commissioner on education addressed to the Azerbaijany Revolutionary Committee (Azrevcom) with a memorandum on the establishment of the polytechnic institute in Baku. The document included the following justification: “*The necessity to have a high technical education institution is so obvious that there is no need to prove it. Baku is an industrial centre which needs highly qualified human resources*”. The decree “On the establishment of the polytechnic institute in the city of Baku” signed by Nariman Narimanov (Chairman of the Council of People’s Commissionners of Azerbaijan) has been issued on the 16-th of November, 1920.

The decree was the most important event in the life of the Azerbaijani people at that time. For the first time, on a state level, they got access to the high technical education. We consider necessary to look through the content of this document:

*“The decree of the Azrevcom on the establishment of the Polytechnic Institute:*

- 1. Baku polytechnic school is transforming into a high education institution under the following name “Baku Polytechnic Institute named after Azizbekov” with five faculties: oil industry, electromechanical, engineering-construction, agricultural and economic.*
- 2. Premises and inventory of the Baku polytechnic school, as well as of the Russian Technical Society’s chemical laboratory (Baku branch of the Imperial Russian Technical Society - IRTS) are delivered to the authority of the Polytechnic Institute.*

3. During the admission of the students to the Polytechnic Institute, the students of the Baku polytechnic school are taken in first place on the following grounds: those who have sufficient general education are admitted to the first semester; special classes on general education subjects are organized for those who do not have such education; and, eventually, special classes are organized for the senior pupils, which would give them an opportunity to obtain technical education to a degree sufficient for engineers of the relevant professions.

4. The students of the Polytechnic Institute are equal to the students of the Baku State University in terms of rights for social care security and all types of food.

5. Those of the professors and teachers of University, as well as of the employees working in other institutions, who will occupy professor and teacher positions in the Polytechnic Institute, should get, in spite of the second employment, full payment conforming to their positions in the Polytechnic Institute.

6. Professors and teachers of the institute are equal to the staff of the Baku State University in terms of their payment and teaching quota.

7. The organization of the Polytechnic Institute and the drawing up of the institute's regulations are entrusted to the committee on professional technical education.

*Chairman of the Azrevcom – N. Narimanov*

*People's commissioner on education – D. Buniatzade*

*14 November 1920, Baku."*

A temporary organizational commission under the Baku Polytechnic Institute (BPI) was established for the implementation of the Azrevcom's decree. The commission's composition was of professors, and different categories of engineers (mining, communication lines', electrical, and construction). This commission drafted a final project of the decree "On the establishment of the Baku Polytechnic Institute and on the appointment of the first professor-teaching staff and the Institute's Scientific Council", and set a deadline for the preparatory works and the start of the education year in the institute – January 1, 1920.

A typical trait of that period was the admission commission organized by decree, which had to complete admission of the students until January 1. The admission commission was guided by the following norms: the pupils of the Baku polytechnic school and the students of the special high education institutions are admitted in the first place, secondly – the candidates speaking Turkish (Azerbaijany), thirdly – labourers, fourthly – the officials from the Central Committee and the Baku Committee of Azerbaijan Communist Party (the Bolsheviks), fifthly – Red Army soldiers, Soviet officials in the sixth place and seventhly – the rest of citizens" [3, 5].

According to the decree, professors, engineers and agronomists were appointed as professors of the Institute, and as professional staff members in various departments conforming to their specialization and previous teaching activities.

At last, the first ring, which announced the birth of the BPI, was made on January 2, 1921 at 09:30 a.m. The first lecture in the history of this institute was delivered by the communication lines engineer Samedaga Ahmedaga ogly Vekilov on higher mathematics. The total number of students studying in the first year of BPI was 1135.

In order to understand the real conditions in which the institute was formed and developed we have to underline a grim time existing in young Azerbaijan Soviet Republic – a time of constant enemy threats, internal diversions, hunger and destructions. After the foundation of "Azneft" / Azerbaijanoil (the largest Soviet association in that period in Baku) certain positive developments had been noticed in the work of Azerbaijan's oil industry: a number of new oil fields were discovered as a result of the geologic researches on the Apsheron peninsula – Ilyich bay (currently – Bayil port) and Baku settlements: Zikh, Locbatan, Gala, Garachukhur, Buzovni, Sulutepe, Korgez, Pirsaat and so on; more modern methods (rotary and down hole turbine motor drilling) started replacing the outdated ones (bailer method of production and impact method of well

drilling). The first successful test of the turbo-drill, invented by M.A. Kapelyushnikov, was carried out in 1923 under the leadership of Azneft's technical director F. A. Rustambekov.

The Committee for the construction of the factory facility for thermal cracking (by the project of engineer Semyon Kvitko) was established in May 1924 in "Azneft". It consisted of one cub sampling action with synchronous spilling. The chairman of the committee was Victor Herr. Victor Fyodorovich/Fredrick Herr (1875 ÷ 1942) was a famous oil chemist, professor of chemistry, and he has become, in 1909, the first laureate of the Baku prize named after Emanuel Nobel.

The Emanuel Nobel prize was founded under the Baku Branch (BB) of the IRTS, in November 1904, when the Rothschild's "Mazut" company in Baku paid a capital in the amount of 10 thousand to establish this new prize, which was named after Emanuel Nobel (son of Ludwig Nobel) worthy successor of his grandfather's and father's work in Russia (the BB of the IRTS was established on March 24<sup>th</sup>, 1879 in Baku)<sup>2</sup>.

Emanuel Nobel's prizes were intended to be awarded annually for the best works or inventions in the field of the oil business. The amount of the prize annually established by the BB of the IRTS was representing a capital in the amount of 1000 rubles<sup>3</sup>. E. L. Nobel's prize was awarded in Baku four times: in 1909, 1910, 1911 and 1914.

The first Baku Emanuel Nobel's prize was awarded in 1909 to the oil-chemist V. F. Herr for his work "Acquiring of the dibasic acids (adipinic, glutaric, acetic and amber) with oxidation of narrow oil fractions by nitric acid"<sup>4</sup>.

At the 3<sup>rd</sup> International Oil Congress in Bucharest (on September 8 ÷ 13, 1907) he had reported on a chemical composition of Baku oils, generating great interest among the delegates. V. F. Herr has isolated from water of Boyuk Shor's lake (in which oil-rig waters of Balakhani area in Baku were gathered) the naphthenic acids with density above 1·kg/m<sup>3</sup>. In the Soviet period, Victor Herr was the head of the chair of organic chemistry in Azerbaijan teacher's training college. During Stalin's mass repressions, he has been arrested in 1940, charged with undercover work for the benefit of Germany and exiled to prison where he died.

In the same 1924 year, Fatulla Asad ogly Rustambekov published an article about "Azneft's suggestions on the technical rationalization of oil production by the five-year programme (1923/24 ÷ 1927/28)" that for the first time presented the ways to adopt new well designs and the methods of their mounting, improvements of the transportation system and of oil storage, as well as foundations of gas industry.

Azerbaijan as part of the USSR had reached quite a lot of achievements in the beginning of the first five-year plan (1928 ÷ 1932). However, in spite of its 45-thousand staff, "Azneft" was in great need of technical and engineering staff members: at that time, the number of technical and engineering personnel of "Azneft" constituted only 218. The leadership of the association had repeatedly reported to Azrevcom: "*The lack of the technical and engineering personnel has a painful impact on oil industry in Azerbaijan*".

The BPI's task consisted of preparing the oil specialists: professor-teaching staff consisted of the engineers working at that time in Baku and the qualified teachers sent to Azerbaijan from Russia. There were 66 teaching staff in the institute in 1921. Six of them were professors, 54 assistant professors, two assistants and four lecturers.

First graduation of the engineers-specialists took place in 1923, with three graduates, while the following graduation (1924/25) gave 13 specialists to Azerbaijan, the third one (1925/26) – 46, and in 1926/27 – 289 specialists with high education were graduated from the institute for the

<sup>2</sup> Труды Бакинского отделения Императорского русского технического общества (БО ИРТО), 1904, выпуск 6, с.33 / Transactions of the Baku Branch of the Imperial Russian Technical Society (BB IRTS), 1904, issue 6, p.33

<sup>3</sup> "Transactions of BB IRTS", 1904, # 6, p.33-55 and 1910, # 3-4, p.10-11; "Oil Business", 1910, # 13, p.35

<sup>4</sup> "Transactions of BB IRTS", 1909, # 5-6

republic. During the industrialization of the USSR (in 1929), the institute received the task to prepare in the up-coming five years 430 specialists for oil industry, 151 – for oil production, 199 – for oil exploratory drilling field. The plan was fully implemented and by the end of the first five-year plan (in 1932) the number of oil specialists in “Azneft” increased three times. It would be appropriate to mention that oil production in the USSR in 1932 was 22.2 million tons (against the planned 21.7 million tons); share of “Azneft” made up 12.2 million tons or 55%.

New faculties were established in the BPI under Nikishin’s leadership: mechanical, oil development, geologic-exploratory, oil-chemical, construction, transportation, industrial-economic and hydropower. His book with the title *Black gold. Overtake and surpass* was published in 1930 in Baku. He described in details the events in Absheron in the early 20s of the 20<sup>th</sup> century and presented the actions of Baku oil workers for the restoration of Azerbaijan’s oil history. Nikishin’s contribution to the establishment of the first high education institution in the republic and his timely actions for its development were appreciated with the high prize – Order of the Labor Red Banner.

It is important to emphasize here that the reorganization of BPI in the AOI (Azerbaijan Oil Institute) laid the foundations in the 30s of the 20<sup>th</sup> century for the rapid spread of technical and oil special higher education in Azerbaijan. As a matter of fact, following the reorganization of BPI as the AOI the hydroeconomic faculty existing in the BPI was transferred to the newly organized Trans-Caucasian Cotton Institute in Baku, while, in part, it (the hydraulic specialization) remained in the oil institute. The new industrial-economic faculty was established in AOI on the basis of the economic faculty closed before. Eventually, the former BPI had separated on Azerbaijani Agricultural Institute (organized on the basis of the agricultural faculty of the AOI), Azerbaijan construction institute and, finally, the AOI.

It was an integrated view about the engineers and specialists prepared in AOI, thus about the disciplines necessary to this type of engineers and specialists in the whole economy of the country. For example, a physics department was organized in the institute from the very first days of its establishment. It is symbolical that a "Father" of the Soviet atomic bomb, I. V. Kurchatov, made his first steps to big science in this department in the 1924/25 academic year [7].

The scientific work of the departments of physics and of colloidal chemistry was quite substantial, already in the first years of their existence. Its staff member, professor V. I. Tikhomirov has discovered new phenomena – the “abnormal polarization” of platinum electrodes under a silent electric discharge between them in the air and hydrogen. The professor of physical chemistry in the Leningrad polytechnic institute, academician V. A. Kistjakovsky called this research the “*Tikhomirov’s polarization*”. It has to be underlined that the “*Tikhomirov’s polarization*” terminology got recognition in the world literature. For the first time in the USSR, in 1931, two books by Professor Tikhomirov were printed in Baku: “Physical chemistry for the oil technologists students” and “Colloidal chemistry for oil workers”.

The world-level research had been carried out in the organic chemistry department since 1929, when the well-known professor K. A. Krasusky had led this unit. He was supervising the scientific works until the end of his life in 1937 and had done a lot for the development of organic chemistry in young Azerbaijan Soviet Republic. He formulated in 1911 a rule (which carries his name so far) on epoxy ring break in the organic compounds, which is recognized by organic chemists all over the world.

Professor M. M. Skvortsov, who led the oil industry energetic department that was established in the BPI in 1927, designed in 1925, for the first time in the world, a device with automatic drill feed – “automatic driller”, which was tested for the first time in Surakhany (near Baku). The creation of the first electrical dewaxing unit in the USSR (so-called “*machines of professors M. M. Skvortsov and Z.B. Yelyashevich*”) was one of the main achievements of this department in 1940÷1945.

The direction followed by the first graduates of the institute was typical: they, as a rule, were going to work in oil and other industry branches of the Republic. Obviously, the young Azerbaijan Soviet Republic desperately needed young specialists with high oil education. This is why, most of the graduates stayed to work in the Republic up to 1931.

However, starting from 1932, following the development of oil industry in the USSR and the exploration of new oil-gas bearing regions, more graduates of the Baku Polytechnic Institute started leaving Azerbaijan. For instance, in 1932, 117 out of 274 graduates had been sent to “Azneft”, while the remaining graduates were assigned to other oil associations of USSR: “Maykopneft”, “Sredaneft” (Central Asia Oil), “Embaneft”, “Grozneft”, “Turkmenneft”, “Vostokneft”, “Sakhalinneft”, as well as to oil factories and bases in Moscow, Saratov and others cities. Only 109 out of 254 graduates in 1935 remained in Azerbaijan, while the rest of them were assigned to various republics of the Soviet Union. As an example, we can also note that from 1960 to 1981, the Baku Polytechnic Institute trained 892 engineers, 50 candidates of sciences (PhDs) and 26 masters from 48 countries of the world.

Of course, we understand that it is impossible to cover everything within one article. Our goal was to show the origins of the oldest higher education institute in the Transcaucasia (South Caucasus) and to highlight the work of at least some of the world-known scientists, who were the founders of the Baku Polytechnic Institute (at the moment, from September of 2015 its name is Azerbaijan State University of Oil and Industry).

### 3. Interesting facts:

1) The list of famous graduates from Baku Polytechnic Institute:

- Nikolai Baibakov, head of Gosplan (USSR State Committee for Planning) of the USSR;
- Lavrentiy Beria, chief of the Soviet security and secret police apparatus under Iosif Stalin, manager of the atomic project in the USSR;
- Farman Salmanov, famous oil and gas scientist who discovered oil deposits in Siberia;
- Sabit Orujov, minister of the gas industry of the USSR;
- Kerim Kerimov, head of Soviet space program;
- Vitaly Zholobov, Soviet cosmonaut who flew on Soyuz 21 (1976).
- Heydar Aliyev, President of Azerbaijan from June 1993 to October 2003;
- Vagit Alekperov, President of the Russian oil company LUKOIL;
- José Eduardo dos Santos, president of Angola;
- Mahaman Laouan Gaya, former minister, secretary general of ministry of energy and petroleum of Niger;

2) At present, Baku Polytechnic Institute is cooperating with several foreign universities:

- Georgia State University (USA),
- Zigen University (Germany),
- Ploiesti Oil and Gas University (Romania),
- Trondheim City Science and Technology University (Norway),
- Russia's State Oil and Gas University (Russia),
- Genua University (Italy),
- Nisa Sofia-Antipolis University (France),
- Athens National Technical University (Greece),
- Khazar State University of Technology and Engineering (Kazakhstan).

### 4. Conclusion

During its 100-years existence this institute had various names, but the most important is that it never betrayed the basic principles implementing its oil industry assignment. We should always remember that this oil “forge of drilling specialists” was the first institute in Europe and in Asia, which started the training of the technical, oil and chemical specialists for all branches of oil and

chemical industry. A clear evidence for it - is that in 1981 the Baku Institute trained oil specialists on 31 engineering professions; more than 15000 students, including 1200 students from 55 foreign countries, were studying there. And also, from 1970 to 1980, 399 technical solutions developed by the employees of the Baku Polytechnic Institute were recognized as inventions in the field of drilling; 11 patents were obtained in the USA, Japan, France, Spain, Venezuela and Italy.

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