

BRIEF HISTORY OF THE FIRST OIL DRILLING WELLS IN BAKU REGION

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ABSTRACT

Azerbaijan, which has been linked with oil for centuries, became a famous frontrunner in the world's oil industry in the 19th century. Well before the famous discovery of oil in a drilled well in Pennsylvania by Edwin Drake in 1859, Azerbaijan had drilled its first oil well in Bibi-Heybat (settlement of Baku) in 1846. And also, in 1851 at the World Exhibition in London, samples of oil from Baku (Absheron) oil fields were exhibited by Prince Mikhail Vorontsov (Viceroy of the Russian emperor in the Caucasus). Historical sources and documents found in recent years in the Central State Historical Archives of Russia and Azerbaijan prove that the drilling of industrial oil wells in the world began in Bibi-Heybat in 1846.

KEYWORDS: 19th century Russia (Azerbaijan), oil well drilling, oil recovery, wells, technical society, oil magazine.

1. Early years of oil extraction in Baku region

On January 1st, 1825, the Baku petroleum fields started to be administrated directly by the Tsar Treasury. At the same time, N.I. Voskoboynikov, a talented mountain engineer, was seconded, together with his mission-mate Ensign Talalayev, to be sent to Baku Town in accordance with the Mountain Expedition in order: "... to check and accept Baku town's major wells and warehouses with white and black oils as the public property located in Balakhani, Binagadi, Surakhani and Bake (Baku – Author) from Tarumov; tax-farmer² had to present the detailed registration book signed commonly about the number of wells and warehouses, their status and quantities of unsold oil still stored at warehouses; which buildings and assets belonging to the tax-farmer had to be handed over to the Treasury; how much unsold and stored oil in Masazyr and Zykh³ was in Baku; are the warehouses comfortable in use."⁴

Nikolay Ivanovich Voskoboynikov (1801-1860) – was a Lieutenant Colonel in the mining engineering corps. After having successfully accomplished the mission, Voskoboynikov sent the extensive report to the Mining expedition about the status of the oil and salt resources of the Absheron Peninsula. It is interesting that his materials remain currently the only source where one can find a comprehensive description of the status of the public and private oil wells of the Absheron Peninsula under the lease-out system and on the eve of its transition to the direct State administration. In this context, in accordance with the data of Voskoboynikov: there were 17 wells near Bibi-Heybat on January 1st, 1825 which were farmed out by Tarumov; 1 private well; and 82 public wells with black oil in Balakhany. Voskoboynikov emphasized that there were 16 stone warehouses⁵ constructed alongside the northern ramparts of Baku city which were full of oil which had been transported on carts from almost all of the oil wells on the Absheron Peninsula (Fig. 1) [1-3].

Furthermore, N.I. Voskoboynikov worked several times as the director of the Baku oil and salt fields in 1825 and 1834-1838, which positively impacted the development of the Azerbaijani oil

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² The tax-farmer is a person who owns and keeps wells and gives a certain amount of income (a paying sum) to the tsar's treasury for this privilege.

³ Balakhani, Binagadi, Surakhani, Masazyr and Zykh are the settlements of Baku on Absheron peninsula (Author).

⁴ The State Historical Archives of the Republic of Azerbaijan, f.24, op.24, d.390, p. 2.

⁵ Currently, these places of warehousing are taken for the building of the Presidium of the National Academy of Sciences called "Ismailia" and Mirza Sabir's square in Baku.

history. His main achievements are the following: elaboration of the extensive action plans in the fields of extraction, exploration, storage, and sales of oil.

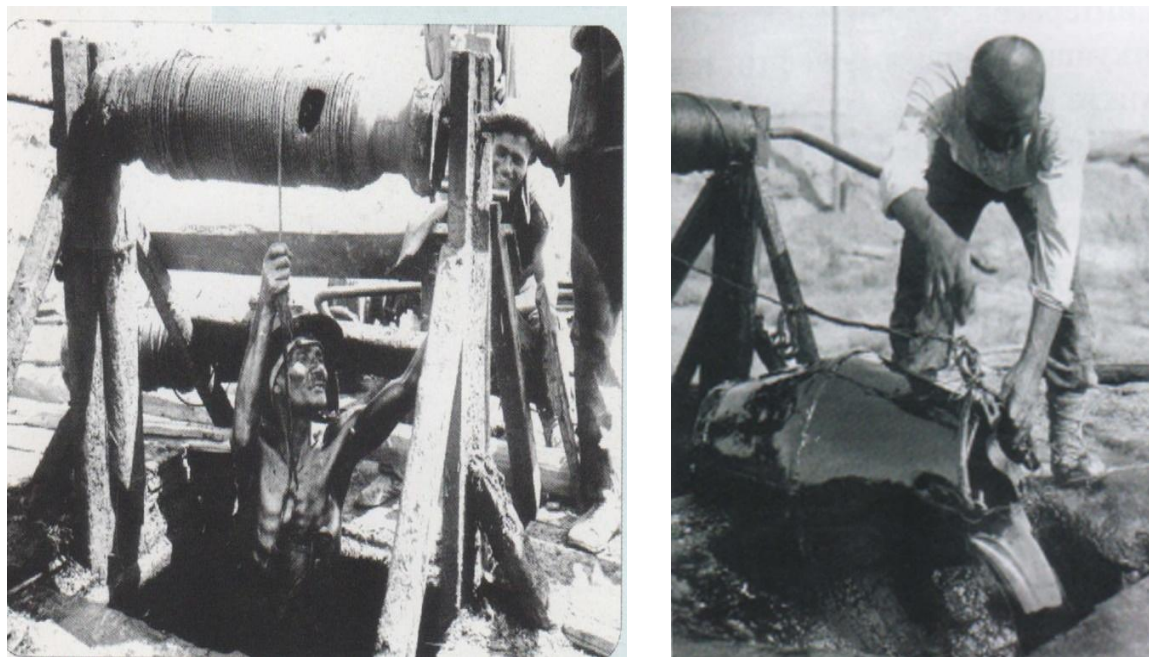


Fig. 1. Two photos of oil recovery from wells on the Absheron peninsula (Azerbaijan National Archives / ANA).

Having faced in his pathway the significant obstacles put there by the power of the rich elite⁶, which had absolutely been against cessation of wells to the Treasury, Voskoboynikov undertook full-scale measures in the Absheron, which definitely favoured the creation and development of the oil industry in Azerbaijan. For example, he undertook the concreting of pavement at oil warehouses; obtained equipment to get kerosene for illumination by refining the Surakhani oil; accounting for oil by installing cuttings in oil storage facilities; the use of white and black oil instead of turpentine, tar, and cod-liver oil for lighting the houses, street lamps, and lighthouses; as well as the process to "...impregnate timber with oil, which is used for the construction of the top sides of ships" [1, 2].

In 1837, the Trans-Caucasus Society for the Promotion of Industry and Trade, created by the initiative of Voskoboynikov, ensured data collection on oil consumption in all the Caucasus oil fields. Activities of this Society favoured oil sales in Azerbaijan and Trans-Caucasus as a whole. The oil refining plant of Voskoboynikov became the first such plant in the Absheron which started its activities in Balakhany in 1837 and mastered "...special refining facility and steel bulks for transportation."⁷ But he did not succeed in completing the process of refining oil into kerosene, for Voskoboynikov resigned in 1846 and left the Absheron Peninsula forever.

In accordance with data of the Caspian Chamber of the State of Properties of the Ministry for Public Properties in 1842, there were 136 functioning wells in the Absheron, which annually yielded up to 3.8 thousand tons of oil; and, in fact, the oil extracted in large quantities was exported to Persia. The deepest point of the wells was up to 14 sazhen⁸.

⁶ Such as E.F. Kankrin, Minister of Finances; General E.A. Golovin, Commander-in-Chief in the Caucasus who had replaced General A.P. Yermolov; and others.

⁷ ACAC, volume 9, page 651.

⁸ 1 sazhen is equal 2.13 meters; sazhen is an Old Russian measure of length.

2. First drilled well in the world

In 1846, Vasily Nikolayevich Semyonov (1801-1863), a member of the Caucasus Main Administrative Council, proposed to drill an oil well to a depth of 21 meters for oil exploration, thus becoming the first and deepest drilled well in the world (Fig. 2). The drilling operation was led by Major Alekseev, Director of the Mining Engineer Corps of the Baku oil fields⁹. Thus, Azerbaijan preceded the United States of America by 13 years in drilling the first oil well as the first American drilled oil well is dated August 1859. However, it is indeed true that it wasn't until after 1859, and after tapping huge artesian sources in Venango County, Pennsylvania, that the exploitation of the large commercial oil fields started to expand.



Fig. 2. A replica of the world's first drilled oil well derrick; drilled at Bibi-Heybat, Baku, in 1846 [Azernews, N31 (1233) April 28 – 2 May 2017, p.1].

In his address to Fyodor Pavlovich Vronchenko (1779-1852), Stats-Secretary, dated 8th - 14th of July, 1847, Grand Duke Mikhail Vorontsov, Governor-General of the Caucasus (1782-1856), officially confirmed the completion of the drilling the first oil well in Bibi-Heybat: *I authorized the Shemakha Public Chamber to conduct oil exploration works in Baku uyezd, on the shore of the Caspian, in Beybad tract using earth augers at the basis of required fees to the amount of 1000 roubles in silver allocated by you in 1845 for this purpose. With this result, acting Director of Baku and Shirvan mineral fields reported that they had tapped Oil in Beybad...*¹⁰

Also, the Caucasus Vice-Roy, Prince Mikhail Vorontsov, led the Russian delegation to the Great Exhibition which opened in London on 1 May 1851. Samples of Baku (Absheron) oil were displayed in the Chemical products section under the numbers: 32) Black oil from the Shemakha province of Baku district, from the Bibi-Heybat, Balakhani and Surakhani wells; and 33) White oil from the Surakhani well.

Even this was eight years before the drilling of the first well in the USA [4, 5].

Another interesting fact is that in 1858-1859, the Russian prominent oil businessmen Vasily Kokorev (1817-1889), Peter Gubonin (1828-1892), and the German Baron Nicolay Tornow (1812-1882) constructed the first factory in Surakhani near the temple of fire-worshippers, to receive

⁹ ACAC, v. 10, p. 137.

¹⁰ ACAC, v.10, p. 145; Beybad means Bibi-Heybat (Author).

lighting material from Balakhani oil. The photonaphthyl (light oil) received there from 1861 became the first competitor of American kerosene in the markets of Russia empire.

This brings us to another interesting person, mentioned above, involved with the Baku oil fields, Mikhail Semyonovich Vorontsov, a Russian commander and statesman. Besides high home awards, in January 1819, he became an Honourable Knight of the Order of Bath, a high military award of Great Britain (Grand Cross Breast Star). In 1844, he was the commander-in-chief of Russian forces on the Caucasus and the Caucasian governor. In May 1845, he served with the forces in the well-known Dargin's Campaign, which in two months of difficult fighting concluded with the capture of village (*aul*) of Dargo, the base station of Shamil. For this campaign, Vorontsov was promoted in princely advantage, and he was appointed a chief of Kura's Chasseur's Regiment¹¹. In 1847, Vorontsov personally headed the forces operating in Dagestan; and he supervised the storming of Gergebil and the capture of Salta. In 1853, before the Crimean War, he was occupied with the strengthening of border with Turkey and protection of the Black Sea coast line. Later, because of age and health's deterioration, Vorontsov resigned and left the Caucasus forever. He died in Odessa in 1856.

Vorontsov's connection to the well drilling comes from a letter in 1844. During that year, V.N. Semyonov in his presentation letter to the Governor General of Caucasus noted that annual revenues from black oil sales were ranking from 80 to 85 thousand roubles in silver, but these sums could be raised to 100 thousand, if it is possible to do the following:

- 1) To rebuild two main wells.
- 2) To drill deeper wells using auger.
- 3) To dig up new wells using the method proposed by Voskoboynikov.
- 4) To create a precipitation tank for the separation of oil from water.
- 5) To ensure conditions for oil refining.¹²

In 1848, a new well, which had yielded 110 poods¹³ of oil per day, was constructed in that epoch in Balakhani; for the construction and arrangement of this well, 1100 roubles in silver were spent [ACAC, v.10, p.868]. But at the time, no serious attempts were made to implement Semyonov's recommendations because Grand Duke M. Vorontsov had supported the tax-farmers [3-5].

Even though the first well was drilled near Baku, the drilling of oil wells was officially forbidden in Russia up to 1869. The government heeded the recommendations of foreign specialists who used to substantiate the uselessness and lack of prospects in drilling for oil extraction. For example, the *Trans-Caucasian Trade Society* was refused authorization when it had solicited the government for permission to drill a well in 1866. It is, indeed, the success of the oil business in the United States that prompted attention to the European (Galicia) and later to the Caucasian (Absheron) oil fields. The intensive construction of existing oil wells (chinks/derricks) to depths of 45-50 meters started in 1872, which halted completely the construction of new wells.

3. Comparisons

A comparison of production rates of the Absheron and American wells were given in the article entitled "Oil in the United States and Russia"¹⁴, written by P.A. Chikhachev (1809-1890), a prominent geographer and orientalist, who had visited European, Near and Middle East countries for almost 30 years. He found that the Absheron wells yielded 3 times more oil than the ones in the

¹¹ Kura is big river in Trans-Caucasian region.

¹² The Archives of Department for Mining and Salts Affairs; section 4, table 2, file #2465.

¹³ A *pood* is a unit of weight equal to 16.4 kg. *Pood* is an Old Russian measure of weight.

¹⁴ Large Encyclopedia. St-Petersburg, Prosvesheniye Publishing House, 1896, v.20, p.119; *Azerbaijan Oil Industry* magazine, 2000, #5, p. 56.

United States at that time. Even the “gusher” or self-flowing wells were higher, *e.g.*, the height of oil fountains in the Baku oil region reached 84 m, while it was just 19 m in the USA. The first powerful fountain, known as “Vermishevskiy”, in the Absheron started inside a well located on the site of “Khalafi” Trading Society on June 13th, 1873. This well produced more than 90 million poods of oil in just three months of operation. On the 14th of October 1875, a new second strong fountain at a depth of 45 sazhen (96 meters) was initiated in the oil field of “Souchastniki” Company; for one month this well yielded up 150,000 to 200,000 poods per day. This fountain formed four large oil lakes in Balakhani [3].

In accordance with data of S.M. Lisichkin, the overall number of functioning wells in 1873 was equal to 158 and the drilled oil wells (chinks/derricks) were just 9, but in 1876, the number of functioning wells and drilled oil wells (chinks/derricks) was the same – 62 [6]. This means that digging, as opposed to drilling, new wells for dredging out the surface oil using the obsolete manual method stopped.

The steep rise in the number of drilled oil wells (chinks/derricks) started by using new techniques in oil extraction and refining in that epoch: the first steam machines were emerging in the market; large capacity spoons in length relevant to the wells’ depth or long steel buckets with an opening bottom were used for oil extraction, and then the contents were poured into trough leading to warehouses.

4. Advances in oil drilling

In 1873, an engineer, V. Neruchev, visited Baku, and noted the oil extraction from drilled wells (chinks/derricks) in the following manner: *... the spoon is lifting almost 5-8 poods of oil which takes from 3/4 up to 3 minutes depending on the movement inertia and the well depth. If lifting and lowering of the spoon is done using steam power and the well depth does not exceed 30 sazhen, then one lifting and lowering of the spoon needs not to be more than 45 seconds; but if the steam power is replaced by horse power, it takes almost 1 minute; the manpower takes approximately 2-3 minutes. This method of oil extraction in Baku is called oil-bailing [Priroda (Nature), 1876, 1st book].*

K.I. Lisenko, a famous oil chemistry specialist and professor of the Saint-Petersburg Mining Institute noted in 1878 that starting from 1874, the number of drilled oil wells (chinks/derricks) had intensively increased, while dug wells were getting fewer; *e.g.*, the primary oil extraction was ensured by drilled oil wells, and dug wells were playing the auxiliary role. In 1878, there were 301 drilled oil wells in the Absheron, 251 were located in Balakhani, Sabunchi, Romani, and Zabrat.

Konon Ivanovich Lisenko (1836-1903) was professor of chemistry, and mine engineer. He graduated from the Mining Cadets Corps in 1856. Later on, he worked in Heidelberg Laboratory of Professors Robert Bunsen and Emil Erlenmeyer. From 1877 to 1888, he worked as the editor of the oldest scientific-technical journal of Russia called *Gorny (Mining) Journal* which was published for the first time in 1825 in Saint-Petersburg. He visited Baku on several occasions to study the oil processing. The scientific writings of Lisenko are numerous, but its main directions are the following:

- 1) Proves the differences between the hydrocarbons found in American and the Baku oils;
- 2) Theoretical substantiation of the practical method of cleansing the oil distillates.

Main Lisenko’s works were published in the *Gorny Journal*, but also in such outlets like *Zapiski Imperatorskogo Russkogo Tekhnicheskogo Obschestva/ IRTO* (Notes of Imperial Russian Technical Society), *Works of Baku Branch (BB) of IRTO* and *Neftyanoye Delo* (Oil Business). K.I. Lisenko was the first to announce the idea of the creation of “the oil station,” sort of a library, in Baku where all journals of drilling works (which enabled the draft the geological map of the Absheron) were kept, as well as to research oil found at various depths.

In the end of the present study, we shall present the notes of I.A. Shteyman, an engineer and administrator of the Mining Mines on the Caucasus, which contains, in our opinion, the necessary and important proposal for that epoch about the organizing of the oil business in the Absheron by using private capital: *In spite of the huge development of the American oil business, the Caucasian oil could compete with the American... The abolishing of the farming system will become an important step towards the development of the industry. Once the government repeals the farming system, it will open up useful possibilities for the private sector. The most principal of its obligations should be the elimination of all economic obstacles put on development of any oil field. The rest will depend on the skills of private people to get involved in the business and their entrepreneurial knowledge. In this respect, it is not possible not to envy the skills of our transatlantic friends.*¹⁵

Ivan Alexandrovich Shteyman (1820-1894) was a famous coordinator of the Russian Mining Business and secret councilor. He graduated from Petersburg's Mining Institute in 1842. In 1866–1885, he headed *The Mining Department on the Caucasus and Transcaucasia*, and he contributed significantly to the establishment and the development of the Russian oil industry. Shteyman is the initiator of drafting the geological maps of the Caucasus and the Absheron peninsula.

In February 1872, Russian Emperor Alexander the Second (1818-1881) approved the project “On Rules in the Oil Business and Excise from the photogenic production” in Saint-Petersburg by writing these simple words on the document presented to him – *To be so!* [Gorny Journal, 1872, # 3, p.20]. This switched on the green light for Russian, local, and foreign capitals to flow into the Azerbaijani oil industry.

Here it should be mentioned that Russian (Azerbaijani) scientists, geologists, and economists believed that the depths of Azerbaijan contain rich oil deposits. The mining engineer G.D. Romanovsky noted that ... *Now when the American petroleum areas, especially the Pennsylvania, are losing their industrial significance year after year, our Caucasus will undoubtedly come to the forefront as the richest country in the world in relation to oil* [Gorny Journal, 1873, v.II, #4, p.2].

Gennady Danilovich Romanovsky (1830-1906) was a Russian geologist and mining engineer, specialist in the field of drilling, exploration and development of mineral deposits. In 1851 he graduated from the St. Petersburg Institute of the corps of mining engineers. In 1851-1902 he worked in the Main Mining Administration in St. Petersburg, at the same time he taught at the Mining Institute (1871-75, 1879-96). In 1859 during exploration drilling for oil in the Moscow region for the first time used a steam engine, applied cementing wells, and developed a new type of drilling bit. He led deep drilling to the underground waters in the vicinity of St. Petersburg and the Crimea, studied the geological structure of Caucasus and Turkestan, and predicted the oil content of the Fergana Valley.

Briefly, drilling the world's first deep well in Bibi-Heybat in 1846 marked the end of the period of dug wells (well-mining) on the Baku (Absheron) oilfields.

5. Historical data on the oil extraction

Here is a time-line of events relating to the dates of drilling of the world's first oil wells at various locations, with reference citations.

The list does not include saltwater wells in which petroleum was a secondary product, but rather only wells in which oil was the specific objective.

¹⁵ Notes of the Caucasian Branch of Imperial Russian Technical Society, 1899, document # 10.

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- 1846: Successful drilling of a 21-meter oil exploration well in Baku (Bibi-Heybat, Azerbaijan). Works were supervised by Mayor Alekseev, the Director of Baku oilfields [*Acts Collected by the Caucasian Archeographic Commission (ACAC)*, Tiflis, 1885, vol. 10, document 1143, p.145; Fooks I.G., Matishev V.A., *Illustrated stories of the history of Russian oil and gas business. Part I* – Moscow, Neft-Gas publishing house, 2000, p.71].
 - 1857: First drilling of oil wells at Bacău, northeast of Bucharest, on the Romanian side of the Carpathians. This year is registered as a beginning of Romania's oil production [www.geohelp.net/world.html].
 - 1858: First oil well in North America was hand-dug at Oil Springs in Ontario, Canada [www.geohelp.net/world.html; Earle Gray, *The great Canadian oil patch, second edition; the petroleum era from birth to peak*: Edmonton, Alberta, Canada, June Warren Publishing Ltd, 2004, 584 p.]; Earle Gray, *Ontario's Petroleum Legacy; the birth, evolution and challenges of a global industry*: Edmonton, Alberta, Canada, Heritage Community Foundation, 2008, 112p.].
 - 1859: Edwin L. Drake and William "Uncle Billy" Smith drilled the first 21-meter (69.5 feet) well in Titusville (Pennsylvania) [William Brice, *Myth Legend Reality. Edwin Laurentine Drake and the Early Oil Industry* – Pennsylvania, Oil region Alliance, 2009, p.311].
 - 1864: Russia's first development well was drilled to the depth of 198 meters in the Kudako River region in Kuban under the supervision of Colonel Ardalion Novosiltsev [Fooks I.G., Matishev V.A., *Illustrated stories of the history of Russian oil and gas business. Part I* – Moscow, Neft-Gas publishing house, 200, p.137].
 - 1893: A well was drilled of 132 meters in Grozny (Alkhan-Yurtovsky-Yermolovsky area), Russia. The works were supervised by L. I. Baskakov. [*Kaspiy (Caspian) newspaper*, #114 of 30-May-1893; *Acts Collected by the Caucasian Archeographic Commission (ACAC)*, Tiflis, 1904, vol. 12, p.621].
 - 1897: China is considered the world's oldest oil producing country. Oil production with the use of bamboo pipes started over 2000 years ago. Contemporary oil history in China began in the 1897. The first field with insignificant oil resources was discovered by Chinese-Russian drilling team in Dushantszi district in south-western part of Jungar basin [Perodon A., *History of large oil and gas discoveries. Translated from French* – Moscow, Mir Publishing House, 1994].
 - 1899: Well # 7 in Karashungul field produced the first gush of oil from the depth of 40 meters. This heralded the beginning of the official history of Kazakhstan oil development [Cherdabayev R.T., *Oil: yesterday, today and tomorrow* – Moscow, Alpina business books publishing house, 2010, p.204].
 - 1904: Mexican Petroleum Co. drilled La-Pas # 1 well to the depth of 502 m on April 3, 1904. The initial production rate was about 500 barrels daily [Perodon A., *History of large oil and gas discoveries. Translated from French* – Moscow, Mir Publishing House, 1994].

6. The Drake Well Museum in USA

It should be mentioned that in 1911, on the 52nd anniversary of the American oil well in Titusville, Pennsylvania, as a memorial to the memory of Edwin Drake (1819-1880), the founder of the American oil business, who, with William "Uncle Billy" Smith, drilled the first well in Pennsylvania in 1859, Edwin C. Bell initiated the establishment of the Drake Memorial Museum [7].

A Russian magazine, *Oil Business* (Fig. 3), published in Baku¹⁶ from 1899, in 1911, writing about that new museum, said that: ... *the history of the oil industry will be presented at this museum*

¹⁶ In 1899 a regular issue of the newspaper *Neftyanoye Delo (Oil Business)* began in Baku. In 1908, the newspaper was transformed into a journal with a significant expansion of the range of topical issues discussed in the oil and gas



a)



b)

Fig. 4. New exhibit space at the Drake Well Museum (a); the replica of the engine house and derrick (b) (Brice, William).

7. New museum under construction

Currently, serious construction continues in Baku by SOCAR (State Oil Company of Azerbaijan Republic) on the creation of the largest Oil Museum in the East. The Museum will be placed in Bibi-Heybat settlement of Baku, behind the big Bibi-Heybat mosque.



Fig. 5. The monument commemorating the drilling of the first oil well in the world [Azernews, N31 (1233) April 28 – 2 May 2017, p.1].

Recently, in 2017, the site of the first oil well on Bibi-Heybat (Baku settlement) - the world's first mechanically drilled oil facility – was restored (Fig. 2, Fig. 4 – Fig. 8) [10].



Fig. 6. The stone monument stands in front of a replica of the original derrick [Azernews, N31 (1233) April 28 – 2 May 2017, p.1].



Fig. 7. An old walking beam at the replica site [Azernews, N31 (1233) April - May 2017, p.1].

In 2017, Azerbaijan celebrated the extraction of two billion tons of oil.



Fig. 8.

I express my gratitude to *Azernews* for taking the photos of restored unique well.

8. Conclusions

The oil industry had been in operation in the Baku region since before Marco Polo travelled through the Caucasus region in the 13th century. And as early as 1842, there were over one hundred functioning oil wells in the Absheron Peninsula, but these were dug wells.

All that changed in 1846, when Vasily Nikolayevich Semyonov proposed drilling for oil, rather than digging. This was done and the world had its first drilled oil well.

A new museum is now being constructed at the site of this well.

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